Avifauna Impact Assessment for the proposed proposed Bushveld Vametco's Phase 2 Solar PV Park Project

Brits, North West Province.

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CLIENT

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Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

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List of Acronyms and Abbreviations

%	**Percent**
ADU	Animal Demography Unit
BESS	Battery Energy Storage System
BI	Biodiversity Importance
CAR	Coordinated Avifaunal Roadcounts
CBA	Critical Biodiversity Area
CI	Conservation Importance
CR	Critically Endangered
CWAC	Coordinated Waterbird Counts
DC	Direct Current
EAP	Environmental Assessment Practitioner
EGI	Electricity Grid Infrastructure
EI	Ecological Importance
EIA	Environmental Impact Assessment
EMPr	Environmental Management Plan report
EN	Endangered
EOO	Extent of occurrence
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FFG	Functional Feeding Guild
FI	Functional Integrity
GIS	Geographic Information Systems
ha	hectares
IBA	Important Bird and Biodiversity Area
KBA	Key Biodiversity Area
km	kilometres
kV	kilo Volt
LC	Least Concern
m	metres
m^2	square metres
MTS	Main Transmission Substation
MW	Mega Watt
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem priority Areas
NPAES	National Protected Areas Expansion Strategy
NT	Near Threatened
ONA	Other Natural Areas
PAOI	Project Area of Influence
PV	Photo Voltaic
REDZ	Renewable Energy Development Zones
REEA	Renewable Energy EIA Application
RR	Receptor Resilience
SABAP2	South African Bird Atlas Project 2
SACAD	South African Conservation Areas Database
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SANBI	South African National Biodiversity Institute
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern

SEI	Site ecological Importance
TBC	The Biodiversity Company
V	Volt
VU	Vulnerable

1 Introduction

The Biodiversity Company was appointed to undertake an avifauna site verification report for the proposed Vametco Solar facility project near Brits, North West Province. The project area of interest (PAOI) consists of the footprint area provided by Nsovo Environmental (Figure 1-1).

The National Web-based Environmental Screening Tool (Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended) indicated that the Animal Species Theme Sensitivity was rated as 'Medium' due to the possible presence of Species of Conservation Concern. Accordingly, The Biodiversity Company was sub-contracted to undertake an Avifauna Impact Assessment to inform on the impact of the proposed PV to the avifauna community within the receiving environment. 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). Based on the size of the PV and the risk associated with it, a Regime 2 assessment was recommended (BirdLife South Africa, 2017). This report deals with only the first survey of a regime 2 assessment.

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

1.1 Project Description

The following description is as per Nsovo Environmental (2023):

The Vametco Phase 2 Renewable Energy Facility builds upon the foundational concepts established in Phase 1 of the project, which encompasses a 3.5 MW solar photovoltaic (PV) plant and a 1 MW / 4 MWh Vanadium Redox Flow Battery (VRFB). Phase 2 of the project is dedicated to the development of a solar PV plant with a potential capacity of up to 400 MWp and a battery energy storage system (BESS) facility with a capacity of up to 200 MW / 800 MWh. To accommodate this expansion, a 400-hectare land parcel located to the north of the Vametco mine was carefully selected. The choice of this location was primarily influenced by the availability of land, in consideration of future mining expansion plans, and the advantageous fact that the land is situated within the mining rights leased area.

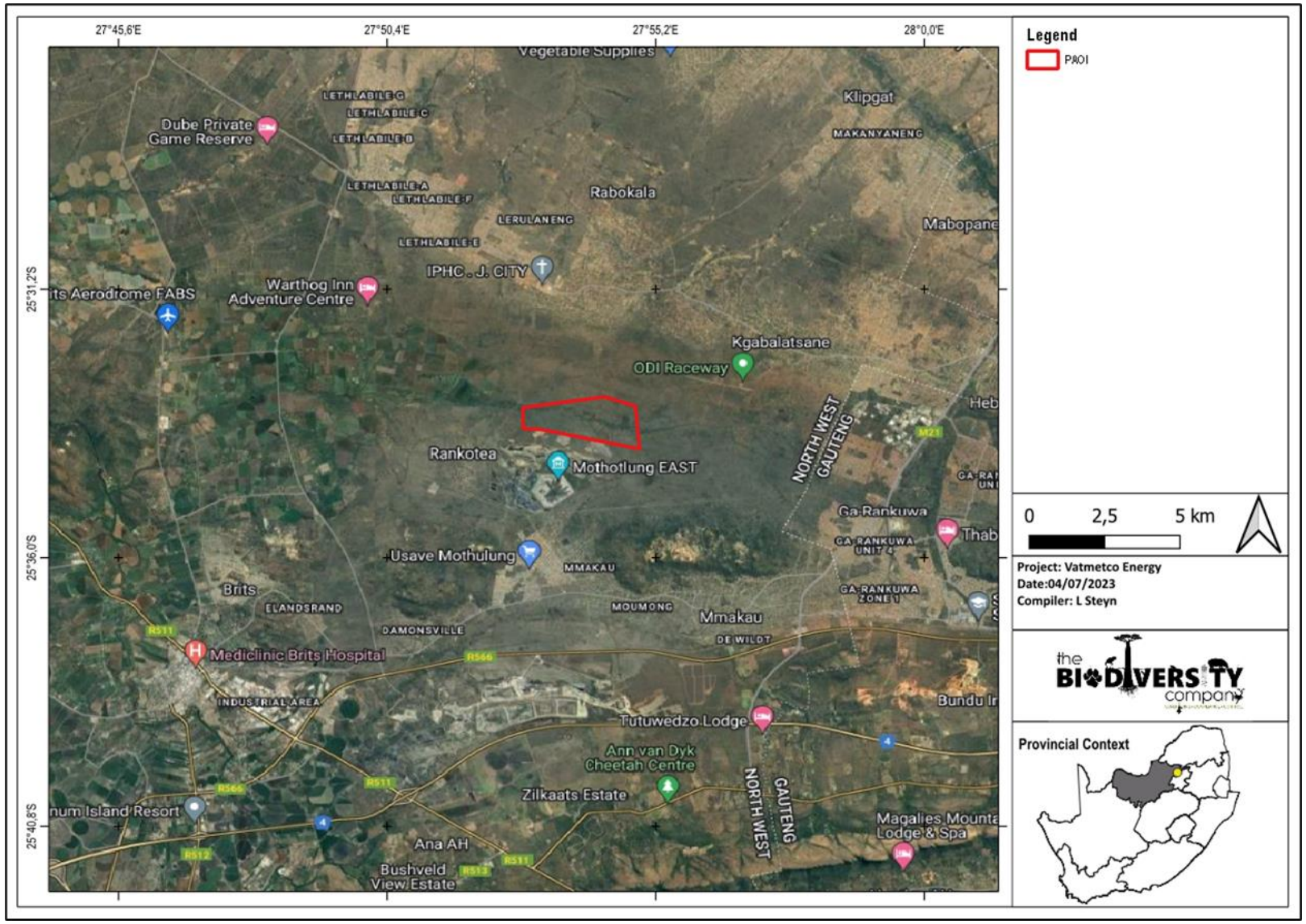


Figure 1-1 Map illustrating the location of the proposed PV Project in relation to the nearby towns.

1.2 Proposed Activities

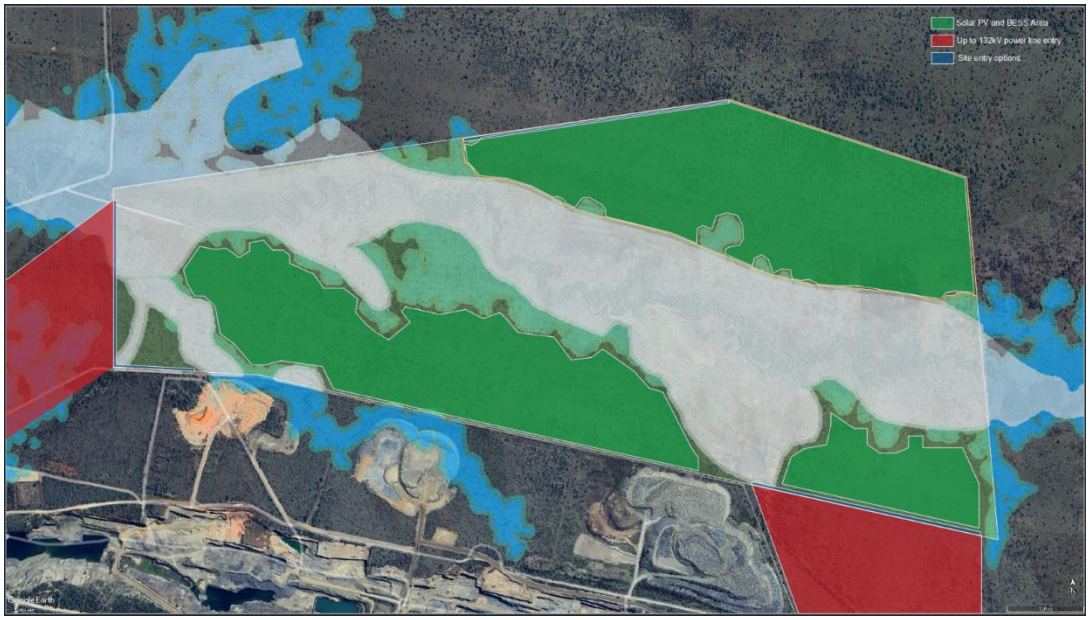
The Vametco Hybrid Mini Grid project comprises the following key components:

- Inverters and Transformers
- Up to 132 kV Transmission Lines and Transmission Towers
- BESS up to 800 MWh (note electrolyte and height requirements)
- Cabling Between Project Components
- Access and Internal Roads
- On-Site Facility Substation
- Borehole for Water Supply
- Telecommunications Mast
- O&M Buildings
- Car Park
- Security, Perimeter Fencing, and Access Control
- Temporary Offices and Construction Yard
- Water and Sewage Pipelines
- Temporary Laydown Area

1.3 Site Layout Considerations

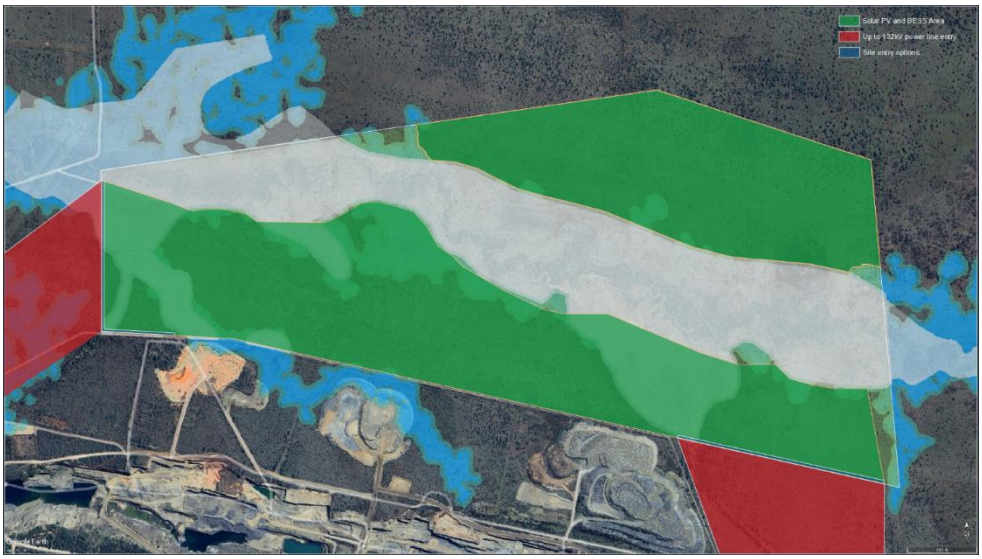
Option 1

The viability of the project is notably impacted by the limited size of the site, which is further complicated by its division into three sub-areas. This division necessitates the establishment of multiple substations, connections between sites, and the construction of additional roadways and bridges.

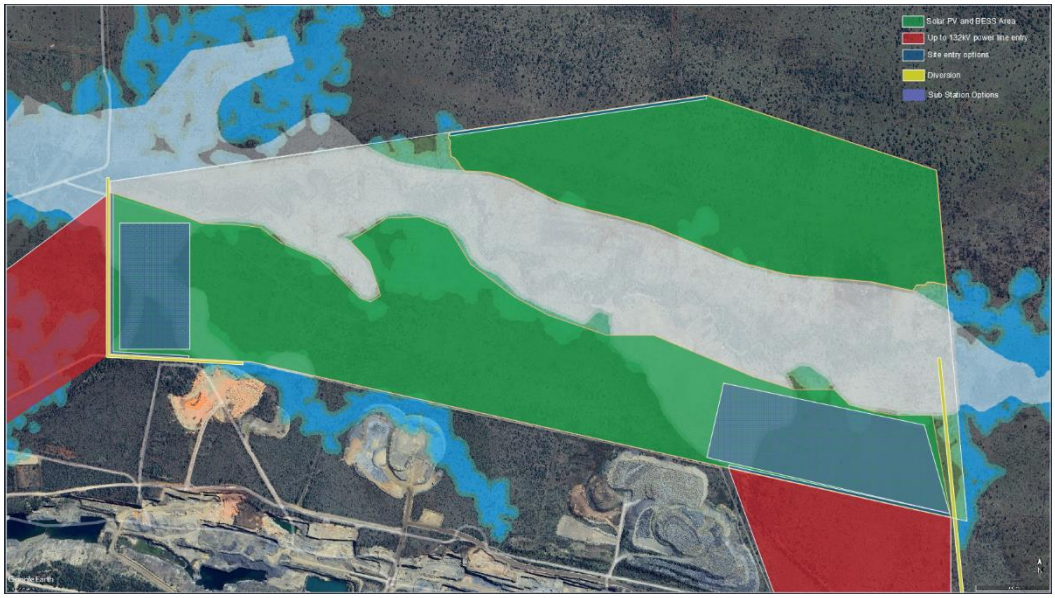


Option 2

The figure below illustrates Option 2, which strategically avoids the primary wetland/river area. It should be note that this option introduces its own set of challenges, including the construction of a bridge and the need to navigate areas designated as wetlands.



Option 3, below, includes the diversion of the sewerage spillway to the south of the site and redirects a smaller stream to the west. Additionally, this option excludes a smaller portion of the wetland area in the central-western region, effectively minimizing the environmental impact on crucial wetland areas. Access to the site will be facilitated by a road to the north, leveraging existing road infrastructure and eliminating the need for a bridge.



All Options are viable only if the management measures including ensuring the construction footprint is kept small and industry-standard and mitigations are put into place for solar panels, fencing and electrical infrastructure, among other measures.

1.4 Scope of Work and Terms of Reference

The assessment was achieved under the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of NEMA ("the Protocols") promulgated in GN No. 320 of 20 March 2020. Where no specific environmental theme protocol has been prescribed, the level of assessment must be based on the findings of the site verification and must comply with Appendix 6 of the EIA Regulations of 2014 (as amended), and the best-practice guidelines and principles for Avifaunal Impact Assessments within the context of PVs 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;
- 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.

1.5 Assumptions and Limitations

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

- This report deals with only the first survey of a regime 2 assessment. The first was conducted in winter, over 2 days from the 12th to the 13th of June 2023, and the second survey is required for the proposed Regime 2 development;
- The Project Area of Influence (PAOI) was based on the project footprint area as provided by the client. See section 2.1 of this report for additional details. Any alterations to the area and/or missing Geographic Information Systems (GIS) information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- Some areas of the PAOI were inaccessible and could not be surveyed during the site visit conducted. This is a significant gap that requires addressing prior to any environmental authorisation for the proposed development and associated complex.
- 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; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features delineated may be offset by up to 5 m.

1.6 Key Legislative Requirements

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

Table 1-1 A list of key legislative requirements relevant to biodiversity and conservation in the North West Province

Region	Legislation / Guideline
National	Constitution of the Republic of South Africa (Act No. 108 of 1996)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989)
	National Protected Areas Expansion Strategy (NPAES)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	National Water Act (NWA) (Act No. 36 of 1998)
	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations and, Alien and Invasive Species List 20142020, published under NEMBA
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
Provincial	North-West Biodiversity Sector Plan of 2015 (READ, 2015).

2 Definitions

2.1 Project Area of Influence (PAOI)

The Project Area of Influence (PAOI) encompasses the geographical extent of the potential impacts of the proposed development on the receiving environment. Essentially, the PAOI is defined according to the important ecosystem processes and functions that may be plausibly affected by the proposed development and its associated activities.

2.2 Species of Conservation Concern (SCC)

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

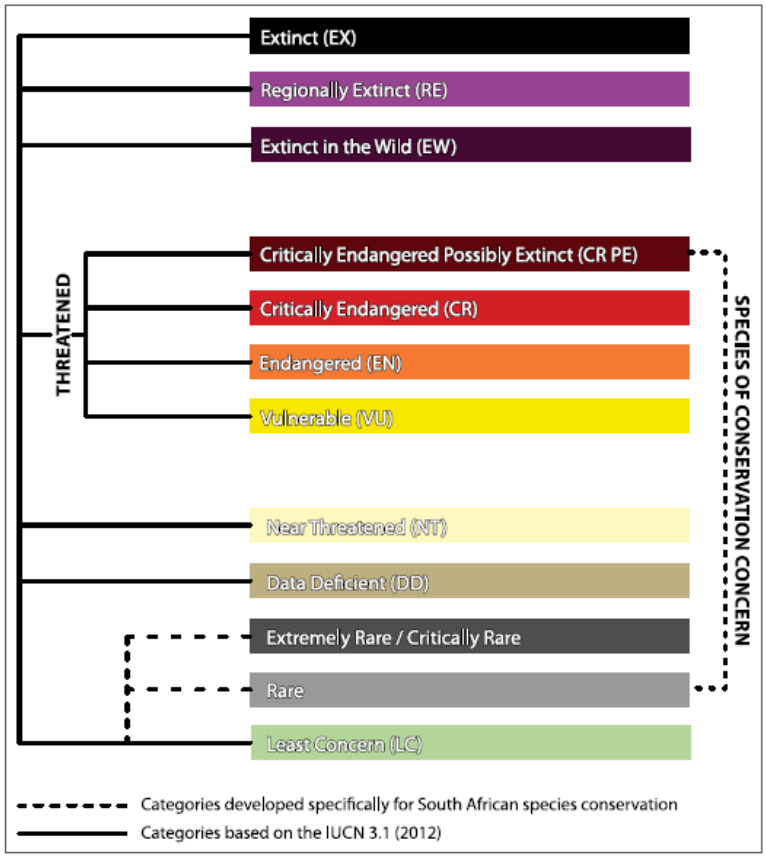


Figure 2-1 The different Species of Conservation Concern categories were modified from the IUCN's extinction risk categories. Source: SANBI (2020)

South Africa uses the internationally endorsed International Union for Conservation of Nature (IUCN) Red List Categories and Criteria (IUCN, 2021). This scientific system is designed to measure species' risk of extinction, and its purpose is to highlight those species that are in need of critical conservation action. As this system has been adopted from the IUCN, the definition of an SCC as described and categorised above is extended to all red list classifications relevant to fauna and the IUCN categories for this report.

2.3 Risk Species

Priority species are susceptible to impacts from energy developments (Ralston Paton *et al.* 2017). These species are typically susceptible to collisions. This list was developed initially for use with Wind Energy Facilities (Ralston Paton *et al.* 2017); however, the collision, electrocution and habitat loss risks are

considered appropriate for renewable energy developments and so are utilised here. Also utilised here is the Eskom and Endangered Wildlife Trust (EWT) poster: Birds and Powerlines (Eskom & EWT, no date), which identifies birds most prone to collision and electrocution from powerlines. Some birds are not included in these lists but are considered by the TBC avifauna specialists as risk species for collisions, electrocutions and habitat loss as a result of Solar PV infrastructure. All of species are referred to collectively in this report as "Risk Species".

3 Methods

3.1 Desktop Assessment

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

3.1.1 Ecologically Important Landscape Features

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

- Protected areas:

- South Africa Protected Areas Database (SAPAD) (DFFE, 2022) – The South African Protected Areas Database (SAPAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (DFFE, 2021) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Important Bird and Biodiversity Areas (BirdLife South Africa, 2022) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria;

- Coordinated Water Bird Counts (CWAC) – The Animal Demography Unit (ADU) launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part South Africa's commitment to international waterbird conservation. The primary aim of CWAC is to act as an effective long-term waterbird monitoring tool. This is being done by means of a programme of regular mid-summer and mid-winter censuses at several wetlands. The database is located at https://cwac.birdmap.africa/index.php.

- Coordinated Avifaunal Roadcounts (CAR) – The Coordinated Avifaunal Roadcounts (CAR) were pioneered in July 1993 in a joint Cape Bird Club/Animal Demography Unit (ADU) project to monitor the populations of two threatened species: *Anthropoides paradiseus* (Blue Crane) and *Neotis denhamii* (Denham's Bustard). Presently it monitors 36 species of large terrestrial birds along 350 fixed routes covering over 19 000 km using a standardised method.

- The North-West Department of Rural, Environment, and Agricultural Development (READ), as custodian of the environment in the North West, is the primary implementing agent of the Biodiversity Sector Plan. The spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by READ. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land use planning and decision-making guidelines (READ, 2015), and

- Hydrological Context
    - South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.,* 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.
    - National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al.,* 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

3.1.2 Expected Avifauna Species

The following resources were considered during the desktop assessment and for the compilation of the expected species list:

- South African Bird Atlas Project 2 (SABAP2). Full protocol data from 9 relevant pentads (2530_2745, 2530_2750, 2530_2755, 2535_2745, 2535_2750, 2535_2755, 2540_2740, 2540_2745, 2540_2750, 2540_2755) were used to compile the expected species list;
- Coordinated Water Bird Counts (CWAC) – The Animal Demography Unit (ADU) launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part of South Africa's commitment to international waterbird conservation. The primary aim of CWAC is to act as an effective long-term waterbird monitoring tool. This is done through a programme of regular mid-summer and mid-winter censuses at several wetlands. The database is located at https://cwac.birdmap.africa/index.php;
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- Hockey *et al*. (2005), Roberts Birds of Southern Africa (7th edition). The primary source for species identification, geographic range, and life history information;
- Sinclair and Ryan (2010), Birds of Africa South of the Sahara. Secondary source for identification; and
- Taylor *et al*. (2015), Eskom Red Data Book of Birds of South Africa, Lesotho, and Swaziland. Used for conservation status, nomenclature, and taxonomical ordering.

3.2 Field Survey

This report deals with only the first survey of a regime 2 assessment. The first was conducted in winter, over 2 days from the 12th to the 13th of June 2023, and the second survey is required for the proposed Regime 2 development and, therefore must be resurveyed before any development can commence. Sampling consisted of Standardised Point Counts as well as random diurnal incidental surveys. Standardised 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 utilised as it was demonstrated to outperform line routes (Cumming & Henry,

2019). Each point count was run over a 10-minute period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access (Figure 3-1).

Figure 3-1 Map illustrating the field survey area and locations of Standardised Point Counts for the proposed development PAOI

3.3 Data Analysis

The analyses described below only used the data collected from the Standardised Point Counts. Raw count data was converted to relative abundance values and used to establish dominant species and calculate the diversity of each habitat. Present, and potentially occurring species were assigned to 13 major trophic guilds loosely based on the classification system developed by González-Salazar *et al.* (2014). Species were first classified by their dominant diet (carnivore, herbivore, granivore, frugivore, nectarivore, omnivore), then by the medium upon / within which they most frequently forage (ground, water, foliage, air) and lastly by their activity period (nocturnal or diurnal).

3.4 Site Ecological Importance (SEI)

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

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

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 3-1 and Table 3-2, respectively.

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

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

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

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

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

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

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very High	High	Medium	Low	Very Low
Functional Integrity (FI)	Very High	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 3-4.

Table 3-4 Summary of Receptor Resilience (RR) criteria

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

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

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

Site Ecological Importance		Biodiversity Importance (BI)				
		Very high	High	Medium	Low	Very low
sReceptor 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 project is provided in Table 3-6.

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

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

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

3.5 Environmental Impact Assessment

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 3-7, Table 3-8 and Table 3-9. First, the impact is assigned a score based on Likelihood descriptors Probability and Sensitivity (Likelihood = Probability + Sensitivity) (Table 3-7), and then assigned a Severity rating based on Consequence descriptors Severity, Scope and Duration (Severity = Severity + Scope + Duration) (Table 3-8). Overall Consequence and Likelihood scores are then used to Determine the Significance Rating (Table 3-9).

Table 3-7 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 3-8 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 3-9 Environmental Impact Assessment: Significance Rating Matrix

	CONSEQUENCE (Severity + Spatial Scope + Duration)															
LIKELIHOOD (Probability of impact + Sensitivity of receiving environment)	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Absent
	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	301	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	High
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	Critical
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

4 Results & Discussion

4.1 Desktop Assessment

4.1.1 Ecologically Important Landscape Features

The following features describe the general area and habitat. This assessment is based on spatial data from various sources, such as the provincial environmental authority and SANBI. The desktop analysis and its relevance to this project are listed in Table 4-1.

Table 4-1 Summary of the relevance of the proposed development to ecologically important landscape features

Desktop Information Considered	Relevant/Irrelevant	Section
Biodiversity Spatial Plan	North West Conservation Plan The key output of a systematic biodiversity plan is a map of biodiversity priority areas. The CBA map delineates Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), Other Natural Areas (ONAs), Protected Areas (PAs), and areas that have been irreversibly modified from their natural state. **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. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017). **Ecological Support Areas (ESAs)** are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic (SANBI-BGIS, 2017). **Other Natural Areas (ONAs)** consist of all those areas in a good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (SANBI-BGIS, 2017). Irrelevant - The PAOI doesn't overlap any provincial conservation plan	4.1.1.1
Ecosystem Threat Status	Relevant - The proposed PAOI overlaps with an EN ecosystem	4.1.1.2
Ecosystem Protection Level	Relevant - The proposed PAOI project overlaps mainly with PP ecosystem	4.1.1.3
Protected Areas	Irrelevant -	4.1.1.4
National Protected Areas Expansion Strategy	Irrelevant - The PAOI doesn't overlap any NPAES areas	4.1.1.5
Important Bird and Biodiversity Areas	Irrelevant - The PAOI does not overlap with any IBA	4.1.1.6

Desktop Information Considered	Relevant/Irrelevant	Section
Coordinated Avifaunal Road Count	Irrelevant - The PAOI does not overlap with Coordinated Avifaunal Roadcount	4.1.1.7
Coordinated Waterbird Count	Irrelevant - The PAOI does not overlap with any Coordinated Waterbird Count	4.1.1.8
Strategic Water Source Areas	Irrelevant - The PAOI does not fall within any Strategic Water Source Areas	4.1.1.9
South African Inventory of Inland Aquatic Ecosystems	Irrelevant - The PAOI does not overlap with any threatened wetlands and	4.1.1.9
National Freshwater Priority Area	Relevant - The PAOI does not overlap with some FEPA wetlands	4.1.1.9
Powerline Corridor	Relevant - The PAOI does not overlap with any EGI corridor	4.1.1.10
Renewable Energy Development Zone (REDZ)	Irrelevant - The PAOI does not overlap with any REDZ	4.1.1.11
Renewable Energy EIA Application Database (REEA)	Relevant - The PAOI is in close proximity to already approved REEA project	4.1.1.12

4.1.1.1 North West Conservation Plan

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

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. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

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

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

Irrelevant - The PAOI doesn't overlap any provincial conservation plan (Figure 4-1).

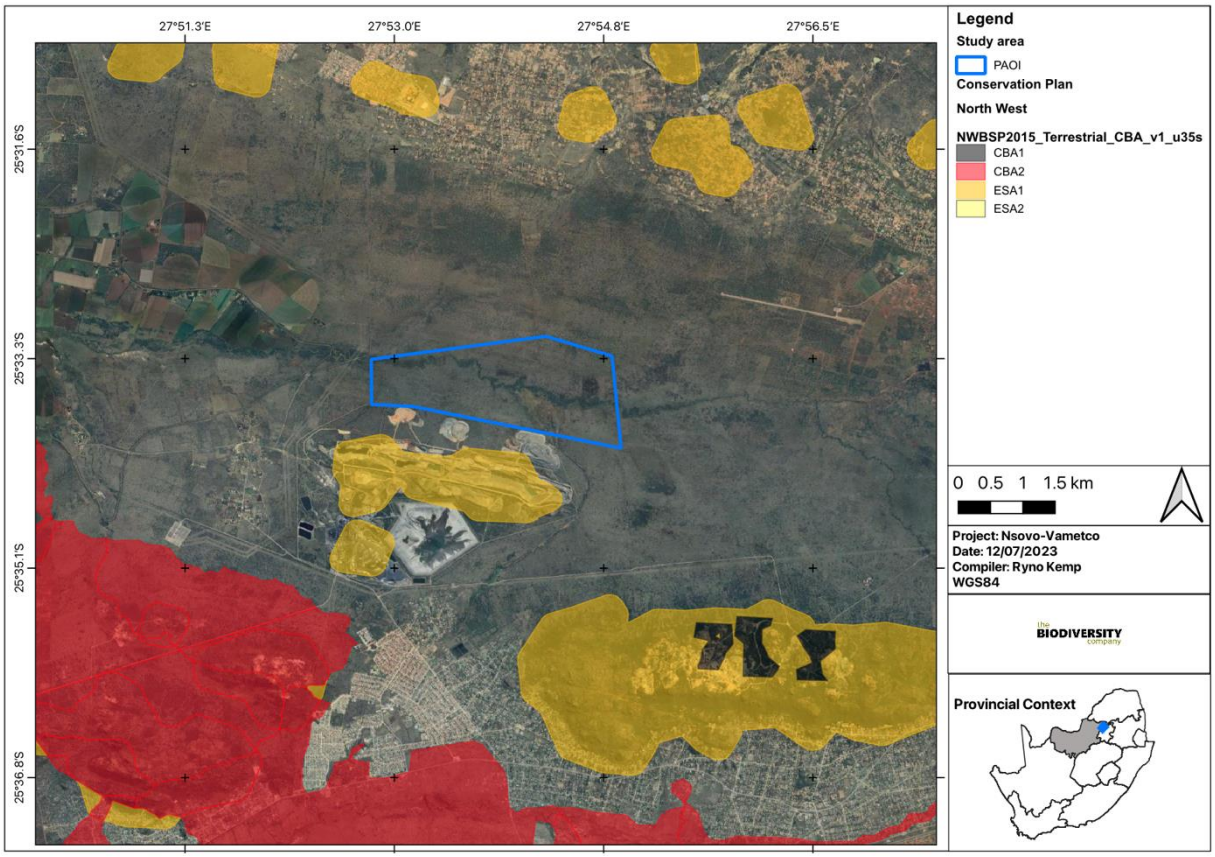

Figure 4-1 Map illustrating the location of Critical Biodiversity and Ecological Support Areas proximal to the Project Area of influence.

4.1.1.2 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's well-being 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. Relevant - The proposed PAOI overlaps with an EN ecosystem (Figure 4-2).

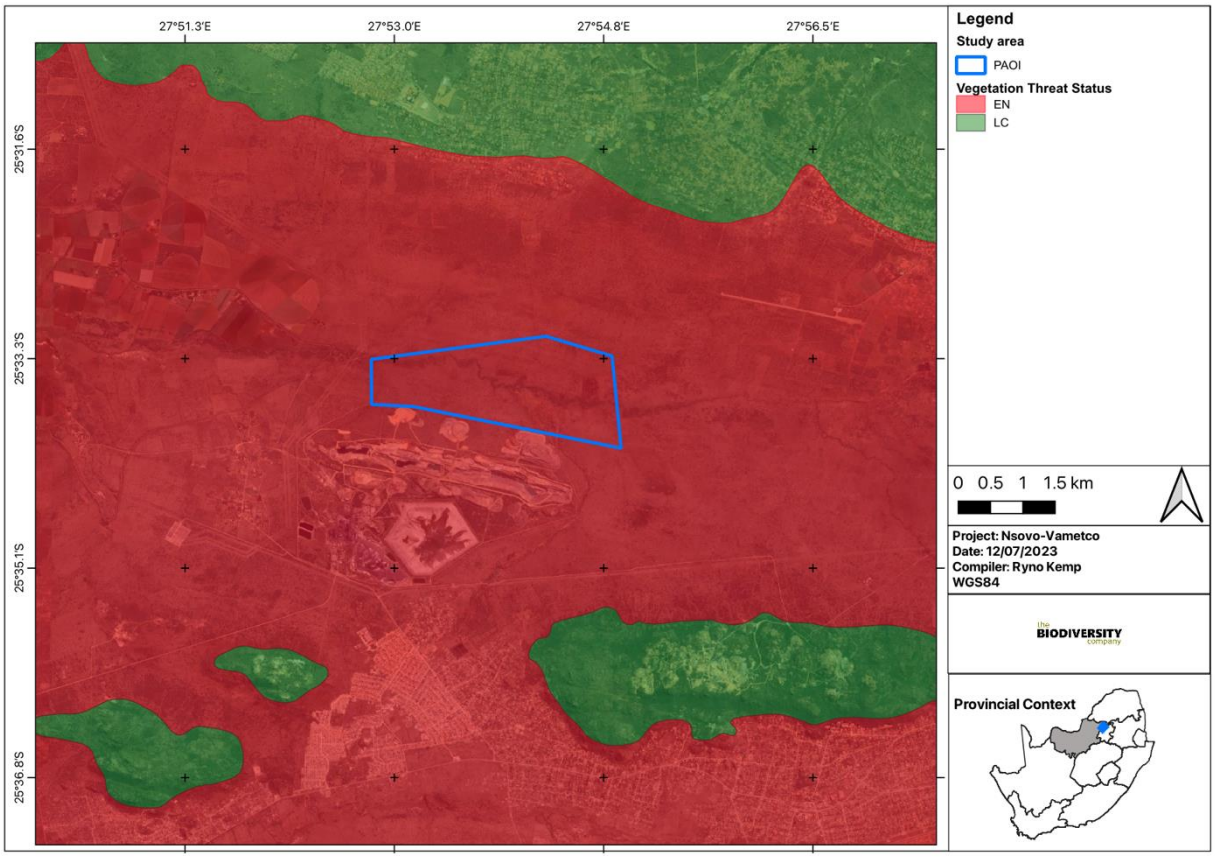

Figure 4-2 Map illustrating the ecosystem threat status associated with the PAOI.

4.1.1.3 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. Relevant - The proposed PAOI project overlaps mainly with PP ecosystem (Figure 4-3).

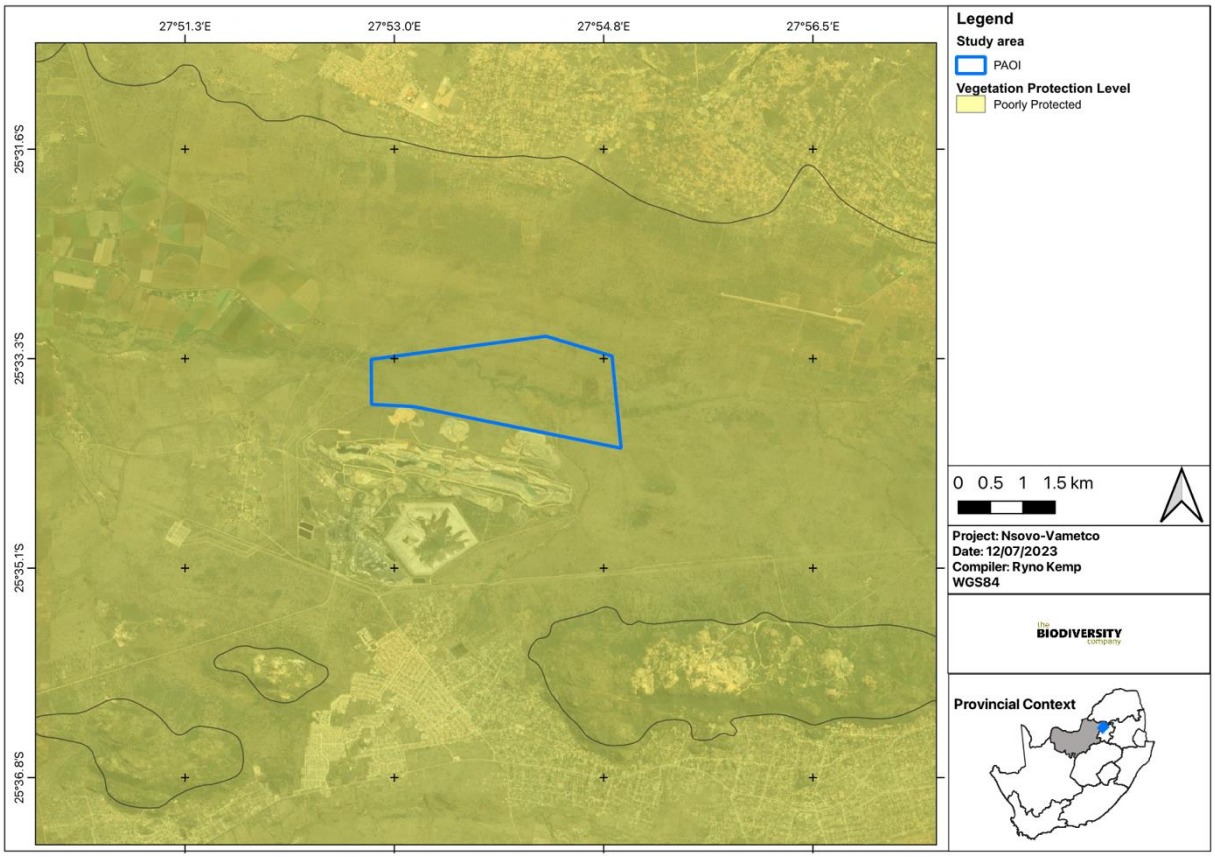

Figure 4-3 Map illustrating the ecosystem protection level associated with the PAOI

4.1.1.4 Protected Areas

According to the protected area spatial datasets from SAPAD (DFFE, 2022) and SACAD (DFFE, 2022). Irrelevant - The PAOI doesn't overlap any protected areas (Figure 4-4).

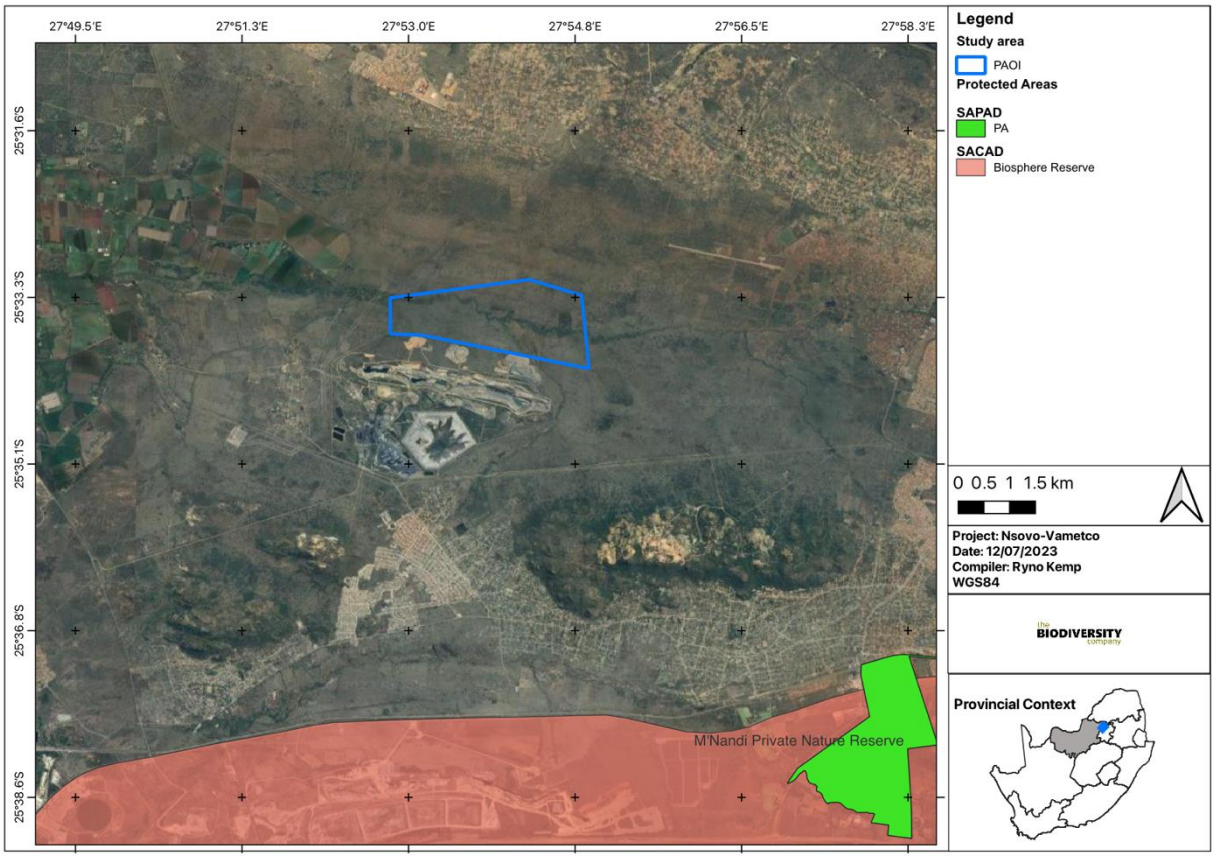

Figure 4-4 Map illustrating the Project Area of Influence (PAOI) in relation to Conservation and Protected Areas

4.1.1.5 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy (NPAES) areas were identified through a systematic biodiversity planning process. They presented the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases, only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine-scale planning, which may identify different priority sites based on local requirements, constraints and opportunities (DFFE, 2021). Irrelevant - The PAOI doesn't overlap any NPAES areas (Figure 4-5).

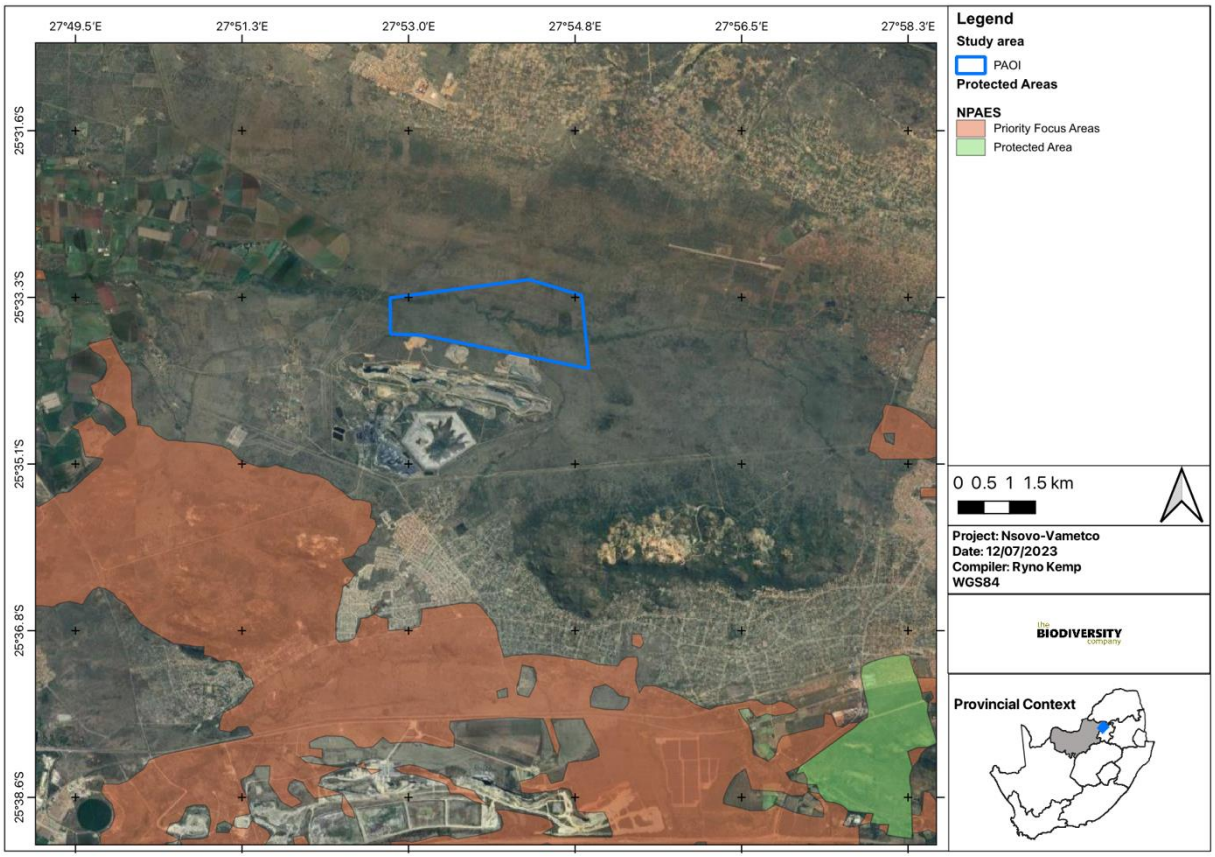

Figure 4-5 Map illustrating the Project Area of Influence (PAOI) in relation to NPAES Focus Areas

4.1.1.6 Important Bird and Biodiversity Area

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

According to Birdlife South Africa (2017), selecting IBAs is achieved by applying quantitative ornithological criteria grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among and enabling comparability between sites at national, continental and global levels. Irrelevant - The PAOI does not overlap with any IBA (Figure 4-6).

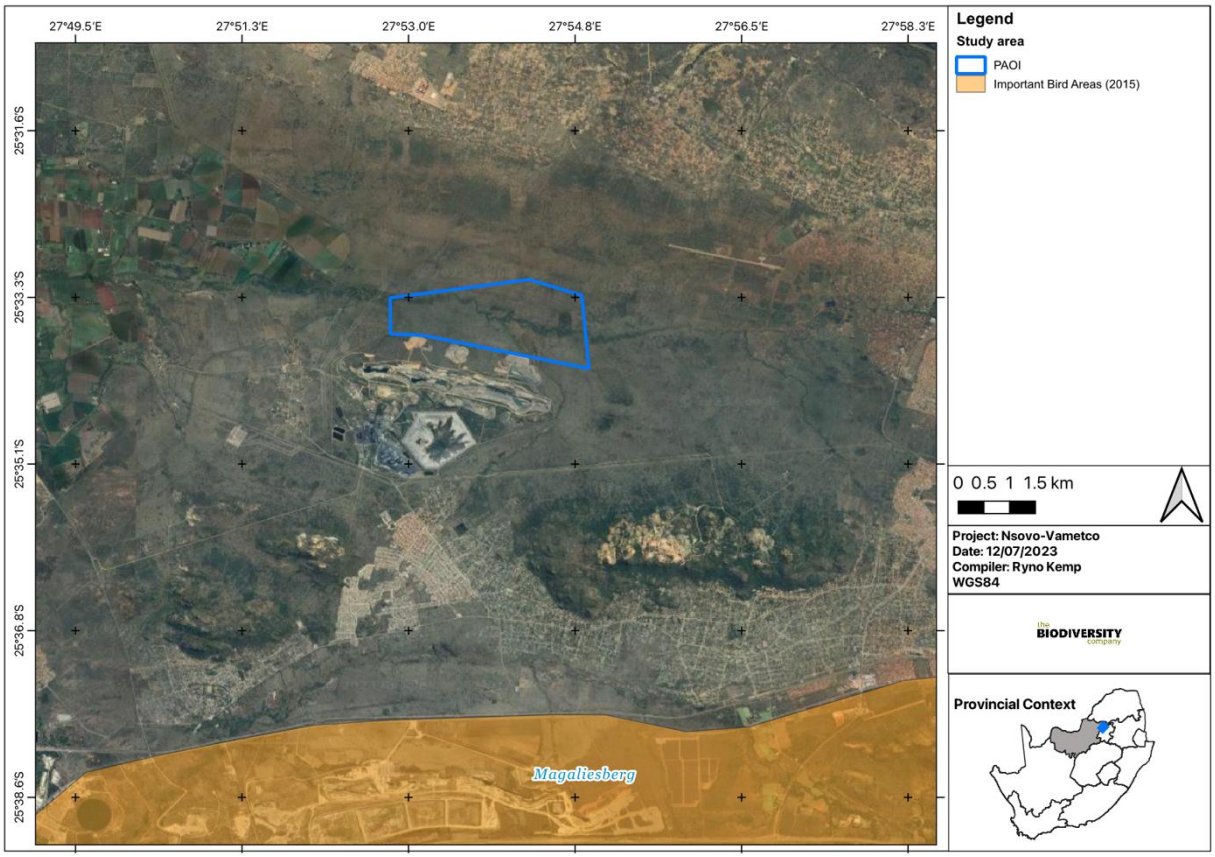

Figure 4-6 Map illustrating the locations of Important Bird and Biodiversity Areas proximal to the Project Area of Influence (PAOI)

4.1.1.7 Coordinated Avifaunal Roadcount (CAR)

The Animal Demographic Unit (ADU)/Cape bird club pioneered the avifaunal road counts of larger birds in 1993 in South Africa. Originally it was started to monitor the Blue Crane (*Anthropoides paradiseus*) and Denham's/Stanley's Bustard (*Neotis Denham*). Today it has been expanded to monitor 36 species of large terrestrial birds (cranes, bustards, korhaans and storks) along 350 fixed routes covering over 19 000 km. Road counts are carried out twice yearly in midsummer (the last Saturday in January) and midwinter (the last Saturday in July) using this standardised method. These counts are essential for conserving these larger species that are under threat due to habitat loss through land use changes, increases in crop agriculture and human population densities, poisoning, and man-made structures like powerlines. With the prospect of increasing wind and solar farms, using renewable energy sources and monitoring these species is most important (CAR, 2020). Irrelevant - The PAOI does not overlap with Coordinated Avifaunal Roadcount Routes.

4.1.1.8 Coordinated Waterbird Count

The ADU launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part of South Africa's commitment to international waterbird conservation. Regular mid-summer and mid-winter censuses are done to determine the various features of water birds, including population size, how waterbirds utilise water sources and determining the health of wetlands. For a full description of CWAC, please refer to http://cwac.birdmap.africa/about.php. Irrelevant - The PAOI does not overlap with any Coordinated Waterbird Count sites.

4.1.1.9 Hydrological Context

Irrelevant - The PAOI does not fall within any Strategic Water Source Areas (SWSA).

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. The ecosystem threat status (ETS) of the river and wetland ecosystem types is based on the extent to which each river ecosystem type has 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). Irrelevant - The PAOI does not overlap with any threatened wetlands and rivers (Figure 4-7).

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 are envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEMBA) biodiversity goals (Nel et al., 2011). Relevant - The PAOI does not overlap with some FEPA wetlands (Figure 4-8).

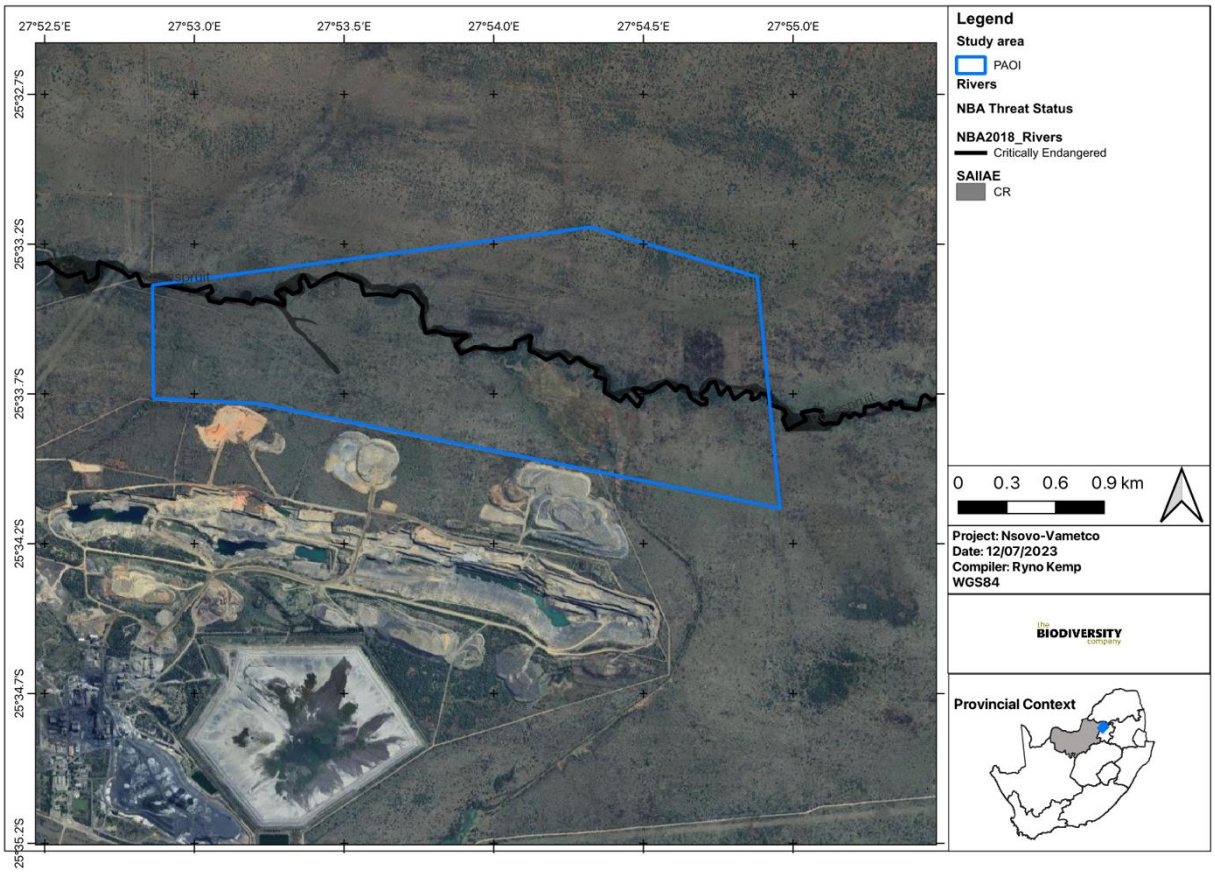

Figure 4-7 Map illustrating the Project Area of Influence (PAOI) in relation to South African Inventory of Inland Aquatic Ecosystems (SAIIAE) features

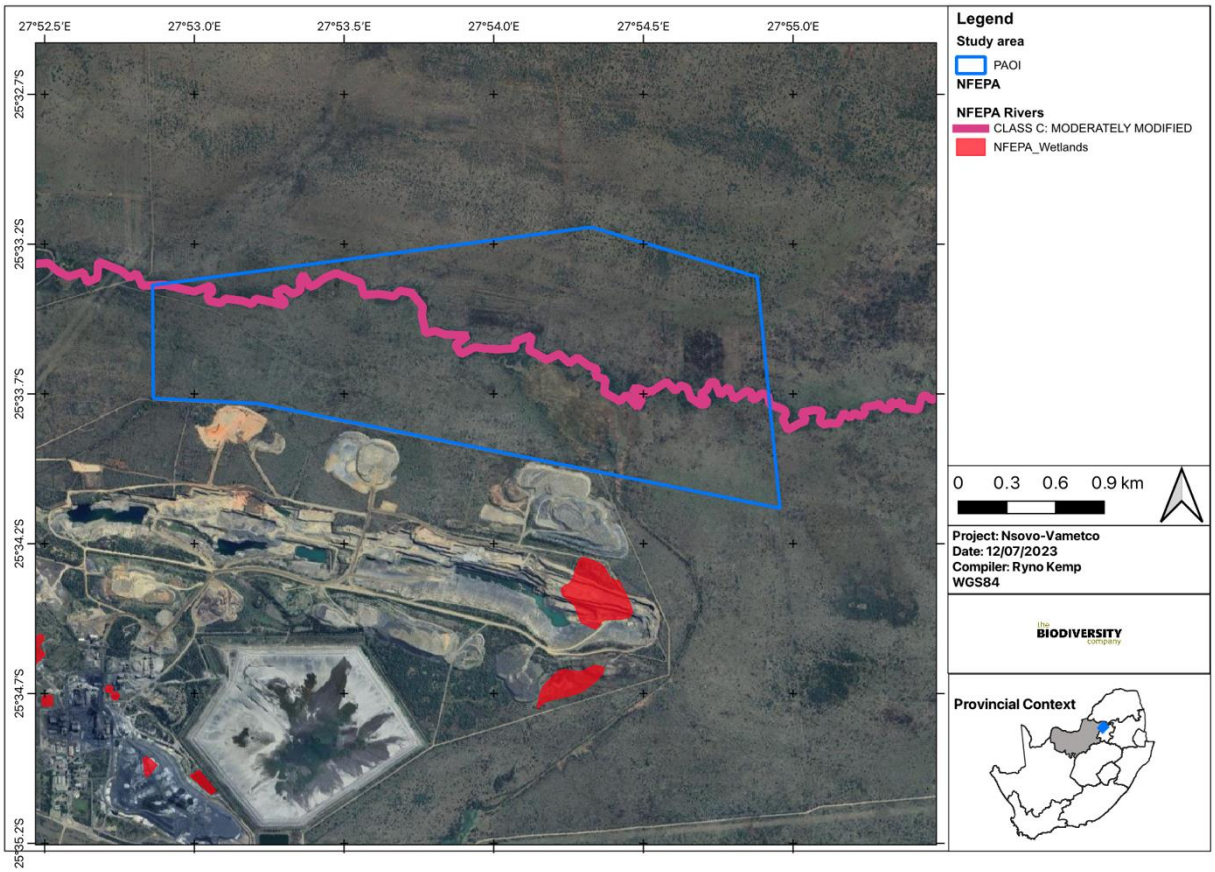

Figure 4-8 Map illustrating the Project Area of Influence (PAOI) in relation to the National Freshwater Ecosystem Priority Areas

4.1.1.10 Strategic Transmission Corridors (EGI)

On the 16 February 2018, Minister Edna Molewa published Government Notice No. 113 in Government Gazette No. 41445, which identified 5 strategic transmission corridors important for the planning of electricity transmission and distribution infrastructure as well as the procedure to be followed when applying for environmental authorisation for electricity transmission and distribution expansion when occurring in these corridors.

On 29 April 2021, Minister Barbara Dallas Creecy published Government Notice No. 383 in Government Gazette No. 44504, which expanded the eastern and western transmission corridors and gave notice of the applicability of the application procedures identified in Government Notice No. 113, to these expanded corridors. More information on this can be obtained from https://egis.environment.gov.za/egi. Relevant - The PAOI does not overlap with any EGI corridor. (Figure 4-9)

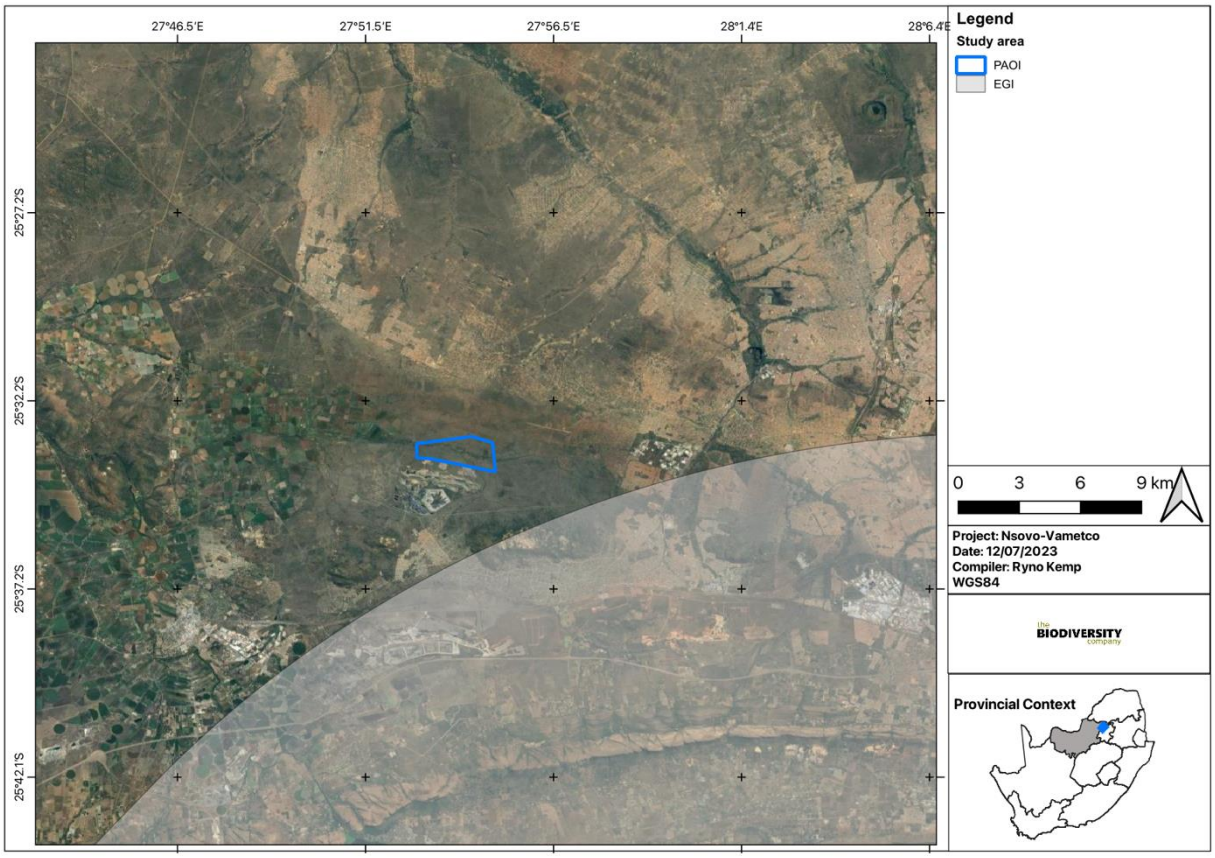

Figure 4-9 Map illustrating the locations of the Strategic Transmission Corridors proximal to the Project Area of Influence (PAOI)

4.1.1.11 Renewable Energy Development Zones (REDZ)

In 2018 the Government Notice No. 114 in Government Gazette No. 41445 was published where 8 renewable energy development zones important for the development of large-scale wind and solar photovoltaic facilities were identified. In 2021 an additional 3 sites were included. The REDZs were identified through the undertaking of 2 Strategic Environmental Assessments. Irrelevant - The PAOI does not overlap with any REDZ.

4.1.1.12 Renewable Energy EIA Application Database

The Renewable Energy Database (http://egis.environment.gov.za/), shows that there several other projects in the near vicinity (Figure 4-10). This increases the overall impact on the habitats in the area. Relevant - The PAOI is in close proximity to already approved REEA project (Figure 4-10).

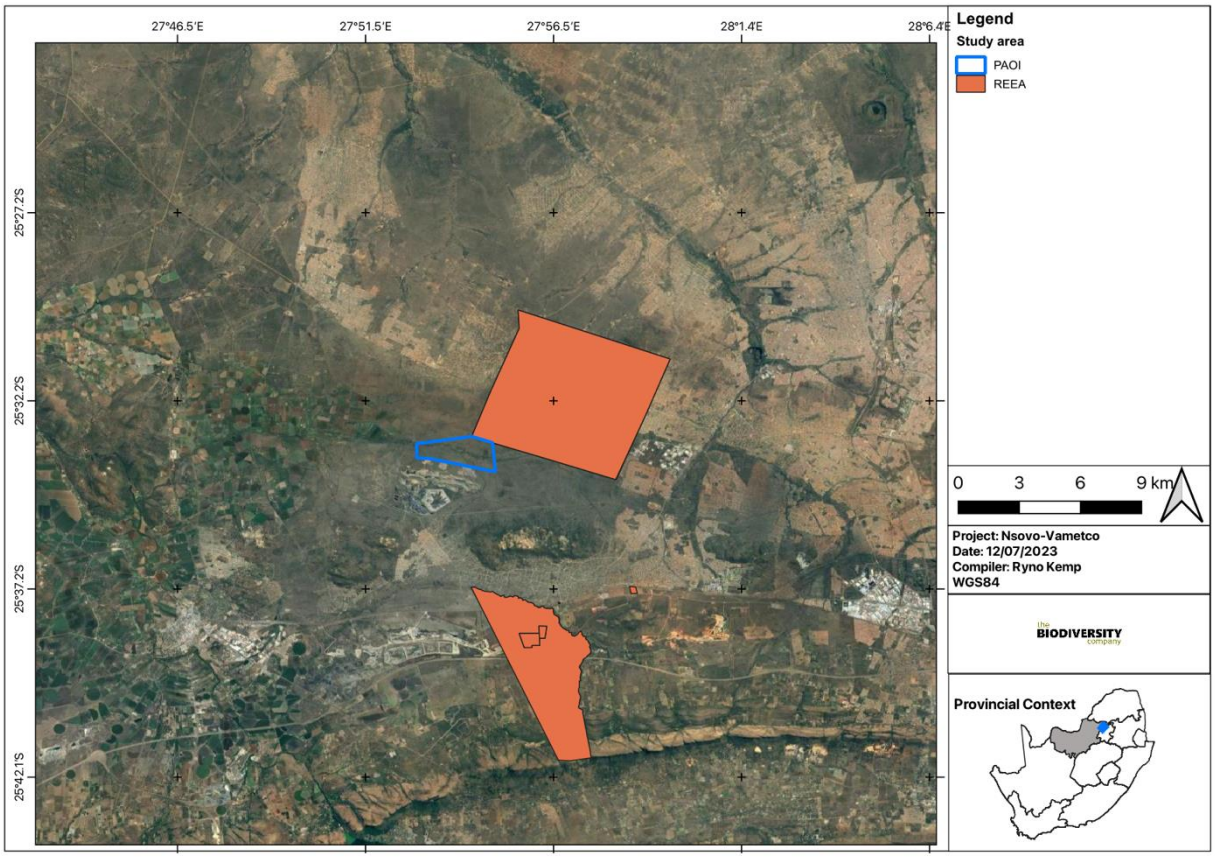

Figure 4-10 The PAOI in relation to the Renewable Energy EIA Application Database projects in the area.

4.2 Expected Species of Conservation Concern

The SABAP2 Data lists 278 indigenous avifauna species that could be expected to occur within the PAOI and surrounding landscape (Figure 4-11; Appendix A). Fifteen of these expected species is regarded as SCC (Table 4-2). These species are described below.

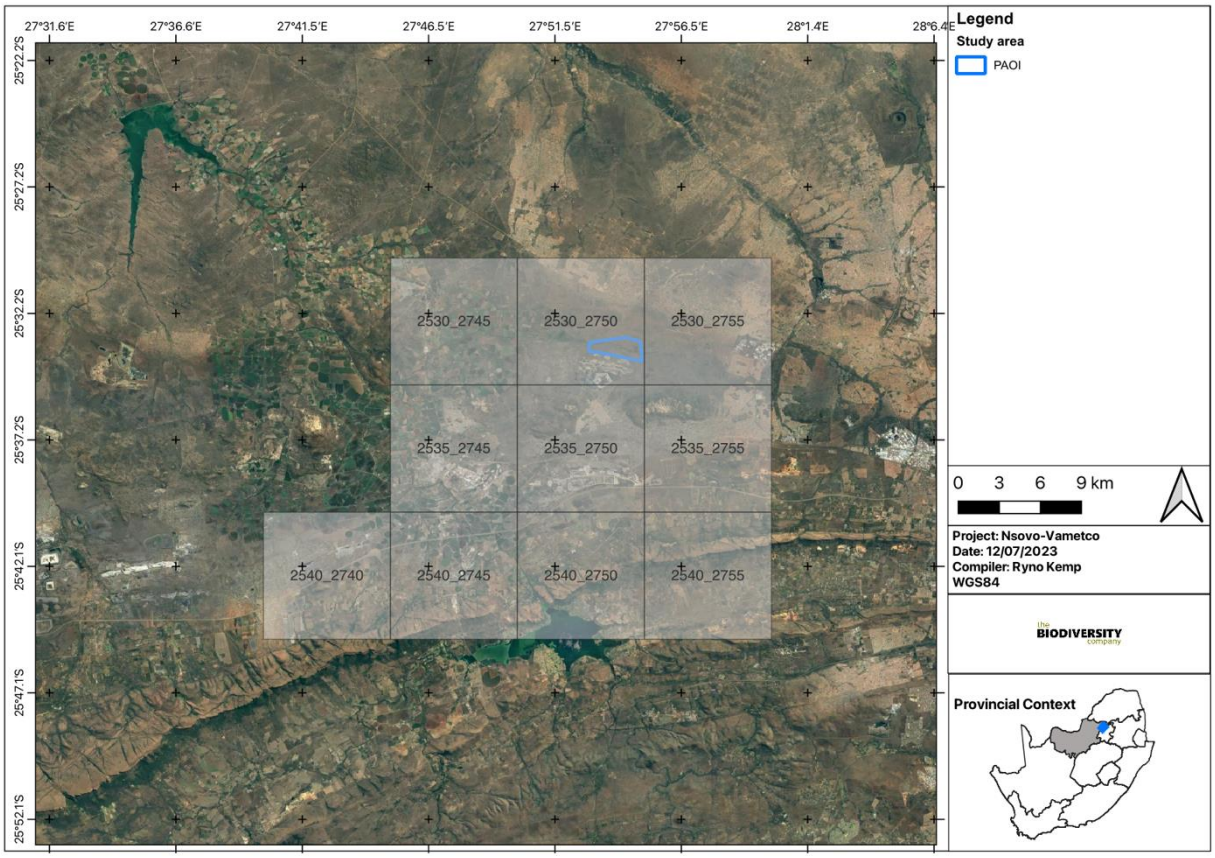

Figure 4-11 ***Map illustrating the SABAP2 pentads used to compile the expected species list***

Table 4-2 ***Expected avifauna Species of Conservation Concern that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable***

Common Name	Scientific Name	Regional*	Global+	Likelihood of Occurrence
Abdim's Stork	*Ciconia abdimii*	NT	LC	High
African Grass Owl	*Tyto capensis*	VU	LC	Moderate
Black Stork	*Ciconia nigra*	VU	LC	Moderat
Cape Vulture	*Gyps coprotheres*	VU	VU	Confirmed
Caspian Tern	*Hydropogne caspia*	VU	LC	Low
Curlew Sandpiper	*Calidris ferruginea*	LC	NT	Low
European Roller	*Coracias garrulus*	NT	LC	Moderate
Greater Flamingo	*Phoenicopterus roseus*	NT	LC	Moderate
Greater Painted-snipe	*Rostratula benghalensis*	NT	LC	Moderate
Half-collared Kingfisher	*Alcedo semitorquata*	NT	LC	High
Lanner Falcon	*Falco biarmicus*	VU	LC	High
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	Low
Marabou Stork	*Leptoptilos crumenifer*	NT	LC	Moderate
Red-footed Falcon	*Falco vespertinus*	NT	VU	Moderate
Secretarybird	*Sagittarius serpentarius*	VU	EN	Confirmed

*(Taylor *et al*. 2015), + (IUCN 2021)

Ciconia abdimii (Abdim's Stork) is listed as NT on a local and international scale and the species is known to be found in open grassland and savanna woodland often near water but also in semi-arid areas, gathering beside pools and water-holes (IUCN, 2017). 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.

Tyto capensis (African Grass-owl) is rated as Vulnerable (VU) on a regional basis. The distribution of the species includes the eastern parts of South Africa. The species is generally solitary, but it does also occur in pairs, in moist grasslands where it roosts (IUCN, 2017). The species prefers thick grasses around wetlands and rivers which are not present in the project area. Furthermore, this species specifically has a preference for nesting in dense stands of the grass species *Imperata cylindrica*.

Ciconia nigra (Black Stork) is native to South Africa, and inhabits old, undisturbed, open forests (BirdLife International, 2023). They are known to forage in shallow streams, pools, marshes swampy patches, damp meadows, flood-plains, pools in dry riverbeds and occasionally grasslands, especially where there are stands of reeds or long grass (BirdLife International, 2023).

Gyps coprotheres (Cape Vulture) is listed as VU on both a regional and global scale. Cape Vultures are long-lived carrion-feeders specialising on large carcasses, they fly long distances over open country, although they are usually found near steep terrain, where they breed and roost on cliffs (IUCN, 2017). They are resident and partially nomadic, adults may travel up to about 750 km from their colony in the non-breeding season. Barnes (2000) estimated that the population declined by 10% between 1994-1995, which when expanded over 3 generation lengths (41.7 years [Bird *et al.* 2020]) equates to a decline rate of 58.4%. McKean and Botha (2007) also suggested that between 1992-2007, the populations in eastern South Africa declined by 60-70%, equivalent to a rate of 92-96% over 3 generation lengths, if the trend continued for that period. However, there is now evidence to suggest that the colonies have been increasing post 2007.

Coracias garrulous (European Roller) is a summer migrant with the population from South-central Europe and Asia occurring throughout sub-Saharan Africa (BirdLife International, 2023). The European Roller has a preference for bushy plains and dry savannah areas. It is globally listed as LC but NT on a regional scale. Threats include persecution on migration in some Mediterranean countries and numerous individuals are killed for food in Oman and India. The loss of suitable breeding habitat due to changing agricultural practices, conversion to monoculture, loss of nest sites, and use of pesticides (reducing food availability) are the main threats to the species in Europe. It is sensitive to loss of hedgerows and riparian forest in Europe which provide essential habitats for perching and nesting (BirdLife International, 2023).

Phoenicopterus roseus (Greater Flamingo) is widely distributed throughout sub-Saharan Africa and inhabits shallow eutrophic waterbodies such as saline lagoons, saltpans and large saline or alkaline lakes (BirdLife International, 2023). Juveniles, and to a lesser extent adults undertake irregular nomadic or partially migratory movements throughout the species' range in response to water-level changes. In sub-Saharan Africa, the species may also join large flocks of non-breeding *Phoeniconaias minor* (Lesser Flamingo). The sub-Saharan African populations between 100 000 and 120 000 mature individuals. The species suffers from low reproductive success if exposed to disturbance at breeding colonies, or if water-levels surrounding nest-sites lower resulting in increased predation from ground predators. Further threats include effluents mining, pollution from sewage and heavy metal effluents from industries and collisions with powerlines (BirdLife International, 2023).

Rostratula benghalensis (Greater Painted-snipe) shows a preference for recently flooded areas in shallow lowland freshwater temporary or permanent wetland, it has a wide range of these freshwater habitats which they occur in, which may include, sewage pools, reservoirs, and mudflats overgrown with marsh grass (BirdLife International, 2023).

Alcedo semitorquata (Half-collared Kingfisher) is listed as Near Threatened (NT) on a regional scale and occurs across a large range. This species generally prefers narrow rivers, streams, and estuaries with dense vegetation onshore, but it may also move into coastal lagoons and lakes. It mainly feeds on fish (IUCN, 2017).

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (BirdLife International, 2023). They may occur in groups up to 20 individuals, but have also been observed solitary. Their diet is mainly composed of small birds such as pigeons and francolins (BirdLife International, 2023).

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.

Leptoptilos crumenifer (Marabou Stork) is a sedentary or locally nomadic species that disperse based on water availability, prey abundance and breeding (BirdLife International 2023). This species breeds in colonies of up to several thousand birds and may nest with other species. When not breeding, this species tends to feed in groups and roost in large groups of up to 1000 birds. Habitat for this species is open dry savanna, grassland, swampy areas, the banks of rivers, and shores of lakes and dams. Diet includes prey such as fish, termites, locusts, frogs, lizards, snakes, rats, mice and birds, as well as carrion. This species has a very large range and is very large in size globally (BirdLife International 2023).

Falco vespertinus (Red-footed Falcon) is known to breed from eastern Europe and northern Asia to north-western China, heading south in the non-breeding season to southern Angola and southern Africa. Within southern Africa it is locally uncommon to common in Botswana, northern Namibia, central Zimbabwe and the area in and around Gauteng, South Africa (Hockey et al, 2005). The habitat it generally prefers is open habitats with scattered trees, such as open grassy woodland, wetlands, forest fringes and croplands.

Sagittarius serpentarius (Secretarybird) is listed as EN on a global scale (BirdLife International, 2023). The species has a wide distribution across sub-Saharan Africa but surveyed densities suggest that the total population size does not exceed a five-figure number. Ad-hoc records, localised surveys and anecdotal observations indicate apparent declines in many parts of the species' range, especially in South Africa where reporting rates decreased by at least 60% of quarter degree grid cells used in Southern African Bird Atlas Projects. Threats include excessive burning of grasslands that may suppress populations of prey species, whilst the intensive grazing of livestock is also probably degrading otherwise suitable habitat. Disturbance by humans is likely to negatively affect breeding. The species is captured and traded; however, it is unknown how many deaths occur in captivity and transit. Direct hunting and nest-raiding for other uses and indiscriminate poisoning at waterholes are also further threats. A proposed conservation action is that landowners of suitable properties should join biodiversity stewardship initiatives and to manage their properties in a sustainable way for the species populations (BirdLife International, 2023).

4.3 Field Assessment

4.3.1 First Field Survey

4.3.1.1 Species List of First Field Survey

Only one site visit was conducted for the proposed development for this regime 2 assessment. The field investigation was conducted in winter, over 2 days from the 12th to the 14th of June 2023 (Appendix B). Sixty-nine species were observed a total number of individual species accounts for approximately 24.8% of the total number of expected species

Two of the expected SCC, as mentioned in section 4.2 of this report, were recorded within the PAOI during the survey period within point counts or incidental sightings i.e., *Sagittarius serpentarius* (Secretarybird) (Figure 4-12). Table 4-3 lists the species recorded, Figure 4-12 shows a photograph of the species, while **Error! Reference source not found.** shows the location of the observed species.

Table 4-3 Summary of the avifauna species of conservation concern recorded within the proposed PV PAOI during the field survey

Scientific Name	Common Name	Conservation Status	
		Red List (Regional)*	Red List (Global)+
Sagittarius serpentarius	Secretarybird	VU	EN
Gyps coprotheras	Cape Vulture	VU	VU

*(Taylor *et al*. 2015), + (IUCN 2021)

Figure 4-12 Photograph illustrating the SCC recorded from the project area – Sagittarius serpentarius (Secretarybird)

4.3.1.2 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. Seventeen (17) of the species observed within the PAOI are regarded as priority species (Table 4-4).

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

Common Name	Scientific Name	Sources	Collision	Electrocution	Disturbance/Habitat Loss
Black-winged Kite	*Elanus caeruleus*	X	x	x	x
Greater Kestrel	*Falco rupicoloides*	X	x	x	x
Secretarybird	*Sagittarius serpentarius*	X	x	x	x
Northern Black Korhaan	*Afrotis afraoides*	X	x	x	x
Hamerkop	*Scopus umbretta*	O	x	x	x

4.3.1.3 Dominant Species

Table 4-5 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 *Cisticola aridulus* (Desert Cisticola) with a relative abundance of 0.208 and a frequency of occurrence of 5.556% (Table 4-5). Additional ubiquitous species comprised of *Streptopelia capicola* (Ring-necked dove) with a frequency of occurrence of 100%.

Table 4-5 Relative abundance and frequency of occurrence of dominant avifauna species recorded within the proposed PV PAOI and surrounds during the field survey. Only data from the standardized point counts were considered.

Common Name	Scientific Name	Relative abundance	Frequency
Desert Cisticola	Cisticola aridulus	0.208	5.556
White-browed Scrub Robin	Cercotrichas leucophrys	0.063	50.000
Crowned Lapwing	Vanellus coronatus	0.060	38.889
Chestnut-vented Warbler	Curruca subcoerulea	0.058	88.889
Ring-necked Dove	Streptopelia capicola	0.046	100.000
Southern Boubou	Laniarius ferrugineus	0.040	44.444
Acacia Pied Barbet	Tricholaema leucomelas	0.029	50.000
Rattling Cisticola	Cisticola chiniana	0.029	61.111
Black-chested Prinia	Prinia flavicans	0.027	61.111
Kalahari Scrub Robin	Cercotrichas paena	0.027	55.556
Natal Spurfowl	Pternistis natalensis	0.025	44.444
Crimson-breasted Shrike	Laniarius atrococcineus	0.023	55.556
Grey Go-away-bird	Corythaixoides concolor	0.023	38.889
Red-faced Mousebird	Urocolius indicus	0.021	27.778
Orange-breasted Waxbill	Amandava subflava	0.021	11.111
Blue Waxbill	Uraeginthus angolensis	0.019	27.778
Dark-capped Bulbul	Pycnonotus tricolor	0.017	38.889
Blacksmith Lapwing	Vanellus armatus	0.015	16.667
Southern Fiscal	Lanius collaris	0.015	22.222
Cape Robin-Chat	Cossypha caffra	0.010	22.222

*(Taylor *et al*. 2015), + (IUCN 2021)

4.3.1.4 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 13 major groups based on their diet, habitat, and main area of activity. Although species to 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 insectivorous birds that feed on the ground during the day (IGD). Followed by Omnivores (OMD) and Granivores (GGD) (Figure 4-13). The species composition is spread throughout the various groups.

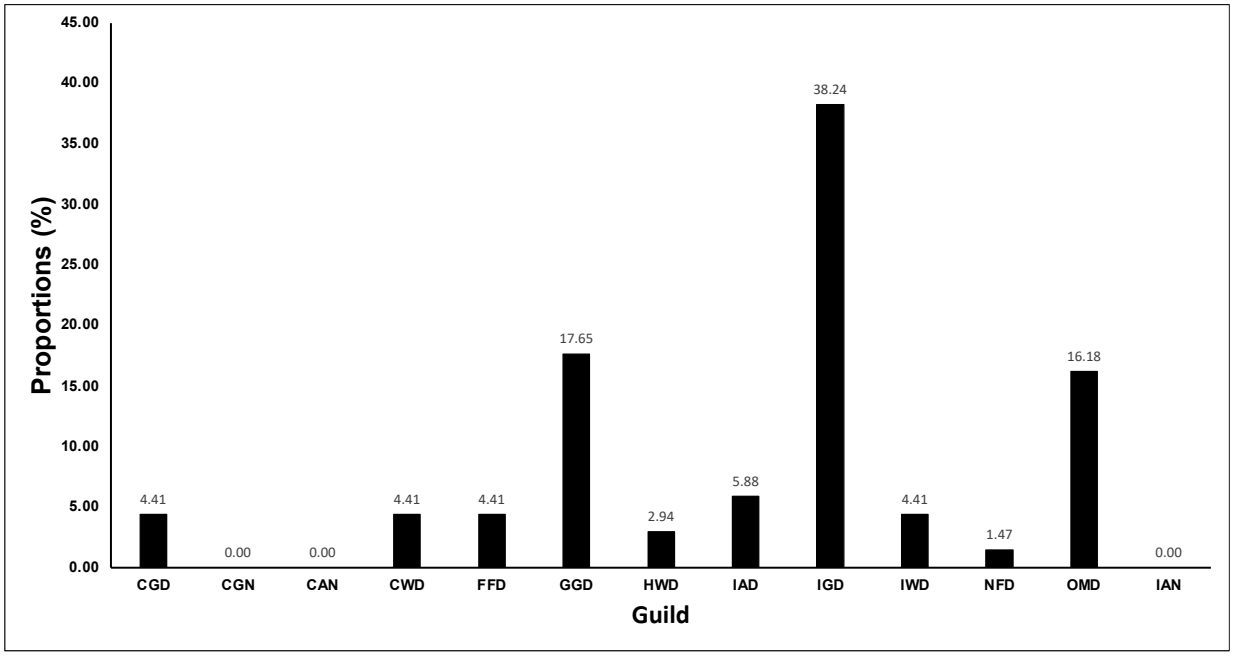

Figure 4-13 ***Column plot illustrating the proportion of each Functional Feeding Guild to the total abundance. Avifaunal trophic guilds – CGD, Carnivore Ground Diurnal; CGN, Carnivore Ground Nocturnal, CAN, Carnivore Air Nocturnal, CWD, Carnivore Water Diurnal; FFD, Frugivore Foliage Diurnal; GGD, Granivore Ground Diurnal; HWD, Herbivore Water Diurnal; IAD, Insectivore Air Diurnal; IGD, Insectivore Ground Diurnal; IWD, Insectivore Water Diurnal; NFD, Nectivore Foliage Diurnal; OMD, Omnivore Multiple Diurnal; IAN, Insectivore Air Nocturnal.***

4.3.1.5 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 with caution based on the limited time spend on this component.

No specific flight paths were noted.

No confirmed nest sites were recorded during the field investigation, this is mainly attributed to the point count analysis protocol which allows for accurate sampling of the avifauna but does not exhaustively cover the site locating nests.

4.4 Fine-Scale Habitat Use

Fine-scale habitats within the landscape are important in supporting a diverse avifauna community as they provide differing nesting, foraging and reproductive opportunities. Two different habitat types were delineated within the PAOI, comprising of Degraded Savannah and Water Resources (Table 4-6).

Table 4-6 Habitat types identifies during the initial site survey

Habitat	Description	SCC possibly (or recorded) occurring there	Photographs
Degraded Savannah	This habitat is made up of old agricultural fields as well as areas more natural savannah areas with shrubs and small trees interspersed in between grass. The avifauna community was found to be the same in the more disturbed areas as compared to the more natural sections therefore it has been combined.	Some of the SCCs that could occur here, Lanner Falcon, Secretarybird, Cape Vulture and European Roller	 

Habitat	Description	SCC possibly (or recorded) occurring there	Photographs
Water Resources	This habitat provides crucial habitat for waterbirds, but is also a water source for more terrestrial species. Some of the water resources are natural while others are artificial, from an avifauna perspective both are important.	Greater-painted Snipe and Curlew Sandpiper are some of the SCC that could be expected here.	 

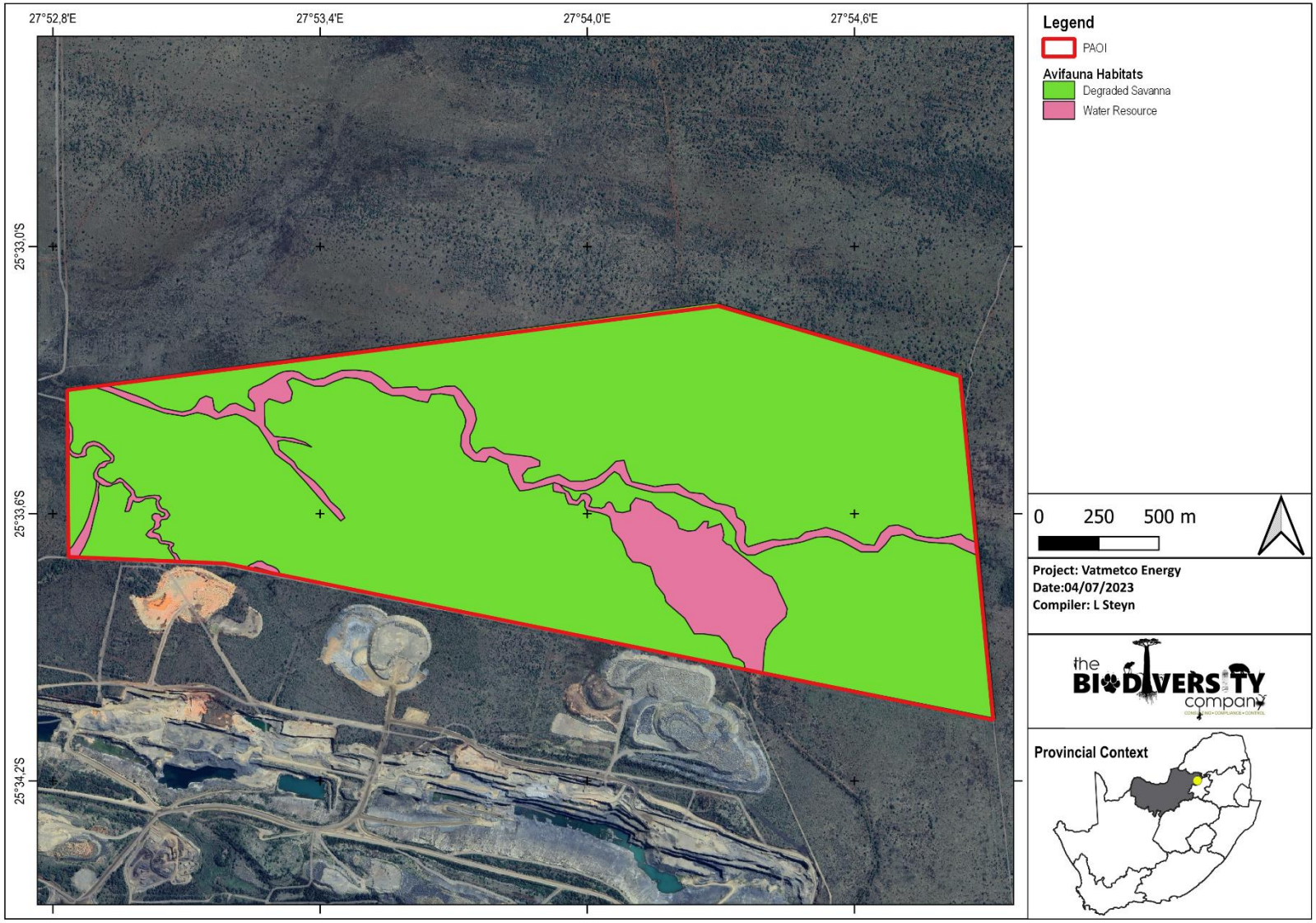

Figure 4-14 Map illustrating the habitat types delineated within the proposed Vametco Energy Solar PV and associated infrastructure PAOI

5 Site Ecological Importance (SEI)

5.1 Environmental Screening Tool

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

- Terrestrial Biodiversity Theme sensitivity is 'Very High' for the project area, due to the Endangered Marikana Thornveld classification of the area (Figure 5-1); and
- Animal Species Theme sensitivity is 'Medium' for the project area, only mammal species are listed (Figure 5-2).

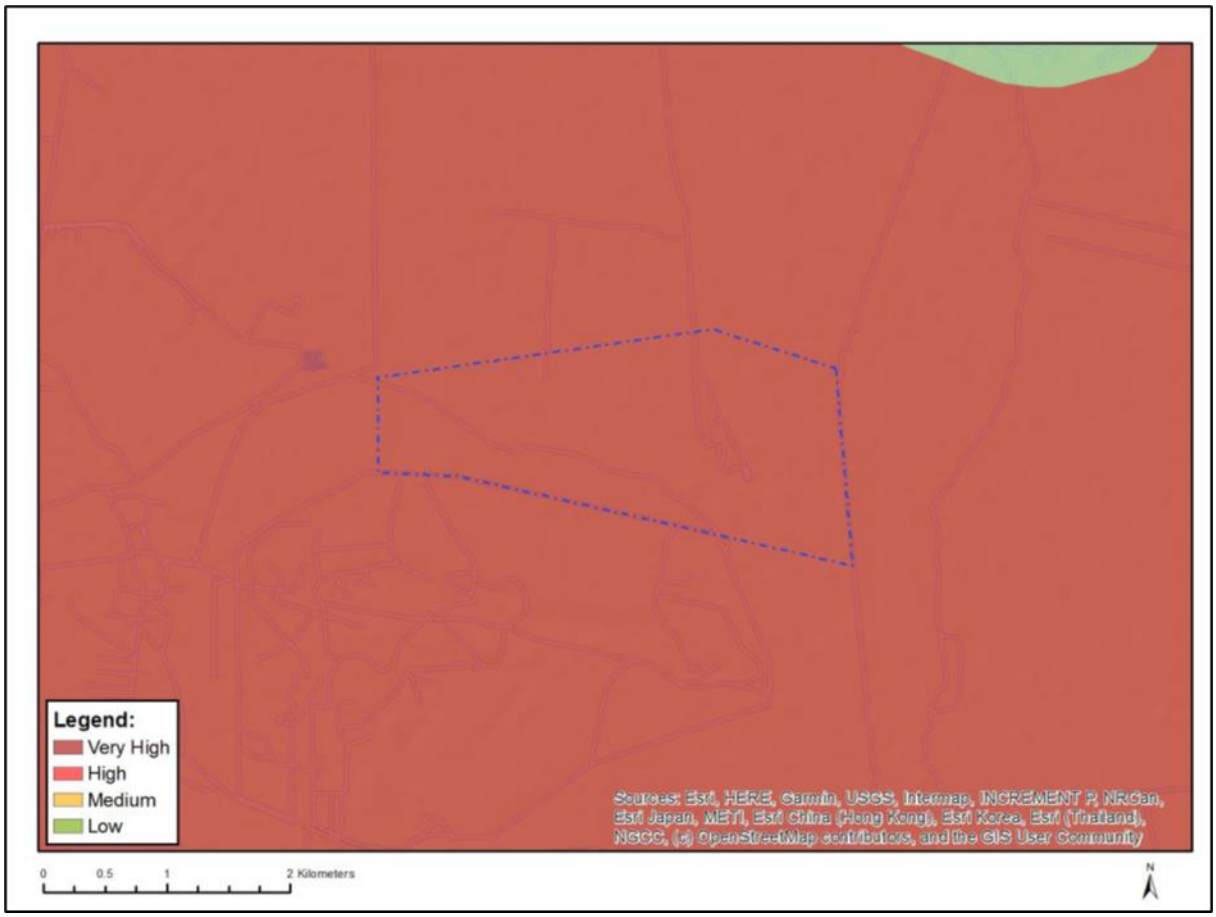

Figure 5-1 Terrestrial Biodiversity Theme Sensitivity for the PAOI, National Web based Environmental Screening Tool

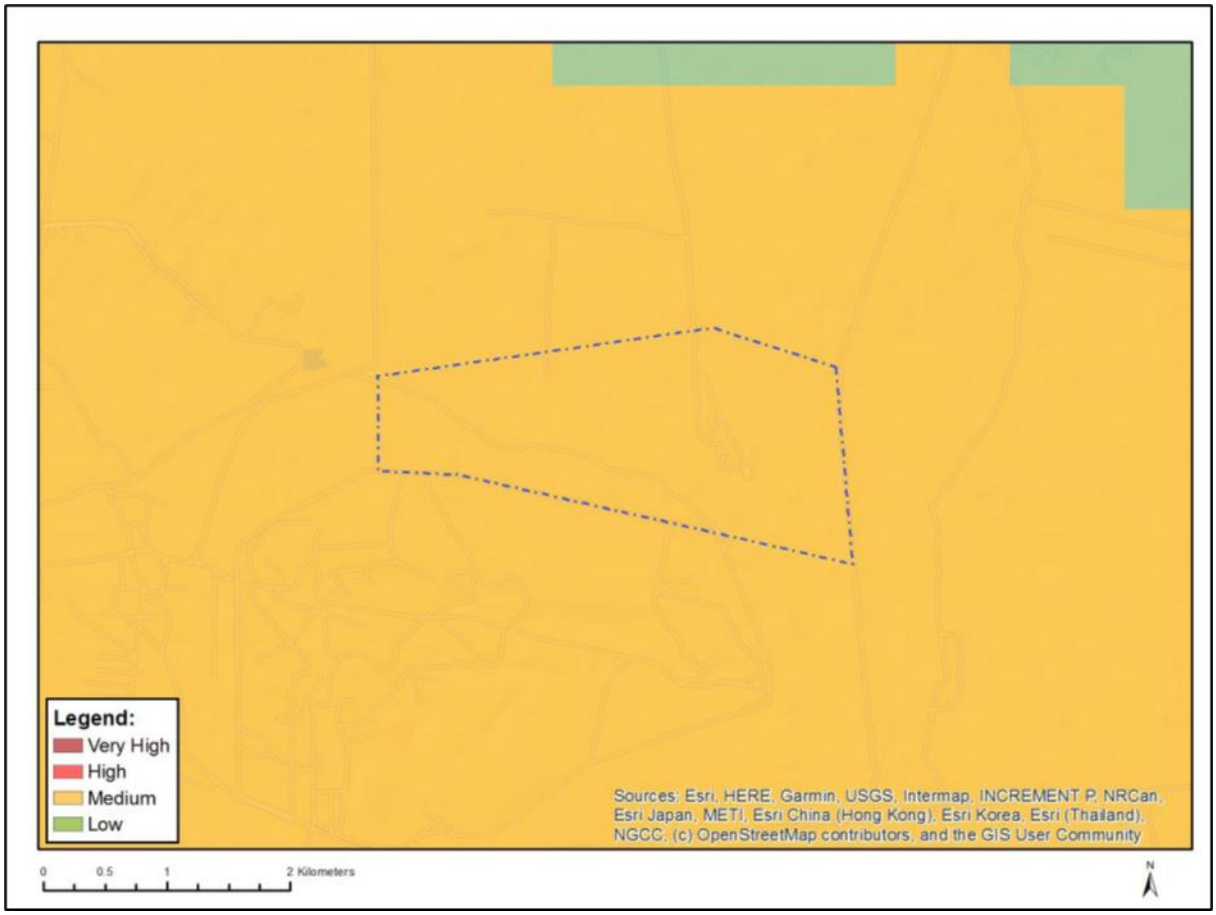

Figure 5-2 Fauna Theme Sensitivity for the PAOI, National Web based Environmental Screening Tool

5.2 Site Ecological Importance (SEI)

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.

Two habitat types were delineated within the Project Area, namely Disturbed Savanna and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in

Table 5-1. It is important to note the water resources delineated are delineated solely on avifauna habitat availability.

Table 5-1 SEI Summary of habitat types delineated within field assessment area of project area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance	Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities
Degraded Savanna	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.	High Only minor current negative ecological impacts with no signs of major disturbance and good rehabilitation potential.	**Medium**	Medium Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality	**Medium**	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Water Resource	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.	High Only minor current negative ecological impacts with no signs of major disturbance and good 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	**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.

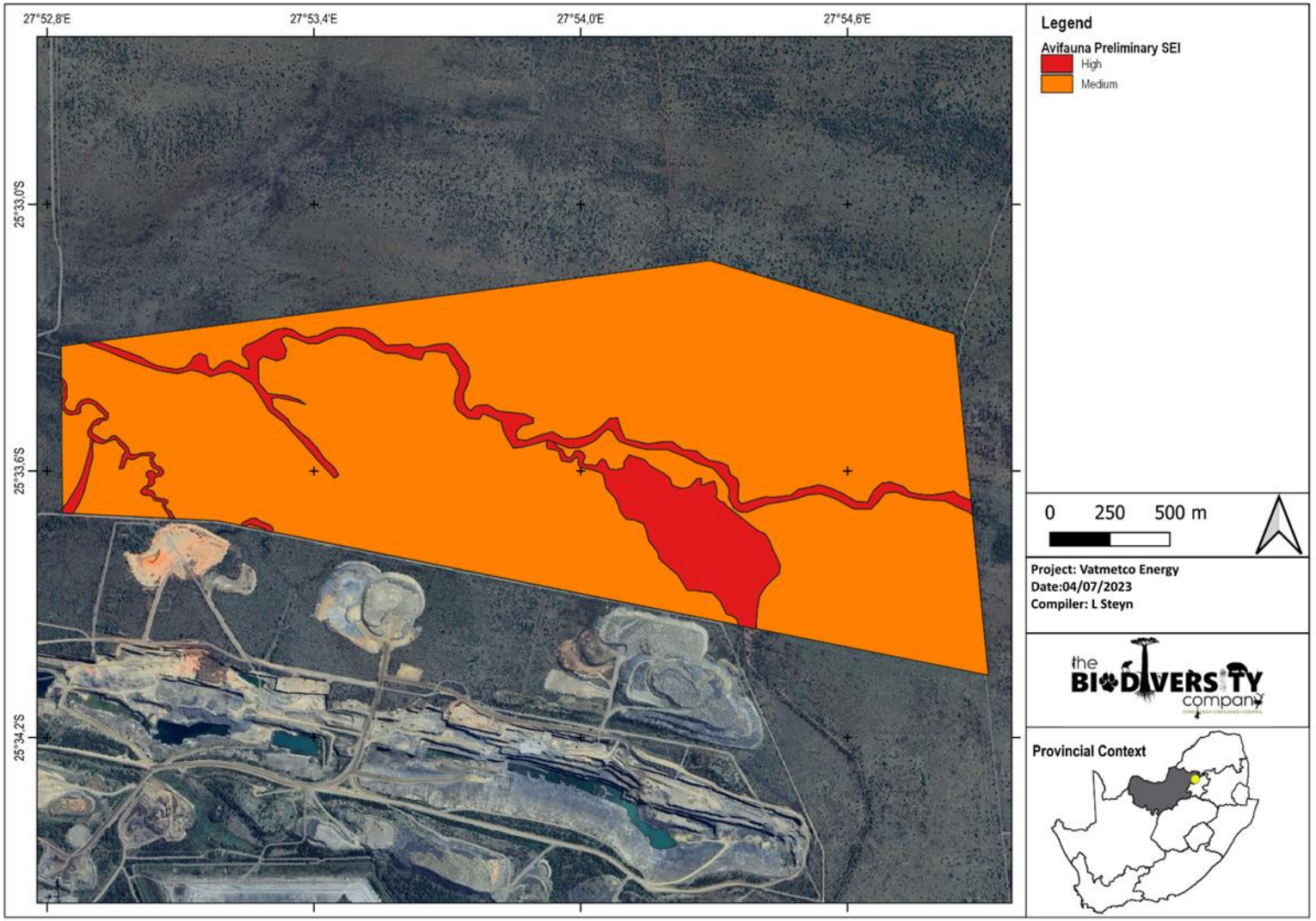

Figure 5-3 Map illustrating the Site Ecological Importance of the proposed Vemetco Energy PAOI

Interpretation of the SEI in the context of the proposed project is provided in Table 5-2.

Table 5-2 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities

Site Ecological Importance (SEI)	Interpretation in relation to proposed development activities
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

5.3 Screening Tool Comparison

Table 5-3 provides a comparison between the Environmental Screening Tool and the specialist determined Site Ecological Importance (SEI). 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. Due to the different distinctive habitats present within the Project Area, these were compared separately.

Table 5-3 Summary of the Screening Tool Sensitivity versus the Specialist assigned Site Ecological Importance (SEI) for the Project Area

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	Medium	Degraded Savanna	Medium	Validated – Habitat is generally intact, and high likelihood of SCC. The adjacent mining activities reduces the overall sensitivity.
		Water Resources	High	Validated– Habitat is generally intact, possesses low resilience to impacts and very high likelihood of SCC to occur.

6 Impact Assessment

Potential impacts were evaluated against the data captured during the fieldwork and from a desktop perspective to identify relevance to the project site, specifically the proposed development footprint area. The assessment of the significance of direct, indirect and cumulative impacts was undertaken. 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 frag- mentation 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.

- 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. Three phases were considered for the impact assessment:

- Construction Phase;
- Operational Phase; and
- Closure/Rehabilitation Phase.

6.1 Present Impacts on Avifauna

In consideration that there are anthropogenic activities and influences are present within the landscape, there are several negative impacts to biodiversity, including avifauna (Figure 6-1). These include:

- Existing energy infrastructure;
- Minor and major gravel roads and associated vehicle traffic;
- Invasive Alien Plants;
- Livestock and associated erosion; and
- Fences and associated infrastructure.

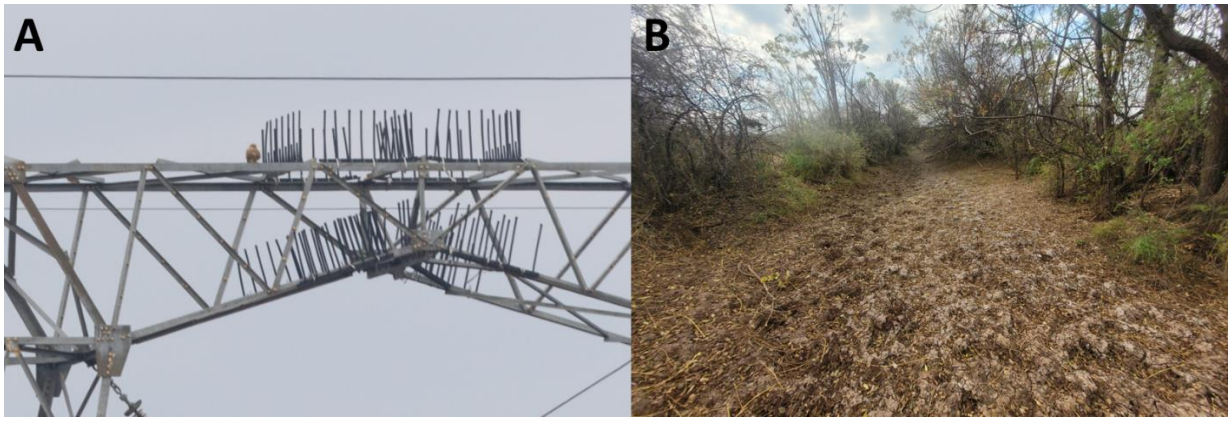

Figure 6-1 Photographs illustrating examples of impacts observed within the PAOI. A) Existing Powerlines and B) Areas trampled by livestock.

6.2 Anticipated Impacts

This section describes the potential impacts on avifauna associated with the construction and operational phases of the proposed development and is only relevant to the PV site and associated infrastructure.

During the construction phase vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise pollution. Increased human presence can lead to poaching and the increase in vehicle traffic and heavy machinery will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution, collisions, fencing, chemical pollution due to chemical cleaning of the PV panels and habitat loss. Solar panels have been implicated as a potential risk for bird collisions. Collisions are thought to arise when birds (particularly waterbirds) mistake the panels for waterbodies, known as the "lake effect" (Lovich & Ennen, 2011), or when migrating or dispersing birds become disorientated by the polarised light reflected by the panels. This "lake-effect" hypothesis has not been substantiated or refuted to date (Visser *et al,* 2019). It can however be said that the combination of powerlines, fencing and large infrastructure will influence avifauna species. Visser *et al* (2019) performed a study at a utility-scale PV SEF in the Northern Cape and found that most of the species affected by the facility were passerine species. This is due to collisions with solar panels from underneath. During a predator attack while foraging under the panels, individuals may alight and then collide with the panel. Larger species were said to be more influenced by the facilities when they were found foraging close by and were disturbed by predators which resulted in collisions with infrastructure.

Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they are able to touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties.

Fencing of the PV site can influence birds in six ways (BirdLife South Africa, 2015):

- Snagging – occurs when a body part is impaled on one or more barbs or razor points of a fence;
- Snaring – when a bird's foot/leg becomes trapped between two overlapping wires;
- Impact injuries – birds flying into a fence, the impact may kill or injure the bird;
- Snarling – when birds try and push through a mesh or wire stands, ultimately becoming trapped (uncommon);
- Electrocution – electrified fence can kill or severely injure birds; and
- Barrier effect – fences may limit flightless birds including moulting waterfowl from resources.

Chemical pollution from PV cleaning, if not environmentally friendly will result in either acute or chronic affects. Should this chemical penetrate into the surrounding environment, it would impact populations on a larger scale and not just species found in and around the PV footprint.

6.3 Alternatives considered

No alternatives were considered for this project.

6.1 Loss of Irreplaceable Resources

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

- Habitat and possible nesting sites for avifauna SCC.

6.2 Assessment of Impact Significance

The assessment of impact significance considers pre-mitigation as well as implemented of 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.

6.2.1 Construction Phase

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 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	2	2	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	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Likely	**Low**
Displacement/emigration of avifauna community (including SCC) due to noise pollution	4	3	3	4	4		4	2	2	4	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted /	Significant / ecosystem structure and function	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	Small / ecosystem structure and function	Ecology highly sensitive /important	Likely	**Moderate**

		Linear features affected < 1000m	moderately altered					impacted / Linear features affected < 100m	largely unchanged			
Direct mortality from persecution or poaching of avifauna species and collection of eggs	4	3	3	4	4		2	2	2	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 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 highly sensitive /important	Likely	**Low**
Direct mortality from increased vehicle and heavy machinery traffic	4	3	3	4	4		2	2	2	4	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 highly sensitive /important	Highly likely	**Moderately High**	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 highly sensitive /important	Highly unlikely	**Low**
Chemical pollution associated with dust suppressants	4	4	4	4	4		2	2	2	4	1	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted /	Great / harmful/ ecosystem structure and function	Ecology highly sensitive /important	Highly likely	**Moderately High**	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha	Small / ecosystem structure and function	Ecology highly sensitive /important	Highly unlikely	**Low**

		Linear features affected < 3000m	largely altered					impacted / Linear features affected < 100m	largely unchanged			

6.2.2 Operational Phase

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	4		4	2	3	4	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	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	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Likely	**Moderate**
Electrocution due to infrastructure associated with the PV Facility	5	2	3	4	4		4	2	3	4	2	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately 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	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Possible	**Moderate**
Direct mortality from roadkills, persecution or poaching of avifauna species and collection of eggs	4	3	3	4	3		4	2	2	4	2	
	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	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	**Low**

								affected < 100m				
Direct mortailities and hinderance of movement from fencing infrastructure	5	3	3	4	3		4	2	2	4	2	
	Permanent	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	**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 highly sensitive /important	Possible	**Low**
Pollution due to chemicals used to keep the PV panels clean	4	3	3	4	3		4	2	2	4	2	
	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 highly sensitive /important	Possible	**Low**

6.2.3 Decommissioning Phase

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	5	3	3	4	3		2	2	3	4	1	
	Permanent	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	**Moderately High**	One month to one year: Short 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	Highly unlikely	**Low**
Direct mortality due to infrastructure including collisions with PV infrastructure, fences etc	5	3	3	4	4		2	2	3	4	1	
	Permanent	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 month to one year: Short 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	Highly unlikely	**Low**
	5	3	3	4	4		2	2	2	4	2	

Continued habitat degradation due to Invasive Alien Plant encroachment and erosion	Permanent	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 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 highly sensitive /important	Possible	**Low**

6.3 Unplanned Events

The planned activities will have anticipated impacts as discussed above; however, unplanned events may occur on any project, and these could lead to potential impacts which will require appropriate management.

Table 6-1 is a summary of the findings of an unplanned event assessment conducted from a terrestrial ecology perspective. Note that not all potential unplanned events may be captured herein, and this process must therefore be managed throughout all phases and according to events that take place or have a high likelihood of taking place.

Table 6-1 Summary of unplanned events, potential impacts and mitigations

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

6.4 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.

The total area within the 30 km buffer around the project area amounts to 305771,14 ha, but when considering the transformation (126604,4 ha) (this includes the REEA renewable developments authorised in the area) that has taken place within this radius, 162836,3 ha of intact habitat remains according to the 2018 National Biodiversity Assessment. Therefore, the area within 30 km of the project has experienced approximately 41.4% loss in natural habitat. Table 6-2 outlines the calculation procedure for the spatial assessment of cumulative impacts. Figure 6-2 shows the total habitat loss in the area.

Table 6-2 Loss of habitat within a 30 km radius of the project

	Total Habitat (ha)	Tot. Remaining Habitat (ha) (Remnants)	REEA developments overlapping with 30km	Total Historical Loss	Cumulative Habitat Lost (%)
Cumulative loss	305771,14	162836,3	16330,45	126604,4	**41.4**

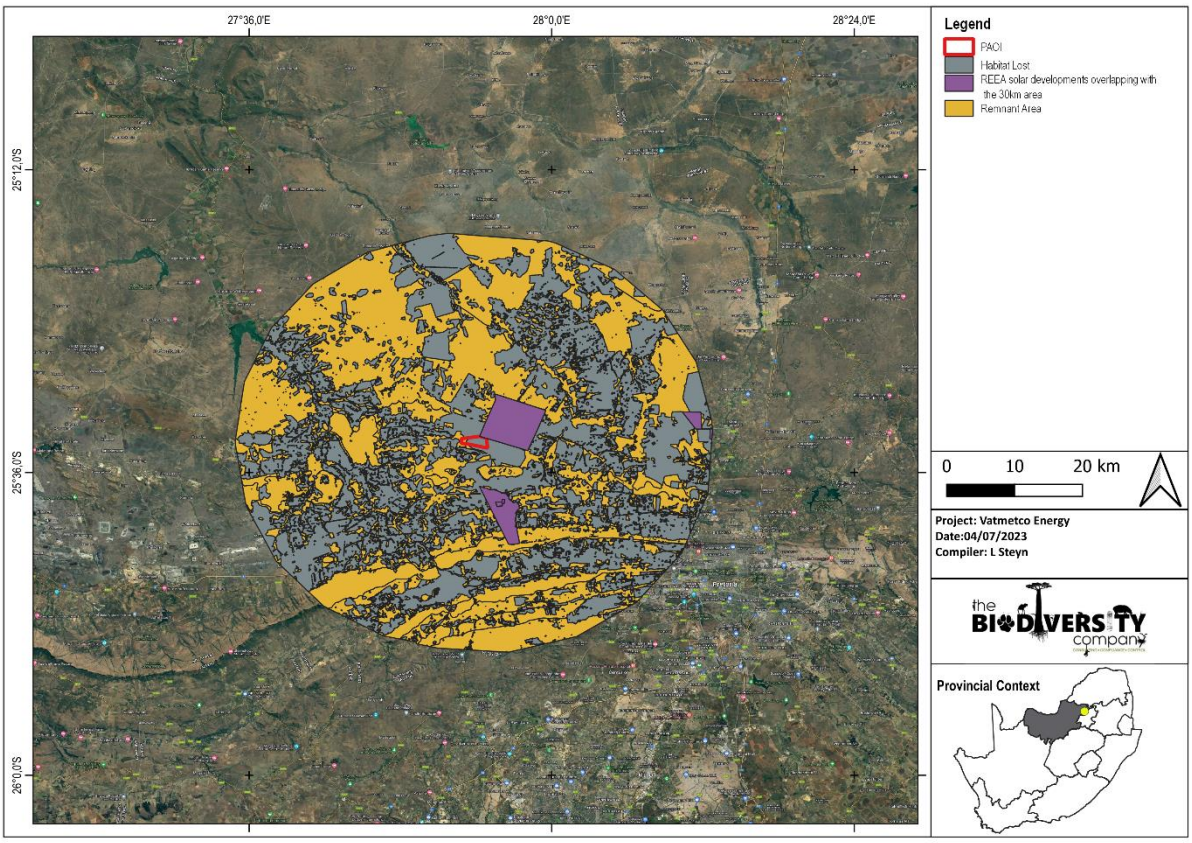

Figure 6-2 Map illustrating the additional renewable energy developments within the landscape overlaid onto the remnant vegetation types

Table 6-3 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
	4	3	3	4	3		5	4	3	4	4	
Loss of habitat, and disruption of surrounding ecological corridors.	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**	Permanent	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**

7 Avifauna Impact Management Actions

The purpose of the Biodiversity Impact Management Actions of 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 7-1 presents the recommended mitigation measures and the respective timeframes, targets, and performance indicators pertaining to the avifaunal component.

Table 7-1 Summary of 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
High sensitivity areas must be declared No-go areas, they must be demarcated to ensure no vehicles or people move into these areas.	Life of operation	Project Manager Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.	Life of operation	Project Manager Environmental Officer	Areas of indigenous vegetation	Ongoing
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.	Life of operation	Project Manager	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	Life of operation
Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018).	Life of operation	Project Manager	Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018).	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	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	Decommissioning /Rehabilitation

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.			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.	
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.	Life of operation	Environmental Officer Contractor	Spill events, Vehicles dripping.	Ongoing
Cement mixed on site must be mixed in a bunded area or on a removable surface such as thick plastic sheeting at least 50 m away from any wetlands or water resources.	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 project area 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

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
The duration of the construction should be kept to a minimum to avoid disturbing avifauna.	Construction/Operational Phase	Project Manager Environmental Officer	Construction/Closure Phase	Ongoing

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Outside lighting should be designed and limited to minimize impacts on avifauna. 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 wherever possible.	Construction/Operational Phase	Project Manager Environmental Officer Design Engineer	Light pollution and period of light.	Ongoing
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (20 km/h), to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	Life of Operation	Health and Safety Officer	Compliance to the training.	Ongoing
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
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.	Construction	Environmental Officer	Presence of avifauna species and nests	During Phase
The design of the proposed PV and grid lines must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins *et al.,* 2015). It therefore must be a bird-friendly design.	Planning and Construction	Project Manager Environmental Officer Contractor Engineer	Presence of electrocuted birds or bird strikes	During Phase
Infrastructure should 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
All the parts of the infrastructure must be nest-proofed and anti-perch devices placed on areas that can lead to electrocution	Planning and Construction	Environmental Officer Contractor Engineer	Presence of electrocuted birds	During phase
Use environmentally friendly cleaning and dust suppressant products	Construction and Operation	Environmental Officer Contractor Engineer	Chemicals used	During phase
Fencing mitigations for ClearVu or similar fencing: • If needed, any **top** strands must be smooth wire, barbed wire must be avoided; • Routinely monitor all fencing for any collisions and mortality, as well as trapped fauna.	Life of Operation	Project Manager Environmental Officer Contractor Design Engineer	Presence of birds stuck /dead in fences Monitor fences for collisions or mortalities every second day for the first 6 months.	During phase

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
• Place markers/diverters on fences, especially towards the top • A specialist must be consulted if any collisions or mortalities are observed. Conventional fencing mitigations: • Top 2 strands must be smooth wire • Routinely retention loose wires • Minimum 300 mm between wires • Place markers on fences				
As far as possible power cables within the project site should be thoroughly insulated and preferably buried.	Construction and Operation	Project Manager Environmental Officer Design Engineer	Exposed cables	During phase
Any exposed parts must be covered (insulated) to reduce electrocution risk	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase
The BESS must be enclosed in a structure with a non-reflective surface	Construction and Operation	Project Manager Environmental Officer Design Engineer	Reflective surfaces on BESS	During phase
Post-construction monitoring should follow the BirdLife South Africa best practice guidelines for solar energy facilities (BirdLife South Africa, 2017). If monitoring results indicate excessive bird fatalities, then adaptive mitigations should be implemented. Before implementation, these should be discussed with the avifaunal specialist and ECO and could include the retrofitting/incorporation of additional visual cues/diverters to existing PV panels/infrastructure.	Operational	Project Manager Environmental Officer Design Engineer	Presence of dead birds in the project site. Monitoring must be undertaken in accordance with the BirdLife South Africa best practice guidelines for solar energy facilities (BirdLife South Africa, 2017). The precise location of any dead birds found should be recorded and mapped (using GPS). All carcasses should be photographed as found then placed in a plastic bag, labelled as to the location and date, and preserved (refrigerated or frozen) until identified. Feather spots (e.g., a group of feathers attached to skin) and body parts should also be collected.	During phase. The monitoring frequency is based on the collision rate.
There is little to no information on the recovery of the avifauna community subsequent to the closure of Solar PV facilities within South Africa. A post-closure monitoring regime is recommended	Closure/Rehabilitation	Project Manager Environmental Officer	Avifauna community	Wet-season and dry-season survey for the initial 3-5 years after closure.

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
for the proposed project to document any impacts and this data must be used for improving rehabilitation measures				
All infrastructure including powerlines must be removed if the facility is decommissioned	Closure/Rehabilitation	Project Manager Environmental Officer	Infrastructure removal	During Process

8 Conclusion and Impact Statement

8.1 Conclusion

The aim of this Avifauna Impact Assessment was to provide information to guide the risk of the proposed Solar PV project to the avifauna community likely affected by its development.

During the only field assessment performed in the dry season (5th – 8th of January 2023) 69 species were recorded during the point counts. Two species recorded were SCC i.e., *Sagittarius serpentarius* (Secretarybird). Five (5) risk species were recorded in the field investigation. These are species at risk for collisions, electrocutions or sensitive to habitat loss.

The SEI of the proposed development was found to be 'Medium' and 'High' for degraded Savannah and Water Resources, respectively. The current impacts are identified as roads, fences, associated infrastructure, cattle grazing, and energy infrastructure. Impacts were identified as being Moderately High to Moderate in the Construction Phase, most of which could be reduced to Moderate to Low, and even Absent with the application of mitigation measures. Impacts in the operational phase are expected to be Moderately High to Moderate and can be reduced to Moderate to Low with mitigation measures. Decommissioning phase impacts are expected to be Moderately High to Moderate and can be reduced to Low with mitigation measures. Cumulative impacts are Moderate for the project in isolation but Moderately High for the project in consideration of the entire cluster.

Management measures include ensuring the construction footprint is kept small and industry-standard mitigations are put into place for solar panels, fencing and electrical infrastructure, among other measures.

8.2 Impact Statement

The main expected impacts of the proposed PV and associated infrastructure will include the following:

- Habitat loss and fragmentation;
- Electrocutions; and
- Collisions.

Mitigation measures as described in this report can be implemented to reduce the significance of the risk to an acceptable residual risk level. Considering the above-mentioned information, and that a second peak season survey needs to be conducted it is the opinion of the specialist that the project may be favourably considered, on condition that all the mitigation and recommendations provided in this report and other specialist reports are implemented.

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10 Appendix Items

10.1 Appendix A: Expected species

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Ciconia abdimii	Abdim's Stork	Ciconiidae	NT	LC
Tricholaema leucomelas	Acacia Pied Barbet	Lybiidae	Unlisted	Unlisted
Cuculus gularis	African Cuckoo	Cuculidae	Unlisted	Unlisted
Anhinga rufa	African Darter	Anhingidae	Unlisted	Unlisted
Lagonosticta rubricata	African Firefinch	Estriididae	Unlisted	Unlisted
Polyboroides typus	African Harrier-Hawk	Accipitridae	Unlisted	Unlisted
Aquila spilogaster	African Hawk Eagle	Accipitridae	Unlisted	Unlisted
Upupa africana	African Hoopoe	Upupidae	Unlisted	Unlisted
Actophilornis africanus	African Jacana	Jacanidae	Unlisted	Unlisted
Anastomus lamelligerus	African Openbill	Ciconiidae	Unlisted	Unlisted
Anthus cinnamomeus	African Pipit	Motacillidae	Unlisted	Unlisted
Gallinago nigripennis	African Snipe	Scolopacidae	Unlisted	Unlisted
Platalea alba	African Spoonbill	Threskiornithidae	Unlisted	Unlisted
Saxicola torquatus	African Stonechat	Muscicapidae	Unlisted	Unlisted
Porphyrio madagascariensis	African Swamphen	Rallidae	Unlisted	Unlisted
Anas sparsa	African Black Duck	Anatidae	Unlisted	Unlisted
Apus barbatus	African Black Swift	Apodidae	Unlisted	Unlisted
Haliaeetus vocifer	African Fish Eagle	Accipitridae	Unlisted	Unlisted
Tyto capensis	African Grass Owl	Strigidae	VU	LC
Treron calvus	African Green Pigeon	Columbidae	Unlisted	Unlisted
Lophoceros nasutus	African Grey Hornbill	Bucerotidae	Unlisted	Unlisted
Columba arquatrix	African Olive Pigeon	Columbidae	Unlisted	Unlisted
Cypsiurus parvus	African Palm Swift	Apodidae	Unlisted	Unlisted
Terpsiphone viridis	African Paradise Flycatcher	Monarchidae	Unlisted	Unlisted
Motacilla aguimp	African Pied Wagtail	Motacillidae	Unlisted	Unlisted
Ispidina picta	African Pygmy Kingfisher	Alcedinidae	Unlisted	Unlisted
Pycnonotus nigricans	African Red-eyed Bulbul	Pycnonotidae	Unlisted	Unlisted
Threskiornis aethiopicus	African Sacred Ibis	Threskiornithidae	Unlisted	Unlisted
Otus senegalensis	African Scops Owl	Strigidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Vanellus senegallus	African Wattled Lapwing	Charadriidae	Unlisted	Unlisted
Tachymarptis melba	Alpine Swift	Apodidae	Unlisted	Unlisted
Chalcomitra amethystina	Amethyst Sunbird	Nectariniidae	Unlisted	Unlisted
Falco amurensis	Amur Falcon	Falconidae	Unlisted	Unlisted
Turdoides jardineii	Arrow-marked Babbler	Leiothrichidae	Unlisted	Unlisted
Melaniparus cinerascens	Ashy Tit	Paridae	Unlisted	Unlisted
Riparia cincta	Banded Martin	Hirundinidae	Unlisted	Unlisted
Hirundo rustica	Barn Swallow	Hirundinidae	Unlisted	Unlisted
Calamonastes fasciolatus	Barred Wren-Warbler	Cisticolidae	Unlisted	Unlisted
Apalis thoracica	Bar-throated Apalis	Cisticolidae	Unlisted	Unlisted
Chloropicus namaquus	Bearded Woodpecker	Picidae	Unlisted	Unlisted
Campethera bennettii	Bennett's Woodpecker	Picidae	Unlisted	Unlisted
Zapornia flavirostra	Black Crake	Rallidae	Unlisted	Unlisted
Cuculus clamosus	Black Cuckoo	Cuculidae	Unlisted	Unlisted
Campephaga flava	Black Cuckooshrike	Campephagidae	Unlisted	Unlisted
Egretta ardesiaca	Black Heron	Ardeidae	Unlisted	Unlisted
Milvus migrans	Black Kite	Accipitridae	Unlisted	Unlisted
Accipiter melanoleucus	Black Sparrowhawk	Accipitridae	Unlisted	Unlisted
Ciconia nigra	Black Stork	Ciconiidae	VU	LC
Dryoscopus cubla	Black-backed Puffback	Malaconotidae	Unlisted	Unlisted
Prinia flavicans	Black-chested Prinia	Cisticolidae	Unlisted	Unlisted
Circaetus pectoralis	Black-chested Snake Eagle	Accipitridae	Unlisted	Unlisted
Lybius torquatus	Black-collared Barbet	Lybiidae	Unlisted	Unlisted
Tchagra senegalus	Black-crowned Tchagra	Malaconotidae	Unlisted	Unlisted
Nycticorax nycticorax	Black-crowned Night Heron	Ardeidae	Unlisted	Unlisted
Brunhilda erythronotos	Black-faced Waxbill	Estrildidae	Unlisted	Unlisted
Ardea melanocephala	Black-headed Heron	Ardeidae	Unlisted	Unlisted
Oriolus larvatus	Black-headed Oriole	Oriolidae	Unlisted	Unlisted
Vanellus armatus	Blacksmith Lapwing	Charadriidae	Unlisted	Unlisted
Crithagra atrogularis	Black-throated Canary	Fringillidae	Unlisted	Unlisted
Elanus caeruleus	Black-winged Kite	Accipitridae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Himantopus himantopus	Black-winged Stilt	Recurvirostridae	Unlisted	Unlisted
Uraeginthus angolensis	Blue Waxbill	Estrildidae	Unlisted	Unlisted
Spatula hottentota	Blue-billed Teal	Anatidae	Unlisted	Unlisted
Merops persicus	Blue-cheeked Bee-eater	Meropidae	Unlisted	Unlisted
Telophorus zeylonus	Bokmakierie	Malaconotidae	Unlisted	Unlisted
Hieraaetus pennatus	Booted Eagle	Accipitridae	Unlisted	Unlisted
Spermestes cucullata	Bronze Mannikin	Estrildidae	Unlisted	Unlisted
Rhinoptilus chalcopterus	Bronze-winged Courser	Glareolidae	Unlisted	Unlisted
Circaetus cinereus	Brown Snake Eagle	Accipitridae	Unlisted	Unlisted
Prodotiscus regulus	Brown-backed Honeybird	Indicatoridae	Unlisted	Unlisted
Tchagra australis	Brown-crowned Tchagra	Malaconotidae	Unlisted	Unlisted
Halcyon albiventris	Brown-hooded Kingfisher	Alcedinidae	Unlisted	Unlisted
Riparia paludicola	Brown-throated Martin	Hirundinidae	Unlisted	Unlisted
Nilaus afer	Brubru	Malaconotidae	Unlisted	Unlisted
Anthus vaalensis	Buffy Pipit	Motacillidae	Unlisted	Unlisted
Centropus burchellii	Burchell's Coucal	Cuculidae	Unlisted	Unlisted
Eremomela usticollis	Burnt-necked Eremomela	Cisticolidae	Unlisted	Unlisted
Anthus caffer	Bushveld Pipit	Motacillidae	Unlisted	Unlisted
Emberiza capensis	Cape Bunting	Emberizidae	Unlisted	Unlisted
Corvus capensis	Cape Crow	Corvidae	Unlisted	Unlisted
Sphenoeacus afer	Cape Grassbird	Macrosphenidae	Unlisted	Unlisted
Macronyx capensis	Cape Longclaw	Motacillidae	Unlisted	Unlisted
Cossypha caffra	Cape Robin-Chat	Muscicapidae	Unlisted	Unlisted
Spatula smithii	Cape Shoveler	Anatidae	Unlisted	Unlisted
Passer melanurus	Cape Sparrow	Passeridae	Unlisted	Unlisted
Lamprotornis nitens	Cape Starling	Sturnidae	Unlisted	Unlisted
Anas capensis	Cape Teal	Anatidae	Unlisted	Unlisted
Gyps coprotheres	Cape Vulture	Accipitridae	EN	VU
Motacilla capensis	Cape Wagtail	Motacillidae	Unlisted	Unlisted
Ploceus capensis	Cape Weaver	Ploceidae	Unlisted	Unlisted
Zosterops virens	Cape White-eye	Zosteropidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Anthoscopus minutus	Cape Penduline Tit	Remizidae	Unlisted	Unlisted
Monticola rupestris	Cape Rock Thrush	Muscicapidae	Unlisted	Unlisted
Oenanthe pileata	Capped Wheatear	Muscicapidae	Unlisted	Unlisted
Dendropicos fuscescens	Cardinal Woodpecker	Picidae	Unlisted	Unlisted
Hydropogne caspia	Caspian Tern	Laridae	VU	LC
Curruca subcoerulea	Chestnut-vented Warbler	Sylviidae	Unlisted	Unlisted
Batis molitor	Chinspot Batis	Platysteiridae	Unlisted	Unlisted
Emberiza tahapisi	Cinnamon-breasted Bunting	Emberizidae	Unlisted	Unlisted
Cisticola textrix	Cloud Cisticola	Cisticolidae	Unlisted	Unlisted
Buteo buteo	Common Buzzard	Accipitridae	Unlisted	Unlisted
Tringa nebularia	Common Greenshank	Pycnonotidae	Unlisted	Unlisted
Gallinula chloropus	Common Moorhen	Rallidae	Unlisted	Unlisted
Acridotheres tristis	Common Myna	Sturnidae	Unlisted	Unlisted
Struthio camelus	Common Ostrich	Struthionidae	Unlisted	Unlisted
Coturnix coturnix	Common Quail	Phasianidae	Unlisted	Unlisted
Actitis hypoleucos	Common Sandpiper	Scolopacidae	Unlisted	Unlisted
Rhinopomastus cyanomelas	Common Scimitarbill	Phoeniculidae	Unlisted	Unlisted
Apus apus	Common Swift	Apodidae	Unlisted	Unlisted
Estrilda astrild	Common Waxbill	Estrildidae	Unlisted	Unlisted
Delichon urbicum	Common House Martin	Hirundinidae	Unlisted	Unlisted
Acrocephalus baeticatus	Common Reed Warbler	Acrocephalidae	Unlisted	Unlisted
Acrocephalus baeticatus	Common Reed Warbler	Acrocephalidae	Unlisted	Unlisted
Peliperdix coqui	Coqui Francolin	Phasianidae	Unlisted	Unlisted
Trachyphonus vaillantii	Crested Barbet	Lybiidae	Unlisted	Unlisted
Dendroperdix sephaena	Crested Francolin	Phasianidae	Unlisted	Unlisted
Laniarius atrococcineus	Crimson-breasted Shrike	Malaconotidae	Unlisted	Unlisted
Vanellus coronatus	Crowned Lapwing	Charadriidae	Unlisted	Unlisted
Anomalospiza imberbis	Cuckoo Finch	Viduidae	Unlisted	Unlisted
Calidris ferruginea	Curlew Sandpiper	Scolopacidae	LC	NT
Amadina fasciata	Cut-throat Finch	Estriididae	Unlisted	Unlisted
Pycnonotus tricolor	Dark-capped Bulbul	Pycnonotidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Cisticola aridulus	Desert Cisticola	Cisticolidae	Unlisted	Unlisted
Chrysococcyx caprius	Diederik Cuckoo	Cuculidae	Unlisted	Unlisted
Vidua funerea	Dusky Indigobird	Viduidae	Unlisted	Unlisted
Ixobrychus sturmii	Dwarf Bittern	Ardeidae	Unlisted	Unlisted
Certhilauda semitorquata	Eastern Long-billed Lark	Alaudidae	Unlisted	Unlisted
Alopochen aegyptiaca	Egyptian Goose	Anatidae	Unlisted	Unlisted
Turtur chalcospilos	Emerald-spotted Wood Dove	Columbidae	Unlisted	Unlisted
Falco subbuteo	Eurasian Hobby	Falconidae	Unlisted	Unlisted
Numenius phaeopus	Eurasian Whimbrel	Scolopacidae	Unlisted	Unlisted
Merops apiaster	European Bee-eater	Meropidae	Unlisted	Unlisted
Pernis apivorus	European Honey Buzzard	Accipitridae	Unlisted	Unlisted
Coracias garrulus	European Roller	Coraciidae	NT	LC
Stenostira scita	Fairy Flycatcher	Muscicapidae	Unlisted	Unlisted
Oenanthe familiaris	Familiar Chat	Muscicapidae	Unlisted	Unlisted
Caprimulgus pectoralis	Fiery-necked Nightjar	Caprimulgidae	Unlisted	Unlisted
Melaenornis silens	Fiscal Flycatcher	Muscicapidae	Unlisted	Unlisted
Mirafra rufocinnamomea	Flappet Lark	Alaudidae	Unlisted	Unlisted
Dicrurus adsimilis	Fork-tailed Drongo	Dicruridae	Unlisted	Unlisted
Caprimulgus tristigma	Freckled Nightjar	Caprimulgidae	Unlisted	Unlisted
Dendrocygna bicolor	Fulvous Whistling Duck	Anatidae	Unlisted	Unlisted
Micronisus gabar	Gabar Goshawk	Accipitridae	Unlisted	Unlisted
Sylvia borin	Garden Warbler	Sylviidae	Unlisted	Unlisted
Megaceryle maxima	Giant Kingfisher	Alcedinidae	Unlisted	Unlisted
Plegadis falcinellus	Glossy Ibis	Threskiornithidae	Unlisted	Unlisted
Emberiza flaviventris	Golden-breasted Bunting	Emberizidae	Unlisted	Unlisted
Campethera abingoni	Golden-tailed Woodpecker	Picidae	Unlisted	Unlisted
Ardea goliath	Goliath Heron	Ardeidae	Unlisted	Unlisted
Ardea alba	Great Egret	Ardeidae	Unlisted	Unlisted
Passer motitensis	Great Sparrow	Passeridae	Unlisted	Unlisted
Podiceps cristatus	Great Crested Grebe	Podicipedidae	Unlisted	Unlisted
Acrocephalus arundinaceus	Great Reed Warbler	Acrocephalidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Clamator glandarius	Great Spotted Cuckoo	Cuculidae	Unlisted	Unlisted
Phoenicopterus roseus	Greater Flamingo	Phoenicopteridae	NT	LC
Indicator indicator	Greater Honeyguide	Indicatoridae	Unlisted	Unlisted
Falco rupicoloides	Greater Kestrel	Falconidae	Unlisted	Unlisted
Rostratula benghalensis	Greater Painted-snipe	Rostratulidae	NT	LC
Cinnyris afer	Greater Double-collared Sunbird	Nectariniidae	Unlisted	Unlisted
Cecropis cucullata	Greater Striped Swallow	Hirundinidae	Unlisted	Unlisted
Phoeniculus purpureus	Green Wood Hoopoe	Phoeniculidae	Unlisted	Unlisted
Pytilia melba	Green-winged Pytilia	Estrildidae	Unlisted	Unlisted
Corythaixoides concolor	Grey Go-away-bird	Musophagidae	Unlisted	Unlisted
Ardea cinerea	Grey Heron	Ardeidae	Unlisted	Unlisted
Myioparus plumbeus	Grey Tit-Flycatcher	Muscicapidae	Unlisted	Unlisted
Camaroptera brevicaudata	Grey-backed Camaroptera	Cisticolidae	Unlisted	Unlisted
Malaconotus blanchoti	Grey-headed Bush-shrike	Malaconotidae	Unlisted	Unlisted
Chroicocephalus cirrocephalus	Grey-headed Gull	Laridae	Unlisted	Unlisted
Halcyon leucocephala	Grey-headed Kingfisher	Alcedinidae	Unlisted	Unlisted
Turdus litsitsirupa	Groundscraper Thrush	Turdidae	Unlisted	Unlisted
Bostrychia hagedash	Hadada Ibis	Threskiornithidae	Unlisted	Unlisted
Alcedo semitorquata	Half-collared Kingfisher	Alcedinidae	NT	LC
Scopus umbretta	Hamerkop	Scopidae	Unlisted	Unlisted
Coturnix delegorguei	Harlequin Quail	Phasianidae	Unlisted	Unlisted
Numida meleagris	Helmeted Guineafowl	Numididae	Unlisted	Unlisted
Apus horus	Horus Swift	Apodidae	Unlisted	Unlisted
Passer domesticus	House Sparrow	Passeridae	Unlisted	Unlisted
Hippolais icterina	Icterine Warbler	Acrocephalidae	Unlisted	Unlisted
Buteo rufofuscus	Jackal Buzzard	Accipitridae	Unlisted	Unlisted
Clamator jacobinus	Jacobin Cuckoo	Cuculidae	Unlisted	Unlisted
Lagonosticta rhodopareia	Jameson's Firefinch	Estriididae	Unlisted	Unlisted
Cercotrichas paena	Kalahari Scrub Robin	Muscicapidae	Unlisted	Unlisted
Turdus smithi	Karoo Thrush	Turdidae	Unlisted	Unlisted
Charadrius pecuarius	Kittlitz's Plover	Charadriidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Chrysococcyx klaas	Klaas's Cuckoo	Cuculidae	Unlisted	Unlisted
Sarkidiornis melanotos	Knob-billed Duck	Anatidae	Unlisted	Unlisted
Turnix sylvaticus	Kurrichane Buttonquail	Turnicidae	Unlisted	Unlisted
Turdus libonyana	Kurrichane Thrush	Turdidae	Unlisted	Unlisted
Falco biarmicus	Lanner Falcon	Falconidae	VU	LC
Torgos tracheliotos	Lappet-faced Vulture	Accipitridae	EN	EN
Emberiza impetuani	Lark-like Bunting	Emberizidae	Unlisted	Unlisted
Spilopelia senegalensis	Laughing Dove	Columbidae	Unlisted	Unlisted
Cisticola aberrans	Lazy Cisticola	Cisticolidae	Unlisted	Unlisted
Indicator minor	Lesser Honeyguide	Indicatoridae	Unlisted	Unlisted
Falco naumanni	Lesser Kestrel	Falconidae	Unlisted	Unlisted
Paragallinula angulata	Lesser Moorhen	Rallidae	Unlisted	Unlisted
Lanius minor	Lesser Grey Shrike	Laniidae	Unlisted	Unlisted
Ploceus intermedius	Lesser Masked Weaver	Ploceidae	Unlisted	Unlisted
Cecropis abyssinica	Lesser Striped Swallow	Hirundinidae	Unlisted	Unlisted
Acrocephalus gracilirostris	Lesser Swamp Warbler	Acrocephalidae	Unlisted	Unlisted
Cisticola tinniens	Levaillant's Cisticola	Cisticolidae	Unlisted	Unlisted
Clamator levaillantii	Levaillant's Cuckoo	Cuculidae	Unlisted	Unlisted
Coracias caudatus	Lilac-breasted Roller	Coraciidae	Unlisted	Unlisted
Merops pusillus	Little Bee-eater	Meropidae	Unlisted	Unlisted
Ixobrychus minutus	Little Bittern	Ardeidae	Unlisted	Unlisted
Egretta garzetta	Little Egret	Ardeidae	Unlisted	Unlisted
Tachybaptus ruficollis	Little Grebe	Podicipedidae	Unlisted	Unlisted
Accipiter minullus	Little Sparrowhawk	Accipitridae	Unlisted	Unlisted
Calidris minuta	Little Stint	Scolopacidae	Unlisted	Unlisted
Apus affinis	Little Swift	Apodidae	Unlisted	Unlisted
Bradypterus baboecala	Little Rush Warbler	Locustellidae	Unlisted	Unlisted
Kaupifalco monogrammicus	Lizard Buzzard	Accipitridae	Unlisted	Unlisted
Sylvietta rufescens	Long-billed Crombec	Macrosphenidae	Unlisted	Unlisted
Lophaetus occipitalis	Long-crested Eagle	Accipitridae	Unlisted	Unlisted
Euplectes progne	Long-tailed Widowbird	Ploceidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Vidua paradisaea	Long-tailed Paradise Whydah	Viduidae	Unlisted	Unlisted
Urolestes melanoleucus	Magpie Shrike	Laniidae	Unlisted	Unlisted
Corythornis cristatus	Malachite Kingfisher	Alcedinidae	Unlisted	Unlisted
Nectarinia famosa	Malachite Sunbird	Nectariniidae	Unlisted	Unlisted
Anas platyrhynchos	Mallard	Anatidae	Unlisted	Unlisted
Leptoptilos crumenifer	Marabou Stork	Ciconiidae	NT	LC
Melaenornis mariquensis	Marico Flycatcher	Muscicapidae	Unlisted	Unlisted
Cinnyris mariquensis	Marico Sunbird	Nectariniidae	Unlisted	Unlisted
Asio capensis	Marsh Owl	Strigidae	Unlisted	Unlisted
Tringa stagnatilis	Marsh Sandpiper	Scolopacidae	Unlisted	Unlisted
Acrocephalus palustris	Marsh Warbler	Acrocephalidae	Unlisted	Unlisted
Mirafra cheniana	Melodious Lark	Alaudidae	Unlisted	Unlisted
Thamnolaea cinnamomeiventris	Mocking Cliff Chat	Muscicapidae	Unlisted	Unlisted
Mirafra passerina	Monotonous Lark	Alaudidae	Unlisted	Unlisted
Myrmecocichla monticola	Mountain Wheatear	Muscicapidae	Unlisted	Unlisted
Oena capensis	Namaqua Dove	Columbidae	Unlisted	Unlisted
Pternistis natalensis	Natal Spurfowl	Phasianidae	Unlisted	Unlisted
Cisticola fulvicapilla	Neddicky	Cisticolidae	Unlisted	Unlisted
Anthus nicholsoni	Nicholson's Pipit	Motacillidae	Unlisted	Unlisted
Afrotis afraoides	Northern Black Korhaan	Otididae	Unlisted	Unlisted
Scleroptila gutturalis	Orange River Francolin	Phasianidae	Unlisted	Unlisted
Chlorophoneus sulfureopectus	Orange-breasted Bush-shrike	Malaconotidae	Unlisted	Unlisted
Amandava subflava	Orange-breasted Waxbill	Estrildidae	Unlisted	Unlisted
Accipiter ovampensis	Ovambo Sparrowhawk	Accipitridae	Unlisted	Unlisted
Melaenornis pallidus	Pale Flycatcher	Muscicapidae	Unlisted	Unlisted
Melierax canorus	Pale Chanting Goshawk	Accipitridae	Unlisted	Unlisted
Gypohierax angolensis	Palm-nut Vulture	Accipitridae	Unlisted	Unlisted
Hirundo dimidiata	Pearl-breasted Swallow	Hirundinidae	Unlisted	Unlisted
Glaucidium perlatum	Pearl-spotted Owlet	Strigidae	Unlisted	Unlisted
Falco peregrinus	Peregrine Falcon	Falconidae	Unlisted	Unlisted
Recurvirostra avosetta	Pied Avocet	Recurvirostridae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Corvus albus	Pied Crow	Corvidae	Unlisted	Unlisted
Ceryle rudis	Pied Kingfisher	Alcedinidae	Unlisted	Unlisted
Lamprotornis bicolor	Pied Starling	Sturnidae	Unlisted	Unlisted
Vidua macroura	Pin-tailed Whydah	Viduidae	Unlisted	Unlisted
Anthus leucophrys	Plain-backed Pipit	Motacillidae	Unlisted	Unlisted
Ardea purpurea	Purple Heron	Ardeidae	Unlisted	Unlisted
Vidua purpurascens	Purple Indigobird	Viduidae	Unlisted	Unlisted
Coracias naevius	Purple Roller	Coraciidae	Unlisted	Unlisted
Ortygospiza atricollis	Quailfinch	Estrildidae	Unlisted	Unlisted
Cisticola chiniana	Rattling Cisticola	Cisticolidae	Unlisted	Unlisted
Lanius collurio	Red-backed Shrike	Laniidae	Unlisted	Unlisted
Lagonosticta senegala	Red-billed Firefinch	Estriididae	Unlisted	Unlisted
Buphagus erythrorynchus	Red-billed Oxpecker	Buphagidae	Unlisted	Unlisted
Quelea quelea	Red-billed Quelea	Ploceidae	Unlisted	Unlisted
Anas erythrorhyncha	Red-billed Teal	Anatidae	Unlisted	Unlisted
Bubalornis niger	Red-billed Buffalo Weaver	Ploceidae	Unlisted	Unlisted
Cecropis semirufa	Red-breasted Swallow	Hirundinidae	Unlisted	Unlisted
Calandrella cinerea	Red-capped Lark	Alaudidae	Unlisted	Unlisted
Cuculus solitarius	Red-chested Cuckoo	Cuculidae	Unlisted	Unlisted
Sarothrura rufa	Red-chested Flufftail	Sarothruridae	Unlisted	Unlisted
Euplectes ardens	Red-collared Widowbird	Ploceidae	Unlisted	Unlisted
Lophotis ruficrista	Red-crested Korhaan	Otididae	Unlisted	Unlisted
Streptopelia semitorquata	Red-eyed Dove	Columbidae	Unlisted	Unlisted
Urocolius indicus	Red-faced Mousebird	Coliidae	Unlisted	Unlisted
Falco vespertinus	Red-footed Falcon	Falconidae	NT	VU
Amadina erythrocephala	Red-headed Finch	Estriididae	Unlisted	Unlisted
Anaplectes rubriceps	Red-headed Weaver	Ploceidae	Unlisted	Unlisted
Fulica cristata	Red-knobbed Coot	Rallidae	Unlisted	Unlisted
Jynx ruficollis	Red-throated Wryneck	Picidae	Unlisted	Unlisted
Onychognathus morio	Red-winged Starling	Sturnidae	Unlisted	Unlisted
Microcarbo africanus	Reed Cormorant	Phalacrocoracidae	Unlisted	Unlisted

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
Streptopelia capicola	Ring-necked Dove	Columbidae	Unlisted	Unlisted

*(Taylor *et al*. 2015), + (IUCN 2021)

10.2 Appendix B

10.2.1 Point count data

Common Name	Scientific Name	Family Name	RD (Regional, Global)
Acacia Pied Barbet	*Tricholaema leucomelas*	Lybiidae	0
African Pipit	*Anthus cinnamomeus*	Motacillidae	0
Black-winged Kite	*Elanus caeruleus*	Accipitridae	0
Blacksmith Lapwing	*Vanellus armatus*	Charadriidae	0
Cape Robin-Chat	*Cossypha caffra*	Muscicapidae	0
Cape Wagtail	*Motacilla capensis*	Motacillidae	0
Cape White-eye	*Zosterops virens*	Zosteropidae	0
Chestnut-vented Warbler	*Curruca subcoerulea*	Sylviidae	0
Common Moorhen	*Gallinula chloropus*	Rallidae	0
Crowned Lapwing	*Vanellus coronatus*	Charadriidae	0
Dark-capped Bulbul	*Pycnonotus tricolor*	Pycnonotidae	0
Desert Cisticola	*Cisticola aridulus*	Cisticolidae	0
Fiscal Flycatcher	*Melaenornis silens*	Muscicapidae	0
Fork-tailed Drongo	*Dicrurus adsimilis*	Dicruridae	0
Greater Kestrel	*Falco rupicoloides*	Falconidae	0
Hadada Ibis	*Bostrychia hagedash*	Threskiornithidae	0
Helmeted Guineafowl	*Numida meleagris*	Numididae	0
Laughing Dove	*Spilopelia senegalensis*	Columbidae	0
Lesser Swamp Warbler	*Acrocephalus gracilirostris*	Acrocephalidae	0
Levaillant's Cisticola	*Cisticola tinniens*	Cisticolidae	0
Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	0
Long-billed Crombec	*Sylvietta rufescens*	Macrosphenidae	0
Namaqua Dove	*Oena capensis*	Columbidae	0
Pied Crow	*Corvus albus*	Corvidae	0
Red-eyed Dove	*Streptopelia semitorquata*	Columbidae	0
Red-faced Mousebird	*Urocolius indicus*	Coliidae	0
Ring-necked Dove	*Streptopelia capicola*	Columbidae	0
Secretarybird	*Sagittarius serpentarius*	Sagittariidae	VU, EN
Southern Fiscal	*Lanius collaris*	Laniidae	0
Southern Masked Weaver	*Ploceus velatus*	Ploceidae	0
Southern Red Bishop	*Euplectes orix*	Ploceidae	0
Water Thick-knee	*Burhinus vermiculatus*	Burhinidae	0
Rufous-naped Lark	*Mirafra africana*	Alaudidae	0
Northern Black Korhaan	*Afrotis afraoides*	Otididae	0
Black-chested Prinia	*Prinia flavicans*	Cisticolidae	0
Brown-crowned Tchagra	*Tchagra australis*	Malaconotidae	0
Black-faced Waxbill	*Brunhilda erythronotos*	Estrildidae	0
Tawny-flanked Prinia	*Prinia subflava*	Cisticolidae	0
Violet-eared Waxbill	*Granatina granatina*	Estrildidae	0
Blue Waxbill	*Uraeginthus angolensis*	Estrildidae	0

Common Myna	*Acridotheres tristis*	Sturnidae	0
White-bellied Sunbird	*Cinnyris talatala*	Nectariniidae	0
Red-billed Quelea	*Quelea quelea*	Ploceidae	0
Brubru	*Nilaus afer*	Malaconotidae	0
Kalahari Scrub Robin	*Cercotrichas paena*	Muscicapidae	0
Western Cattle Egret	*Bubulcus ibis*	Ardeidae	0
Orange-breasted Waxbill	*Amandava subflava*	Estrildidae	0
Cape Starling	*Lamprotornis nitens*	Sturnidae	0
Crimson-breasted Shrike	*Laniarius atrococcineus*	Malaconotidae	0
Southern Boubou	*Laniarius ferrugineus*	Malaconotidae	0
Red-throated Wryneck	*Jynx ruficollis*	Picidae	0
African Palm Swift	*Cypsiurus parvus*	Apodidae	0
Natal Spurfowl	*Pternistis natalensis*	Phasianidae	0
Rattling Cisticola	*Cisticola chiniana*	Cisticolidae	0
White-browed Scrub Robin	*Cercotrichas leucophrys*	Muscicapidae	0
Burchell's Coucal	*Centropus burchellii*	Cuculidae	0
Grey Go-away-bird	*Corythaixoides concolor*	Musophagidae	0
Little Rush Warbler	*Bradypterus baboecala*	Locustellidae	0
Black Crake	*Zapornia flavirostra*	Rallidae	0
Arrow-marked Babbler	*Turdoides jardineii*	Leiothrichidae	0
Lazy Cisticola	*Cisticola aberrans*	Cisticolidae	0
Grey-backed Camaroptera	*Camaroptera brevicaudata*	Cisticolidae	0
Green-winged Pytilia	*Pytilia melba*	Estrildidae	0
Speckled Mousebird	*Colius striatus*	Coliidae	0
Hamerkop	*Scopus umbretta*	Scopidae	0
Red-knobbed Coot	*Fulica cristata*	Rallidae	0
Burnt-necked Eremomela	*Eremomela usticollis*	Cisticolidae	0
African Grey Hornbill	*Lophoceros nasutus*	Bucerotidae	0

*(Taylor *et al*. 2015) + (IUCN 2021)Appendix C:

10.3 Appendix F: 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 Regulation 71 and is punishable in terms of Section 24F of the Act.

Lindi Steyn

Biodiversity Specialist

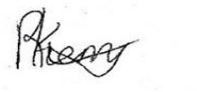
The Biodiversity Company

July 2023

I, Ryno Kemp, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations, and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;

- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Ryno Kemp

Biodiversity Specialist

The Biodiversity Company

July 2023