THE TERRESTRIAL ECOLOGY BASELINE & IMPACT ASSESSMENTS FOR THE PROPOSED CASTLE OHL CORRIDOR

De Aar, Northern Cape Province

May 2022

CLIENT

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a fauna and flora baseline and impact assessment for the project consisting of Overhead transmission line (OHL) to connect to the authorised Castle Wind Energy Facility (WEF) to the existing Hydra Main Transmission Substation (MTS), on farms near De Aar in the Northern Cape. The proposed transmission line would consist of a 132kV to 400kV (single or double circuit) OHL. Associated infrastructure will include permanent access/service tracks (where no existing roads exist) as well as temporary laydown areas and site camps that will be rehabilitated after construction (Figure 1-1).

The Proponent obtained Environmental Authorisation (EA) for the construction of the proposed Castle WEF and associated infrastructure, near De Aar (DEA ref: 14/12/16/3/3/2/278) on 8 May 2015. Subsequently the EA has been amended several times to account for changes to the proposed project's scope. Moreover, an EA for a proposed OHL from Castle to the Hydra MTS was obtained by the proponent (DEA ref: 14/12/16/3/3/1/1351), on 5 October 2018. During the several years ensuing these EAs the number of Renewable Energy (RE) developments and associated infrastructure such as transmission lines planned for around the town of De Aar (specifically the Hydra MTS) has increased significantly. This can mainly be attributed to two factors, the availability of RE resources and ability of RE developments to feed into the national grid at the Hydra MTS. The congestion of RE infrastructure has subsequently led to the OHL authorised (DEA ref: 14/12/16/3/3/1/1351) to evacuate electricity generated from the Castle WEF to become unfeasible. Consequently, the Proponent has identified a feasible alternative OHL route to connect the Castle WEF to the Hydra MTS. The new alternative includes in part a new OHL (Section A) and in part the upgrading of an existing OHL (Section B) as well as a small section that could potentially feed into the planned (authorised but not built) De Aar South WEF substation.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 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" (Reporting Criteria). The National Web based Environmental Screening Tool has characterised the terrestrial sensitivity of the OHL corridor as "Very High".

The purpose of the specialist studies is to provide relevant input into the basic assessment process and 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.

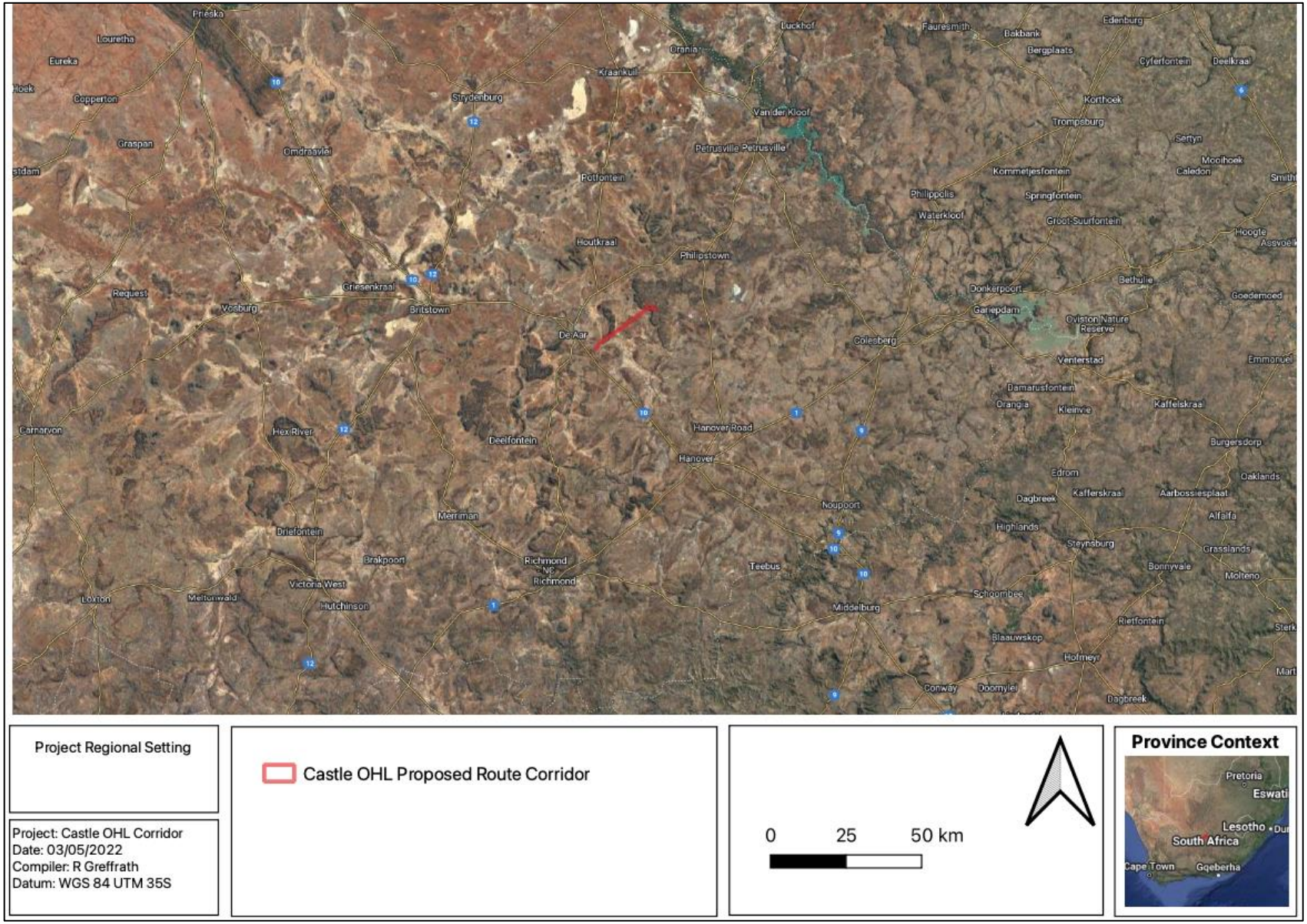


Figure 1-1 Proposed location of the project area in relation to the nearby towns.

1.2 Specialist Details

Report Name	**THE TERRESTRIAL ECOLOGY BASELINE & IMPACT ASSESSMENTS FOR THE PROPOSED CASTLE OHL CORRIDOR**
Reference	**Castle OHL Corridor**
Submitted to	EnviroAgri Environmental Consultants
Report Writer	**Rudolph Greffrath** 
	Rudolph is a terrestrial ecology specialist with 14 years of experience in biodiversity baseline assessments, biodiversity action planning design and development, biodiversity off-set design and implementation, biodiversity strategy design, conservation management planning and implementation, IFC performance standards best practice, ecological restoration, ecosystems services and environmental impact assessments, across Africa. He is Pr Sci Nat registered (400018/17) in the following fields of practice, Conservation Science.
Reviewer and Wetland Report Writer	**Andrew Husted** 
	Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

1.3 Scope of Work

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

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

2 Key Legislative Requirements

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

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

Region	Legislation / Guideline
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 1996)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989)
	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) (Act No. 36 of 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 and, Alien and Invasive Species List 20142020, published under NEMBA
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
Provincial	Northern Cape Planning and Development Act no. 7 of 1998
	Northern Cape Nature Conservation act no. 9 of 2009

3 Methods

3.1 Project Area

The authorised Castle OHL Corridor east of De Aar, Northern Cape. Presently, the project area is surrounded by natural land and is adjacent to a secondary road (Figure 3-1).

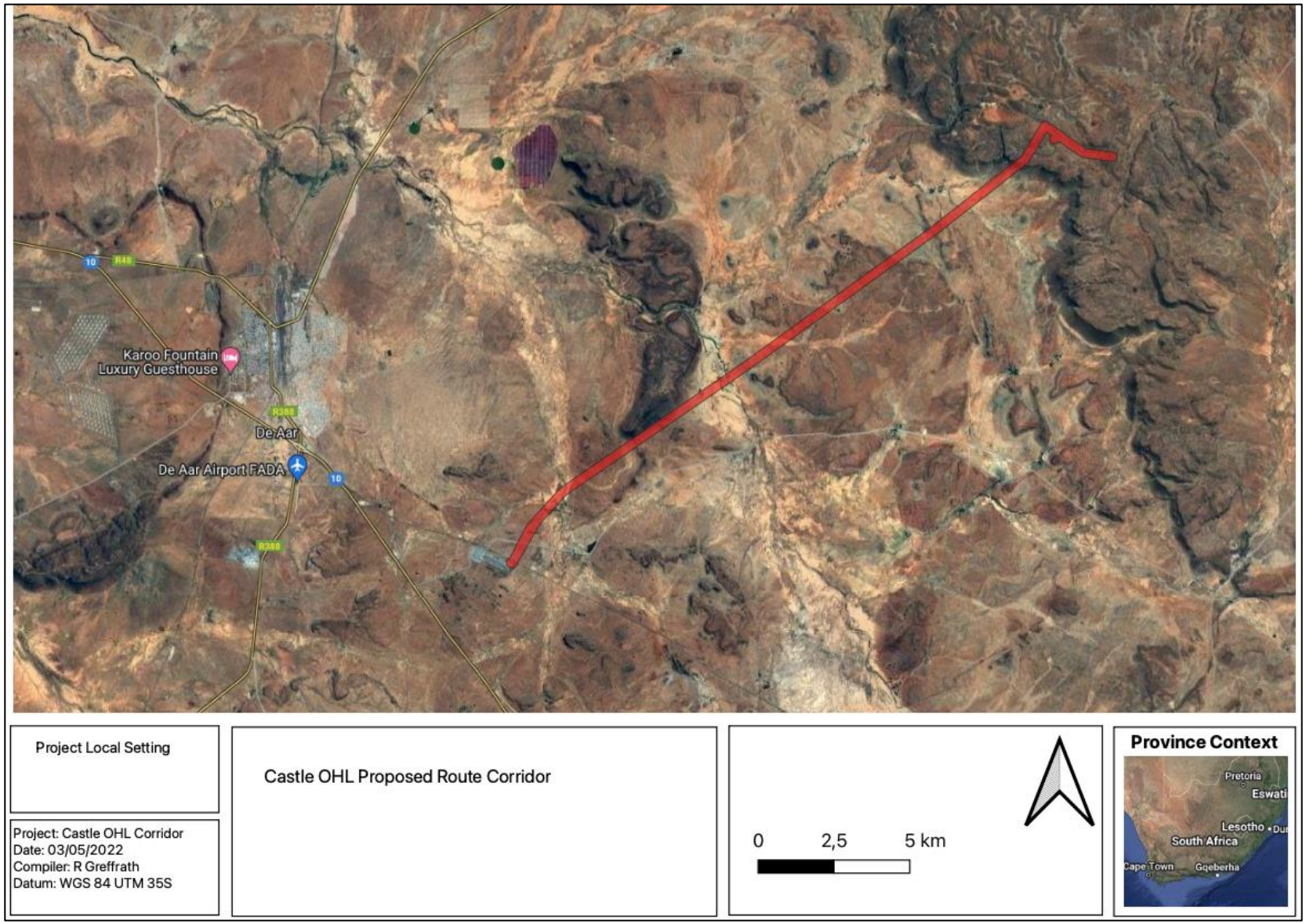


Figure 3-1 Map illustrating the location of the proposed project area

3.2 Desktop Assessment

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

3.2.1 Ecologically Important Landscape Features

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

- *National Biodiversity Assessment 2018 (Skowno et al, 2019) (NBA)*- The purpose of the NBA is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
    - *Ecosystem Threat Status* – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.
    - *Ecosystem Protection Level* – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
    - *South Africa Protected Areas Database (SAPAD) (DEA, 2020)* – The (SAPAD) Database 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, 2016)* – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- Northern Cape Biodiversity Sector Plan
- The Northern Cape Department of Environment and Nature Conservation has developed the Northern Cape CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

The identification of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and

process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated.

The Northern Cape Critical Biodiversity Area (CBA) Map updates, revises and replaces all older systematic biodiversity plans and associated products for the province. These include the:

  - Namakwa District Biodiversity Sector Plan;
  - Cape Fine-Scale Plan (only the extent of the areas in the Northern Cape i.e., Bokkeveld and Nieuwoudtville); and
  - Richtersveld Municipality Biodiversity Assessment.

- Important Bird and Biodiversity Areas (IBAs) (BirdLife South Africa, 2017) – 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.

3.2.2 Desktop Flora Assessment

The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) and SANBI (2019) was used to identify the vegetation type that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Plants of Southern Africa (POSA) database was accessed to compile a list of expected flora species within the project area (Figure 3-2). 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, 331 species are listed as being expected.

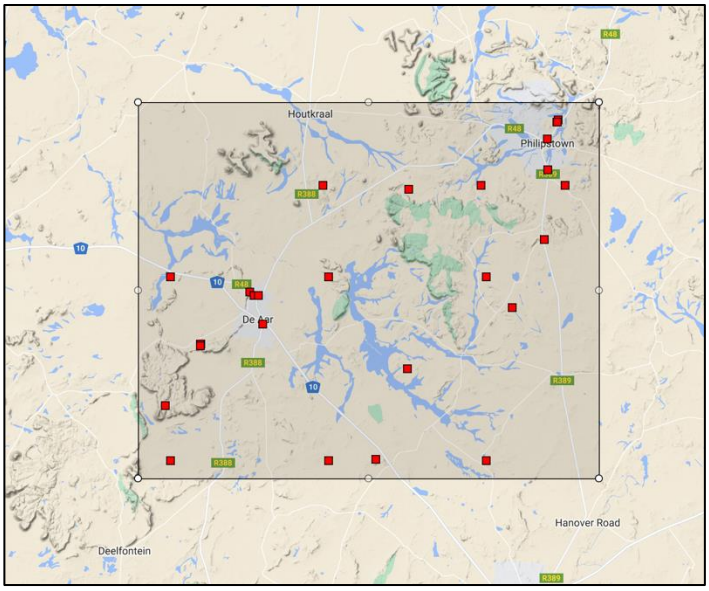


Figure 3-2 ***Map illustrating extent of area used to obtain the expected flora species list from the Plants of South Africa (POSA) database. Red icon indicates approximate location of the project area. The red squares are cluster markers of botanical records as per POSA data.***

3.2.3 Desktop Faunal Assessment

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

- Amphibian list, generated from the IUCN spatial dataset (2017) and ReptileMap database (Fitzpatrick Institute of African Ornithology, 2021a), using the 2917 quarter degree square;
- Reptile list, generated from the IUCN spatial dataset (2017) and AmphibianMap database (Fitzpatrick Institute of African Ornithology, 2021b), using the 2917 quarter degree square;

- Avifauna list, generated for the SABAP2 dataset by looking at pentads 3035_2400; 3040_2400; 3040_2405; 3035_2410; 3040_2410; 3035_2415; 3040_2415; and
- Mammal list from the IUCN spatial dataset (2017).

3.3 Biodiversity Field Assessment

A single field survey was undertaken in May 2022, which is a dry-season survey, 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.

3.3.1 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, 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 highly efficient for conducting floristic analysis, specifically in detecting flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search 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.

3.3.2 Fauna Survey

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

- *Visual and auditory searches* - This typically comprised of meandering and using binoculars to view species from a distance without them being disturbed; and listening to species calls;
- 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.); and
- Utilization of local knowledge.

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

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

- Book of birds of South Africa, Lesotho and Swaziland (Taylor *et al.,* 2015); and
- Roberts – Birds of Southern Africa (Hockey *et al.,* 2005).

3.4 Terrestrial Site Ecological Importance

The different habitat types within the project area were delineated and identified based on observations during the field assessment, and 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 3-1 and Table 3-2, respectively.

Table 3-1 Summary of Conservation Importance (CI) criteria

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

Table 3-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.

	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

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

Table 3-3 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 3-4.

Table 3-4 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: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 3-5.

Table 3-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		**Biodiversity Importance (BI)**				
		Very high	**High**	**Medium**	**Low**	**Very low**
Receptor Resilience (RR)	Very Low	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low

Site Ecological Importance		Biodiversity Importance (BI)				
		Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very High	Medium	Low	Very low	Very low	Very low

Interpretation of the SEI in the context of the proposed project is provided in Table 3-6.

Table 3-6 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities

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

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

4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The assessment area was based on the area provided by the client and any alterations to the route and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The area was only surveyed during a single season site visit and therefore, this assessment does not consider temporal trends;
- Whilst every effort is made to cover as much of the site as possible, representative sampling is completed and by its nature, it is possible that some plant and animal species that are present on site were not recorded during the field investigations; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by 5 m.

5 Results & Discussion

5.1 Desktop Assessment

5.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features are summarised in Table 5-1.

Table 5-1 Summary of relevance of the proposed project to ecologically important landscape features.

Desktop Information Considered	Relevant/Irrelevant	Section

Ecosystem Threat Status	Relevant – Overlaps with a Least Concern ecosystem	5.1.1.1
Ecosystem Protection Level	Relevant – Overlaps with a Not Protected and Partially Ecosystems	5.1.1.2
Protected Areas	Irrelevant – 35km from the closest Protected Area	-
Renewable Energy Development Zones	Irrelevant – The project area falls within the Springbok Wind REDZ	-
Powerline Corridor	Relevant – The project area falls within the Central corridor	-
National Protected Areas Expansion Strategy	Relevant – The northern project area overlaps with Senqu NPAES area	5.1.1.3
Critical Biodiversity Area	Relevant – The project area overlaps with a CBA1, CBA2 and Ecological Support area.	5.1.1.4
Succulent Karoo Ecosystem Programme	Irrelevant – The project area overlaps with no areas	-
Important Bird and Biodiversity Areas	Relevant – Located within the Platberg-Karoo Conservancy IBA	5.1.1.5

5.1.1.1 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the proposed project overlaps with a LC ecosystem (Figure 5-1).

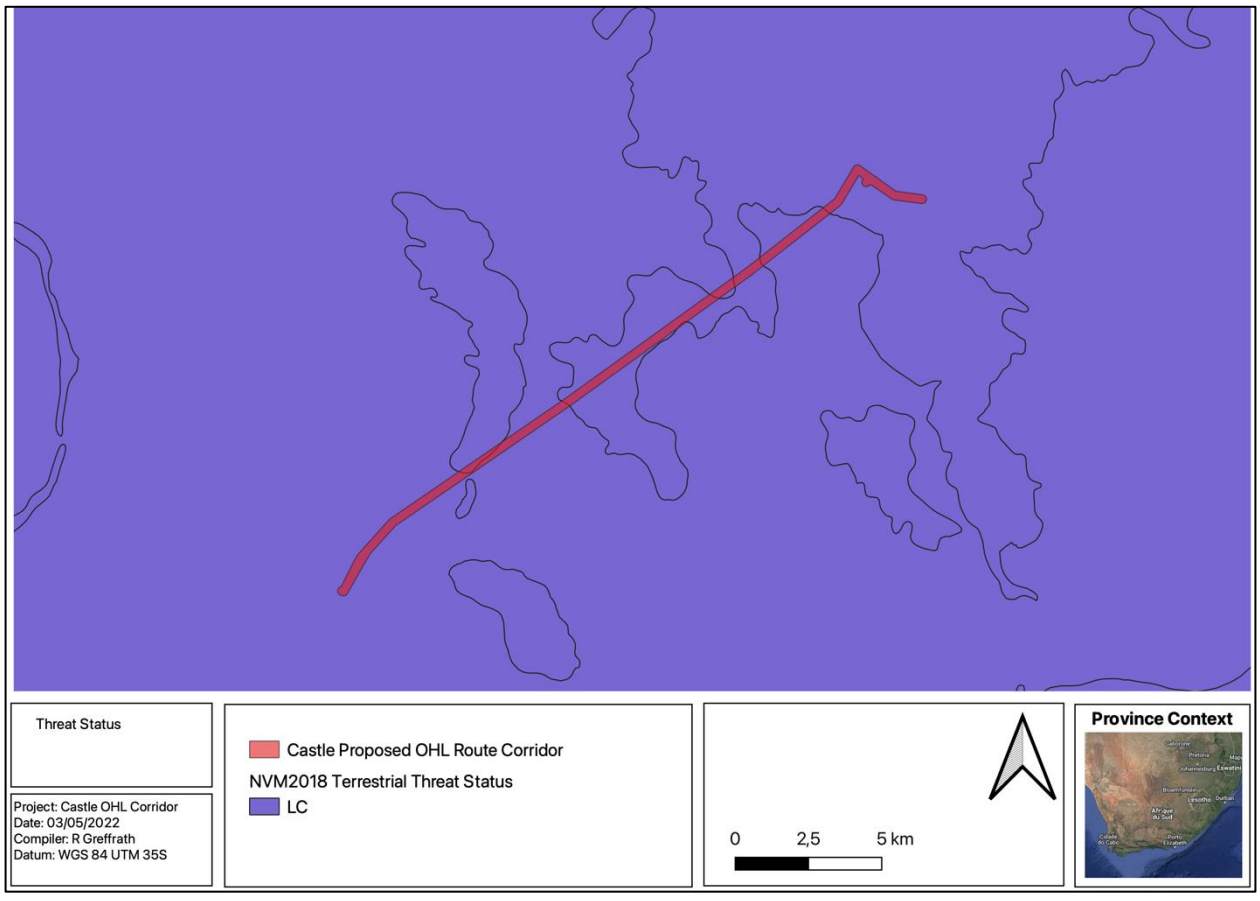


Figure 5-1 Map illustrating the ecosystem threat status associated with the project area.

5.1.1.2 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that

is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project overlaps with PP and NP ecosystems (Figure 5-2).

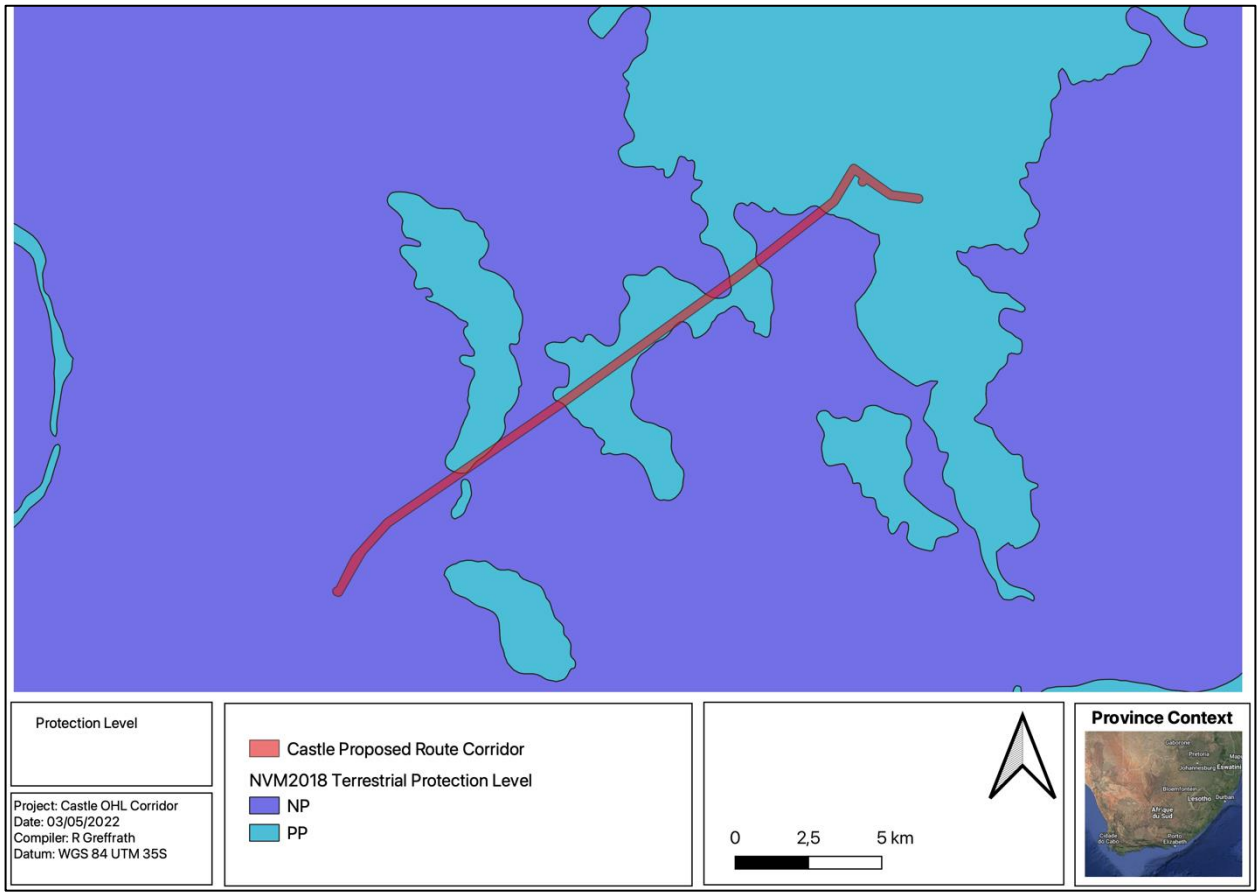


Figure 5-2 Map illustrating the ecosystem protection level associated with the project area

5.1.1.3 National Protected Area Expansion Strategy (NPAES)

National Protected Area Expansion Strategy 2010 (NPAES) were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2010). The project area's northern section overlaps with the Senqu NPAES area as can be seen below.

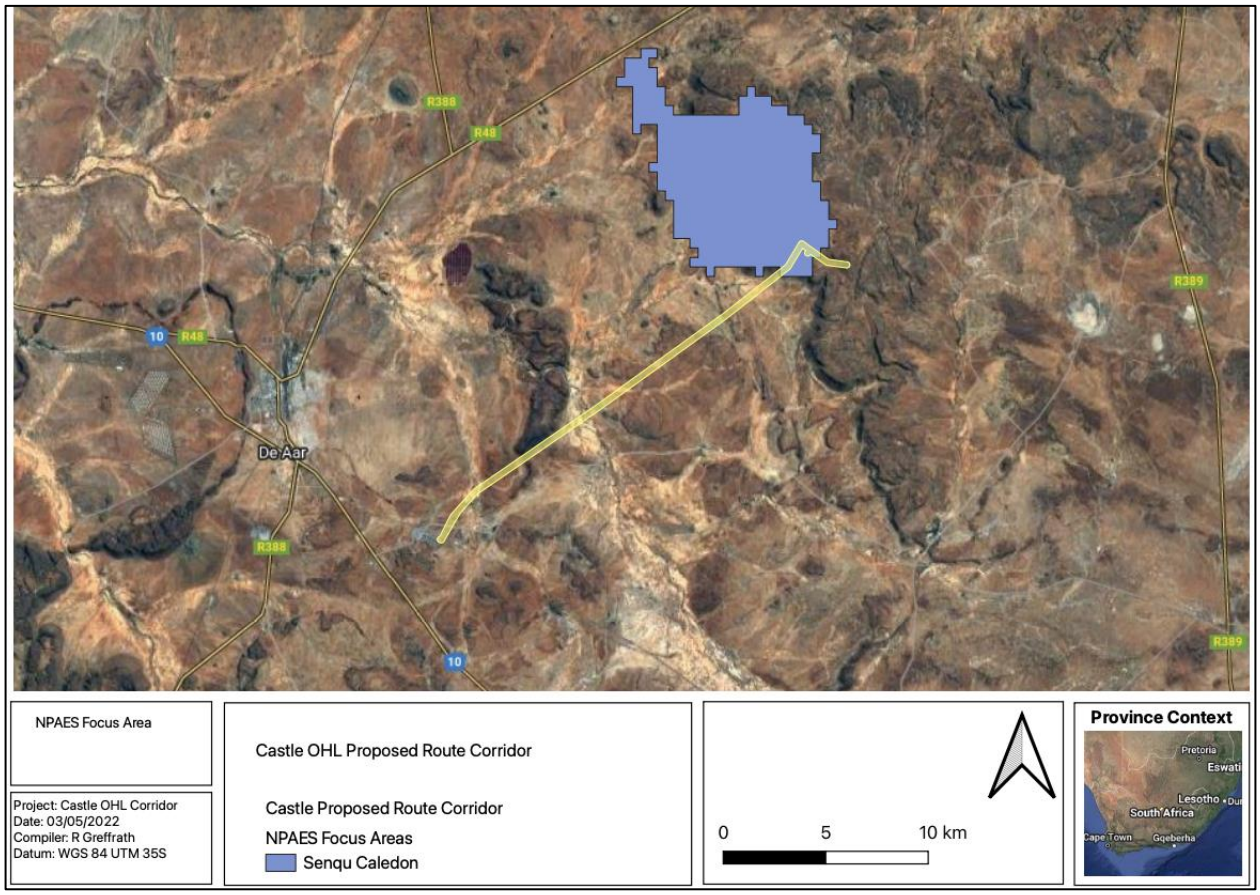


Figure 5-3 NPAES focus area

5.1.1.4 Critical Biodiversity Areas and Ecological Support Areas

The key output of a systematic biodiversity plan is a map of biodiversity priority areas. The CBA map delineates Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), Other Natural Areas (ONAs), Protected Areas (PAs), and areas that have been irreversibly modified from their natural state.

CBAs are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

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

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

Figure 5-4 shows the project area superimposed on the Terrestrial CBA map. The project area overlaps with a CBA1 area.

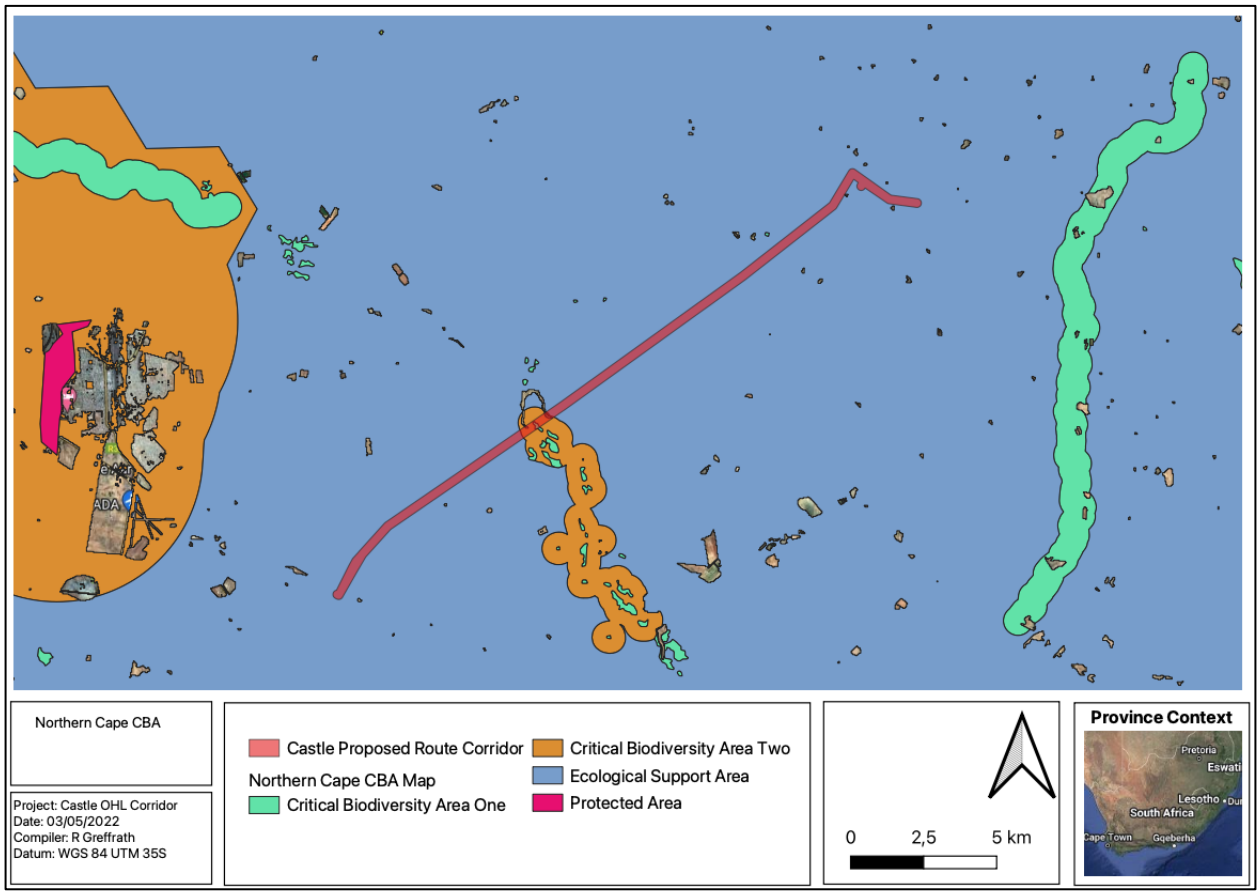


Figure 5-4 Map illustrating the locations of CBAs in the project area

5.1.1.5 Important Bird & Biodiversity Areas

Important Bird & Biodiversity Areas (IBAs) are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (Birdlife, 2017).

According to Birdlife International (2017), the selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels. Figure 5-5 shows the project area overlaps with the Platberg-Karoo Conservancy IBA.

Platberg–Karoo Conservancy IBA can be found in the districts of De Aar, Philipstown and Hanover. This IBA falls across two biomes, the Nama Karroo and the Grassland Biome, which contributes to its diversity of species. In total 289 bird species have been recorded here. Threats in this IBA include overgrazing, erosion and encroachment by Karoo shrubs, all of which result in the loss of habitat and a decrease in available food for large terrestrial birds.

Large terrestrial birds and raptors found here includes: Blue Crane (*Anthropoides paradiseus*), Ludwig's Bustard (*Neotis ludwigii*), Kori Bustard (*Ardeotis kori*), Blue Korhaan (*Eupodotis caerulescens*), Black Stork (*Ciconia nigra*), Secretarybird (*Sagittarius serpentarius*), Martial Eagle (*Polemaetus bellicosus*), Verreauxs' Eagle (*Aquila verreauxii*) and Tawny Eagle (*A. rapax*).

Biome-restricted species found here include Karoo Lark (*Calendulauda albescens)*, Karoo Long-billed Lark (*Certhilauda subcoronata)*, Karoo Chat (*Cercomela schlegelii)*, Tractrac Chat (*C. tractrac)*, Sickle-winged Chat (*C. sinuata)*, Namaqua Warbler (*Phragmacia substriata)*, Layard's Tit-Babbler (*Sylvia layardi)*, Pale-

winged Starling (*Onychognathus nabouroup)* and Black-headed (*Canary Serinus alario)*. Two congregatory species found here are the Lesser Kestrel and the Amur Falcon.

Other biodiversity species of importance found here include Aardwolf (*Proteles cristatus)*, Aardvark (*Orycteropus afer)*, Bat-eared Fox (*Otocyon megalotis)* and Black-footed Cat (*Felis nigripes)* (Vulnerable) (Birdlife, 2015).

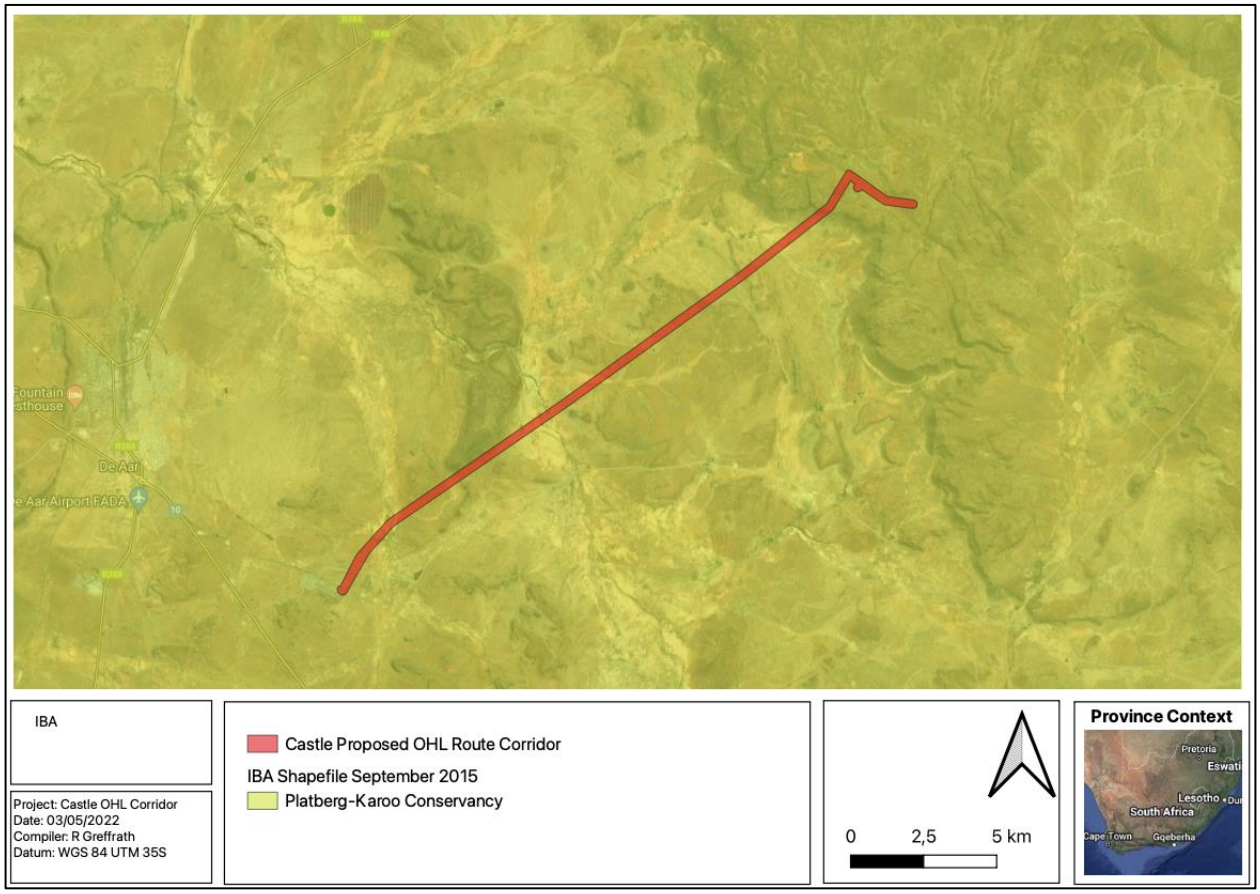


Figure 5-5 Map illustrating the locations of IBAs in the project area

5.1.2 Flora Assessment

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

5.1.2.1 Vegetation Type

The project area is situated within the Nama Karoo biome.

Nama Karoo biome.

This biome is found in the central plateau of the western half of South Africa. The geology underlying the biome is varied, as the distribution of this biome is determined primarily by rainfall. The rain falls in summer and varies between 100 and 520mm per year. This also determines the predominant soil type - over 80% of the area is covered by a lime-rich, weakly developed soil over rock. Although less than 5% of rain reaches the rivers, the high erodibility of soils poses a major problem where overgrazing occurs (SANBI, 2019).

The dominant vegetation is a grassy, dwarf shrubland. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils. Grazing rapidly increases the relative abundance of shrubs. Most of the grasses are of the C4 type and, like the shrubs, are deciduous in response to rainfall events (SANBI, 2019).

On a fine-scale vegetation type, the project area overlaps with one vegetation type: Northern Upper Karoo (Figure 5-6).

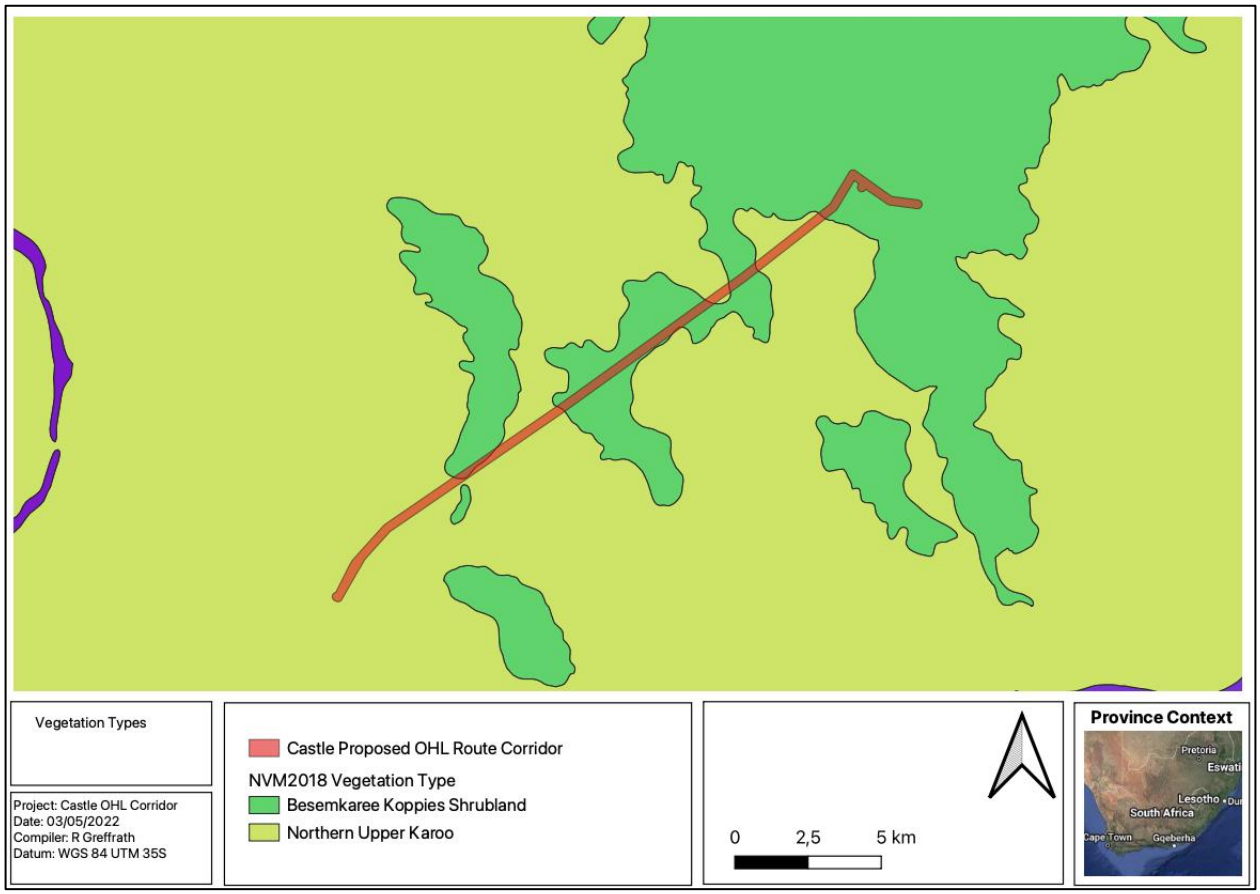


Figure 5-6 Map illustrating the vegetation type associated with the project area

5.1.2.1.1 Northern Upper Karoo

This vegetation type is found in the Northern Cape, Eastern Cape and Western Cape Provinces. This vegetation type consists of alluvial shrubland dominated by dwarf microphyllous shrubs, with 'white' grasses of the genera *Aristida* and *Eragrostis* (Mucina & Rutherford, 2006).

Important Plant Taxa

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

The following species are important in the ***Northern Upper Karoo*** vegetation type, (d)=dominant:

Tall Shrubs: *Lycium cinereum (d), L. horridum, L. oxycarpum. Low Shrubs: Chrysocoma ciliata (d), Eriocephalus ericoides subsp. ericoides (d), E. spinescens (d), Pentzia globosa (d), P. incana (d), Phymaspermum parvifolium (d), Salsola calluna (d), Aptosimum procumbens, Felicia muricata, Gnidia polycephala, Helichrysum dregeanum, H. lucilioides, Limeum aethiopicum, Nenax microphylla, Osteospermum leptolobum, Plinthus karooicus, Pteronia glauca, Rosenia humilis, Selago geniculata, S. saxatilis.*

Succulent Shrubs: *Euphorbia hypogaea, Ruschia intricata.*

Herbs: *Indigofera alternans, Pelargonium minimum, Tribulus terrestris.*

Geophytic Herbs*: Moraea pallida (d), Moraea polystachya, Syringodea bifucata, S. concolor.*

Succulent Herbs: *Psilocaulon coriarium, Tridentea jucunda, T. virescens.*

Graminoids: *Aristida congesta (d), A. diffusa (d), Cynodon incompletus (d), Eragrostis bergiana (d), E. bicolor (d), E. lehmanniana (d), E. obtusa (d), Sporobolus fimbriatus (d), Stipagrostis ciliata (d), Tragus koelerioides (d), Aristida adscensionis, Chloris virgata, Cyperus usitatus, Digitaria eriantha, Enneapogon desvauxii, E. scoparius, Eragrostis curvula, Fingerhuthia africana, Heteropogon contortus, Sporobolus ludwigii, S. tenellus, Stipagrostis obtusa, Themeda triandra, Tragus berteronianus.*

Endemic Taxa

Succulent Shrubs: *Chasmatophyllum rouxii, Hertia cluytiifolia, Rabiea albinota, Salsola tetrandra.*

Tall Shrub: *Phymaspermum scoparium.*

Low Shrubs: *Aspalathus acicularis subsp. planifolia, Selago persimilis, S. walpersii.*

Conservation Status of the Vegetation Type

The vegetation type is listed as Least Threatened (SANBI, 2018). Conservation Target 21%. Statutorily conserved in Mountain Zebra and Karoo National Parks as well as in Oviston, Commando Drift, Rolfontein and Gariep Dam Nature Reserves. About 2% of the unit has been transformed, largely due to building of dams (Gariep, Grassridge, Killowen, Kommandodrift, Kriegerspoort, Lake Arthur, Modderpoort, Schuil Hoek, Vanderkloof, Victoria West, Wonderboom and Zoetvlei).

5.1.2.1.2 Besemkaree Koppies Shrubland

This vegetation type occurs in the Northern Cape, Free State and Eastern Cape Provinces, more specifically on plains of Eastern Upper Karoo (between Richmond and Middelburg in the south and the Orange River) and within dry grasslands of the southern and central Free State. Extensive dolerite-dominated landscapes along the upper Orange River belong to this unit as well. Extends northwards to around Fauresmith in the northwest and to the Wepener District in the northeast. Altitude 1 120–1 680 m.

Important Plant taxa

Small Trees: *Cussonia paniculata, Ziziphus mucronata. Tall Shrubs: Diospyros austro-africana (d), Euclea crispa subsp. ovata (d), Olea europaea subsp. africana (d), Rhus burchellii (d), R. ciliata (d), R. erosa (d), Buddleja saligna, Diospyros lycioides subsp. lycioides, Ehretia rigida, Grewia occidentalis, Gymnosporia polyacantha, Tarchonanthus minor.*

Low Shrubs: *Asparagus suaveolens (d), Chrysocoma ciliata (d), Amphiglossa triflora, Aptosimum elongatum, Asparagus striatus, Diospyros pallens, Eriocephalus ericoides, E. spinescens, Euryops empetrifolius, Felicia filifolia subsp. filifolia, F. muricata, Helichrysum dregeanum, H. lucilioides, Hermannia multiflora, H. vestita, Lantana rugosa, Limeum aethiopicum, Lycium cinereum, Melolobium candicans, M. microphyllum, Nenax microphylla, Pegolettia retro¬fracta, Pentzia globosa, Rhigozum obovatum, Selago saxatilis, Stachys linearis, S. rugosa, Sutera halimifolia, Wahlenbergia albens.*

Succulent Shrubs: *Aloe broomii, Chasmatophyllum musculinum, C. verdoorniae, Cotyledon orbiculata var. dactylopsis, Pachypodium succulentum.*

Graminoids: *Aristida adscensionis (d), A. congesta (d), A. diffusa (d), Cenchrus ciliaris (d), Cymbopogon caesius (d), Cynodon incompletus (d), Digitaria eriantha (d), Eragrostis curvula (d), E. lehmanniana (d), Heteropogon contortus (d), Setaria lindenbergiana (d), Themeda triandra (d), Tragus koelerioides (d), Cymbopogon pospischilii, Enneapogon scoparius, Eragrostis chloromelas, E. obtusa, Eustachys paspaloides, Fingerhuthia africana, Hyparrhenia hirta, Sporobolus fimbriatus.*

Herbs: *Convolvulus sagittatus, Dianthus caespitosus subsp. caespitosus, Gazania krebsiana subsp. krebsiana, Hibiscus pusillus, Indigofera alternans, I. rhytidocarpa, Lepidium africanum subsp. africanum, Pollichia campestris.*

Herbaceous Climber: *Argyrolobium lanceolatum.*

Geophytic Herbs: *Albuca setosa, Asplenium cordatum, Cheilanthes bergiana, C. eckloniana, Freesia andersoniae, Haemanthus humilis subsp. humilis, Oxalis depressa, Pellaea calomelanos. Succulent Herbs: Aloe grandidentata, Crassula nudicaulis, Duvalia caespitosa, Euphorbia pulvinata, Huernia piersii, Stapelia grandiflora, S. olivacea, Tridentea gemmiflora.*

Endemic Taxa Small Tree: Cussonia sp. nov. (P.J. du Preez 3666 BLFU). Succulent Shrubs: Euphorbia crassipes, Neohenricia sibbettii, N. spiculata.

Conservation Status of the Vegetation Type

Least threatened because largely excluded from intensive agricultural activities. Target 28%. About 5% statutorily conserved in the Rolfontein, Tussen Die Riviere, Oviston, Gariep Dam, Caledon and Kalkfontein Dam Nature Reserves. In addition, a small patch is also protected in the private Vulture Conservation Area. About 3% of the area has been lost through building of dams (Bethulie, Egmont, Gariep, Kalkfontein, Vanderkloof and Welbedacht Dams). Erosion moderate (68%), high (20%) and low (10%).

5.1.2.2 Expected Flora Species

The POSA database indicates that 217 species of indigenous plants are expected to occur within the project area. Appendix A provides the list of species and their respective conservation status and endemism. One (1) SCC based on their conservation status could be expected to occur within the project area and are provided in Table 5-2 below.

Table 5-2 Threatened flora species that may occur within the project area.

Family	Taxon	Author	IUCN	Ecology
Euphorbiaceae	*Euphorbia flanaganii*	N.E.Br.	VU	Indigenous; Endemic

Euphorbia flanaganii dwarf succulent plant with a swollen underground stem. The specie is known to occur in Coastal grasslands and low dune bush, mainly on sandstones, 40-800 m. Most of the known recordings for this species, are in a high density within the Kwa-Zulu Natal province, with sparse observations in the Eastern Cape. The like hood of occurrence is rated low as it is unlikely to occur so far out of its known range.

5.1.3 Faunal Assessment

5.1.3.1 Amphibians

Based on the IUCN Red List Spatial Data and AmphibianMap, 13 amphibian species are expected to occur within the area (Appendix B). One (1) is regarded as threatened (Table 5-3).

Table 5-3 Threatened amphibian species that are expected to occur within the project area

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

5.1.3.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 35 reptile species are expected to occur within the area (Appendix C). None are regarded as threatened.

5.1.3.3 Mammals

The IUCN Red List Spatial Data lists 58 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. Seven (7) of these expected species are regarded as threatened (Table 5-4), one of these have a low likelihood of occurrence based on the lack of suitable habitat and food sources in the project area.

Table 5-4 Threatened mammal species that are expected to occur within the project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Eidolon helvum	African Straw-colored Fruit Bat	LC	NT	Low
Felis nigripes	Black-footed Cat	VU	VU	Moderate
Leptailurus serval	Serval	NT	LC	Moderate
Panthera pardus	Leopard	VU	VU	Moderate
Parahyaena brunnea	Brown Hyaena	NT	NT	Moderate
Parotomys littledalei	Littledale's Whistling Rat	NT	LC	Moderate
Poecilogale albinucha	African Striped Weasel	NT	LC	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 can be considered to be sub-optimal for the species and the likelihood of occurrence is rated as moderate.

Leptailurus serval (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa, they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Due to the presence of suitable habitat in the project area, the likelihood of occurrence for this species is rated as moderate.

Panthera pardus (Leopard) has a wide distributional range across Africa and Asia, but populations have become reduced and isolated, and they are now extirpated from large portions of their historic range (IUCN, 2017). Impacts that have contributed to the decline in populations of this species include continued persecution by farmers, habitat fragmentation, increased illegal wildlife trade, excessive harvesting for ceremonial use of skins, prey base declines and poorly managed trophy hunting (IUCN, 2017). Although known to occur and persist outside of formally protected areas, the densities in these areas are considered to be low. The likelihood of occurrence in the project area is rated as moderate based on the secluded location and lack of development in the project area.

Parahyaena brunnea (Brown Hyaena) is endemic to southern Africa. This species occurs in dry areas, generally with annual rainfall less than 100 mm, particularly along the coast, semi-desert, open scrub and open woodland savanna. Given its known ability to persist outside of formally protected areas the likelihood of occurrence of this species in the project area is moderate to good. The presence of moderate to large herbivores on adjacent farms increases the likelihood of occurrence of this species.

Parotomys littledalei (Littledale's Whistling Rat) is listed as NT on a regional scale. This diurnal species occurs in shrubland and is dependent on ground cover. Littledale's Whistling Rat is herbivorous only, feeding on fresh plant material, including annuals, succulent perennials, non-succulent perennials, and grasses. The presence of ground cover increases their likelihood of occurrence in the project area. Suitable but not ideal habitat is found in the project area, therefore the likelihood of occurrence was rated as moderate.

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 moderate.

5.1.3.4 Avifauna

The SABAP2 Data lists 174 avifauna species that could be expected to occur within the area (Appendix E). Fourteen (14) of these expected species are regarded as threatened (Table 5-5), the Blue Crane was confirmed to occur on site.

Table 5-5 Threatened avifauna species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Anthropoides paradisea	Crane, Blue	NT	VU	**Confirmed**
Anthus crenatus	Pipit, African Rock	NT	NT	Moderate
Aquila rapax	Eagle, Tawny	EN	VU	Low-Moderate
Aquila verreauxii	Eagle, Verreaux's	VU	LC	Moderate
Ardeotis kori	Bustard, Kori	NT	NT	High
Calidris ferruginea	Sandpiper, Curlew	LC	NT	Low
Ciconia nigra	Stork, Black	VU	LC	Moderate
Eupodotis caerulescens	Korhaan, Blue	LC	NT	High
Eupodotis vigorsii	Korhaan, Karoo	NT	LC	High
Falco biarmicus	Falcon, Lanner	VU	LC	Moderate
Neotis ludwigii	Bustard, Ludwig's	EN	EN	Confirmed
Phoenicopterus roseus	Flamingo, Greater	NT	LC	Low
Polemaetus bellicosus	Eagle, Martial	EN	EN	Moderate
Sagittarius serpentarius	Secretarybird	VU	EN	Moderate

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. The species was confirmed present within the area during the field survey.

Anthus crenatus (African Rock Pipit) is endemic to South Africa and Lesotho (IUCN, 2021). They are classed as near threatened after undergoing a decline in habitat of 34% in the last 10 years (IUCN, 2017). The species is associated with rocky habitats that has abundant shrub and grassy areas. The lack of suitable rocky areas decreases the likelihood of finding this species in the project area, however, can be found more to the west.

Aquila rapax (Tawny Eagle) is listed as EN on a regional scale and occupies dry open habitats from sea level to 3000 m. It will occupy both woodland and wooded savannah (IUCN, 2017). Due to its large distributional range the likelihood of occurrence of this species is rated as moderate, however the presence of suitable prey items is low and therefore the likelihood that it will be resident in the area also low.

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, 2021). Based on the expected habitat, the likelihood of occurrence of this species at the project site is rated as moderate.

Ardeotis kori (Kori Bustard) is listed as NT both on a regional and global scale. It occurs in flat, arid, mostly open country such as grassland, karoo, bushveld, thornveld, scrubland and savanna but also including modified habitats such as wheat fields and firebreaks. Collisions with high voltage power lines are a major

threat to this species in the Karoo of South Africa (IUCN, 2007). The habitat at the project area, is the typical habitat of this species, and the species is known to occur in the IBA and therefore it's likelihood of occurrence is rated as high.

Ciconia nigra (Black Stork) is native to South Africa, and inhabits old, undisturbed, open forests. They are known to forage in shallow streams, pools, marshes swampy patches, damp meadows, flood-plains, pools in dry riverbeds and occasionally grasslands, especially where there are stands of reeds or long grass (IUCN, 2021). It is unlikely that this species would breed in the project area due to the lack of forested areas, however some suitable foraging habitat remains in the form of the open grasslands and drainage areas, and as such the likelihood of occurrence is rated as moderate.

Eupodotis caerulescens (Blue Korhaan) is listed as NT according to the IUCN (2021). Their moderately rapid decline is accredited to habitat loss that is a result of intensive agriculture. They are found in high grassveld in close proximity to water, usually above an altitude of 1 500m (del Hoyo *et al.* 1996). The species nests in bare open ground, situated in thick grass or cropland. Based on the required habitat the likelihood of occurrence of this species is rated as high.

Eupodotis vigorsii (Karoo Korhaan) is listed as NT on a regional scale and as LC on a global scale. This species has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The likelihood of the species occurring in the project area 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 records of this species in the project area is rated as moderate due to the natural veld condition 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 power lines. The species was confirmed present within the area during the field survey.

Polemaetus bellicosus (Martial Eagle) is listed as EN on a regional scale and 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 power lines (IUCN, 2021). It inhabits open woodland, wooded savanna, bushy grassland, thorn-bush and, in southern Africa, more open country and even sub-desert (IUCN, 2021). With the presence of good grassland habitat in the project area but an absence of large trees for roosting and nesting this species may only use the site for foraging and thus there is a moderate chance of this species occurring.

Sagittarius serpentarius (Secretarybird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2021). The likelihood of occurrence is rated as moderate due to the extensive grasslands areas present in the project area, in which this species may forage.

5.2 Field Assessment

The following sections provide the results from the field survey for the proposed development that was undertaken during the 9th to the 11th of May 2022.

5.2.1 Flora Assessment

This section is divided into two sections:

- Indigenous flora; and

- Invasive Alien Plants (IAPs).

5.2.1.1 Indigenous Flora

The species composition of the assessment area was consistent with typical Northern Upper Karoo and Besemkaree Koppies Shrubland vegetation types. Distinctive vegetation communities were observed within these vegetation types and can be classified into degraded shrubland, degraded grassland, rocky areas and drainage lines and washes (alluvial shrubland). The plant species recorded is by no means comprehensive, and repeated surveys during different phenological periods not covered, may likely yield up to 30% additional flora species for the project area. However, floristic analysis conducted to date is however regarded as a sound representation of the local flora for the project area.

The degraded Northern Upper Karoo Shrubland floral community was found in the **lowland areas** and is characterised by dominant dwarf karoo shrubs scattered grasses and occasional large shrubs typical of the Northern Upper Karoo vegetation type. *The floral species most commonly associated with this vegetation type included* Three-awn (Aristida) and Lovegrasses (Eragrostis) grasses, with low Sheepbush (Pentzia) shrubs and the occasional tall shrub *Lycium cinereum* scattered in clumps, and was typically dominated by karoo dwarf shrubs and grasses such as *Pentzia incana, Eriocephalus spinescens, Eriocephalus ericoides subsp. ericoides, Osteospermum leptolobum, Hertia pallens, Lycium cinereum, Salsola calluna, Ruschia spinosa, Rosenia humilis, Pteronia erythrochaeta, Aristida adscensionis, Eragrostis lehmanniana var. lehmanniana, Eragrostis bergiana, Cynodon incompletus and Aristida congesta subsp. congesta.*

Plateau vegetation was typical of Besemkaree Koppies Shrubland vegetation was found on the slopes and flat areas at higher elevations on the project site, and is dominated by abundant grasses, dwarf small-leaved shrubs and taller shrubs. The increased structure provided by woody species such as Searsia and Euclea bush clumps as well as scattered rocks offer habitats for a different suite of animal species to those in the lowland plains. Typical species encountered included, *Searia burchellii, Felicia filifolia, Chrysocoma ciliate, Gazania krebsiana subsp. krebsiana, Euclea crispa, Olea europaea, Ehretia rigida, Grewia occidentalis,* graminoids such as *Aristida adscensionis, Aristida congesta congesta, Heteropogon contortus, Tragus koelerioides, Eragrostis chloromelas, Geigeria filifolia, Sporobolus fimbriatus* and *Enneapogon scoparius*.

The **drainage areas and washes areas** are areas where intermittent steams and drains sporadically flow and exists as well as the plains connected to these areas. This habitat generally consisted of species such as *Artemisia afra, Asparagus suaveolens, Pteronia erythrochaeta, Atriplex vestita, Lycium pumilum, Melianthus comosus and Salsola aphylla* and grasses such as *Cynodon incompletus, Aristida adscensionis, Sporobolus fimbriatus* and *Scirpoides dioecus.* An abundant geophyte within the habitat was *Ammocharis coranica* as well as *Ruschia spinosa* in the washes, both protected in the NC.

Succulents were ubiquitous throughout the assessment area and occurred within all the communities described above. Geophytes were present and occurred within the lowland areas. It is important to note that these growth forms, and their non-succulent relatives, are protected under the Northern Cape Legislation.

Figure 5-7 ***Photographs illustrating some of the flora recorded within the assessment area. Clockwise from the top left. Geigeria filifolia, Ammocharis coranica (Protected), Chrysocoma ciliate, Salsola calluna (Endemic)***

5.2.1.2 Invasive Alien Plants

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

NEMBA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182, 24th of February 2021. The legislation calls for the removal and / or control of IAP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

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

Note that according to the Alien and Invasive Species Regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

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

No species were recorded within the project area, however, their absence could not be completely discounted. Any species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b. Category 1b species must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA, as stated above.

5.2.2 Faunal Assessment

Herpetofauna, avifauna and mammal observations and recordings are discussed in the information below.

5.2.2.1 Amphibians and Reptiles

One species of reptiles was recorded in the project area during survey period, the Karoo girdled lizard. There is the possibility of more species being present, as certain reptile species are secretive and require long-term surveys to ensure capture. One amphibian species was recorded during the survey period, this was largely due to the season in which the field survey was carried out as well as the fact that no pitfall trapping was done, surveys relied on opportunistic sightings. The only other method utilised was refuge examinations using visual scanning of terrains to record smaller herpetofauna species that often conceal themselves under rocks, in fallen logs, rotten tree stumps, in leaf litter, rodent burrows, ponds, old termite mounds, this method was also not intensively applied in the field.

Figure 5-8 **Karoo Girdled Lizard (*Karusasaurus polyzonus*)**

Table 5-6 ***Summary of herpetofauna species recorded within the project area.***

Species	Common Name	Conservation Status		NC Nature Conservation Act No. 9 Of 2009
		Regional (SANBI, 2016)	IUCN (2021)	
Cacosternum boettgeri	*Common Caco*	LC	LC	Not Protected
Karusasaurus polyzonus	*Karoo Girdled Lizard*	LC	LC	Not Protected

5.2.2.2 Mammals

Five (5) mammal species were observed during the survey of the project area (Table 5-7) based on either direct observation or the presence of visual tracks and signs (Table 5-7)(Figure 5-9, Figure 5-10, Figure 5-11). None of the species recorded are regarded as SCCs form an international or national perspective but three are protected provincially.

Table 5-7 ***Summary of mammal species recorded within the project area***

Species	**Common Name**	**Conservation Status**		**NC Nature Conservation Act No. 9 Of 2009**
		Regional (SANBI, 2016)	**IUCN (2021)**	
Lepus saxatilis	Scrub Hare	LC	LC	Schedule 2
Antidorcas marsupialis	Springbuck	LC	LC	-
Raphicerus campestris	Steenbok	LC	LC	Schedule 2

Canis mesomelas	Black-backed Jackal	LC	LC	Schedule 4
Xerus inauris	Ground Squirrel	LC	LC	-

Figure 5-9 Springbuck observed in the project area.

Figure 5-10 Steenbok observed in the project area

Figure 5-11 Ground Squirrel observed in the project area

5.2.2.3 Avifauna

Eighteen (18) species were recorded in the project area during the survey based on either direct observation, vocalisations, or the presence of visual tracks & signs, (Table 5-8). All species were listed as protected provincially, and two are considered as SCC, Blue crane is shown in Figure 5-12. The number of SCC is expected due to the project being within the Platberg–Karoo Conservancy IBA.

Table 5-8 A list of avifaunal species recorded for the project area

Species	Common Name	Conservation Status		NC Nature Conservation Act No. 9 Of 2009
		Regional (SANBI, 2016)	IUCN (2021)	
Afrotis afraoides	Korhaan, Northern Black	Unlisted	LC	Schedule 2
Alopochen aegyptiaca	Goose, Egyptian	Unlisted	LC	Schedule 2
Cercotrichas coryphoeus	Scrub-robin, Karoo	Unlisted	LC	Schedule 2
Corvus albus	Crow, Pied	Unlisted	LC	Schedule 3
Coturnix coturnix	Quail, Common	Unlisted		Schedule 2
Cossypha caffra	Robin-chat, Cape	Unlisted	LC	Schedule 2
Eupodotis vigorsii	Korhaan, Karoo	NT	LC	Schedule 2
Falco rupicolus	Kestrel, Rock	Unlisted	LC	Schedule 1
Grus paradisea	Crane, Blue	NT	VU	-
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC	Schedule 2
Melierax canorus	Goshawk, Southern Pale Chanting	Unlisted	LC	Schedule 1
Merops apiaster	Bee-eater, European	Unlisted	LC	Schedule 2
Myrmecocichla formicivora	Chat, Anteating	Unlisted	LC	Schedule 2
Oena capensis	Dove, Namaqua	Unlisted	LC	Schedule 2

Spilopelia senegalensis	Dove, Laughing	Unlisted	LC	Schedule 2
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC	Schedule 2
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC	Schedule 2
Sylvietta rufescens	Crombec, Long-billed	Unlisted	LC	Schedule 2

Figure 5-12 Blue Cranes recorded on site

6 Habitat Assessment and Site Ecological Importance

6.1 Habitat Assessment

The main habitat types identified across the project area were initially identified largely based on aerial imagery. These main habitat types were refined based on the field coverage and data collected during the survey; the delineated habitats can be seen in Figure 6-1. Emphasis was placed on limiting timed meander searches along the proposed project area within the natural habitats and therefore habitats with a higher potential of hosting SCC. The habitats observed, coincide with the vegetation types as described by Mucina & Rutherford in 2006 and SANBI (2019) due to the lack of large-scale transformation, these are discussed in detail in the sections that follow. A summary of habitat types delineated within the project area can be seen in Table 6-1

Table 6-1 Summary of habitat types delineated within the project area

Habitat Type	Description	Ecosystem Processes and Services	Habitat Sensitivity
Lowland Northern Upper Karoo Shrubland	Semi-natural shrubland, but slightly disturbed due to the grazing by livestock, mismanagement and also human infringement.	Provides grazing for livestock. Assists in filtration of water permeating through the soil into drainage lines. Acts as corridor for fauna dispersion within the landscape. Acts as buffer for high sensitivity areas. The unit acts as a refuge which supports viable plant species populations and is also used for foraging by fauna.	Medium-High
Plateau Besemkaree Koppies Shrubland	Semi-natural shrubland, but slightly disturbed due to the grazing by livestock, mismanagement and also human infringement.	Provides grazing for livestock. Assists in filtration of water permeating through the soil into lower lying and drainage lines. Acts as refuge for fauna away from more accessible areas the landscape. Acts as buffer for high sensitivity areas. The unit acts as a refuge which supports viable plant species populations and is also used for foraging by fauna.	Medium
Rocky Outcrops	Rocky outcrops ridges occurring from higher lying areas, creating inselburgs in the landscape	Refuge area for fauna and flora species and not easily accessible, also bot suitable for development, and is a refuge from fire.	High
Drainage features and washes (Alluvial Shrubland)	Low to no slope with alluvial soils. Channel through which surface water naturally collates and flows. Ephemeral systems were both considered for this habitat type.	Water Paths, functions as important Water resources. Provides refuge and grazing areas, especially during the dry seasons Provides surface water within the landscape. Aids in trapping sediment and nutrients derived from land runoff.	Deep channels (High) Washes (Medium)

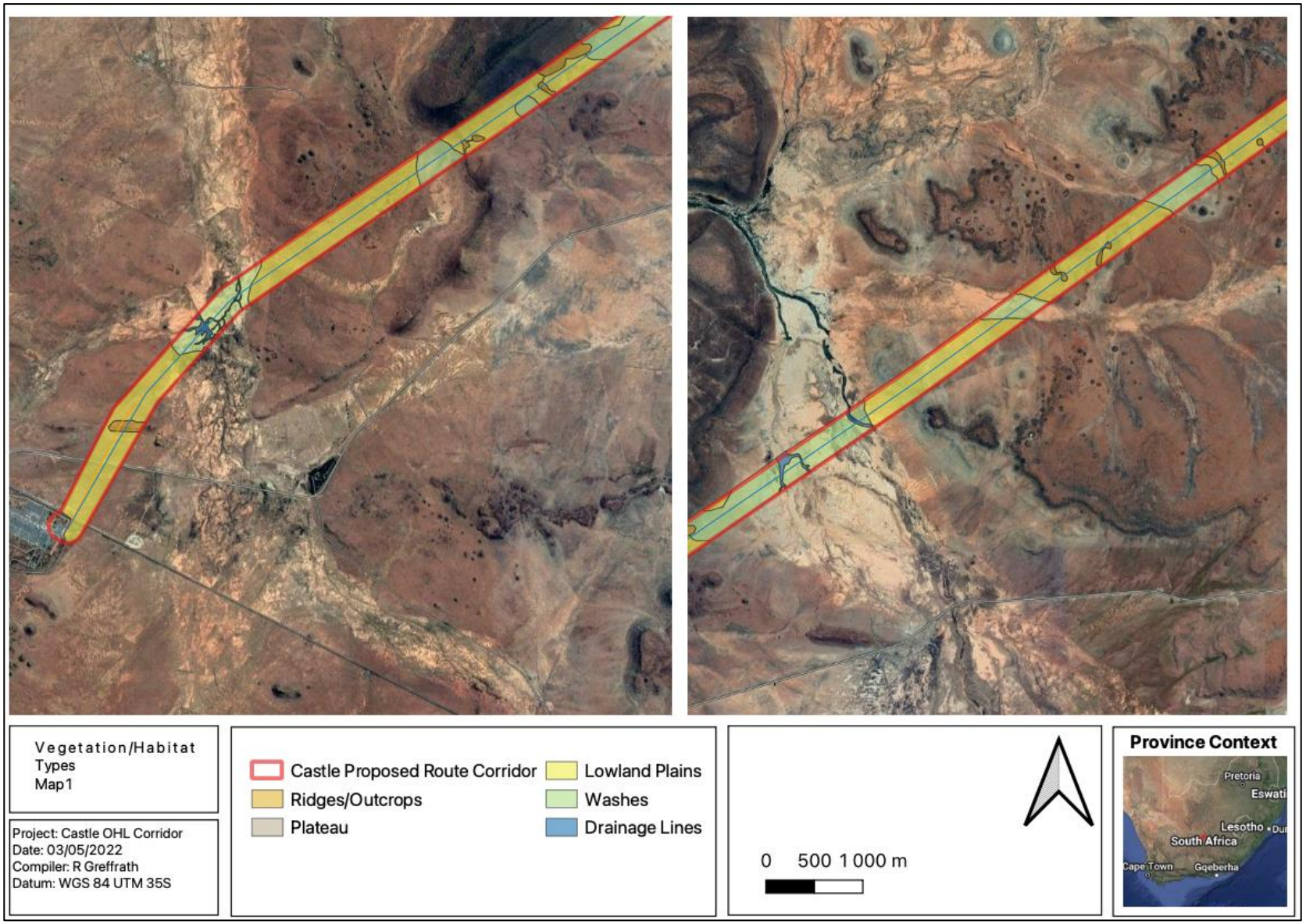


Figure 6-1 Habitats identified in the project area.

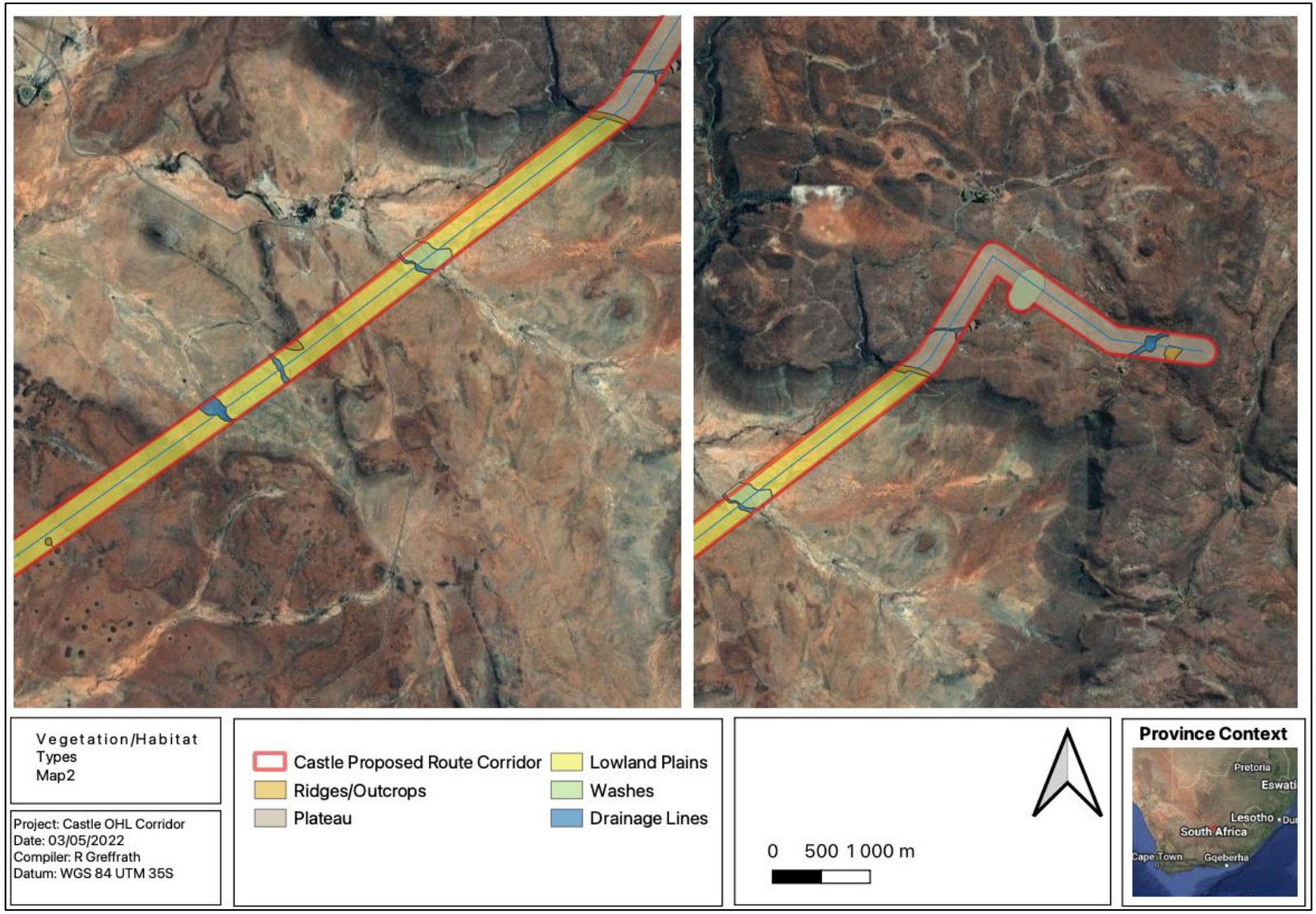


Figure 6-2: Habitats identified in the project area

6.1.1 Lowland Degraded Northern Upper Karoo Shrubland

The lowland areas are dominated by dwarf karoo shrubs scattered grasses and occasional large and was the most widespread and was fairly uniform across the project site, occurring on all the flat plain areas. This habitat type is regarded as semi-natural shrubland, but slightly disturbed due to the grazing by livestock, mismanagement and also human infringement.

Even though this habitat is partly disturbed, it supports largely intact vegetation and has a rehabilitation potential. This habitat type acts as a corridor for fauna dispersion within the landscape as well as a buffer for high sensitivity areas. Its current state is degraded CBA 1, it will however recover if left undisturbed. The unit acts as a refuge which supports viable plant species populations and is also used for foraging by fauna.

Several small wetlands, depressions, temporary pools, vleis and dams are scattered throughout the lowland plains and act as important habitat for numerous species, particularly during the wet season. Most of the amphibian species listed in Appendix VII could potentially utilise seasonally inundated areas in these areas. These habitats and microhabitats are widespread in the area and the localised impact associated with the footprint would be negligible if mitigation measures are adhered to.

Figure 6-3 Lowland Degraded Northern Upper Karoo Shrubland, with temporary pool.

6.1.2 Plateau Besemkaree Koppies Shrubland

At higher elevations in the northern section of the project area, slopes and flat areas are dominated by abundant grasses, dwarf small-leaved shrubs and taller shrubs typical of Besemkaree Koppies Shrubland (Figure 10). An increase in topological complexity introduces variation in slope and aspect and therefore the available microhabitats for different species. Species such as Grey Rhebuck (Near Threatened) and Greater Kudu show preference for these areas, and the scattered rocks provide refuge

for many of the species. These habitats and microhabitats are widespread in the area and the localised impact associated with the footprint would be negligible if mitigation measures are adhered to.

Figure 6-4 Plateau Besemkaree Koppies Shrubland

6.1.3 Rocky Outcrops

Cliffs and rocky outcrops are associated areas where bedrock is exposed or where high lying cliffs are not as easily weathered as the surrounding areas (Figure 11). They are characterised by the presence of boulders and loose rocks with an open canopy of medium to tall woody shrubs above a sparse layer of grasses. These features provide potential habitat for animals such as Cape Elephant Shrew, Eastern Rock Elephant Shrew, Round-Eared Elephant Shrew, Spectacled Dormouse, Hewitt's Red Rock Hare, Western Rock Elephant Shrew, Cape Dassie, Southern Rock Agama, Western Rock Skink, Karoo Girdled Lizard and Common Banded Gecko amongst others. These habitats and microhabitats are widespread in the area and the localised impact associated with the footprint would be negligible if mitigation measures are adhered to.

Figure 6-5 Rocky Outcrops/Ridges

6.1.4 Drainage features and washes (Alluvial Shrubland)

The project site includes several drainage areas where water is channelled during rainfall events and includes areas with woody shrubs, grass cover, bare areas and erosion gulley's. The drainage lines provide habitat for many animals in such an arid landscape as they provide refuge, shelter, and food for extended periods. This habitat is found in areas where intermittent rivers sporadically flow and exists as well as the drainage flats/floodplains connected to these areas. This habitat is shrubland that has been disturbed mainly by the historic and current grazing (Figure 6-7 and Figure 6-6). This habitat type is regarded as semi-natural shrubland, but slightly disturbed due to the grazing by livestock the associated human infringement and use (roads). Current human infringement still occurs throughout, especially in areas close to roads. The current ecological condition of this habitat with regard to the main driving forces, are intact, which is evident in the amount of the species recorded in the flora and faunal assessment.

Drainage lines with deeper, looser soils are considered to have a higher sensitivity than those on shallow soils. The areas in and adjacent to drainage lines is particularly important for important species listed above such as Springhare, Black-footed Cat, Giant Bullfrog and potentially Riverine Rabbit. Small farm dams are scattered around the project site and together with various erosion control berms provide additional habitat for species. These habitats are susceptible to impacts associated with erosion and the invasion of alien plant species.

The drainage lines and within the project area can be regarded as non-perennial and possess surface flow only briefly during and following a period of rainfall (ephemeral), which is a feature of semi-arid/arid regions. These seasonal streams create an ecological link between the stream and its surrounding terrestrial landscape and has the same function albeit on a smaller scale than a river. These habitats, jointly, is important as a movement corridor as it creates a link between the system and its surrounding

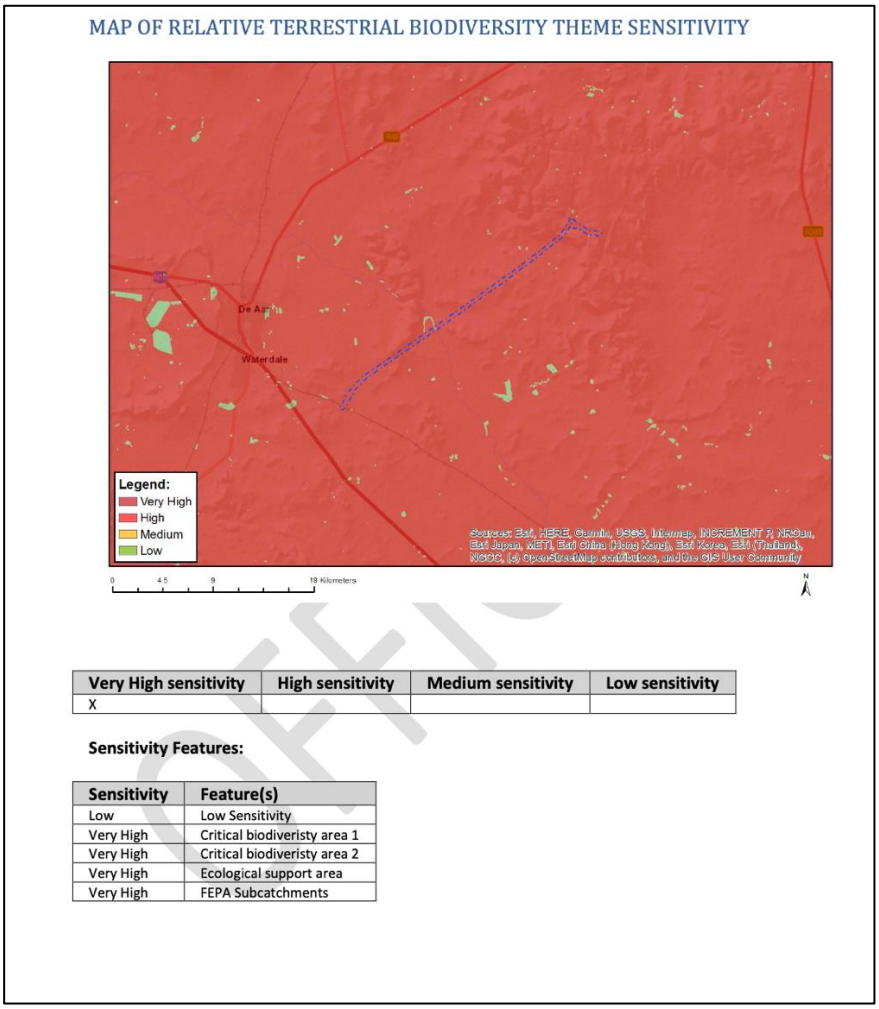
terrestrial landscape for several faunal species, especially birds and mammals, and plays a vital role as a water resource not only for the biodiversity but also the local community.

Figure 6-6 Stream/drainage feature.

Figure 6-7 Washes (Alluvial shrubland)

6.2 Site Ecological Importance

The biodiversity theme sensitivity, as indicated in the screening report, was derived to be Very High, mainly due to the project area being within an CBA 1, ESA and a FEPA sub-catchment (Figure 6-8).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

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

Figure 6-8 Terrestrial Biodiversity Theme Sensitivity, National Web based Environmental Screening Tool.

The location and extent of these habitats are illustrated in Figure 6-1. Based on the criteria provided in Section 3.4 of this report, all habitats within the assessment area of the proposed project were allocated a sensitivity category (Table 6-2). The sensitivities of the habitat types delineated are illustrated in Figure 6-9. 'Very High-High Sensitivity' areas are due to the following and the guidelines can be seen in Table 6-3:

- CBA1;
- CBA2
- FEPA sub catchment;
- Ecological Support Area
- Threatened/Protected flora and fauna species were abundant and ubiquitous within the assessment area; and
- A high richness of protected fauna species was present within the assessment area.

Table 6-2 SEI Summary of habitat types delineated within field assessment area of project area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Lowland Northern Upper Karoo Shrubland	Low	Medium	Low	Medium	Low
Plateau Besemkaree Koppies Shrubland	Low	Medium	Low	Medium	Low
Rocky Outcrops	Medium	High	Medium	Low	High
Drainage features washes	Low	High	Medium	Medium	Medium
Drainage features deep channels	Medium	High	High	Low	High

Table 6-3 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities

Site Ecological Importance	Interpretation in relation to proposed development activities
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.

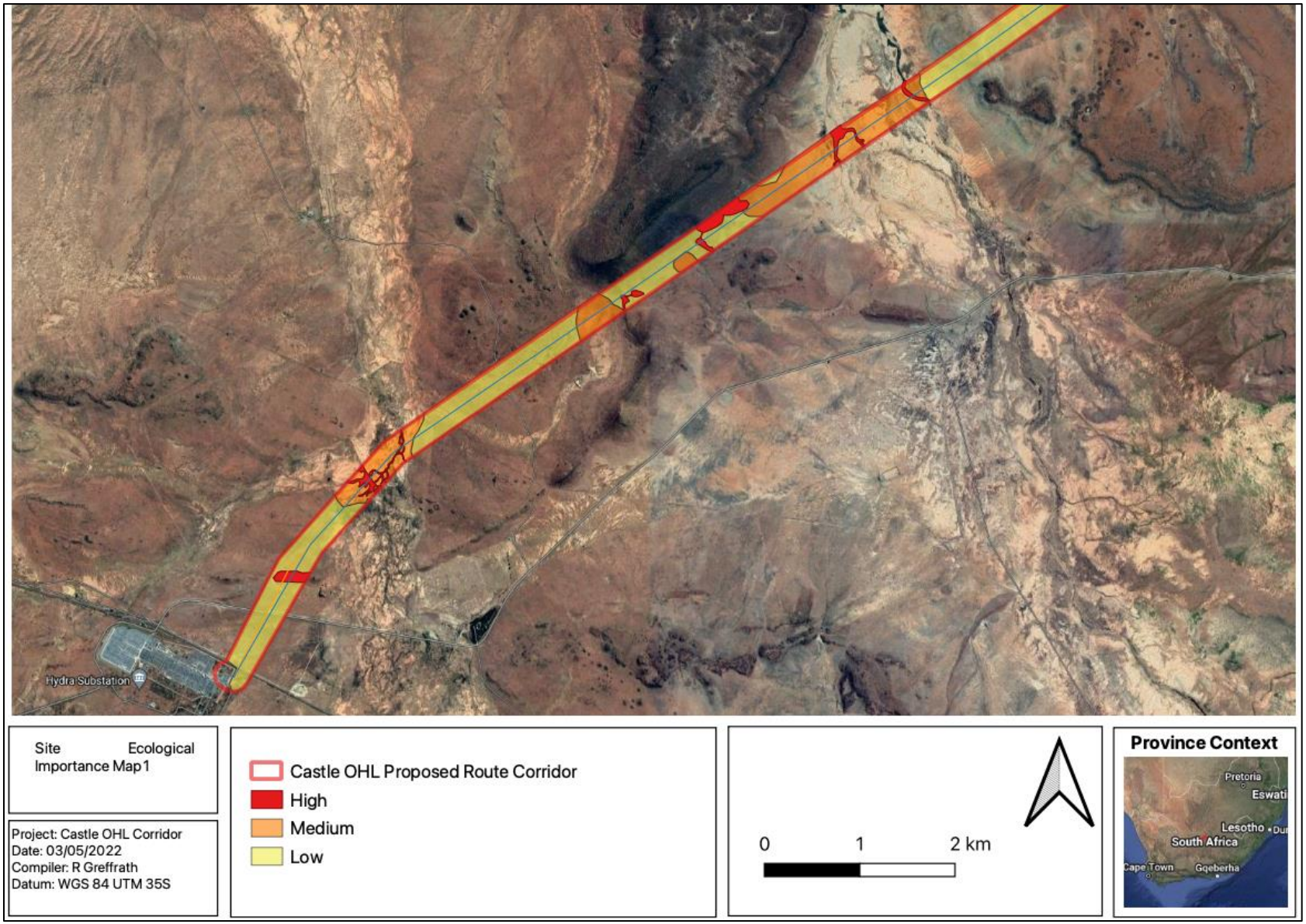


Figure 6-9 Project Area SEI

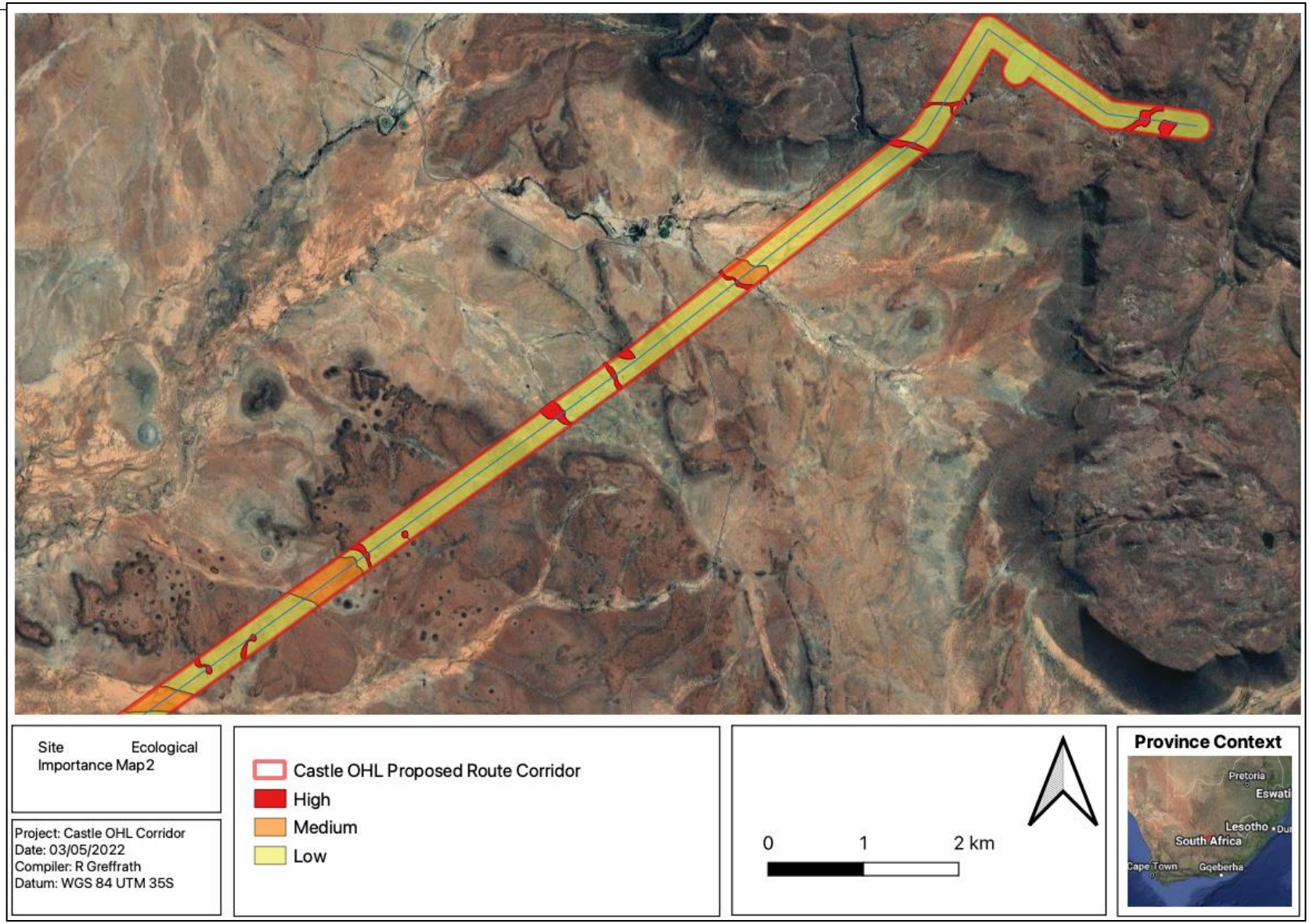


Figure 6-10 Project Area SEI

7 Impact Risk Assessment

The section below and associated tables serve to indicate and summarise the significance of perceived impacts on the terrestrial ecology of the project area. Potential impacts were evaluated against the data captured during the desktop and field assessment to identify relevance to the project area. The relevant impacts associated with the proposed construction of the development were then subjected to a prescribed impact assessment methodology which were provided by the client and is available on request.

7.1 Biodiversity Risk Assessment

7.1.1 Present Impacts to Biodiversity

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

- Historic land modification;
- Grazing and trampling of natural vegetation by livestock in certain areas;
- Alien and/or Invasive Plants (IAP);
- Erosion; and
- Fences and associated maintenance.

7.1.2 Terrestrial Impact Assessment

Potential impacts were evaluated against the data captured during the desktop and field assessments to identify relevance to the project area. The relevant impacts associated with the proposed development were then subjected to a prescribed impact assessment methodology which was provided by EnviroAgri Environmental and is available on request. No decommissioning phase was considered based on the nature of the development.

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

7.1.3 Loss of Irreplaceable Resources

- CBA 1 areas will be lost; and
- CBA 2 areas will be lost.

7.1.4 Anticipated Impacts

The impacts anticipated for the proposed activities are considered in order to predict and quantify these impacts and assess & evaluate the magnitude on the identified terrestrial biodiversity (Table 7-1).

Table 7-1 Anticipated impacts for the proposed activities on terrestrial biodiversity

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

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

7.1.5 Unplanned Events

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

Table 7-2 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 7-2 Summary of unplanned events for terrestrial biodiversity

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

7.1.6 Identification of Additional Potential Impacts

7.1.6.1 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 8.1.8 of this report.

7.1.6.2 Construction Phase

The following potential main impacts on the biodiversity (based on the framework above) were considered for the construction phase of the proposed development. This phase refers to the period during construction when the proposed features are constructed; and is considered to have the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered:

- Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community (Table 7-3);
- Introduction of alien species, especially plants (

No.	1			
Project phase	**Construction**			
Impact title	Habitat and Vegetation destruction			
Impact description	Destruction, loss and fragmentation of the of habitats, ecosystems and vegetation community			
Impact Assessment	**Impact not mitigated**		**Impact mitigat**	
Nature	**Negative**		**Negative**	
Extent	**Local**	Extending across the site and to nearby settlements.	**Limited**	Limited to the surroundings.
Duration	**Long term**	Impact will last between 6 and 25 years.	**Short term**	Impact will las
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**Low**	Impacts affect such a way tha social function slightly affecte
Magnitude	**High - negative**		**Low - negative**	
Probability	**Very likely (>90%)**	There are sound reasons that the impact will occur.	**Unlikely (>33%)**	The impacts o happened bef
Significance	**Major - negative**		**Minimal - negative**	
Importance	**Moderate**	Moderate	**Moderate**	Moderate
Consequence	**Moderately-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Established, but incomplete**	
Reversibility	**Medium**	The affected environment may only recover from the impact with significant inte time period.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

- Table 7-4);
- Destruction of protected plant species (Table 7-5); and
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching) (Table 7-6).

Table 7-3 Impacts to biodiversity associated with the proposed construction phase.

No.	1			
Project phase	**Construction**			
Impact title	Habitat and Vegetation destruction			
Impact description	Destruction, loss and fragmentation of the of habitats, ecosystems and vegetation community			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Local**	Extending across the site and to nearby settlements.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Long term**	Impact will last between 6 and 25 years.	**Short term**	Impact will last less than 1 year.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**Low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are slightly affected.
Magnitude	**High - negative**		**Low - negative**	
Probability	**Very likely (>90%)**	There are sound reasons that the impact will occur.	**Unlikely (>33%)**	The impacts occurrence is rare but has happened before.
Significance	**Major - negative**		**Minimal - negative**	
Importance	**Moderate**	Moderate	**Moderate**	Moderate
Consequence	**Moderately-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Established, but incomplete**	
Reversibility	**Medium**	The affected environment may only recover from the impact with significant intervention or over long time period.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

Table 7-4 Impacts to biodiversity associated with the proposed construction phase.

No.	2			
Project phase	**Construction**			
Impact title	AIP Introduction			
Impact description	Introduction of alien species, especially plants			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Permanent**	Impact may be permanent, or in excess of 25 years.	**Temporary**	Impact will last less than 1 month.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**Very low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are not affected.
Magnitude	**High - negative**		**Very low - negative**	
Probability	**Likely (>66%)**	The impact may occur, but not necessarily proof that it will.	**Unlikely (>33%)**	The impacts occurrence is rare but has happened before.
Significance	**Major - negative**		**Minimal - negative**	
Importance	**High**	High	**High**	High
Consequence	**Highly-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Inconclusive**	
Reversibility	**Medium**	The affected environment may only recover from the impact with significant intervention or over long time period.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

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

No.	3			
Project phase	**Construction**			
Impact title	SCC destruction			
Impact description	Destruction of protected plant species			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Long term**	Impact will last between 6 and 25 years.	**Short term**	Impact will last less than 1 year.
Intensity	**Medium**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are moderately altered.	**Low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are slightly affected.
Magnitude	**High - negative**		**Low - negative**	
Probability	**Very likely (>90%)**	There are sound reasons that the impact will occur.	**Very unlikely (>10%)**	There are reasons that make the impact conceivable, yet improbable.
Significance	**Major - negative**		**Minimal - negative**	
Importance	**High**	High	**Low**	Low
Consequence	**Highly-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Deficient**	
Reversibility	**Low**	The affected environment may not be able to recover from the impact - permanently modified.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

Table 7-6 Impacts to biodiversity associated with the proposed construction phase.

No.	4			
Project phase	**Construction**			
Impact title	Fauna species			
Impact description	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Long term**	Impact will last between 6 and 25 years.	**Temporary**	Impact will last less than 1 month.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**Low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are slightly affected.
Magnitude	**High - negative**		**Low - negative**	
Probability	**Likely (>66%)**	The impact may occur, but not necessarily proof that it will.	**Very unlikely (>10%)**	There are reasons that make the impact conceivable, yet improbable.
Significance	**Moderate - negative**		**Minimal - negative**	
Importance	**Moderate**	Moderate	**Low**	Low
Consequence	**Slightly-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Inconclusive**	
Reversibility	**Low**	The affected environment may not be able to recover from the impact - permanently modified.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

7.1.6.3 Operation Phase

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

- Continued fragmentation and degradation of habitats and ecosystems (Table 7-7);
- Spread of alien and/or invasive species (Table 7-8);
- Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration) (Table 7-9);
- Avifaunal SCC mortality.

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

No.	5			
Project phase	**Operation**			
Impact title	Habitat and Vegetation destruction			
Impact description	Continued fragmentation and degradation of habitats and ecosystems			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Permanent**	Impact may be permanent, or in excess of 25 years.	**Short term**	Impact will last less than 1 year.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**Low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are slightly affected.
Magnitude	**High - negative**		**Low - negative**	
Probability	**Very likely (>90%)**	There are sound reasons that the impact will occur.	**Unlikely (>33%)**	The impacts occurrence is rare but has happened before.
Significance	**Major - negative**		**Minimal - negative**	
Importance	**Moderate**	Moderate	**Moderate**	Moderate
Consequence	**Moderately-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Established, but incomplete**	
Reversibility	**Medium**	The affected environment may only recover from the impact with significant intervention or over long time period.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

Table 7-8 Impacts to biodiversity associated with the proposed operational phase.

No.	6			
Project phase	**Operation**			
Impact title	AIP infestation			
Impact description	Spread of alien and/or invasive species			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Permanent**	Impact may be permanent, or in excess of 25 years.	**Temporary**	Impact will last less than 1 month.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**Very low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are not affected.
Magnitude	**High - negative**		**Very low - negative**	
Probability	**Likely (>66%)**	The impact may occur, but not necessarily proof that it will.	**Unlikely (>33%)**	The impacts occurrence is rare but has happened before.
Significance	**Major - negative**		**Minimal - negative**	
Importance	**High**	High	**High**	High
Consequence	**Highly-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Inconclusive**	
Reversibility	**Medium**	The affected environment may only recover from the impact with significant intervention or over long time period.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

Table 7-9 Impacts to biodiversity associated with the proposed operational phase

No.	7			
Project phase	**Operation**			
Impact title	Fauna Communities			
Impact description	Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Limited**	Limited to the site and its immediate surroundings.
Duration	**Long term**	Impact will last between 6 and 25 years.	**Short term**	Impact will last less than 1 year.
Intensity	**Medium**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are moderately altered.	**Low**	Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are slightly affected.
Magnitude	**High - negative**		**Low - negative**	
Probability	**Very likely (>90%)**	There are sound reasons that the impact will occur.	**Very unlikely (>10%)**	There are reasons that make the impact conceivable, yet improbable.
Significance	**Major - negative**		**Minimal - negative**	
Importance	**High**	High	**Low**	Low
Consequence	**Highly-detrimental**		**Very slightly-detrimental**	
Confidence	**Well established**		**Deficient**	
Reversibility	**Low**	The affected environment may not be able to recover from the impact - permanently modified.		
Mitigatability	**High**	Mitigation exists and will considerably reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

Table 7-10 Impacts to biodiversity associated with the proposed operational phase

No.	8			
Project phase	**Operation**			
Impact title	Avifaunal SCC			
Impact description	Avifaunal SCC Mortality			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**National**	Impacts manifest at a national level / provincial.	**National**	Impacts manifest at a national level / provincial.
Duration	**Permanent**	Impact may be permanent, or in excess of 25 years.	**Permanent**	Impact may be permanent, or in excess of 25 years.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.
Magnitude	**Very high - negative**		**Very high - negative**	
Probability	**Very likely (>90%)**	There are sound reasons that the impact will occur.	**Very likely (>90%)**	There are sound reasons that the impact will occur.
Significance	**Severe - negative**		**Severe - negative**	
Importance	**High**	High	**High**	High
Consequence	**Highly-detrimental**		**Highly-detrimental**	
Confidence	**Virtually certain**		**Virtually certain**	
Reversibility	**Low**	The affected environment may not be able to recover from the impact - permanently modified.		
Mitigatability	**Low**	Mitigation does not exist; or mitigation may only slightly reduce the significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings	Avifaunal SCC impacts cannot be mitigated and mortalities will occur			

7.1.6.4 Cumulative Impacts

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

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 fauna and flora.

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 nearby wind farm with associated roads within the area). These include dust deposition, noise and vibration, disruption of corridors or habitat, groundwater drawdown, groundwater and surface water quality, and transport.

Long-term cumulative impacts due to extensive powerline corridors already established as well as the OHL corridor footprint and associated roads can lead to the loss of endemic species and threatened species, loss of habitat and vegetation types and even degradation of sensitive areas (Table 7-1).

Table 7-11 Cumulative Impacts to biodiversity associated with the proposed project.

No.	10			
Project phase	**Construction & Decommissioning**			
Impact title	Cumulative Impacts			
Impact description	Cumulative impacts on Biodiversity			
Impact Assessment	**Impact not mitigated**		**Impact mitigated**	
Nature	**Negative**		**Negative**	
Extent	**Regional**	Impacts manifest at a regional / municipal level.	**Local**	Extending across the site and to nearby settlements.
Duration	**Long term**	Impact will last between 6 and 25 years.	**Long term**	Impact will last between 6 and 25 years.
Intensity	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.	**High**	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease.
Magnitude	**High - negative**		**High - negative**	
Probability	**Likely (>66%)**	The impact may occur, but not necessarily proof that it will.	**Likely (>66%)**	The impact may occur, but not necessarily proof that it will.
Significance	**Moderate - negative**		**Moderate - negative**	
Importance	**High**	High	**High**	High
Consequence	**Moderately-detrimental**		**Moderately-detrimental**	
Confidence	**Virtually certain**		**Virtually certain**	
Reversibility	**Medium**	The affected environment may only recover from the impact with significant intervention or over long time period.		
Mitigatability	**Medium**	Mitigation exists and may notably reduce significance of impacts.		
Potential mitigation	See BMP			
Comment on ratings				

7.1.7 Biodiversity Management Plan

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 7-12 presents the recommended mitigation measures and the respective timeframes, targets and performance indicators for the terrestrial 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 areas in the vicinity of the project area;
- As far as possible, reduce the negative fragmentation effects of the development and enable safe movement of faunal species;
- Prevent the direct and indirect loss and disturbance of faunal species and community (including occurring and potentially occurring species of conservation concern); and
- Follow the guidelines for interpreting Site Ecological Importance (SEI).

Table 7-12 Mitigation measures including requirements for timeframes, roles and responsibilities for the terrestrial study

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
	Management outcome: Vegetation and Habitats			
Areas rated as High sensitivity outside of the direct project development areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to these areas from construction workers and machinery. The infrastructure should be realigned to prioritise development within medium sensitivity areas. Mitigated development in High sensitivity areas is permissible. The OHL can span these High sensitivity areas.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to within the low/medium sensitivity areas. No further loss of high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
Existing access routes, especially roads must be made use of.	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
All laydown, chemical toilets etc. should be restricted to medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated project areas.	Construction/Operational Phase	Environmental Officer & Design Engineer	Laydown areas	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. All livestock must always be kept out of the project area, especially areas that have been recently re-planted	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

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. Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.				
It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
A fire management plan needs to be complied and implemented to restrict the impact fire might have on the surrounding areas.	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
Any individual of the protected plants that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. Hi visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. Infrastructure, development areas and routes where protected plants cannot be avoided, these plants many being geophytes or small succulents should be removed from the soil and relocated/ re-planted in similar habitats where they should be able to resprout and flourish again. All protected and red-data plants should be relocated, and as many other geophytic species as possible.	Life of operation	Project manager, Environmental Officer	Protected Tree/Plant species	Ongoing
A pre-construction survey in the flowering season (July-September) should be conducted in order to ensure that a more comprehensive floral presence confirmation. For the threatened species that may not be destroyed, it is recommended that professional service providers that deal with plant search and rescue be used to remove such plants and use them either for later rehabilitation work or other conservation projects.	Planning Phase, Pre-Construction	Project manager, Environmental Officer & Contractor	Flora species	During Phase
Management outcome: Fauna				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any SSC should be noted. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required	Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal species.	During phase

permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated				
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, • Signs must be put up to enforce this.	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna.	Construction	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed • Signs must be put up to enforce this;	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Light pollution and period of light.	Ongoing
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing
Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day in the case.	Ongoing
As far as possible power cables within the project area should be thoroughly insulated.	Planning and construction	Environmental Officer & Contractor, Engineer	Exposed cables	During phase
Eskom guidelines on impacts to avifaunal mitigation measures must be followed	Construction and Operational phase	Environmental Officer & Contractor, Engineer	Avifaunal SCC	Ongoing
Any exposed parts must be covered (insulated) to reduce electrocution risk	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase
All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are 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.	Construction and Operational phase	Project manager, Environmental Officer	Presence of Nests and faunal species	Planning, Construction and Rehabilitation
Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight; • Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in.	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
Management outcome: Alien species				

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Compilation of and implementation of an alien vegetation management plan.	Life of operation	Project manager, Environmental Officer & Contractor	Assess presence and encroachment of alien vegetation	Twice a year
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	Life of operation	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation
A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of SCCs	Life of operation	Environmental Officer & Health and Safety Officer	Evidence or presence of pests	Life of operation

Management outcome: Dust

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces. • No non environmentally friendly suppressants may be used as this could result in pollution of water sources	Life of operation	Contractor	Dustfall	Dust monitoring program.

Management outcome: Waste management

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Waste management must be a priority and all waste must be collected and stored effectively.	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
Litter, spills, fuels, chemicals and human waste in and around the project area.	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility	Life of operation	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste.	Ongoing
Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste.	Ongoing

management. Under no circumstances may domestic waste be burned on site				
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.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days
Management outcome: Environmental awareness training				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
All personnel and contractors 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
Speed limits must be put in place to reduce erosion. • Reducing the dust generated by the listed activities above, especially the earth moving machinery, through wetting the soil surface and putting up signs to enforce speed limit as well as speed bumps built to force slow speeds; • Signs must be put up to enforce this.	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
Where possible, existing access routes and walking paths must be made use of.	Life of operation	Project manager, Environmental Officer	Routes used within the area	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds.	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
A stormwater management plan must be compiled and implemented, especially for where the road crosses the drainage feature.	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

8 Conclusion and Impact Statement

8.1 Terrestrial Ecology

The completion of a comprehensive desktop study, in conjunction with the results from the field survey, suggest there is a good confidence in the information provided. The survey ensured that there was a suitable groundtruth coverage of the assessment area and most habitats and ecosystems were assessed to obtain a general species (fauna and flora) overview and the major current impacts were observed. The conservation status is classified as Least Concern albeit the protection level is regarded as 'Not Protected' Ecosystem. Moreover, the proposed activity overlaps with an CBA 1, CBA2, IBA and an ecological support area.

The current layout overlaps within sensitive habitats and other areas of high biodiversity potential. Portions of the current expected corridor of the development would be considered to have a significant and high negative impact as it would directly affect the habitat of threatened/protected plant species and expected listed faunal species that use these ecosystems;

- The assessment area possesses a high diversity and density of protected flora species. Moreover, protected fauna are ubiquitous within the assessment area and surrounding landscape.

The developer is urged to alter the layout or design within the general corridor, which represents a compromise between the needs of the development and the environmental concerns at the site, especially in regard to the high sensitivity areas.

Historically, overgrazing from livestock (Sheep and cattle) and mismanagement has led to the deterioration these habits. However, the 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 the landscape.

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 the local landscape, not to mention the sensitivity according to various ecological datasets.

Development within confirmed CBA areas is not considered favourably by the regulating authorities, and implementation of the mitigation hierarchy must be demonstrated. This must include concerted efforts to avoid these high sensitive areas. Development of the corridor is not considered a destructive development and may be permitted within High sensitivity area, if pylons are placed with care. Development in High sensitivity areas must demonstrate avoidance mitigation, and offset mitigation may be further required. Development of the corridor and associated infrastructure must avoid the High sensitivity area, and disturbances to the medium sensitivity area must be kept to a minimum. The high sensitivity terrestrial areas still:

- Serve as and represent CBA1 and CBA2 as per the Conservation Plan;
- Supports and protects fauna and flora (including protected and threatened species); 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 High sensitivity areas will lead the direct destruction and loss of portions of functional CBA1 and CBA2, and 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.

It's the specialist opinion that existing corridors should be used instead of establishing new ones. This will not only result in a less significant environmental and cumulative impact but will most likely save money due to already existing roads.

8.2 Recommendations

The following recommendations should be considered for the authorisation:

- The High sensitivity area should be avoided as much is feasible, but the OHL can span these systems.

8.3 Impact Statement

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

- Habitat loss and fragmentation;
- Degradation of surrounding habitat;
- Direct loss of drainage areas; and
- Mortality, disturbance and displacement caused during the construction and operational phases.

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

Development within the High sensitivity is not regarded as a fatal flaw for the project, however, should not be considered for the pylon placements, avifaunal collision and electrocution mitigation measures must be followed. It is the opinion of the specialists that the project may be favourably considered, on condition all prescribed mitigation measures and supporting recommendations be implemented correctly and timeously.

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10 Appendix Items

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

Family	Taxon	IUCN
Poaceae	*Oropetium capense*	LC
Hyacinthaceae	*Lachenalia ensifolia*	LC
Asteraceae	*Chrysocoma ciliata*	LC
Poaceae	*Eragrostis curvula*	LC
Thymelaeaceae	*Lasiosiphon polycephalus*	LC
Poaceae	*Stipagrostis obtusa*	LC
Hyacinthaceae	*Daubenya comata*	LC
Scrophulariaceae	*Selago albida*	LC
Scrophulariaceae	*Nemesia sp.*	
Poaceae	*Tragus racemosus*	LC
Poaceae	*Eragrostis truncata*	LC
Asteraceae	*Phymaspermum aciculare*	LC
Scrophulariaceae	*Nemesia linearis*	LC
Asparagaceae	*Asparagus striatus*	LC
Poaceae	*Eragrostis procumbens*	LC
Crassulaceae	*Crassula corallina subsp. corallina*	LC
Asteraceae	*Pentzia calcarea*	LC
Ricciaceae	*Riccia albornata*	
Asteraceae	*Phymaspermum parvifolium*	LC
Poaceae	*Tragus berteronianus*	LC
Pteridaceae	*Cheilanthes hirta var. hirta*	LC
Poaceae	*Eragrostis procumbens*	LC
Scrophulariaceae	*Manulea fragrans*	LC
Poaceae	*Eragrostis tef*	NE
Hyacinthaceae	*Lachenalia ensifolia*	LC
Pteridaceae	*Cheilanthes eckloniana*	LC
Poaceae	*Eragrostis truncata*	LC
Melianthaceae	*Melianthus dregeanus subsp. dregeanus*	LC
Geraniaceae	*Monsonia salmoniflora*	LC
Amaranthaceae	*Salsola humifusa*	LC
Scrophulariaceae	*Jamesbrittenia filicaulis*	LC
Aizoaceae	*Oscularia deltoides*	LC
Amaranthaceae	*Bassia salsoloides*	LC
Asteraceae	*Pentzia incana*	LC
Malvaceae	*Hermannia burkei*	LC
Poaceae	*Eragrostis lehmanniana var. lehmanniana*	LC
Scrophulariaceae	*Limosella africana var. africana*	LC
Asteraceae	*Pentzia globosa*	LC

Scrophulariaceae	*Jamesbrittenia tysonii*	LC
Anacardiaceae	*Searsia ciliata*	LC
Colchicaceae	*Colchicum asteroides*	LC
Poaceae	*Enneapogon desvauxii*	LC
Iridaceae	*Syringodea concolor*	LC
Solanaceae	*Solanum retroflexum*	LC
Gentianaceae	*Sebaea pentandra var. pentandra*	LC
Scrophulariaceae	*Selago albida*	LC
Asteraceae	*Hertia kraussii*	LC
Hypericaceae	*Hypericum lalandii*	LC
Campanulaceae	*Wahlenbergia nodosa*	LC
Amaranthaceae	*Alternanthera pungens*	
Scrophulariaceae	*Jamesbrittenia tysonii*	LC
Asteraceae	*Chrysocoma ciliata*	LC
Poaceae	*Tragus koelerioides*	LC
Orchidaceae	*Satyrium longicauda var. longicauda*	NE
Euphorbiaceae	*Euphorbia arida*	LC
Oxalidaceae	*Oxalis depressa*	LC
Limeaceae	*Limeum sp.*	
Scrophulariaceae	*Chaenostoma rotundifolium*	LC
Poaceae	*Aristida vestita*	LC
Poaceae	*Eragrostis bicolor*	LC
Asteraceae	*Hertia kraussii*	LC
Asphodelaceae	*Haworthiopsis tessellata var. tessellata*	
Scrophulariaceae	*Chaenostoma halimifolium*	LC
Poaceae	*Digitaria eriantha*	LC
Scrophulariaceae	*Peliostomum leucorrhizum*	LC
Ruscaceae	*Sansevieria aethiopica*	LC
Scrophulariaceae	*Peliostomum origanoides*	LC
Apocynaceae	*Microloma armatum var. armatum*	LC
Asteraceae	*Arctotis leiocarpa*	LC
Poaceae	*Fingerhuthia africana*	LC
Lamiaceae	*Salvia verbenaca*	LC
Caryophyllaceae	*Dianthus micropetalus*	LC
Asteraceae	*Geigeria ornativa subsp. ornativa*	LC
Acanthaceae	*Barleria rigida var. rigida*	
Zygophyllaceae	*Roepera lichtensteiniana*	
Solanaceae	*Lycium horridum*	LC
Apocynaceae	*Stapelia grandiflora var. grandiflora*	LC
Apocynaceae	*Asclepias gibba var. gibba*	LC
Cucurbitaceae	*Cucumis africanus*	LC
Asteraceae	*Pentzia globosa*	LC

Amaranthaceae	*Bassia salsoloides*	LC
Scrophulariaceae	*Selago albida*	LC
Asteraceae	*Hertia kraussii*	LC
Asteraceae	*Lepidostephium denticulatum*	LC
Amaranthaceae	*Chenopodiastrum murale*	
Malvaceae	*Hermannia burkei*	LC
Poaceae	*Puccinellia acroxantha*	LC
Cyperaceae	*Bulbostylis humilis*	LC
Asteraceae	*Helichrysum asperum var. asperum*	LC
Asteraceae	*Pentzia sp.*	
Cucurbitaceae	*Cucumis heptadactylus*	LC
Asteraceae	*Pentzia lanata*	LC
Aizoaceae	*Mesembryanthemum coriarium*	
Iridaceae	*Moraea sp.*	
Pteridaceae	*Cheilanthes eckloniana*	LC
Scrophulariaceae	*Zaluzianskya karrooica*	LC
Poaceae	*Eragrostis pilosa*	LC
Boraginaceae	*Heliotropium lineare*	LC
Asphodelaceae	*Kniphofia ensifolia subsp. ensifolia*	LC
Poaceae	*Stipagrostis ciliata var. capensis*	LC
Scrophulariaceae	*Hebenstretia dura*	LC
Iridaceae	*Syringodea concolor*	LC
Asteraceae	*Pentzia spinescens*	LC
Poaceae	*Pentameris setifolia*	LC
Scrophulariaceae	*Selago albida*	LC
Asteraceae	*Felicia muricata subsp. muricata*	LC
Hyacinthaceae	*Dipcadi viride*	LC
Santalaceae	*Osyris lanceolata*	LC
Asteraceae	*Hertia pallens*	LC
Asteraceae	*Oedera humilis*	
Poaceae	*Sorghum halepense*	NE
Orchidaceae	*Disa pulchra*	LC
Aizoaceae	*Ruschia sp.*	
Aizoaceae	*Galenia pubescens*	LC
Dryopteridaceae	*Arachniodes webbiana subsp. foliosa*	LC
Caryophyllaceae	*Dianthus micropetalus*	LC
Asphodelaceae	*Haworthiopsis tessellata*	
Amaranthaceae	*Salsola dealata*	LC
Asteraceae	*Gazania jurineifolia subsp. jurineifolia*	LC
Poaceae	*Chloris virgata*	LC
Scrophulariaceae	*Selago albida*	LC
Poaceae	*Eragrostis homomalla*	LC

Asteraceae	*Senecio isatideus*	LC
Poaceae	*Eragrostis obtusa*	LC
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	LC
Asteraceae	*Osteospermum leptolobum*	LC
Pottiaceae	*Tortula atrovirens*	
Malvaceae	*Hermannia pulchella*	LC
Asteraceae	*Osteospermum scariosum var. scariosum*	NE
Poaceae	*Tragus berteronianus*	LC
Pottiaceae	*Pseudocrossidium crinitum*	
Aizoaceae	*Ruschia sp.*	
Malvaceae	*Hermannia pulchella*	LC
Asteraceae	*Oedera humilis*	
Asteraceae	*Oedera humilis*	
Poaceae	*Heteropogon contortus*	LC
Leucobryaceae	*Campylopus robillardei*	
Asteraceae	*Felicia filifolia subsp. filifolia*	LC
Poaceae	*Sporobolus ioclados*	LC
Lobeliaceae	*Monopsis scabra*	LC
Poaceae	*Sporobolus discosporus*	LC
Poaceae	*Enneapogon desvauxii*	LC
Aizoaceae	*Ruschia sp.*	
Poaceae	*Cynodon incompletus*	LC
Scrophulariaceae	*Aptosimum spinescens*	LC
Amaranthaceae	*Salsola calluna*	LC
Poaceae	*Stipagrostis obtusa*	LC
Asteraceae	*Pteronia glaucescens*	LC
Malvaceae	*Hermannia erodioides*	LC
Poaceae	*Puccinellia acroxantha*	LC
Poaceae	*Aristida congesta subsp. barbicollis*	LC
Brassicaceae	*Erucastrum strigosum*	LC
Poaceae	*Eragrostis curvula*	LC
Aizoaceae	*Mesembryanthemum coriarium*	
Asparagaceae	*Asparagus suaveolens*	LC
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	LC
Asteraceae	*Osteospermum leptolobum*	LC
Poaceae	*Themeda triandra*	LC
Asteraceae	*Dimorphotheca cuneata*	LC
Aizoaceae	*Delosperma sp.*	
Aizoaceae	*Mesembryanthemum coriarium*	
Kewaceae	*Kewa salsoloides*	LC
Fabaceae	*Lessertia annularis*	LC
Poaceae	*Enneapogon scaber*	LC

Poaceae	*Eragrostis barrelieri*	NE
Poaceae	*Eragrostis curvula*	LC
Asteraceae	*Pentzia globosa*	LC
Asteraceae	*Dimorphotheca zeyheri*	LC
Poaceae	*Puccinellia distans*	NE
Asteraceae	*Helichrysum micropoides*	LC
Amaranthaceae	*Salsola glabrescens*	LC
Asteraceae	*Osteospermum leptolobum*	LC
Asteraceae	*Osteospermum leptolobum*	LC
Geraniaceae	*Pelargonium minimum*	LC
Poaceae	*Aristida adscensionis*	LC
Poaceae	*Sporobolus ioclados*	LC
Hyacinthaceae	*Daubenya comata*	LC
Poaceae	*Cenchrus longisetus*	NE
Poaceae	*Oropetium capense*	LC
Polygalaceae	*Polygala asbestina*	LC
Scrophulariaceae	*Aptosimum spinescens*	LC
Asteraceae	*Helichrysum zeyheri*	LC
Asteraceae	*Osteospermum spinescens*	LC
Acanthaceae	*Dicliptera clinopodia*	LC
Poaceae	*Enneapogon scaber*	LC
Poaceae	*Tragus racemosus*	LC
Caryophyllaceae	*Dianthus micropetalus*	LC
Scrophulariaceae	*Aptosimum spinescens*	LC
Amaryllidaceae	*Cyrtanthus huttonii*	LC
Scrophulariaceae	*Aptosimum procumbens*	LC
Asteraceae	*Pentzia lanata*	LC
Hyacinthaceae	*Ornithogalum nanodes*	LC
Aizoaceae	*Mesembryanthemum coriarium*	
Gisekiaceae	*Gisekia pharnaceoides var. pharnaceoides*	LC
Poaceae	*Eragrostis mexicana subsp. virescens*	NE
Asteraceae	*Osteospermum leptolobum*	LC
Poaceae	*Eragrostis bergiana*	LC
Pottiaceae	*Trichostomum brachydontium*	
Asteraceae	*Dimorphotheca sp.*	
Solanaceae	*Lycium pumilum*	LC
Poaceae	*Eragrostis homomalla*	LC
Asteraceae	*Othonna pavonia*	LC
Asteraceae	*Oedera humilis*	
Asteraceae	*Lepidostephium denticulatum*	LC
Poaceae	*Eragrostis chloromelas*	LC
Geraniaceae	*Pelargonium aestivale*	LC

Aizoaceae	*Ruschia sp.*	
Poaceae	*Panicum impeditum*	LC
Colchicaceae	*Ornithoglossum vulgare*	LC
Poaceae	*Cenchrus ciliaris*	LC
Fabaceae	*Leobordea platycarpa*	LC
Orchidaceae	*Orthochilus foliosus*	LC
Asteraceae	*Oedera oppositifolia*	
Aizoaceae	*Mesembryanthemum coriarium*	
Iridaceae	*Syringodea concolor*	LC
Asteraceae	*Pentzia globosa*	LC
Poaceae	*Enneapogon scoparius*	LC
Scrophulariaceae	*Selago albida*	LC
Aizoaceae	*Tetragonia fruticosa*	LC
Iridaceae	*Gladiolus ecklonii*	LC
Sapindaceae	*Allophylus decipiens*	LC
Hyacinthaceae	*Lachenalia sp.*	
Iridaceae	*Syringodea concolor*	LC
Amaranthaceae	*Atriplex vestita var. appendiculata*	LC
Iridaceae	*Gladiolus permeabilis subsp. edulis*	LC
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	LC
Poaceae	*Eragrostis bicolor*	LC
Poaceae	*Tragus racemosus*	LC
Polygonaceae	*Rumex lanceolatus*	LC
Malvaceae	*Hermannia cuneifolia var. cuneifolia*	LC
Scrophulariaceae	*Aptosimum spinescens*	LC
Asteraceae	*Oedera humilis*	
Iridaceae	*Gladiolus dalenii subsp. dalenii*	LC
Lamiaceae	*Stachys cuneata*	LC
Poaceae	*Eragrostis curvula*	LC
Fabaceae	*Melolobium candicans*	LC
Aizoaceae	*Mesembryanthemum coriarium*	
Asteraceae	*Pentzia incana*	LC
Asteraceae	*Pteronia glauca*	LC
Pteridaceae	*Cheilanthes eckloniana*	LC
Hyacinthaceae	*Ledebouria apertiflora*	LC
Asteraceae	*Osteospermum leptolobum*	LC
Solanaceae	*Lycium horridum*	LC
Fabaceae	*Cullen tomentosum*	LC
Asparagaceae	*Asparagus striatus*	LC
Poaceae	*Cenchrus ciliaris*	LC
Asteraceae	*Athanasia minuta subsp. minuta*	LC
Aspleniaceae	*Asplenium cordatum*	LC

Asteraceae	*Pentzia elegans*	LC
Poaceae	*Eragrostis curvula*	LC
Asphodelaceae	*Haworthiopsis tessellata*	
Solanaceae	*Lycium horridum*	LC
Asteraceae	*Printzia huttoni*	LC
Apocynaceae	*Ceropegia rubella*	
Solanaceae	*Lycium horridum*	LC
Cucurbitaceae	*Cucumis africanus*	LC
Hypoxidaceae	*Empodium elongatum*	LC
Amaranthaceae	*Salsola dealata*	LC
Aizoaceae	*Ruschia sp.*	
Asteraceae	*Phymaspermum parvifolium*	LC
Lamiaceae	*Stachys linearis*	LC
Asteraceae	*Geigeria filifolia*	LC
Gisekiaceae	*Gisekia pharnaceoides var. pharnaceoides*	LC
Lamiaceae	*Salvia verbenaca*	LC
Asteraceae	*Felicia burkei*	LC
Poaceae	*Sporobolus albicans*	LC
Asteraceae	*Oedera humilis*	
Malvaceae	*Hermannia pulchella*	LC
Zygophyllaceae	*Tetraena microcarpa*	
Malvaceae	*Hermannia erodioides*	LC
Pottiaceae	*Trichostomum brachydontium*	
Iridaceae	*Moraea falcifolia*	LC
Poaceae	*Aristida adscensionis*	LC
Amaryllidaceae	*Brunsvigia radulosa*	LC
Pottiaceae	*Pseudocrossidium crinitum*	
Malvaceae	*Grewia flava*	LC
Malvaceae	*Radyera urens*	LC
Poaceae	*Tragus berteronianus*	LC
Asteraceae	*Helichrysum dregeanum*	LC
Scrophulariaceae	*Zaluzianskya karrooica*	LC
Hyacinthaceae	*Daubenya comata*	LC
Santalaceae	*Thesium congestum*	LC
Asteraceae	*Gazania krebsiana subsp. arctotoides*	LC
Poaceae	*Puccinellia distans*	NE
Euphorbiaceae	*Euphorbia juttae*	LC
Asteraceae	*Pteronia sordida*	LC
Asteraceae	*Dimorphotheca cuneata*	LC
Poaceae	*Oropetium capense*	LC
Asteraceae	*Pentzia spinescens*	LC
Iridaceae	*Moraea falcifolia*	LC

Scrophulariaceae	*Selago paniculata*	LC
Poaceae	*Eragrostis curvula*	LC
Asphodelaceae	*Haworthiopsis tessellata*	
Asphodelaceae	*Haworthia bolusii var. blackbeardiana*	NE
Poaceae	*Chloris virgata*	LC
Asteraceae	*Oedera humilis*	
Asteraceae	*Schistostephium flabelliforme*	LC
Lobeliaceae	*Monopsis scabra*	LC
Fabaceae	*Calobota spinescens*	LC
Orchidaceae	*Satyrium membranaceum*	LC
Melianthaceae	*Melianthus dregeanus subsp. dregeanus*	LC
Poaceae	*Eragrostis procumbens*	LC
Scrophulariaceae	*Peliostomum leucorrhizum*	LC
Apocynaceae	*Pachypodium succulentum*	LC
Lobeliaceae	*Lobelia flaccida subsp. flaccida*	LC
Malvaceae	*Hermannia pulchella*	LC
Asteraceae	*Felicia muricata subsp. muricata*	LC
Asteraceae	*Felicia muricata subsp. muricata*	LC
Asteraceae	*Hertia pallens*	LC
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	LC
Asteraceae	*Berkheya sp.*	
Poaceae	*Stipagrostis namaquensis*	LC
Pteridaceae	*Cheilanthes eckloniana*	LC
Asteraceae	*Oedera humilis*	
Apocynaceae	*Microloma armatum var. armatum*	LC
Scrophulariaceae	*Manulea fragrans*	LC
Asteraceae	*Hertia pallens*	LC
Asteraceae	*Senecio niveus*	LC
Poaceae	*Tragus koelerioides*	LC
Poaceae	*Eragrostis curvula*	LC
Polygalaceae	*Polygala ephedroides*	LC
Asteraceae	*Berkheya eriobasis*	LC
Geraniaceae	*Pelargonium tragacanthoides*	LC
Malvaceae	*Hermannia pulchella*	LC
Asphodelaceae	*Kniphofia ensifolia subsp. ensifolia*	LC
Asteraceae	*Leysera tenella*	LC
Euphorbiaceae	*Euphorbia flanaganii*	VU
Poaceae	*Eragrostis nindensis*	LC
Tecophilaeaceae	*Cyanella lutea*	
Poaceae	*Oropetium capense*	LC

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

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Amietia delalandii	Delalande's River Frog	LC	Unlisted
Amietia fuscigula	Cape River Frog	LC	LC
Amietia poyntoni	Poynton's River Frog	LC	LC
Breviceps adspersus	Bushveld Rain Frog	LC	LC
Cacosternum boettgeri	Common Caco	LC	LC
Kassina senegalensis	Bubbling Kassina	LC	LC
Poyntonophrynus vertebralis	Southern Pygmy Toad	LC	LC
Pyxicephalus adspersus	Giant Bullfrog	NT	LC
Sclerophrys gutturalis	Guttural Toad	LC	LC
Tomopterna cryptotis	Tremelo Sand Frog	LC	LC
Tomopterna tandyi	Tandy's Sand Frog	LC	LC
Vandijkophrynus gariepensis	Karoo Toad	Not listed	Not listed
Xenopus laevis	Common Platanna	LC	LC

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

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Afrotyphlops schlegelii	Schlegel's Beaked Blind Snake	LC	Unlisted
Agama aculeata	Western Ground Agama	LC	Unlisted
Agama atra	Southern Rock Agama	LC	LC
Aspidelaps lubricus	Coral Shield Snake	LC	LC
Bitis arietans	Puff Adder	LC	Unlisted
Boaedon capensis	Brown House Snake	LC	LC
Chondrodactylus bibronii	Bibron's Gecko	LC	Unlisted
Dasypeltis scabra	Rhombic Egg-eater	LC	LC
Homopus femoralis	Greater Dwarf Tortoise	LC	LC
Karusasaurus polyzonus	Southern Karusa Lizard	LC	LC
Lamprophis aurora	Aurora House Snake	LC	LC
Leptotyphlops scutifrons	Peters' Thread Snake	LC	Unlisted
Lycophidion capense	Cape Wolf Snake	LC	Unlisted
Monopeltis capensis	Cape Worm Lizard	LC	LC
Naja nivea	Cape Cobra	LC	Unlisted
Pachydactylus capensis	Cape Gecko	LC	Unlisted
Pachydactylus mariquensis	Common Banded Gecko	LC	LC
Pedioplanis laticeps	Karoo Sand Lizard	LC	LC
Pedioplanis lineoocellata	Spotted Sand Lizard	LC	Unlisted
Pedioplanis namaquensis	Namaqua Sand Lizard	LC	Unlisted
Pelomedusa galeata	South African Marsh Terrapin	Not evaluated	Unlisted
Psammobates tentorius	Tent Tortoise	LC	LC
Psammophis notostictus	Karoo Sand Snake	LC	Unlisted
Psammophis trinasalis	Fork-marked Sand Snake	LC	Unlisted
Pseudaspis cana	Mole Snake	LC	Unlisted
Ptenopus garrulus	Common Barking Gecko	LC	Unlisted
Rhinotyphlops lalandei	Delalande's Beaked Blind Snake	LC	Unlisted
Stigmochelys pardalis	Leopard Tortoise	LC	LC
Trachylepis capensis	Cape Skink	LC	Unlisted
Trachylepis occidentalis	Western Three-striped Skink	LC	Unlisted
Trachylepis punctatissima	Speckled Rock Skink	LC	LC
Trachylepis sulcata sulcata	Westren Rock Skink	LC	Unlisted
Trachylepis variegata	Variegated Skink	LC	Unlisted
Varanus albigularis albigularis	Southern Rock Monitor	LC	Unlisted
Varanus niloticus	Water Monitor	LC	Unlisted

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

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Aethomys namaquensis	Namaqua rock rat	LC	LC
Antidorcas marsupialis	Sclater's Shrew	LC	LC
Atilax paludinosus	Water Mongoose	LC	LC
Canis mesomelas	Black-backed Jackal	LC	LC
Caracal caracal	Caracal	LC	LC
Chlorocebus pygerythrus	Vervet Monkey	LC	LC
Cryptomys hottentotus	Common Mole-rat	LC	LC
Cynictis penicillata	Yellow Mongoose	LC	LC
Desmodillus auricularis	Short-tailed Gerbil	LC	LC
Eidolon helvum	African Straw-colored Fruit Bat	LC	NT
Elephantulus edwardii	Cape Rock Sengi	LC	LC
Elephantulus myurus	Eastern Rock Sengi	LC	LC
Elephantulus rupestris	Western Rock Sengi	LC	LC
Eptesicus hottentotus	Long-tailed Serotine Bat	LC	LC
Felis nigripes	Black-footed Cat	VU	VU
Felis silvestris	African Wildcat	LC	LC
Genetta genetta	Small-spotted Genet	LC	LC
Gerbilliscus brantsii	Highveld Gerbil	LC	LC
Gerbilliscus leucogaster	Bushveld Gerbil	LC	LC
Gerbillurus paeba	Hairy-footed Gerbil	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	Round Eared Elephant Shrew	LC	LC
Malacothrix typica	Gerbil Mouse	LC	LC
Mastomys coucha	Multimammate Mouse	LC	LC
Mellivora capensis	Honey Badger	LC	LC
Mus musculus	House Mouse	Unlisted	LC
Neoromicia capensis	Cape Serotine Bat	LC	LC
Neoromicia zuluensis	Aloe Bat	LC	LC
Orycteropus afer	Aardvark	LC	LC
Otocyon megalotis	Bat-eared Fox	LC	LC
Otomys unisulcatus	Karoo Bush Rat	LC	LC

Panthera pardus	Leopard	VU	VU
Papio ursinus	Chacma Baboon	LC	LC
Parahyaena brunnea	Brown Hyaena	NT	NT
Parotomys brantsii	Brants' Whistling Rat	LC	LC
Parotomys littledalei	Littledale's Whistling Rat	NT	LC
Pedetes capensis	Springhare	LC	LC
Phacochoerus africanus	Common Warthog	LC	LC
Poecilogale albinucha	African Striped Weasel	NT	LC
Procavia capensis	Rock Hyrax	LC	LC
Pronolagus saundersiae	Hewitt's Red Rock Rabbit	LC	LC
Proteles cristata	Aardwolf	LC	LC
Raphicerus campestris	Steenbok	LC	LC
Rattus rattus	House Rat	Exotic (Not listed)	LC
Rhabdomys pumilio	Xeric Four-striped Mouse	LC	LC
Rhinolophus darlingi	Darling's Horseshoe Bat	LC	LC
Rousettus aegyptiacus	Egyptian Fruit Bat	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
Xerus inauris	Cape Ground Squirrel	LC	LC

10.5 Appendix E -Avifauna Species expected to occur within the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Acrocephalus baeticatus	Reed-warbler, African	Unlisted	Unlisted
Acrocephalus gracilirostris	Swamp-warbler, Lesser	Unlisted	LC
Actitis hypoleucos	Sandpiper, Common	Unlisted	LC
Afrotis afraoides	Korhaan, Northern Black	Unlisted	LC
Alopochen aegyptiaca	Goose, Egyptian	Unlisted	LC
Amadina erythrocephala	Finch, Red-headed	Unlisted	LC
Anas capensis	Teal, Cape	Unlisted	LC
Anas erythrorhyncha	Teal, Red-billed	Unlisted	LC
Anas sparsa	Duck, African Black	Unlisted	LC
Anas undulata	Duck, Yellow-billed	Unlisted	LC
Anthoscopus minutus	Penduline-tit, Cape	Unlisted	LC
Anthus cinnamomeus	Pipit, African	Unlisted	LC
Anthus crenatus	Pipit, African Rock	NT	NT
Anthus nicholsoni	Nicholson's pipit	Unlisted	LC
Anthus similis	Pipit, Long-billed	Unlisted	LC
Anthus vaalensis	Pipit, Buffy	Unlisted	LC
Apus affinis	Swift, Little	Unlisted	LC
Apus apus	Swift, Common	Unlisted	LC
Apus barbatus	Swift, African Black	Unlisted	LC
Apus bradfieldi	Swift, Bradfield's	Unlisted	LC
Apus caffer	Swift, White-rumped	Unlisted	LC
Aquila rapax	Eagle, Tawny	EN	VU
Aquila verreauxii	Eagle, Verreaux's	VU	LC
Ardea cinerea	Heron, Grey	Unlisted	LC
Ardea melanocephala	Heron, Black-headed	Unlisted	LC
Ardeotis kori	Bustard, Kori	NT	NT
Batis pririt	Batis, Pririt	Unlisted	LC
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC
Bubo africanus	Eagle-owl, Spotted	Unlisted	LC
Bubulcus ibis	Egret, Cattle	Unlisted	LC
Burhinus capensis	Thick-knee, Spotted	Unlisted	LC
Buteo buteo	Buzzard, Common (Steppe)	Unlisted	LC
Buteo rufofuscus	Buzzard, Jackal	Unlisted	LC
Calendulauda albescens	Lark, Karoo	Unlisted	LC
Calendulauda sabota	Lark, Sabota	Unlisted	LC
Calidris ferruginea	Sandpiper, Curlew	LC	NT

Calidris minuta	Stint, Little	LC	LC
Calidris pugnax	Ruff	Unlisted	LC
Cecropis cucullata	Swallow, Greater Striped	Unlisted	LC
Cercotrichas coryphoeus	Scrub-robin, Karoo	Unlisted	LC
Certhilauda subcoronata	Lark, Karoo Long-billed	Unlisted	LC
Charadrius hiaticula	Plover, Common Ringed	Unlisted	LC
Charadrius pecuarius	Plover, Kittlitz's	Unlisted	LC
Charadrius tricollaris	Plover, Three-banded	Unlisted	LC
Chersomanes albofasciata	Lark, Spike-heeled	Unlisted	LC
Chroicocephalus cirrocephalus	Gull, Grey-headed	Unlisted	LC
Chrysococcyx caprius	Cuckoo, Diderick	Unlisted	LC
Ciconia ciconia	Stork, White	Unlisted	LC
Ciconia nigra	Stork, Black	VU	LC
Cinnyris fuscus	Sunbird, Dusky	Unlisted	LC
Cisticola aridulus	Cisticola, Desert	Unlisted	LC
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
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
Corythornis cristatus	Kingfisher, Malachite	Unlisted	Unlisted
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 atrogularis	Canary, Black-throated	Unlisted	LC
Crithagra flaviventris	Canary, Yellow	Unlisted	LC
Curruca layardi	Tit-Babbler, Layard's	Unlisted	LC
Curruca subcoerulea	Tit-babbler, Chestnut-vented	Unlisted	Unlisted
Dendrocygna viduata	Duck, White-faced Whistling	Unlisted	LC
Egretta garzetta	Egret, Little	Unlisted	LC
Elanus caeruleus	Kite, Black-shouldered	Unlisted	LC
Emarginata schlegelii	Chat, Karoo	Unlisted	LC
Emarginata sinuata	Chat, Sickle-winged	Unlisted	LC
Emberiza capensis	Bunting, Cape	Unlisted	LC

Emberiza impetuani	Bunting, Lark-like	Unlisted	LC
Emberiza tahapisi	Bunting, Cinnamon-breasted	Unlisted	LC
Eremomela icteropygialis	Eremomela, Yellow-bellied	Unlisted	LC
Eremopterix verticalis	Sparrowlark, Grey-backed	Unlisted	LC
Estrilda astrild	Waxbill, Common	Unlisted	LC
Euplectes orix	Bishop, Southern Red	Unlisted	LC
Eupodotis caerulescens	Korhaan, Blue	LC	NT
Eupodotis vigorsii	Korhaan, Karoo	NT	LC
Euryptila subcinnamomea	Warbler, Cinnamon-breasted	Unlisted	LC
Falco amurensis	Falcon, Amur	Unlisted	LC
Falco biarmicus	Falcon, Lanner	VU	LC
Falco naumanni	Kestrel, Lesser	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
Grus paradisea	Crane, Blue	NT	VU
Hieraaetus pennatus	Eagle, Booted	Unlisted	LC
Himantopus himantopus	Stilt, Black-winged	Unlisted	LC
Hirundo albigularis	Swallow, White-throated	Unlisted	LC
Hirundo rustica	Swallow, Barn	Unlisted	LC
Lamprotornis bicolor	Starling, Pied	Unlisted	LC
Lamprotornis nitens	Starling, Cape Glossy	Unlisted	LC
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC
Malcorus pectoralis	Warbler, Rufous-eared	Unlisted	LC
Melaenornis infuscatus	Flycatcher, Chat	Unlisted	LC
Melaenornis silens	Flycatcher, Fiscal	Unlisted	LC
Melaniparus afer	Tit, Grey	Unlisted	Unlisted
Melierax canorus	Goshawk, Southern Pale Chanting	Unlisted	LC
Merops apiaster	Bee-eater, European	Unlisted	LC
Micronisus gabar	Goshawk, Gabar	Unlisted	LC
Mirafra fasciolata	Lark, Eastern Clapper	Unlisted	LC
Monticola brevipes	Rock-thrush, Short-toed	Unlisted	LC
Motacilla capensis	Wagtail, Cape	Unlisted	LC
Muscicapa striata	Flycatcher, Spotted	Unlisted	LC
Myrmecocichla formicivora	Chat, Anteating	Unlisted	LC
Myrmecocichla monticola	Wheatear, Mountain	Unlisted	LC
Neotis ludwigii	Bustard, Ludwig's	EN	EN

Numida meleagris	Guineafowl, Helmeted	Unlisted	LC
Oena capensis	Dove, Namaqua	Unlisted	LC
Oenanthe familiaris	Chat, Familiar	Unlisted	LC
Oenanthe pileata	Wheatear, Capped	Unlisted	LC
Onychognathus morio	Starling, Red-winged	Unlisted	LC
Onychognathus nabouroup	Starling, Pale-winged	Unlisted	LC
Ortygospiza atricollis	Quailfinch, African	Unlisted	LC
Passer diffusus	Sparrow, Southern Grey-headed	Unlisted	LC
Passer domesticus	Sparrow, House	Unlisted	LC
Passer melanurus	Sparrow, Cape	Unlisted	LC
Petrochelidon spilodera	Cliff-swallow, South African	Unlisted	LC
Phalacrocorax lucidus	Cormorant, White-breasted	Unlisted	LC
Phoenicopterus roseus	Flamingo, Greater	NT	LC
Platalea alba	Spoonbill, African	Unlisted	LC
Plectropterus gambensis	Goose, Spur-winged	Unlisted	LC
Plegadis falcinellus	Ibis, Glossy	Unlisted	LC
Plocepasser mahali	Sparrow-weaver, White-browed	Unlisted	LC
Ploceus capensis	Weaver, Cape	Unlisted	LC
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC
Polemaetus bellicosus	Eagle, Martial	EN	EN
Polyboroides typus	Harrier-Hawk, African	Unlisted	LC
Prinia flavicans	Prinia, Black-chested	Unlisted	LC
Prinia maculosa	Prinia, Karoo	Unlisted	LC
Pterocles namaqua	Sandgrouse, Namaqua	Unlisted	LC
Ptyonoprogne fuligula	Martin, Rock	Unlisted	Unlisted
Pycnonotus nigricans	Bulbul, African Red-eyed	Unlisted	LC
Quelea quelea	Quelea, Red-billed	Unlisted	LC
Recurvirostra avosetta	Avocet, Pied	Unlisted	LC
Rhinoptilus africanus	Courser, Double-banded	Unlisted	LC
Riparia paludicola	Martin, Brown-throated	Unlisted	LC
Sagittarius serpentarius	Secretarybird	VU	EN
Saxicola torquatus	Stonechat, African	Unlisted	LC
Scleroptila afra	Francolin, Grey-winged	Unlisted	LC
Scopus umbretta	Hamerkop, Hamerkop	Unlisted	LC
Serinus alario	Canary, Black-headed	Unlisted	LC
Spatula smithii	Shoveler, Cape	Unlisted	LC
Spilopelia senegalensis	Dove, Laughing	Unlisted	LC
Stenostira scita	Flycatcher, Fairy	Unlisted	LC
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC

Streptopelia semitorquata	Dove, Red-eyed	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
Tringa glareola	Sandpiper, Wood	Unlisted	LC
Tringa nebularia	Greenshank, Common	Unlisted	LC
Turdus smithi	Thrush, Karoo	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
Zapornia flavirostra	Crake, Black	Unlisted	LC
Zosterops pallidus	White-eye, Orange River	Unlisted	LC
Zosterops virens	White-eye, Cape	Unlisted	LC

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

THE TERRESTRIAL ECOLOGY BASELINE & IMPACT ASSESSMENTS FOR THE PROPOSED CASTLE OHL CORRIDOR. DE AAR, NORTHERN CAPE PROVINCE

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

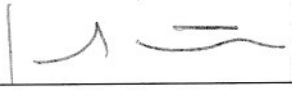
1. SPECIALIST INFORMATION

Specialist Company Name:	THE BIODIVERSITY COMPANY			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	ANDREW HUSTED			
Specialist Qualifications:	MSc AQUATIC HEALTH			
Professional affiliation/registration:	SACNASP 400213/11			
Physical address:	777 PERIDOT STREET, JUKSKEI PARK, RANDBURG			
Postal address:	SAME AS ABOVE			
Postal code:	2188	Cell:	081 319 1225	
Telephone:	081 319 1225	Fax:		
E-mail:	andrew@thebiodiversitycompany.com			

2. DECLARATION BY THE SPECIALIST

I, ANDREW HUSTED, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

THE BIODIVERSITY COMPANY

Name of Company:

01/07/2022

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, ANDREW HUSTED, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

THE BIODIVERSITY COMPANY

Name of Company

01/07/2022

Date

Signature of the Commissioner of Oaths

Date

Certified as a true copy of original

Farai Shadreck Mbirimi BD52805
Minister of Religion / Commissioner of Oaths
391 11th Road, Erand, Midrand 1685
Date 01/07/2022