



The Terrestrial Biodiversity Compliance Statement for the proposed Zibulo Overhead Powerline Project

Ogies, Mpumalanga Province, South Africa

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CLIENT



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Declaration	<p>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.</p>
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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a terrestrial biodiversity (habitat, flora and fauna, including avifauna) baseline assessment for the proposed Zibulo Overhead Powerline (OHPL) Project. The proposed project is located approximately 6.6 km south of Kendal Power Station and approximately 14.5 km southwest of Ogies in the Mpumalanga Province.

A map of the Project Area in relation to the local region is presented in Figure 1-1, and a detailed map of the Project Area locality is presented in Figure 1-2. Initially, two separate OHPL routes were proposed and assessed as part of separate specialist verification reports, and subsequently route option 1 was selected for a proposed tower placement layout (illustrated in the locality map below). Both route options were assessed with a 220 m corridor, and this represents the total assessment area covered as part of the terrestrial field survey. A 2 km assessment buffer was implemented as part of the avifauna survey.

To determine the baseline ecological state of the area and to present a detailed description of the receiving environment, both a desktop assessment as well as field surveys were conducted during July 2023. Furthermore, the desktop assessment and field surveys both involved the detection, identification and description of any locally relevant sensitive receptors and habitats, and the manner in which these sensitive features may be affected by the proposed development was also investigated.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 30 October 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation". The National Web based Environmental Screening Tool has characterised the Terrestrial Biodiversity Theme for the area as 'Very High' sensitivity (National Environmental Screening Tool, 2023).

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

1.2 Project Information

The following information is as provided by EIMS: Zibulo North Shaft requires a 20MVA electricity supply for the mining operations by 2025. The following assets will be established for the supply:

- A new Zibulo North Shaft 132/11kV 2x20MVA Substation for the Zibulo North Shaft Point of Supply (POS). 2x20MVA TRFR's will be installed in phase 1 with an open TRFR bay for the installation of the third TRFR in 2032 should it be required.
- Establish 132kV Feeder Bay at the existing Cologne Substation and at the existing Modiri Substation.
- Build 7km (option 1 & 2) Kingbird 132kV line from Cologne Substation to Zibulo North Shaft Substation.
- Build 10.5km (option 1) or 15km (option 2) Kingbird 132kV line from Modiri Substation to the Zibulo North Shaft Substation. The route options will be assessed during the course of this environmental application process.

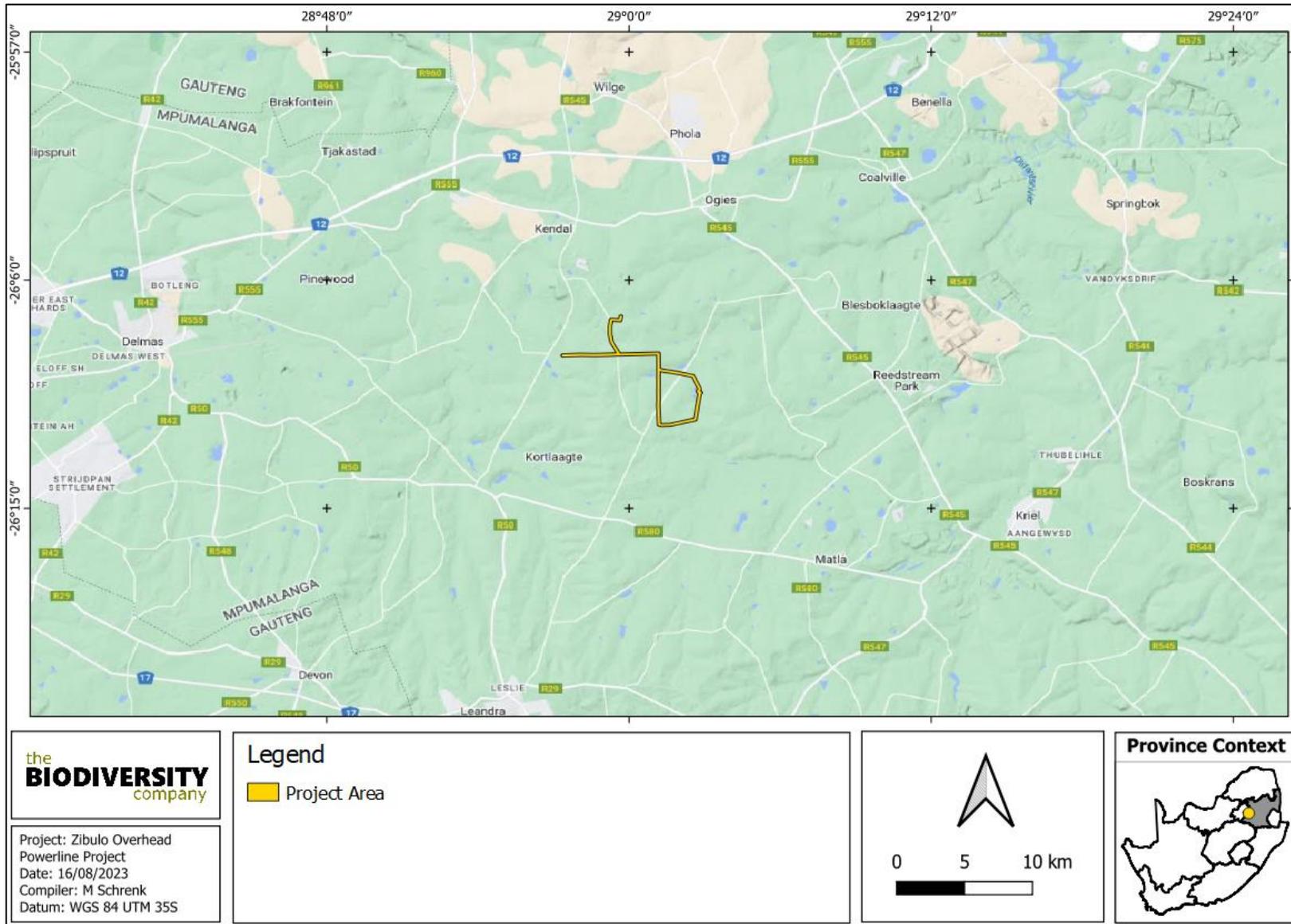


Figure 1-1 Map illustrating the regional locality of the Project Area

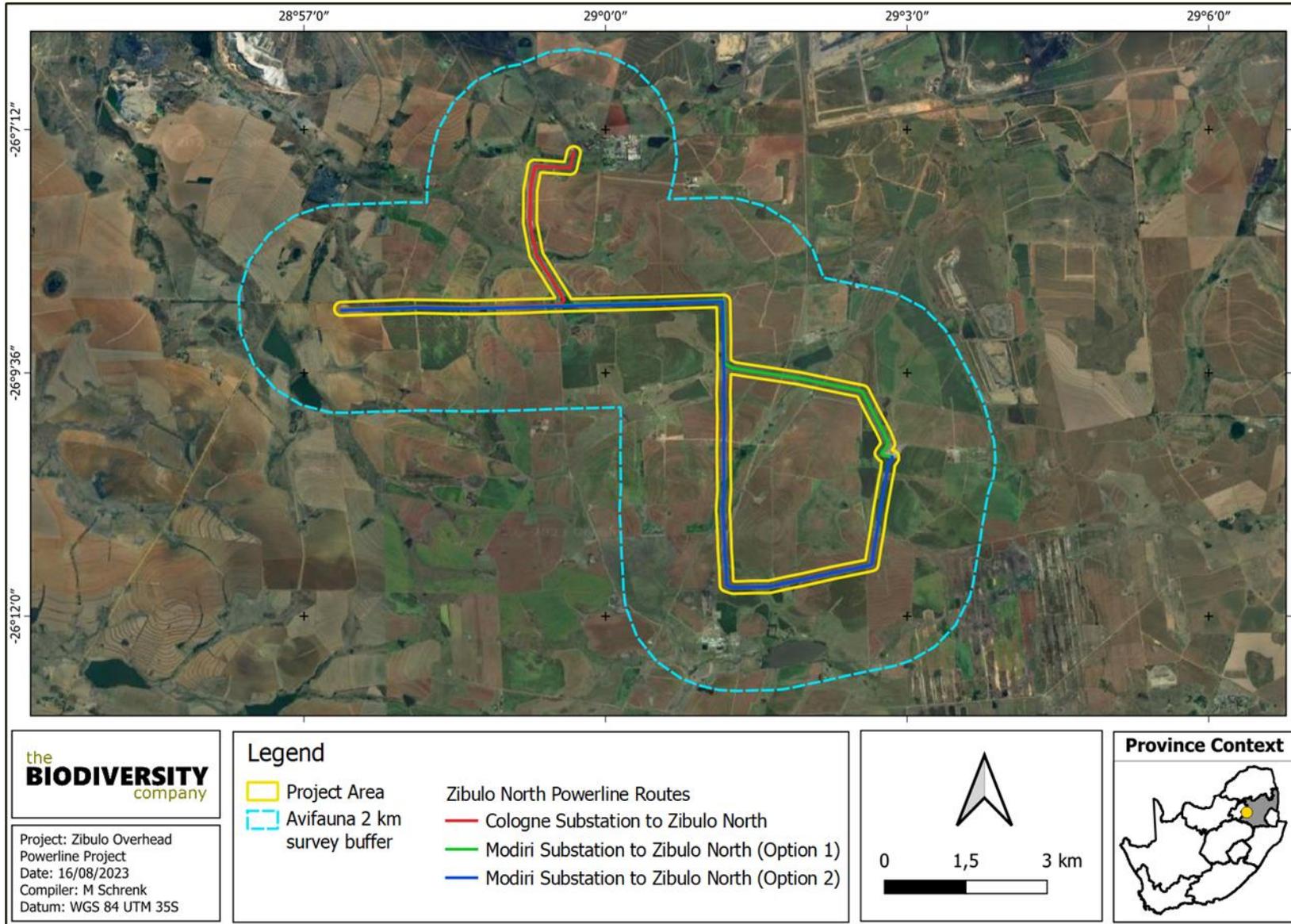


Figure 1-2 Map illustrating the details of the Project Area

1.3 Report Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 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); 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” – section 3, subsection 1:

- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however-
- Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey, confirmed that the proposed footprint area is of a 'Low' sensitivity. Therefore, this report constitutes a Terrestrial Biodiversity Compliance Statement.

As per sections 2 and 3 of the protocol discussed above, a Terrestrial Biodiversity Compliance Statement must contain the information as presented in Table 1-1 below.

Table 1-1 *Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report*

Information to be Included (as per GN 320, 20 March 2020)	Report Section
Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used	2
Description of the assumptions and any uncertainties or gaps in knowledge or data	1.4
A baseline profile description of biodiversity and ecosystems of the site	3
Site sensitivity verification: Desktop Analysis using satellite imagery and available information	3.3
A statement on the duration, date and season of the site inspection	2.4
Site sensitivity verification: Onsite inspection, include a description of current land use and vegetation found on-site	3.3
Site sensitivity verification: Photographs/evidence of environmental sensitivity	3.3
Screening tool confirmation/dispute: The assessment must verify the “low” sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes	3.3.2
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	4
Indicate whether or not the proposed development will have any impact on the terrestrial environment, animals and/or plants	5
A signed statement of independence by the specialist	7.1
Specialist details, including a CV	7.2

A signed copy of the compliance statement must be appended to the Environmental Assessment Report.

Note: The term 'Terrestrial Biodiversity' used in the paragraphs above can be replaced by the term 'Terrestrial Plant Species' and 'Terrestrial Animal Species' – as relevant. This Terrestrial Biodiversity Compliance Statement satisfies the requirements of both a Terrestrial Plant Species and Terrestrial Animal Species Compliance Statement.

Note: Although the project area is confirmed to be of a low sensitivity (including avifauna considerations), the fact that many sensitive avifauna species are known to occur in the area warrants the undertaking of an avifauna-specific impact assessment process, included in section 4.1 below.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client and landowner is accurate;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (Project Area) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- The project description was based on information provided by the client, and any alterations to the area and/or missing data pertaining to the development would have affected the area surveyed and hence the results of this assessment;
- The area was surveyed during a single site visit and therefore this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline);
- The single site visit was conducted during the dry season, and this means that certain flora and fauna would not have been present or observable due to seasonal constraints;
- Whilst every effort was made to cover as much of the Project Area as possible, representative sampling is completed, and by its nature it is possible that some plant and animal species that are present within the Project Area were not recorded during the field investigations;
- This report must be considered in conjunction with the accompanying Wetland Baseline and Impact Assessment report; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

2 Methods

2.1 Spatial Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to determine if any are applicable to the site. These datasets and their respective dates of publishing are provided below.

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

- Strategic Transmission Corridors (EGI) – as per *Government Gazette* No. 47095 of 27 July 2022;
- The Mpumalanga Biodiversity Sector Plan of 2014 (MTPA, 2014);
- 2018 National Biodiversity Assessment (NBA, 2018) (Skowno *et al.*, 2019);
- 2022 Red List of Ecosystems for terrestrial realm for South Africa (Skowno & Monyeke, 2021);
- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018);
- South Africa Protected and Conservation Areas Databases (DFFE, 2023 & DFFE, 2023a);
- National Protected Areas Expansion Strategy, 2016 (DEA, 2016);
- Important Bird and Biodiversity Areas, 2015 (Marnewick *et al.*, 2015);
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Awuah, 2018 & Van Deventer *et al.*, 2019);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel, 2011); and
- Strategic Water Source Areas, 2021 (Lötter & Le Maitre, 2021).

2.2 Botanical Desktop Assessment

The Plants of Southern Africa (POSA, 2019) database was accessed to compile a list of expected flora species within the area and the Red List of South African Plants website (SANBI, 2016) was used to provide the most current account of the national conservation status of flora.

Screening tool data was also utilised to supplement the expected species list.

2.3 Faunal Desktop Assessment

The faunal desktop assessment involved the compilation of expected species lists and the identification of any protected and/or SCC fauna potentially occurring in the area. The respective species lists, and international Red-List statuses, were obtained from the IUCN spatial dataset (2017), in addition to the Animal Demography Unit and the FitzPatrick Institute of African Ornithology website.

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

The avifaunal desktop assessment comprised of the following:

- Compiling an expected avifauna list from the Southern African Bird Atlas Project 2 (SABAP2) using the 2605_2855; 2605_2900; 2605_2905; 2610_2900; 2610_2905; 2615_2855; 2615_2905; 2615_2900 pentads.

- Confirmation of nearby Coordinated Avifaunal Road Count (CAR) route.
- Confirmation of nearby Coordinated Waterbird Count (CWAC) site.

2.4 Vegetation Field Survey

A single season field survey was undertaken on the 17th and 18th of July 2023, which constitutes a dry season survey, to determine the overall condition of the vegetation landscape, the presence of any local flora SCC, and to achieve the delineation of local habitat types and their associated sensitivities. Effort was made to cover all the different habitat types within the Project Area, within the limits of time and access. These site visit parameters are considered sufficient for the project scope.

2.5 Faunal Field Survey

2.5.1 Mammals and Herpetofauna

The faunal field survey utilised a variety of sampling techniques, including but not limited to:

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

2.5.2 Avifauna

One avifaunal site visit was conducted for the proposed development. It was conducted in winter, over 2 days, from the 17th to the 18th of July 2023. The expected SCC was confirmed during the winter site visit but supplemented by sufficient online data to account for seasonal changes. Sampling consisted of standardized point counts as well as random diurnal incidental surveys and vantage point surveys. Standardized point counts (following Buckland et al. 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, river scanning and road cruising. Nests, feathers, individuals and signs were photographed and GPS coordinates were taken. Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

2.6 Terrestrial Site Ecological Importance

The different habitat types within the Project Area were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were

assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

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

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

Table 2-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km ² . 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 2-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. 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	<p>Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types.</p> <p>Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.</p> <p>Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.</p>
Low	<p>Small (> 1 ha but < 5 ha) area.</p> <p>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.</p> <p>Low rehabilitation potential.</p> <p>Several minor and major current negative ecological impacts.</p>
Very Low	<p>Very small (< 1 ha) area.</p> <p>No habitat connectivity except for flying species or flora with wind-dispersed seeds.</p> <p>Several major current negative ecological impacts.</p>

BI can be derived from a simple matrix of CI and FI as provided in

Table 2-3.

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

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

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 2-4.

Table 2-4 Summary of Receptor Resilience (RR) criteria

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

Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.
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After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 2-5.

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

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

Interpretation of the SEI in the context of the proposed project is provided in Table 2-6.

Table 2-6 Guideline for interpreting Site Ecological Importance in the context of proposed activities

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

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

3 Results & Discussion

3.1 Desktop Assessment

Table 3-1 below has been produced as a result of the spatial data collected and analysed (as provided by various sources such as the national and provincial environmental authorities and SANBI). It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or Project Area.

Table 3-1 Summary of the spatial relevance of the Project Area to local ecologically important landscape features

Desktop Information Considered	Relevance	Reasoning
Strategic Transmission Corridors (EGI)	Yes	The project area falls within the International EGI corridor
Provincial Conservation Plan (Terrestrial)	Yes	The project area mostly overlaps with 'Heavily Modified' areas. Some 'Moderately modified' and 'Other Natural Areas' also occur within the project area. Several fragmented CBA: Optimal sites occur within the 2 km avifauna survey buffer.
NBA 2018: Ecosystem Threat Status	Yes	Project area situated within a 'Vulnerable' ecosystem
NBA 2018: Ecosystem Protection Level	Yes	Project area situated within a 'Poorly Protected' ecosystem
2022 Red List of Ecosystems	Yes	Project area situated within an 'Endangered' ecosystem
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Yes	Two 'Critically Endangered' rivers and multiple extensive 'Critically Endangered' wetlands cross the project area
Protected and Conservation Areas (SAPAD & SACAD)	No	No relevant areas occur within 10 km of the project area
Important Bird and Biodiversity Areas (IBA)	No	No IBA sites occur within 10 km of the project area
National Freshwater Ecosystem Priority Areas (NFEPA)	No	No NFEPA systems occur within the project area
Strategic Water Source Areas	No	No SWSA sites occur within 10 km of the pipeline
National Protected Areas Expansion Strategy (NPAES)	No	No NPAES priority areas exist nearby (within at least the 2 km buffer)

3.1.1 Important Desktop Features

As illustrated in Figure 3-1 the proposed routes overlap with 'Heavily Modified', 'Moderately modified' and 'Other Natural Areas', according to the provincial terrestrial conservation plan. Several fragmented CBA: Optimal sites occur within the 2 km buffer.

As per MTPA (2014):

- Other Natural Areas (ONAs) are areas that have not been identified as a priority in the latest systematic biodiversity plan, but they do retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.

The overall management objective should be to ensure ecosystem functionality and minimise the loss of natural habitat and species through strategic landscape planning.

- Moderately or Heavily Modified Areas are areas that have been heavily modified by human activity such that they are no longer natural, and no longer contribute to biodiversity targets. Some of these areas may still provide limited biodiversity and ecological infrastructural functions but their biodiversity value has been significantly or sometimes irreversibly compromised.

Land-use should be managed in a biodiversity-friendly manner, aiming to maximise ecological functionality where possible.

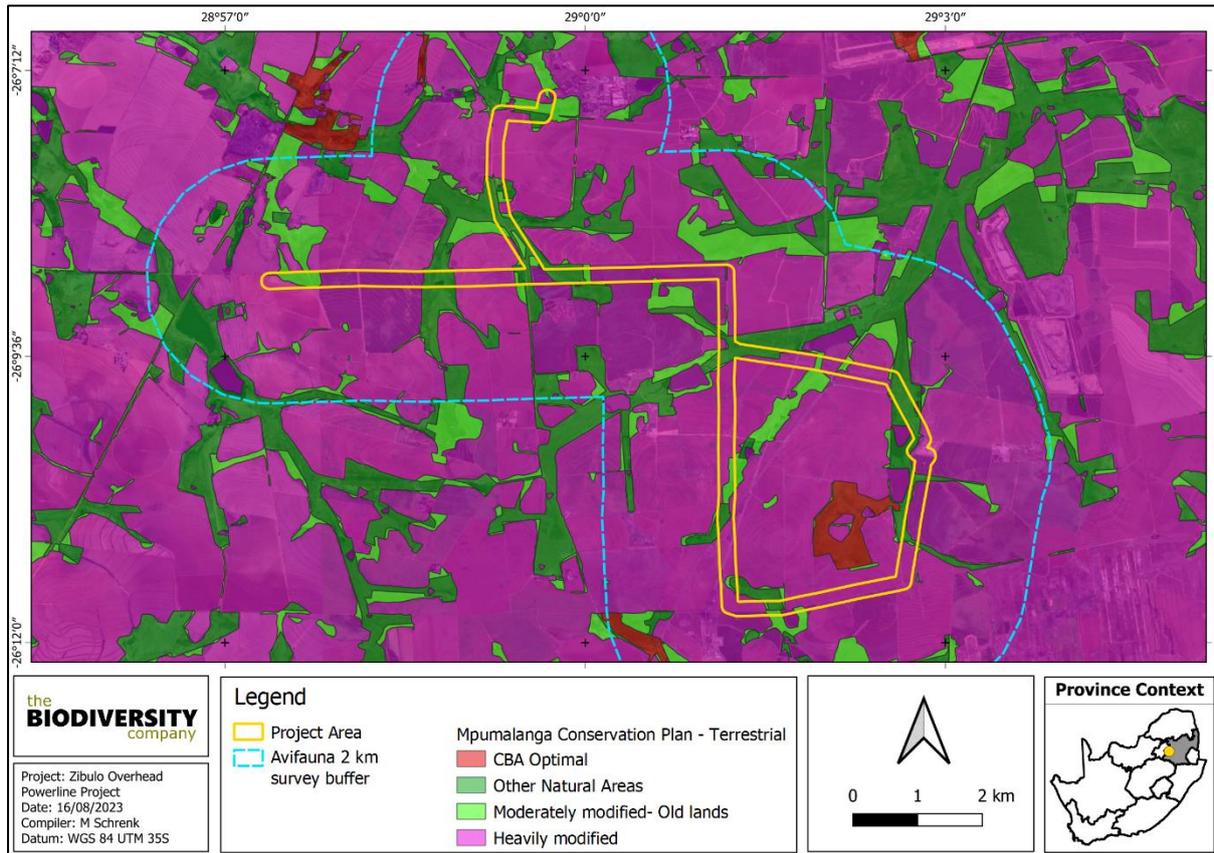


Figure 3-1 Map illustrating the project area superimposed over the provincial terrestrial conservation plan dataset

3.1.2 Species of Conservation Concern

This section outlines the numbers of expected species that may be found to occur in the local region, as well as any potential Species of Conservation Concern (SCC).

3.1.2.1 Flora

The POSA database indicates that over 180 species of plants could be expected to occur within and around the project area (this full list of expected species can be made available upon request).

The project screening tool report indicates that four (4) sensitive species may occur in the region (Table 3-2), and this triggers a medium plant species theme sensitivity for small parts of the project area. The specialist assigned Likelihood of Occurrence (LOO) is provided within the table and this is prescribed based on the known habitat preferences for a particular species – when compared with the habitat that occurs within the project area.

Table 3-2 SCC flora species that may occur within the Project Area of Influence. LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered and CR = Critically Endangered

LOO	Family	Species	Author	SANBI Red-List Status
Low	Orchidaceae	<i>Brachycorythis conica</i> subsp. <i>transvaalensis</i>	(Summerh.) Summerh.	CR
Low	Apocynaceae	<i>Pachycarpus suaveolens</i>	(Schltr.) Nicholas & Goyder	VU
-	-	Sensitive species 601	-	-
-	-	Sensitive species 691	-	-

3.1.2.2 Mammals and Herpetofauna

The screening tool report listed five (5) sensitive mammal species that may occur, triggering a medium sensitivity rating. These species, and their respective likelihoods of project area occurrence, are included in Table 3-3. No sensitive herpetofauna species are expected.

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

LOO	Species	Common Name	Conservation Status	
			Regional	Global
Moderate	<i>Chrysospalax villosus</i>	Rough-haired Golden Mole	VU	VU
Moderate	<i>Dasymys robertsii</i>	Robert's Marsh Rat	VU	-
Moderate	<i>Hydriactis maculicollis</i>	Spotted-necked Otter	VU	NT
Low	<i>Crocidura maquassiensis</i>	Maquassie Musk Shrew	VU	LC
Low	<i>Ourebia ourebi ourebi</i>	Oribi	EN	LC

3.1.2.3 Avifauna

SABAP2 data indicates that 213 avifauna species are expected for the project area and surrounds. Of these, 19 are considered SCC and include those listed in Table 3-4. The likelihood of occurrence within the area is included here.

The project screening tool report lists 5 (five) sensitive avifauna species as likely to occur in the area, triggering a medium - high animal species theme sensitivity. These species are included in the table below and denoted by an Asterix (*).

Table 3-4 SCC avifauna species that are expected to occur within the project area

LOO	Scientific Name	Common Name	Family	Conservation Status	
				Regional	Global
Confirmed	<i>Circus ranivorus</i> *	African Marsh Harrier	Accipitridae	EN	LC
Confirmed	<i>Phoeniconaias minor</i>	Lesser Flamingo	Phoenicopteridae	NT	NT
Confirmed	<i>Phoenicopterus roseus</i>	Greater Flamingo	Phoenicopteridae	NT	LC
Confirmed	<i>Rostratula benghalensis</i>	Greater Painted-snipe	Rostratulidae	NT	LC
High	<i>Eupodotis caerulescens</i>	Blue Korhaan	Otididae	LC	NT
High	<i>Eupodotis senegalensis</i> *	White-bellied Korhaan	Otididae	VU	LC
High	<i>Falco biarmicus</i>	Lanner Falcon	Falconidae	VU	LC
High	<i>Falco vespertinus</i>	Red-footed Falcon	Falconidae	NT	VU
High	<i>Mycteria ibis</i> *	Yellow-billed Stork	Ciconiidae	EN	LC
Moderate	<i>Circus macrourus</i>	Pallid Harrier	Accipitridae	NT	NT
Moderate	<i>Glareola nordmanni</i>	Black-winged Pratincole	Glareolidae	NT	NT
Moderate	<i>Hydropogon caspia</i> *	Caspian Tern	Laridae	VU	LC
Moderate	<i>Sagittarius serpentarius</i>	Secretarybird	Sagittariidae	VU	EN
Moderate	<i>Tyto capensis</i> *	African Grass Owl	Strigidae	VU	LC
Low	<i>Anthropoides paradiseus</i>	Blue Crane	Gruidae	NT	VU
Low	<i>Coracias garrulus</i>	European Roller	Coraciidae	NT	LC
Low	<i>Calidris ferruginea</i>	Curlew Sandpiper	Scolopacidae	LC	NT

Low	<i>Geronticus calvus</i>	Southern Bald Ibis	Threskiornithidae	VU	VU
Low	<i>Pelecanus onocrotalus</i>	Great White Pelican	Pelecanidae	VU	LC

3.2 Field Surveys

The following sections discuss the results from the field surveys that were conducted for the proposed project, which were undertaken on the 17th and 18th of July 2023.

3.2.1 Vegetation and habitat

Three (3) terrestrial habitat units were encountered, and these are each described in Table 3-7 below. The vegetation was found to be dominated by pioneer graminoids and exotic and alien invasive flora species, however a list of some of the most predominant indigenous flora species recorded is provided in Table 3-5 (21 species). No SCC or protected flora species were observed.

The SEI was determined based on the method as described in section 2.6 above. The resulting SEI value is mostly based on the flora composition and overall vegetation profile recorded within the Project Area landscape.

Table 3-5 *Predominant indigenous flora recorded within the local project area*

Family	Scientific Name	Common name	SANBI Red List Status
Poaceae	<i>Agrostis sp</i>	Bentgrass	LC
Asteraceae	<i>Arctotheca sp</i>	Dandelion	LC
Poaceae	<i>Cymbopogon excavatus</i>	Turpentine grass	LC
Poaceae	<i>Cynodon dactylon</i>	Bermuda grass	LC
Cyperaceae	<i>Cyperus bipartitus</i>	Shining flatsedge	LC
Poaceae	<i>Eragrostis curvula</i>	Weeping lovegrass	LC
Apocynaceae	<i>Gomphocarpus fruticosus</i>	Milkweed	LC
Poaceae	<i>Hyparrhenia hirta</i>	Tambookie grass	LC
Poaceae	<i>Imperata cylindrica</i>	Cogongrass	LC
Juncaceae	<i>Juncus effusus</i>	Common rush	LC
Juncaceae	<i>Juncus torreyi</i>	Torrey's rush	LC
Poaceae	<i>Melinis repens</i>	Natal redtop	LC
Plantaginaceae	<i>Plantago lanceolata</i>	Ribwort plantain	LC
Poaceae	<i>Pogonarthria squarrosa</i>	Herringbone grass	LC
Asteraceae	<i>Senecio coronatus</i>	Ragworts	LC
Asteraceae	<i>Seriphium plumosum</i>	Bankrupt bush	LC
Solanaceae	<i>Solanum carolinense</i>	Carolina horsenettle	LC
Poaceae	<i>Sporobolus africanus</i>	Paramatta grass	LC
Poaceae	<i>Sporobolus indicus</i>	Smut grass	LC
Poaceae	<i>Tridens strictus</i>	Long-spike tridens	LC
Typhaceae	<i>Typha capensis</i>	Bulrush	LC

Eleven (11) Exotic and Alien Invasive Species (AIS) were recorded throughout the project area, listed in Table 3-6. Five (5) of these are listed as Category 1b invasive species and according to legislation these must be controlled according to an AIS management plan.

Table 3-6 Invasive and exotic flora recorded within the local project area

Family	Scientific Name	Common name	Invasive Status
Fabaceae	<i>Acacia mearnsii</i>	Black wattle	Category 2 invader
Asteraceae	<i>Cirsium vulgare</i>	Bull thistle	Category 1b invader
Poaceae	<i>Cortaderia selloana</i>	Pampas grass	Category 1b invader
Solanaceae	<i>Datura stramonium</i>	Jimsonweed	Category 1b invader
Asteraceae	<i>Erigeron canadensis</i>	Horseweed	Naturalized invader
Myrtaceae	<i>Eucalyptus camaldulensis</i>	River red gum	Category 2 invader
Myrtaceae	<i>Eucalyptus sp.</i>		
Juncaceae	<i>Juncus tenuis</i>	Poverty rush	Naturalized exotic
Solanaceae	<i>Solanum mauritianum</i>	Bugweed	Category 1b invader
Asteraceae	<i>Tagetes minuta</i>	Southern cone marigold	Naturalized invader
Verbenaceae	<i>Verbena bonariensis</i>	Tall verbena	Category 1b invader

Note: A separate habitat assessment is conducted as relevant to avifauna species in particular, and the 2 km avifauna survey buffer. Refer to section 3.2.3 below.

Table 3-7 *Habitat and Sensitivity summary of the Project Area Vegetation Profile*

Habitat	Description and Vegetation Details	SEI	Photographs
<p>Modified</p>	<p>This habitat unit characterises those portions of the landscape that have been cleared of most vegetation for agriculture or development activities of some kind. Roads and road verges are included in this unit, however not all of these features were delineated by the specialist.</p> <p>Only very limited ecological services are provided by this unit, including some habitat connectivity and basic foraging for common mammal and herpetofauna species.</p> <p>Dominant flora includes:</p> <ul style="list-style-type: none"> • <i>Cynodon dactylon</i> • <i>Erigeron canadensis</i> • <i>Melinis repens</i> • <i>Tagetes minuta</i> • <i>Verbena bonariensis</i> 	<p>Very Low</p>	

**Degraded
Grassland**

Most portions of this habitat were comprised of either old lands in recovery, regularly mowed portions of grazing land, and fragmented grassland areas adjacent to wetlands. The unit is characterised by degraded and poor condition grassland vegetation that experiences a high level of ongoing anthropogenic impacts, which include human and vehicle ingress, presence of domestic animals, grazing of livestock, water pollution, and invasion by alien and invasive plant species. This habitat state may be contributed to the significant levels of nearby agricultural and roadway development that occurs throughout the local region, as well as the resulting low levels of ecological connectivity within the landscape.

These impacts have resulted in an indigenous flora vegetation profile that is highly fragmented, generally invaded and of a low diversity. The areas were instead characterised by a variety of pioneer grasses and invasive plants and exotic weeds.

Some of the key ecosystem services provided include erosion control which encourages groundwater seepage and percolation, as well as foraging and coverage for fauna species.

Dominant flora includes:

- *Agrosits sp*
- *Cymbopogon excavates*
- *Eragrostis curvula*
- *Hyparrhenia hirta*
- *Pogonarthria squarrosa*
- *Sporobolus spp.*

Low



<p>Water Resource</p>	<p>These portions of habitat include those areas delineated by the terrestrial ecologist as representing seasonally or permanently wet grassland areas. Other than four artificial dams, the majority of the water resource areas are made up of seep wetlands.</p> <p>Other than the numerous important water management services provided by these areas, they are also important fauna movement corridors and support unique flora and aquatic dependant fauna.</p> <p>Dominant flora includes:</p> <ul style="list-style-type: none"> • <i>Cyperus bipartitus</i> • <i>Imperata cylindrica</i> • <i>Juncus effusus</i> • <i>Typha capensis</i> <p>Note: This habitat unit is both limited and highly fragmented within the project area, and the detrimental effects/impacts of pylon construction is considered minor as these can largely span the water resource areas (where they occur close to or within these habitats, they generally occur within/near to a road verge). Additionally, the disturbance caused by a single pylon placement is limited to a small area no larger than 3 m in diameter.</p>	<p>Medium</p>	 
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3.2.2 Mammals and Herpetofauna

Mammal and herpetofauna activity was found to be low during the survey, and the majority of these species are expected to only occasionally occur within the water resource areas – utilising them as movement corridors and foraging habitat. The high levels of regular disturbance means that few species would remain in the areas for long periods of time, other than those adapted to anthropogenic activities.

Six (6) mammal species were recorded (Table 3-8), and no herpetofauna species were observed during the survey.

Table 3-8 Mammals recorded within the local project area

Family	Scientific Name	Common name	National Red List Status
Canidae	<i>Canis mesomelas</i>	Black-backed jackal	LC
Herpestidae	<i>Cynictis penicillata</i>	Yellow mongoose	LC
Muridae	<i>Gerbilliscus brantsii</i>	Highveld Gerbil	LC
Hystriidae	<i>Hystrix africaeustralis</i>	Cape porcupine	LC
Orycteropodidae	<i>Orycteropus afer</i>	Aardvark	LC
Sciuridae	<i>Xerus inauris</i>	Cape ground squirrel	LC

3.2.3 Avifauna

Four (4) avifauna – relevant habitats were defined for the 2 km buffer region of the project area (Table 3-9).

Table 3-9 Habitats specific to avifauna and the 2 km avifauna buffer

Habitat and SEI	Description and Likely SCC	Photo
Transformed (Very Low SEI)	Roads and buildings that do not provide much habitat for avifauna, except for common (usually urban) species which are able to tolerate the disturbance (FIG). No SCC are likely to occur here.	
Agriculture (Very Low SEI)	Agricultural areas used for crop management. This habitat includes past and current agricultural areas. These provide foraging for Avifauna species. SCC that could occur here include: Secretarybird, Blue Korhaan and White-bellied Korhaan.	

<p>Grasslands (Low SEI)</p>	<p>Grasslands, in some cases seasonally inundated. These areas have likely not been cleared for agriculture or development in the past.</p> <p>SCC that could occur here include: Secretarybird, Blue Korhaan, Lanner Falcon, European Roller and White-bellied Korhaan.</p>	
<p>Water resources (Low SEI)</p>	<p>Wetlands and dams that provide habitat for various bird species. These also function as crucial water supplies in the area.</p> <p>SCC that could occur here include: Greater-painted Snipe, Greater Flamingo, Lesser Flamingo, African Marsh Harrier and African Grass-Owl.</p>	

During this assessment, performed in the winter, 68 species were recorded in the point counts and 55 during incidental records, with a total of 85 unique species observed. The results are deemed sufficient to draw a conclusion on the risk of the development. Four (4) SCC were recorded during the survey.

3.2.3.1 Risk Species

A priority species list (Ralston Paton *et al.* 2017) was developed initially for use with Wind Energy Facilities; however, the collision, electrocution and habitat loss risks are considered appropriate for powerline developments and so are utilised here. Also utilised here is the Eskom and EWT poster: Birds and Powerlines (Eskom and EWT, Date unknown), which identifies birds most prone to collision and electrocution from powerlines. Some birds are not included in these lists but are considered by the TBC avifauna specialists as risk species for collisions, electrocutions and habitat loss as a result of powerline infrastructure. All of species are referred to collectively in this report as “Risk Species” (Table 3-10). A photograph showing some of the species is presented in Figure 3-2.

Table 3-10 Summary of Risk Species recorded within and around the proposed project area

Scientific Name	Common Name	Collisions	Electrocutions	Habitat Loss
<i>Alopochen aegyptiaca</i>	Egyptian Goose	x	x	
<i>Anas sparsa</i>	African Black Duck	x		
<i>Anas undulata</i>	Yellow-billed Duck	x		
<i>Ardea cinerea</i>	Grey Heron	x	x	
<i>Ardea intermedia</i>	Yellow-billed Egret	x	x	
<i>Ardea melanocephala</i>	Black-headed Heron	x	x	
<i>Asio capensis</i>	Marsh Owl	x	x	x
<i>Bostrychia hagedash</i>	Hadada Ibis	x	x	

<i>Circus ranivorus</i>	African Marsh Harrier	x	x	x
<i>Corvus albus</i>	Pied Crow		x	
<i>Corvus capensis</i>	Cape Crow		x	
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	x		
<i>Numida meleagris</i>	Helmeted Guineafowl	x		
<i>Phoeniconaias minor</i>	Lesser Flamingo	x		
<i>Phoenicopterus roseus</i>	Greater Flamingo	x		
<i>Plectropterus gambensis</i>	Spur-winged Goose	x		
<i>Sarkidiornis melanotos</i>	Knob-billed Duck	x		
<i>Tadorna cana</i>	South African Shelduck	x		
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	x	x	



Figure 3-2 Photograph: *Phoeniconaias minor* and *Phoenicopterus roseus* observed within the area

3.2.3.2 Dominant Species

Table 3-11 provides the relative abundance of the dominant species as well as the frequency with which each species appeared in the point count samples. 38 of the recorded species accounted for more than 85% of the total number of individuals recorded during the assessment.

Table 3-11 *Relative abundance and frequency of occurrence of dominant avifauna species recorded within the area during the field survey. Dominant species cumulatively account for more than 85% of the overall abundance. Only data from the standardized point counts were considered.*

Common Name	Scientific Name	Relative abundance	Frequency (%)
<i>Quelea quelea</i>	Red-billed Quelea	0,168	25,93
<i>Alopochen aegyptiaca</i>	Egyptian Goose	0,069	48,15
<i>Vanellus armatus</i>	Blacksmith Lapwing	0,045	44,44
<i>Euplectes axillaris</i>	Fan-tailed Widowbird	0,045	22,22
<i>Numida meleagris</i>	Helmeted Guineafowl	0,039	18,52
<i>Ploceus velatus</i>	Southern Masked Weaver	0,039	33,33
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	0,036	25,93
<i>Fulica cristata</i>	Red-knobbed Coot	0,036	33,33
<i>Saxicola torquatus</i>	African Stonechat	0,033	37,04
<i>Bostrychia hagedash</i>	Hadada Ibis	0,033	33,33
<i>Streptopelia capicola</i>	Ring-necked Dove	0,033	40,74
<i>Euplectes progne</i>	Long-tailed Widowbird	0,030	14,81
<i>Anas undulata</i>	Yellow-billed Duck	0,027	14,81
<i>Anthus cinnamomeus</i>	African Pipit	0,024	29,63
<i>Corvus albus</i>	Pied Crow	0,021	14,81
<i>Macronyx capensis</i>	Cape Longclaw	0,021	18,52
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	0,021	14,81
<i>Tachybaptus ruficollis</i>	Little Grebe	0,018	22,22
<i>Ardea melanocephala</i>	Black-headed Heron	0,015	18,52
<i>Elanus caeruleus</i>	Black-winged Kite	0,015	18,52
<i>Streptopelia semitorquata</i>	Red-eyed Dove	0,015	11,11
<i>Passer melanurus</i>	Cape Sparrow	0,012	14,81
<i>Emberiza impetواني</i>	Lark-like Bunting	0,012	11,11
<i>Scleroptila gutturalis</i>	Orange River Francolin	0,012	11,11
<i>Spilopelia senegalensis</i>	Laughing Dove	0,009	11,11
<i>Anas erythrorhyncha</i>	Red-billed Teal	0,009	11,11
<i>Spatula smithii</i>	Cape Shoveler	0,009	11,11
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	0,006	7,41
<i>Vanellus coronatus</i>	Crowned Lapwing	0,006	7,41
<i>Phoenicopterus roseus</i>	Greater Flamingo	0,006	7,41
<i>Cisticola tinniens</i>	Levaillant's Cisticola	0,006	7,41
<i>Microcarbo africanus</i>	Reed Cormorant	0,006	7,41
<i>Tadorna cana</i>	South African Shelduck	0,006	7,41
<i>Phalacrocorax lucidus</i>	White-breasted Cormorant	0,006	7,41
<i>Vanellus senegallus</i>	African Wattled Lapwing	0,006	7,41
<i>Euplectes afer</i>	Yellow-crowned Bishop	0,006	3,70
<i>Anas sparsa</i>	African Black Duck	0,006	7,41
<i>Corvus capensis</i>	Cape Crow	0,006	7,41

3.3 Site Sensitivity and Screening Tool Comparison

3.3.1 Site Sensitivity Assessment

Based on the criteria provided in section 2.6 of this report, the delineated habitat types have each been allocated a sensitivity category, or SEI. In order to identify and spatially present sensitive features in terms of the relevant specialist discipline, the sensitivities of each of the habitat types delineated within the relevant areas are mapped for each distinction made in the subsections below.

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

3.3.1.1 Terrestrial habitat, Fauna and Flora

The three delineated habitat types have each been allocated a sensitivity category, or SEI, and this breakdown is presented in Table 3-12. The sensitivities of each of the habitat types delineated within the project area are mapped in Figure 3-3 below.

Table 3-12 Sensitivity summary of the habitat types delineated within the project area (for terrestrial habitat, fauna and flora)

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Modified	Low	Low	Low	High	Very Low
Degraded Grassland	Medium	Medium	Medium	High	Low
Water Resource	Medium	Medium	Medium	Medium	Medium

Consider the following guidelines when interpreting SEI in the context of any proposed development or disturbance activities (noted in conjunction with provincial guidelines for CBA/protected areas):

- Very Low: Minimisation mitigation – Development activities of medium to high impact acceptable and restoration activities may not be required.
- Low: Minimisation and restoration mitigation – Development activities of medium to high impact acceptable followed by appropriate restoration activities.
- Medium: Minimisation and restoration mitigation – Development activities of medium impact acceptable followed by appropriate restoration activities.

Note: The water resource areas delineated below were not defined by a freshwater ecologist. These are instead provided here from a terrestrial perspective and are meant to only serve as indicative freshwater sites. For the accurate delineations and descriptions refer to the freshwater specialist report and shapes. The SEI value assigned within this report for water resource areas is applicable to those as delineated by the freshwater ecologist.

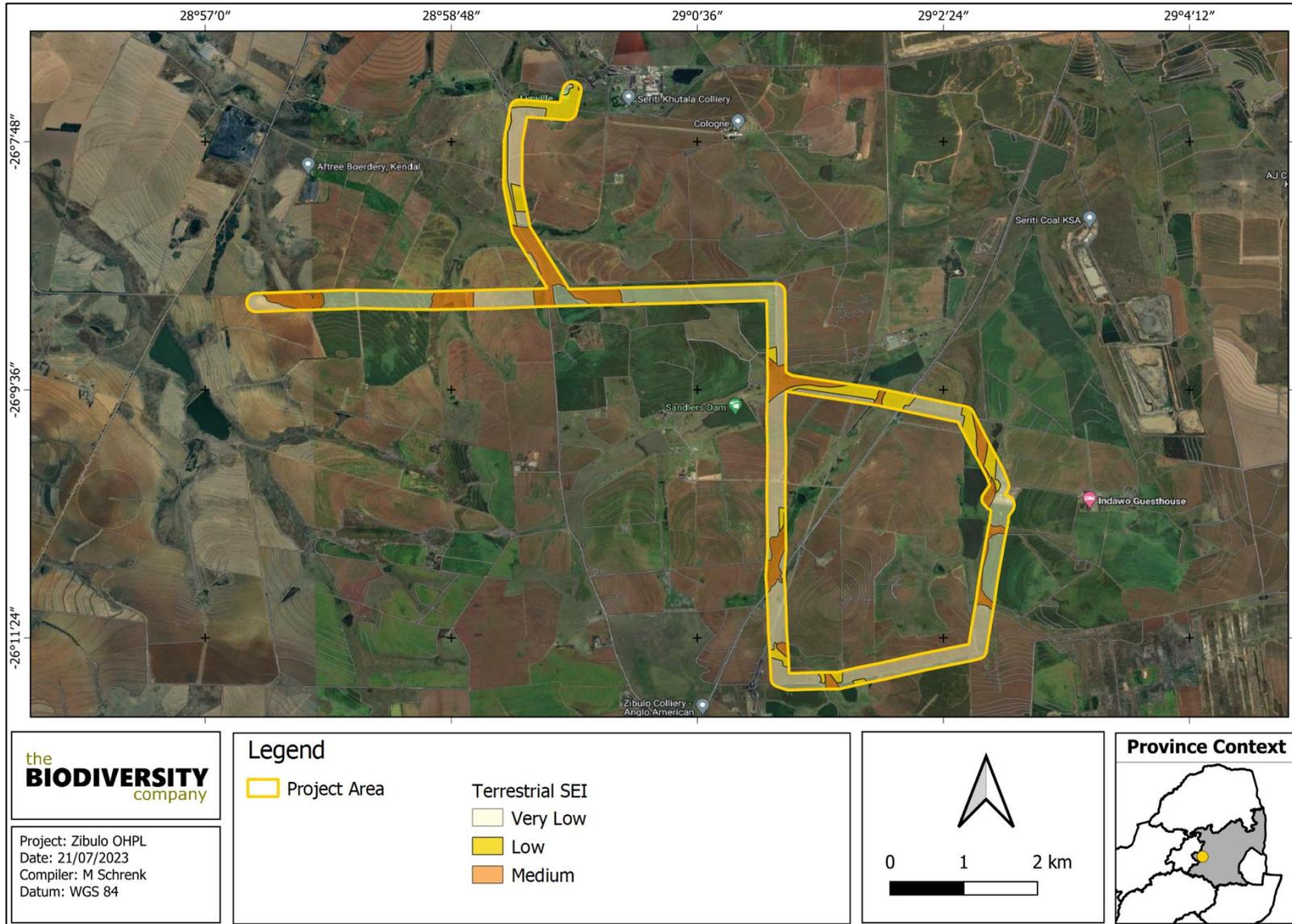


Figure 3-3 Map illustrating the terrestrial habitat, fauna and flora SEI for the project area

3.3.1.2 Avifauna

The four delineated avifauna - specific habitat types have each been allocated a sensitivity category, or SEI, and this breakdown is presented in Table 3-13. The sensitivities of each of the habitat types delineated within the project area are mapped in Figure 3-4 below.

Table 3-13 *Sensitivity summary of the habitat types delineated within the project area (for avifauna)*

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Transformed	Very Low	Low	Very Low	Very High	Very Low
Agriculture	High	Low	Medium	Very High	Very Low
Grassland	High	Medium	Medium	High	Low
Water Resource	High	Medium	Medium	High	Low

Consider the following guidelines when interpreting SEI in the context of any proposed development or disturbance activities (noted in conjunction with provincial guidelines for CBA/protected areas):

- Very Low: Minimisation mitigation – Development activities of medium to high impact acceptable and restoration activities may not be required.
- Low: Minimisation and restoration mitigation – Development activities of medium to high impact acceptable followed by appropriate restoration activities.

Note: The water resource areas delineated below were not defined by a freshwater ecologist. These are instead provided here from an avifauna perspective and are meant to only serve as indicative freshwater sites. For the accurate delineations and descriptions refer to the freshwater specialist report and shapes. The SEI value assigned within this report for water resource areas is applicable to those as delineated by the freshwater ecologist.

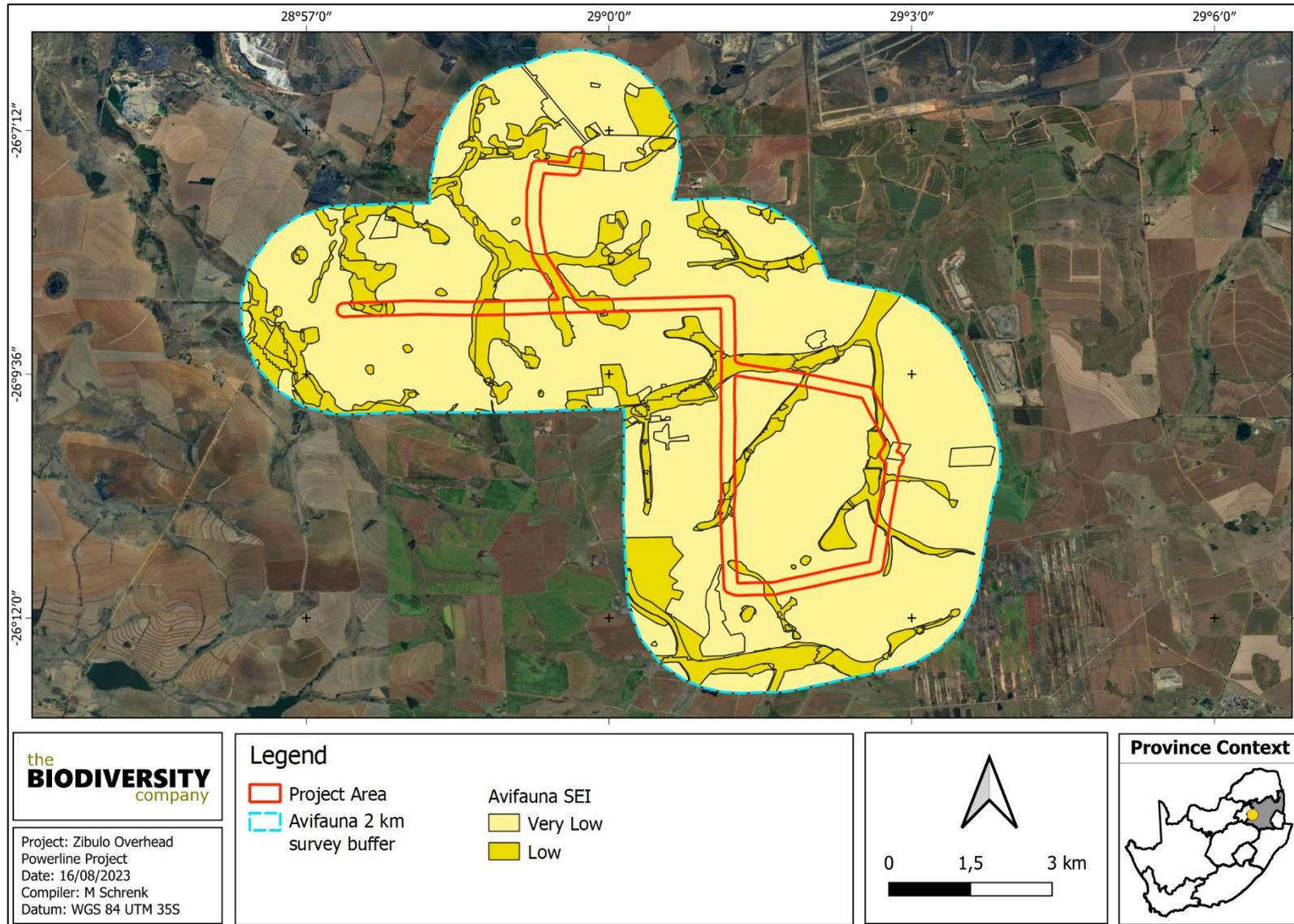


Figure 3-4 Map illustrating the avifauna - specific SEI for the project area

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall Project Area in Table 3-14 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI processes followed in the previous sections, and consideration is given to any observed or likely presence of SCC or protected species. The screening tool Terrestrial Biodiversity Theme sensitivity can be seen in Figure 3-5 below, the Plant Species Theme in Figure 3-6, and the Animal Species Theme in Figure 3-7.

Table 3-14 Summary of the screening tool vs. specialist assigned sensitivities (including avifauna considerations)

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Terrestrial Theme	Very High	Low	Disputed – Significant habitat fragmentation was present and only limited functional vegetation areas were recorded. No terrestrial ESA or CBA sites.
Plant Theme	Medium	Medium	Validated – No SCC or sensitive spp. were recorded but there is potential for them to occur within or nearby to some of the water resource areas.
Animal Theme	High	Medium	Disputed – Mammal SCC may occasionally occur within the water resource areas. Avifauna SCC confirmed in specific areas. Towers can be positioned to limit the amount of physical direct risks. A key consideration is the use of existing access routes. The placement of towers/pylons must avoid the delineated wetlands.

Note: Although the Plant and Animal species theme sensitivities are rated as medium by the specialist, the risks and impacts posed by linear powerline infrastructure are considered to be minor. The confirmed presence of certain avifauna SCC that are susceptible to collision does however warrant an operational phase avifauna impact assessment, and the implementation of specific key mitigation measures (see next section).

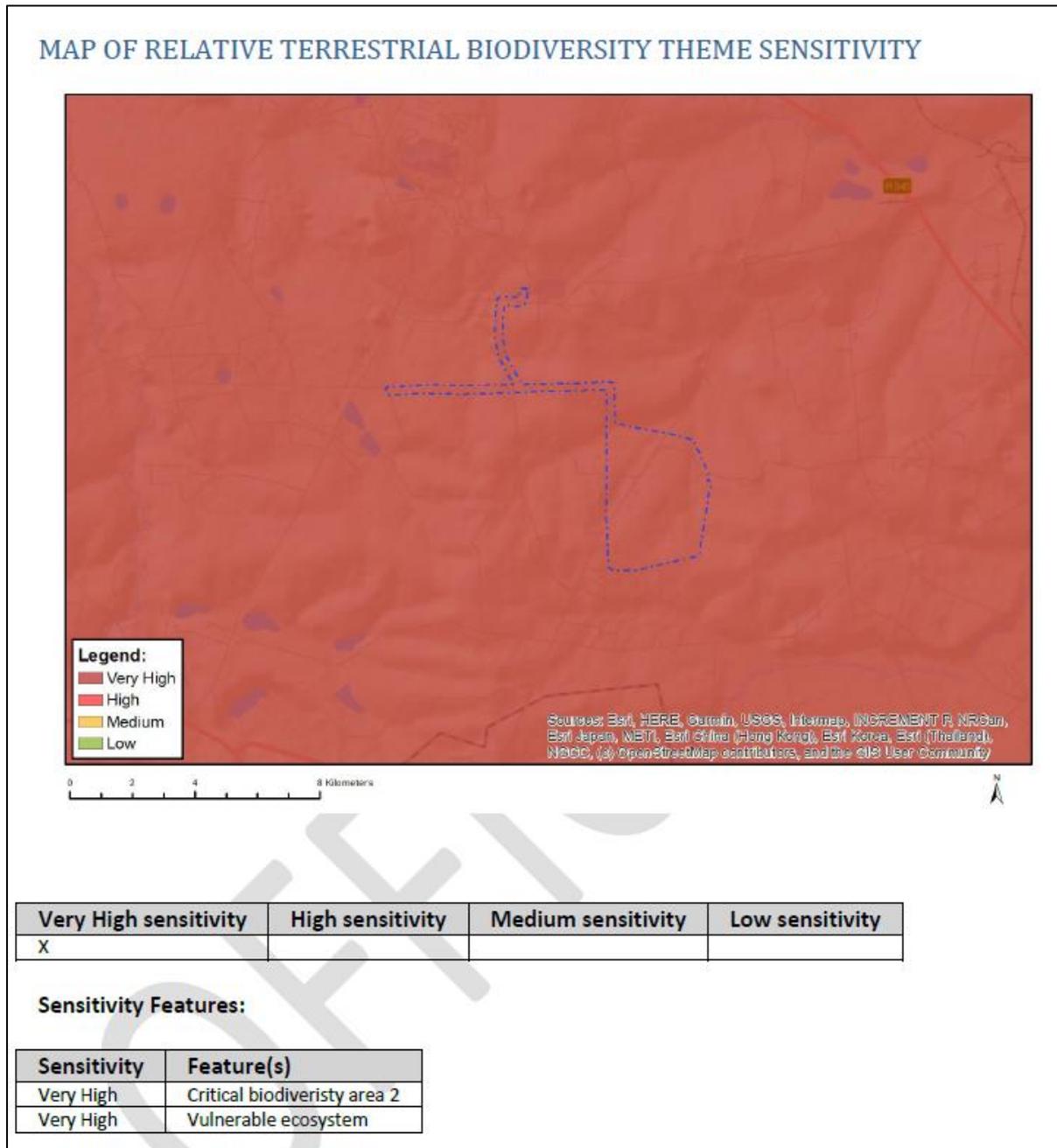


Figure 3-5 *Terrestrial Biodiversity Theme Sensitivity for the Project Area (National Environmental Screening Tool, 2022)*

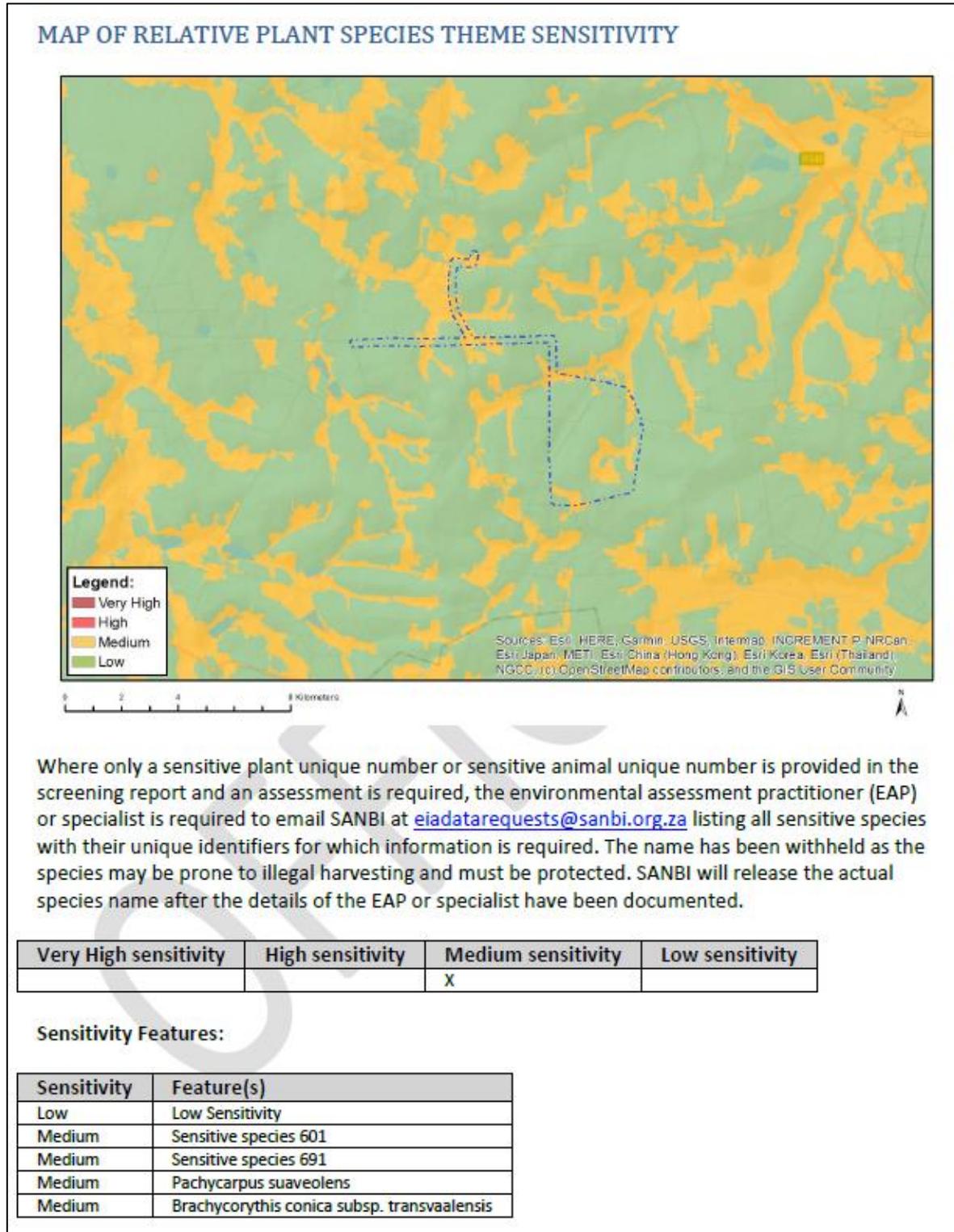


Figure 3-6 Plant Species Theme Sensitivity for the Project Area (National Environmental Screening Tool, 2022)

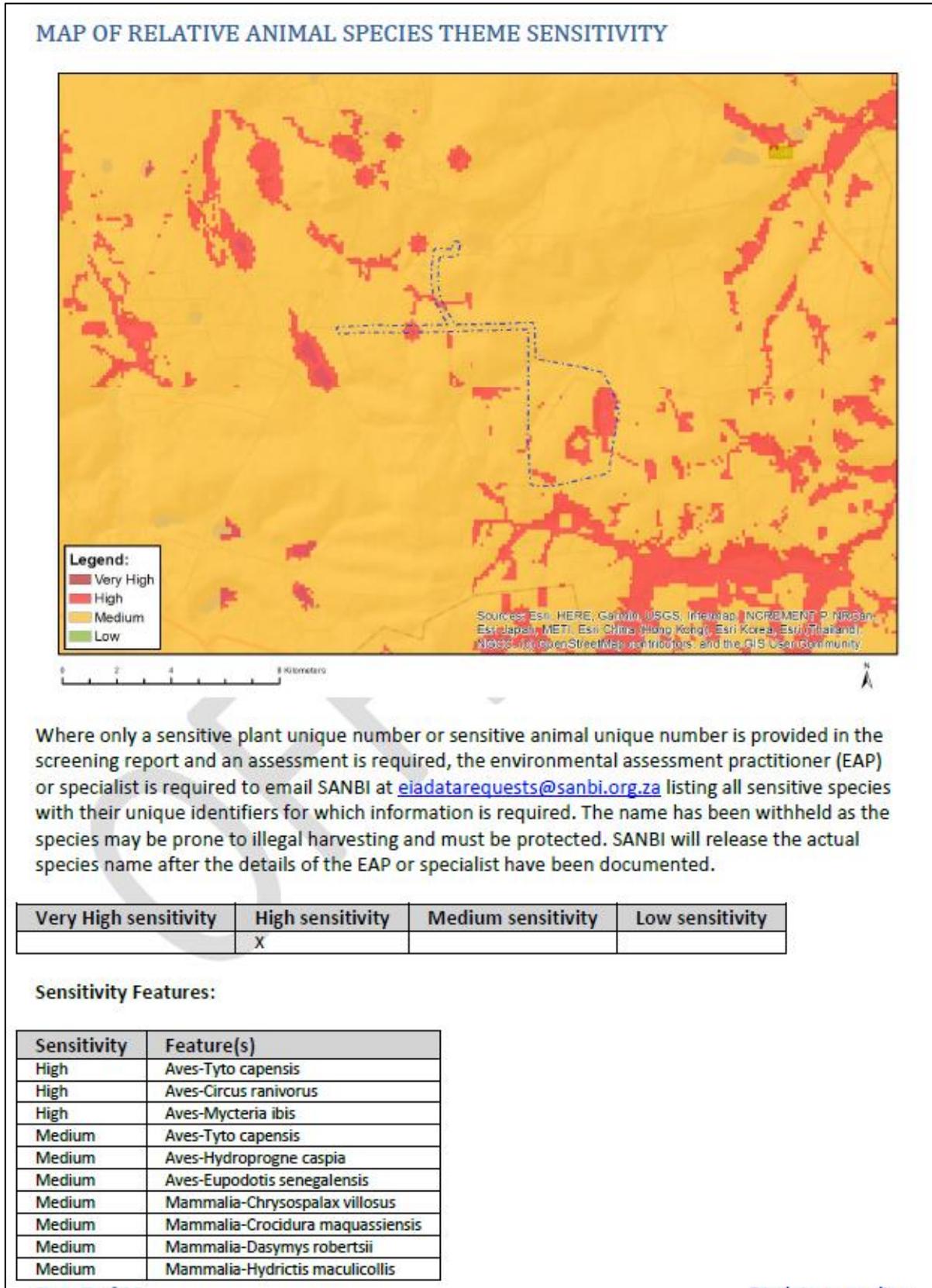


Figure 3-7 Animal Species Theme Sensitivity for the Project Area (National Environmental Screening Tool, 2022)

4 Impact Assessment and Mitigation Measures

4.1 Impact Analysis

Due to the overall low sensitivity of the site, in terms of both habitat and flora/fauna (incl. avifauna), the significance of potential impacts is considered to be low. Additionally, according to the protocols as outlined in section 1.3 no impact assessment is required as part of a compliance statement.

The specialist does however acknowledge that the presence of a number of avifauna SCC risk species in the region warrants an impact assessment procedure specifically for the operational phase, due to the risks associated with collisions and electrocutions with powerlines.

Birds prone to collisions can be divided into five categories;

- 1) large species with high body weight ratio to wing span resulting in low manoeuvrability,
- 2) species that are distracted in flight, this includes predatory birds and smaller species with areal displays,
- 3) species flying at high speeds,
- 4) crepuscular species that are active in low light conditions, and
- 5) species with limited narrow forward vision (Jenkins *et al.*, 2010; Noguera *et al.*, 2010).

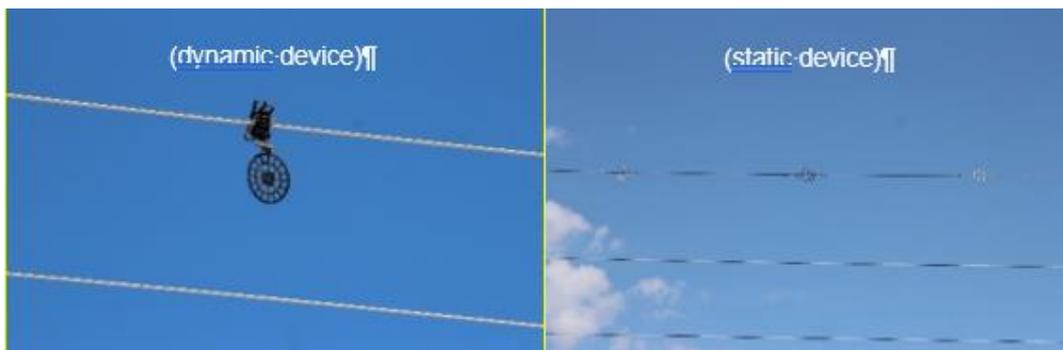
Species that tend to fly in flocks also may be influenced more by collisions as the birds flying in the rear will not be able to detect the powerlines. Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they are able to touch conductors and ground/earth wires, or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties. Winds parallel or diagonal to cross-arms are the most detrimental, due to exacerbating the difficulty in manoeuvrability during landing or take-off.

During the decommissioning phase should the infrastructure not be removed, and the area rehabilitated, the infrastructure will continue to result in collisions.

Refer to Table 4-1 for the impact assessment procedure followed for the final preferred powerline route. In order to reduce the overall negative impact rating from medium to low, the following key mitigation measures must be applied (Note: These mitigations are raised as key concerns, however all mitigations as outlined in the “Generic Environmental Management Programme Relevant to an Application for Substation and Overhead Electricity Transmission and Distribution Infrastructure”, outlined in *Government Gazette* No. 42323 of 22 March 2019, must be adhered to):

Powerline construction must follow the guidelines as set out in [this document](#).

- Collisions with the powerlines:
 - The air space used by the connection and gridlines must be minimised by burying them as far as possible;
 - Overhead cables/lines across and nearby to water resource areas must be fitted with industry standard bird flight diverters in order to make the lines as visible as possible to collision-susceptible species. Shaw *et al.* (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.



- Electrocutions with the OHPL:
 - Energised parts and/or grounded parts must be insulated appropriately to avoid incidental contact by birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered;
 - OHLs must be of a design that minimizes electrocution risk by using adequately insulated 'bird friendly' monopole structures, with clearances between live components of 2 m or greater;
 - As far as possible power cables within the project area should be thoroughly insulated and preferably buried;
 - Ensure that the phase cables are spaced far enough apart to reduce the risk of large birds touching both simultaneously (2 m for large raptors) (Prinsen et al., 2012). If such separation (isolation) cannot be provided, exposed parts must be covered (insulated) to reduce electrocution risk;
 - Applying covers on phases or grounds where adequate separation is not feasible. Examples of covers include insulator/conductor covers, bushing covers, arrester covers, cutout covers, and jumper wire covers; and
 - Perch discouragers can be used such as perch guards or spikes. Considerable success has been achieved by providing artificial bird safe perches, which are placed at a safe distance from the energised parts (Prinsen *et al.* 2012). All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution.



Table 4-1 Operational Phase impact assessment: Bird collisions and electrocutions with powerlines

Alternative	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Cumulative Impact	Irreplaceable loss	Final score
Preferred	Bird Collisions with powerlines	Operation	-17	-6,75	2	2	-8,4375
Preferred	Bird Electrocutions as a result of powerlines	Operation	-15	-4,5	2	2	-5,625

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

Figure 4-1 Description of the final impact score ratings (EIMS, 2021)

4.2 Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 4-2 presents the recommended mitigation measures and the respective time frames, targets, and performance indicators relative to the terrestrial assessment.

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

- Prevent the further loss and fragmentation of indigenous vegetation communities within the Endangered ecosystem, and in the vicinity of the Project Area;
- Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of indigenous flora and fauna species and communities; and
- Adequately follow the guidelines for interpreting the Site Ecological Importance ratings assigned to the Project Area (see Table 2-6).

Table 4-2 Project specific mitigation measures including requirements for timeframes, roles and responsibilities

Management outcome: Vegetation and Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas (very Low SEI) and should take up the smallest footprint possible. These must not occur within water resource areas.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
It is recommended that areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must not be fragmented or disturbed further.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles as far as possible.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
The clearing of indigenous vegetation must be minimised. All activities must be restricted to within the authorised areas. It is recommended that areas to be developed be specifically and responsibly demarcated so that during the construction phase only the demarcated areas be impacted upon.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
A site walk down should be conducted prior to the construction phase. The site walk down must be conducted during the summer season (between September and March) and priority must be the identification of any protected or listed flora species.	Planning Phase, Pre-Construction	Project manager, Environmental Officer & Contractor	Plant & animal species	Once off
Any observed SCC flora or protected plants must be clearly demarcated prior to the commencement of site clearing. If construction activities are likely to affect any SCC or protected plants these individuals must be relocated as part of a plant rescue and protection plan, and a permit must be obtained before doing so.	Planning Phase	Environmental Officer	Protected plants and SCC	During phase

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 laydown areas.

Construction and Operational Phase

Environmental Officer, Design Engineer, and Contractor

Laydown areas

Ongoing

Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by more alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been replanted.

Operational phase

Environmental Officer & Contractor

Assess the state of rehabilitation and encroachment of alien vegetation

Quarterly for up to two years after the closure

A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.

- Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.
- No servicing of equipment on site unless necessary.
- All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.
- Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.
- Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.
- All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the Project Area.

Life of operation

Environmental Officer & Contractor

Spill events, Vehicles dripping.

Ongoing

It must be made an offence for any staff member to remove any indigenous plant species from the Project Area or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.

Life of operation

Project manager, Environmental Officer

Any instances

Ongoing

All management outcomes and mitigations put forward in the accompanying freshwater report must be strictly adhered to.	Life of operation	Project Manager & Environmental Officer	All aspects	Ongoing
All construction waste must be removed from site at the closure of the construction phase.	Construction phase	Environmental Officer & Contractor	Construction waste	During Phase
New powerlines must make use of existing supportive infrastructure (i.e., bridges and cleared areas) as far as possible.	Construction phase	Environmental Officer & Contractor	Use existing infrastructure	During Phase
Management Outcome: Fauna				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Powerline construction must follow the guidelines as set out in this document . And the measures outlined in the “Generic Environmental Management Programme Relevant to an Application for Substation and Overhead Electricity Transmission and Distribution Infrastructure”, outlined in Government Gazette No. 42323 of 22 March 2019, must be adopted. However, diverters needs to be placed every 2 m where the line crosses water courses.	Operational Phase	Environmental Officer, Contractor	Bird collisions and electrocution	Ongoing
A qualified environmental control officer must be on site when activities begin. A site walk down is recommended prior to any activities taking place and any fauna SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.	Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal SCC	During phase
Any clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the Project Area, so as to provide an easy escape route for all small mammals and herpetofauna.	Construction Phase	Environmental Officer & Contractor	Progressive land clearing operations and the movement of fauna	Ongoing
The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing

Zibulo Overhead Powerline Project

The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.	Construction	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	Ongoing
Noise must be kept to a minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed and Signs must be put up to enforce this. Monitoring must take place in this regard.	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
Any outside lighting must be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any 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 be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training	Ongoing
Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day	Ongoing
Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling.	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.	Planning and construction	Environmental Officer & Contractor, Engineer	Fauna movement corridor	Ongoing
Use environmentally friendly cleaning and dust suppressant products.	Construction and operation	Environmental Officer & Contractor, Engineer	Presence of chemicals in and around the Project Area	Ongoing

Management outcome: Alien species

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency

<p>An Alien Invasive Plant (AIP) Management Plan should be compiled and implemented for the control of category 1b IAP along the route. This plan should be regularly updated to reflect any changes in AIP composition.</p>	Life of operation	Project manager, Environmental Officer & Contractor	Manage and assess presence and encroachment of alien vegetation	Twice a year
<p>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. Footprints of the roads must be kept to prescribed widths.</p>	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
Management outcome: Waste management				
<p>Impact Management Actions</p>	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible.</p>	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
<p>Litter, spills, fuels, chemical and human waste in and around the Project Area must be minimised and controlled according to the waste management plan.</p>	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
<p>Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.</p>	Construction Phase	Environmental Officer & Contractor	Cement mixing and spills	Every occurrence
<p>Toilets to the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site.</p>	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
<p>The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.</p>	Life of operation	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste	Ongoing
<p>Where a registered disposal facility is not available close to the Project Area, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried on open pits.</p>	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste	Ongoing

<p>Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.</p>	<p>Life of operation</p>	<p>Environmental Officer, Contractor & Health and Safety Officer</p>	<p>Management of bins and collection of waste</p>	<p>Ongoing, every 10 days</p>
<p>Management outcome: Environmental awareness training</p>				
<p>Impact Management Actions</p>	<p>Implementation</p>		<p>Monitoring</p>	
	<p>Phase</p>	<p>Responsible Party</p>	<p>Aspect</p>	<p>Frequency</p>
<p>All personnel and contractors should undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.</p> <p>Discussions are required on sensitive environmental receptors nearby to the Project Area to inform contractors and site staff of the presence of sensitive habitats, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr.</p> <p>Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided, such as the local CBA and DMOSS sites.</p>	<p>Pre-construction phase</p>	<p>Health and Safety Officer, Environmental Officer</p>	<p>Compliance to the training</p>	<p>Ongoing</p>
<p>Management outcome: Erosion</p>				
<p>Impact Management Actions</p>	<p>Implementation</p>		<p>Monitoring</p>	
	<p>Phase</p>	<p>Responsible Party</p>	<p>Aspect</p>	<p>Frequency</p>
<p>Speed limits must be put in place to reduce erosion. Speed bumps and signs must be erected to enforce slow speeds.</p>	<p>Life of operation</p>	<p>Project manager, Environmental Officer</p>	<p>Water Runoff from road surfaces</p>	<p>Ongoing</p>
<p>Only existing access routes and walking paths may be made use of. Where new access routes must be made these must be along the same line as the proposed pipeline route.</p>	<p>Life of operation</p>	<p>Project manager, Environmental Officer</p>	<p>Routes used within the area</p>	<p>Ongoing</p>
<p>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc. This must be guided by an effective habitat rehabilitation plan.</p>	<p>Life of operation</p>	<p>Project manager, Environmental Officer</p>	<p>Re-establishment of indigenous vegetation</p>	<p>Progressively</p>

An emergency spill/leak response and management plan must be compiled and implemented.

Life of operation

Project manager, Environmental
Officer

Management plan

Before construction phase:
Ongoing

5 Conclusion and Impact Statement

The Project Area is defined by grassland habitat which exists in a degraded state, having lost much of its ecological functionality as a result of the ongoing anthropogenic impacts due to its close proximity to extensive and dense agricultural activities and road networks. However, the Project Area is situated within an endangered ecosystem, SCC are confirmed to occur, and numerous water resources occur throughout the area, and therefore it is important that the management outcomes presented above be adhered to in order to properly manage and mitigate the negative environmental impacts that will stem from the project activities.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the Terrestrial Biodiversity Theme sensitivity, as allocated by the National Environmental Screening Tool. The Project Area is assigned an overall sensitivity of 'Low' - largely due to the high levels of persistent anthropogenic disturbance present and the overall low indigenous flora species diversity which is heavily impacted by the dominance of a wide array of weedy species and pioneers. For these reasons, in addition to the fact that the ecological connectivity of the region has been historically severed, the local project area habitat is not currently considered to form a viable constituent of the regional natural endangered ecosystem type.

Four (4) avifaunal SCC were recorded, and five (5) additional SCC are likely to be regularly found in the area. An operational phase avifaunal impact assessment procedure was therefore undertaken, and it was noted that a number of key mitigation measures must be applied to the powerlines in order to reduce the negative impacts associated with collisions and electrocutions.

5.1 Impact Statement

It is the opinion of the specialists that the project may be favourably considered, provided that the mitigation measures presented in this report be implemented, along with the recommendations below. The poor state of the ecosystem, and the corresponding low impact levels due to the type of proposed linear development, means that it is unlikely that any functional habitat or sensitive flora will be lost as a result of the impacts arising from the proposed activities.

Impacts to mammals and herpetofauna are also expected to be low, due to the minor levels of disturbance expected during all project phases. However, operational phase impacts to avifauna SCC will be of significance if proper mitigations for collision and electrocution are not adhered to. Measures outlined in the "Generic Environmental Management Programme Relevant to an Application for Substation and Overhead Electricity Transmission and Distribution Infrastructure", as outlined in *Government Gazette* No. 42323 of 22 March 2019, must be adhered to in this regard – along with the key mitigations presented by the specialist in section 4.1 above.

5.2 Specialist Recommendations

The water resource delineations, and management and mitigation measures put forward by the accompanying project freshwater report must be strictly adhered to in order to effectively control the risks presented by powerline construction and operation to project area aquatic systems.

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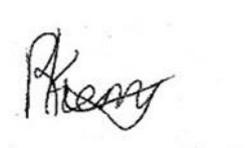
7 Appendix Items

7.1 Appendix A: Specialist Declarations

DECLARATION

I, Ryno Kemp, declare that:

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



Ryno Kemp

Avifauna Specialist

The Biodiversity Company

August 2023

DECLARATION

I, Michael Schrenk, declare that:

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



Michael Schrenk

Environmental Consultant

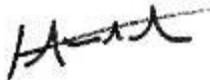
The Biodiversity Company

August 2023

DECLARATION

I, Andrew Husted, declare that:

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



Andrew Husted

Terrestrial Ecologist

The Biodiversity Company

August 2023

7.2 Appendix B: Specialist CVs

Available upon request.