



**AVIFAUNA IMPACT ASSESSMENT FOR THE
PROPOSED BENYA SOLAR PHOTOVOLTAIC (PV)
AND GRID CONNECTION INFRASTRUCTURE
PROJECT**

**Thabazimbi Local Municipality, Waterberg District
Municipality, Limpopo Province, South Africa**

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Report Name	AVIFAUNA IMPACT ASSESSMENT FOR THE PROPOSED BENYA SOLAR PHOTOVOLTAIC (PV) AND GRID CONNECTION INFRASTRUCTURE PROJECT	
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Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>	

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	foliage diurnal; OGD, omnivore ground diurnal; OWD, omnivore water diurnal; OFD, omnivore foliage diurnal.	34
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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an avifauna assessment for the proposed Benya Solar Photovoltaic (PV) and Electrical Grid Connection Infrastructure Project. The proposed project involves the development of a PV solar energy facility and associated substations and overhead power line. The development area is situated approximately 21 km West of Dwaalboom within the Thabazimbi Local and Waterberg District Municipalities, in the Limpopo Province, South Africa (Figure 1-1). The Project Area of Interest (PAOI) consists of a 5 km area around the development footprint provided (Figure 1-2).

The approach was informed by the Environmental Impact Assessment Regulations, 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices 320 (20 March 2020) in terms of NEMA, dated 20 March and 30 October 2020: “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” (Reporting Criteria).

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

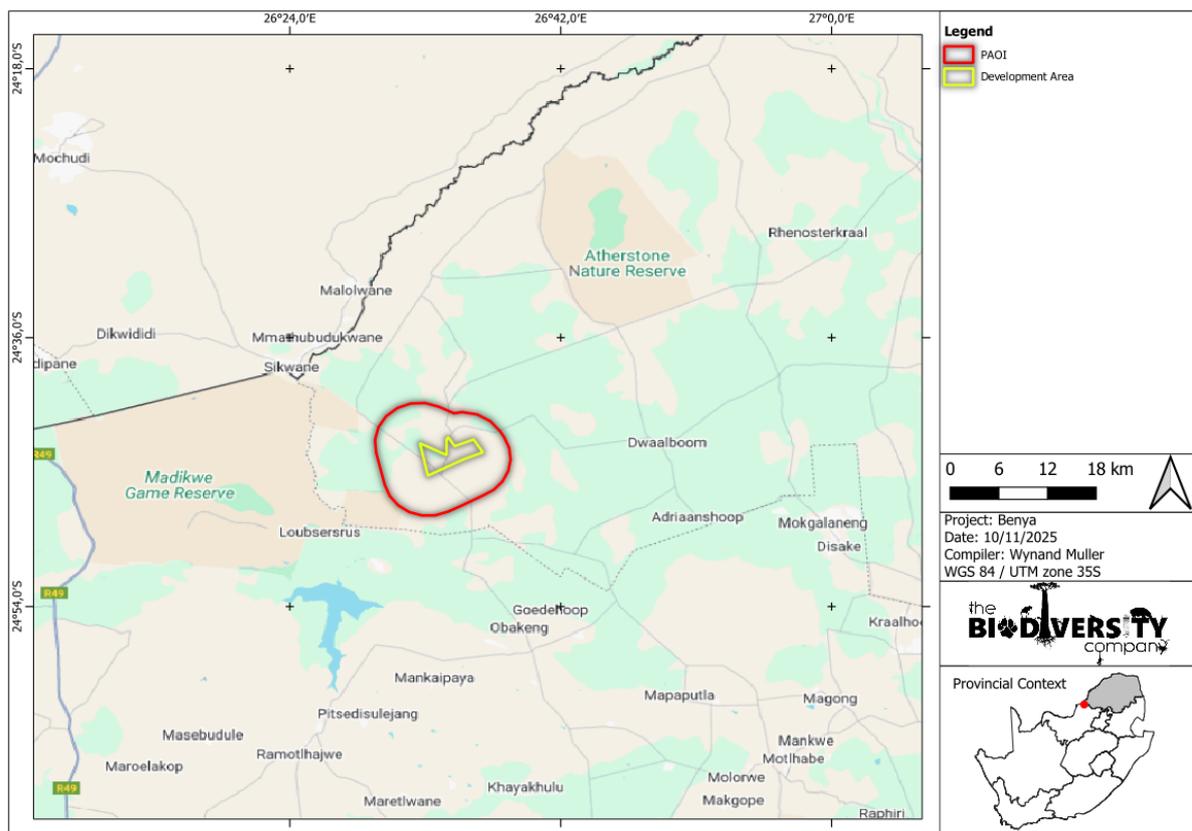


Figure 1-1 Proposed location of the project area in relation to the nearby towns

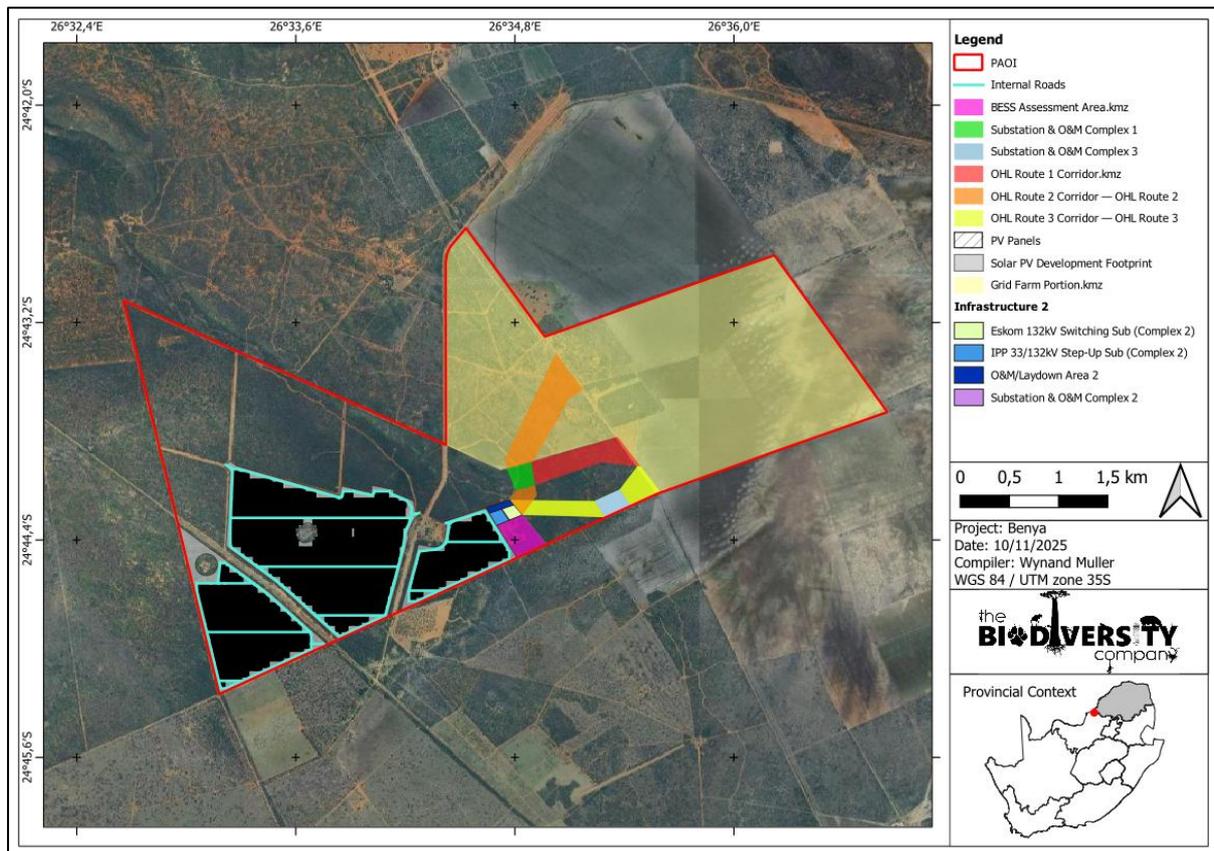


Figure 1-2 Project layout

1.2 Project Description

Benya Solar PV (RF) (Pty) Ltd is proposing the development of the proposed Benya Solar PV Facility and associated infrastructure on the Remainder of Farm Portugal 198, as well as the Integrated Electrical Grid Connection Infrastructure (substations and power line) on the Remainder of Farm Portugal 198 and Farm Napoleon 216 in the Thabazimbi Local Municipality in the Waterberg District, Limpopo Province.

The solar PV facility will comprise of several arrays of PV panels and associated infrastructure and at this stage it is anticipated that it will have a contracted capacity of up to 300 MW. The solar PV facility will also include associated electrical grid connection infrastructure, to evacuate the electricity generated, which will include a 33kV/132kV Independent Power Producer (IPP) Step-up Substation, a 132kV Eskom Switching Substation and 132kV overhead power line. The project site is accessible via the existing D113 and D1629 roads that pass through the site.

A study site of approximately 1 500 ha¹ is being assessed as part of this Environmental Process for the PV facility and supporting infrastructure, which includes the on-site and switching substations and grid connection corridors for the placement of the power line infrastructure required to connect the substations to one (1) of the nearby existing 132kV Eskom overhead power lines. It should be noted

¹ A section of one (1) of the electrical grid connection corridor alternatives is located within a 642 ha study site (i.e., grid property), while the entire extent of the solar PV facility and majority of the electrical grid connection infrastructure alternatives are proposed within an 856 ha study site (i.e., solar PV property).

that the solar PV and electrical grid connection infrastructure would not cover the entire extent of the study sites.

The key infrastructure associated with the Benya Solar PV Development includes the following:

- PV modules and mounting structures, up to 6m in height and a maximum footprint of up to 350 ha.
- Inverters and transformers.
- Operation and Maintenance buildings (up to 6m in height), including a gate house, ablution facilities, security building, control centre, offices, warehouses and workshops for storage and maintenance.
 - An area of up to 1.5 ha within the assessed development footprint will be occupied by buildings.
- Temporary and permanent laydown areas, situated within the assessed development footprint.
 - Temporary laydown areas will occupy up to 5 ha, while up to 1.5 ha will remain in place for the permanent laydown area, as required for facility operation.
- Site and internal access roads (between 6m and 8m wide). Existing internal roads will be used as far as possible.
- Perimeter fencing up to 3m in height.
- Battery Energy Storage System (BESS), up to 7.5 ha in extent and located within a 10 ha development area².
 - The infrastructure will be located within the assessed development footprint.
- Associated Electrical Grid Connection Infrastructure, including:
 - 33kV cabling between the project components and the on-site facility substation;
 - A 33kV/132kV Independent Power Producer (IPP) Step-up Substation, up to 1.83 ha in extent;
 - A 132kV Eskom Switching Substation, up to 1.64 ha in extent; and
 - A 132kV overhead power line (up to 40m in height) connecting the on-site switching substation to one (1) of the nearby 132kV Eskom overhead power lines, via a Loop In – Loop Out (LILLO) connection.

Table 1-1 Project Information

Project Name		Benya Solar PV Facility and Integrated Electrical Grid Connection Infrastructure.	
Applicant Details		Applicant Name:	Benya Solar PV (RF) (Pty) Ltd
Company Registration Number:		2025/570171/07	
BBBEE Status:		N/A	

2 10 ha development area assessed for the placement of BESS infrastructure.

Project Name:		Benya Solar PV Facility and Integrated Electrical Grid Connection Infrastructure
Site Details		
Size of the property	Description of the affected property	PV Facility and Integrated Electrical Grid Connection Infrastructure Remainder of Farm Portugal 198 (PV Facility & Grid Infrastructure) Farm Napoleon 216 (Grid Infrastructure – one of the three power line corridor alternatives)
Size of the study area	Size in ha of initial study area.	PV Site: 856 ha ³ Electrical Grid Connection Site: 642 ha
Development Footprint	This includes the total footprint of PV panels, BESS auxiliary buildings, On-site Substation, Mini-substations, inverter stations and internal roads.	~440 ha ³
PV Technology Details		
Capacity of the facility	Capacity of the PV facility (in MW)	Net generation capacity of up to 300 MWAC
Solar technology selection	Type of technology	Solar photovoltaic (PV) with Monofacial or Bifacial PV panels to be utilised. The panels will either be fixed to a single- and/or double-axis horizontal tracking structures, or fixed-tilt structure. PV panels with single axis tracking is preferred over fixed-axis or double axis tracking systems from a technical perspective. Both technology options are considered feasible for the project site, however, the technology type will be determined during the final design phase.
Structure height		<ul style="list-style-type: none"> • PV Panels up to 6m in height • Buildings up to 6m in height • Fencing up to 3m in height
Surface area to be covered (including associated infrastructure such as roads)		~350 ha
Structure orientation		PV panels will either be fixed to a single- and/or double-axis horizontal tracking structure, or fixed-tilt structure, where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.
Laydown area dimensions		Temporary and permanent laydown areas will be situated within the assessed development footprint and will occupy up to 5 ha, while 1.5 ha will remain in place for the permanent laydown area, as required for facility operation.
BESS Technology Details		
BESS technology section	Capacity of BESS facility (in MWh)	Up to 300 MW capacity, with up to 1 800 MWh (6-hour) storage capacity
Type of technology (preferred)		Pre-Assembled Solid state Lithium-Ion or Sodium-Ion
Type of technology (alternatives)		The BESS will make use of solid state or flow battery technology. Three (3) types of battery technologies can be considered for the proposed project: Lithium-ion (Lithium-Phosphate), Sodium-sulphur or Vanadium Redox flow battery, depending on which is most feasible at the time of implementation.

3 Total development footprint considering the largest/longest of the grid connection corridor alternatives currently under consideration. Only one (1) substation & O&M complex and grid connection corridor will however be proposed for authorisation and thus the total development footprint may be less than this (depending on preferred grid connection corridor).

Structure height	Containerized types, including all solid-state types = maximum of 4m from ground level (may have vent pipes and lightning conductors exceeding 4m above ground level).	
Surface area to be covered (including associated infrastructure such as roads)	Up to 7.5 ha in extent and located within a 10 ha study area ² . The infrastructure will be located within the assessed development footprint.	
Structure locations	DC Coupled BESS within the PV field and AC coupled BESS adjacent to the project substation.	
Grid Connection Infrastructure Details		
Grid connection technology section	Power line capacity (in kV)	132kV
Switching substation capacity (in kV)	132kV	
Switching substation footprint	1.64 ha	
Step-up substation capacity (in kV)	33kV/132kV	
Step-up substation footprint	1.83 ha	
Power line corridor length	OHL Corridor Alternative 1 = 1km OHL Corridor Alternative 2 = 1.5km OHL Corridor Alternative 3 = 1.3km	
Power line corridor footprint	OHL Corridor Alternative 1 = 21 ha OHL Corridor Alternative 2 = 36 ha OHL Corridor Alternative 3 = 25 ha	
Power line servitude	32m	
Power line pylons	Monopole or Lattice pylons, or a combination of both where required	
Structure height	<ul style="list-style-type: none"> • Switching substation = up to 6m in height • Power line = up to 40m in height 	

1.3 Scope of Work

The assessment was conducted according to the above-mentioned (Section 1.1) legislation on assessment and reporting criteria and the best-practice guidelines and principles for Avifaunal Impact Assessments within the context of solar PV facilities as outlined by BirdLife South Africa (2017).

The scope of the Avifaunal Impact Assessment included the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the Project Area of Influence (PAOI) and surrounding landscape
- Desktop assessment to compile an expected species list and possible avifauna Species of Conservation Concern (SCC) that potentially occur within the PAOI;
- Field work to determine the density and composition of species in the PAOI;
- Description of the baseline avifauna species and Functional Feeding Guild (FFG) composition assemblage within the PAOI;
- Delineate site sensitivity or sensitivities i.e., the Site Ecological Importance (SEI) within the context of the avifauna species assemblage of the PAOI;
- Identify the manner that the proposed development impacts the avifauna community and evaluate the level of risk of these potential impacts; and
- Provide mitigation measures to prevent or reduce the possible impacts.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- The first avifaunal field survey was conducted from the 9-12 December 2024, which constitutes a wet season survey, whilst the second survey was conducted from the 18-20 June 2025, which constituted a winter assessment. These assessments include a wet and dry season survey and are deemed sufficient for a Regime 2 assessment;
- Whilst every effort was made to cover as much of the PAOI as possible, it is possible that some species that are present within the PAOI were not recorded during the field investigations due to their secretive behaviour;
- The GPS used in the assessment has an accuracy of 5m and consequently any spatial features delineated may be offset by up to 5m; and
- The whole footprint was not covered in the field, the areas not covered in the field was included in Figure 1-3, however all the information is strictly based on desktop information. A walkdown of these areas would be required. The habitats and SEI are only delineated for the areas covered in the field.

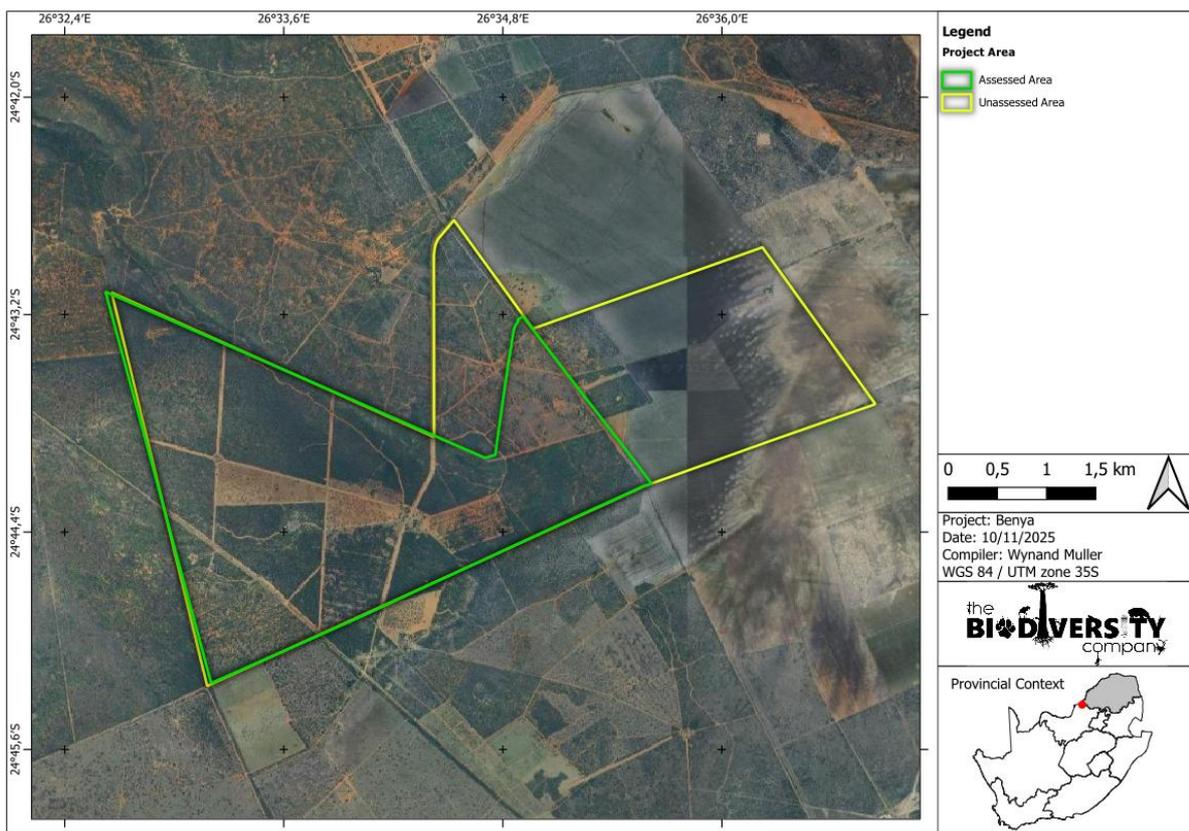


Figure 1-3 Areas Assessed in field

1.5 Key Legislative Requirements

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

Table 1-2 **A list of key legislative requirements**

Region	Legislation / Guideline	Comment
National	NEMA	Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	Assessment Protocol (March 2020)	The minimum criteria for reporting.
	Assessment Protocol (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	NEMWA	The regulation of waste management to protect the environment.
	NWA	The regulation of water uses.
	GN 1003 of GG 43726 of 18 Sept 2020	The regulation and management of alien invasive species.
Provincial	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilisation of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants.
	Limpopo Environmental Management Act (2003)	To provide for the management and conservation of the Limpopo's Province's biophysical environment and protected areas.
	Limpopo Conservation Plan (2018)	Designation of conservation areas and targets.

2 Fieldwork

2.1 Avifauna Field Assessment

The first avifaunal field survey was conducted from the 9-12 December 2024, which constitutes a wet season survey, whilst the second survey was conducted from the 18-20 June 2025, which constituted a winter assessment. These assessments include a wet and dry season survey and are deemed sufficient for a Regime 2 assessment, as per the Birds and Solar energy best practice guidelines (2017).

Point Counts

Standardized point counts (Buckland *et al.*, 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilized 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.

Drive Transects

The drive transects focused on larger terrestrial birds and raptors. Transects were performed in and around the development footprint to ensure the larger area was considered. The transects were conducted by driving at approximately 15 km/h and stopping at regular intervals of 100 meters, scanning the surrounding environment with binoculars. All large terrestrial species and raptors were recorded, including their number, detection method (seen or heard), behaviour (perched or flying), and general notes on habitat and nesting suitability.

Water Resource Assessments

Water resources on-site as well as larger features outside the project footprint were assessed. This consisted of a focal assessment at the water's edge to determine if SCC (species of conservation concern) as well as congregator species, were present.

Nest Survey

Possible nesting sites such as power lines, stands of trees, marshes and drainage lines, cliffs, and gravel areas were surveyed for nests. All breeding sites were mapped, and the activity at the nests was assessed during all the surveys as per the Birds and Solar energy best practice guidelines (2017).

Incidental Observations

To supplement the species inventory with cryptic and elusive species that may not be detected during the rigid point count and drive transect protocols, diurnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods as well as random meandering. Figure 2-1 shows the locations of the point counts conducted and the GPS tracks of the specialists during the two field surveys.

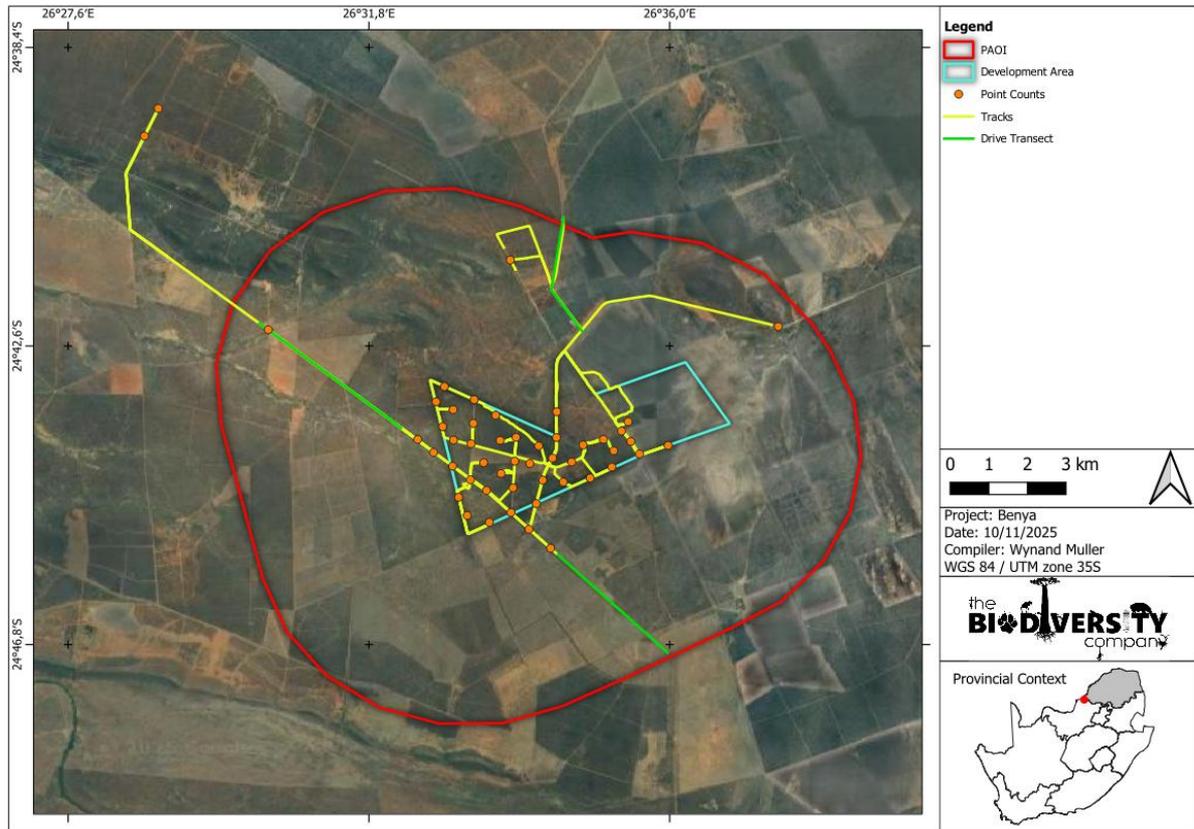


Figure 2-1 Map illustrating the point count locations, drive transects and GPS tracks during the field surveys

3 Results & Discussion

3.1 Ecologically Important Landscape Features

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

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

Desktop Information Considered	Relevant/Irrelevant	Section
Ecosystem Threat Status	Irrelevant – Overlaps with an “LC” Ecosystems (RLE, 2021).	3.1.1
Ecosystem Protection Level	Relevant – Overlaps with a ‘Moderately Protected’ Ecosystem.	3.1.2
Provincial Conservation Plan	Relevant – The PAOI falls across areas classified as CBA1, CBA2, ESA2, ONA, PA, and NNR. The development footprint falls across CBA2, NNR, and ESA2.	3.1.3
National Protected Areas Expansion Strategy	Relevant – the PAOI overlaps with a priority focus area. The development footprint however does not overlap.	3.1.5
SAPAD & SACAD	Relevant –The PAOI overlap with the Weltevreden Private Nature Reserve. The development footprint does not overlap with any protected areas, it is however within the 5 km buffer zone	3.1.4
Key Biodiversity Areas	Relevant – shows the PAOI and development footprint overlaps with the Madikwe-Atherstone KBA	3.1.6
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant – The PAOI and development footprint overlaps with an LC and partially EN river, as well as a LC wetland	3.1.7
National Freshwater Priority Area	Relevant – The PAOI and development footprint overlaps with non-priority wetlands, and a non-priority river.	3.1.8
South Africa’s Strategic Water Source Areas	Irrelevant – The PAOI does not overlap with any Strategic Water Source Areas.	-
RAMSAR Wetlands	Irrelevant – The PAOI does not overlap with any RAMSAR Area	-
Renewable Energy Development Zones	Irrelevant – The PAOI does not overlap with any REDZ.s	-
Strategic Transmission Corridors (EGI)	Irrelevant – The PAOI does not overlap with any corridors	-
Coordinated Water Bird Count	Irrelevant – Nearest CWAC site ~ 103 km from the project area	-
Coordinated Avifaunal Road Count	Irrelevant – Nearest CAR route ~ 153 km from the project area	-

3.1.1 Red List of Ecosystems

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



Figure 3-1 Map illustrating the ecosystem threat status associated with the proposed development

3.1.2 Ecosystem Protection Level

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



Figure 3-2 Map illustrating the ecosystem protection level associated with the PAOI

3.1.3 Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

The key output of this systematic biodiversity plan is a map of biodiversity priority areas (LCPv2, 2018). The LCPv2 CBA map delineates Critical Biodiversity Areas, Ecological Support Areas, Other Natural Areas, Protected Areas, and areas that have been irreversibly modified from their natural state ((LCPv2, 2018). The LCPv2 uses the following terms to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area (CBA);
- Ecological Support Area (ESA);
- Other Natural Area (ONA);
- Protected Area (PA); and
- No Natural Remaining (NNR).

According to the LCPv2 the PAOI falls across areas classified as CBA1, CBA2, ESA2, ONA, PA, and NNR (Figure 3-3). The development footprint falls across CBA2, NNR and ESA2.



Figure 3-3 Map illustrating the biodiversity spatial plan in relation to the PAOI

3.1.4 Protected Areas

According to the protected and conservation area spatial datasets from SAPAD and SACAD (DFFE, 2025). The PAOI overlap with the Weltevreden Private Nature Reserve (Figure 3-4). The development footprint does not overlap with any protected areas, it is however within the 5 km buffer zone.

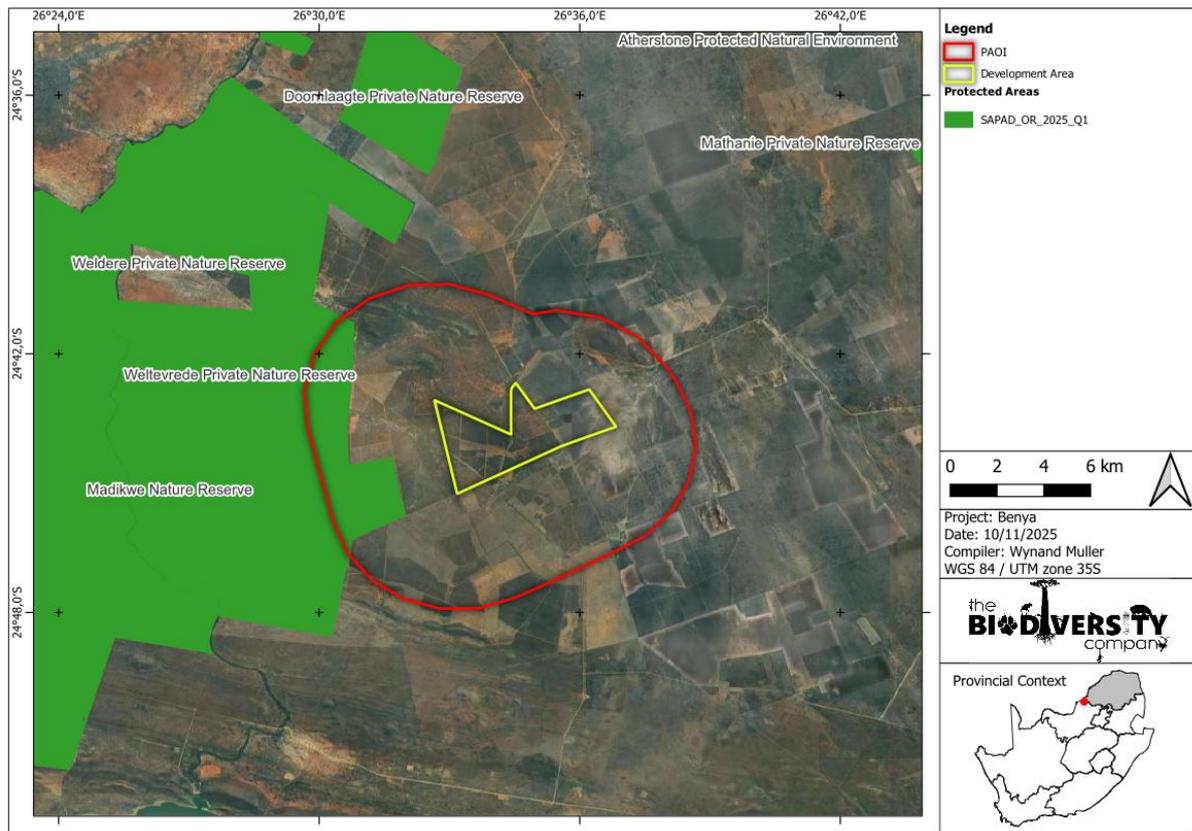


Figure 3-4 Map illustrating the location of conservation and protected areas proximal to the PAOI

3.1.5 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2018 (NPAES) were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES, and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for finescale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2018). Figure 3-5 shows the PAOI overlaps with a priority focus area. The development footprint however does not overlap.

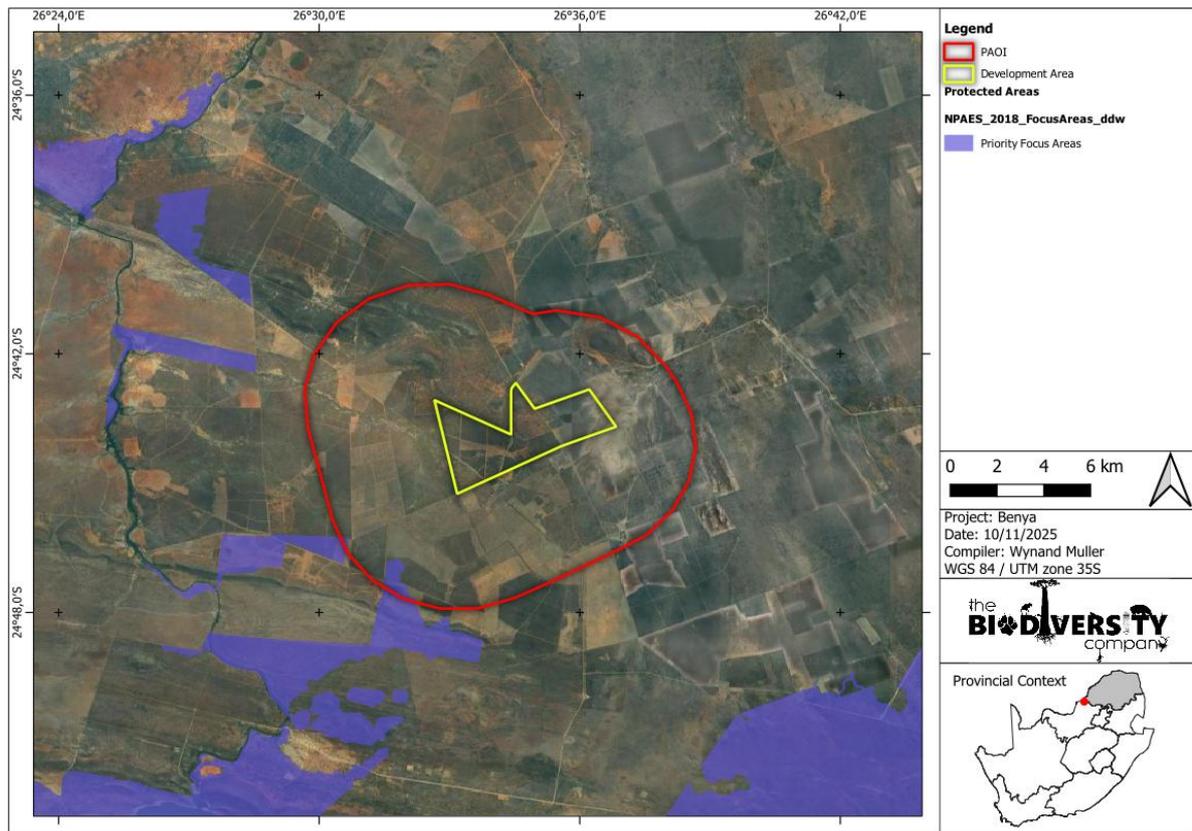


Figure 3-5 The PAOI in relation to the NPAES (2018)

3.1.6 Key Biodiversity Area

A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.

Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024). Figure 3-6 shows the PAOI overlaps with the Madikwe-Atherstone KBA. The KBA is triggered by mammal species as opposed to avifauna species.

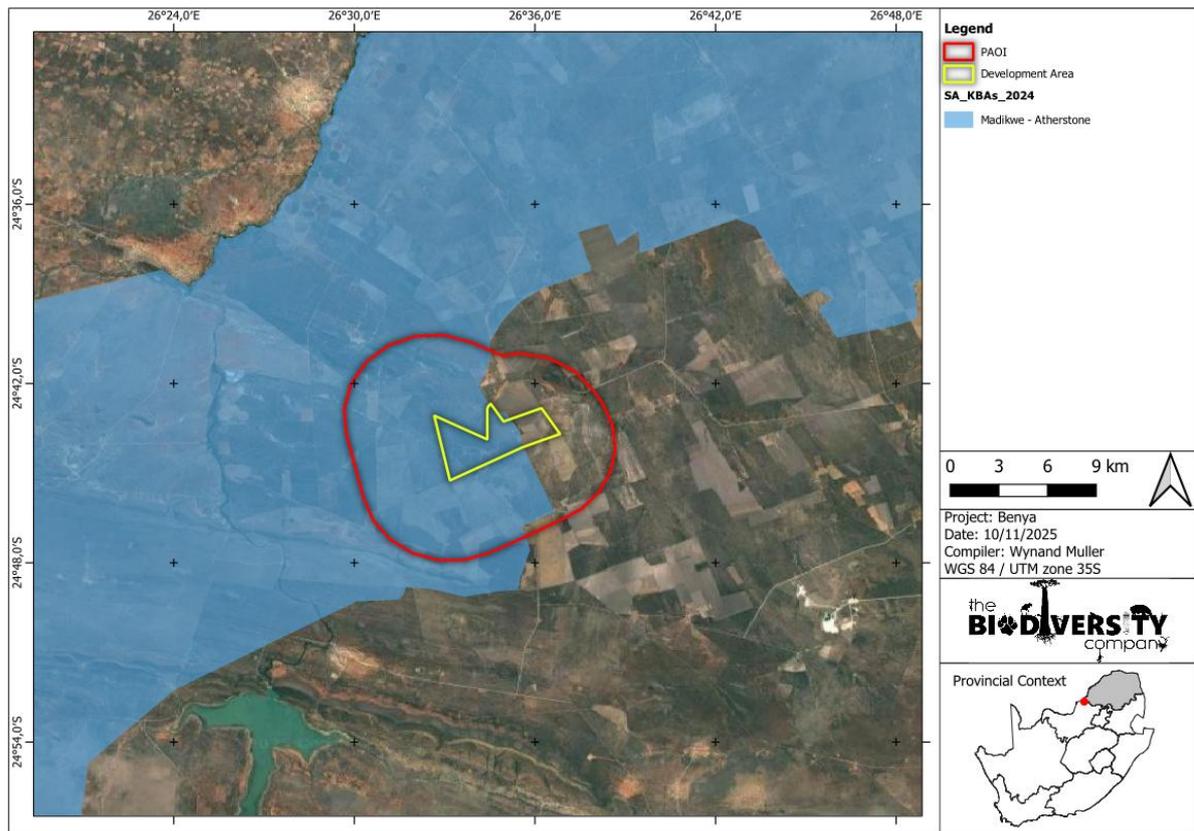


Figure 3-6 The PAOI in relation to the KBA

3.1.7 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as ‘threatened’ (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019). The PAOI and development footprint overlaps with an LC and partially EN river, as well as a LC wetland (Figure 3-7).

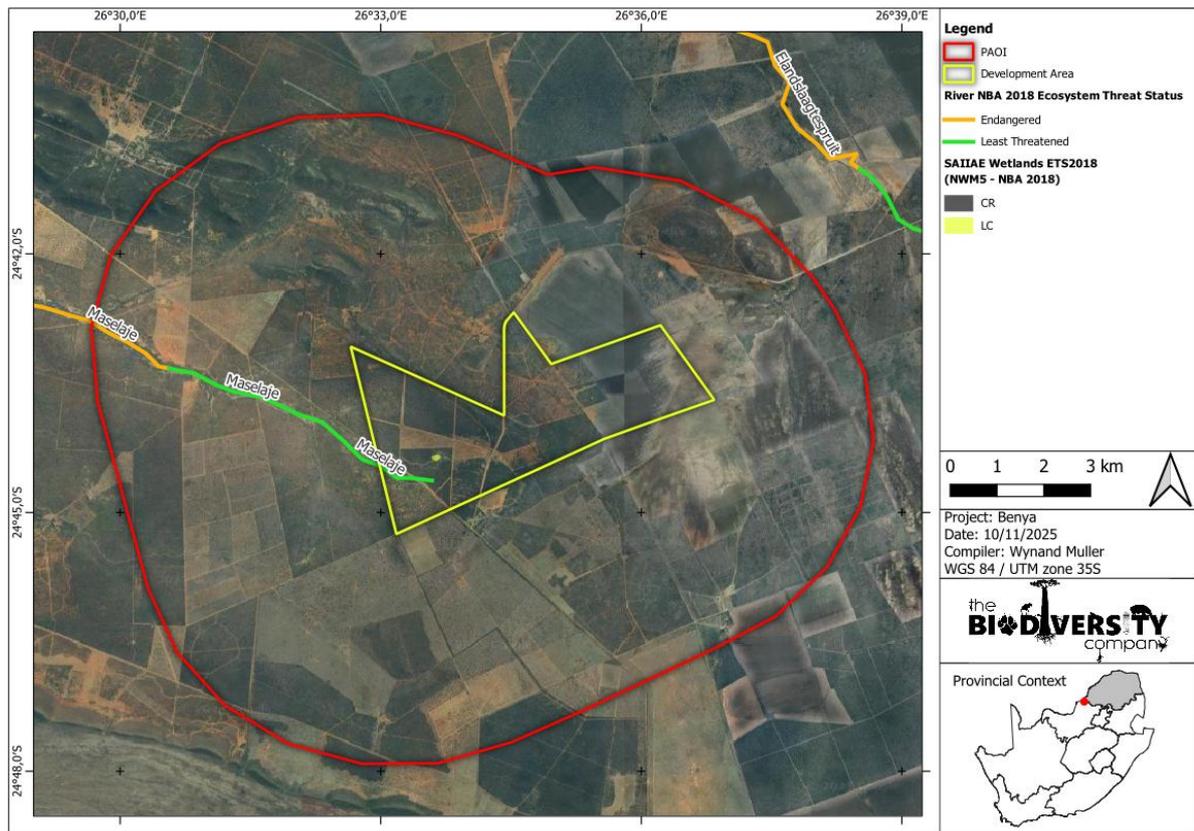


Figure 3-7 Map illustrating ecosystem threat status of rivers and wetland ecosystems in relation to the PAOI

3.1.8 National Freshwater Ecosystem Priority Area Status

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al.*, 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act’s (NEM:BA) biodiversity goals (Nel *et al.*, 2011).

Figure 3-8 shows that the PAOI and development footprint overlaps with non-priority wetlands, and a non-priority river.

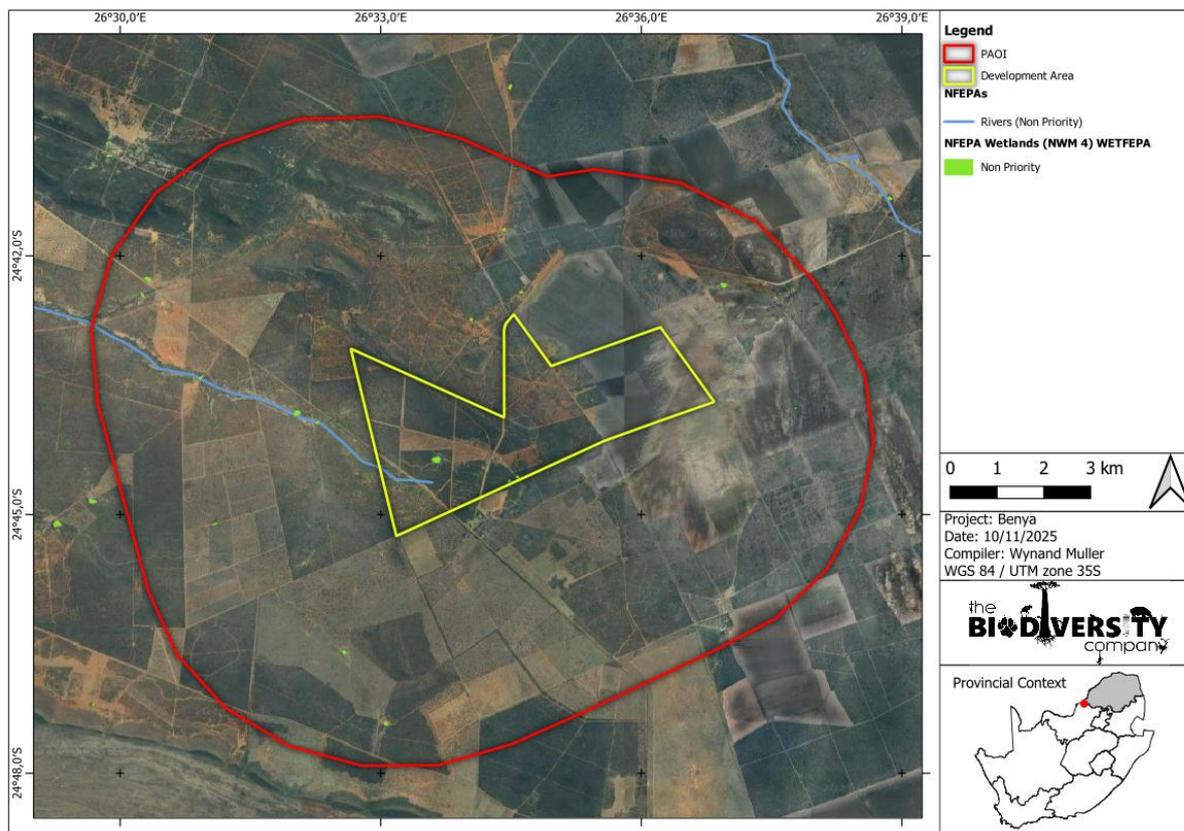


Figure 3-8 The PAOI in relation to the National Freshwater Ecosystem Priority Areas

3.2 Avifauna Expected Species

SABAP2 data indicate that 282 avifauna species are expected for the PAOI and surrounds. Of these, 23 are considered SCC. The likelihood of occurrence for these SCCs within the PAOI is indicated in Table 3-2. Of these, 16 SCCs have a high likelihood of occurrence, with three of these species being observed during the field surveys, and a further 2 SCCs have a moderate likelihood of occurrence.

Table 3-2 Threatened avifauna species that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened, VU = Vulnerable and NA = Not Assessed

Scientific Name	Common Name	Family Name	Regional (2025)	Global	Likelihood of occurrence
<i>Anas erythrorhyncha</i>	Red-billed Teal	Anatidae	NT	LC	Confirmed
<i>Anas undulata</i>	Yellow-billed Duck	Anatidae	NT	LC	High
<i>Anhinga rufa</i>	African Darter	Anhingidae	NT	LC	High
<i>Aquila nipalensis</i>	Steppe Eagle	Accipitridae	EN	EN	Moderate
<i>Aquila rapax</i>	Tawny Eagle	Accipitridae	EN	VU	High
<i>Ardea alba</i>	Great Egret	Ardeidae	NT	LC	High
<i>Ardeotis kori</i>	Kori Bustard	Otididae	NT	NT	High
<i>Bucorvus leadbeateri</i>	Southern Ground Hornbill	Bucorvidae	EN	VU	High
<i>Ciconia abdimii</i>	Abdim's Stork	Ciconiidae	NT	LC	High
<i>Ciconia nigra</i>	Black Stork	Ciconiidae	EN	LC	High
<i>Circus macrourus</i>	Pallid Harrier	Accipitridae	NA	NT	Low

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<i>Coracias garrulus</i>	European Roller	Coraciidae	NT	LC	High
<i>Elanus caeruleus</i>	Black-winged Kite	Accipitridae	NT	LC	Confirmed
<i>Falco naumanni</i>	Lesser Kestrel	Falconidae	VU	LC	High
<i>Gyps africanus</i>	White-backed Vulture	Accipitridae	CR	CR	High
<i>Gyps coprotheres</i>	Cape Vulture	Accipitridae	VU	VU	High
<i>Leptoptilos crumenifer</i>	Marabou Stork	Ciconiidae	NT	LC	High
<i>Podica senegalensis</i>	African Finfoot	Heliornithidae	VU	LC	Low
<i>Polemaetus bellicosus</i>	Martial Eagle	Accipitridae	EN	EN	High
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	Pteroclididae	NT	LC	Confirmed
<i>Sarkidiornis melanotos</i>	Knob-billed Duck	Anatidae	NT	LC	High
<i>Scopus umbretta</i>	Hamerkop	Scopidae	NT	LC	High
<i>Torgos tracheliotos</i>	Lappet-faced Vulture	Accipitridae	CR	EN	High

Anas erythrorhyncha (Red-billed Teal) is listed as regionally NT and globally LC. It occurs in a large variety of shallow wetlands. The threats are not well understood but leech infestations and other changes to their habitats. This species was confirmed at the site during the field study.

Anas undulata (Yellow-billed Duck) is listed as regionally NT and globally LC. Could be found in almost any open water habitat, including both artificial and natural, as well as marine and freshwater systems. It appears that this species has experienced significant recent population declines. The reasons for this decline are unclear, but significant factors could be reduced food availability due to changing salinity levels of their habitat, their susceptibility to botulism and hybridization with Mallard (*Anas platyrhynchos*). This species has a high likelihood of occurring due to the dams on site.

Anhinga rufa (African Darter) is listed as regionally NT and globally LC. They inhabit a large range of wetland systems but avoid fast flowing rivers and thick floating vegetation. They breed in colonies alongside other waterbird species. They also often roost colonially. They are threatened by destruction of breeding and foraging habitat and environmental pollution. They were historically persecuted due to their perceived impact on fish stocks, but it is unclear whether this still occurs. This species has a high likelihood of occurring due to the dams on site.

Aquila nipalensis (Steppe Eagle) is listed as LT regionally but as EN on a global scale. It is a migrant bird species that over-winters in South Africa and has undergone extremely rapid population declines within its range. This species does not breed in South Africa and would only use the project area as a temporary foraging site, as such the likelihood of occurrence is rated as moderate.

Aquila rapax (Tawny Eagle) is listed as EN on a regional scale and VU internationally and occupies dry open habitats from sea level to 3000 m. It will occupy both woodland and wooded savannah (IUCN, 2017). The habitat is highly suitable for this species, as such the likelihood of occurrence is rated as high.

Ardea alba (Great Egret) is a monogamous species that can be found in colonies in open water systems as well as flooded grasslands. They are mainly nomadic, movements of 1766km have been observed for one bird between Western Cape and Mozambique. Their diet consists of fish, frogs, insects and reptiles (Roberts, 2024). Suitable habitat can be found in the PAOI, especially in the form of the dams. The likelihood of occurrence is therefore high.

Ardeotis kori (Kori Bustard) is listed as NT on a regional and global scale (BirdLife International, 2016a). This species has a large but disjunct range in sub-Saharan Africa, occurring from Ethiopia and Somalia south to Tanzania, and from southern Angola and Zimbabwe south to South Africa. The species

occupies flat, arid, mostly open country such as grassland, karoo, bushveld, thornveld, scrubland and savanna but also including modified habitats such as wheat fields and firebreaks. The diet includes a wide range of plants and animals including insects, reptiles, small rodents, birds, carrion, seeds, berries and roots. It is largely sedentary but does undertake local movements. The global population size has not been quantified, but the population in South Africa has been estimated at 2 000-5 000 birds individuals (BirdLife International, 2016c). A major threat is collision with overhead powerlines, but the causes of population declines and range losses in many parts of the distribution are unknown. These have been hypothesised to include persecution, rangeland degradation and bush encroachment. This species has a high likelihood of occurrence.

Bucorvus leadbeateri (Southern Ground Hornbill) is listed as EN regionally and as VU globally. Secondary poisoning, trade and persecution are estimated to have caused very rapid population declines in this species in South Africa (IUCN, 2017). It inhabits woodland and savanna, also frequenting grassland adjoining patches of forest. The project site has sufficient foraging area and habitat for this species to occur, as such the likelihood is therefore high.

Ciconia abdimii (Abdim's Stork) is listed as NT on a local scale and the species is known to be found in open grassland, savanna woodland and cultivated lands. Non-breeding visitor to southern Africa, departing from its northern breeding grounds in the period from May-August, eventually arriving in southern Africa at the onset of the rainy season in the period from October-December. It is nomadic in southern Africa, moving in response to food availability. It gathers in large flocks then departs in February, March and early April. It mainly eats large insects, doing most of its foraging on pastures, irrigated land and recently ploughed fields, usually in groups which split up to cover more ground. The habitat is suitable for this species, it has a high likelihood of occurring on site.

Black Stork (*Ciconia nigra*) is listed as regionally EN and globally LC. They nest on cliff faces and forage in a variety of wetland habitats where there are fish and frogs, often near mountainous areas, but not exclusively. They are threatened by loss of shallow water bodied which they use for foraging and by collisions with powerlines. The likelihood of occurrence at the site is high, due to the presence of shallow wetland systems in the area.

Coracias garrulous (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller prefers bushy plains and dry savannah areas (IUCN, 2017). The habitat is highly suitable for this species, it has a high likelihood of occurring on site.

Elanus caeruleus (Black-winged Kite) can be found in open Savana, grasslands, croplands, fynbos as well as grassy scrubs. They specialise in hunting rodent species but will also feed on birds, lizards and insects. They appear to be less impacted by habitat clearance for agriculture than other raptors, as this creates more areas for foraging. This species was confirmed in the project area.

Falco naumanni (Lesser Kestrel) is a non-breeding palearctic migrant that can mainly be found in South Africa between October and April. It often roosts in large number in tall trees including gum trees. In South African they occur in grasslands, shrublands, open savanna and agricultural fields. The feed mostly insects and occasionally vertebrates such as small rodents, birds and reptiles. This species has a high likelihood of occurring in the project area.

Gyps africanus (White-backed Vulture) has a large range and only occurs throughout sub-Saharan Africa. Primarily a lowland species of open wooded savanna, particularly areas of Acacia (*Vachellia*). It requires tall trees for nesting. According to the IUCN (2017) this species faces similar threats to other African vultures, being susceptible to habitat conversion to agro-pastoral systems, loss of wild ungulates leading to a reduced availability of carrion, hunting for trade, persecution and poisoning. The likelihood of suitably large trees for nesting for this species is high at the project site, and the abundance of game on the property and surrounding properties, as such the likelihood of occurrence for the species is high. A potential White-backed Vulture (*Gyps africanus*) nest was observed during the first field survey.

However, due to the fact that the field survey was conducted outside the vulture's breeding season, it could not be confirmed if it still in use.

Leptoptilos crumenifer (Marabou Stork) is a large bird of the Ciconiidae family. This species is found in both wet and arid habitat, often near human inhabitation, due to the waste dumps where they scavage. It's a colonial breeder and builds their nests in larger trees. Breeding takes place in the winter season mainly as a result of lower water levels which increases the chances of catching frogs and fish for the young (Campbell, 1972). The diet of the adult birds mainly consists of carrion but will also eat termites, small birds and mammals. The species has a high likelihood of occurring in the PAOI.

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

Pterocles gutturalis (Yellow Throated Sandgrouse) is categorised as Near Threatened on a regional scale. The species inhabits short open grassland and recently burnt veld, especially on black clay soils near water. This species mostly feed in pairs or flocks, they feed mainly on seeds from legumes, grasses and crops. This monogamous solitary nester nests in a shallow scrape in the soil lined with dry grass and weed stems. This species was observed in the assessments.

Knob-billed Duck (*Sarkidiornis melanotos*) is listed as regionally NT and globally LC. When breeding, primarily occupies marshes and pans in savannah habitat. When not breeding, wanders widely and may occupy many different natural and artificial wetlands. Its threats are poorly understood but are thought to be related to habitat loss and degradation. The presence of suitable wetlands suggests that this species has a high likelihood of occurrence.

Scopus umbretta (Hamerkop) is found mainly either in pairs or solitary, however occasionally they can build communal nests. Nests are large structures resembling an inverter pyramid with chambers, nests often used for consecutive years. This species is associated with rivers, lakes, dams and other wetlands. They feed on frogs, tadpoles, small fish and aquatic insects. The presence of suitable wetlands suggests that this species has a high likelihood of occurrence.

Torgos tracheliotus (Lappet-faced Vulture) is listed as EN, both on a regional and global level. Only a small, very rapidly declining population remains, owing primarily to poisoning and persecution, as well as ecosystem alterations (IUCN, 2017). The species inhabits dry savanna, arid plains, deserts and open mountain. It ranges widely when foraging and is mainly a scavenger, feeding predominantly on any large carcasses or their remains. The species has a high likelihood of occurring in the PAOI, based on the confirmation provided by Vulpro.

3.3 Vultures

Due to the fact that eight of South Africa's nine Vulture species are threatened, vulture-specific information is required to ensure this project does not affect their conservation efforts. Figure 3-9 illustrates the PAOI in relation to recorded Vulture electrocutions and collisions (Eskom/EWT Strategic Partnership database unpublished 2020). These maps indicate that there are no recorded fatalities near the PAOI, however, vultures and vulture deaths are recorded within the broader area. As such, some appropriate mitigation measures are required. For mitigations refer to section 5.

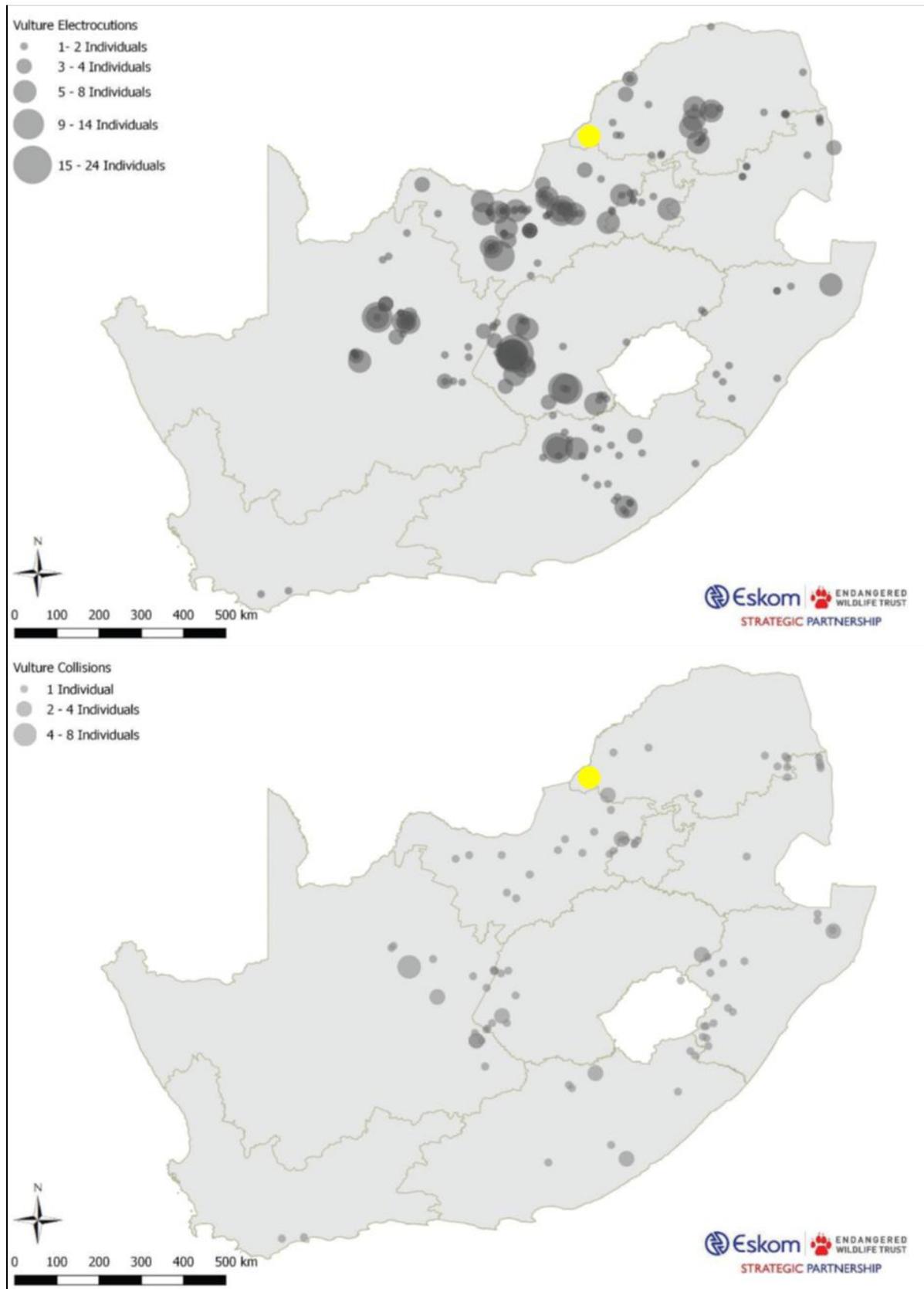


Figure 3-9 Maps indicating fatal vulture A) electrocutions and B) collisions on powerlines across South Africa reported to the EWT/Eskom Central Incident Register from 1996-2022 (Eskom/EWT Strategic Partnership database unpublished, 2022). This map and information are as per Government Gazette No 47632. The yellow pin indicates the approximate location of the project area

3.4 Fieldwork Findings

3.4.1 Species List of First Field Survey

The first avifaunal field survey was conducted from the 9-12 December 2024 over the course of four days. This constitutes a wet season survey. This site visit was conducted to determine the presence of Species of Conservation Concern (SCC). Effort was made to cover all the different habitat types, within the limits of time and access.

Two SCC were recorded during the first survey period (Table 3-3).

Table 3-3 SCC recorded in the first assessment.

Scientific Name	Common Name	Regional (2025)	Global
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	NT	LC
<i>Anas erythrorhyncha</i>	Red-billed Teal	NT	LC

3.4.1.1 Risk Species

Priority Species are considered threatened, rare or prone to impacts from energy development (Ralston Paton *et al*, 2017). TBC has defined Risk Species as those species that are listed in Ralston Paton *et al* (2017) as Priority Species, 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. Six of the species observed within the PAOI are regarded as priority species (Table 3-4).

Table 3-4 Summary of Priority Species recorded within and around the proposed development.

Common Name	Scientific Name	Collision	Electrocution	Disturbance/Habitat Loss
African Harrier-Hawk	<i>Polyboroides typus</i>		x	
Egyptian Goose	<i>Alopochen aegyptiaca</i>	x	x	
Hadada Ibis	<i>Bostrychia hagedash</i>		x	
Red-billed Teal	<i>Anas erythrorhyncha</i>	x		x
Red-crested Korhaan	<i>Lophotis ruficrista</i>	x	x	
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>	x	x	

3.4.1.2 Dominant Species

Table 3-5 provides the relative abundance of the dominant species as well as the frequency with which each species appeared in the point count samples. The most abundant species was the Ring-necked Dove (*Streptopelia capicola*), with a relative abundance of 0.084 and with a frequency of occurrence of 42.59% (Table 3-5).

Table 3-5 Relative abundance and frequency of occurrence of dominant avifauna species recorded during the standardised point counts within and around the proposed development during the field survey.

Common Name	Scientific Name	Relative abundance	Frequency (%)
Ring-necked Dove	<i>Streptopelia capicola</i>	0,084	42,593
Wattled Starling	<i>Creatophora cinerea</i>	0,064	5,556
Rattling Cisticola	<i>Cisticola chiniana</i>	0,050	27,778
White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>	0,048	31,481

Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>	0,036	24,074
Red-faced Mousebird	<i>Urocolius indicus</i>	0,032	7,407
Grey Go-away-bird	<i>Corythaixoides concolor</i>	0,029	14,815
Helmeted Guineafowl	<i>Numida meleagris</i>	0,029	7,407
Crimson-breasted Shrike	<i>Laniarius atrococcineus</i>	0,027	14,815
Chinspot Batis	<i>Batis molitor</i>	0,023	12,963
Red-chested Cuckoo	<i>Cuculus solitarius</i>	0,023	12,963
Red-backed Shrike	<i>Lanius collurio</i>	0,021	18,519
Burchell's Starling	<i>Lamprotornis australis</i>	0,020	9,259
Blue Waxbill	<i>Uraeginthus angolensis</i>	0,018	9,259
Blue-cheeked Bee-eater	<i>Merops persicus</i>	0,018	5,556
Lesser Striped Swallow	<i>Cecropis abyssinica</i>	0,018	5,556
Red-billed Quelea	<i>Quelea quelea</i>	0,018	3,704
Arrow-marked Babbler	<i>Turdoides jardineii</i>	0,016	5,556
Black-backed Puffback	<i>Dryoscopus cubla</i>	0,014	12,963
Brown-crowned Tchagra	<i>Tchagra australis</i>	0,014	14,815
Common Swift	<i>Apus apus</i>	0,014	1,852
Namaqua Dove	<i>Oena capensis</i>	0,014	1,852
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	0,013	7,407
Tawny-flanked Prinia	<i>Prinia subflava</i>	0,013	9,259
African Grey Hornbill	<i>Lophoceros nasutus</i>	0,011	5,556
European Bee-eater	<i>Merops apiaster</i>	0,011	1,852
Long-billed Crombec	<i>Sylvietta rufescens</i>	0,011	9,259
Natal Spurfowl	<i>Pternistis natalensis</i>	0,011	5,556
Southern Grey-headed Sparrow	<i>Passer diffusus</i>	0,011	5,556
Southern Yellow-billed Hornbill	<i>Tockus leucomelas</i>	0,011	7,407
Swainson's Spurfowl	<i>Pternistis swainsonii</i>	0,011	5,556
White-bellied Sunbird	<i>Cinnyris talatala</i>	0,011	9,259
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	0,011	1,852
Willow Warbler	<i>Phylloscopus trochilus</i>	0,011	5,556

3.4.1.3 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014); they divided avifauna into the major groups based on their diet, habitat, and main area of activity. Although species tend to exhibit varied diet with invertivores consuming fruit and frugivores consuming insects for example, the dominant composition of the diet was considered.

The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by Invertivore Foliage Diurnal (IFD) and Insectivore Ground Diurnal (IGD) birds (Figure 3-10).

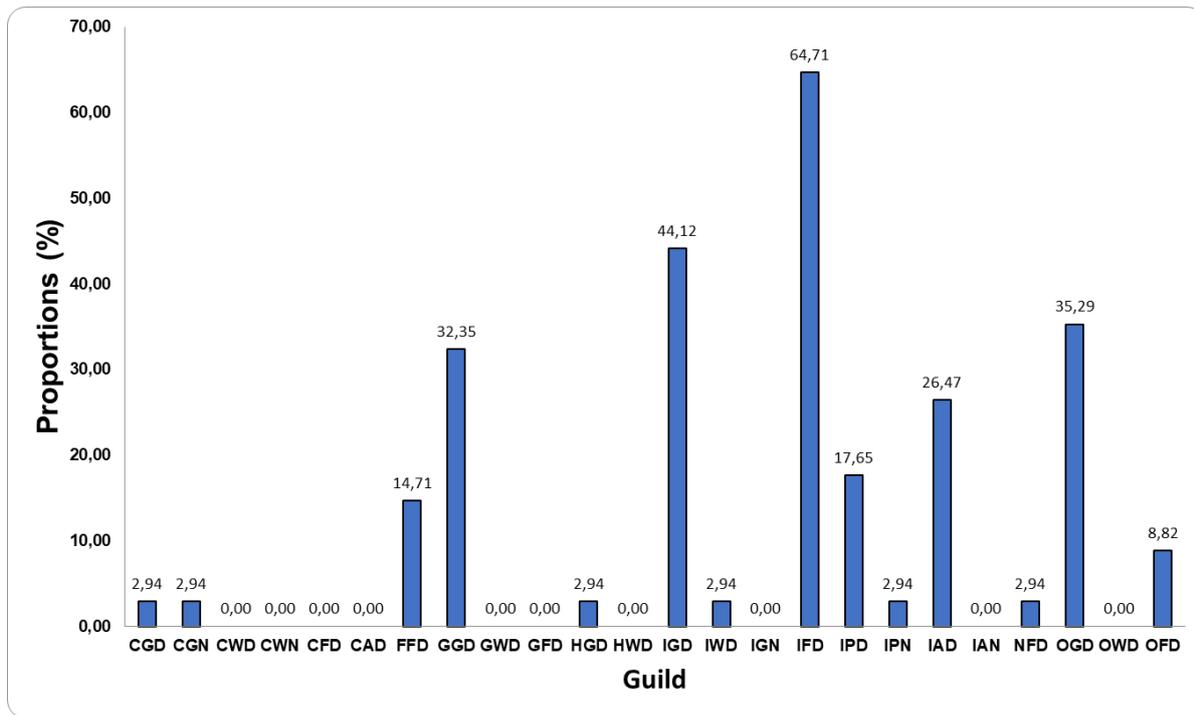


Figure 3-10 Column plot illustrating the proportion of each Functional Feeding Guild to the total abundance. Avifaunal trophic guilds – CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal; CWD, carnivore water diurnal; CWN, carnivore water nocturnal; CFD, carnivore foliage diurnal; CAD, carnivore air nocturnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; GWD, granivore water diurnal; GFD, granivore foliage diurnal; HGD, herbivore ground diurnal; HWD, herbivore water diurnal; IGD, invertivore ground diurnal; IWD, invertivore, water diurnal; IGN, invertivore ground nocturnal; IFD, invertivore foliage diurnal; IPD, invertivore perch diurnal; IPN, invertivore perch nocturnal; IAD, invertivore air diurnal; IAN, invertivore air nocturnal; NFD, nectivore foliage diurnal; OGD, omnivore ground diurnal; OWD, omnivore water diurnal; OFD, omnivore foliage diurnal.

3.4.2 Species List of Second Field Survey

The second avifaunal field survey was conducted from the 18-20 June 2025 over the course of three days. This constitutes a dry season survey. This site visit was conducted to determine the presence of SCC. Effort was made to cover all the different habitat types, within the limits of time and access.

Three SCC was recorded during the second survey period (Table 3-6).

Table 3-6 SCC recorded in the second assessment.

Species	Common Name	Conservation Status	
		Regional	Global
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	NT	LC
<i>Anas erythrorhyncha</i>	Red-billed Teal	NT	LC
<i>Elanus caeruleus</i>	Black-winged Kite	NT	LC

3.4.2.1 Risk Species

As aforementioned, Priority Species are considered threatened, rare or prone to impacts from energy development (Ralston Paton *et al*, 2017). TBC has defined Risk Species as those species that are listed in Ralston Paton *et al* (2017) as Priority Species, 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. Nine of the species observed within the PAOI are regarded as priority species (Table 3-7).

Table 3-7 Summary of Priority Species recorded within and around the proposed development.

Common Name	Scientific Name	Collision	Electrocution	Disturbance/Habitat Loss
African Harrier-Hawk	<i>Polyboroides typus</i>		x	
Black-winged Kite	<i>Elanus caeruleus</i>	x	x	x
Egyptian Goose	<i>Alopochen aegyptiaca</i>	x	x	
Helmeted Guineafowl	<i>Numida meleagris</i>	x		
Little Grebe	<i>Tachybaptus ruficollis</i>	x		
Red-billed Teal	<i>Anas erythrorhyncha</i>	x		x
Red-crested Korhaan	<i>Lophotis ruficrista</i>	x	x	
White-faced Whistling Duck	<i>Dendrocygna viduata</i>	x		
Yellow-throated Sandgrouse	<i>Pterocles gutturalis</i>			x

3.4.2.2 Dominant Species

Table 3-8 provides the relative abundance of the dominant species as well as the frequency with which each species appeared in the point count samples. The most abundant species was the Ring-necked Dove (*Streptopelia capicola*), with a relative abundance of 0.134 and with a frequency of occurrence of 116%, this means this species were recorded more than once in some of the point counts (Table 3-8).

Table 3-8 Relative abundance and frequency of occurrence of dominant avifauna species recorded during the standardised point counts within and around the proposed development during the field survey.

Common Name	Scientific Name	Relative abundance	Frequency (%)
Ring-necked Dove	<i>Streptopelia capicola</i>	0,138	116
Helmeted Guineafowl	<i>Numida meleagris</i>	0,124	6
Red-billed Quelea	<i>Quelea quelea</i>	0,091	10
White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>	0,040	58
Laughing Dove	<i>Spilopelia senegalensis</i>	0,039	52
Crimson-breasted Shrike	<i>Laniarius atrococcineus</i>	0,032	40
Southern Red-billed Hornbill	<i>Tockus rufirostris</i>	0,028	32
Blue Waxbill	<i>Uraeginthus angolensis</i>	0,026	24
Red-headed Weaver	<i>Anaplectes rubriceps</i>	0,026	6
Chin-spot Batis	<i>Batis molitor</i>	0,023	30
Red-eyed Dove	<i>Streptopelia semitorquata</i>	0,022	32
Natal Spur-fowl	<i>Pternistis natalensis</i>	0,020	10
Rattling Cisticola	<i>Cisticola chiniana</i>	0,019	16
African Red-eyed Bulbul	<i>Pycnonotus nigricans</i>	0,019	22
Long-billed cormorant	<i>Sylvietta rufescens</i>	0,019	22
Grey Go-away-bird	<i>Corythaixoides concolor</i>	0,019	24

Southern Pied Babbler	<i>Turdoides bicolor</i>	0,017	10
Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>	0,016	32
Chestnut-vented Warbler	<i>Curruca subcoerulea</i>	0,015	24
Arrow-marked Babbler	<i>Turdoides jardineii</i>	0,014	8
Red-faced Mousebird	<i>Urocolius indicus</i>	0,014	8
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	0,011	16
African Grey Hornbill	<i>Lophoceros nasutus</i>	0,011	16
Chestnut-backed Sparrow-lark	<i>Eremopterix leucotis</i>	0,011	4
Crested Francolin	<i>Dendroperdix sephaena</i>	0,009	10
Burchell's Starling	<i>Lamprotornis australis</i>	0,009	10
Red-billed Teal	<i>Anas erythrorhyncha</i>	0,009	2
Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>	0,008	8

3.4.2.3 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014); they divided avifauna into the major groups based on their diet, habitat, and main area of activity. Although species tend to exhibit varied diet with invertivores consuming fruit and frugivores consuming insects for example, the dominant composition of the diet was considered.

The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by Invertivore Ground Diurnal (IGD) and, Granivore Ground Diurnal (GGD) birds (Figure 3-11).

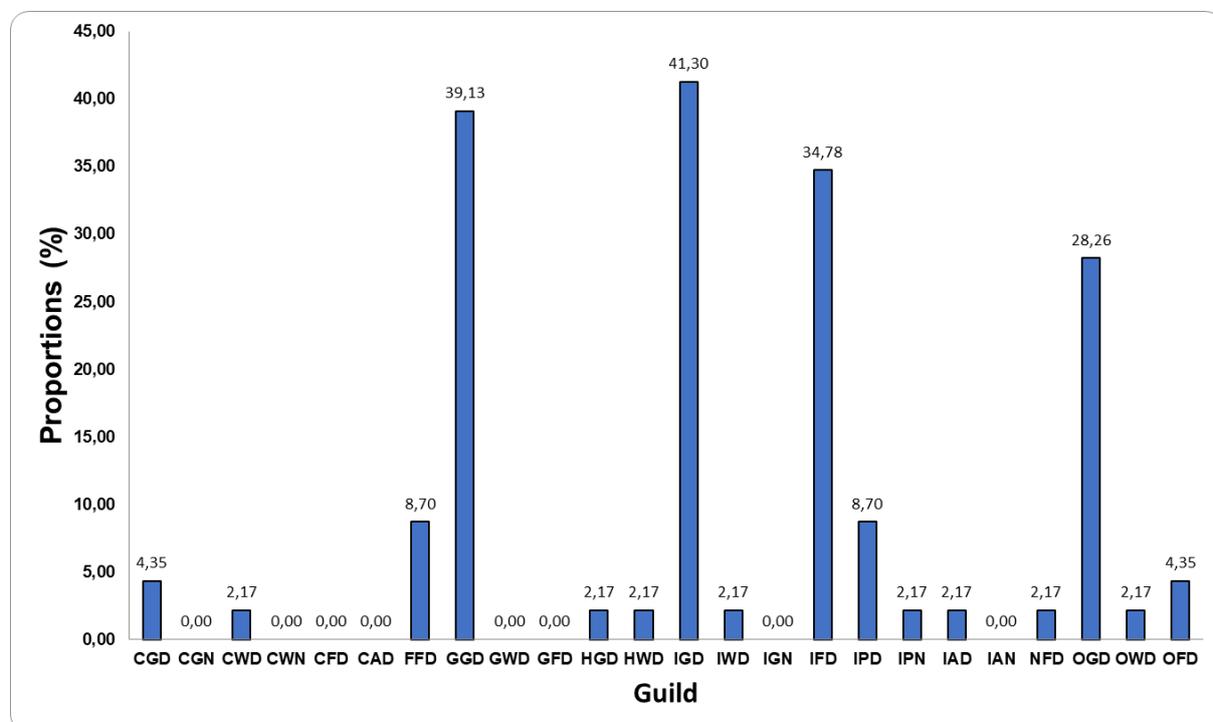


Figure 3-11 Column plot illustrating the proportion of each Functional Feeding Guild to the total abundance. Avifaunal trophic guilds – CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal; CWD, carnivore water diurnal; CWN, carnivore

water nocturnal; CFD, carnivore foliage diurnal; CAD, carnivore air nocturnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; GWD, granivore water diurnal; GFD, granivore foliage diurnal; HGD, herbivore ground diurnal; HWD, herbivore water diurnal; IGD, invertivore ground diurnal; IWD, invertivore, water diurnal; IGN, invertivore ground nocturnal; IFD, invertivore foliage diurnal; IPD, invertivore perch diurnal; IPN, invertivore perch nocturnal; IAD, invertivore air diurnal; IAN, invertivore air nocturnal; NFD, nectivore foliage diurnal; OGD, omnivore ground diurnal; OWD, omnivore water diurnal; OFD, omnivore foliage diurnal.

3.4.3 Flight and Nest Analysis

Observing and monitoring flight paths and nesting sites of SCC and/or priority species are important in ascertaining habitat sensitivity and evaluating the impact risk significance of any proposed development. Flight analysis is also important for species that exhibit diel movement between roosting and foraging sites to prevent the risk of collision with infrastructure. A very condensed version of flight path analysis was done, the aim of this was to determine if there is a general direction of most birds on site. This section needs to be interpreted cautiously based on the limited time spent on this component.

No specific flight paths were noted.

An active nest of a Verreaux Eagle Owl, an African Hawk Eagle and what is believed to be a White-backed Vultures (green material were present, the species however were not confirmed) were found (Figure 3-12). Two other nests of what is believed to be White-backed Vultures were also found. They were however not active from what could be ascertained. A 1 km nest buffer was placed around the active nests, while a 1 km seasonal buffer was placed around the inactive nests. Three alternative powerline routes were considered. Since the nest was found to be inactive during the second assessment, Overhead Line (OHL) Alternative 1 is preferred, as it is the most direct and shortest route, thereby posing the lowest collision risk. However, OHL Alternative 1 can only be implemented if an avifaunal specialist confirms there is no activity at the nest during the May–August breeding season, and the appropriate permits have been obtained for the removal of the nest.

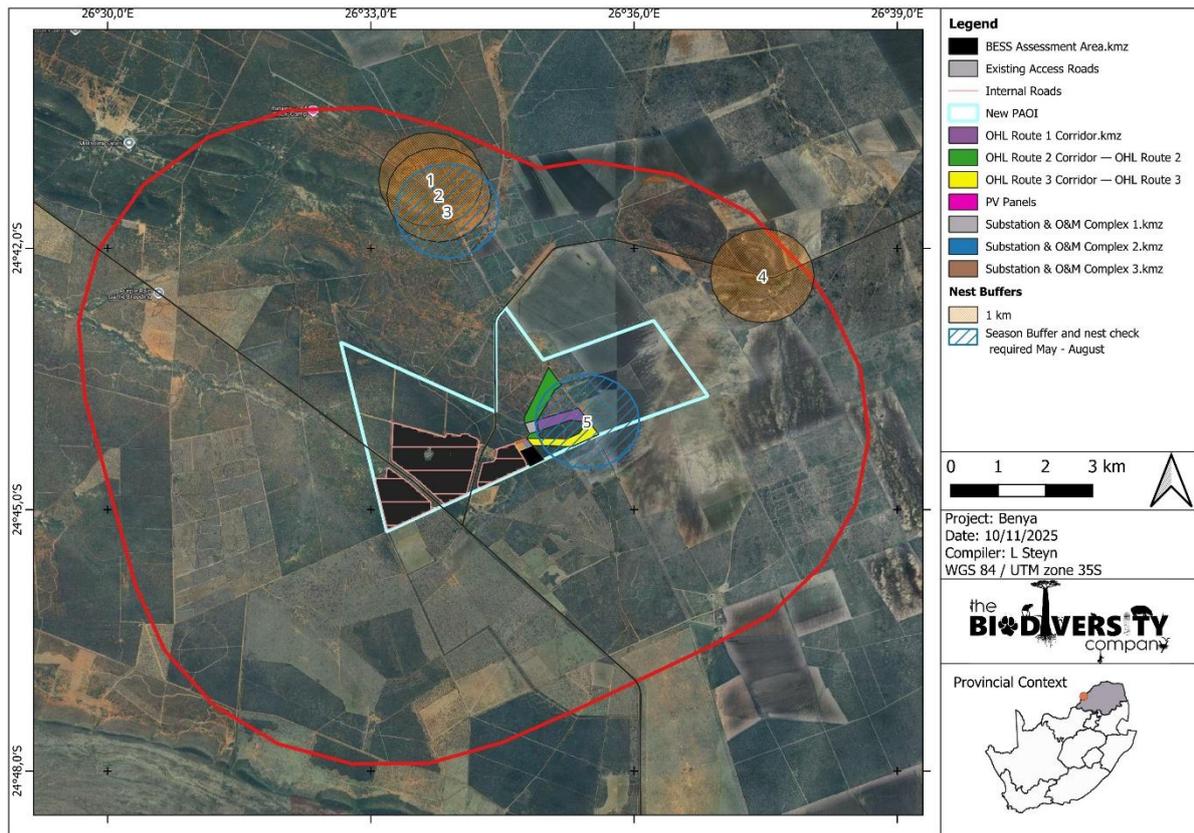


Figure 3-12 Nests and their associated buffers recorded in the PAOI

3.5 Habitat Assessment

Fine-scale habitats within the landscape are important in supporting a diverse avifauna community as they provide differing nesting, foraging and reproductive opportunities.

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four habitats were delineated in total (Figure 3-13), with a full description of the habitats provided below.

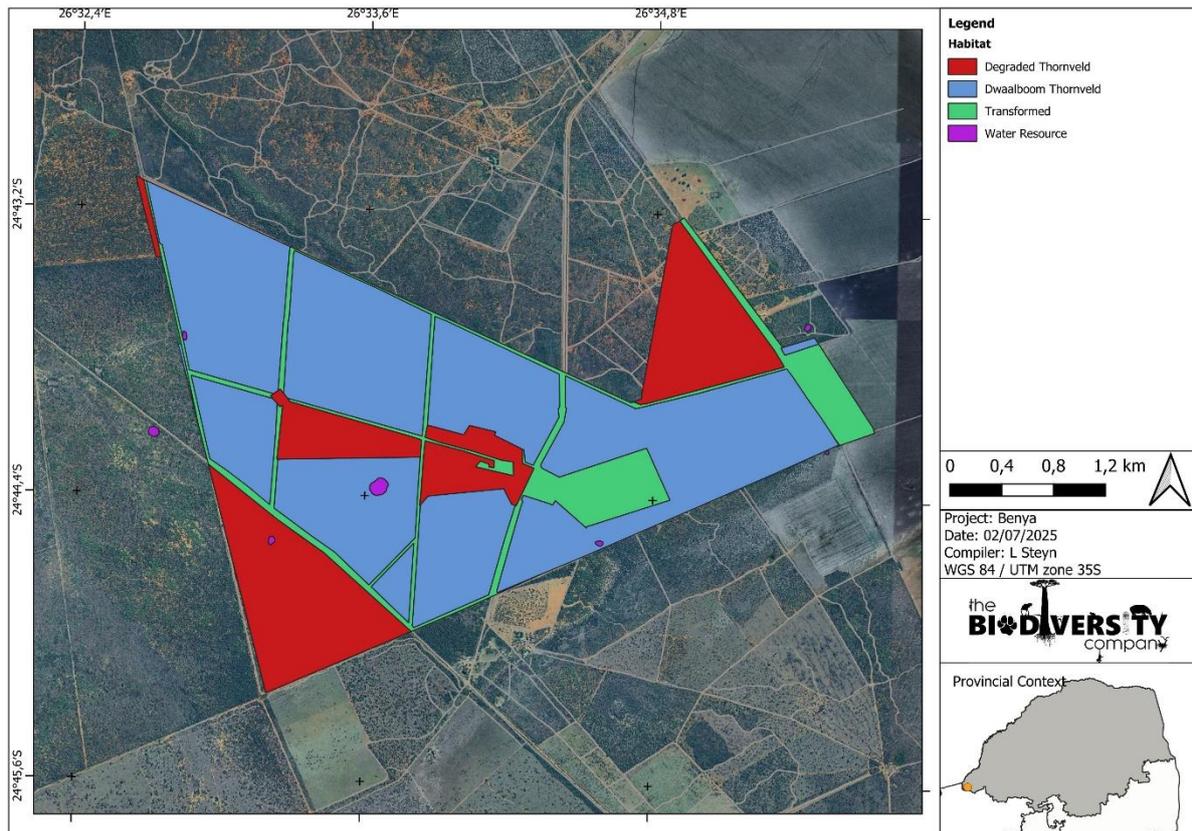


Figure 3-13 *Habitats identified within the assessment areas of the areas that has been covered*

3.5.1 Dwaalboom Thornveld

This habitat consists of the grasses, shrubs and trees of varying sizes. The majority of the impacts associated with this habitat are associated with habitat fragmentation due to the construction of roads through the habitat. This habitat is still in good condition and provides suitable foraging, nesting and roosting habitats for a variety of avifauna SCC (Figure 3-14).

SCCs possible occupying this habitat include: European Roller, Kori Bustard, Marabou Stork, Martial Eagle, Southern Ground Hornbill, Tawny Eagle, Steppe Eagle, Black-winged Kite, Lesser Kestrel, White-backed Vulture, Yellow-throated Sandgrouse and Lappet-faced Vulture.



Figure 3-14 Example of the Dwaalboom Thornveld habitat at -24.722623° ; 26.554542° and -24.749798° ; 26.552920°

3.5.2 Degraded Thornveld

This habitat has been severely altered from its original state, with many trees within this area being cleared. The nature of the authorisation for the clearing of a CBA is not yet known. Although this habitat has been severely disturbed, it still provides suitable foraging, nesting and roosting habitats for a variety of avifauna SCC (Figure 3-15).

SCCs possible occupying this habitat include: European Roller, Kori Bustard, Marabou Stork, Martial Eagle, Southern Ground Hornbill, Tawny Eagle, Steppe Eagle, Black-winged Kite, Lesser Kestrel, White-backed Vulture, Yellow-throated Sandgrouse and Lappet-faced Vulture.



Figure 3-15 Examples of the Degraded Thornveld habitat at -24.737600° ; 26.567493°

3.5.3 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and agricultural practices. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives (Figure 3-16). Although this habitat has been severely negatively affected, it still provides suitable foraging habitat for avifauna SCC.

SCCs possible occupying this habitat include: Abdim's Stork, Black Stork, European Roller, and Yellow-throated Sandgrouse.



Figure 3-16 Transformed habitat at -24.729982° ; 26.588846°

3.5.4 Water Resources

This habitat provides crucial habitat for waterbirds, as well as neighbouring thornveld species. Some of the water resources are natural while others are artificial, and from an avifauna perspective both are important. Due to the overall importance of this resource, the different water resources were combined. The SCC recorded and expected would also utilise varying depths of water, including the riparian vegetation. This habitat provides a vital source of hydration, as well as providing suitable foraging and

nesting site for the local avifauna (Figure 3-17). SCCs possible occupying this habitat include: Abdim's Stork, Black Stork, European Roller, Marabou Stork, Yellow-throated Sandgrouse, Red-billed Teal, Yellow-billed Duck, African Darter, Great Egret, Abdim's Stork, Black Stork, Knob-billed Duck, Hamerkop.



Figure 3-17 Water Resource at 24°44'21.95"S 26°33'37.29"E

3.6 Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types were assigned Site Ecological Importance (SEI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern.

Three habitat types were delineated within the Project Area, namely Dwaalboom Thornveld, Degraded Thornveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-9.

Table 3-9 Summary of habitat types delineated within field assessment area

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Degraded Thornveld	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.	Low Several minor and major current negative ecological impacts.	Medium	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.	Low Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Dwaalboom Thornveld	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.	Medium Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	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.	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.
Transformed	Medium Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals	Very Low Several major current negative ecological impacts.	Very Low	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	Very Low Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

				of returning to a site once the disturbance or impact has been removed.	
Water Resources	<u>Medium</u> Confirmed or highly likely occurrence of populations of NT species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	<u>Medium</u> Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	<u>Low</u> 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.	<u>High</u> 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.
1 km Seasonal Nest Buffer					No-Go development for powerlines between May-August until nest is confirmed inactive and permits required.
1 km Nest Buffer					No-Go development for powerlines

3.6.1 Desktop Ecological Sensitivity

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):

- Animal Species Theme sensitivity is ‘High’ for the PAOI, with the possibility of Avifaunal Species of Conservation Concern (SCC) being present (Figure 3-18).
- Avian Species Theme sensitivity is ‘Low’ for the PAOI (Figure 3-19).

3.6.2 Site Sensitivity Verification (Screening Tool Comparison)

The allocated sensitivities if the mitigation measures are followed for each of the relevant themes identified in the National Web-based Environmental Screening Tool are either disputed or validated for the assessed areas in Table 3-10 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-20.

Table 3-10 Summary of the screening tool vs specialist assigned sensitivities post mitigation

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	High	Dwaalboom Thornveld	High	Validated – The habitat is in good condition and SCC are likely to occur here, with a low resilience to impacts.
		Degraded Thornveld	Low	Disputed – Habitat shows significant impacts but still provides some suitable habitat for SCC.
		Transformed	Very Low	Disputed – Habitat has been severely altered with limited potential to support SCC.
		Water Resources	High	Validated – Habitat has potential to host SCC and provides important ecological function
Avian Theme	Low	Dwaalboom Thornveld	High	Disputed – The habitat is in good condition and SCC are likely to occur here, with a low resilience to impacts.
		Degraded Thornveld	Low	Validated – Habitat shows significant impacts but still provides some suitable habitat for SCC.
		Transformed	Very Low	Disputed – Habitat has been severely altered with limited potential to support SCC.
		Water Resources	High	Disputed – Habitat has potential to host SCC and provides important ecological function

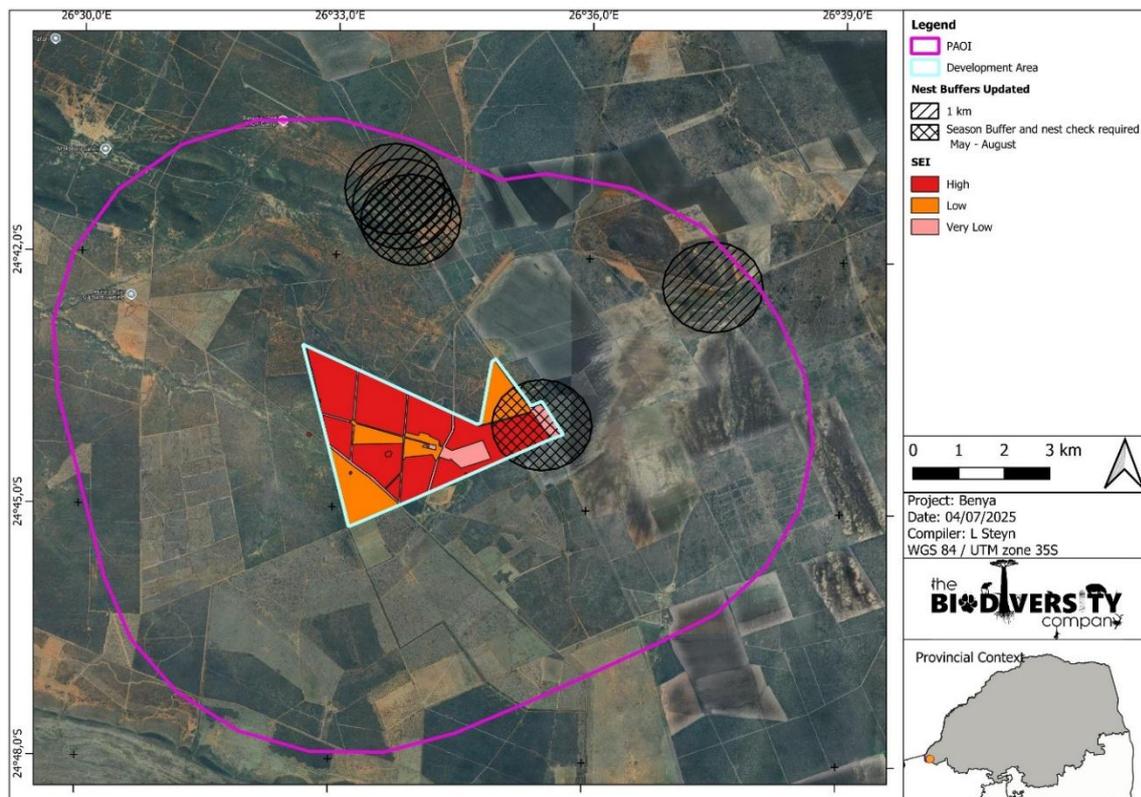


Figure 3-20 Site ecological importance, with mitigation measures applied for the areas that has been assessed

4 Impact Assessment

4.1 Current Impacts to Biodiversity

In consideration that there are anthropogenic activities and influences present within the landscape, there are currently several negative impacts to biodiversity, including avifauna. These include:

- Historic land modification to accommodate roads, powerline infrastructure, and housing;
- Livestock and game;
- Cleared areas; and
- Fences and the associated infrastructure (Figure 4-1).



Figure 4-1 Photograph illustrating current negative impacts associated with the PAOI: Fences, and Roads

4.2 Alternatives Considered

Three alternative powerline routes were provided along with their associated substations and O&M complexes (Figure 4-2 and Table 4-1).

Table 4-1 Comparison between the various alternatives.

Infrastructure	Length/size	SEI	Habitat
OHL Corridor Alternative 1	Approximately 1km	High	Dwaalboom Thornveld

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OHL Corridor Alternative 2	Approximately 1.5km	High and Low	Degraded Thornveld, Dwaalboom Thornveld
OHL Corridor Alternative 3	Approximately 1.3km	High	Dwaalboom Thornveld
Substation & O&M Complex 1	5ha	High	Dwaalboom Thornveld
Substation & O&M Complex 2	5ha	Low	Transformed
Substation & O&M Complex 3	5ha	High	Dwaalboom Thornveld

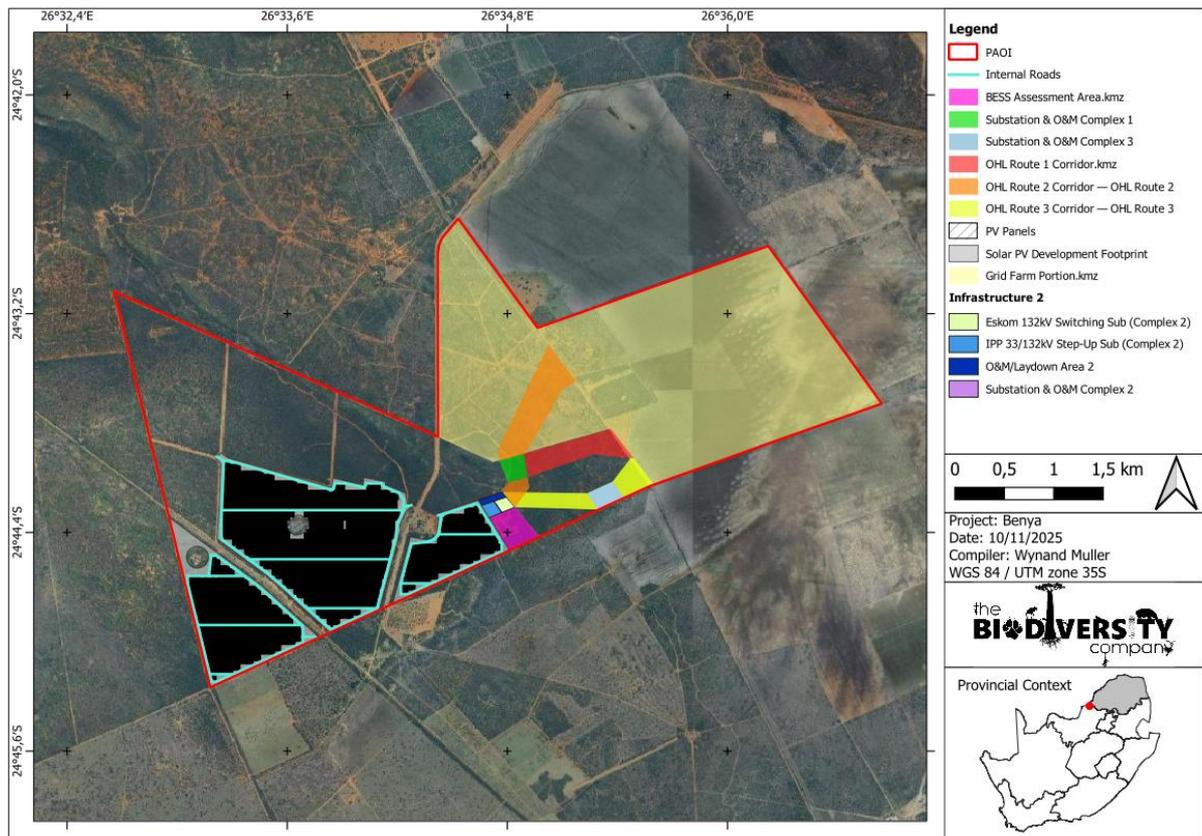


Figure 4-2 Alternatives provided

An active nest of a Verreaux Eagle Owl, an African Hawk Eagle and what is believed to be a White-backed Vultures (green material were present, the species however were not confirmed) were found (Figure 3-12). Two other nests of what is believed to be White-backed Vultures were also found. They were however not active from what could be ascertained. A 1 km nest buffer was placed around the active nests, while a 1 km seasonal buffer was placed around the inactive nests. Three alternative powerline routes were considered. Since the nest was found to be inactive during the second assessment, Overhead Line (OHL) Alternative 1 is preferred, as it is the most direct and shortest route, thereby posing the lowest collision risk. However, OHL Alternative 1 can only be implemented if an avifaunal specialist confirms there is no activity at the nest during the May–August breeding season, and the appropriate permits have been obtained for the removal of the nest.

4.3 Loss of Irreplaceable Resources

The proposed development will lead to the loss of the following irreplaceable resources:

- Habitat and possible nesting sites for numerous expected avifauna SCC; and
- Loss of avifauna SCC due to displacement or death.

4.4 Quantitative Impact Assessment

Potential impacts were evaluated against the data captured during the fieldwork and from a desktop perspective to identify relevance to the project area of interest, specifically the proposed development footprint area. Bennun *et al* (2021) describes three broad types of impacts associated with solar energy development:

- Direct impacts – Impacts that result from project activities or operational decisions that can be predicted based on planned activities and knowledge of local biodiversity, such as habitat loss under the project footprint, habitat fragmentation as a result of project infrastructure and species disturbance or mortality as a result of project operations;
- Indirect impacts – Impacts induced by, or ‘by-products’ of, project activities within a project’s area of influence; and
- Cumulative impacts – Impacts that result from the successive, incremental and/or combined effects of existing, planned and/or reasonably anticipated future human activities in combination with project development impacts.

The assessment of impact significance considers pre-mitigation as well as implemented post-mitigation scenarios. Although different species and groups will react differently to the development, the risk assessment was undertaken bearing in mind the potential impacts to the priority species listed in this report. Three phases were considered for the impact assessment:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

4.4.1 Construction Phase

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

- Habitat destruction within the project PV footprint;
- Destruction, degradation and fragmentation of surrounding habitats;
- Displacement/emigration of avifauna community (including SCC);
- Direct mortality from persecution or poaching of avifauna species and collection of eggs;
- Direct mortality from increased vehicle and heavy machinery traffic;
- Powerline Alternative 2 habitat destruction;
- Powerline Alternative 1 and 3 habitat destruction;
- Substation & O&M Complex 1 and 3 habitat destruction;
- Substation & O&M Complex 2 habitat destruction.

The pre-mitigation and post-mitigation impact ratings for the construction phase are shown in Table 4-2.

Table 4-2 Construction Phase Impacts

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Habitat destruction within the project PV footprint	5	3	4	4	5		4	2	4	4	4	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Definite	High	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Highly likely	Moderately High
Destruction, degradation and fragmentation of surrounding habitats	4	3	3	4	4		3	3	3	4	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	Moderately High	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	Moderate
Displacement/emigration of avifauna community (including SCC)	3	4	3	4	4		3	3	2	4	3	
	One year to five years: Medium Term	Regional within 5 km of the site boundary / <	Significant / ecosystem structure and function	Ecology highly sensitive /important	Highly likely	Moderately High	One year to five years: Medium Term	Local area/ within 1 km of the site boundary /	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Likely	Moderate

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		2000ha impacted / Linear features affected < 3000m	moderately altered					< 5000ha impacted / Linear features affected < 1000m				
	4	3	3	4	4		3	2	2	4	2	
Direct mortality from persecution or poaching of avifauna species and collection of eggs	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	Moderately High	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	Low
	4	3	3	4	4		3	2	2	4	2	
Direct mortality from increased vehicle and heavy machinery traffic	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	Moderately High	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	Low
	4	3	3	3	4		3	2	2	3	2	
Powerline 2 habitat destruction	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary	Significant / ecosystem structure and function	Ecology moderately sensitive /important	Highly likely	Moderate	One year to five years: Medium Term	Development specific/ within the site boundary /	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive /important	Possible	Low

		/ < 5000ha impacted / Linear features affected < 1000m	moderately altered					< 100 ha impacted / Linear features affected < 100m				
	4	3	3	4	4		3	2	2	4	2	
Powerline 1 and 3 habitat destruction	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	Moderately High	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	Low
	4	3	3	4	4		3	2	2	4	2	
Substation 1 and 3 habitat destruction	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	Moderately High	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	Low
	4	3	3	2	4		3	2	2	2	2	
Substation 2 habitat destruction	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary	Significant / ecosystem structure and function	Ecology with limited sensitivity/importance	Highly likely	Moderate	One year to five years: Medium Term	Development specific/ within the site boundary /	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	Low

4.4.2 Operation Phase

The operational phase includes the following impacts:

- Collisions with infrastructure associated with the PV Facility;
- Powerline Alternative 2 collisions;
- Powerline Alternative 1 and 3 collisions;
- Electrocution due to infrastructure associated with the PV Facility and powerlines;
- Direct mortality from roadkills, persecution or poaching of avifauna species and collection of eggs;
- Direct mortalities and hinderance of movement from fencing infrastructure;
- Pollution of water sources and surrounding habitat due to cleaning products of the PV panels; and
- Heat radiation from the PV panels.

The pre-mitigation and post-mitigation impact ratings for the construction phase are shown in Table 4-3.

Table 4-3 Operational Phase Impacts

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Collisions with infrastructure associated with the PV Facility	5	2	4	4	3		4	2	3	3	3	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Likely	Moderately High	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	Moderate
Electrocution due to infrastructure associated with the PV Facility and powerline	4	2	3	4	3		4	2	3	3	2	
	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Possible	Low
Direct mortality from roadkills, persecution or poaching of avifauna species and collection of eggs	3	3	3	4	3		3	2	2	3	1	
	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	Moderate	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Highly unlikely	Low

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								affected < 100m				
	4	3	3	4	3		4	2	2	3	2	
Direct mortalities and hinderance of movement from fencing infrastructure	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	Low
	4	3	3	4	3		4	2	2	3	1	
Pollution due to chemicals used to keep the PV panels clean	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Highly unlikely	Low
	4	3	3	4	3		4	2	2	3	2	
Heat radiation from the PV panels.	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	Low
Powerline Alternative 2 collisions	5 Permanent	4	4	4	4		4	2	2	3	2	Low
					Highly likely	High					Possible	

		Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important			Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important		
	5	3	4	4	4		4	2	2	3	2	
Powerline Alternative 1 and 3 collisions	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Highly likely	Moderately High	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	Low

As can be seen from the table above, the overall residual impacts for the operation phase range from moderate to low. Mitigation measures can be implemented to reduce the significance of the impacts to an acceptable level and thus the development can be favourably considered, should the mitigation measures and management actions be implemented.

4.4.3 Decommissioning Phase

This phase is when the scaling down of activities ahead of temporary or permanent closure is initiated. During this phase, the Operational Phase impacts will persist until the activity reduces and the rehabilitation measures are implemented.

The following potential impacts were considered:

- Direct mortality due to earthworks, vehicle collisions and persecution;
- Direct mortality due to infrastructure including collisions with PV infrastructure, powerlines, fences, etc; and
- Continued habitat degradation due to Invasive Alien Plant encroachment and erosion.

The pre-mitigation and post-mitigation impact ratings for the construction phase are shown in Table 4-4.

Table 4-4 Decommissioning Phase Impacts

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Direct mortality due to earthworks, vehicle collisions and persecution	4	3	3	3	3		2	2	2	3	1	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Likely	Moderate	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Highly unlikely	Absent
Direct mortality due to infrastructure including collisions with PV infrastructure, fences etc	4	2	3	3	4		2	2	2	3	1	
	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Highly likely	Moderate	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Highly unlikely	Absent
Continued habitat degradation due to Invasive Alien	4	3	3	3	4		2	2	2	3	2	
	Life of operation or less than 20	Local area/ within 1 km of the site boundary / <	Significant / ecosystem structure and	Ecology moderately sensitive/ /important	Highly likely	Moderate	One month to one year:	Development specific/ within the site boundary / <	Small / ecosystem structure and	Ecology moderately sensitive/ /important	Possible	Low

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Plant encroachment and erosion	years: Long Term	5000ha impacted / Linear features affected < 1000m	function moderately altered				Short Term	100 ha impacted / Linear features affected < 100m	function largely unchanged			
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As can be seen from the table above, the overall residual impacts for the decommissioning phase are either absent or low in significance. Mitigation measures can be implemented to reduce the significance of the impacts to an acceptable level and thus the development can be favourably considered, should the mitigation measures and management actions be implemented.

4.4.4 Cumulative Impacts

Cumulative impacts are assessed within the context of the extent of the proposed PAOI, other developments and activities in the area (existing and proposed) and general habitat loss and disturbance resulting from any other anthropogenic activities in the area. The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts in an area or region, it is appropriate to consider the cumulative effects of development or disturbance activities. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a specific point in time may actually represent a significant change from the original state of the system. This section describes the potential cumulative impacts of the project on the local and regional avifauna community.

Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers (such as nearby large road networks, other solar PV facilities, and power infrastructure). Relevant activities and impacts include dust deposition, noise and vibration, loss of corridors or habitat, disruption of waterways, groundwater drawdown, groundwater and surface water depletion, and transport activities. Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent game parks and reserves.

According to the latest version of the DFFE's South African Renewable Energy EIA Application Database (REEA_OR_2025_Q2), only one project has been authorised within a 30 km radius from the project site, namely the PPC Dwaalboom Cement Plant Heat Recovery Plant, which is a petroleum project according to the database.

The proposed development in isolation has a Negative Moderate impact significance (Table 4-5). In consideration of the aforementioned information, the cumulative impact was determined to be of a Negative Moderately high significance. Figure 4-3 shows a portion of the 30 km area overlaps with Botswana, which would hinder the calculation of the remaining habitat in a 30 km area. The figure does however illustrate, that large sections of the habitat does still remain and is mostly intact. One renewable development has been approved in the 30 km radius.

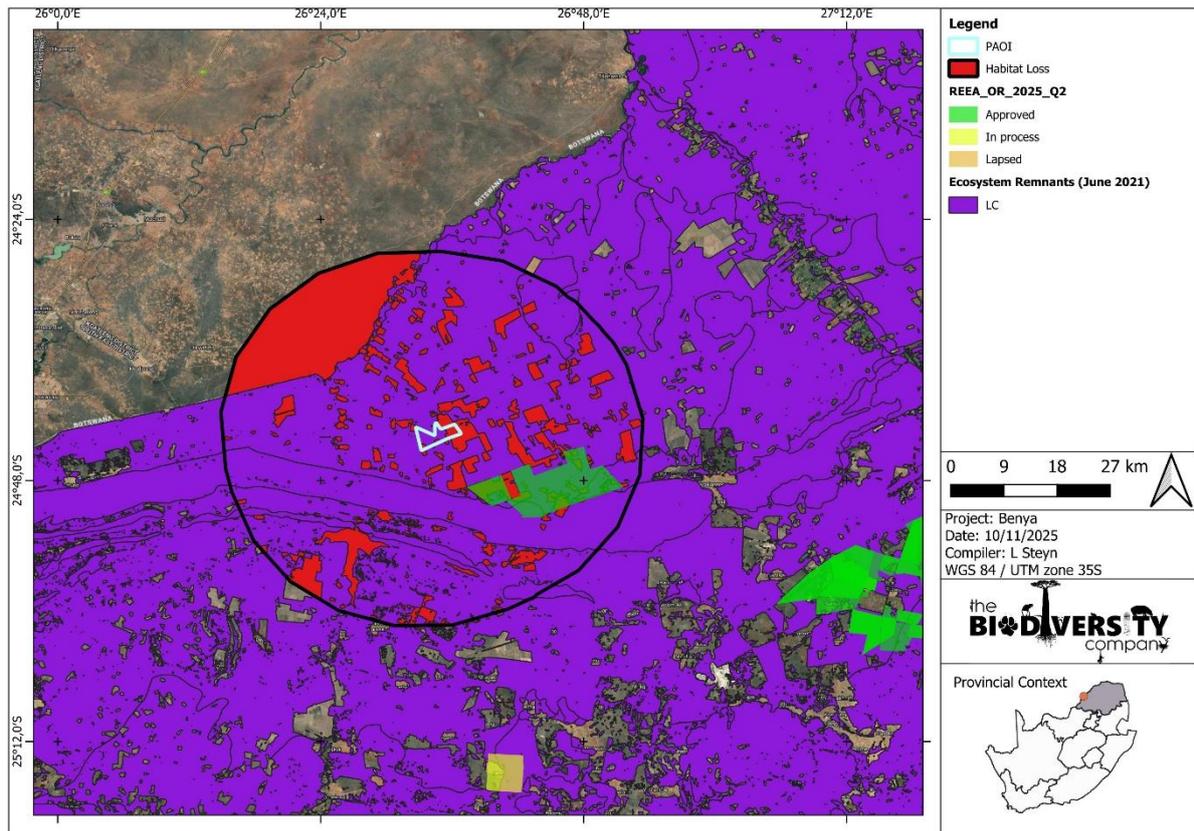


Figure 4-3 Cumulative habitat loss in 30 km surrounding the PAOI

The pre-mitigation and post-mitigation impact ratings for the cumulative impacts are shown in Table 4-5.

Table 4-5 Cumulative Impacts to avifauna associated with the proposed project

Impact	Project in Isolation						Cumulative Effect					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Loss of habitat, and disruption of SCC home ranges	4	3	3	4	2		4	4	3	4	4	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Possible	Moderate	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	Moderately High

5 Avifauna Impact Management Actions

The purpose of the Biodiversity Impact Management Actions is to present the mitigations in such a way that they can be incorporated into the Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring guidelines.

Table 5-1 details the mitigation measure necessary for implementation, while providing recommended mitigation measures for the Environmental Assessment Practitioner (EAP) to consider, aimed at minimizing the overall impact on avifauna. Both tables include corresponding timeframes, targets, and performance indicators specific to the avifaunal component.

Table 5-1 Specific avifauna management outcomes pertaining to impacts to avifauna and their habitats

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Management outcome: Habitats				
A nest walkdown must be performed prior to clearance of the site. If nests are found, necessary permits and appropriate relocation mitigations should be followed under the consultation with a qualified specialist.	Construction Phase	Environmental Officer	Development footprint	During Phase
Solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both below and above-ground biodiversity where possible.	Life of operation	Project Manager	Decrease erosion risk	Life of operation
Management outcome: Avifauna				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
A 1 km nest buffer was placed around the active nests, this must be treated as No-Go areas, while a 1 km seasonal buffer was placed around the inactive nests. Inside of the months of May to August an avifauna specialist must confirm there is no activity at the nest and after obtaining the appropriate	Construction and pre-construction	Environmental Officer	Nests and activity at the nests	During Phase

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permits the onsite nest can be broken down if found in active.				
The duration of the construction must be kept to a minimum to avoid disturbing avifauna.	Construction/Operational Phase	Project Manager Environmental Officer	Construction/Closure Phase	Ongoing
Latest technology solar panels with an anti-reflective coating must be used. This will also improve the light transmittance and therefore increases the overall efficiency.	Construction/Operational Phase	Project Manager Environmental Officer Design Engineer	Bird collisions, and drawing of insects in turn drawing of avifauna	Ongoing
Overhead cables/lines must be fitted with industry standard bird flight diverters to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%) as a result thereof. Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted as per industry standards. The use of Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites; Powerlines must be fitted with bird diverters for the extent of the line	Construction/Operational Phase	Project Manager Environmental Officer Design Engineer	Bird collisions	Ongoing
Ensure that the phase cables are spaced far enough apart to reduce the risk of large birds touching both simultaneously (2m for large raptors) (Prinsen et al., 2012). 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 collisions	Ongoing
All the parts of the infrastructure must be nest proofed, and anti-perch devices placed on areas that can lead to electrocution;	Construction/Operational Phase	Project Manager Environmental Officer Design Engineer	Bird electrocutions	Ongoing
Any exposed parts must be covered (insulated) to reduce electrocution risk	Construction/Operational Phase	Project Manager Environmental Officer Design Engineer	Bird electrocutions	Ongoing
If generators are to be used these must be soundproofed. Reduce the decibel level of a generator by 15-30 decibels.	Planning and construction	Environmental Officer & Contractor, Engineer	Noise limitation	During phase
BESS must be in a non-reflective surface to ensure fire risk is mitigated	Construction and Operation	Project Manager Environmental Officer Design Engineer	Reflective surfaces to reduce fire risk	During phase

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<p>All areas to be developed must be walked through 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.</p>	<p>Construction</p>	<p>Environmental Officer</p>	<p>Presence of avifauna species and nests</p>	<p>During Phase</p>
<p>All the parts of the infrastructure must be nest proofed, and anti-perch devices placed on areas that can lead to electrocution</p>	<p>Planning and Construction</p>	<p>Environmental Officer Contractor Engineer</p>	<p>Presence of electrocuted birds</p>	<p>During phase</p>
<p>Outside lighting must be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (red/green) lights should be used.</p>	<p>Construction/Operational Phase</p>	<p>Project Manager Environmental Officer Design Engineer</p>	<p>Light pollution and period of light.</p>	<p>During phase</p>
<p>Markers should be placed on fence to enhance visibility. Additionally, 30cm by 30cm openings must be incorporated at the bottom of the fence to facilitate the free movement of ground-dwelling species.</p>	<p>Life of Operation</p>	<p>Project Manager Environmental Officer Contractor Design Engineer</p>	<p>Presence of birds stuck /dead in fences.</p>	<p>During phase</p>
<p>As far as possible, power cables within the PAOI should be thoroughly insulated and preferably buried.</p>	<p>Construction and Operation</p>	<p>Project Manager Environmental Officer Design Engineer</p>	<p>Exposed cables</p>	<p>During phase</p>
<p>Any exposed parts must be covered (insulated) to reduce electrocution risk</p>	<p>Planning and construction</p>	<p>Environmental Officer Contractor, Engineer &</p>	<p>Presence of electrocuted birds</p>	<p>During phase</p>
<p>All infrastructure must be removed if the facility is decommissioned.</p>	<p>Closure/Rehabilitation</p>	<p>Project Manager Environmental Officer</p>	<p>Infrastructure removal</p>	<p>During phase</p>
<p>Due to the sensitivity of the site, a detailed post-construction monitoring plan must be developed. This plan should clearly describe the procedures for post-construction monitoring as well as carcass management. Diverters must be monitored as per the ESKOM maintenance schedule, and must be replaced within one year should it not be functional.</p>	<p>Life of Operation</p>	<p>Project Manager Environmental Officer</p>	<p>Monitoring</p>	<p>Ongoing</p>

Table 5-2 Generic management outcomes pertaining to impacts to avifauna and their habitats

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Management outcome: Habitats				
The areas to be developed must be specifically demarcated to prevent movement into surrounding environments.	Life of operation	Project Manager Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further.	Life of operation	Project Manager Environmental Officer	Areas of indigenous vegetation	Ongoing
Indigenous vegetation to be maintained under the solar panels where possible to ensure biodiversity is maintained and to prevent soil erosion (Beatty <i>et al</i> , 2017; Sinha <i>et al</i> , 2018).	Life of operation	Project Manager	Indigenous vegetation under the solar panels.	Life of operation
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.	Decommissioning / Rehabilitation	Project Manager	Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.	Decommissioning / Rehabilitation
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over, that it does not run into the surrounding areas. The Contractor must be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone must be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.	Life of operation	Environmental Officer Contractor	Spill events, Vehicles dripping.	Ongoing

Cement must be mixed in a designated area on a liner away from water sources and buffers, so 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
A fire management plan needs to be complied to restrict the impact of fire.	Life of operation	Environmental Officer Contractor	Fire Management	During Phase
Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.	Life of operation	Project Manager Contractor	Dustfall	As per dust monitoring program.
Only environmentally friendly substances must be used for the cleaning/washing of the panels	Operational Phase	Project Manager Environmental Officer	Water pollution	During Phase

Management outcome: Avifauna

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All construction and maintenance motor vehicle operators to 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 to the training.	Ongoing
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
Infrastructure must be consolidated where possible in order to minimise the amount of ground and air space used.	Planning and Construction	Project Manager Environmental Officer Contractor Engineer	Presence of bird collisions	During phase
Use environmentally friendly cleaning and dust suppressant products	Construction and Operation	Environmental Officer Contractor Engineer	Chemicals used	During phase

6 Monitoring

Due to the sensitivity of the site, a detailed post-construction monitoring plan must be developed. This plan should clearly describe the procedures for post-construction monitoring as well as carcass

management. Diverters must be monitored as per the Eskom maintenance schedule, and must be replaced within one year should it not be functional.

7 Conclusion

The assessment confirmed the presence of three Species of Conservation Concern (SCC), these were Yellow-throated Sandgrouse (*Pterocles gutturalis*), Red-billed Teal (*Anas erythrorhyncha*) and Black-winged Kite (*Elanus caeruleus*). The SCC observed contributed to the sensitivity of the project site and resulted in stringent mitigations being proposed.

Four main habitat types were delineated within the PAOI, including Dwaalboom Thornveld, Degraded Thornveld, Transformed, and Water Resources. The overall habitat is mostly intact with a high number of SCC likely to be present in addition to the three recorded. The screening tool rated the animal sensitivity as 'High', this was validated for the water resources and Dwaalboom thornveld habitats but were disputed for the degraded thornveld and transformed habitats.

Two nests of what is believed to be White-backed Vultures were also found within the study site, however, they were not active from what could be ascertained. Only one of these nests falls within the project site, on one of the existing Eskom powerlines. A 1 km seasonal buffer was placed around these nests. Three alternative powerline routes and associated substation & O&M complexes were considered. Since the nest on one of the Eskom powerlines within the project site was found to be inactive during the second assessment, Overhead Line (OHL) Corridor Alternative 1 is preferred, as it is the most direct and shortest route, thereby posing the lowest collision risk. However, OHL Corridor Alternative 1 can only be implemented if an avifaunal specialist confirms there is no activity at the nest inside the May–August breeding season, and the appropriate permits have been obtained for the removal of the nest.

Some habitat areas have been assigned a high sensitivity. Selected habitat areas may incur a lowering of the assigned sensitivity to medium, should avoidance be demonstrated by the development. The dams in this area must be decommissioned to avoid collision risks. Figure 7-1 shows the advised "avoidance" area. The layout has avoided the areas indicated, it is therefore deemed acceptable.



Figure 7-1 Proposed project area alterations

7.1 Response to Comments Received

Comments were received from both Vulpro and an attorney representing some adjacent landowners.

Vulpro:

The Vulpro comment in summary stated:

Vulpro comments were made on the regarding the Draft Scoping Report for the Benya Energy PV and Electrical Grid Infrastructure Project in Limpopo Province, South Africa.

Key points from the document:

- *Vulture Activity and Sensitivity: Vulpro’s tracking data confirms the presence and activity of White-backed, Cape, and Lappet-faced Vultures in the project area, including foraging and overnight roosting. There are also monitored White-backed Vulture nests within 8 km of the site, indicating likely breeding activity nearby.*
- *Concerns About Buffer Zones: Vulpro questions the use of a 1 km buffer for avifaunal sensitivity, noting that White-backed Vultures are highly sensitive to disturbance and that nesting habitat loss is a major concern. They request clarification on the guidelines used to justify this buffer.*
- *Risks from Power Lines: The letter highlights the significant risks of electrocution and collision posed by existing and proposed power lines, especially since White-backed Vultures are known to nest on pylons. Vulpro requests a thorough assessment of these risks, including checks for bird collisions and electrocutions as recommended by the Birds and Solar Energy Guidelines.*

- *Solar PV Facility Impacts: While solar PV facilities themselves pose minimal direct risk to vultures, the proximity to nesting colonies of Critically Endangered White-backed Vultures raises concerns about disturbance from construction and associated infrastructure, which could negatively affect breeding success.*
- *Recommendations: Vulpro urges that the avifaunal specialist thoroughly assess these risks, apply appropriate buffers, and ensure all mitigation measures are considered to protect the region's vulture populations.*

Thank you for your detailed and constructive comments on the Draft Scoping Report (DSR) for the Benya PV and Electrical Grid Infrastructure Project in the Limpopo Province. We appreciate your engagement and the valuable data and insights you have provided regarding vulture activity in the project area. We acknowledge your confirmation of the presence of White-backed, Cape, and Lappet-faced Vultures within both the proposed area of influence (POAI) and the broader 30 km buffer. Your tracking data and monitoring of White-backed Vulture nests, including those located as close as 8 km from the site, have greatly contributed to our understanding of the local avifauna. In response, we have included additional mitigation measures and monitoring requirements in the report to ensure these species are protected not only in the short term but also over the long term.

In line with the Species Environmental Assessment Guideline (2020) and the associated BirdLife South Africa recommended buffer sizes for species of conservation concern (SCC) at risk from linear and energy infrastructure (such as vultures, raptors, cranes, and bustards), with specific consideration given to nesting sites, the recommended 1 km buffer was applied in this assessment. The White-backed Vulture nest identified was found to be inactive during both the initial and follow-up assessments; however, to ensure accuracy, a third assessment will be conducted to confirm its status. We also believe that, for the overall vulture population, a LILO (Loop-In Loop-Out) tie-in line presents a lower risk than a longer transmission line, and we have therefore motivated for this approach in the project design rather than increasing the overall risk of the area.

Attorney representing some adjacent landowners:

The information below is the text extract as received for Cape EAP:

“3.2 Individual Specialist Reports are already not being done in accordance with the law”

3.2.1 It has unfortunately become common practice to manipulate the Specialist Report findings to justify an acceptable impact in support of the proposed development.

For example, the Avifauna report states at page 20:

*“A White-backed Vulture (*Gyps africanus*) nest was found during the survey, which has a 1 km No-Go buffer for power line development. This will directly affect the proposed placement of the LILO connection for the power line. It is recommended that the second survey be conducted in the vulture's breeding season in June, to confirm if the nest is still active. If the nest is found to still be active a 1 km No-Go buffer where no power lines can be constructed will be placed around the nest. If the nest is confirmed to be inactive, the nest should be removed, and the nest buffer will not be put in place. If the nest buffer is to be put in place, an alternative route will be required. A proposed alternative route is indicated in Figure 5-1.”*

This is shocking and embarrassing. If the vulture is not found on the nest, then the nest will be removed and if it's on the nest, only a 1-kilometre buffer will be implemented? In other words, the vulture is condemned either way. White backed Vultures are critically endangered mainly due to deaths from poisoning and electrocution (Roberts Bird Guide 2) and the critically endangered status of the White backed Vulture has been exacerbated by recent large-scale poisoning events.

Nothing is mentioned of the other hundreds (possibly thousands) of bird species nesting on the site. This could be misrepresentation by omission.

False representations made by Specialists in the EIA process are a criminal offence, according to the 2014 EIA Regulations and confirmed in the case of S v Frylinck North Gauteng Regional Court 14/1740/2010 (6 April 2011) (judgment attached as Annexure "C")."

The site has been re-checked, and the nest remains inactive. All nest assessments were conducted as focal assessments in strict accordance with the Birds and Solar Energy Best Practice Guidelines (2017) published by BirdLife South Africa. These assessments were undertaken over two separate periods, four days and three days, respectively, rather than as a single-day assessment, as previously suggested. This approach was adopted to ensure a thorough and reliable determination of any potential activity at the nest.

We further recommend that a third assessment be conducted, and emphasize that all necessary permits must be obtained prior to any deconstruction activities.

In line with the Species Environmental Assessment Guideline (2020) and the associated BirdLife South Africa recommended buffer sizes for species of conservation concern (SCC) at risk from linear and energy infrastructure (including vultures, raptors, cranes, and bustards), a 1 km buffer was applied to this assessment, with specific consideration given to nesting sites.

The presence of the nest has been clearly documented, and we have exercised due diligence in confirming its inactivity. Our assessments included careful observation of species' behaviour, checks for eggs or green nesting material, and monitoring for any indication that other species may have started using the nest. The nest was found to be dry and unused.

Additionally, the report includes information on all other species observed during the assessment, as well as the associated impacts and recommended mitigation measures.

We trust this clarifies our approach and demonstrates our commitment to both regulatory compliance and best practice in environmental assessment.

7.2 Impact Statement

The main expected impacts of the proposed PV and electrical grid infrastructure will include habitat loss and fragmentation, as well as electrocutions and collisions resulting in possible bird mortalities including SCCs.

The overall residual impacts for the project range from moderately high to low. Mitigation measures, as described in this report, can be implemented to reduce the significance of the impacts to an acceptable level.

7.3 Specialist Opinion

It is the opinion of the specialist that the development can be favourably considered should the mitigation measures and management actions be implemented.

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9 Appendix Items

9.1 Appendix A: Methodology

9.1.1 Desktop Dataset Assessment

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

9.1.1.1 Expected Species

The avifaunal desktop assessment comprised of the following, compiling an expected species list:

- Avifauna list, generated from the SABAP2 dataset by looking at pentads 2435_2625; 2435_2630; 2435_2635; 2435_2640; 2440_2625; 2440_2630; 2440_2635; 2440_2640; 2445_2625; 2445_2630; 2445_2635; 2445_2640.

9.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem’s wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.*, 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;
- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.*, 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2018). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2018). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:
 - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2018).
 - Ecological Support Areas (ESA's) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services (SANBI, 2017). Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic.
 - Other Natural Areas (ONAs) consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (Driver et al., 2017).
 - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).
- A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.; and
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.*, 2018) – A SAIIAE was established during the NBA of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types and pressures on these systems.

9.1.2 Avifauna Survey

Point Counts

Standardized point counts (Buckland et al., 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilized 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), behavior (perched or flying), and general notes on habitat and nesting suitability for conservation-important species.

Drive Transects

The drive transects focused on larger terrestrial birds and raptors. Transects were performed in and around the development footprint to ensure the larger area was considered. The transects were conducted by driving at approximately 15 km/h and stopping at regular intervals of 100 meters, scanning the surrounding environment with binoculars. All large terrestrial species and raptors were recorded, including their number, detection method (seen or heard), behaviour (perched or flying), and general notes on habitat and nesting suitability.

Water Resource Assessments

Water resources on-site as well as larger features outside the project footprint were assessed. This consisted of a focal assessment at the water's edge to determine if SCC (species of conservation concern) as well as congregator species, were present.

Nest Survey

Possible nesting sites such as power lines, stands of trees, marshes and drainage lines, cliffs, and gravel areas were surveyed for nests. All breeding sites were mapped, and the activity at the nests was assessed during all the surveys as per the Birds and Solar energy best practice guidelines (2017).

Incidental Observations

To supplement the species inventory with cryptic and elusive species that may not be detected during the rigid point count and drive transect protocols, diurnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods as well as random meandering.

9.2 Appendix B: 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 9-1 and, respectively Table 9-2.

Table 9-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
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Very High	<p>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 km².</p> <p>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.</p> <p>Globally significant populations of congregatory species (> 10% of global population).</p>
High	<p>Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km². IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.</p> <p>If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.</p> <p>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.</p> <p>Presence of Rare species.</p> <p>Globally significant populations of congregatory species (> 1% but < 10% of global population).</p>
Medium	<p>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.</p> <p>Any area of natural habitat of threatened ecosystem type with status of VU.</p> <p>Presence of range-restricted species.</p> <p>> 50% of receptor contains natural habitat with potential to support SCC.</p>
Low	<p>No confirmed or highly likely populations of SCC.</p> <p>No confirmed or highly likely populations of range-restricted species.</p> <p>< 50% of receptor contains natural habitat with limited potential to support SCC.</p>
Very Low	<p>No confirmed and highly unlikely populations of SCC.</p> <p>No confirmed and highly unlikely populations of range-restricted species.</p> <p>No natural habitat remaining.</p>

Table 9-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	<p>Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types.</p> <p>High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches.</p> <p>No or minimal current negative ecological impacts with no signs of major past disturbance.</p>
High	<p>Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types.</p> <p>Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches.</p> <p>Only minor current negative ecological impacts with no signs of major past disturbance and good rehabilitation potential.</p>
Medium	<p>Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types.</p> <p>Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.</p> <p>Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.</p>
Low	<p>Small (> 1 ha but < 5 ha) area.</p> <p>Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area.</p> <p>Low rehabilitation potential.</p> <p>Several minor and major current negative ecological impacts.</p>
Very Low	<p>Very small (< 1 ha) area.</p> <p>No habitat connectivity except for flying species or flora with wind-dispersed seeds.</p> <p>Several major current negative ecological impacts.</p>

BI can be derived from a simple matrix of CI and FI as provided in Table 9-3.

Table 9-3 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 9-4.

Table 9-4 Summary of Resource Resilience (RR) criteria

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

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 9-5.

Table 9-5 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 9-6.

Table 9-6 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.

9.3 Appendix C: Impact / Risk Assessment

whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- Construction;
- Operation; and
- Decommissioning.

The significance of the identified impacts was determined using an accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998. As with all impact methodologies, the impact is defined in a semi-quantitative way and was assessed according to methodology as per the scale utilised for the evaluation of Environmental Impact Ratings in Table 9-7, Table 9-8, and Table 9-9. First, the impact is assigned a score based on Likelihood descriptors Probability and Sensitivity (Likelihood = Probability + Sensitivity) (Table 9-7). and then assigned a Severity rating based on Consequence descriptors Severity, Scope and Duration (Severity = Severity + Scope + Duration) (Table 9-8). Overall Consequence and Likelihood scores are then used to Determine the Significance Rating (Table 9-9).

Table 9-7 Environmental Impact Assessment: Likelihood Descriptors

Probability of impact	Rating
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	Rating
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2

Ecology moderately sensitive /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

Table 9-8 Environmental Impact Assessment: Consequence Descriptors

Severity of impact	Rating
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
Spatial scope of impact	Rating
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	2
Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear features affected > 3000m	5
Duration of impact	Rating
One day to one month: Temporary	1
One month to one year: Short Term	2
One year to five years: Medium Term	3
Life of operation or less than 20 years: Long Term	4
Permanent	5

Table 9-9 Environmental Impact Assessment: Significance Rating Matrix

	CONSEQUENCE (Severity + Spatial Scope + Duration)															Absent
	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LIKELIHOOD (Probability of impact + Sensitivity of receiving environment)	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	Low
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	Moderate
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	Moderately High
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	High
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	

	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	
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9.4 Appendix D: Avifauna Expected Species

Scientific Name	Common Name	Family Name	Regional	Global
<i>Accipiter badius</i>	Shikra	Accipitridae		
<i>Accipiter minullus</i>	Little Sparrowhawk	Accipitridae		
<i>Acridotheres tristis</i>	Common Myna	Sturnidae		
<i>Acrocephalus palustris</i>	Marsh Warbler	Acrocephalidae		
<i>Actitis hypoleucos</i>	Common Sandpiper	Scolopacidae		
<i>Actophilornis africanus</i>	African Jacana	Jacanidae		
<i>Afrotis afroides</i>	Northern Black Korhaan	Otididae		
<i>Alopochen aegyptiaca</i>	Egyptian Goose	Anatidae		
<i>Amadina erythrocephala</i>	Red-headed Finch	Estrididae		
<i>Amadina fasciata</i>	Cut-throat Finch	Estrididae		
<i>Amblyospiza albifrons</i>	Thick-billed Weaver	Ploceidae		
<i>Anas erythrorhyncha</i>	Red-billed Teal	Anatidae	NT	LC
<i>Anas sparsa</i>	African Black Duck	Anatidae		
<i>Anas undulata</i>	Yellow-billed Duck	Anatidae	NT	LC
<i>Anhinga rufa</i>	African Darter	Anhingidae	NT	LC
<i>Anthoscopus minutus</i>	Cape Penduline Tit	Remizidae		
<i>Anthus cinnamomeus</i>	African Pipit	Motacillidae		
<i>Anthus leucophrys</i>	Plain-backed Pipit	Motacillidae		
<i>Anthus vaalensis</i>	Buffy Pipit	Motacillidae		
<i>Apalis thoracica</i>	Bar-throated Apalis	Cisticolidae		
<i>Apus affinis</i>	Little Swift	Apodidae		
<i>Apus apus</i>	Common Swift	Apodidae		
<i>Apus barbatus</i>	African Black Swift	Apodidae		
<i>Apus caffer</i>	White-rumped Swift	Apodidae		
<i>Aquila nipalensis</i>	Steppe Eagle	Accipitridae	EN	EN
<i>Aquila rapax</i>	Tawny Eagle	Accipitridae	EN	VU
<i>Aquila spilogaster</i>	African Hawk-Eagle	Accipitridae		
<i>Ardea alba</i>	Great Egret	Ardeidae	NT	LC
<i>Ardea cinerea</i>	Grey Heron	Ardeidae		
<i>Ardea goliath</i>	Goliath Heron	Ardeidae		
<i>Ardea intermedia</i>	Intermediate Egret	Cisticolidae		
<i>Ardea melanocephala</i>	Black-headed Heron	Ardeidae		
<i>Ardeola ralloides</i>	Squacco Heron	Ardeidae		
<i>Ardeotis kori</i>	Kori Bustard	Otididae	NT	NT

Benya Solar and Grid Connection

<i>Batis molitor</i>	Chin-spot Batis	Platysteiridae		
<i>Bostrychia hagedash</i>	Hadada Ibis	Threskiornithidae		
<i>Brunhilda erythronotos</i>	Black-faced Waxbill	Estrildidae		
<i>Bubalornis niger</i>	Red-billed Buffalo Weaver	Ploceidae		
<i>Bubo africanus</i>	Spotted Eagle-Owl	Strigidae		
<i>Bubo lacteus</i>	Verreaux's Eagle-Owl	Strigidae		
<i>Bubulcus ibis</i>	Western Cattle Egret	Ardeidae		
<i>Bucorvus leadbeateri</i>	Southern Ground Hornbill	Bucorvidae	EN	VU
<i>Buphagus erythrorhynchus</i>	Red-billed Oxpecker	Buphagidae		
<i>Burhinus capensis</i>	Spotted Thick-knee	Burhinidae		
<i>Burhinus vermiculatus</i>	Water Thick-knee	Burhinidae		
<i>Buteo buteo</i>	Common Buzzard	Accipitridae		
<i>Butorides striata</i>	Striated Heron	Ardeidae		
<i>Calamonastes fasciolatus</i>	Barred Wren-Warbler	Cisticolidae		
<i>Calandrella cinerea</i>	Red-capped Lark	Alaudidae		
<i>Calendulauda africanoides</i>	Fawn-colored Lark	Alaudidae		
<i>Calendulauda sabota</i>	Sabota Lark	Alaudidae		
<i>Calidris minuta</i>	Little Stint	Scolopacidae		
<i>Camaroptera brevicaudata</i>	Grey-backed Camaroptera	Cisticolidae		
<i>Campephaga flava</i>	Black Cuckooshrike	Campephagidae		
<i>Campethera abingoni</i>	Golden-tailed Woodpecker	Picidae		
<i>Campethera bennettii</i>	Bennett's Woodpecker	Picidae		
<i>Caprimulgus fossii</i>	Square-tailed Nightjar	Caprimulgidae		
<i>Caprimulgus pectoralis</i>	Fiery-necked Nightjar	Caprimulgidae		
<i>Caprimulgus rufigena</i>	Rufous-cheeked Nightjar	Caprimulgidae		
<i>Caprimulgus tristigma</i>	Freckled Nightjar	Caprimulgidae		
<i>Cecropis abyssinica</i>	Lesser Striped Swallow	Hirundinidae		
<i>Cecropis cucullata</i>	Greater Striped Swallow	Hirundinidae		
<i>Cecropis semirufa</i>	Red-breasted Swallow	Hirundinidae		
<i>Centropus burchellii</i>	Burchell's Coucal	Cuculidae		
<i>Cercotrichas leucophrys</i>	White-browed Scrub Robin	Muscicapidae		
<i>Cercotrichas paena</i>	Kalahari Scrub Robin	Muscicapidae		
<i>Ceryle rudis</i>	Pied Kingfisher	Alcedinidae		
<i>Chalcomitra amethystina</i>	Amethyst Sunbird	Nectariniidae		
<i>Charadrius tricollaris</i>	Three-banded Plover	Charadriidae		
<i>Chlorocichla flaviventris</i>	Yellow-bellied Greenbul	Pycnonotidae		
<i>Chlorophoneus sulfureopectus</i>	Orange-breasted Bushshrike	Malaconotidae		
<i>Chloropicus namaquus</i>	Bearded Woodpecker	Picidae		
<i>Chrysococcyx caprius</i>	Diederik Cuckoo	Cuculidae		

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<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	Cuculidae		
<i>Ciconia abdimii</i>	Abdim's Stork	Ciconiidae		
<i>Ciconia ciconia</i>	White Stork	Ciconiidae		
<i>Ciconia nigra</i>	Black Stork	Ciconiidae	EN	LC
<i>Cinnyricinclus leucogaster</i>	Violet-backed Starling	Sturnidae		
<i>Cinnyris mariquensis</i>	Marico Sunbird	Nectariniidae		
<i>Cinnyris talatala</i>	White-bellied Sunbird	Nectariniidae		
<i>Circaetus cinereus</i>	Brown Snake Eagle	Accipitridae		
<i>Circaetus pectoralis</i>	Black-chested Snake Eagle	Accipitridae		
<i>Circus macrourus</i>	Pallid Harrier	Accipitridae	NA	NT
<i>Cisticola aridulus</i>	Desert Cisticola	Cisticolidae		
<i>Cisticola chiniana</i>	Rattling Cisticola	Cisticolidae		
<i>Cisticola fulvicapilla</i>	Neddicky	Cisticolidae		
<i>Cisticola juncidis</i>	Zitting Cisticola	Cisticolidae		
<i>Cisticola tinniens</i>	Levaillant's Cisticola	Cisticolidae		
<i>Clamator glandarius</i>	Great Spotted Cuckoo	Cuculidae		
<i>Clamator jacobinus</i>	Jacobin Cuckoo	Cuculidae		
<i>Clamator levaillantii</i>	Levaillant's Cuckoo	Cuculidae		
<i>Clanga pomarina</i>	Lesser Spotted Eagle	Accipitridae		
<i>Colius striatus</i>	Speckled Mousebird	Coliidae		
<i>Columba guinea</i>	Speckled Pigeon	Columbidae		
<i>Coracias caudatus</i>	Lilac-breasted Roller	Coraciidae		
<i>Coracias garrulus</i>	European Roller	Coraciidae	NT	LC
<i>Coracias naevius</i>	Purple Roller	Coraciidae		
<i>Corvus albus</i>	Pied Crow	Corvidae		
<i>Corythaixoides concolor</i>	Grey Go-away-bird	Musophagidae		
<i>Corythornis cristatus</i>	Malachite Kingfisher	Alcedinidae		
<i>Cossypha humeralis</i>	White-throated Robin-Chat	Muscicapidae		
<i>Coturnix coturnix</i>	Common Quail	Phasianidae		
<i>Coturnix delegorguei</i>	Harlequin Quail	Phasianidae		
<i>Creatophora cinerea</i>	Wattled Starling	Sturnidae		
<i>Crecopsis egregia</i>	African Crake	Rallidae		
<i>Crithagra atrogularis</i>	Black-throated Canary	Fringillidae		
<i>Crithagra mozambica</i>	Yellow-fronted Canary	Fringillidae		
<i>Cuculus clamosus</i>	Black Cuckoo	Cuculidae		
<i>Cuculus solitarius</i>	Red-chested Cuckoo	Cuculidae		
<i>Curruca subcoerulea</i>	Chestnut-vented Warbler	Sylviidae		
<i>Cursorius temminckii</i>	Temminck's Courser	Glareolidae		
<i>Cypsiurus parvus</i>	African Palm Swift	Apodidae		

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<i>Delichon urbicum</i>	Common House Martin	Hirundinidae		
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	Anatidae		
<i>Dendroperdix sephaena</i>	Crested Francolin	Phasianidae		
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	Picidae		
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	Dicruridae		
<i>Dryoscopus cubla</i>	Black-backed Puffback	Malaconotidae		
<i>Egretta ardesiaca</i>	Black Heron	Ardeidae		
<i>Egretta garzetta</i>	Little Egret	Ardeidae		
<i>Elanus caeruleus</i>	Black-winged Kite	Accipitridae	NT	LC
<i>Emberiza flaviventris</i>	Golden-breasted Bunting	Emberizidae		
<i>Emberiza impetuani</i>	Lark-like Bunting	Emberizidae		
<i>Emberiza tahapisi</i>	Cinnamon-breasted Bunting	Emberizidae		
<i>Eremomela icteropygialis</i>	Yellow-bellied Eremomela	Cisticolidae		
<i>Eremomela usticollis</i>	Burnt-necked Eremomela	Cisticolidae		
<i>Eremopterix leucotis</i>	Chestnut-backed Sparrow-Lark	Alaudidae		
<i>Estrilda astrild</i>	Common Waxbill	Estrildidae		
<i>Euplectes afer</i>	Yellow-crowned Bishop	Ploceidae		
<i>Euplectes albonotatus</i>	White-winged Widowbird	Ploceidae		
<i>Eurocephalus anguitemens</i>	Southern White-crowned Shrike	Laniidae		
<i>Falco amurensis</i>	Amur Falcon	Falconidae		
<i>Falco naumanni</i>	Lesser Kestrel	Falconidae	VU	LC
<i>Falco rupicolus</i>	Rock Kestrel	Falconidae		
<i>Falco subbuteo</i>	Eurasian Hobby	Falconidae		
<i>Fulica cristata</i>	Red-knobbed Coot	Rallidae		
<i>Gallinula chloropus</i>	Common Moorhen	Rallidae		
<i>Glaucidium perlatum</i>	Pearl-spotted Owlet	Strigidae		
<i>Granatina granatina</i>	Violet-eared Waxbill	Estrildidae		
<i>Gymnoris superciliaris</i>	Yellow-throated Bush Sparrow	Passeridae		
<i>Gyps africanus</i>	White-backed Vulture	Accipitridae	CR	CR
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	Alcedinidae		
<i>Halcyon chelicuti</i>	Striped Kingfisher	Alcedinidae		
<i>Halcyon senegalensis</i>	Woodland Kingfisher	Alcedinidae		
<i>Haliaeetus vocifer</i>	African Fish Eagle	Accipitridae		
<i>Hieraaetus wahlbergi</i>	Wahlberg's Eagle	Accipitridae		
<i>Hippolais olivetorum</i>	Olive-tree Warbler	Acrocephalidae		
<i>Hirundo albicularis</i>	White-throated Swallow	Hirundinidae		
<i>Hirundo dimidiata</i>	Pearl-breasted Swallow	Hirundinidae		
<i>Hirundo rustica</i>	Barn Swallow	Hirundinidae		
<i>Indicator indicator</i>	Greater Honeyguide	Indicatoridae		

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<i>Indicator minor</i>	Lesser Honeyguide	Indicatoridae		
<i>Ispidina picta</i>	African Pygmy Kingfisher	Alcedinidae		
<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch	Estridiidae		
<i>Lagonosticta senegala</i>	Red-billed Firefinch	Estridiidae		
<i>Lamprotornis australis</i>	Burchell's Starling	Sturnidae		
<i>Lamprotornis nitens</i>	Cape Starling	Sturnidae		
<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike	Malaconotidae		
<i>Laniarius ferrugineus</i>	Southern Boubou	Malaconotidae		
<i>Lanius collaris</i>	Southern Fiscal	Laniidae		
<i>Lanius collurio</i>	Red-backed Shrike	Laniidae		
<i>Lanius minor</i>	Lesser Grey Shrike	Laniidae		
<i>Leptoptilos crumenifer</i>	Marabou Stork	Ciconiidae	NT	LC
<i>Lophoceros nasutus</i>	African Grey Hornbill	Bucerotidae		
<i>Lophotis ruficrista</i>	Red-crested Korhaan	Otididae		
<i>Lybius torquatus</i>	Black-collared Barbet	Lybiidae		
<i>Malaconotus blanchoti</i>	Grey-headed Bushshrike	Malaconotidae		
<i>Megaceryle maxima</i>	Giant Kingfisher	Alcedinidae		
<i>Melaenornis mariquensis</i>	Marico Flycatcher	Muscicapidae		
<i>Melaenornis pammelaina</i>	Southern Black Flycatcher	Muscicapidae		
<i>Melaniparus cinerascens</i>	Ashy Tit	Paridae		
<i>Melaniparus niger</i>	Southern Black Tit	Paridae		
<i>Melierax canorus</i>	Pale Chanting Goshawk	Accipitridae		
<i>Merops apiaster</i>	European Bee-eater	Meropidae		
<i>Merops bullockoides</i>	White-fronted Bee-eater	Meropidae		
<i>Merops hirundineus</i>	Swallow-tailed Bee-eater	Meropidae		
<i>Merops nubicooides</i>	Southern Carmine Bee-eater	Meropidae		
<i>Merops persicus</i>	Blue-cheeked Bee-eater	Meropidae		
<i>Merops pusillus</i>	Little Bee-eater	Meropidae		
<i>Microcarbo africanus</i>	Reed Cormorant	Phalacrocoracidae		
<i>Micronisus gabar</i>	Gabar Goshawk	Accipitridae		
<i>Milvus aegyptius</i>	Yellow-billed Kite	Accipitridae		
<i>Mirafra africana</i>	Rufous-naped Lark	Alaudidae		
<i>Mirafra passerina</i>	Monotonous Lark	Alaudidae		
<i>Monticola brevipes</i>	Short-toed Rock Thrush	Muscicapidae		
<i>Motacilla aguimp</i>	African Pied Wagtail	Motacillidae		
<i>Motacilla capensis</i>	Cape Wagtail	Motacillidae		
<i>Muscicapa striata</i>	Spotted Flycatcher	Muscicapidae		
<i>Myioparus plumbeus</i>	Grey Tit-Flycatcher	Muscicapidae		
<i>Myrmecocichla formicivora</i>	Ant-eating Chat	Muscicapidae		

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<i>Nilous afer</i>	Brubru	Malaconotidae		
<i>Numida meleagris</i>	Helmeted Guineafowl	Numididae		
<i>Oena capensis</i>	Namaqua Dove	Columbidae		
<i>Oenanthe familiaris</i>	Familiar Chat	Muscicapidae		
<i>Onychognathus morio</i>	Red-winged Starling	Sturnidae		
<i>Oriolus larvatus</i>	Black-headed Oriole	Oriolidae		
<i>Oriolus oriolus</i>	Eurasian Golden Oriole	Oriolidae		
<i>Ortygospiza atricollis</i>	Quailfinch	Estrildidae		
<i>Otus senegalensis</i>	African Scops Owl	Strigidae		
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	Passeridae		
<i>Passer domesticus</i>	House Sparrow	Passeridae		
<i>Passer melanurus</i>	Cape Sparrow	Passeridae		
<i>Passer motitensis</i>	Great Sparrow	Passeridae		
<i>Peliperdix coqui</i>	Coqui Francolin	Phasianidae		
<i>Phalacrocorax lucidus</i>	White-breasted Cormorant	Phalacrocoracidae		
<i>Phoeniculus purpureus</i>	Green Wood Hoopoe	Phoeniculidae		
<i>Phylloscopus trochilus</i>	Willow Warbler	Phylloscopidae		
<i>Platalea alba</i>	African Spoonbill	Threskiornithidae		
<i>Plectropterus gambensis</i>	Spur-winged Goose	Anatidae		
<i>Plocepasser mahali</i>	White-browed Sparrow-Weaver	Ploceidae		
<i>Ploceus cucullatus</i>	Village Weaver	Ploceidae		
<i>Ploceus intermedius</i>	Lesser Masked Weaver	Ploceidae		
<i>Ploceus velatus</i>	Southern Masked Weaver	Ploceidae		
<i>Podica senegalensis</i>	African Finfoot	Heliornithidae	VU	LC
<i>Pogoniulus chrysoconus</i>	Yellow-fronted Tinkerbird	Lybiidae		
<i>Poicephalus meyeri</i>	Meyer's Parrot	Psittacidae		
<i>Polemaetus bellicosus</i>	Martial Eagle	Accipitridae	EN	EN
<i>Polyboroides typus</i>	African Harrier-Hawk	Accipitridae		
<i>Prinia flavicans</i>	Black-chested Prinia	Cisticolidae		
<i>Prinia subflava</i>	Tawny-flanked Prinia	Cisticolidae		
<i>Prionops plumatus</i>	White-crested Helmetshrike	Vangidae		
<i>Pternistis adspersus</i>	Red-billed Spurfowl	Phasianidae		
<i>Pternistis natalensis</i>	Natal Spurfowl	Phasianidae		
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	Phasianidae		
<i>Pterocles bicinctus</i>	Double-banded Sandgrouse	Pteroclididae		
<i>Pterocles burchelli</i>	Burchell's Sandgrouse	Pteroclididae		
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	Pteroclididae	NT	LC
<i>Ptilopsis granti</i>	Southern White-faced Owl	Strigidae		
<i>Pycnonotus nigricans</i>	African Red-eyed Bulbul	Pycnonotidae		

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<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	Pycnonotidae		
<i>Pytilia melba</i>	Green-winged Pytilia	Estrildidae		
<i>Quelea quelea</i>	Red-billed Quelea	Ploceidae		
<i>Rhinopomastus cyanomelas</i>	Common Scimitarbill	Phoeniculidae		
<i>Rhinoptilus africanus</i>	Double-banded Courser	Glareolidae		
<i>Rhinoptilus chalcopterus</i>	Bronze-winged Courser	Glareolidae		
<i>Riparia paludicola</i>	Brown-throated Martin	Hirundinidae		
<i>Sarkidiornis melanotos</i>	Knob-billed Duck	Anatidae	NT	LC
<i>Scopus umbretta</i>	Hamerkop	Scopidae	NT	LC
<i>Spilopelia senegalensis</i>	Laughing Dove	Columbidae		
<i>Sporopipes squamifrons</i>	Scaly-feathered Weaver	Ploceidae		
<i>Streptopelia capicola</i>	Ring-necked Dove	Columbidae		
<i>Streptopelia semitorquata</i>	Red-eyed Dove	Columbidae		
<i>Struthio camelus</i>	Common Ostrich	Struthionidae		
<i>Sylvietta rufescens</i>	Long-billed Crombec	Macrosphenidae		
<i>Tachybaptus ruficollis</i>	Little Grebe	Podicipedidae		
<i>Tadorna cana</i>	South African Shelduck	Anatidae		
<i>Tchagra australis</i>	Brown-crowned Tchagra	Malaconotidae		
<i>Tchagra senegalus</i>	Black-crowned Tchagra	Malaconotidae		
<i>Terpsiphone viridis</i>	African Paradise Flycatcher	Monarchidae		
<i>Thamnolaea cinnamomeiventris</i>	Mocking Cliff Chat	Muscicapidae		
<i>Tockus leucomelas</i>	Southern Yellow-billed Hornbill	Bucerotidae		
<i>Tockus rufirostris</i>	Southern Red-billed Hornbill	Bucerotidae		
<i>Torgos tracheliotos</i>	Lappet-faced Vulture	Accipitridae	CR	EN
<i>Trachyphonus vaillantii</i>	Crested Barbet	Lybiidae		
<i>Treron calvus</i>	African Green Pigeon	Columbidae		
<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	Lybiidae		
<i>Tringa glareola</i>	Wood Sandpiper	Scolopacidae		
<i>Tringa nebularia</i>	Common Greenshank	Pycnonotidae		
<i>Turdoides bicolor</i>	Southern Pied Babbler	Leiotherichidae		
<i>Turdoides jardineii</i>	Arrow-marked Babbler	Leiotherichidae		
<i>Turdus libonyana</i>	Kurrichane Thrush	Turdidae		
<i>Turdus litsitsirupa</i>	Groundscraper Thrush	Turdidae		
<i>Turdus smithi</i>	Karoo Thrush	Turdidae	NE	
<i>Turnix sylvaticus</i>	Common Buttonquail	Turnicidae		
<i>Turtur chalcospilos</i>	Emerald-spotted Wood Dove	Columbidae		
<i>Tyto alba</i>	Western Barn Owl	Strigidae		
<i>Upupa africana</i>	African Hoopoe	Upupidae		
<i>Uraeginthus angolensis</i>	Blue Waxbill	Estrildidae		

<i>Urocolius indicus</i>	Red-faced Mousebird	Coliidae	
<i>Urolestes melanoleucus</i>	Magpie Shrike	Laniidae	
<i>Vanellus armatus</i>	Blacksmith Lapwing	Charadriidae	
<i>Vanellus coronatus</i>	Crowned Lapwing	Charadriidae	
<i>Vanellus senegallus</i>	African Wattled Lapwing	Charadriidae	
<i>Vidua chalybeata</i>	Village Indigobird	Viduidae	
<i>Vidua macroura</i>	Pin-tailed Whydah	Viduidae	
<i>Vidua paradisaea</i>	Long-tailed Paradise Whydah	Viduidae	
<i>Vidua purpurascens</i>	Purple Indigobird	Viduidae	
<i>Vidua regia</i>	Shaft-tailed Whydah	Viduidae	
<i>Zapornia flavirostra</i>	Black Crake	Rallidae	
<i>Zosterops virens</i>	Cape White-eye	Zosteropidae	NE

9.5 Appendix E: Species observed in the First Survey

Common Name	Scientific Name
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>
African Grey Hornbill	<i>Lophoceros nasutus</i>
African Harrier-Hawk	<i>Polyboroides typus</i>
African Hoopoe	<i>Upupa africana</i>
African Paradise Flycatcher	<i>Terpsiphone viridis</i>
African Red-eyed Bulbul	<i>Pycnonotus nigricans</i>
Arrow-marked Babbler	<i>Turdoides jardineii</i>
Barred Wren-Warbler	<i>Calamonastes fasciolatus</i>
Bearded Woodpecker	<i>Chloropicus namaquus</i>
Black Cuckoo	<i>Cuculus clamosus</i>
Black-backed Puffback	<i>Dryoscopus cubla</i>
Black-headed Oriole	<i>Oriolus larvatus</i>
Blacksmith Lapwing	<i>Vanellus armatus</i>
Blue Waxbill	<i>Uraeginthus angolensis</i>
Blue-cheeked Bee-eater	<i>Merops persicus</i>
Brown-crowned Tchagra	<i>Tchagra australis</i>
Brubru	<i>Nilaus afer</i>
Burchell's Starling	<i>Lamprotornis australis</i>
Burnt-necked Eremomela	<i>Eremomela usticollis</i>
Cape Starling	<i>Lamprotornis nitens</i>
Cape White-eye	<i>Zosterops virens</i>
Chestnut-vented Warbler	<i>Curruca subcoerulea</i>
Chinspot Batis	<i>Batis molitor</i>
Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>
Common Myna	<i>Acridotheres tristis</i>
Common Scimitarbill	<i>Rhinopomastus cyanomelas</i>

Common Swift	<i>Apus apus</i>
Crested Barbet	<i>Trachyphonus vaillantii</i>
Crested Francolin	<i>Dendroperdix sephaena</i>
Crimson-breasted Shrike	<i>Laniarius atrococcineus</i>
Crowned Lapwing	<i>Vanellus coronatus</i>
Diederik Cuckoo	<i>Chrysococcyx caprius</i>
Egyptian Goose	<i>Alopochen aegyptiaca</i>
Emerald-spotted Wood Dove	<i>Turtur chalcospilos</i>
European Bee-eater	<i>Merops apiaster</i>
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>
Golden-breasted Bunting	<i>Emberiza flaviventris</i>
Golden-tailed Woodpecker	<i>Campethera abingoni</i>
Green Wood Hoopoe	<i>Phoeniculus purpureus</i>
Grey Go-away-bird	<i>Corythaixoides concolor</i>
Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>
Grey-headed Bushshrike	<i>Malaconotus blanchoti</i>
Groundscraper Thrush	<i>Turdus litsitsirupa</i>
Hadada Ibis	<i>Bostrychia hagedash</i>
Helmeted Guineafowl	<i>Numida meleagris</i>
Jacobin Cuckoo	<i>Clamator jacobinus</i>
Klaas's Cuckoo	<i>Chrysococcyx klaas</i>
Laughing Dove	<i>Spilopelia senegalensis</i>
Lesser Grey Shrike	<i>Lanius minor</i>
Lesser Masked Weaver	<i>Ploceus intermedius</i>
Lesser Striped Swallow	<i>Cecropis abyssinica</i>
Levaillant's Cuckoo	<i>Clamator levaillantii</i>
Lilac-breasted Roller	<i>Coracias caudatus</i>
Little Bee-eater	<i>Merops pusillus</i>
Long-billed Crombec	<i>Sylvietta rufescens</i>
Marico Flycatcher	<i>Melaenornis mariquensis</i>
Monotonous Lark	<i>Mirafra passerina</i>
Namaqua Dove	<i>Oena capensis</i>
Natal Spurfowl	<i>Pternistis natalensis</i>
Neddicky	<i>Cisticola fulvicapilla</i>
Orange-breasted Bushshrike	<i>Chlorophoneus sulfureopectus</i>
Pearl-spotted Owlet	<i>Glaucidium perlatum</i>
Purple Roller	<i>Coracias naevius</i>
Rattling Cisticola	<i>Cisticola chiniana</i>
Red-backed Shrike	<i>Lanius collurio</i>
Red-billed Buffalo Weaver	<i>Bubalornis niger</i>
Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>
Red-billed Quelea	<i>Quelea quelea</i>
Red-chested Cuckoo	<i>Cuculus solitarius</i>

Red-crested Korhaan	<i>Lophotis ruficrista</i>
Red-eyed Dove	<i>Streptopelia semitorquata</i>
Red-faced Mousebird	<i>Urocolius indicus</i>
Ring-necked Dove	<i>Streptopelia capicola</i>
Southern Black Tit	<i>Melaniparus niger</i>
Southern Grey-headed Sparrow	<i>Passer diffusus</i>
Southern Yellow-billed Hornbill	<i>Tockus leucomelas</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Swainson's Spurfowl	<i>Pternistis swainsonii</i>
Swallow-tailed Bee-eater	<i>Merops hirundineus</i>
Tawny-flanked Prinia	<i>Prinia subflava</i>
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>
Violet-backed Starling	<i>Cinnyricinclus leucogaster</i>
Wattled Starling	<i>Creatophora cinerea</i>
White-bellied Sunbird	<i>Cinnyris talatala</i>
White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Woodland Kingfisher	<i>Halcyon senegalensis</i>
Yellow-fronted Canary	<i>Crithagra mozambica</i>

9.6 Appendix F: Species observed in the Second Survey

Common Name	Scientific Name
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>
African Grey Hornbill	<i>Lophoceros nasutus</i>
African Harrier-Hawk	<i>Polyboroides typus</i>
African Hoopoe	<i>Upupa africana</i>
African Red-eyed Bulbul	<i>Pycnonotus nigricans</i>
African Stonechat	<i>Saxicola torquatus</i>
Arrow-marked Babbler	<i>Turdoides jardineii</i>
Ashy Tit	<i>Melaniparus cinerascens</i>
Barred Wren-Warbler	<i>Calamonastes fasciolatus</i>
Bearded Woodpecker	<i>Chloropicus namaquus</i>
Black Crake	<i>Zapornia flavirostra</i>
Black-backed Puffback	<i>Dryoscopus cubla</i>
Black-faced Waxbill	<i>Brunhilda erythronotos</i>
Black-headed Oriole	<i>Oriolus larvatus</i>
Blacksmith Lapwing	<i>Vanellus armatus</i>
Black-winged Kite	<i>Elanus caeruleus</i>
Blue Waxbill	<i>Uraeginthus angolensis</i>
Brown-crowned Tchagra	<i>Tchagra australis</i>

Brubru	<i>Nilaus afer</i>
Burchell's Coucal	<i>Centropus burchellii</i>
Burchell's Starling	<i>Lamprotornis australis</i>
Cape Starling	<i>Lamprotornis nitens</i>
Chestnut-backed Sparrow-lark	<i>Eremopterix leucotis</i>
Chestnut-vented Warbler	<i>Curruca subcoerulea</i>
Chin-spot Batis	<i>Batis molitor</i>
Common Buttonquail	<i>Turnix sylvaticus</i>
Common Scimitarbill	<i>Rhinopomastus cyanomelas</i>
Crested Barbet	<i>Trachyphonus vaillantii</i>
Crested Francolin	<i>Dendroperdix sephaena</i>
Crimson-breasted Shrike	<i>Laniarius atrococcineus</i>
Crowned Lapwing	<i>Vanellus coronatus</i>
Egyptian Goose	<i>Alopochen aegyptiaca</i>
Emerald-spotted Wood Dove	<i>Turtur chalcospilos</i>
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>
Golden-breasted Bunting	<i>Emberiza flaviventris</i>
Golden-tailed Woodpecker	<i>Campethera abingoni</i>
Green Wood Hoopoe	<i>Phoeniculus purpureus</i>
Green-winged Pytilia	<i>Pytilia melba</i>
Grey Go-away-bird	<i>Corythaixoides concolor</i>
Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>
Grey-headed Bushshrike	<i>Malaconotus blanchoti</i>
Helmeted Guineafowl	<i>Numida meleagris</i>
Laughing Dove	<i>Spilopelia senegalensis</i>
Lilac-breasted Roller	<i>Coracias caudatus</i>
Little Grebe	<i>Tachybaptus ruficollis</i>
Long-billed crombec	<i>Sylvietta rufescens</i>
Long-tailed Paradise Whydah	<i>Vidua paradisaea</i>
Magpie Shrike	<i>Urolestes melanoleucus</i>
Namaqua Dove	<i>Oena capensis</i>
Natal Spurfowl	<i>Pternistis natalensis</i>
Neddicky	<i>Cisticola fulvicapilla</i>
Pearl-spotted Owlet	<i>Glaucidium perlatum</i>
Pied Crow	<i>Corvus albus</i>
Quailfinch	<i>Ortygospiza atricollis</i>
Rattling Cisticola	<i>Cisticola chiniana</i>
Red-billed Buffalo Weaver	<i>Bubalornis niger</i>
Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>
Red-billed Quelea	<i>Quelea quelea</i>
Red-billed Teal	<i>Anas erythrorhyncha</i>
Red-crested Korhaan	<i>Lophotis ruficrista</i>
Red-eyed Dove	<i>Streptopelia semitorquata</i>

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Red-faced Mousebird	<i>Urocolius indicus</i>	
Red-headed Weaver	<i>Anaplectes rubriceps</i>	
Ring-necked Dove	<i>Streptopelia capicola</i>	
Southern Black Tit	<i>Melaniparus niger</i>	
Southern Grey-headed Sparrow	<i>Passer diffusus</i>	
Southern Masked Weaver	<i>Ploceus velatus</i>	
Southern Pied Babbler	<i>Turdoides bicolor</i>	
Southern Red Bishop	<i>Euplectes orix</i>	
Southern Red-billed Hornbill	<i>Tockus rufirostris</i>	
Southern White-crowned Shrike	<i>Eurocephalus anguitimens</i>	
Southern Yellow-billed Hornbill		#N/A
Southern Yellow-billed Hornbill	<i>Tockus leucomelas</i>	
Speckled Pigeon	<i>Columba guinea</i>	
Spotted Thick-knee	<i>Burhinus capensis</i>	
Swainson's Spurfowl	<i>Pternistis swainsonii</i>	
Tawny-flanked Prinia	<i>Prinia subflava</i>	
Violet-eared Waxbill	<i>Granatina granatina</i>	
White-bellied Sunbird	<i>Cinnyris talatala</i>	
White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>	
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	
White-crested Helmetshrike	<i>Prionops plumatus</i>	
White-faced Whistling Duck	<i>Dendrocygna viduata</i>	
White-throated Robin	<i>Irania gutturalis</i>	
White-throated Robin-chat	<i>Cossypha humeralis</i>	
Yellow-fronted Canary	<i>Crithagra mozambica</i>	
Yellow-throated Sandgrouse	<i>Pterocles gutturalis</i>	

9.7 Appendix I: Specialist Declaration of Independence

I, Lindi Steyn, declare that:

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



Dr Lindi Steyn

Ecologist

The Biodiversity Company

July 2025

9.8 Appendix J – Specialist CVs

Avialable on request