



Great Karoo Overhead Line – Avifaunal and Terrestrial Ecological Walkdown

**Karoo Hoogland Local Municipality, Karoo Hoogland NU
District Municipality, Northern Cape Province, South
Africa**

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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.	

Table of Contents

1	Introduction.....	1
1.1	Background	1
1.2	Scope of Work.....	2
1.3	Assumptions and Limitations	2
1.4	Definitions.....	3
1.4.1	Species of Conservation Concern.....	3
1.4.2	Protected Species	3
2	Approach	5
2.1	Spatial Data and Project Area of Influence	5
2.2	Past Project Ecological and Assessment Findings	5
2.3	Methods.....	8
3	Walkdown.....	10
3.1	Flora Species	10
3.2	Avifauna Species	14
3.3	Site Specific Summary	15
3.4	Observations	1
3.4.1	Habitat Types and Sensitivity.....	1
3.4.2	Existing Impacts	2
3.4.3	Species of Conservation Concern and Protected Species	2
3.5	Mitigation Measures	3
4	Conclusions and Recommendations	7
5	References	8
6	Appendix Items.....	9
6.1	Appendix A – Screening Tool.....	9
6.2	Appendix B – Avifauna Site Ecological Importance	12
6.3	Appendix C – Avifauna Expected Species.....	14
6.4	Appendix D – Avifauna species recorded during the walkdown and original assessment..	18
6.5	Appendix E – Specialist Declaration of Independence	21
6.6	Appendix F – Specialist CVs.....	23

List of Tables

Table 2-1	List of fauna and flora SCC that are expected to occur within the PAOI. EN = Endangered, LC = Le	6
Table 2-2	Threatened avifauna species that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable	7
Table 3-1	Flora recorded within the PAOI. NE = Not Evaluated and LC = Least Concern.	10
Table 3-2	Table presenting an estimate of the number of protected plant species predicted for the pylon footprint (15 m radius).....	12
Table 3-3	The avifauna Species of Conservation Concern recorded during the walkdown and original survey. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable	14
Table 3-4	Avifauna risk species recorded during the walkdown	15
Table 3-5	Site-specific summary, comments and recommendations on the route associated with the OHL project.	1
Table 3-6	Terrestrial biodiversity management objectives for the powerline development	3
Table 3-7	Specific avifauna management outcomes pertaining to impacts on avifauna and their habitats	4
Table 3-8	Generic management outcomes pertaining to impacts to avifauna and their habitats .	6
Table 6-1	Summary of Conservation Importance (CI) criteria	12
Table 6-2	Summary of Functional Integrity (FI) criteria	12
Table 6-3	Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)	13
Table 6-4	Summary of Resource Resilience (RR) criteria	13
Table 6-5	Matrix used to derive Site Ecological Importance (SEI) from Receptor Resilience (RR) and Biodiversity Importance (BI)	14
Table 6-6	Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities	14
Table 6-7	Expected avifauna species list for the PAOI	14
Table 6-8	Avifauna species recorded during the walkdown and original assessment	18

List of Figures

Figure 1-1	The proposed project locality	1
Figure 1-2	Threatened species and Species of Conservation Concern (SANBI, 2023).....	3
Figure 2-1	Figure presenting the proposed powerline route and pylon locations.....	5
Figure 2-2	Figure presenting the habitats delineated for the original Ecological Assessment	8
Figure 2-3	Figure presenting the field survey points and the field survey tracks	9
Figure 3-1	The protected species recorded from the PAOI: A) Aizoon africanum, B) Brunsvigia sp., C) Cheiridopsis namaquensis, D) Crassula columnaris, E) Crassula deltoidei, F) Crassula muscosa, G) Euphorbia rhombifolia, H) Haemanthus coccineus, I) Moraea sp., J) Ruschia sp., K) Stomatium sp. And L) Wurmbea cf. variabilis	14
Figure 3-2	Figure presenting the habitats originally delineated for the PAOI (Desai, 2020) in relation to the proposed powerline route and pylon locations	1
Figure 3-3	The avifauna sensitivities assigned to the respective habitats	2
Figure 6-1	Terrestrial Biodiversity Theme Sensitivity of the PAOI.....	9
Figure 6-2	Plant Species Theme Sensitivity of the PAOI	10
Figure 6-3	Animal Species Theme Sensitivity of the PAOI	11

1 Introduction

1.1 Background

The Biodiversity Company (TBC) was commissioned by Savannah Environmental to undertake an avifauna and terrestrial ecology walkdown of the proposed development of the Great Karoo Overhead Line (OHL). The project is located approximately 43 km south of Sutherland within the Karoo Hoogland Local Municipality and the Karoo Hoogland NU District Municipality in the Northern Cape Province (Figure 1-1).

The walkdown was undertaken from the 23rd to the 28th of February 2026 to inform the layout. The survey constituted a dry season assessment. The provided powerline route is referred to as the Project Area of Influence (PAOI) for reporting purposes.

The purpose of the ecological walkdowns was to locate and identify any sensitive ecological habitats, and protected or and threatened plant species, as well as and/or fauna of conservation concern within the development footprint areas. The walkdown was also necessary to detail relevant special/tower specific mitigation measures and make final assessments within the developmental footprint. The presence of all listed and protected species is detailed herein, where applicable, and this information can be used to supplement the requirements of the necessary permit application that is required from the provincial authority, i.e., the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform, prior to the removal, destruction and/or relocation. Spatial data was also provided for the walkdowns which demarcated sensitivity areas which were also considered for the placement of infrastructure or clearance of vegetation.

Please note that this report only presents the findings from the avifauna and ecological walkdown, which specifically focused on the avifauna and vegetation of the PAOI. These disciplines will collectively provide the demarcation of ecological constraints for the larger area.

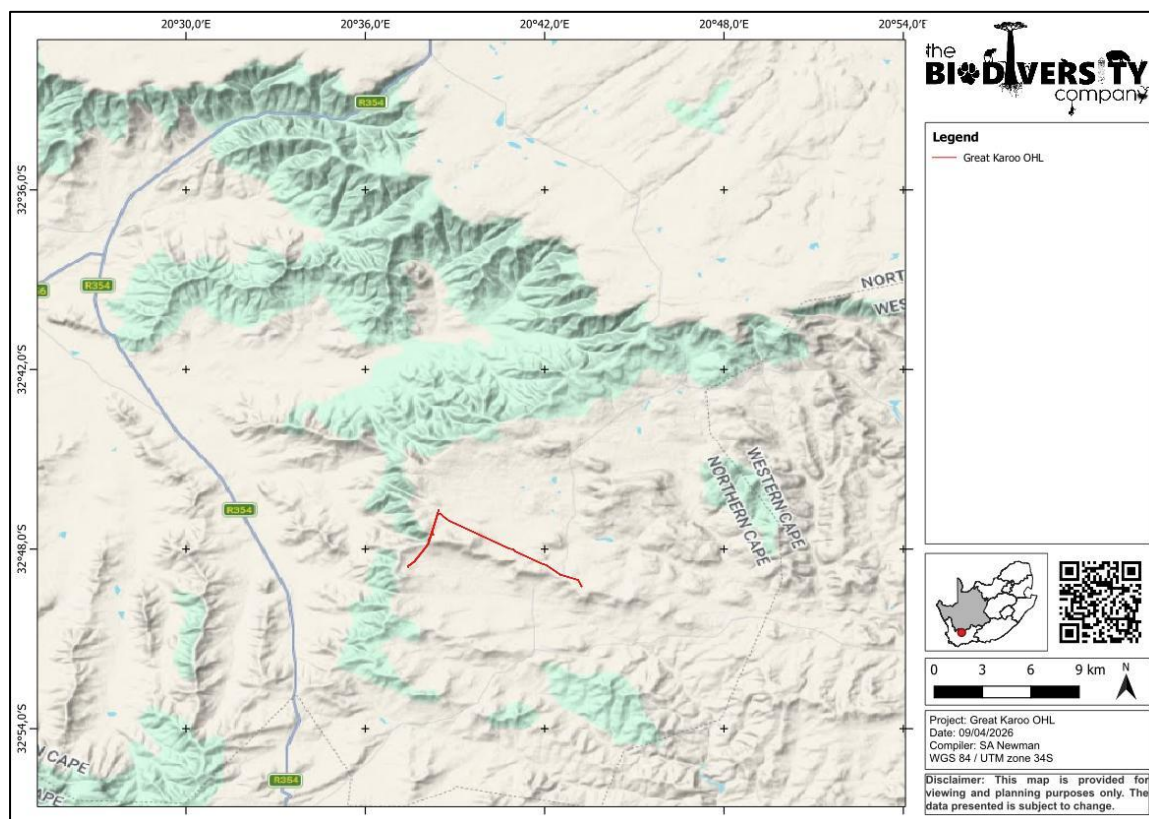


Figure 1-1 The proposed project locality

1.2 Scope of Work

The Scope of Work (SoW) for this assessment include the following:

- Review of existing information related to the development;
- Conduct an ecological walkdown for the current footprint areas;
- Compilation of a report detailing the results of the walkdown;
- Detail and ecological constraints identified for the current infrastructure;
- Provide site/tower-specific mitigation measures to supplement the approved EMP; and
- Present information on the presence of any Species of Conservation Concern (SCC); and
- Provide information to adequately inform any contractors, environmental officers and personnel pertaining to the ecological significance of the area.

1.3 Assumptions and Limitations

The following assumptions and limitations should be noted for the assessment:

- The Global Positioning System (GPS) used for the assessment is accurate to 5 metres and therefore any spatial features may be offset by this distance;
- The assessment area was based on the spatial file provided by the client before commencement of the field assessment and any alterations to the development area subsequently may affect the results;
- The survey was undertaken from the 23rd to the 28th of February 2026, which constitutes a dry season (summer) survey. The optimal survey period for the Fynbos biome is between August and September; therefore, this survey does not meet the seasonal requirements for floral observations within the biome [especially because previous studies have observed SCCs (*viz.* *Eriocephalus grandiflorus* and *Ehrharta eburnean*) within the PAOI, refer to section 2.2];
- Due to seasonal constraints, certain fauna and flora species may not have been observable and/or identifiable at the time of the assessment;
- Proposed Access roads were not provided prior to this walkdown, therefore, this assessment pertains to the proposed pylon locations only and does not address any proposed access roads;
- This assessment considers flora and fauna, including avifauna; and
- All regional and site-specific environmental information that was contained within the original (submitted) documents is not repeated within this document (*viz.* Desai, M. 2020. The Biodiversity Company: Great Karoo Wind Farm Grid Infrastructure Expansion - Biodiversity Basic Assessment). This document focuses only on the very specific mandate and findings of the walkdown and its associated ecosystem evaluations.

1.4 Definitions

1.4.1 Species of Conservation Concern

In accordance with the National Red List of South African Plants website, managed and maintained by the South African National Biodiversity Institute (SANBI), a Species of Conservation Concern (SCC) is a species that has a high conservation importance in terms of preserving South Africa's rich biodiversity. This classification covers a range of red list categories as illustrated in Figure 1-2 below.

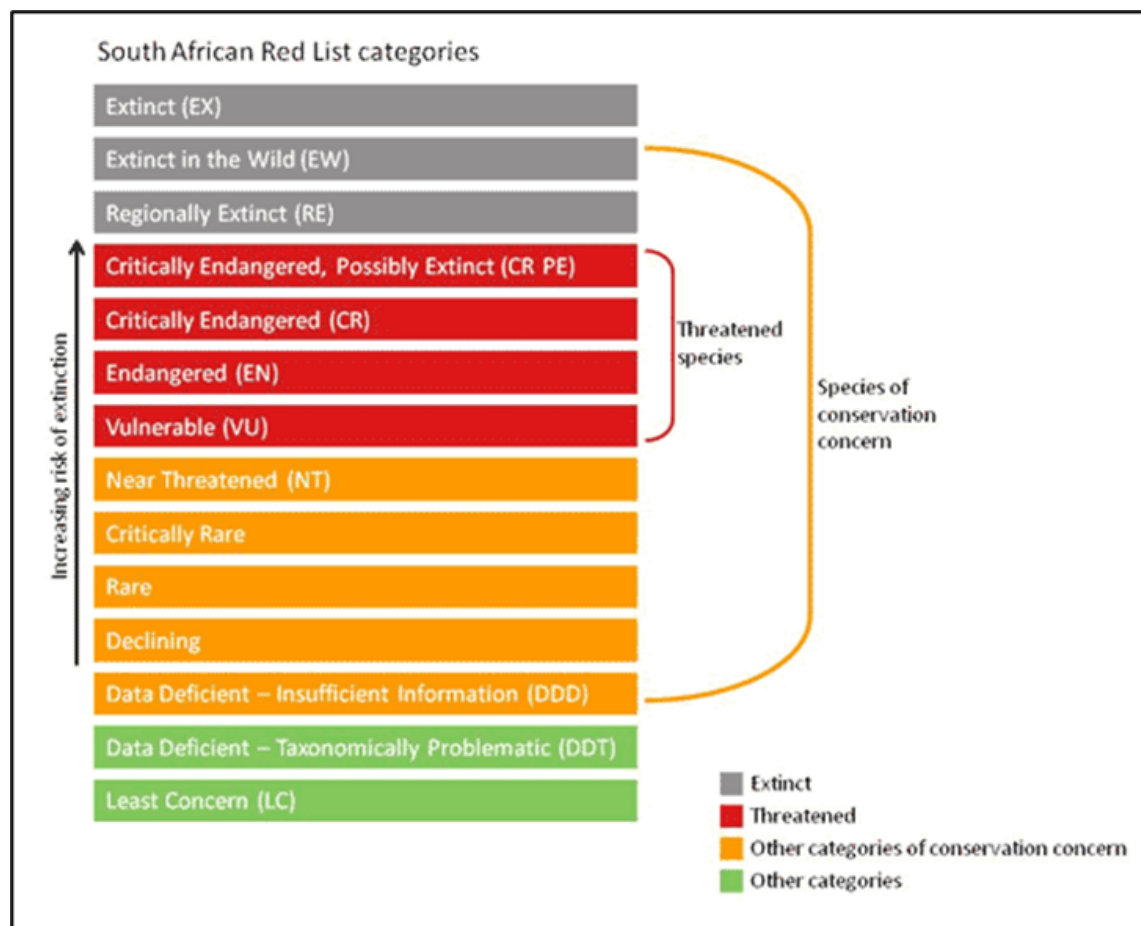


Figure 1-2 Threatened species and Species of Conservation Concern (SANBI, 2023)

South Africa uses the internationally endorsed International Union for Conservation of Nature (IUCN) Red List Categories and Criteria (IUCN, 2023). This scientific system is designed to measure species' risk of extinction, and its purpose is to highlight those species that need critical conservation action. As this system has been adopted from the IUCN, the definition of an SCC as described and categorised above is extended to all red list classifications relevant to fauna as well as the IUCN categories, for the purposes of this report.

1.4.2 Protected Species

Protected species include both flora and fauna species that are protected according to some form of relevant legislation, be it provincial, national, or international. Provincial legislation may include that published in the form of a provincial ordinance, bill, or act (specifically, provincially protected species area listed in Schedule 12 of the Limpopo Environmental Management Act No. 7 of 2003), and national legislation includes that which is published in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) or the National Forests Act (Act No. 84 of 1998). The updated annual list of all tree species which are protected in terms of the National Forests Act was published by the Minister of Forestry, Fisheries and the Environment, Ms Barbara Creecy, in Government Gazette

Great Karoo OHL

46094 (Notice No. 1935) on 25 March 2022. Relevant international legislation includes the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 2021).

Permits will be required should any of the protected species be removed, destroyed, or relocated from the relevant governing body. It is advised that they be avoided wherever observed.

2 Approach

2.1 Spatial Data and Project Area of Influence

The development footprint of interest was provided by the client, specifically the powerline route and pylon locations, which constitutes the PAOI (Figure 2-1). The PAOI was traversed on foot during the walkdown and the proposed pylon locations targeted as sampling points. Global positioning system (GPS) accuracy during the field surveys varied from 2 to 5 m. The findings of select sample points are discussed in the subsequent sections.

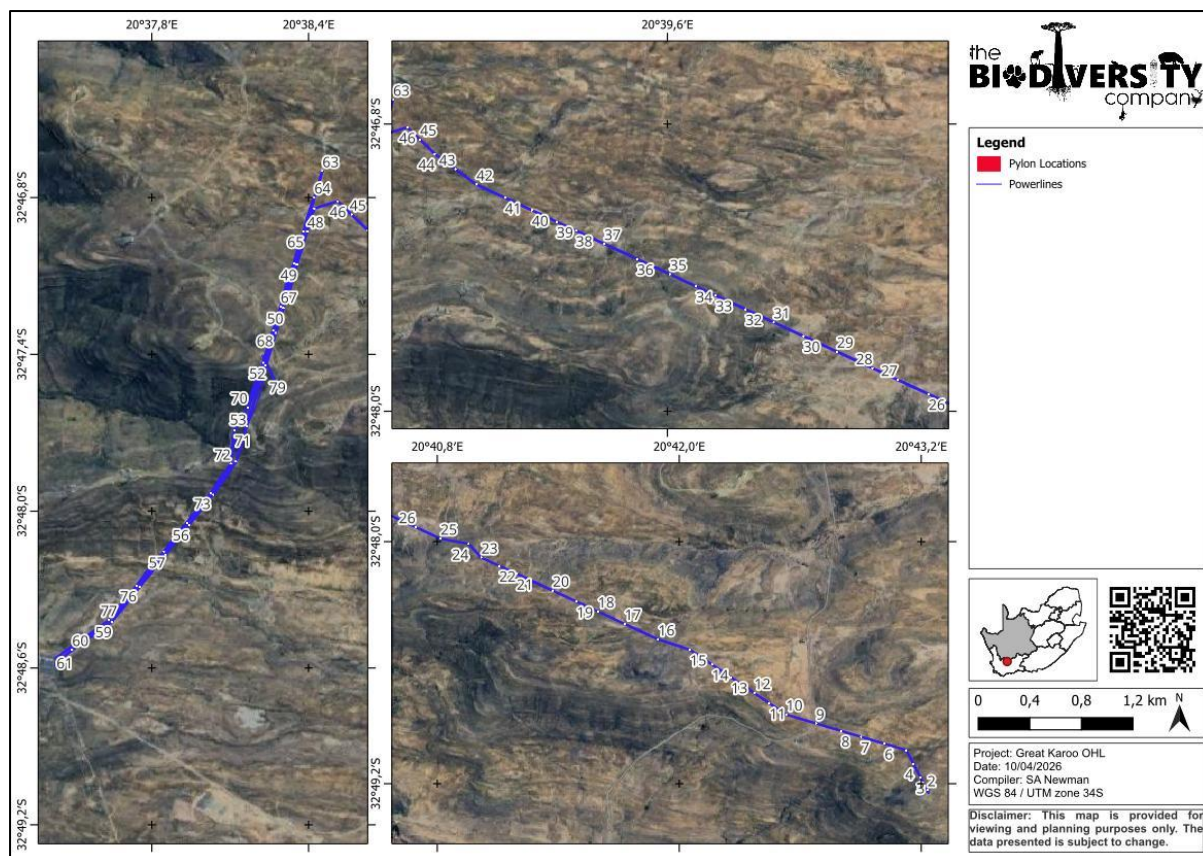


Figure 2-1 Figure presenting the proposed powerline route and pylon locations

2.2 Past Project Ecological and Assessment Findings

One previous assessment for the PAOI was considered for background information, namely:

- Desai, M. 2020. The Biodiversity Company: Great Karoo Wind Farm Grid Infrastructure Expansion - Biodiversity Basic Assessment.

This assessment indicates that two species of flora SCC were recorded from the PAOI: *Eriocephalus grandiflorus* and *Ehrharta eburnean*. In addition, numerous provincially protected flora species were recorded from the PAOI.

No reptile SCC were recorded from the PAOI, but of the seven species recorded, five are protected under the provincial legislation. One (1) mammal SCC was recorded from the PAOI: *Palea capreolus* (Grey Rhebok, NT).

The findings of the abovementioned report listed a total of 160 flora species that are expected from the PAOI, six (6) of which are SCC, 52 mammal species, including five (5) SCC, and six (6) herpetofauna species, three (3) of which are SCC.

Great Karoo OHL

In terms of avifauna, SABAP2 data indicates that a total of 147 bird species are expected for the PAOI and surrounds. Of these, 19 are considered SCC.

Additional assessments from the area were also consulted to supplement the project information and species data:

- Erasmus, M. 2022. The Biodiversity Company: Biodiversity Baseline and Impact Assessment for the Proposed Maralla 132 KV Power Line; and
- Schrenk, M. 2022. The Biodiversity Company: Esizayo Wind Farm – Plant Rescue Plan.

Table 2-1 presents the flora and fauna SCC that are expected from the PAOI and their respective likelihood of occurrence and Table 2-2 lists the avifauna SCC that are expected within the PAOI and their likelihood of occurrence. Figure 2-2 presents the habitats delineated for the original ecological assessment (Desai, 2020).

Table 2-1 List of fauna and flora SCC that are expected to occur within the PAOI. EN = Endangered, LC = Le

Family	Species	Threat Status (SANBI)		Habitat	Likelihood of Occurrence
		SANBI	IUCN		
Flora					
Aizoaceae	<i>Antimima pumila</i>	DD	-	Rocky slopes, possibly favouring south-facing slopes.	High
Amaryllidaceae	<i>Brunsvigia josephinae</i>	VU	-	Rocky slopes and clay flats in renosterveld.	High
Apocynaceae	<i>Duvalia parviflora</i>	VU	-	Flat, stony to loamy ground, under small karroid bushes.	Moderate
Asphodelaceae	<i>Bulbine torta</i>	Rare	-	Shallow pans on sandstone slabs, 230-1000 m.	Moderate
Asteraceae	<i>Eriocephalus grandiflorus</i>	Rare	-	Lower foothills in quartz patches.	Moderate
Crassulaceae	<i>Adromischus mammillaris</i>	EN	-	Lower gravelly slopes.	Low
Fabaceae	<i>Lotononis venosa</i>	EN	-	Open karroid scrub on sandy clay alluvium. Known only from four locations. Extent of occurrence 84 km² and area of occupancy 16 km².	Moderate
Geraniaceae	<i>Pelargonium denticulatum</i>	Rare	-	Sandy soils near mountain streams.	Low
Hyacinthaceae	<i>Lachenalia longituba</i>	VU	-	Stony clay in seasonally wet, boggy sites that bake rock hard in summer. Known from five locations. EOO 350 km², AOO <20 km².	Moderate
Iridaceae	<i>Geissorhiza karoica</i>	NT	-	Coarse shale slopes. Known from six locations. EOO 497 km²	High
Iridaceae	<i>Ixia mollis</i>	VU	-	Among rocks on seasonally moist south-facing sandy or clay slopes. Known from only five locations in the Olifants River Valley between Clanwilliam	Low

Great Karoo OHL

				and Citrusdal and the western Cederberg. EOO 74 km ²	
Iridaceae	<i>Romulea eburnea</i>	VU	-	Shale soils in the Klein Roggeveld. Rare and localised as it known from only two locations.	High
Poaceae	<i>Ehrharta eburnea</i>	NT	-	Rocky places in mountain renosterveld.	High
Reptiles					
Testudinidae	<i>Chersobius boulengeri</i>	EN		Rocky areas, particularly dolerite ridges. Secretive species sheltering under rock slabs.	Moderate
Testudinidae	<i>Psammobates tentorius tentorius</i>	NT		Shrubland habitats with summer- or all-year-rainfall and frequent frost	Low
Testudinidae	<i>Psammobates tentorius verroxii</i>	NT		Inland plateau above 900 m in summer-rainfall areas of open shrubland.	High
Mammals					
Bovidae	<i>Pelea capreolus</i>	NT		Rocky hills, rocky mountainsides, mountain plateaux with good grass cover.	High
Felidae	<i>Felis nigripes</i>	VU		Open habitat in arid areas with some cover in the form of tall stands of grass or scrub.	High
Felidae	<i>Panthera pardus</i>	VU		Diverse. Rocky areas and forest.	Low-Moderate
Leporidae	<i>Bunolagus monticularis</i>	CR		Confined to riparian bush on the narrow alluvial fringe of seasonally dry watercourses in the Central Karoo.	Low
Mustelidae	<i>Aonyx capensis</i>	NT		Permanent water bodies with suitable abundance of prey items.	Low

Table 2-2 *Threatened avifauna species that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

Common Name	Scientific Name	Regional*	Global*	Likelihood of Occurrence
African Rock Pipit	<i>Anthus crenatus</i>	LC	NT	High
Black Harrier	<i>Circus maurus</i>	EN	EN	High
Black Stork	<i>Ciconia nigra</i>	EN	LC	Moderate
Black-winged Kite	<i>Elanus caeruleus</i>	NT	LC	High
Cape Shoveler	<i>Spatula smithii</i>	NT	LC	Low
Ground Woodpecker	<i>Geocolaptes olivaceus</i>	NT	NT	High
Hamerkop	<i>Scopus umbretta</i>	NT	LC	Moderate
Karoo Korhaan	<i>Eupodotis vigorsii</i>	NT	LC	High
Kittlitz's Plover	<i>Charadrius pecuarius</i>	NT	LC	High

Great Karoo OHL

Lanner Falcon	<i>Falco biarmicus</i>	NT	LC	Confirmed
Lesser Kestrel	<i>Falco naumanni</i>	VU	LC	High
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN	EN	Confirmed
Martial Eagle	<i>Polemaetus bellicosus</i>	EN	EN	High
Red-billed Teal	<i>Anas erythrorhyncha</i>	NT	LC	Confirmed
Secretarybird	<i>Sagittarius serpentarius</i>	VU	EN	High
Southern Black Korhaan	<i>Afrotis afra</i>	VU	VU	Confirmed
Southern Pochard	<i>Netta erythrophthalma</i>	NT	LC	Low
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU	LC	Confirmed
Yellow-billed Duck	<i>Anas undulata</i>	NT	LC	High

*Lee et al., 2025; *IUCN 2025

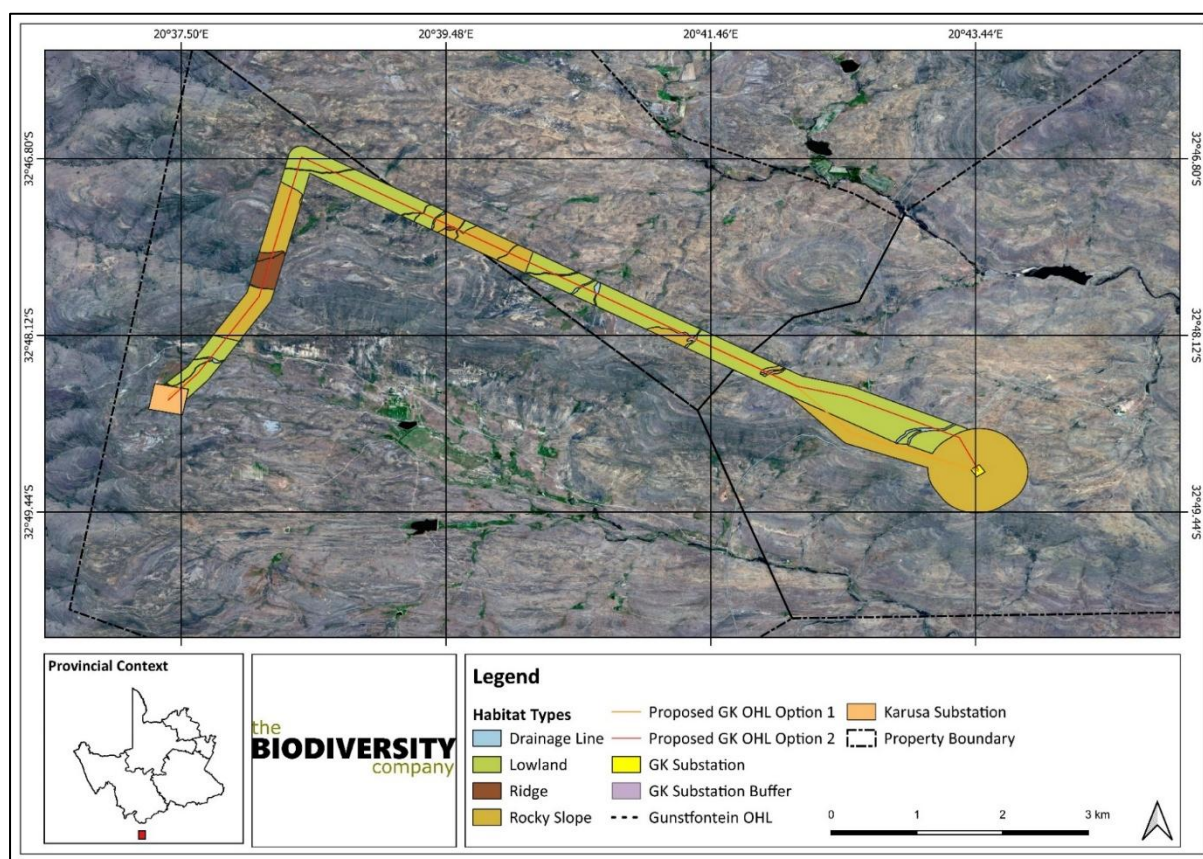


Figure 2-2 Figure presenting the habitats delineated for the original Ecological Assessment

2.3 Methods

The avifauna and terrestrial ecological walkdown was conducted from the 23rd to the 28th of February 2026, which constitutes a dry season (summer) survey.

At each pylon location, records were made for every plant species observed within 15 m of the pylon. These records include some plants which could only be identified to genus or family level. Note that due to the time of year, most perennial plants were not flowering and there were very few annuals. For a comprehensive floral assessment, additional surveys must be conducted in multiple seasons, especially during the optimal survey period for the biome (August-September).

Great Karoo OHL

In terms of avifauna, the walkdown included searching for sensitive habitats, nests and any avifauna SCC believed to occur within the area being searched. At each assessment point, standardised point counts (Buckland *et al.*, 1993) were conducted to gather data on the avifauna species composition and relative abundance of species within the broad habitat types identified. The standardised point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was conducted over a 10-minute period. The horizontal detection limit was set at 150 meters. At each point, the observer would document the date, start time, 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.

The field survey tracks and field survey points can be seen presented in Figure 2-3.

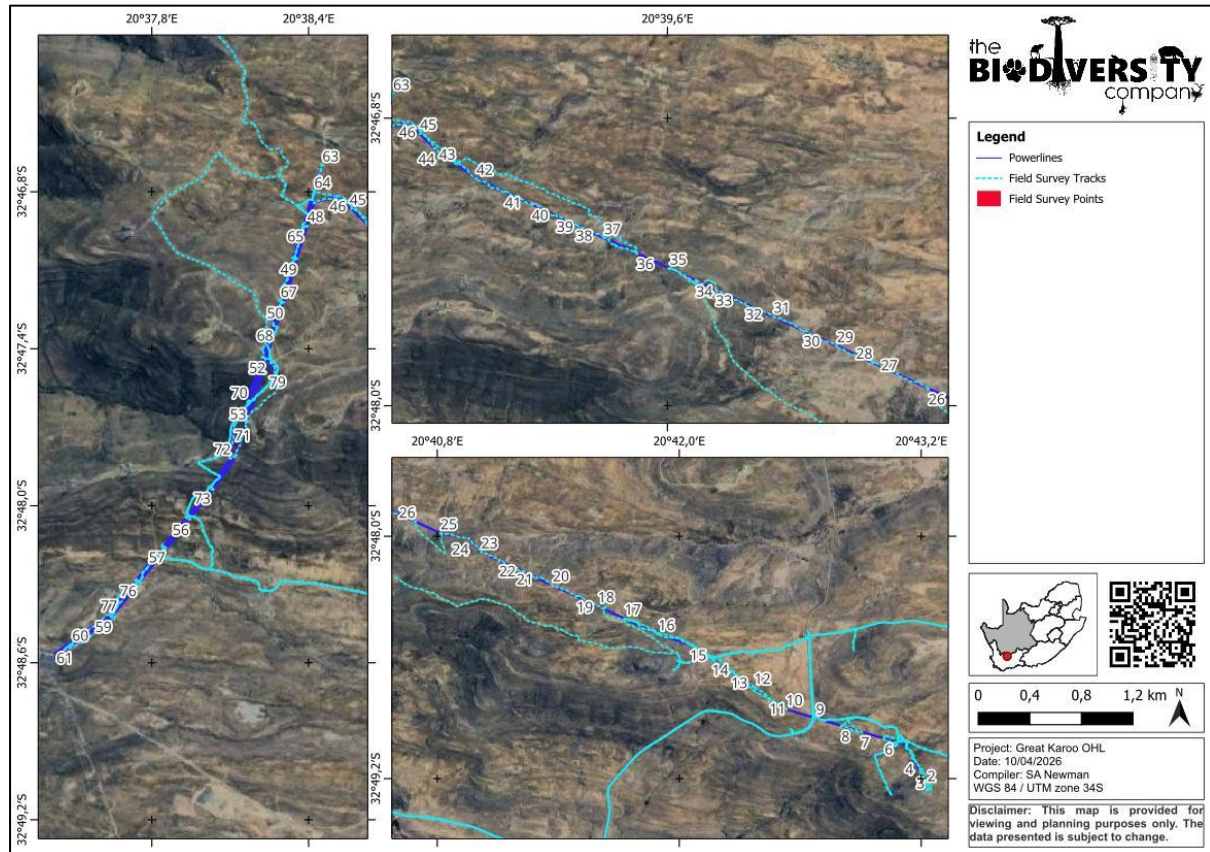


Figure 2-3 Figure presenting the field survey points and the field survey tracks

3 Walkdown

3.1 Flora Species

The specialist ecologist targeted the planned pylon locations searching for ecologically sensitive habitats and any SCC within a 15 m radius of the proposed pylon location, representing the pylon footprint.

Ninety-six (96) indigenous flora species were observed, of which at least 21 are provincially protected under the Northern Cape Nature Conservation act no. 9 of 2009. The observed flora species are listed in Table 3-1 with the provincially protected species presented in Figure 3-1. An estimate of the number of individuals of each species recorded per site is presented in Table 3-2.

Table 3-1 Flora recorded within the PAOI. NE = Not Evaluated and LC = Least Concern.

Family	Scientific Name	Conservation Status (SANBI)	Protection Status
Aizoaceae	<i>Aizoaceae sp.</i>		Provincially Protected
Aizoaceae	<i>Aizoon africanum</i>	LC	Provincially Protected
Aizoaceae	<i>Cheiridopsis namaquensis</i>	LC	Provincially Protected
Aizoaceae	<i>Ruschia sp.</i>		Provincially Protected
Aizoaceae	<i>Stomatium sp.</i>		Provincially Protected
Aizoaceae	<i>Trichodiadema sp.</i>		Provincially Protected
Amaryllidaceae	<i>Brunsvigia sp.</i>		Provincially Protected
Amaryllidaceae	<i>Haemanthus coccineus</i>	LC	Provincially Protected
Anacardiaceae	<i>Searsia burchellii</i>	LC	
Apocynaceae	<i>Gomphocarpus fruticosus</i>	LC	
Asparagaceae	<i>Asparagus capensis</i>	LC	
Asparagaceae	<i>Asparagus retrofractus</i>	LC	
Asparagaceae	<i>Asparagus sp.</i>		
Asphodelaceae	<i>Aloe microstigma</i>	LC	Provincially Protected
Aspleniaceae	<i>Asplenium sp.</i>		
Asteraceae	<i>Amphiglossa tomentosa</i>	LC	
Asteraceae	<i>Arctotheca prostrata</i>	LC	
Asteraceae	<i>Berkheya carlinifolia</i>	LC	
Asteraceae	<i>Berkheya sp.</i>		
Asteraceae	<i>Chrysocoma ciliata</i>	LC	
Asteraceae	<i>Chrysocoma sp.</i>		
Asteraceae	<i>Chrysocoma valida</i>	LC	
Asteraceae	<i>Dicerotheramnus rhinocerotis</i>		
Asteraceae	<i>Dimorphotheca cuneata</i>	LC	
Asteraceae	<i>Dimorphotheca sp.</i>		
Asteraceae	<i>Eriocephalus africanus</i>	LC	
Asteraceae	<i>Eriocephalus ericoides</i>	LC	
Asteraceae	<i>Eriocephalus sp.</i>		
Asteraceae	<i>Eriocephalus cf. africanus</i>	LC	

Great Karoo OHL

Asteraceae	<i>Eriocephalus spinescens</i>	LC	
Asteraceae	<i>Euryops lateriflorus</i>	LC	
Asteraceae	<i>Euryops sulcatus</i>	LC	
Asteraceae	<i>Felicia filifolia</i>	LC	
Asteraceae	<i>Gnaphalieae (Helichrysum sp.)</i>		
Asteraceae	<i>Helichrysum hamulosum</i>	LC	
Asteraceae	<i>Helichrysum pumilio</i>		
Asteraceae	<i>Leysera gnaphalodes</i>	LC	
Asteraceae	<i>Nidorella ivifolia</i>	LC	
Asteraceae	<i>Oedera genistifolia</i>	LC	
Asteraceae	<i>Oedera sp.</i>		
Asteraceae	<i>Pentzia incana</i>	LC	
Asteraceae	<i>Pentzia sp.</i>		
Asteraceae	<i>Pentzia cf. spinescens</i>	LC	
Asteraceae	<i>Pteronia empetrifolia</i>	LC	
Asteraceae	<i>Pteronia glauca</i>		
Asteraceae	<i>Pteronia glomerata</i>	LC	
Asteraceae	<i>Pteronia incana</i>	LC	
Colchicaceae	<i>Wurmbea cf. variabilis</i>	LC	Provincially Protected
Convolvulaceae	<i>Convolvulus sp.</i>		
Convolvulaceae	<i>Convolvulus cf. sagittatus or capensis</i>	LC	
Crassulaceae	<i>Crassula barbata</i>		Provincially Protected
Crassulaceae	<i>Crassula columnaris</i>		Provincially Protected
Crassulaceae	<i>Crassula deltoidea</i>	LC	Provincially Protected
Crassulaceae	<i>Crassula muscosa</i>	NE	Provincially Protected
Crassulaceae	<i>Crassula tetragona</i>		Provincially Protected
Crassulaceae	<i>Tylecodon ventricosus</i>	LC	Provincially Protected
Crassulaceae	<i>Tylecodon wallichii</i>		Provincially Protected
Cyperaceae	<i>cf. Afroscirpoides dioeca</i>	LC	
Ebenaceae	<i>Diospyros austro-africana</i>	LC	
Euphorbiaceae	<i>Euphorbia rhombifolia</i>		Provincially Protected
Euphorbiaceae	<i>Euphorbia cf. serpens</i>	NE	Provincially Protected
Fabaceae	<i>Argyrolobium argenteum</i>	LC	
Fabaceae	<i>cf. Wiborgia sericea</i>	LC	
Fabaceae	<i>Melolobium candicans</i>	LC	
Geraniaceae	<i>Geraniaceae sp.</i>		
Geraniaceae	<i>Pelargonium abrotanifolium</i>	LC	
Geraniaceae	<i>Pelargonium karoocicum</i>	LC	
Geraniaceae	<i>Pelargonium sp.</i>		
Grimmiaceae	<i>Grimmia sp.</i>		

Great Karoo OHL

Hyacinthaceae	<i>Drimia capensis</i>	LC	
Hyacinthaceae	<i>Drimia physodes</i>	LC	
Hyacinthaceae	<i>cf. Drimia sp.</i>		
Hypoxidaceae	<i>Empodium cf. plicatum</i>	LC	
Hypoxidaceae	<i>Empodium cf. flexile</i>	LC	
Iridaceae	<i>Moraea sp.</i>		Provincially Protected
Lamiaceae	<i>Salvia verbenaca</i>	LC	
Malvaceae	<i>Anisodontea triloba</i>	LC	
Malvaceae	<i>Hermannia sp.</i>		
Melanthaceae	<i>Melianthus comosus</i>	LC	
Oxalidaceae	<i>Oxalis sp.</i>		Provincially Protected
Poaceae	<i>Poaceae</i>		
Poaceae	<i>cf. Tribolium purpureum</i>		
Poaceae	<i>Tribolium sp. or Pentameris sp.</i>		
Poaceae	<i>Tenaxia stricta</i>	LC	
Poaceae	<i>Tribolium hispidum</i>	LC	
Polygalaceae	<i>Muraltia spinosa</i>	LC	
Pottiaceae	<i>Pseudocrossidium crinitum</i>		
Rubiaceae	<i>Anthospermum spathulatum</i>		
Rubiaceae	<i>Nenax sp.</i>		
Rubiaceae	<i>Nenax cf. cinerea or namaquensis</i>	LC	
Ruscaceae	<i>Eriospermum paradoxum</i>	LC	
Ruscaceae	<i>Eriospermum sp.</i>		
Scrophulariaceae	<i>Selago sp.</i>		
Solanaceae	<i>Lycium cinereum</i>	LC	
Solanaceae	<i>Lycium sp.</i>		

Table 3-2 Table presenting an estimate of the number of protected plant species predicted for the pylon footprint (15 m radius)

Site	Aizoaceae sp.	Aizoon africanum	Brunsvigia sp.	Cheiridopsis namaquensis	Crassula columnaris	Crassula deltoidea	Crassula muscosa	Euphorbia rhombifolia	Haemanthus coccineus	Moraea sp.	Ruschia sp.	Stomatium sp.	Wurmbea cf. variabilis
1	≥25			≥25	≥25	≥25		≥25			≥50	≥50	
2							≥25				≥50		
3								≥25					
4											≥50		
7		≥50											
8											≥25		
9								≥10					

Great Karoo OHL

11	≥25												
14	≥25										≥25		
15		≥25				≥25					≥50		
16											≥50		
19	≥10												
24	≥50												
25											≥25		
28	≥5												
44										≥5			
50	≥25							≥5					
52	≥25											≥5	
53											≥10		
54	≥50												
58	≥10												
59											≥25		
60											≥25		
67	≥25												
68	≥25												
72											≥50		
76	≥10										≥10		
77											≥25		
78											≥25		
Estimated total	~50	~305	~5	~50	~25	~25	~25	~85	~5	~5	~495	~50	~5

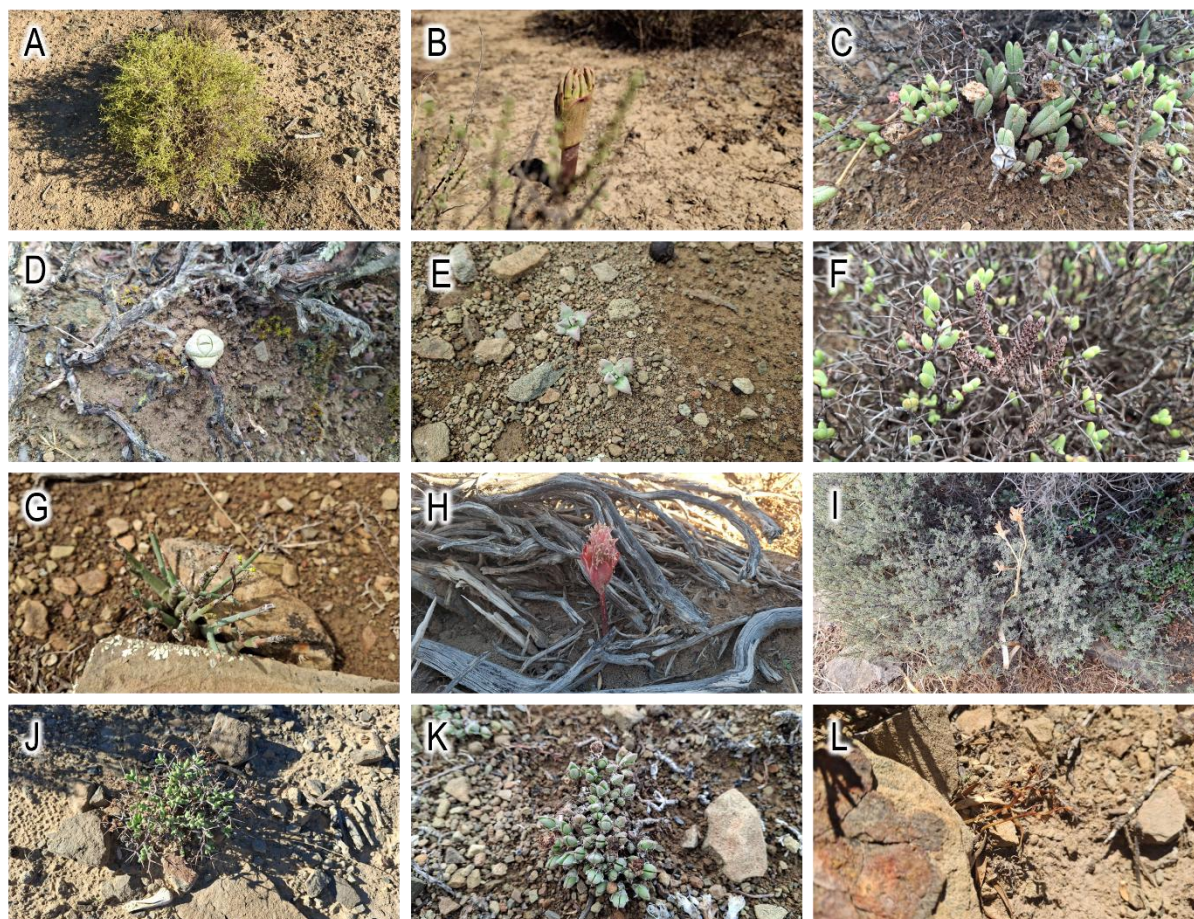


Figure 3-1 The protected species recorded from the PAOI: A) *Aizoon africanum*, B) *Brunsvigia* sp., C) *Cheiridopsis namaquensis*, D) *Crassula columnaris*, E) *Crassula deltoidei*, F) *Crassula muscosa*, G) *Euphorbia rhombifolia*, H) *Haemanthus coccineus*, I) *Moraea* sp., J) *Ruschia* sp., K) *Stomatium* sp. And L) *Wurmbea cf. variabilis*

3.2 Avifauna Species

Sixty (60) avifauna species were observed during the walkdown, of which 4 are SCC. An additional SCC (Ludwig's Bustard) was confirmed within the PAOI during the original assessment (TBC, 2020). These five species are listed in Table 3-3.

Table 3-3 The avifauna Species of Conservation Concern recorded during the walkdown and original survey. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable

Common Name	Scientific Name	Family Name	Regional	Global	Endemism
Lanner Falcon	<i>Falco biarmicus</i>	Falconidae	NT	LC	
Ludwig's Bustard	<i>Neotis ludwigii</i>	Otididae	EN	EN	NE
Red-billed Teal	<i>Anas erythrorhyncha</i>	Anatidae	NT	LC	
Southern Black Korhaan	<i>Afrotis afra</i>	Otididae	VU	VU	E
Verreaux's Eagle	<i>Aquila verreauxii</i>	Accipitridae	VU	LC	

In addition to the avifauna SCC recorded, several Priority Species were also observed during the walkdown. Priority species are considered threatened, rare or prone to impacts from electrical infrastructure and energy development projects (Ralston Paton et al, 2017). The Biodiversity Company has defined risk species as those species that are listed in Ralston Paton et al (2017) as priority species,

Great Karoo OHL

as well as those listed in the Eskom poster of Birds and Power Lines (Eskom and EWT, no date), which together include all species - common or red-listed - that may be at risk of collision, electrocution or habitat loss as a result of the proposed activity. Twenty-three (23) of the species observed during the walkdown area are regarded as risk species, with one additional risk species (Black-chested Snake Eagle) observed within the PAOI during the original assessment (TBC, 2020). These are species which are specifically prone to electrocution and collision with powerlines, and those that would be impacted by habitat loss (Table 3-4). One notable nests was recorded, belonging to Spotted Eagle Owl (*Bubo africanus*). Appropriate buffers were assigned to this nest site (Figure 3-3).

Table 3-4 Avifauna risk species recorded during the walkdown

Common Name	Scientific Name	Collision - OHL	Electrocution	Habitat Loss
African Black Duck	<i>Anas sparsa</i>		X	X
African Sacred Ibis	<i>Threskiornis aethiopicus</i>		X	
African Spoonbill	<i>Platalea alba</i>	X	X	
Black-chested Snake Eagle	<i>Circaetus pectoralis</i>	X	X	
Cape Spurfowl	<i>Pternistis capensis</i>		X	X
Egyptian Goose	<i>Alopochen aegyptiaca</i>	X	X	
Grey Heron	<i>Ardea cinerea</i>	X	X	
Grey-winged Francolin	<i>Scleroptila afra</i>		X	X
Hadada Ibis	<i>Bostrychia hagedash</i>		X	
Jackal Buzzard	<i>Buteo rufofuscus</i>	X	X	
Lanner Falcon	<i>Falco biarmicus</i>		X	X
Namaqua Sandgrouse	<i>Pterocles namaqua</i>		X	X
Pale Chanting Goshawk	<i>Melierax canorus</i>		X	
Pied Crow	<i>Corvus albus</i>		X	
Red-billed Teal	<i>Anas erythrorhyncha</i>		X	X
Rock Kestrel	<i>Falco rupicolus</i>		X	
South African Shelduck	<i>Tadorna cana</i>	X		
Southern Black Korhaan	<i>Afrotis afra</i>		X	X
Spotted Eagle Owl	<i>Bubo africanus</i>	X	X	
Spotted Thick-knee	<i>Burhinus capensis</i>			X
Verreaux's Eagle	<i>Aquila verreauxii</i>	X	X	X
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>		X	
White-necked Raven	<i>Corvus albicollis</i>		X	

3.3 Site Specific Summary

The findings of sample points at the proposed pylon locations are discussed in Table 3-5 below. The table gives a brief description with accompanying photo of the habitat present at each sample point. Recommendations are given for Terrestrial Biodiversity and Avifauna, respectively. Notable plant species are listed as found within a 15 m radius at each sampling point, whilst the avifauna SCC listed include those that were confirmed within the specific habitat type, as well as those that were not necessarily recorded but have high likelihood of occurring within the described habitat. The survey points have also had sensitivities assigned from an avifauna perspective as a separate avifauna assessment was not performed for the original application. The Terrestrial Biodiversity retains its sensitivity from the original assessment (Desai, 2020).

Table 3-5 **Site-specific summary, comments and recommendations on the route associated with the OHL project.**

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
1	20,72062	-32,8208	Succulent stone field with karoo scrub nearby 	<u>Avifauna</u> : High	<u>Terrestrial</u>: Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: Aizoaceae sp., <i>Cheiridopsis namaquensis</i>, <i>Crassula columnaris</i>, <i>Crassula deltoidea</i>, <i>Euphorbia rhombifolia</i>, <i>Ruschia</i> sp., <i>Stomatium</i> sp. <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
2	20,72051	-32,8205	Low karoo scrub near succulent stone fields 	<u>Avifauna</u> : High	<u>Terrestrial</u>: Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: <i>Crassula muscosa</i>, <i>Ruschia</i> sp. <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
3	20,71997	-32,8195	Low karoo scrub on rocky slope.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: <i>Euphorbia rhombifolia</i> <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
4	20,71933	-32,8183	Low karoo scrub on rocky slope.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: <i>Ruschia sp.</i> <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
5	20,71875	-32,8172	Low karoo scrub close to a watercourse.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna</u> : Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
6	20,71695	-32,8167	Karoo scrub on uneven rocky slopes.	<u>Avifauna:</u> High	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
7	20,71503	-32,8161	Rocky karoo scrub dominated by <i>Aizoon africanum</i> .	<u>Avifauna:</u> High		<u>Terrestrial:</u> <i>Aizoon africanum</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
8	20,7134	-32,8156	Low degraded karoo scrub on rocky slope.	<u>Avifauna:</u> High	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Ruschia sp.</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
9	20,71132	-32,815	Degraded karoo scrub close to road.	<u>Avifauna:</u> High		<u>Terrestrial:</u> <i>Euphorbia rhombifolia</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
10	20,70881	-32,8143	Karoo scrub dominated by renosterbos and Oedera species	<u>Avifauna:</u> High	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
11	20,70742	-32,8134	Karoo scrub dominated by renosterbos and <i>Oedera</i> species. Sandy soil with rocks.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: <i>Aizoaceae</i> sp. <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
12	20,70618	-32,8125	Karoo scrub with lots of bare patches. Dominated by <i>Oederas</i> , renosterbos and other Asterids.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
					<u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
13	20,70428	-32,8112	Karoo scrub. Lots of bare patches due to surface erosion from overgrazing.	<u>Avifauna</u> : High	<u>Terrestrial</u>: Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
14	20,70272	-32,8102	Degraded karoo scrub on gradual slope	<u>Avifauna</u> : High	<u>Terrestrial</u>: Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: <i>Aizoon africanum</i>, <i>Ruschia</i> sp. <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
15	20,70087	-32,8089	Sparse low karoo scrub dominated by <i>Ruschia</i> sp.	<u>Avifauna</u> : High		

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Cheiridopsis namaquensis</i>, <i>Euphorbia rhombifolia</i>, <i>Ruschia sp.</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
16	20,69823	-32,8081	Rocky karoo scrub on side of valley. Vegetation dominated by <i>Ruschia sp.</i> , <i>Eriocephalus sp.</i> and grass.	<u>Avifauna:</u> High	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Ruschia sp.</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
17	20,69544	-32,8068	Karoo scrub on gravelly slope next to shallow valley.	<u>Avifauna</u> : High	<u>Terrestrial</u>: Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
18	20,69328	-32,8058	Rocky karoo scrub on low ridge.	<u>Avifauna</u> : High	<u>Terrestrial</u>: Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
19	20,6915	-32,805	Degraded karoo scrub on slope.	<u>Avifauna</u> : High		<u>Terrestrial</u> : <i>Aizoon africanum</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
20	20,68954	-32,804	Karoo scrub dominated by <i>Euryops</i> close to edge of ridge	<u>Avifauna:</u> High	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
21	20,68653	-32,8027	Degraded karoo scrub on rocky slope. Dominated by <i>Oedera</i> species.	<u>Avifauna</u> : Medium	<u>Terrestrial</u> : Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
					<u>Avifauna</u> : Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna</u> : Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
22	20,68512	-32,802	Karoo scrub dominated by <i>Euryops</i> and <i>Oedera</i> species.	<u>Avifauna</u> : Medium	<u>Terrestrial</u> : Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
					<u>Avifauna</u> : Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna</u> : Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
23	20,68363	-32,8013	Karoo scrub on rocky slope close to steep slope	<u>Avifauna</u> : Medium	<u>Terrestrial</u> : Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna</u> : Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,68257	-32,8002	Karoo scrub on lower slopes of ridge.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
24					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Terrestrial:</u> <i>Aizoon africanum</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
25	20,68024	-32,7998	Karoo scrub on lower slopes of ridge. Dominated by <i>Eriocephalus</i> and <i>Pteronia</i> species.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	<u>Terrestrial:</u> <i>Ruschia</i> sp. <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,67818	-32,7988	Old cropland. Degraded scrub.	<u>Avifauna</u> : Medium	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
26					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial</u>: <i>Ruschia sp.</i> <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
27	20,67599	-32,7978	Degraded karoo scrub close to old cropland.	<u>Avifauna</u> : Medium		<u>Terrestrial</u> : <i>Ruschia sp.</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
28	20,67429	-32,797	Degraded karoo scrub with lots of bare patches.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Brunsvigia</i> sp. <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
29	20,67179	-32,7958	Karoo scrub dominated by renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
30	20,66947	-32,7948	Degraded karoo scrub with lots of bare ground.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
31	20,6674	-32,7938	Karoo scrub dominated by renosterbos and grass.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,66543	-32,7929	Karoo scrub on ridge. Vegetation dominated by <i>Euryops</i> , <i>renosterbos</i> and <i>Pteronia</i> species.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
32					<u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
33	20,66335	-32,7919	Karoo scrub on top of ridge. Dominated by <i>Euryops</i> and <i>Helichrysum</i> species.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Ludwig's Bustard, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
	20,66199	-32,7913	Karoo scrub on rocky ridge. Dominated by <i>Euryops</i> , <i>Helichrysum</i> and <i>renosterbos</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
34					<u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
35	20,66015	-32,7904	Karoo scrub on rocky slope. Dominated by <i>Euryops</i> , <i>Oedera</i> and <i>reboosterbos</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> African Rock Pipit, Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
	20,65787	-32,7894	Karoo scrub on lower slopes of ridge. Dominated by <i>Helichrysum</i> , grass and <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
36					<u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> African Rock Pipit, Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
37	20,65559	-32,7883	Degraded karoo scrub around a bare patch of grass.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,65361	-32,7874	Karoo scrub on sandy surface. Dominated by <i>Euryops lateriflorus</i> .	<u>Avifauna:</u> Medium		
38					<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
39	20,65228	-32,7868	Degraded Karoo scrub on sandy gradual slopes. Dominated by <i>renosterbos</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Ludwig's Bustard, Secretarybird, Southern Black Korhaan
40	20,65054	-32,786	Degraded karoo scrub dominated by renosterbos and <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
41	20,64867	-32,7851	Karoo scrub dominated by grasses and <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
42	20,64668	-32,7842	Karoo scrub on rocky surface. Dominated by <i>Euryops</i> and <i>renosterbos</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
43	20,64521	-32,7831	Karoo scrub on sandy gradual slopes. Dominated by <i>renosterbos</i> and <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,64379	-32,7821	Degraded karoo scrub in valley below farm dam	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
44					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters every 5 m on the preceding span due to proximity to farm dam to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to farm dam..	<u>Terrestrial:</u> <i>Moraea sp.</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
45	20,64277	-32,7811	Karoo scrub dominated by reboosterbos, <i>Euryops</i> and <i>Dimorphotheca</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,6419	-32,7802	Karoo scrub on gravelly ground. Dominated by grass, renosterbos and <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
46						
47	20,64038	-32,7807	Rocky landscape with some shrubs	<u>Avifauna:</u> Medium		<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,63992	-32,7821	Rocky karoo scrub close to farm dam and dominated by <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
48					<u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters every 5 m on the preceding span due to proximity to farm dam to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to farm dam.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
49	20,63927	-32,7843	Karoo scrub dominated by <i>Helichrysum</i> , renosterbos and grasses.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,6384	-32,787	Rocky karoo scrub dominated by <i>Euryops</i> . Some damage from nearby roads.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
50					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Terrestrial:</u> <i>Aizoon africanum</i>, <i>Haemanthus coccineus</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
51	20,63793	-32,7886	Rocky karoo scrub dominated by <i>Euryops</i> . Some damage from nearby roads.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Ground Woodpecker, Karoo Korhaan, Lanner Falcon,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,63726	-32,7907	Rocky karoo scrub dominated by <i>Euryops</i> . Some damage from nearby roads.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
52					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Aizoon africanum</i>, <i>Wurmbea cf. variabilis</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
54	20,63536	-32,7968	Existing pylon in karoo scrub dominated by <i>Euryops</i> . Vegetation cleared at site.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	<u>Terrestrial:</u> <i>Aizoon africanum</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,63393	-32,7989	Karoo scrub dominated by <i>Oedera</i> and with some damage from road nearby	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
55					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Aizoon africanum</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
56	20,63239	-32,8009	Rocky karoo scrub dominated by <i>renosterbos</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
57	20,63089	-32,8028	Degraded karoo scrub dominated by renosterbos and <i>Dimorphotheca</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
58	20,62922	-32,8048	Cleared land next to farm dam. Karoo scrub at distance.	<u>Avifauna:</u> High		<u>Terrestrial:</u> <i>Aizoon africanum</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters every 5 m on the preceding span due to proximity to farm dam to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to farm dam.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Kittlitz's Plover, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Red-billed Teal, Secretarybird, Southern Black Korhaan, Yellow-billed Duck
59	20,62745	-32,8071	Degraded karoo scrub.	<u>Avifauna:</u> High	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Ruschia sp.</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	
	20,62493	-32,8089	Degraded karoo scrub between transmission lines.	<u>Avifauna</u> : High – in proximity to Spotted Eagle-owl nest site	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
60					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Avoid no-go nest buffer for development Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Terrestrial</u>: <i>Ruschia sp.</i> <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
60	20,62393	-32,8096	Cleared land next to substation among karoo scrub.	<u>Avifauna</u> : High – in proximity to Spotted Eagle-owl nest site	<u>Terrestrial</u> : Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna</u> : Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Avoid no-go nest buffer for development Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Southern Black Korhaan
	20,62387	-32,8098	On substation boundary. Transformed land. Karoo scrub 15 m to the east.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
62					<u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna:</u> Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
63	20,6409	-32,7783	Existing pylon in Karoo scrub dominated by renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
64	20,6404	-32,78	Existing pylon in karoo scrub on dominated by renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
65	20,63972	-32,7822	Existing pylon in karoo scrub dominated by <i>Euryops</i> and renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Ludwig's Bustard, Secretarybird, Southern Black Korhaan
66	20,63909	-32,7842	Existing pylon in karoo scrub dominated by renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
67	20,63828	-32,7869	Existing pylon in disturbed karoo scrub due to construction.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	<u>Terrestrial:</u> <i>Aizoon africanum</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
	20,63777	-32,7885	Degraded karoo scrub dominated by <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
68					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Terrestrial:</u> <i>Aizoon africanum</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
69	20,63712	-32,7906	Existing pylon in disturbed karoo scrub due to construction.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	<u>Terrestrial:</u> <i>Aizoon africanum</i>

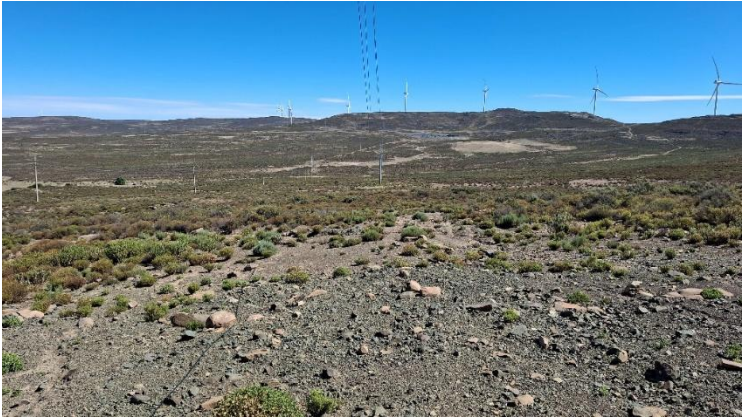
Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
70	20,63605	-32,7946		<u>Avifauna</u> : High	Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	<u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Southern Black Korhaan
					<u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	
					<u>Terrestrial</u>: Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur.	
71	20,6353	-32,7948		<u>Avifauna</u> : High	<u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Avifauna</u>: African Rock Pipit, Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
					<u>Terrestrial</u>: Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna</u>: African Rock Pipit, Black Harrier, Black-winged Kite, Karoo

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan, Verreaux's Eagle
	20,63504	-32,797	Rocky karoo scrub dominated by <i>Euryops</i> .	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	
72					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Terrestrial:</u> <i>Ruschia sp.</i> <u>Avifauna:</u> Black Harrier, Black-winged Kite, Black Harrier, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan
73	20,63376	-32,7989	Existing pylon with area cleared around it and karoo scrub beyond that.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species.	<u>Terrestrial:</u> <i>Ruschia sp.</i>

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan
74	20,63226	-32,8007	Degraded karoo scrub dominated by renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan
75	20,63076	-32,8026	Degraded karoo scrub dominated by renosterbos.	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Conduct a plant search and rescue during the optimal flowering season for the biome (August-	<u>Avifauna:</u> Black Harrier, Black-winged Kite, Karoo Korhaan,

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters every 5 m on the preceding span due to proximity to farm dam to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to farm dam.	Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan
	20,62903	-32,8048	Cleared land next to farm dam.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
76					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters every 5 m on the preceding span due to proximity to farm dam to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to farm dam.	<u>Terrestrial</u>: <i>Aizoon africanum</i>, <i>Ruschia</i> sp. <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Kittlitz's Plover, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Red-billed Teal, Secretarybird, Southern Black Korhaan, Yellow-billed Duck
77	20,62726	-32,807	Degraded karoo scrub.	<u>Avifauna</u> : High		<u>Terrestrial</u> : <i>Ruschia</i> sp.

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
					<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.	<u>Avifauna:</u> Black harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan
20,63711	-32,7901		Existing pylon in rocky karoo scrub dominated by <i>Euryops</i>	<u>Avifauna:</u> Medium	<u>Terrestrial:</u> Apply for permits for the relocation and/or destruction of protected plant species. Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna:</u> Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Terrestrial:</u> <i>Ruschia sp.</i> <u>Avifauna:</u> Black harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Martial Eagle, Secretarybird, Southern Black Korhaan
78						

Great Karoo OHL

Sampling Point No.	Longitude	Latitude	Findings	Sensitivity	Recommendations	Notable Species
79	20,63805	-32,792	Existing pylon in disturbed karoo scrub due to construction.	<u>Avifauna</u> : High	<u>Terrestrial</u> : Apply for permits for the relocation and/or destruction of protected plant species.	
					Conduct a plant search and rescue during the optimal flowering season for the biome (August-September) for all protected and threatened plant species that may occur. <u>Avifauna</u>: Install anti-perch devices on this pylon to prevent avian nesting or roosting, particularly for large raptors and corvids. Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk. Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, and/or recorded bird flight paths.	<u>Terrestrial</u>: <i>Ruschia sp.</i> <u>Avifauna</u>: Black Harrier, Black-winged Kite, Karoo Korhaan, Lanner Falcon, Lesser Kestrel, Ludwig's Bustard, Secretarybird, Martial Eagle, Southern Black Korhaan

3.4 Observations

3.4.1 Habitat Types and Sensitivity

Four (4) main habitat types have been identified within the PAOI as defined by Desai (2020) in the original Biodiversity Assessment, namely:

- Drainage Lines;
- Lowland;
- Ridges; and
- Rocky Slopes.

The habitats in relation to the proposed powerline route and pylon locations are depicted in Figure 3-2.

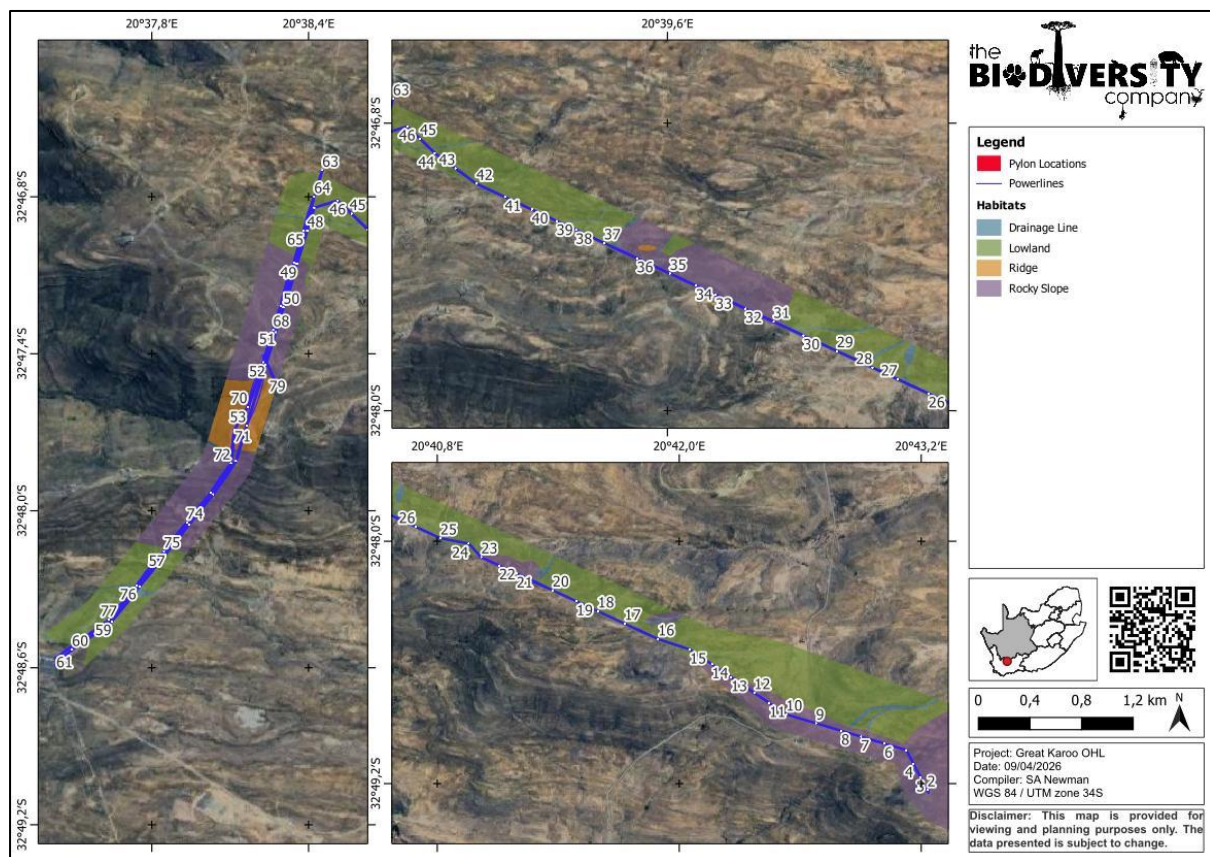


Figure 3-2 *Figure presenting the habitats originally delineated for the PAOI (Desai, 2020) in relation to the proposed powerline route and pylon locations*

Habitat sensitivities have been assigned from an avifauna perspective and can be seen presented in Figure 3-3 below.

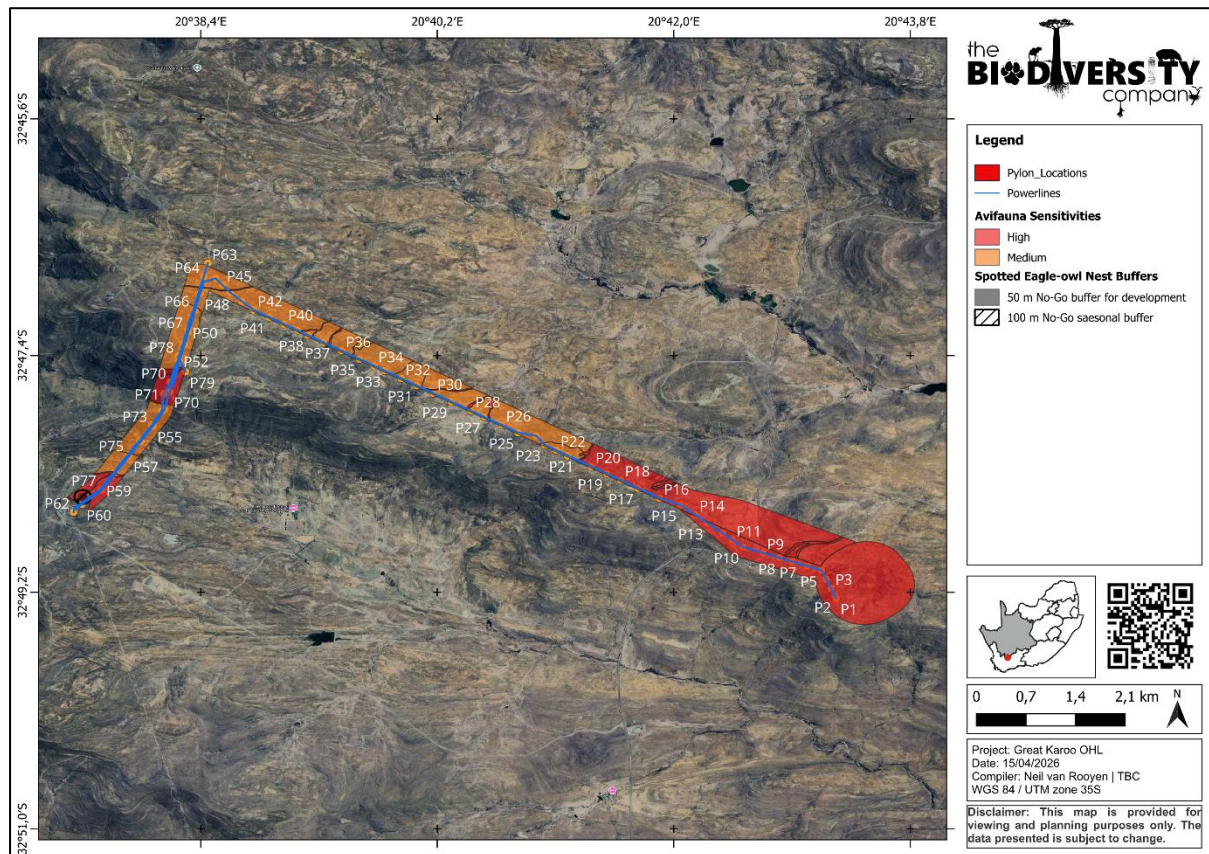


Figure 3-3 The avifauna sensitivities assigned to the respective habitats

3.4.2 Existing Impacts

Due to recent and ongoing anthropogenic disturbance associated with the PAOI, especially those impacts associated with the recent construction activities, the following impacts were noted for the PAOI:

- The edge effects associated with roads;
- Construction of pylons and the associated vegetation clearance;
- Grazing by livestock;
- Areas of bare ground and the associated erosion;
- Historic agriculture; and
- Existing transmission lines.

3.4.3 Species of Conservation Concern and Protected Species

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

- All species of Amaryllidaceae;
- All species of Asphodelaceae;

- All species of Crassulaceae;
- All Iridaceae;
- All species of Mesembryanthemaceae:
- All *Colchicum* (Colchicaceae);
- All *Euphorbia* (Euphorbiaceae);
- All *Lachenalia* (Hyacinthaceae); and
- All *Oxalis* (Oxalidaceae).

Numerous provincially protected plant species were recorded from the PAOI during the walkdown and can be seen listed in Table 3-1. As this survey was not conducted during the optimal flowering season for the biome, many more are expected. In addition, some species of flora SCC are also expected for the PAOI and can be seen listed in Table 2-1, including the two species which were recorded during the original Biodiversity Assessment (Desai, 2020): *Eriocephalus grandiflorus* and *Ehrharta eburnean*. Therefore, it is recommended that a plant search and rescue be conducted during the optimal flowering season for the biome.

One species of mammal SCC was recorded from the PAOI during the walkdown, namely Grey Rhebok (*Pelea capreolus*). This species is unlikely to be impacted by the project activities, provided that all mitigation measures are implemented correctly.

3.5 Mitigation Measures

The aim of the management outcomes objectives is to present the mitigations in such a way that these site-specific and/or new measures can be incorporated into the existing Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring guidelines. These mitigations correspond to and add to the mitigations provided in the original Biodiversity Assessment (Desai, 2020). Impact management actions for the terrestrial biodiversity are listed in Table 3-6 while the avifauna-specific mitigations and generic mitigations are listed in Table 3-7.

Table 3-6 Terrestrial biodiversity management objectives for the powerline development

Mitigation	Action/control
• The appropriate permits must be procured prior to the relocation or destruction of any and all protected plants species. • A suitably qualified environmental control officer must be on site when construction begins. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. • A plant search and rescue must be conducted during the optimal flowering season for the biome (August-September) for any threatened and protected plant species which may be impacted by the proposed project activities. • Areas of indigenous vegetation, even secondary communities outside of the direct footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimised and avoided where possible (and the necessary permits obtained were applicable). It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. All structure footprints to be rehabilitated and landscaped after installation is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. • Restrict all activities to authorised footprint areas only. • Existing access routes, especially roads, must be made use of. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon.	

Great Karoo OHL

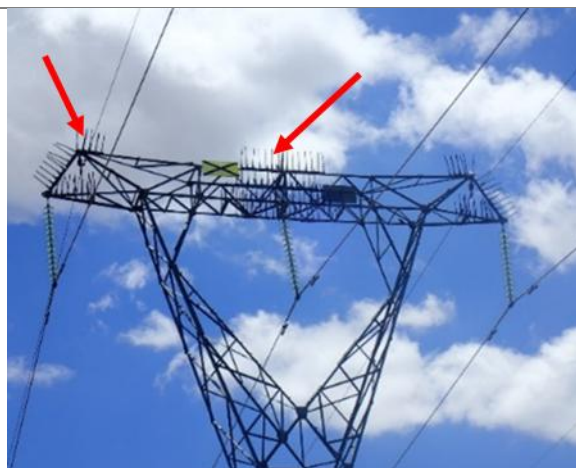
- Areas that are denuded during construction must be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.
- Address any observed erosion promptly using suitable erosion control structures and revegetation methods.
- Implementation of an alien vegetation management plan.
- 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.
- 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 List species, and protected species (trees and plants) their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMP. The avoidance and protection of the very high sensitivity 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.

Table 3-7 ***Specific avifauna management outcomes pertaining to impacts on avifauna and their habitats***

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All areas to be developed must be walked through by the ECO prior to any activity to ensure no nests or avifauna species are found in the area. Should any Species of Conservation Concern be found and 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	Environmental Officer	Presence of avifauna species and nests	During phase
Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction or operational phases. The intentional killing, hunting or poaching of any avifauna and/or eggs should be strictly prohibited.	Life of Operation	Project Manager Environmental Officer	Avifauna mortalities	Ongoing
Appropriate speed reducing measures, such as speed bumps and speed limit signs, should be incorporated into the road design to reduce the chance of road-kills.	Construction	Project Manager Environmental Officer	Avifauna mortalities	During phase
If required, a fire management plan must be in place for the areas surrounding the project area and the road to restrict the impact from fire on the natural flora and fauna communities. A fire expert should be consulted for suitable guidelines for the area and project requirements.	Life of Operation	Project Manager Environmental Officer	Avifauna mortalities	Ongoing
Install anti-perch devices on all pylons to prevent avian nesting or roosting, particularly for large raptors and corvids.	Life of Operation	Project Manager Environmental Officer Design Engineer	Development footprint	Ongoing
Fit bird flight diverters on the preceding span as per industry standards to minimise avifauna collision risk.				
Around all farm dams, fit bird flight diverters on the preceding span every 5 m to minimise avifauna collision risk.				
Mark both earth wires and phase conductors with bird diverters in this span due to proximity to rocky mountain habitat, farm dams and/or recorded bird flight paths.	Operational Phase	Project Manager Environmental Officer	Bird Collisions	Ongoing
Any devices that become damaged or fall during the operational phase must be replaced as per Eskom standards.				

Great Karoo OHL

Ensure that the phase cables are spaced far enough apart to reduce the risk of large birds (eagles and other raptors) touching both simultaneously. If such separation (isolation) cannot be provided, exposed parts must be covered (insulated) to reduce electrocution risk.	Construction/ Operational Phase	Project Manager Environmental Officer Design Engineer	Bird Electrocution s	Ongoing
A maintenance schedule must be followed yearly to ensure that all components are still intact and do not pose an electrocution risk, this must be done for the extent of the lifetime of the powerline.	Life of Operation	Developer	No loose wires, etc. to pose an electrocution risk	Ongoing
All infrastructure must be removed if the facility is decommissioned.	Closure/Reha bilitation	Project Manager Environmental Officer	Infrastructure removal	During Process
The design of the grid lines must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2015).	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds or bird strikes	During Phase
Infrastructure should be consolidated where possible to minimise the amount of ground and air space used.	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of bird collisions	During phase
Due to high number of avifauna SCC, all lines should be fitted with flight diverters as per industry standards, and every 5 m at areas in close proximity to farm dams. 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) must be fitted. 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.				
 (dynamic device)	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of bird collisions	During phase
 Inotec BFD800 (source: https://migrator.com)				
All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution	Planning and construction	Environmental Officer Contractor, Engineer	& Presence of electrocuted birds	During phase



Any exposed parts must be covered (insulated) to reduce electrocution risk	Planning and construction	Environmental Officer Contractor Design Engineer	Presence of electrocuted birds	During phase
ClearVu fencing (or similar) should be used, with markers placed on the fence to enhance visibility and reduce the risk of birds get snagged or snared.	Life of Operation	Project Manager Environmental Officer Contractor Design Engineer	Presence of birds stuck /dead in fences	During phase
Monitoring of the OHL route must be undertaken to detect bird carcasses, to enable the identification of any potential areas of high impact to be marked with bird flappers if not already done so.	Operational Phase	Avifauna specialist	Assess the impact	During phase

Table 3-8 **Generic management outcomes pertaining to impacts to avifauna and their habitats**

Impact Management Actions	Implementation	Monitoring		
	Phase	Responsible Party	Aspect	Frequency
Management outcome: Habitats				
Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.	Planning and Construction	Project Manager Environmental Officer Contractor Engineer	Water pollution and restricted rehabilitation	During phase
Leaking equipment and vehicles must be repaired immediately or be removed from PAOI to facilitate repair.	Life of operation	Environmental Officer Contractor	Leaks and spills	Ongoing
Management outcome: Avifauna				
Impact Management Actions	Implementation	Monitoring		
	Phase	Responsible Party	Aspect	Frequency
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), 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 with the training.	Ongoing

Great Karoo OHL

All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region	Construction/Operational Phase	Project Manager Environmental Officer	Noise	Ongoing
Use environmentally friendly cleaning and dust suppressant products	Construction and Operation	Environmental Officer Contractor Engineer	Chemicals used	During phase

4 Conclusions and Recommendations

The site walkdown was performed for the proposed powerline route and each proposed pylon location assessed, and noteworthy plant and animal species were recorded.

In terms of plants, this assessment was not performed during the optimal flowering season for the biome (between August and September for the Fynbos biome), therefore, these records include some plants which could only be identified to genus or family level. Note that due to the time of year, most perennial plants were not flowering and there were very few annuals. As a result, more protected species are expected to occur within the PAOI, as well as some plant SCC, especially those recorded in the original assessment (Desai, 2020). It is recommended that a plant search and rescue be conducted for any protected and threatened plant species during the optimal flowering season for the biome and the appropriate permits procured prior to their relocation or destruction.

All mitigation measures prescribed by the previous assessment (Desai, 2020) remain applicable for the remainder of the development and must be adhered to.

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6 Appendix Items

6.1 Appendix A – Screening Tool

The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Terrestrial Biodiversity Theme sensitivity is 'Very High' for the project area (Figure 6-1);
- Plant Species Theme sensitivity is 'Medium' for the project area (Figure 6-2); and
- Animal Species Theme sensitivity is 'High' for the project area, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 6-3).

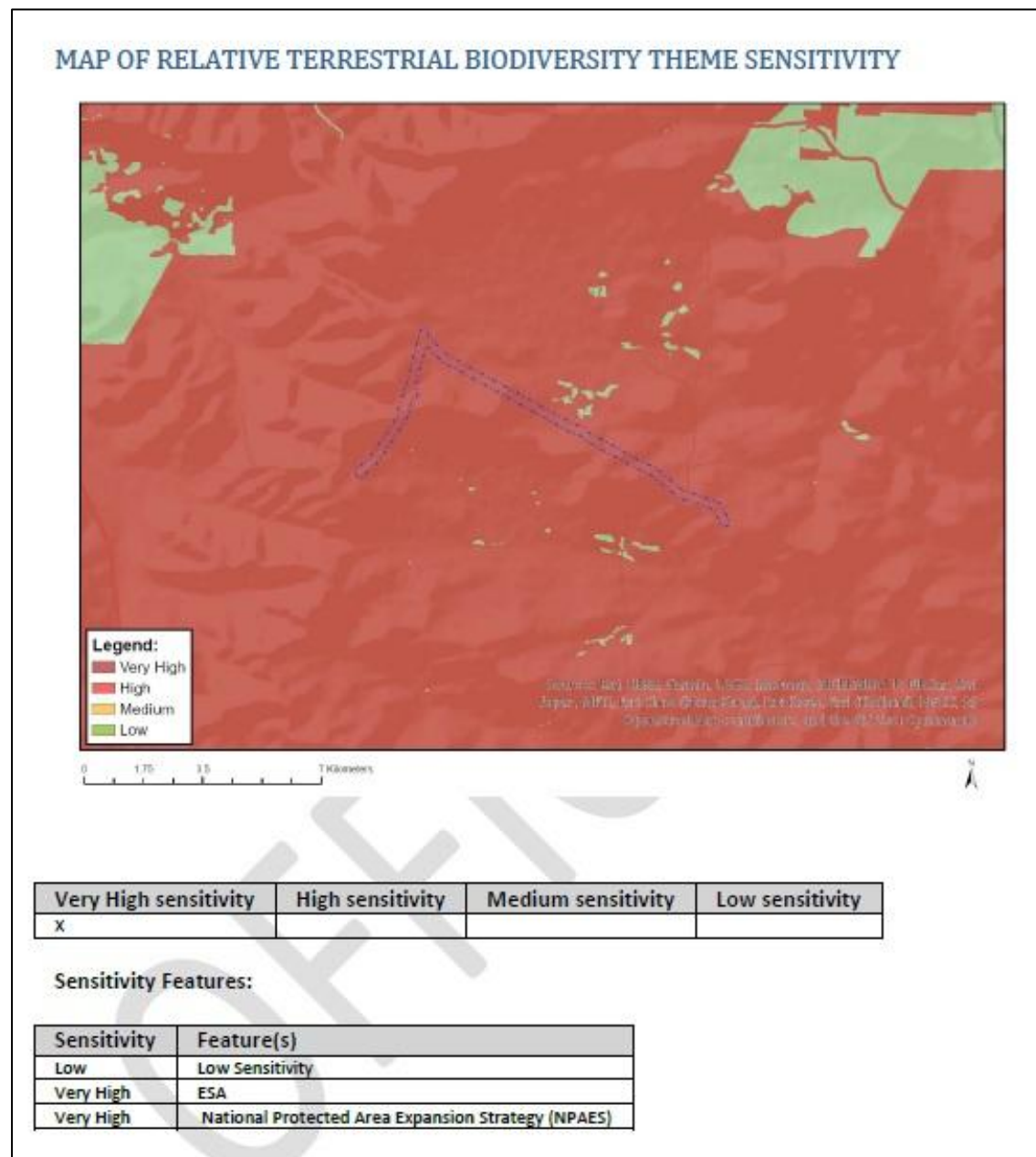


Figure 6-1 Terrestrial Biodiversity Theme Sensitivity of the PAOI

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

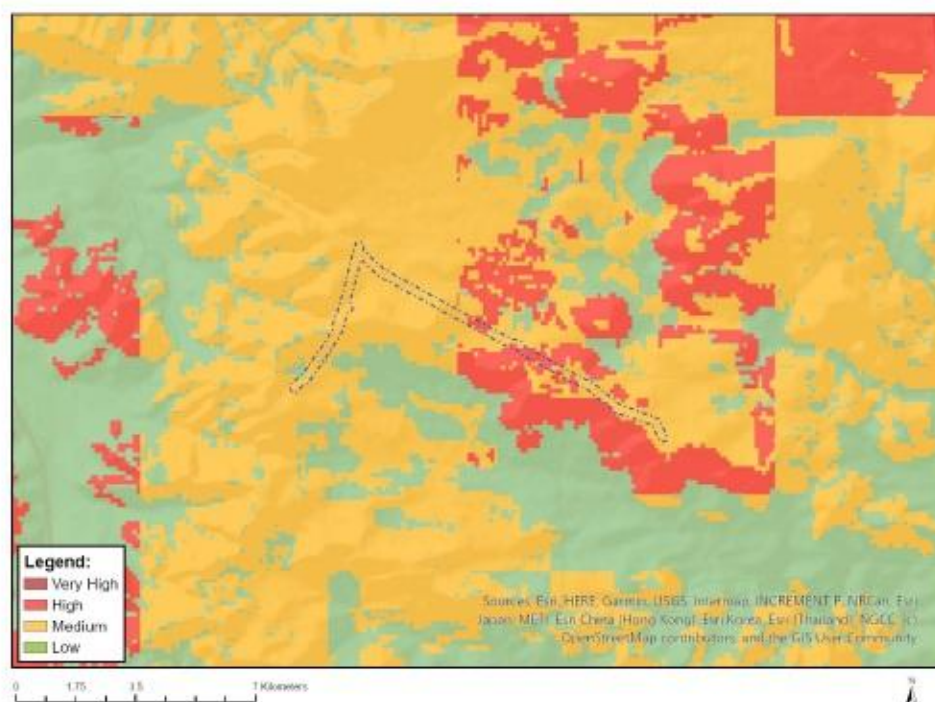
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		x	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	<i>Asparagus mollis</i>
Medium	<i>Lotononis venosa</i>
Medium	<i>Pauridia breviscapa</i>
Medium	<i>Ixia linearifolia</i>
Medium	Sensitive species 33
Medium	<i>Adromischus phillipsiae</i>

Figure 6-2 Plant Species Theme Sensitivity of the PAOI

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	x		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Afrotis afra
High	Aves-Aquila verreauxii
Low	Subject to confirmation
Medium	Aves-Neotis ludwigii
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Aquila verreauxii
Medium	Mammalia-Bunolagus monticularis

Figure 6-3 Animal Species Theme Sensitivity of the PAOI

6.2 Appendix B – Avifauna Site Ecological Importance

The different habitat types within the study 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 SCC and their ecosystem processes.

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 Table 6-1 and Table 6-2, respectively.

Table 6-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or 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 6-2 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 6-3*.

Table 6-3 *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 6-4*.

Table 6-4 *Summary of Resource Resilience (RR) criteria*

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

After the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in *Table 6-5*.

Table 6-5 Matrix used to derive Site Ecological Importance (SEI) from Receptor Resilience (RR) and Biodiversity Importance (BI)

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

Interpretation of the SEI in the context of the proposed development activities is provided in Table 6-6.

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

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

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

6.3 Appendix C – Avifauna Expected Species

SABAP2 data indicates a total of 147 species can be expected to occur within the PAOI. These species are listed in Table 6-7

Table 6-7 Expected avifauna species list for the PAOI

Common Name	Scientific Name	Family Name	Regional	Global	Endemism
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>	Lybiidae			
African Black Duck	<i>Anas sparsa</i>	Anatidae			
African Black Swift	<i>Apus barbatus</i>	Apodidae			
African Harrier-hawk	<i>Polyboroides typus</i>	Accipitridae			
African Hoopoe	<i>Upupa africana</i>	Upupidae			
African Pipit	<i>Anthus cinnamomeus</i>	Motacillidae			
African Rock Pipit	<i>Anthus crenatus</i>	Motacillidae	LC	NT	SLS

Great Karoo OHL

African Sacred Ibis	<i>Threskiornis aethiopicus</i>	Threskiornithidae			
African Spoonbill	<i>Platalea alba</i>	Threskiornithidae			
African Stonechat	<i>Saxicola torquatus</i>	Muscicapidae			
Alpine Swift	<i>Tachymarpis melba</i>	Apodidae			
Ant-eating Chat	<i>Myrmecocichla formicivora</i>	Muscicapidae			
Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae			
Black Harrier	<i>Circus maurus</i>	Accipitridae	EN	EN	NE
Black Stork	<i>Ciconia nigra</i>	Ciconiidae	EN	LC	
Black-chested Snake Eagle	<i>Circaetus pectoralis</i>	Accipitridae			
Black-headed Canary	<i>Serinus alario</i>	Fringillidae			NE
Black-headed Heron	<i>Ardea melanocephala</i>	Ardeidae			
Black-winged Kite	<i>Elanus caeruleus</i>	Accipitridae	NT	LC	
Blacksmith Lapwing	<i>Vanellus armatus</i>	Charadriidae			
Bokmakierie	<i>Telophorus zeylonus</i>	Malaconotidae			
Booted Eagle	<i>Hieraaetus pennatus</i>	Accipitridae			
Brown-throated Martin	<i>Riparia paludicola</i>	Hirundinidae			
Cape Bulbul	<i>Pycnonotus capensis</i>	Pycnonotidae			E
Cape Bunting	<i>Emberiza capensis</i>	Emberizidae			
Cape Canary	<i>Serinus canicollis</i>	Fringillidae			
Cape Clapper Lark	<i>Mirafra apiata</i>	Alaudidae			NE
Cape Crow	<i>Corvus capensis</i>	Corvidae			
Cape Penduline Tit	<i>Anthoscopus minutus</i>	Remizidae			
Cape Robin-chat	<i>Cossypha caffra</i>	Muscicapidae			
Cape Shoveler	<i>Spatula smithii</i>	Anatidae	NT	LC	
Cape Sparrow	<i>Passer melanurus</i>	Passeridae			
Cape Spurfowl	<i>Pternistis capensis</i>	Phasianidae			NE
Cape Teal	<i>Anas capensis</i>	Anatidae			
Cape Wagtail	<i>Motacilla capensis</i>	Motacillidae			
Cape Weaver	<i>Ploceus capensis</i>	Ploceidae			NE
Cape White-eye	<i>Zosterops virens</i>	Zosteropidae			NE
Capped Wheatear	<i>Oenanthe pileata</i>	Muscicapidae			
Chestnut-vented Warbler	<i>Curruca subcoerulea</i>	Sylviidae			
Cinnamon-breasted Warbler	<i>Euryptila subcinnamomea</i>	Cisticolidae			NE
Common Buzzard	<i>Buteo buteo</i>	Accipitridae			
Common Greenshank	<i>Tringa nebularia</i>	Pycnonotidae			
Common Moorhen	<i>Gallinula chloropus</i>	Rallidae			
Common Quail	<i>Coturnix coturnix</i>	Phasianidae			
Common Starling	<i>Sturnus vulgaris</i>	Sturnidae			
Common Swift	<i>Apus apus</i>	Apodidae			

Great Karoo OHL

Common Waxbill	<i>Estrilda astrild</i>	Estrildidae			
Crowned Lapwing	<i>Vanellus coronatus</i>	Charadriidae			
Dusky Sunbird	<i>Cinnyris fuscus</i>	Nectariniidae			
Egyptian Goose	<i>Alopochen aegyptiaca</i>	Anatidae			
European Bee-eater	<i>Merops apiaster</i>	Meropidae			
Fairy Flycatcher	<i>Stenostira scita</i>	Muscicapidae			NE
Familiar Chat	<i>Oenanthe familiaris</i>	Muscicapidae			
Fiscal Flycatcher	<i>Melaenornis silens</i>	Muscicapidae			NE
Greater Striped Swallow	<i>Cecropis cucullata</i>	Hirundinidae			
Grey Heron	<i>Ardea cinerea</i>	Ardeidae			
Grey Tit	<i>Melaniparus afer</i>	Paridae			NE
Grey-backed Cisticola	<i>Cisticola subruficapilla</i>	Cisticolidae			
Grey-backed Sparrow-lark	<i>Eremopterix verticalis</i>	Alaudidae			
Grey-winged Francolin	<i>Scleroptila afra</i>	Phasianidae			SLS
Ground Woodpecker	<i>Geocolaptes olivaceus</i>	Picidae	NT	NT	SLS
Hadada Ibis	<i>Bostrychia hagedash</i>	Threskiornithidae			
Hamerkop	<i>Scopus umbretta</i>	Scopidae	NT	LC	
Helmeted Guineafowl	<i>Numida meleagris</i>	Numididae			
House Sparrow	<i>Passer domesticus</i>	Passeridae			
Jackal Buzzard	<i>Buteo rufofuscus</i>	Accipitridae			NE
Karoo Chat	<i>Emarginata schlegelii</i>	Muscicapidae			
Karoo Eremomela	<i>Eremomela gregalis</i>	Cisticolidae			NE
Karoo Korhaan	<i>Eupodotis vigorsii</i>	Otididae	NT	LC	
Karoo Lark	<i>Calendulauda albescens</i>	Alaudidae			NE
Karoo Long-billed Lark	<i>Certhilauda subcoronata</i>	Alaudidae			
Karoo Prinia	<i>Prinia maculosa</i>	Cisticolidae			NE
Karoo Scrub Robin	<i>Cercotrichas coryphoeus</i>	Muscicapidae			
Karoo Thrush	<i>Turdus smithi</i>	Turdidae			NE
Kittlitz's Plover	<i>Charadrius pecuarius</i>	Charadriidae	NT	LC	
Lanner Falcon	<i>Falco biarmicus</i>	Falconidae	NT	LC	
Large Rock Martin	<i>Ptyonoprogne fuligula</i>	Hirundinidae			
Large-billed Lark	<i>Galerida magnirostris</i>	Alaudidae			NE
Lark-like Bunting	<i>Emberiza impetuani</i>	Emberizidae			
Laughing Dove	<i>Spilopelia senegalensis</i>	Columbidae			
Layard's Warbler	<i>Curruca layardi</i>	Sylviidae			NE
Lesser Honeyguide	<i>Indicator minor</i>	Indicatoridae			
Lesser Kestrel	<i>Falco naumanni</i>	Falconidae	VU	LC	
Lesser Swamp Warbler	<i>Acrocephalus gracilirostris</i>	Acrocephalidae			
Little Grebe	<i>Tachybaptus ruficollis</i>	Podicipedidae			

Great Karoo OHL

Little Stint	<i>Calidris minuta</i>	Scolopacidae			
Little Swift	<i>Apus affinis</i>	Apodidae			
Long-billed Crombec	<i>Sylvietta rufescens</i>	Macrosphenidae			
Ludwig's Bustard	<i>Neotis ludwigii</i>	Otididae	EN	EN	
Malachite Sunbird	<i>Nectarinia famosa</i>	Nectariniidae			
Martial Eagle	<i>Polemaetus bellicosus</i>	Accipitridae	EN	EN	
Mountain Wheatear	<i>Myrmecocichla monticola</i>	Muscicapidae			
Namaqua Dove	<i>Oena capensis</i>	Columbidae			
Namaqua Sandgrouse	<i>Pterocles namaqua</i>	Pteroclididae			
Namaqua Warbler	<i>Phragmacia substriata</i>	Cisticolidae			NE
Neddicky	<i>Cisticola fulvicapilla</i>	Cisticolidae			
Nicholson's Pipit	<i>Anthus nicholsoni</i>	Motacillidae			
Olive Thrush	<i>Turdus olivaceus</i>	Turdidae			
Pale Chanting Goshawk	<i>Melierax canorus</i>	Accipitridae			
Pale-winged Starling	<i>Onychognathus nabouroup</i>	Sturnidae			
Pied Avocet	<i>Recurvirostra avosetta</i>	Recurvirostridae			
Pied Crow	<i>Corvus albus</i>	Corvidae			
Pied Starling	<i>Lamprotornis bicolor</i>	Sturnidae			SLS
Pirit Batis	<i>Batis pirit</i>	Platysteiridae			
Red-billed Teal	<i>Anas erythrorhyncha</i>	Anatidae	NT	LC	
Red-capped Lark	<i>Calandrella cinerea</i>	Alaudidae			
Red-eyed Dove	<i>Streptopelia semitorquata</i>	Columbidae			
Red-faced Mousebird	<i>Urocolius indicus</i>	Coliidae			
Red-knobbed Coot	<i>Fulica cristata</i>	Rallidae			
Red-winged Starling	<i>Onychognathus morio</i>	Sturnidae			
Reed Cormorant	<i>Microcarbo africanus</i>	Phalacrocoracidae			
Ring-necked Dove	<i>Streptopelia capicola</i>	Columbidae			
Rock Dove	<i>Columba livia</i>	Columbidae			
Rock Kestrel	<i>Falco rupicolus</i>	Falconidae			
Rufous-breasted Sparrowhawk	<i>Accipiter rufiventris</i>	Accipitridae			
Rufous-cheeked Nightjar	<i>Caprimulgus rufigena</i>	Caprimulgidae			
Rufous-eared Warbler	<i>Malcorus pectoralis</i>	Cisticolidae			
Secretarybird	<i>Sagittarius serpentarius</i>	Sagittariidae	VU	EN	
Sickle-winged Chat	<i>Emarginata sinuata</i>	Muscicapidae			NE
South African Shelduck	<i>Tadorna cana</i>	Anatidae			
Southern Black Korhaan	<i>Afrotis afra</i>	Otididae	VU	VU	E
Southern Double-collared Sunbird	<i>Cinnyris chalybeus</i>	Nectariniidae			NE
Southern Fiscal	<i>Lanius collaris</i>	Laniidae			
Southern Grey-headed Sparrow	<i>Passer diffusus</i>	Passeridae			

Great Karoo OHL

Southern Masked Weaver	<i>Ploceus velatus</i>	Ploceidae		
Southern Pochard	<i>Netta erythrophthalma</i>	Anatidae	NT	LC
Southern Red Bishop	<i>Euplectes orix</i>	Ploceidae		
Speckled Mousebird	<i>Colius striatus</i>	Coliidae		
Speckled Pigeon	<i>Columba guinea</i>	Columbidae		
Spike-heeled Lark	<i>Chersomanes albofasciata</i>	Alaudidae		
Spotted Eagle Owl	<i>Bubo africanus</i>	Strigidae		
Spotted Thick-knee	<i>Burhinus capensis</i>	Burhinidae		
Spur-winged Goose	<i>Plectropterus gambensis</i>	Anatidae		
Three-banded Plover	<i>Charadrius tricollaris</i>	Charadriidae		
Tractrac Chat	<i>Emarginata tractrac</i>	Muscicapidae		
Verreaux's Eagle	<i>Aquila verreauxii</i>	Accipitridae	VU	LC
Wattled Starling	<i>Creatophora cinerea</i>	Sturnidae		
White-backed Mousebird	<i>Colius colius</i>	Coliidae		
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>	Phalacrocoracidae		
White-necked Raven	<i>Corvus albicollis</i>	Corvidae		
White-rumped Swift	<i>Apus caffer</i>	Apodidae		
White-throated Canary	<i>Crithagra albogularis</i>	Fringillidae		
White-throated Swallow	<i>Hirundo albigularis</i>	Hirundinidae		
Yellow Canary	<i>Crithagra flaviventris</i>	Fringillidae		
Yellow-bellied Eremomela	<i>Eremomela icteropygialis</i>	Cisticolidae		
Yellow-billed Duck	<i>Anas undulata</i>	Anatidae	NT	LC
Zitting Cisticola	<i>Cisticola juncidis</i>	Cisticolidae		

6.4 Appendix D – Avifauna species recorded during the walkdown and original assessment

A combined total of sixty-seven (67) species were recorded within the PAOI between the walkdown assessment and the original Biodiversity Assessment (TBC, 2020). The full combined species list is shown in Table 6-8.

Table 6-8 Avifauna species recorded during the walkdown and original assessment

Common Name	Scientific Name	Family Name	Regional	Global	Endemism
African Black Duck	<i>Anas sparsa</i>	Anatidae			
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	Threskiornithidae			
African Spoonbill	<i>Platalea alba</i>	Threskiornithidae			
Ant-eating Chat	<i>Myrmecocichla formicivora</i>	Muscicapidae			
Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae			
Black-chested Snake Eagle	<i>Circaetus pectoralis</i>	Accipitridae			
Black-headed Canary	<i>Serinus alario</i>	Fringillidae			NE
Blacksmith Lapwing	<i>Vanellus armatus</i>	Charadriidae			
Bokmakierie	<i>Telophorus zeylonus</i>	Malaconotidae			

Great Karoo OHL

Cape Bulbul	<i>Pycnonotus capensis</i>	Pycnonotidae			
Cape Bunting	<i>Emberiza capensis</i>	Emberizidae			E
Cape Clapper Lark	<i>Mirafrapa apiata</i>	Alaudidae			NE
Cape Penduline Tit	<i>Anthoscopus minutus</i>	Remizidae			
Cape Sparrow	<i>Passer melanurus</i>	Passeridae			
Cape Spurfowl	<i>Pternistis capensis</i>	Phasianidae			NE
Cape Wagtail	<i>Motacilla capensis</i>	Motacillidae			
Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>	Emberizidae			
Common Quail	<i>Coturnix coturnix</i>	Phasianidae			
Crowned Lapwing	<i>Vanellus coronatus</i>	Charadriidae			
Egyptian Goose	<i>Alopochen aegyptiaca</i>	Anatidae			
Fairy Flycatcher	<i>Stenostira scita</i>	Muscicapidae			NE
Familiar Chat	<i>Oenanthe familiaris</i>	Muscicapidae			
Greater Striped Swallow	<i>Cecropis cucullata</i>	Hirundinidae			
Grey Heron	<i>Ardea cinerea</i>	Ardeidae			
Grey Tit	<i>Melaniparus afer</i>	Paridae			NE
Grey-backed Cisticola	<i>Cisticola subruficapilla</i>	Cisticolidae			
Grey-winged Francolin	<i>Scleroptila afra</i>	Phasianidae			SLS
Hadada Ibis	<i>Bostrychia hagedash</i>	Threskiornithidae			
Jackal Buzzard	<i>Buteo rufofuscus</i>	Accipitridae			NE
Karoo Chat	<i>Emarginata schlegelii</i>	Muscicapidae			
Karoo Lark	<i>Calendulauda albescens</i>	Alaudidae			NE
Karoo Long-billed Lark	<i>Certhilauda subcoronata</i>	Alaudidae			
Karoo Prinia	<i>Prinia maculosa</i>	Cisticolidae			NE
Karoo Scrub Robin	<i>Cercotrichas coryphoeus</i>	Muscicapidae			
Lanner Falcon	<i>Falco biarmicus</i>	Falconidae	NT	LC	
Large-billed Lark	<i>Galerida magnirostris</i>	Alaudidae			NE
Little Swift	<i>Apus affinis</i>	Apodidae			
Ludwig's Bustard	<i>Neotis ludwigii</i>	Otididae	EN	EN	NE
Malachite Sunbird	<i>Nectarinia famosa</i>	Nectariniidae			
Mountain Wheatear	<i>Myrmecocichla monticola</i>	Muscicapidae			
Namaqua Dove	<i>Oena capensis</i>	Columbidae			
Namaqua Sandgrouse	<i>Pterocles namaqua</i>	Pteroclididae			
Pale Chanting Goshawk	<i>Melierax canorus</i>	Accipitridae			
Pale-winged Starling	<i>Onychognathus nabouroup</i>	Sturnidae			
Pied Crow	<i>Corvus albus</i>	Corvidae			
Pied Starling	<i>Lamprotornis bicolor</i>	Sturnidae			SLS
Red-billed Teal	<i>Anas erythrorhynchos</i>	Anatidae	NT	LC	
Red-capped Lark	<i>Calandrella cinerea</i>	Alaudidae			

Great Karoo OHL

Ring-necked Dove	<i>Streptopelia capicola</i>	Columbidae			
Rock Kestrel	<i>Falco rupicolus</i>	Falconidae			
Sickle-winged Chat	<i>Emarginata sinuata</i>	Muscicapidae			NE
South African Shelduck	<i>Tadorna cana</i>	Anatidae			
Southern Black Korhaan	<i>Afrotis afra</i>	Otididae	VU	VU	E
Southern Fiscal	<i>Lanius collaris</i>	Laniidae			
Southern Masked Weaver	<i>Ploceus velatus</i>	Ploceidae			
Speckled Pigeon	<i>Columba guinea</i>	Columbidae			
Spike-heeled Lark	<i>Chersomanes albofasciata</i>	Alaudidae			
Spotted Eagle Owl	<i>Bubo africanus</i>	Strigidae			
Spotted Thick-knee	<i>Burhinus capensis</i>	Burhinidae			
Verreaux's Eagle	<i>Aquila verreauxii</i>	Accipitridae	VU	LC	
Wattled Starling	<i>Creatophora cinerea</i>	Sturnidae			
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>	Phalacrocoracidae			
White-necked Raven	<i>Corvus albicollis</i>	Corvidae			
White-rumped Swift	<i>Apus caffer</i>	Apodidae			
White-throated Canary	<i>Crithagra albogularis</i>	Fringillidae			
White-throated Swallow	<i>Hirundo albigularis</i>	Hirundinidae			
Yellow Canary	<i>Crithagra flaviventris</i>	Fringillidae			

6.5 Appendix E – Specialist Declaration of Independence

DECLARATION

I, Sarah Newman, 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.



Sarah Newman

Terrestrial Ecologist

The Biodiversity Company

April 2026

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

Ecologist

The Biodiversity Company

April 2026

6.6 Appendix F – Specialist CVs

SARAH NEWMAN



Pr Sci Nat 158474
+27 73 391 6933
sarah@thebiodiversitycompany.com

PROFILE SUMMARY

Terrestrial ecologist with over three years of consulting experience, including international assignments. Demonstrated expertise across renewable energy, mining, and private sector development. Skilled in managing national and international multi-disciplinary projects, providing specialist guidance, technical support, and facilitation to ensure compliance with in-country legislative requirements. Registered as a Professional Natural Scientist (Pr Sci Nat) with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African
Date of birth: 17 December 1993

EXPERIENCE

Terrestrial ecology
Environmental Management Programmes (EMP)
Rehabilitation & management plans
Field work & research

SKILLS

- ✓ Terrestrial Biodiversity Assessments
- ✓ Rehabilitation & management plans
- ✓ GIS spatial analysis & digital cartography
- ✓ Taxonomic classification & curation of insects (Formicidae & Coleoptera)

LANGUAGES

English – Proficient
Afrikaans – Conversational
Spanish - Conversational



Signed: Sarah Newman

ACADEMIC QUALIFICATIONS

University of Pretoria (2018): Master of Science (MSc) in Entomology (Distinction)
Title: *Taxonomic and Functional Diversity of Ants Across Environmental Gradients.*

University of Pretoria (2016): Bachelor of Science Honours (BSc (Hons)) in Zoology
Title: *Rolling versus tunnelling: An evolutionary history of dung relocation and burial behaviour in African dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae)*

University of Pretoria (2015): Bachelor of Science (BSc) in Zoology

PROFESSIONAL EXPERIENCE

Nov 2022 – Present	The Biodiversity Company Terrestrial Ecologist
Feb 2022 – July 2022	University of Pretoria Research Technician (contract)
Feb 2021 – Nov 2021	Ecology Project International Sea Turtle Research Assistant
Jun 2019 – Nov 2020	Cell Path Services (Pty) Ltd Compliance and Regulatory Officer

INTERNATIONAL EXPERIENCE

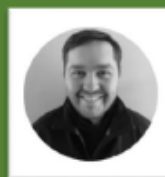
Angola, Costa Rica, Lesotho, Mauritius, South Africa, Zambia

Dr Ryno KEMP

Pr Sci Nat 117462/17

+27 83 273 3488

ryno@thebiodiversitycompany.com



PROFILE SUMMARY

Avifauna and ecological specialist with 5 years' consulting experience, with international working experience. Specialist experience in project exploration, mining, hydropower, renewable energy, and private sector developments. Project management of national and international multi-disciplinary projects. Provides specialist guidance, technical support, and facilitation for compliance with in-country legislative requirements and international lender standards. Registered Pr Sci Nat with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African

Date of birth: 09 October 1991

EXPERIENCE

Lender reporting requirements
Environmental Impact Assessments (EIA)
Environmental Management Programme (EMP)
Project Management
Avifaunal Conservation Surveys
Unit manager

SKILLS

- ✓ Habitat Modelling
- ✓ Flight path modelling
- ✓ Critical Habitat Assessments
- ✓ Avifauna, Faunal and Bat Assessments
- ✓ Long-term Monitoring (Avifauna)
- ✓ Monitoring & Management Plans
- ✓ GIS spatial analysis

LANGUAGES

English – Proficient
Afrikaans – Proficient



ACADEMIC QUALIFICATIONS

University of Pretoria, Pretoria, South Africa (2017 - 2024): PhD in Zoology

Title: Investigates the impacts of climate change on threatened arid-zone Red Lark (*Calendulauda burra*) using a mechanistic model

University of Pretoria, Pretoria, South Africa (2016): BSc Honours in Zoology

Title: Investigated the thermoregulation ability in free-ranging Ground Woodpeckers during cold winter months.

University of Pretoria, Pretoria, South Africa (2011 - 2015): BSc in Zoology

UNISA, South Africa (2020): Certificate in Environmental Law and Liabilities for the Regulated Community (Short course).

PROFESSIONAL EXPERIENCE

Nov 2022 – Present	The Biodiversity Company Ecologist / Avifauna Specialist/Unit Manager
Feb 2020 – Nov 2022	VulPro Research Manager
Sept 2021 – Nov 2022	ZESC Avifauna specialist

INTERNATIONAL EXPERIENCE

Angola, Zambia, South Africa

Signed: Ryno Kemp

PUBLICATIONS

Juan Serratos^a, Steffen Oppel^b, Andrea Santangeli^c, Shay Rotics^d, Stuart H.M. Butchart^{a,e}, Luis S. Cano-Alonso^f, Jose Luis Tellerias, **Ryno Kemp**^h, Aaron Nicholasⁱ, Aigars Kalvānsi, Aitor Galarza^k, Aldina M.A. Franco^l, Alessandro Andreotti^m,many more authors.....(2024) Tracking data highlighted the importance of human-induced mortality for migratory birds at a flyway scale. *Biological Conservation*.

Kemp R, Freeman MT, Colyn R & McKechnie AE (2024) Population status of the range-restricted Red Lark (*Calendulauda burra*) in a conservation area stronghold. *Ostrich*.

McKechnie AE, Freeman MT, **Kemp R**, Wolter K & Naidoo V (2024) Effects of lead on avian thermoregulation in the heat: an experimental test with Pied crows (*Corvus albus*). *Journal of Experimental Biology*

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McClure, C.J., Rolek, B.W., **Kemp, R.** and Wolter, K. (2023) Combining trends from disparate monitoring programs to inform Red List assessments: The case of the Cape Vulture (*Gyps coprotheres*). *Biological Conservation*, 284, p.110175.

Francisco CP, Murgatroyd M; Allan DG, Farwig N, **Kemp R**; Krüger S, Maude G, Mendelsohn J; Rösner S, Schabo DG, Tate G, Wolter K & Amar A. (2023) A spatially explicit encounter risk model for the Cape Vulture *Gyps coprotheres* to guide wind energy development. *Ecological applications*

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Hirschauer MT, Hannweg CG, **Kemp R** & Wolter K. (2021) VulPro: An overview of Africa's Vulture Conservation Centre. *Vulture News*

Czenze ZJ, Freeman MT, **Kemp R**, van Jaarsveld B, Wolf BO & McKechnie AE. (2021) Gular flutter provides the basis for efficient evaporative cooling and pronounced heat tolerance in an eagle-owl, a thick-knee and a sandgrouse from the southern Africa arid zone. *Frontiers in Ecology and Evolution*

Curk T, Scacco M, Safi K, Wikelski M, **Kemp R** & Wolter K. (2021) Severe differences in movement associated with tagging method used in the African Cape vulture.

van Jaarsveld B, Bennett NC, **Kemp R**, Czenze ZJ & McKechnie AE. (2021). Heat tolerance in desert rodents is correlated with microclimate at inter- and intraspecific levels. *Journal of Experimental Biology*

van Jaarsveld B, Bennett NC, **Kemp R**, Czenze ZJ & McKechnie AE. (2021) How hornbills handle the heat: sex-specific thermoregulation in the Southern Yellow-billed Hornbill. *Journal of Experimental Biology*

Kemp R, Freeman MT, van Jaarsveld B, Czenze ZJ, Conradie SR & McKechnie AE. (2020) Sublethal fitness costs of chronic exposure to hot weather vary between sexes in a threatened desert lark. *EMU*

Czenze ZJ, **Kemp R**, van Jaarsveld B, Freeman MT, Smit B, Wolf BO & McKechnie AE. (2020). Regularly-drinking desert birds have a greater capacity for evaporative cooling and higher heat tolerance limits than non-drinking species. *Journal of Functional Ecology*

Lund J, Bolopo D, Thompson RL, Elliott DL, Arnot LF, **Kemp R**, Lowney AM & McKechnie AE. (2020) Winter thermoregulation in free-ranging pygmy falcons in the Kalahari Desert. *Journal of Ornithology*

Kemp R, McKechnie AE (2019) Thermal physiology of a range-restricted desert lark. *Journal of Comparative Physiology B* 189:131-141

Kemp R, Noakes MJ, McKechnie AE (2017) Thermoregulation in free-ranging ground woodpeckers *Geocolaptes olivaceus*: no evidence of torpor. *J Avian Biol* 48:1287–1294

CURRICULUM VITAE: Ryno Kemp