BIRD IMPACT ASSESSMENT REPORT

Proposed Eskom Single Circuit (132kV) Overhead Line (OHL) from Ceres Substation to Witzenberg Substation and construction of the proposed Prince Alfred Hamlet substation

February 2024

AFRIAVIAN ENVIRONMENTAL

DETAILS OF THE SPECIALISTS

Albert Froneman (Bird and GIS Specialist)

Albert is a registered Professional Natural Scientist with the South African Council of Natural Scientific Professionals (SACNASP) in the field of Zoology and has a M.Sc. in Conservation Biology from the University of Cape Town. He started his career in natural sciences as a Geographic Information Systems (GIS) specialist at the Council for Scientific and Industrial Research (CSIR). In 1998 he joined the Endangered Wildlife Trust (EWT) where he headed up the Airports Company South Africa (ACSA) – EWT Strategic Partnership, a position he held until he resigned to work as a private ornithological consultant in 2008. Albert's specialist field is the management of wildlife, and particularly bird related hazards at airports. His expertise is recognized internationally; in 2005 he was elected as Vice-Chairman of the International Bird Strike Committee. Since 2010, Albert has worked closely with Chris van Rooyen in developing a protocol for pre-construction monitoring at wind energy facilities and is currently jointly coordinating pre-construction monitoring programmes at several wind farm facilities. Albert also works outside the electricity industry and had done a wide range of bird impact assessment studies associated with various residential and industrial developments.

Megan Loftie-Eaton (Bird Specialist and Ecologist)

Megan is a registered Professional Natural Scientist with the South African Council of Natural Scientific Professionals (SACNASP) in the field of Ecology, and a member of the Zoological Society of Southern Africa (ZSSA). Megan is also an Environmental Assessment Practitioner and assists with Environmental Impact Assessments (EIA's), Basic Assessments (BA's), and provides specialist input within the avifaunal and ecological fields. She obtained her BSc in Environmental & Conservation Sciences with distinction through the University of Alberta in Edmonton, Canada. After moving back to South Africa in 2011, she went on to complete her MSc in Zoology (2014) at the University of Cape Town, and her PhD in Biological Sciences (2018), looking at the impacts of bush encroachment on bird distributions in the savanna biome of South Africa. Megan has conducted avifaunal field surveys and has experience with conducting avifaunal impact assessments.

DECLARATION OF INDEPENDENCE

I, Albert Froneman, as duly authorised representative of AfriAvian Environmental, and working under the supervision of and in association with Albert Froneman (SACNASP Zoological Science Registration number 400177/09) as stipulated by the Natural Scientific Professions Act 27 of 2003, hereby confirm my independence (as well as that of AfriAvian Environmental) as a specialist and declare that neither I nor AfriAvian Environmental have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which SRK Consulting was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for worked performed, specifically in connection with the Basic Assessment for the proposed Eskom Single Circuit (132kV) Power line from Ceres Substation to Witzenberg Substation.

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Full Name: Albert Froneman
Title / Position: Director

EXECUTIVE SUMMARY

In April 2018 Eskom received an EA to construct a new double circuit power line (132kV and 66kV) from the Romansrivier substation to the Ceres substation. This line would provide 132kV supply to Ceres and replace the partially burnt 66kV line between Romansriver and Ceres, and secure supply to the Ceres and Witzenberg substations (Phase 1 of the Project).

Eskom now proposes to construct a new single circuit 132kV OHL to run approximately 32m from the existing 66kV OHL between the Ceres and Witzenberg substations, and to construct a new Prince Alfred Hamlet substation and a tie-in to this proposed new substation from the proposed new 132kV OHL (Phase 2 of the Project).

Key aspects of the Ceres-Witzenberg Electrical Grid Infrastructure (EGI) Project include:

- Construction of a single circuit OHL (132kV) from Ceres to Witzenberg substation (~17km);
- Construction of the new Prince Alfred Hamlet substation; and
- Construction of a new tie-in to the proposed Prince Alfred Hamlet substation from the proposed new 132kV OHL.

SRK has appointed AfriAvian Environmental to compile a specialist avifaunal assessment report detailing the potential bird related impacts associated with the proposed new OHL and substation.

For the purposes of the avifaunal impact assessment, the **Project Area of Influence (PAOI)** was defined as a 2km buffer zone around the proposed 132kV OHL alignment and proposed substation.

AVIFAUNA

The Southern African Bird Atlas Project (SABAP2) data indicates that a total of 184 bird species could potentially occur within the Broader Area where the PAOI is located – **Appendix 1** provides a comprehensive bird species list. Of these, 61 (33% of) species are classified as EGI sensitive avifauna for Electrical Grid Infrastructure (EGI) developments (i.e. **EGI sensitive avifauna**) and 7 of these are South African Red Listed species (i.e., Species of Conservation Concern – SCC). Of the 61 EGI sensitive avifauna, 47 are likely to occur regularly in or near the Project Area of Influence (PAOI), and 15 EGI sensitive avifauna were recorded during the on-site surveys (26–27 February 2024).

POTENTIAL IMPACTS

The construction of the proposed new 132kV single-circuit overhead power line (OHL) between the Ceres and Witzenberg Substations, and the new Prince Alfred Hamlet 132kV substation is expected to have a range of potential impacts on EGI sensitive avifauna.

The following impacts relative to avifauna have been identified:

Construction Phase

- Displacement due to disturbance associated with the construction of the EGI.
- Displacement due to habitat loss associated with the construction (and presence) of the EGI.

Operational Phase

- Electrocutions at the on-site substations and on the 132kV overhead lines.
- Collisions with the 132kV overhead line (OHL).

Decommissioning Phase

- Displacement due to disturbance associated with the decommissioning of the EGI.

Below is a summary of the anticipated impacts of the EGI Project and its associated infrastructure pre- and post-mitigation:

Environmental Parameter	Impact	Significance Rating Pre-Mitigation	Significance Rating Post Mitigation
Avifauna	*Displacement of EGI sensitive avifauna due to disturbance associated with construction of the EGI.*	Low -	Very Low -
	Displacement due to habitat transformation associated with the construction and presence of the EGI.	Low -	Very Low -
	Mortality of EGI sensitive avifauna due to electrocution in the substation yard.	Low -	Very Low -
	Mortality of EGI sensitive avifauna due to collisions with the 132kV overhead line.	Medium -	Low -
	Displacement of EGI sensitive avifauna due to disturbance associated with decommissioning of the EGI.	Low -	Very Low -

ENVIRONMENTAL SENSITIVITIES

The PAOI and immediate environment is classified as **HIGH/MEDIUM SENSITIVITY** for avifauna according to the Animal Species Theme. The sensitivity classification is linked to the possible occurrence of Verreaux's Eagle *Aquila verreauxii* (Regionally Vulnerable), Black Harrier *Circus maurus* (Globally and Regionally Endangered), Southern Black Korhaan *Afrotis afra* (Globally and Regionally Vulnerable), Striped Flufftail *Sarothrura affinis* (Regionally Vulnerable), Secretarybird *Sagittarius serpentarius* (Globally Endangered and Regionally Vulnerable), and Caspian Tern *Hydroprogne caspia* (Regionally Vulnerable).

The PAOI contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). SCCs are listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Near Threatened, or Vulnerable.

The entire PAOI is a high sensitivity zone from a power line interaction perspective due to the recorded (SABAP2 data and the on-site surveys) and potential presence of EGI sensitive SCC including Blue Crane, Black Harrier, Maccoa Duck, and Verreaux's Eagle which could pass through the and/or utilise the whole PAOI for foraging.

The following sensitives were identified from an avifaunal perspective (**Figure i**). Mitigation in the form of Bird Flight Diverters should therefore be applied to these identified sections of the OHL:

- **High Sensitivity Zones**

Dams and Drainage Lines: The proposed 132kV OHL passes along farm dams and crosses over drainage lines. These areas could attract EGI sensitive avifauna, especially waterbirds, which would put them at risk of colliding with the OHL as they move between dams, or up and down drainage lines.

Stands of Trees: There are several stands of alien trees along the proposed route of the 132kV OHL. EGI sensitive avifauna, especially raptors and corvids, could use these trees for roosting, perching, and nesting and would be at risk of colliding with the OHL when taking off from, or approaching the trees.

Figure i below indicates the identified high sensitivity zones. Refer to **Appendix 4** for more details.

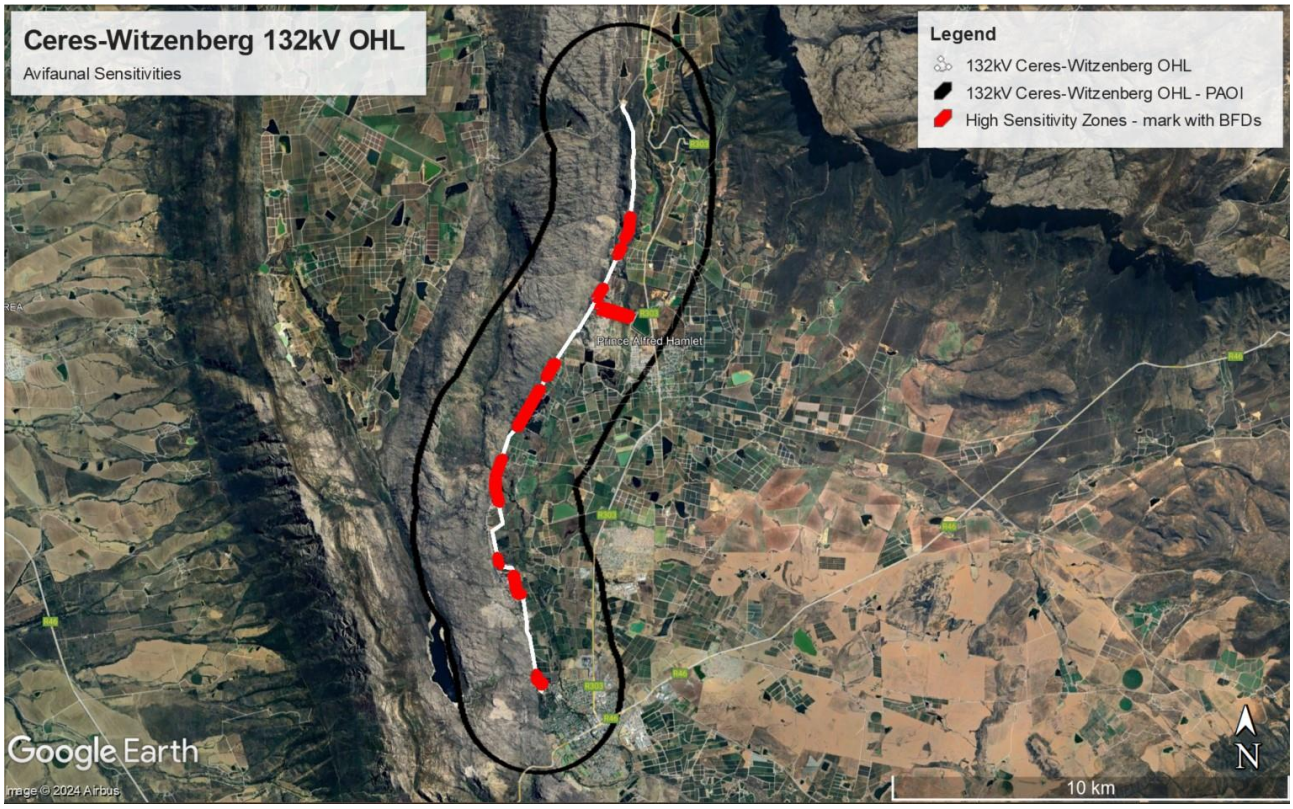

Figure i: High sensitivity areas identified within the PAOI.

CONCLUSION

The proposed Ceres-Witzenberg Electrical Grid Infrastructure will have anticipated medium and low negative impacts on EGI sensitive avifauna, which is expected to be reduced to low and very low with the appropriate mitigation measures. No fatal flaws were discovered during the on-site investigations. It is recommended that the activity is authorised, on condition that the proposed **mitigation measures** as detailed in the Impact Tables (**Section 7** of the report) and the EMPr (**Appendix 5**) are **strictly implemented**.

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1 INTRODUCTION

The Witzenberg substation is currently supplied by one 132kV single circuit OHL. This line runs across the Witzenberg Mountain Range from the Romansrivier substation. Three 66kV feeders out of the Witzenberg substation supply the Ceres, Gydo, and Slangboom substations from where Eskom's customers draw their electricity.

A 66kV OHL runs from Romansriver to Witzenberg substations via Ceres. A portion of this OHL between Romansriver and Ceres burnt down, cutting supply from Romansriver to Ceres and Witzenberg, reducing the reliability of supply to the area. Since the fire, the Ceres substation has been supplied by the 66kV line from the Witzenberg substation (and consequently, by the 132kV OHL between the Romansriver and Witzenberg substations) only. Therefore, both the Ceres and the Witzenberg substations are solely dependent on the 132 kV OHL between Romansriver and Witzenberg. Eskom would be unable to supply the dependent network (i.e. the towns of Prince Alfred Hamlet and Ceres) for several months should a fault occur on this line (i.e. until the line is repaired).

In April 2018 Eskom received an EA to construct a new double circuit power line (132kV and 66kV) from the Romansrivier substation to the Ceres substation. This line would provide 132kV supply to Ceres and replace the partially burnt 66kV line between Romansriver and Ceres and secure supply to the Ceres and Witzenberg substations (Phase 1 of the Project).

Eskom now proposes to construct a new single circuit 132kV OHL to run approximately 32m from the existing 66kV OHL between the Ceres and Witzenberg substations and to construct a new Prince Alfred Hamlet substation and a tie-in to this proposed new substation from the proposed new 132kV OHL (Phase 2 of the Project).

Key aspects of the Ceres-Witzenberg EGI Project include:

- Construction of a single circuit OHL (132kV) from Ceres to Witzenberg substation (~17km);
- Construction of the new Prince Alfred Hamlet substation; and
- Construction of a new tie-in to the proposed Prince Alfred Hamlet substation from the proposed new 132kV OHL.

SRK has appointed AfriAvian Environmental to compile a specialist avifaunal assessment report detailing the potential bird related impacts associated with the proposed new OHL and substation.

See **Figures 1 and 2** below for locality maps of the proposed Ceres-Witzenberg Project.

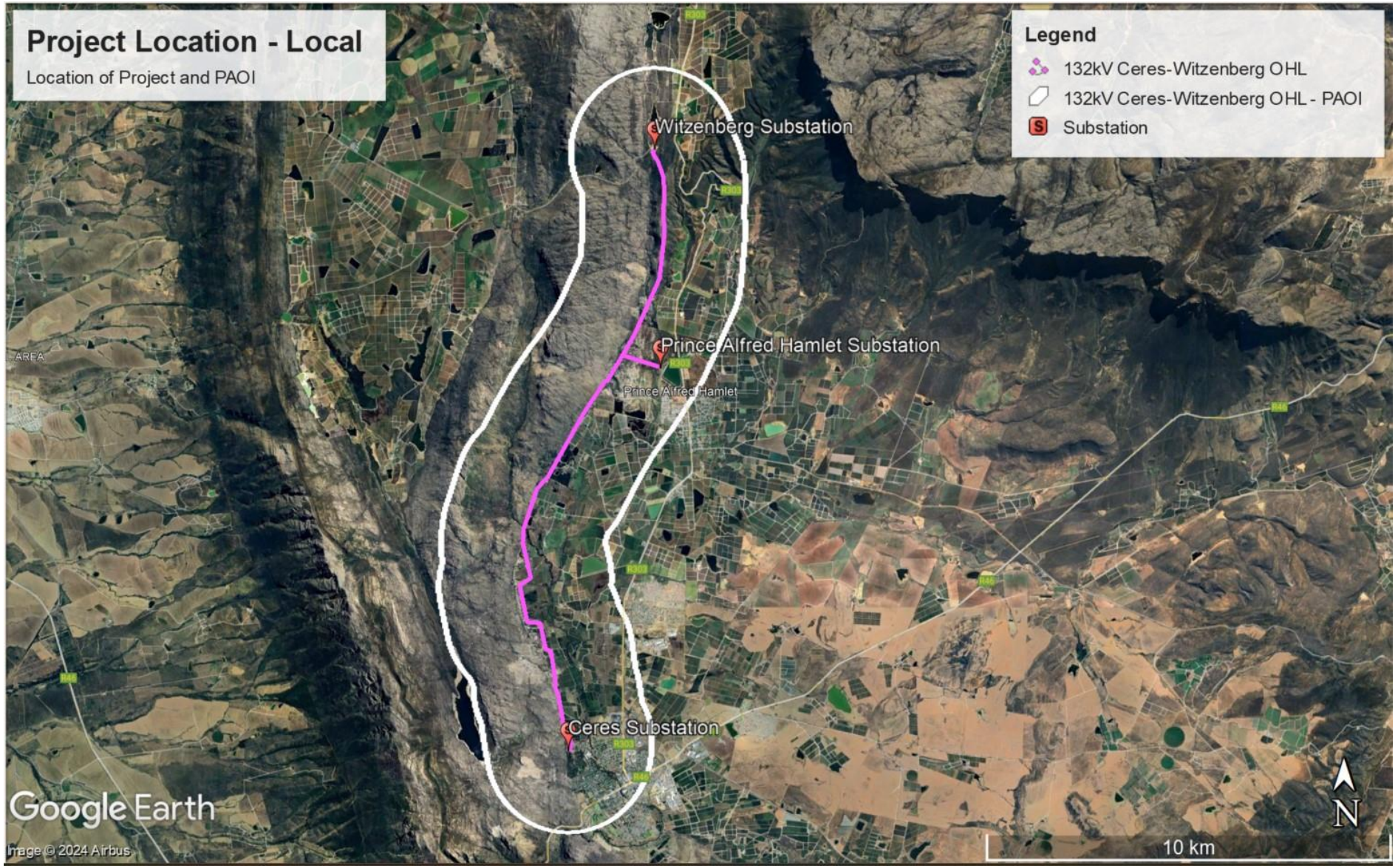

Figure 1: Close-up view of the PAOI and proposed 132kV OHL alignment and Prince Alfred Hamlet substation.

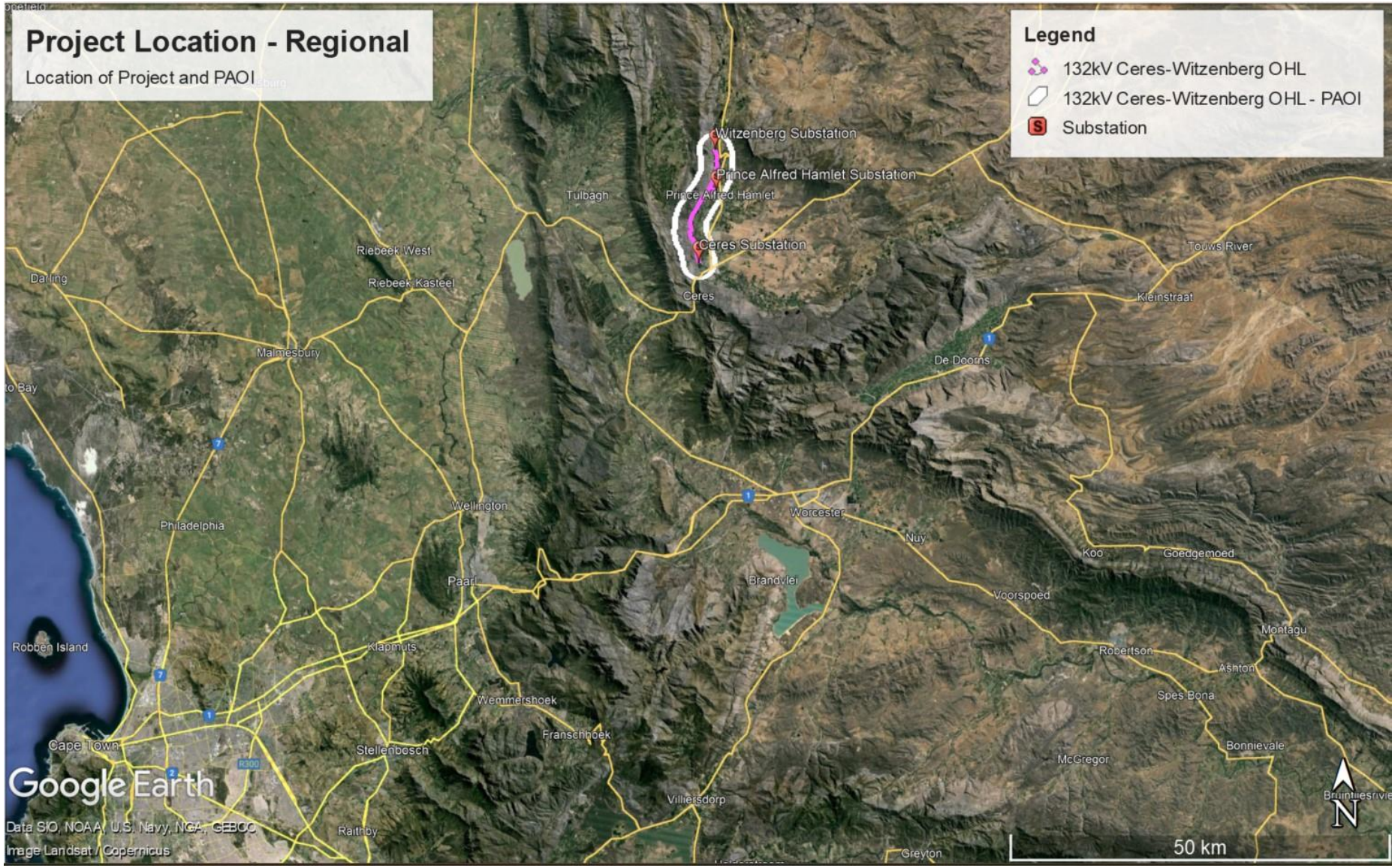

Figure 2: Location of the PAOI – Regional.

2 SCOPE OF STUDY

The purpose of the specialist study is to determine the key issues and potential impacts of the proposed Project on avifauna based on existing information and field assessments. The scope of the study is as follows:

- Describe the affected environment from an avifaunal perspective.
- Discuss gaps in baseline data and other limitations and describe the expected impacts associated with the power lines and associated infrastructure.
- Identify potential sensitive environments and receptors that may be impacted on by the proposed OHL and substation and the types of impacts (i.e., direct, indirect, and cumulative) that are most likely to occur.
- Determine the nature and extent of potential impacts during the construction, operational and decommissioning phases.
- Identify 'No-Go' areas, where applicable.
- Summarise the potential impacts of the OHL and substation.
- Recommend mitigation measures for inclusion in the Environmental Management Programme (EMPr) to reduce the expected impacts to acceptable levels.

2.1 Content of the Report

The National Environmental Management Act 107 of 1998 (NEMA) Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020 is prescribe the required content in a avifauna specialist report for powerline projects. These requirements and the sections of this specialist report in which they are addressed, are summarised in **Error! Reference source not found.**.

GNR 1150 of 2020[1], Ref.:	Item	Report Section:
3.1.1	Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	Pg. 2 and Appendix 6
3.1.2	A signed statement of independence by the specialist;	Pg. 2
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	3.1
3.1.4	A description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	Appendix 3 and Section 3.1
3.1.5	A description of the mean density of observations/ number of sample sites per unit area and the site inspection observations;	6
3.1.6	A description of the assumptions made any uncertainties or gaps in knowledge or data;	3.2
3.1.7	Details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported[2];	6
3.1.8	The online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;	Section 6
3.1.9	The location of areas not suitable for development and to be avoided during construction where relevant;	Section 9 and Appendix 4
3.1.10	A discussion on the cumulative impacts;	10

[1] As amended by GN 3717 of 2023

[2] The actual name of the sensitive species may not appear in the Final EIA report nor any of the specialist reports released into the public domain. It should be referred to as a sensitive plan or animal and its IUCN extinction risk category should be included e.g. Critically Endangered sensitive plant or Endangered sensitive butterfly.

GNR 1150 of 2020[1], Ref.:	Item	Report Section:
3.1.11	Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	8.2
3.1.12	A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant;	11
3.1.13	A motivation must be provided if there were development footprints identified as having "low" or "medium" terrestrial plant species sensitivity (as per paragraph 2.2.12 of Table 1: Assessment and Reporting of Impacts on Terrestrial Animal Species) and were not considered appropriate; and	Appendix 3
3.2	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	See BAR

3 METHODOLODY AND INFORMATION REVIEWED

3.1 Sources of information

The study made use of the following information and data sources:

- Bird distribution data from the Second Southern African Bird Atlas Project (SABAP2) was obtained (https://sabap2.birdmap.africa/) to ascertain which species occur in the pentads where the proposed EGI Project is located. A pentad grid cell covers 5 minutes of latitude by 5 minutes of longitude (5' × 5'). Each pentad is approximately 9 × 8 km in size. To get a representative impression of the bird species in the area a consolidated dataset was obtained for a total of six (6) pentads some of which intersect and others that are near the PAOI, henceforth referred to as "**the Broader Area**" (**Figure 3**). The six pentad grid cells are: 3310_1915, 3310_1920, 3315_1915, 3320_1915, 3315_1920 and 3320_1920. To date, a total of 76 full protocol checklists (i.e., intensive bird listing surveys lasting at least two hours each) and 188 ad hoc protocol lists (surveys lasting less than two hours but still yielding valuable data) have been completed for the six pentads where the PAOI is located.
- The SABAP2 data was regarded as a reliable reflection of the avifauna that occurs in the Broader Area, but the data was also supplemented with data collected during the on-site surveys (February 2024) and with general knowledge of the area.
- A classification of the vegetation types in the PAOI was obtained from the First Atlas of Southern African Birds (SABAP1) and the National Vegetation Map (2018) compiled by the South African National Biodiversity Institute (Mucina & Rutherford 2006).
- The national threatened status of all EGI sensitive avifauna was determined with the use of the most recent edition of the Red List Book of Birds of South Africa, Lesotho, and Swaziland (Taylor *et al.* 2015), and the latest authoritative summary of southern African bird biology (Hockey *et al.* 2005).
- The global threatened status of all EGI sensitive avifauna was determined by consulting the latest (2023.1) IUCN Red List of Threatened Species (http://www.iucnredlist.org/).
- The Important Bird and Biodiversity Areas of South Africa (Marnewick *et al.* 2015; http://www.birdlife.org.za/conservation/important-bird-areas) was consulted for information on potentially relevant Important Bird Areas (IBAs).
- An intensive internet search was conducted to source information on the impacts of electrical grid infrastructure on avifauna.
- Satellite imagery (Google Earth © 2023) was used to view the broader area on a landscape level and to help identify bird habitat on the ground.
- The South African National Biodiversity BGIS map viewer was used to determine the locality of the PAOI relative to National Protected Areas.

- The DFFE National Screening Tool was used to determine the assigned avian sensitivity of the PAOI.
- The following sources were consulted to determine the investigation protocol that is required for the site:
    - 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 NEMA when applying for Environmental Authorisation (Gazetted October 2020)
    - Guidelines for the Implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for EIAs in South Africa produced by the South African National Biodiversity Institute on behalf of the Department of Environment, Forestry and Fisheries (2020).
- A SSV survey was conducted 26–27 February 2024. The PAOI was inspected with a 4x4 vehicle and on foot. All birds were recorded.

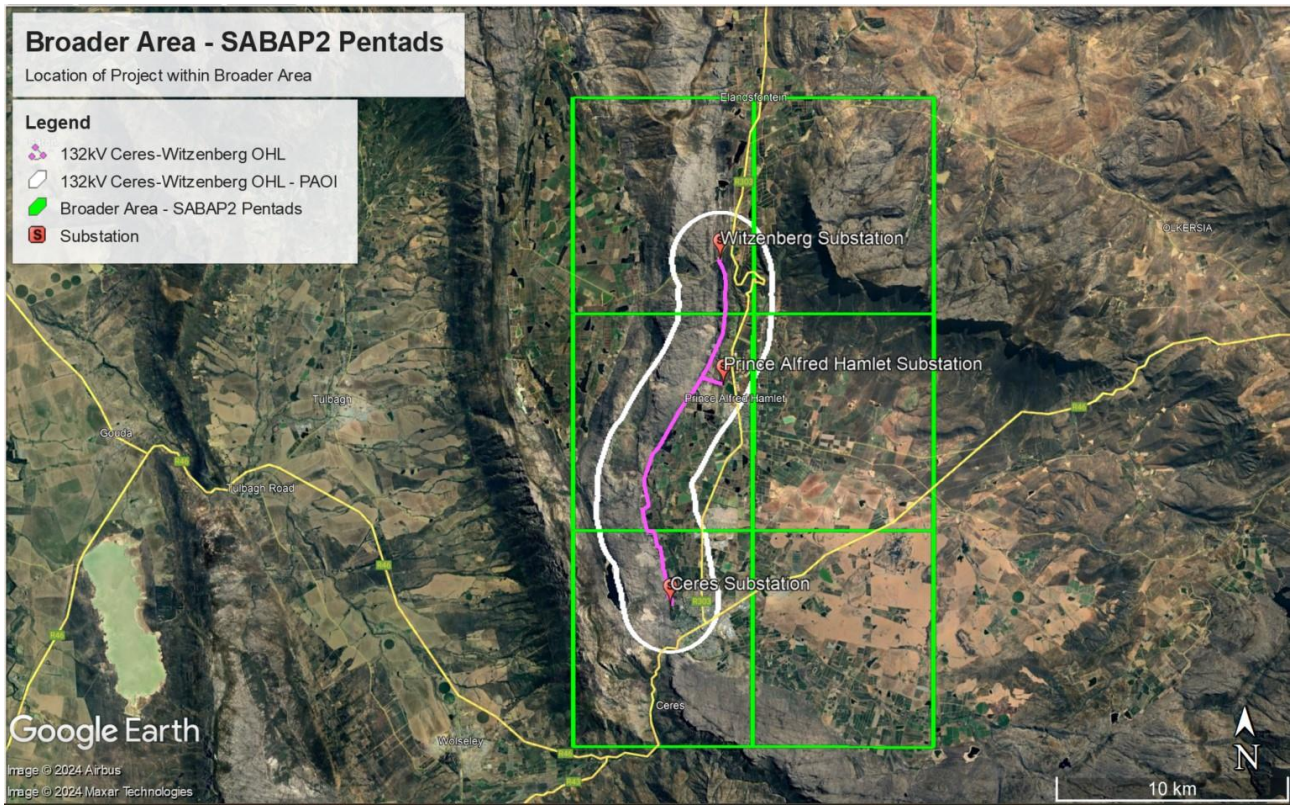

Figure 3: The six (6) SABAP2 pentads (Broader Area), in green, within which the PAOI is located.

3.2 Limitations & Assumptions

This study made the following assumptions:

- The coverage by SABAP2 has been extensive, with a total of 76 full protocol cards and 188 ad hoc protocol cards completed since 2007 for the six pentads where the PAOI is located, this gives an up-to-date snapshot of the birds currently occurring in the area. In view of this, the reporting rates for the species in the PAOI are regarded as an accurate guideline, reflecting approximate densities on the ground.
- The author has travelled and worked extensively on bird impact assessments for a variety of projects in the Western Cape Province since 1996. Personal observations and experience have therefore also been used to interpret the data that is available from SABAP2 and has been used extensively in identifying likely bird/habitat associations.
- Assessments in this study are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will hold true under all circumstances; therefore, professional judgment played an important role in this assessment. It should also be noted that

the impact of power lines on birds has been well researched with a robust body of published research stretching over thirty years.

- The focus of the study was primarily on the potential impacts of the proposed OHL and substation on EGI sensitive avifauna.
- **EGI sensitive avifauna** were defined as species which could potentially be impacted by power line collisions or electrocutions (power line or substation yard), based on specific morphological and/or behavioural characteristics. Species classes which fall under these categories are raptors, large terrestrial birds, waterbirds, crows, and certain ground nesting birds (as well as species vulnerable to displacement due to disturbance/habitat loss.
- The **PAOI** was defined as a 2km radius around the proposed OHL and substation.

4 LEGISLATIVE CONTEXT

There is no legislation pertaining specifically to the impact of electrical infrastructure on avifauna.

4.1 Agreements & Conventions

Table 1 below lists agreements and conventions which South Africa is party to, and which is relevant to the conservation of avifauna[3].

Table 1: Agreements and conventions which South Africa is party to, and which is relevant to the conservation of avifauna.

Convention Name	Description	Geographic Scope
African-Eurasian Waterbird Agreement (AEWA)	The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats across Africa, Europe, the Middle East, Central Asia, Greenland, and the Canadian Archipelago. Developed under the framework of the Convention on Migratory Species (CMS) and administered by the United Nations Environment Programme (UNEP), AEWA brings together countries and the wider international conservation community in an effort to establish coordinated conservation and management of migratory waterbirds throughout their entire migratory range.	Regional
Convention on Biological Diversity (CBD), Nairobi, 1992	The Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has 3 main objectives: The conservation of biological diversity The sustainable use of the components of biological diversity The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.	Global
Convention on the Conservation of Migratory Species of Wild Animals, (CMS), Bonn, 1979	As an environmental treaty under the aegis of the United Nations Environment Programme, CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats. CMS brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.	Global
Convention on the International Trade in	CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between	Global

[3] (BirdLife International (2022) Country profile: South Africa. Available from: http://www.birdlife.org/datazone/country/south_africa. Checked: 2022-04-02).

Convention Name	Description	Geographic Scope
Endangered Species of Wild Flora and Fauna, (CITES), Washington DC, 1973	governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.	
Ramsar Convention on Wetlands of International Importance, Ramsar, 1971	The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.	Global
Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia	The Signatories will aim to take co-ordinated measures to achieve and maintain the favourable conservation status of birds of prey throughout their range and to reverse their decline when and where appropriate.	Regional

4.2 National Legislation

4.2.1 Constitution of the Republic of South Africa, 1996

The Constitution of the Republic of South Africa provides in the Bill of Rights that: Everyone has the right –

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –

  (i) prevent pollution and ecological degradation;

  (ii) promote conservation; and

  (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

4.2.2 The National Environmental Management Act 107 of 1998 (NEMA)

The National Environmental Management Act 107 of 1998 (NEMA) creates the legislative framework for environmental protection in South Africa and is aimed at giving effect to the environmental right in the Constitution. It sets out a number of guiding principles that apply to the actions of all organs of state that may significantly affect the environment. Sustainable development (socially, environmentally, and economically) is one of the key principles, and internationally accepted principles of environmental management, such as the precautionary principle and the polluter pays principle, are also incorporated. NEMA also provides that a wide variety of listed developmental activities, which may significantly affect the environment, may be performed only after an environmental impact assessment has been done and authorization has been obtained from the relevant authority. Many of these listed activities can potentially have negative impacts on bird populations in a variety of ways. The clearance of natural vegetation, for instance, can lead to a loss of habitat and may depress prey populations, while erecting structures needed for generating and distributing energy, communication, and so forth can cause mortalities by collision or electrocution.

NEMA makes provision for the prescription of procedures for the assessment and minimum criteria for reporting on identified environmental themes (Sections 24(5)(a) and (h) and 44) when applying for environmental authorisation. The Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020 is applicable in the case of powerline developments.

4.2.3 The National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) and the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations)

The most prominent statute containing provisions directly aimed at the conservation of birds is the National Environmental Management: Biodiversity Act 10 of 2004 read with the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations). Chapter 1 sets out the objectives of the Act, and they are aligned with the objectives of the Convention on Biological Diversity, which are the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits of the use of genetic resources. The Act also gives effect to CITES, the Ramsar Convention, and the Bonn Convention on Migratory Species of Wild Animals. The State is endowed with the trusteeship of biodiversity and has the responsibility to manage, conserve and sustain the biodiversity of South Africa.

4.3 Provincial Legislation

The Western Cape Nature Conservation Laws Amendment Act, 2000 – This statute provides for the amendment of various laws on nature conservation to transfer the administration of the provisions of those laws to the Western Cape Nature Conservation Board, which includes various regulations pertaining to wild animals, including avifauna.

5 BASELINE ASSESSMENT

5.1 Important Bird Areas (IBAs)

The PAOI overlaps marginally with an area of mostly mountain fynbos in the Cederberg–Koue Bokkeveld Complex IBA (SA 101) (Marnewick *et al*. 2015) in the vicinity of the Witzenberg Substation (**Figure 4**). Red Data IBA trigger species for the Cederberg–Koue Bokkeveld Complex IBA which could potentially (although infrequently) occur in the PAOI are listed below (Marnewick *et al.* 2015).

Globally Threatened Species:

- Black Harrier

Regionally Threatened Species:

- Verreaux's Eagle
- Lanner Falcon
- Cape Rockjumper

The avifauna in the Cederberg–Koue Bokkeveld Complex IBA is not, however, expected to be significantly impacted by the proposed power line and substation.

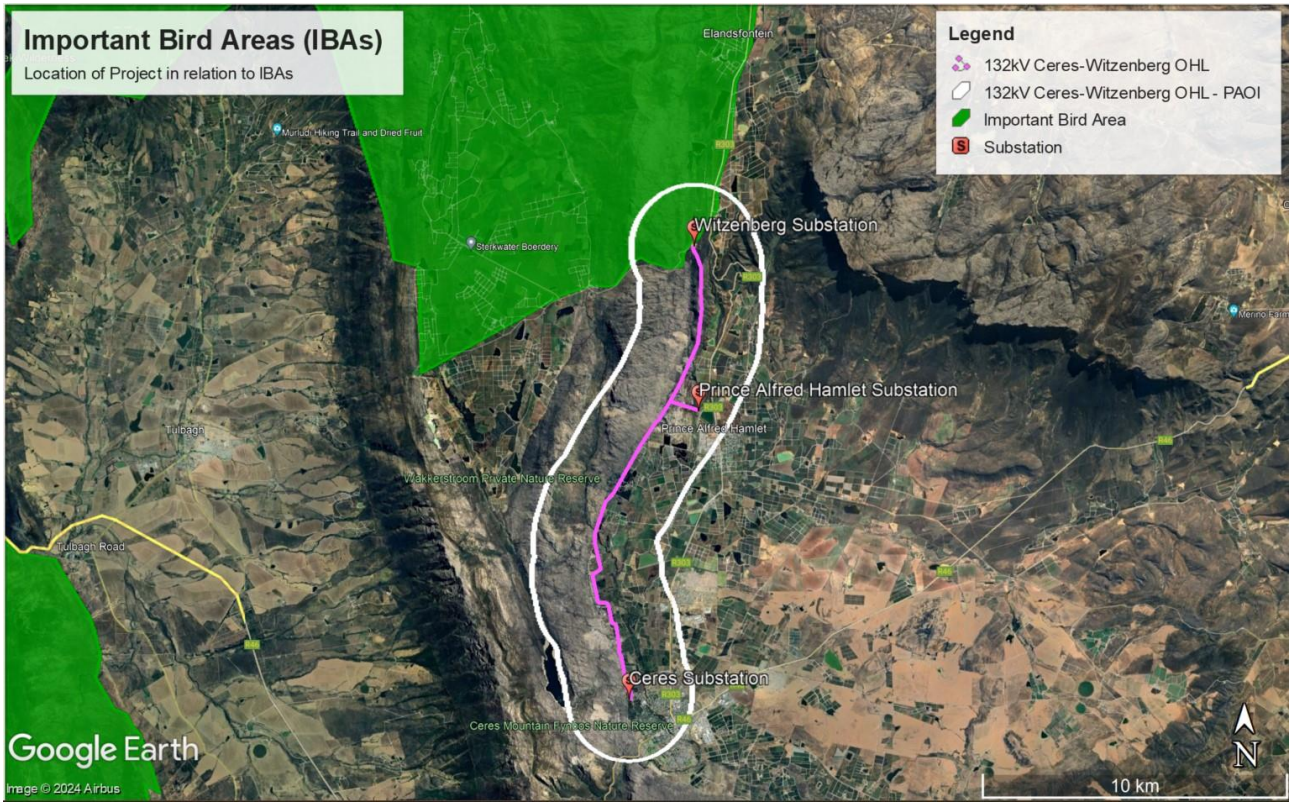

Figure 4: The PAOI overlaps marginally with the Cederberg–Koue Bokkeveld Complex IBA.

5.2 Biomes and Vegetation

The PAOI falls within the Fynbos Biome (Harrison *et al.* 1997; Mucina & Rutherford 2006) and is split between the Western Fynbos-Renosterveld Bioregion and Northwest Fynbos Bioregion (VegMap 2018). The two main vegetation types within the PAOI are Winterhoek Sandstone Fynbos and Ceres Shale Renosterveld (VegMap 2018).

It is generally accepted that vegetation structure rather than the actual plant species, influences bird species distribution and abundance (Harrison *et al.* 1997). In other words, while avifaunal distribution is influenced by primary vegetation divisions (Biomes), avifaunal diversity is more dependent on specific vegetation units within these primary vegetation types.

From an avifaunal perspective, the First Southern African Bird Atlas Project (SABAP1) recognised six primary Biomes within South Africa, namely (1) Fynbos (2) Succulent Karoo (3) Nama Karoo (4) Grassland (5) Savanna and (6) Forest (Harrison *et al.* 1997). These Biome descriptions do not focus on lists of plant species, but rather on factors which are relevant to bird distribution. The criteria used by the SABAP1 authors to amalgamate botanically defined vegetation units, or to keep them separate were (1) the existence of clear differences in vegetation structure, likely to be relevant to birds, and (2) the results of published community studies on bird/vegetation associations.

5.3 Bird Habitat

Bird habitat classes that were recorded in the PAOI are described below. See **Appendix 2** for photographic records of the bird habitats in the PAOI.

5.3.1 Fynbos

The natural vegetation types in the PAOI are a variety of fynbos, consisting of a mixture of Winterhoek Sandstone Fynbos, Breede Shale Fynbos, Ceres Shale Renosterveld, and North Hex Sandstone Fynbos (Mucina & Rutherford 2006). Fynbos is dominated by low shrubs characterised by restioid, erioid and proteoid components (Harrison *et al.* 1997). Fynbos represents most of the natural vegetation in the PAOI. The Fynbos Biome is characterised by a high level of diversity and endemism in its botanical composition, which is not paralleled in its terrestrial avifauna, which is depauperate relative to other southern African biomes. The natural fynbos vegetation in the PAOI has been heavily disturbed in places through alien infestation and burning, but some areas of good quality fynbos habitat do remain.

EGI sensitive avifauna which could be attracted to areas of less disturbed fynbos in the PAOI are the following:

- Black Harrier
- Black Sparrowhawk
- Black-winged Kite
- Blue Crane
- Booted Eagle
- Common Buzzard
- Helmeted Guineafowl
- Jackal Buzzard
- Pied Crow
- Rock Kestrel
- Spotted Eagle-Owl
- Verreaux's Eagle
- Western Barn Owl
- White-necked Raven
- Yellow-billed Kite

5.3.2 Drainage Lines and Rivers

The PAOI contains rivers and drainage lines, e.g. the Dwarsrivier, Waboomsrivier, and several smaller drainage lines. The rivers and drainage lines have generally been heavily infested with Port Jackson *Acacia saligna* and Black Wattle *Acacia mearnsii*. Due to the degraded state of the rivers, few EGI sensitive avifauna are likely to frequent the river systems in the PAOI, although African Black Duck was observed in some of the drainage channels during one of the site visits.

EGI sensitive avifauna that could be attracted to this habitat are the following:

- African Black Duck
- African Fish Eagle
- African Goshawk
- African Harrier-Hawk
- Black-crowned Night Heron
- Hadada Ibis
- Hamerkop
- Little Egret
- Western Cattle Egret

5.3.3 Dams

The PAOI contains several man-made dams of various sizes. The dams could attract many priority waterbird species, with extensive movement between dams to be expected. EGI sensitive avifauna that could be

attracted to this habitat for foraging and some instances breeding (depending on the associated fringe vegetation) are the following:

- African Black Duck
- African Darter
- African Fish Eagle
- African Sacred Ibis
- African Spoonbill
- Black-crowned Night Heron
- Black-headed Heron
- Black-necked Grebe
- Blue Crane
- Cape Shoveler
- Cape Teal
- Common Moorhen
- Egyptian Goose
- Glossy Ibis
- Great Crested Grebe
- Greater Flamingo
- Grey Heron
- Hadada Ibis
- Hamerkop
- Little Egret
- Little Grebe
- Maccoa Duck
- Red-billed Teal
- Red-knobbed Coot
- Reed Cormorant
- South African Shelduck
- Southern Pochard
- Spur-winged Goose
- Western Cattle Egret
- White-breasted Cormorant
- Yellow-billed Duck

5.3.4 Mountain Slopes

The PAOI borders the foothills of the impressive Skurweberge, which is located directly to the west of the proposed OHL.

EGI sensitive avifauna which could be attracted to the slopes of these foothills for foraging are the following:

- Black Harrier
- Black Sparrowhawk
- Black-winged Kite
- Booted Eagle
- Common Buzzard
- Jackal Buzzard
- Lesser Kestrel
- Pied Crow
- Rock Kestrel
- Spotted Eagle-Owl

- Verreaux's Eagle
- White-necked Raven
- Yellow-billed Kite

5.3.5 Alien Trees

The PAOI contains a variety of alien trees, mostly Port Jackson, Black Wattle, *Pinus* and *Eucalyptus* species. In some instances, these trees form dense stands. Alien trees provide important perching, roosting, and possible nesting habitat for various bird species including EGI sensitive avifauna.

EGI sensitive avifauna which could utilise this habitat for perching, roosting and in some instances breeding, are the following*:*

- Black Sparrowhawk
- Black-headed Heron
- Booted Eagle
- Common Buzzard
- Egyptian Goose
- Hadada Ibis
- Helmeted Guineafowl
- Jackal Buzzard
- Pied Crow
- Western Barn Owl
- White-necked Raven
- Yellow-billed Kite

5.3.6 Agriculture and Urban Areas

The PAOI contains several areas of intensive agriculture, mostly fruit orchards and partially encompasses the town of Ceres and Prince Alfred Hamlet. These urban and agricultural environments are generally less attractive to EGI sensitive avifauna.

EGI sensitive avifauna which are most likely to utilise this habitat on occasion are the following:

- Black Sparrowhawk
- Blue Crane
- Common Buzzard
- Egyptian Goose
- Hadada Ibis
- Helmeted Guineafowl
- Pied Crow
- White-necked Raven

5.3.7 Grassy Clearings

The natural fynbos vegetation has been cleared in some areas through burning and clearing, resulting in large grassy clearings.

This habitat could be attractive to the following EGI sensitive avifauna:

- African Sacred Ibis
- Black Harrier
- Black-headed Heron
- Black-winged Kite
- Blue Crane

- Common Buzzard
- Hadada Ibis
- Helmeted Guineafowl
- Pied Crow
- Western Cattle Egret
- Yellow-billed Kite

5.4 DFFE National Screening Tool

The PAOI and immediate environment is classified as **HIGH/MEDIUM SENSITIVITY** for avifauna according to the Animal Species Theme (**Figure 5**). The sensitivity classification is linked to the possible occurrence of Verreaux's Eagle *Aquila verreauxii* (Regionally Vulnerable), Black Harrier *Circus maurus* (Globally and Regionally Endangered), Southern Black Korhaan *Afrotis afra* (Globally and Regionally Vulnerable), Striped Flufftail *Sarothrura affinis* (Regionally Vulnerable), Secretarybird *Sagittarius serpentarius* (Globally Endangered and Regionally Vulnerable), and Caspian Tern *Hydroprogne caspia* (Regionally Vulnerable).

The PAOI contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). SCCs are listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Near Threatened or Vulnerable.

The occurrence of SCC in the PAOI was confirmed during the site visits (26–27 February 2024) with observations of Verreaux's Eagle recorded during surveys. The comprehensive SABAP2 data also reports the occurrence of Blue Crane, Black Harrier, Maccoa Duck and Verreaux's Eagle which could pass through the and/or utilise the PAOI for foraging. Based on the SABAP2 data, the confirmed habitat and the field surveys, the classification of **HIGH SENSITIVITY** for avifauna in the Screening Tool is supported.

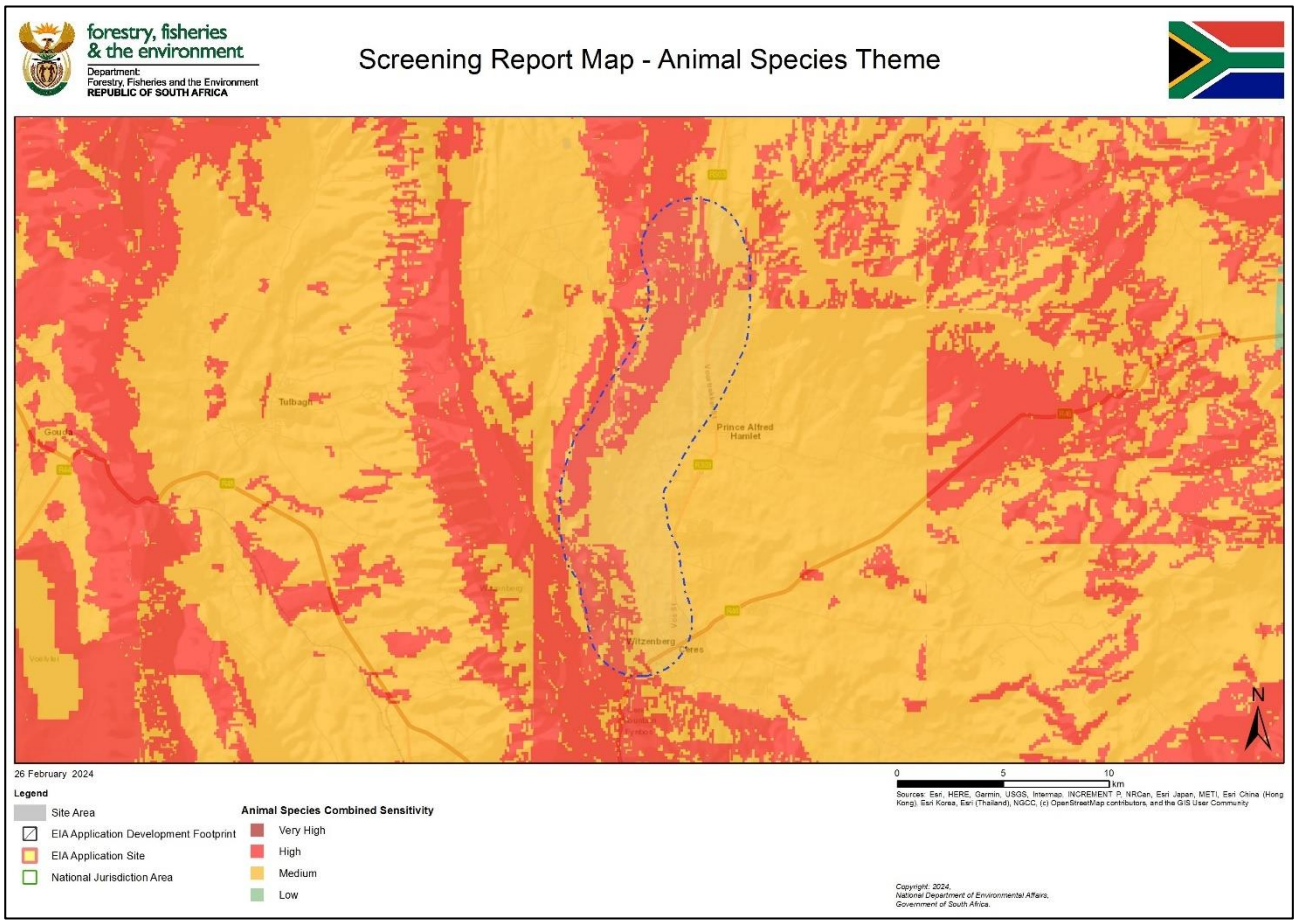

Figure 5: The classification of the Ceres-Witzenberg 132kV OHL and Substation PAOI according to the Animal Species Theme in the DFFE National Screening Tool. The High and Medium sensitivity classification is linked to the possible occurrence of Verreaux's Eagle (Regionally Vulnerable), Black Harrier (Globally and Regionally Endangered), Southern Black Korhaan (Globally and Regionally Vulnerable), Striped Flufftail (Regionally Vulnerable), Secretarybird (Globally Endangered and Regionally Vulnerable), and Caspian Tern (Regionally Vulnerable).

6 AVIFAUNA IN THE PAOI

The Southern African Bird Atlas Project (SABAP2) data indicates that a total of 184 bird species could potentially occur within the Broader Area where the PAOI is located – **Appendix 1** provides a comprehensive bird species list. Of these, 61 (33% of) species are classified as EGI sensitive avifauna for Electrical Grid Infrastructure (EGI) developments (i.e. **EGI sensitive avifauna**) and 7 of these are South African Red Listed species (i.e., Species of Conservation Concern – SCC). Of the 61 EGI sensitive avifauna, 47 are likely to occur regularly in or near the PAOI, and 15 EGI sensitive avifauna were recorded during the on-site surveys (26–27 February 2024).

Table 2 below lists all the EGI sensitive avifauna that are likely to occur regularly at or near the PAOI and the possible impact on the respective species by the proposed EGI. The following abbreviations and acronyms are used:

- NT = Near threatened
- VU = Vulnerable
- EN = Endangered
- CR = Critically Endangered

Table 2: EGI sensitive avifauna that could occur in and/or near the PAOI along with their habitat preferences and the associated impacts of the EGI development. Red Listed species are highlighted in yellow.

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Surveys	Fynbos	Drainage Lines	Dams	Mountain Slopes	Alien Trees	Agriculture & Urban	Grassy Clearings	Substation - Electrocution	Power line - Collision	Disturbance - Displacement	Disturbance - Habitat Loss
		Full Protocol	Ad Hoc Protocol														
African Black Duck	*Anas sparsa*	22,37	6,91	-	-			x	x						x		
African Darter	*Anhinga rufa*	15,79	5,32	-	-				x						x		
African Fish Eagle	*Haliaeetus vocifer*	9,21	2,13	-	-	x		x	x		x			x		x	
African Goshawk	*Accipiter tachiro*	15,79	3,19	-	-			x			x			x		x	
African Harrier-Hawk	*Polyboroides typus*	5,26	1,06	-	-			x			x			x		x	
African Marsh Harrier	*Circus ranivorus*	1,32	0,00	-	EN			x	x				x	x			
African Sacred Ibis	*Threskiornis aethiopicus*	56,58	26,60	-	-	x			x				x	x	x		
African Spoonbill	*Platalea alba*	18,42	8,51	-	-				x						x		
Black Harrier	*Circus maurus*	6,58	1,60	EN	EN		x			x			x	x		x	
Black Sparrowhawk	*Accipiter melanoleucus*	7,89	2,13	-	-		x			x	x	x		x		x	
Black-crowned Night Heron	*Nycticorax nycticorax*	6,58	0,53	-	-			x	x						x		
Black-headed Heron	*Ardea melanocephala*	32,89	3,72	-	-				x		x		x	x	x		
Black-necked Grebe	*Podiceps nigricollis*	9,21	0,53	-	-				x						x		
Black-winged Kite	*Elanus caeruleus*	35,53	11,70	-	-	x	x			x			x	x			
Blue Crane	*Grus paradisea*	13,16	4,79	VU	NT		x		x			x	x		x	x	
Booted Eagle	*Hieraaetus pennatus*	5,26	0,00	-	-	x	x			x	x			x			
Cape Crow	*Corvus capensis*	2,63	0,53	-	-	x	x			x	x			x			
Cape Shoveler	*Spatula smithii*	25,00	9,04	-	-				x						x		
Cape Teal	*Anas capensis*	21,05	3,19	-	-				x						x		
Common Buzzard	*Buteo buteo*	11,84	1,60	-	-		x			x	x	x	x	x			

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Surveys	Fynbos	Drainage Lines	Dams	Mountain Slopes	Alien Trees	Agriculture & Urban	Grassy Clearings	Substation - Electrocution	Power line - Collision	Disturbance - Displacement	Disturbance - Habitat Loss
		Full Protocol	Ad Hoc Protocol														
Common Moorhen	*Gallinula chloropus*	17,11	5,32	-	-				x								
Egyptian Goose	*Alopochen aegyptiaca*	81,58	31,38	-	-	x			x		x	x		x	x	x	
Glossy Ibis	*Plegadis falcinellus*	19,74	3,72	-	-				x						x		
Great Crested Grebe	*Podiceps cristatus*	19,74	5,32	-	-				x						x		
Great Egret	*Ardea alba*	1,32	0,00	-	-			x	x						x		
Greater Flamingo	*Phoenicopterus roseus*	5,26	0,00	-	NT				x						x		
Grey Heron	*Ardea cinerea*	39,47	11,17	-	-				x						x		
Hadada Ibis	*Bostrychia hagedash*	77,63	21,28	-	-	x		x	x		x	x	x	x	x	x	
Hamerkop	*Scopus umbretta*	6,58	2,66	-	-			x	x					x	x		
Helmeted Guineafowl	*Numida meleagris*	68,42	17,02	-	-	x	x				x	x	x	x		x	x
Indian Peafowl	*Pavo cristatus*	2,63	0,53	-	-							x	x	x	x		
Intermediate Egret	*Ardea intermedia*	3,95	1,06	-	-			x	x						x		
Jackal Buzzard	*Buteo rufofuscus*	23,68	9,57	-	-	x	x			x	x			x		x	
Lanner Falcon	*Falco biarmicus*	1,32	0,00	-	VU					x				x			
Lesser Kestrel	*Falco naumanni*	5,26	2,13	-	-					x				x			
Little Egret	*Egretta garzetta*	19,74	4,26	-	-			x	x						x		
Little Grebe	*Tachybaptus ruficollis*	39,47	10,64	-	-				x						x		
Maccoa Duck	*Oxyura maccoa*	14,47	3,72	EN	NT				x						x		
Pale Chanting Goshawk	*Melierax canorus*	1,32	0,00	-	-		x	x		x				x			
Peregrine Falcon	*Falco peregrinus*	3,95	1,06	-	-					x		x		x			
Pied Crow	*Corvus albus*	51,32	14,36	-	-	x	x			x	x	x	x	x		x	

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Surveys	Fynbos	Drainage Lines	Dams	Mountain Slopes	Alien Trees	Agriculture & Urban	Grassy Clearings	Substation - Electrocution	Power line - Collision	Disturbance - Displacement	Disturbance - Habitat Loss
		Full Protocol	Ad Hoc Protocol														
Purple Heron	*Ardea purpurea*	0,00	0,53	-	-			x	x						x		
Red-billed Teal	*Anas erythrorhyncha*	36,84	11,70	-	-				x						x		
Red-knobbed Coot	*Fulica cristata*	55,26	23,40	-	-				x						x		
Reed Cormorant	*Microcarbo africanus*	47,37	13,83	-	-	x			x						x		
Rock Kestrel	*Falco rupicolus*	17,11	3,19	-	-		x			x				x			
Rufous-breasted Sparrowhawk	*Accipiter rufiventris*	3,95	0,00	-	-			x		x	x			x			
South African Shelduck	*Tadorna cana*	25,00	3,19	-	-				x						x		
Southern Pochard	*Netta erythrophthalma*	9,21	1,06	-	-				x						x		
Spotted Eagle-Owl	*Bubo africanus*	9,21	2,13	-	-	x	x			x				x	x	x	x
Spur-winged Goose	*Plectropterus gambensis*	26,32	8,51	-	-				x						x		
Verreaux's Eagle	*Aquila verreauxii*	6,58	3,19	-	VU	x	x			x				x	x	x	
Western Barn Owl	*Tyto alba*	4,01	0,53	-	-		x				x			x	x	x	
Western Cattle Egret	*Bubulcus ibis*	59,21	14,89	-	-	x		x	x				x	x	x		
White Stork	*Ciconia ciconia*	1,32	0,00	-	-				x				x		x		
White-backed Duck	*Thalassornis leuconotus*	3,95	0,53	-	-			x	x						x		
White-breasted Cormorant	*Phalacrocorax lucidus*	27,63	4,79	-	-				x						x		
White-faced Whistling Duck	*Dendrocygna viduata*	2,63	0,53	-	-			x	x						x		
White-necked Raven	*Corvus albicollis*	43,42	14,36	-	-	x	x			x	x	x		x		x	
Yellow-billed Duck	*Anas undulata*	59,21	21,28	-	-				x						x		
Yellow-billed Kite	*Milvus aegyptius*	19,74	4,79	-	-		x			x	x		x	x			

7 IMPACT ASSESSMENT

Negative impacts on avifauna by electricity infrastructure generally take two main forms namely electrocution and collisions (Ledger & Annegarn 1981; Ledger 1983; Ledger 1984; Hobbs and Ledger 1986a; Hobbs & Ledger 1986b; Ledger, Hobbs & Smith, 1992; Verdoorn 1996; Kruger & Van Rooyen 1998; Van Rooyen 1998; Kruger 1999; Van Rooyen 1999; Van Rooyen 2000; Van Rooyen 2004; Jenkins *et al*. 2010). Displacement due to habitat destruction and disturbance associated with the construction of the electricity infrastructure is another impact that could potentially impact on avifauna.

The construction of the proposed new 132kV single-circuit overhead power line (OHL) between the Ceres and Witzenberg Substations, and the new Prince Alfred Hamlet 132kV substation is expected to have a range of potential impacts on EGI sensitive avifauna.

The following impacts relative to avifauna have been identified:

Construction Phase

- Displacement due to disturbance associated with the construction of the EGI.
- Displacement due to habitat loss associated with the construction (and presence) of the EGI.

Operational Phase

- Electrocutions at the on-site substation and on the 132kV overhead lines.
- Collisions with the 132kV overhead line (OHL).

Decommissioning Phase

- Displacement due to disturbance associated with the decommissioning of the EGI.

7.1 Construction: Displacement due to Construction Disturbance and Habitat Loss

The construction activities usually constitute the following:

- Site clearance and preparation;
- Construction of the infrastructure (i.e. the on-site substation, OHL and service roads);
- Transportation of personnel, construction material and equipment to the site, and personnel away from the site;
- Removal of vegetation for the proposed substation and stockpiling of topsoil and cleared vegetation; and
- Excavations for infrastructure.

The above-mentioned activities impact on birds through **disturbance**; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity to breeding locations could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. A potential mitigation measure is the timeous identification of nests and the timing of the construction activities to avoid disturbance during a critical phase of the breeding cycle, although in practice that can admittedly be very challenging to implement. However, this instance no Red Data species are expected to be affected by this impact.

During the construction of (and during the operational phase) power lines, service roads (jeep tracks) and substations, **habitat destruction/transformation** inevitably takes place.

These activities could impact on birds breeding and foraging in the footprint of the Prince Alfred Hamlet substation through transformation of habitat, which will result in permanent displacement from that area. Unfortunately, very little mitigation can be applied to reduce the significance of this impact as the total permanent transformation of the habitat within the construction footprint of the substation yard is unavoidable. Fortunately, the impact of displacement due to direct habitat transformation associated with the construction

of the proposed substation is likely to be fairly minimal, due to the small size of the footprint, the degraded state of the vegetation in the proposed footprint (which consist of a mixture of grass, alien shrubs and fynbos remnants), and the ready availability of similar habitat in close proximity. It is not expected that any Red Data species will be significantly affected. Species which could be potentially affected, albeit minimally, are common to abundant species e.g. Helmeted Guineafowl, Cape Turtle Dove, Cape Sparrow, Bokmakierie, Karoo Prinia, Cape Spurfowl, Laughing Dove, Common Waxbill, Cape Bunting and Pied Starling amongst others.

Fortunately, due to the nature of the vegetation in the Broader Area, and judged by the existing power lines, very little clearing will be required in the servitude of the proposed OHL.

The EGI sensitive avifauna which are potentially vulnerable to disturbance are listed in Table 1, and below:
- African Fish Eagle
- African Goshawk
- African Harrier-Hawk
- Black Harrier
- Black Sparrowhawk
- Blue Crane
- Egyptian Goose
- Hadada Ibis
- Helmeted Guineafowl
- Jackal Buzzard
- Pied Crow
- Spotted Eagle-Owl
- Verreaux's Eagle
- Western Barn Owl
- White-necked Raven

The EGI sensitive avifauna which are potentially vulnerable to habitat loss are listed in Table 1, and below:
- Helmeted Guineafowl
- Spotted Eagle-Owl

7.2 Operational: Electrocutions on the Electrical Infrastructure

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (Van Rooyen 2004). The electrocution risk is largely determined by the pole/tower design.

The proposed OHL will consist of galvanized braced double steel poles, guyed double steel poles and steel monopoles. Composite silicone rubber long rod and post insulators will be used for the 132kV OHL. In the case of the proposed OHL, no electrocution risk is envisaged because the proposed designs should not pose an electrocution threat to any of the EGI sensitive avifauna which are likely to occur in the PAOI. It is unlikely that any of the EGI sensitive avifauna will be able to bridge the gap between live components and/or live and earthed components on the proposed designs.

Electrocutions within the proposed transmission substation yard are possible but should not affect the more sensitive Red Data bird species, as these species are unlikely to use the infrastructure within the substation yard for perching or roosting.

The EGI sensitive avifauna which are potentially vulnerable to this impact are listed in Table 1, and below:
- African Fish Eagle
- African Goshawk
- African Harrier-Hawk

- African Sacred Ibis
- Black Harrier
- Black Sparrowhawk
- Black-headed Heron
- Black-winged Kite
- Booted Eagle
- Common Buzzard
- Egyptian Goose
- Hadada Ibis
- Hamerkop
- Helmeted Guineafowl
- Jackal Buzzard
- Lesser Kestrel
- Pied Crow
- Rock Kestrel
- Spotted Eagle-Owl
- Verreaux's Eagle
- Western Barn Owl
- Western Cattle Egret
- White-necked Raven
- Yellow-billed Kite

7.3 Operational: Collisions with the Overhead Power Line

Collisions are the biggest threat posed by transmission lines to birds in southern Africa (Van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds, and to a lesser extent, vultures. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with transmission lines (Van Rooyen 2004, Anderson 2001). In a PhD study, Shaw (2013) provides a concise summary of the phenomenon of avian collisions with transmission lines:

"The collision risk posed by power lines is complex and problems are often localised. While any bird flying near a power line is at risk of collision, this risk varies greatly between different groups of birds, and depends on the interplay of a wide range of factors (APLIC 1994). Bevanger (1994) described these factors in four main groups – biological, topographical, meteorological and technical. Birds at highest risk are those that are both susceptible to collisions and frequently exposed to power lines, with waterbirds, gamebirds, rails, cranes and bustards usually the most numerous reported victims (Bevanger 1998, Rubolini et al. 2005, Jenkins et al. 2010).

The proliferation of man-made structures in the landscape is relatively recent, and birds are not evolved to avoid them. Body size and morphology are key predictive factors of collision risk, with large-bodied birds with high wing loadings (the ratio of body weight to wing area) most at risk (Bevanger 1998, Janss 2000). These birds must fly fast to remain airborne, and do not have sufficient manoeuvrability to avoid unexpected obstacles. Vision is another key biological factor, with many collision-prone birds principally using lateral vision to navigate in flight, when it is the lower-resolution, and often restricted, forward vision that is useful to detect obstacles (Martin & Shaw 2010, Martin 2011, Martin et al. 2012). Behaviour is important, with birds flying in flocks, at low levels and in crepuscular or nocturnal conditions at higher risk of collision (Bevanger 1994). Experience affects risk, with migratory and nomadic species that spend much of their time in unfamiliar locations also expected to collide more often (Anderson 1978, Anderson 2002). Juvenile birds have often been reported as being more collision-prone than adults (e.g. Brown et al. 1987, Henderson et al. 1996).

Topography and weather conditions affect how birds use the landscape. Power lines in sensitive bird areas (e.g. those that separate feeding and roosting areas, or cross flyways) can be very dangerous (APLIC 1994, Bevanger 1994). Lines crossing the prevailing wind conditions can pose a problem for large birds that use the wind to aid take-off and landing (Bevanger 1994). Inclement weather can disorient birds and reduce their flight altitude, and strong winds can result in birds colliding with power lines that they can see but do not have enough flight control to avoid (Brown et al. 1987, APLIC 2012).

The technical aspects of power line design and siting also play a big part in collision risk. Grouping similar power lines on a common servitude or locating them along other features such as tree lines, are both approaches thought to reduce risk (Bevanger 1994). In general, low lines with short span lengths (i.e. the distance between two adjacent pylons) and flat conductor configurations are thought to be the least dangerous (Bevanger 1994, Jenkins et al. 2010). On many higher voltage lines, there is a thin earth (or ground) wire above the conductors, protecting the system from lightning strikes. Earth wires are widely accepted to cause the majority of collisions on power lines with this configuration because they are difficult to see, and birds flaring to avoid hitting the conductors often put themselves directly in the path of these wires (Brown et al. 1987, Faanes 1987, Alonso et al. 1994a, Bevanger 1994)."

From incidental record keeping by the Endangered Wildlife Trust, it is possible to give a measure of what species are generally susceptible to power line collisions in South Africa (**Figure 6**).

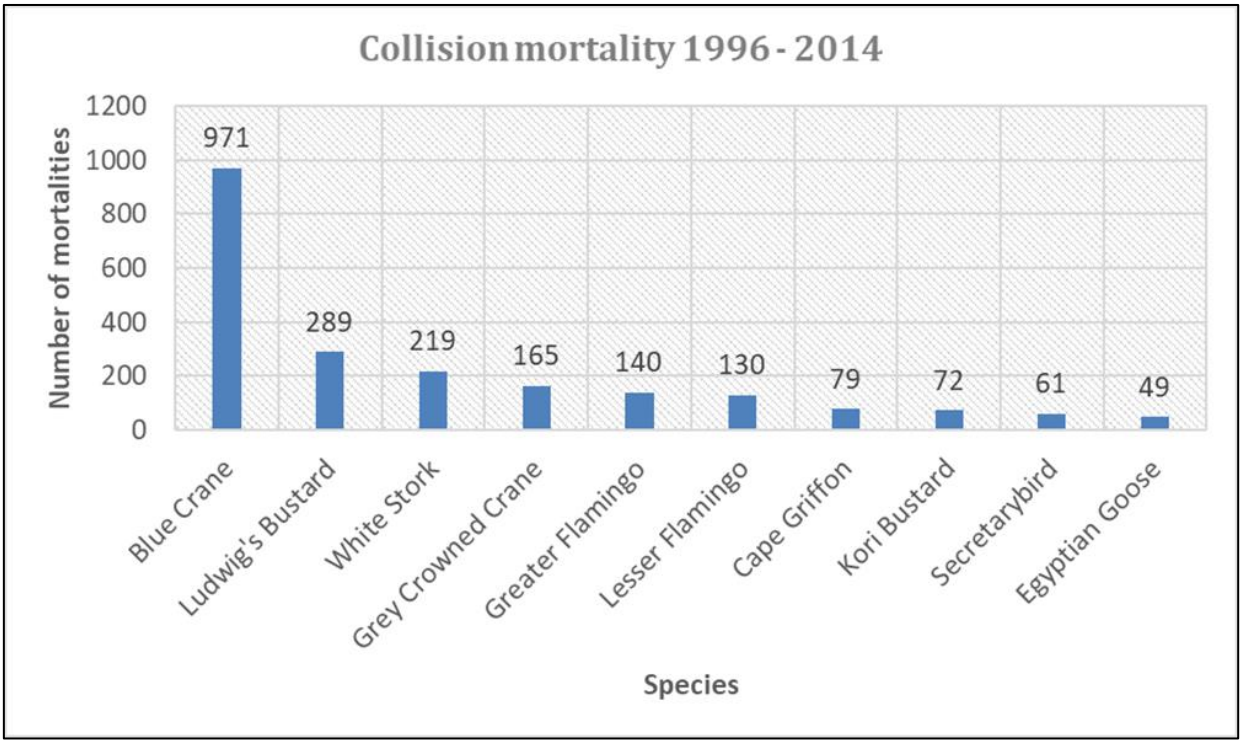

Figure 6: The top 10 collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom/Endangered Wildlife Trust Strategic Partnership central incident register 1996 - 2014 (EWT unpublished data).

Power line collisions are generally accepted as a key threat to bustards (Raab *et al*. 2009; Raab *et al*. 2010; Jenkins & Smallie 2009; Barrientos *et al*. 2012, Shaw 2013). In one study, carcass surveys were performed under high voltage transmission lines in the Karoo for two years, and low voltage distribution lines for one year (Shaw 2013). Ludwig's Bustard was the most common collision victim (69% of carcasses), with bustards generally comprising 87% of mortalities recovered. Karoo Korhaan was also recorded, but to a much lesser extent than Ludwig's Bustard. The reasons for the relatively low collision risk of this species probably include their smaller size (and hence greater agility in flight) as well as their more sedentary lifestyles, as local birds are familiar with their territory and are less likely to collide with power lines (Shaw 2013).

Several factors are thought to influence avian collisions, including the manoeuvrability of the bird, topography, weather conditions and power line configuration. An important additional factor that previously has received little attention is the visual capacity of birds; i.e. whether they are able to see obstacles such as power lines, and whether they are looking ahead to see obstacles with enough time to avoid a collision. In addition to helping explain the susceptibility of some species to collision, this factor is key to planning effective mitigation measures. Recent research provides the first evidence that birds can render themselves blind in the direction of travel during flight through voluntary head movements (Martin & Shaw 2010). Visual fields were determined in three bird species representative of families known to be subject to high levels of mortality associated with power lines i.e. Kori Bustards *Ardeotis kori*, Blue Cranes and White Storks *Ciconia ciconia*. In all species the frontal visual fields showed narrow and vertically long binocular fields typical of birds that take food items directly in the bill under visual guidance. However, these species differed markedly in the vertical extent of their binocular fields and in the extent of the blind areas which project above and below the binocular fields in the forward-facing hemisphere. The importance of these blind areas is that when in flight, head movements in the vertical plane (pitching the head to look downwards) will render the bird blind in the direction of travel. Such movements may frequently occur when birds are scanning below them (for foraging or roost sites, or for conspecifics). In bustards and cranes pitch movements of only 25° and 35°, respectively, are sufficient to render the birds blind in the direction of travel; in storks, head movements of 55° are necessary. That flying birds can render themselves blind in the direction of travel has not been previously recognised and has important implications for the effective mitigation of collisions with human artefacts including wind turbines and power lines. These findings have applicability to species outside of these families especially raptors (A*ccipitridae*) which are known to have small binocular fields and large blind areas similar to those of bustards and cranes, and are also known to be vulnerable to power line collisions.

Despite doubts about the efficacy of line marking to reduce the collision risk for bustards (Jenkins *et al*. 2010; Martin *et al.* 2010), there are numerous studies which prove that marking a line with PVC spiral type Bird Flight Diverters (BFDs) generally reduce mortality rates (e.g. Bernardino *et al.* 2018; Sporer *et al.* 2013, Barrientos *et al*. 2011; Jenkins *et al*. 2010; Alonso & Alonso 1999; Koops & De Jong 1982), including to some extent for bustards (Barrientos *et al*. 2012; Hoogstad 2015 pers.comm). Beaulaurier (1981) summarised the results of 17 studies that involved the marking of earth wires and found an average reduction in mortality of 45%. Barrientos *et al.* (2011) reviewed the results of 15 wire marking experiments in which transmission or distribution wires were marked to examine the effectiveness of flight diverters in reducing bird mortality. The presence of flight diverters was associated with a decrease of 55–94% in bird mortalities. Koops and De Jong (1982) found that the spacing of the BFDs was critical in reducing the mortality rates - mortality rates are reduced up to 86% with a spacing of 5m, whereas using the same devices at 10m intervals only reduces the mortality by 57%. Barrientos *et al*. (2012) found that larger BFDs were more effective in reducing Great Bustard collisions than smaller ones. Line markers should be as large as possible, and highly contrasting with the background. Colour is probably less important as during the day the background will be brighter than the obstacle with the reverse true at lower light levels (e.g. at twilight, or during overcast conditions). Black and white interspersed patterns are likely to maximise the probability of detection (Martin *et al*. 2010).

Using a controlled experiment spanning a period of nearly eight years (2008 to 2016), the Endangered Wildlife Trust (EWT) and Eskom tested the effectiveness of two types of line markers in reducing power line collision mortalities of large birds on three 400kV transmission lines near Hydra substation in the Karoo. Marking was highly effective for Blue Cranes, with a 92% reduction in mortality, and large birds in general with a 56% reduction in mortality, but not for bustards, including the endangered Ludwig's Bustard. The two different marking devices were approximately equally effective, namely spirals and bird flappers, they found no evidence supporting the preferential use of one type of marker over the other (Shaw *et al*. 2017).

The EGI sensitive avifauna which are potentially vulnerable to this impact are listed in Table 1, and below:

- African Black Duck
- African Darter

- African Sacred Ibis
- African Spoonbill
- Black-crowned Night Heron
- Black-headed Heron
- Black-necked Grebe
- Blue Crane
- Cape Shoveler
- Cape Teal
- Egyptian Goose
- Glossy Ibis
- Great Crested Grebe
- Greater Flamingo
- Grey Heron
- Hadada Ibis
- Hamerkop
- Little Egret
- Little Grebe
- Maccoa Duck
- Red-billed Teal
- Red-knobbed Coot
- Reed Cormorant
- South African Shelduck
- Southern Pochard
- Spotted Eagle-Owl
- Spur-winged Goose
- Verreaux's Eagle
- Western Barn Owl
- Western Cattle Egret
- White-breasted Cormorant
- Yellow-billed Duck

8 IMPACT ASSESSMENT RATINGS

8.1 Assessment Criteria

The significance of all potential impacts that would result from the proposed Project is determined in order to assist decision-makers. The significance rating of impacts is considered by decision-makers, as shown below.

- **INSIGNIFICANT**: the potential impact is negligible and **will not** have an influence on the decision regarding the proposed activity.
- **VERY LOW**: the potential impact is very small and **should not** have any meaningful influence on the decision regarding the proposed activity.
- **LOW**: the potential impact **may not** have any meaningful influence on the decision regarding the proposed activity.
- **MEDIUM**: the potential impact **should** influence the decision regarding the proposed activity.
- **HIGH**: the potential impact **will** affect a decision regarding the proposed activity.
- **VERY HIGH**: The proposed activity should only be approved under special circumstances.

Step 1

The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The significance of each identified impact was rated according to the methodology set out below:

Rating	Definition of Rating	Score
A. *Extent* *– the area over which the impact will be experienced*		
Local	Confined to project or PAOI or part thereof (e.g. site)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
(Inter) national	Nationally or beyond	3
B. ***Intensity*** *– the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources*		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. ***Duration*** *– the timeframe over which the impact will be experienced and its reversibility*		
Short-term	Up to 2 years (i.e. reversible impact)	1
Medium-term	2 to 15 years (i.e. reversible impact)	2
Long-term	More than 15 years (state whether impact is irreversible)	3

The combined score of these three criteria corresponds to a **Consequence Rating**, as follows:

Combined Score (A+B+C)	3 – 4	5	6	7	8 – 9
Consequence Rating	Very low	Low	Medium	High	Very high

Step 2

The **probability** of the impact occurring was assessed according to the following definitions:

Probability– the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

Step 3

The overall **significance** of the impact was determined as a combination of the **consequence** and **probability** ratings, as set out below:

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	Low	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	Medium	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	High	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	Very High	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

Step 4

The **status** of the impact (i.e. will the effect of the impact be negative or positive?) was noted.

Step 5

The level of **confidence** in the assessment of the impact (high, medium or low) was stated.

Step 6

Practical **mitigation** and **optimisation** measures that can be implemented effectively to reduce or enhance the significance of the impact were identified and described. Mitigation and optimisation measures were described as either:

- **Essential**: best practice measures which must be implemented and are non-negotiable; and;
- **Best Practice**: recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

8.2 Impact Assessment Tables

8.2.1 Construction Phase

Impact: **Displacement due to habitat destruction and disturbance associated with the construction (and presence) of the proposed OHL and Prince Alfred Hamlet substation**

This impact is assessed to be of ***Low*** significance and mitigation is required to reduce it to ***Very Low*** significance (
Table 5 3).

Table 3: Displacement due to habitat destruction and disturbance associated with the construction of the proposed OHL and Prince Alfred Hamlet substation.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***	***Confidence***
Without mitigation	Local 1	High 3	Short term 1	**Low** **5**	Probable	**Low**	**Negative**	Medium

Essential Mitigation Measures:
• Construction activity must be restricted to the immediate footprint of the infrastructure as far as possible.
• Access to the remainder of the site must be strictly controlled to prevent unnecessary disturbance of priority species.
• Reduce airborne dust at site through e.g.:
  ○ Damping dust-generating areas with freshwater;
  ○ Use of cloth fences; and
  ○ Covering dumps or stockpiles of lose material with plastic sheeting or netting, especially during windy conditions.
• Limit noise levels to less than 70 dB(A) at the boundary of the site.
• Maximum use should be made of existing access roads and the construction of new roads must be kept to a minimum.
• The mitigation measures proposed by the Botanical Specialists pertaining to the limitation of the footprint and habitat restoration are to the benefit of all avifauna and must therefore be strictly implemented.
• Any buffer zones as recommended by the Freshwater Specialist should be followed.								

With mitigation	Local 1	Low 1	Short term 1	**Very Low** 3	Improbable	**Very Low**	**Negative**	Medium

8.2.2 Operational Phase

Impact: **Electrocution of EGI sensitive avifauna in the substation yard of the proposed Prince Alfred Hamlet substation**

The hardware within the proposed substation yard is too complex to warrant any mitigation for electrocution at this stage. **It is recommended that if on-going impacts are recorded once operational, site-specific mitigation be applied reactively in the form of live component insulation.** This is an acceptable approach because EGI sensitive avifauna, especially Red Data species, is unlikely to frequent the substation and be electrocuted.

This impact is assessed to be of ***Low*** significance and mitigation is required to reduce it to ***Very Low*** significance (
Table 54).

Table 4: Potential mortality of EGI sensitive avifauna due to electrocutions in the Prince Alfred Hamlet substation.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***	***Confidence***
Without mitigation	Local 1	Medium 1	Long term (reversible) 3	**Low** **5**	Possible	**Low**	**Negative**	High
Essential Mitigation Measures: • None. If electrocutions are recorded once operational site-specific mitigation should be applied reactively (in the form of live component insulation) if impacts are unacceptable.								
With mitigation	Local 1	Low 1	Long term 3	**Low** **5**	Improbable	**Very Low**	**Negative**	High

Impact: Collisions of EGI sensitive avifauna with the proposed 132kV OHL

This impact is assessed to be of ***Medium*** significance and mitigation is required to reduce it to ***Low*** significance (
Table 55).

Table 5: Significance of the potential mortality of EGI sensitive avifauna due to collisions with the proposed OHL.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***	***Confidence***
Without mitigation	Local 1	Medium 2	Long term 3	**Medium** **6**	Probable	**Medium**	**Negative**	High
Essential Mitigation Measures: • Mark spans of the OHL in high sensitivity areas with Eskom approved Bird Flight Diverters (BFDs) (see **Appendix 4** for a sensitivity map and a list of spans to be marked with BFDs).								
With mitigation	Local 1	Low 2	Long term 3	**Medium** **6**	Possible	**Low**	**Negative**	High

8.2.3 Decommissioning Phase

Impact: Displacement due to disturbance associated with the decommissioning of the proposed OHL and Prince Alfred Hamlet substation

This impact is assessed to be of ***Low*** significance and mitigation is required to reduce it to ***Very Low*** significance (
Table 5 6).

Table 6: Displacement due to disturbance associated with the decommissioning of the proposed OHL and Prince Alfred Hamlet substation.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***	***Confidence***
Without mitigation	Local 1	High 3	Short term 1	**Low** **5**	Probable	**Low**	**Negative**	Medium

Essential Mitigation Measures:
• Decommissioning activity must be restricted to the immediate footprint of the infrastructure as far as possible.
• Access to the remainder of the site must be strictly controlled to prevent unnecessary disturbance of priority species.
• Reduce airborne dust at site through e.g.:
  o Damping dust-generating areas with freshwater;
  o Use of cloth fences; and
  o Covering dumps or stockpiles of lose material with plastic sheeting or netting, especially during windy conditions.
• Limit noise levels to less than 70 dB(A) at the boundary of the site.
• Maximum use should be made of existing access roads and the construction of new roads must be kept to a minimum.
• The mitigation measures proposed by the Terrestrial Biodiversity and Botanical Specialists pertaining to habitat restoration are to the benefit of all avifauna and must therefore be strictly implemented.								

With mitigation	Local 1	Low 1	Short term 1	**Very Low** 3	Improbable	**Very Low**	**Negative**	Medium

8.2.4 No-Go Assessment

The no-go option will result in no additional impacts on avifauna and will result in the ecological status quo being maintained, which will be to the advantage of the avifauna. However, no fatal flaws were identified during the investigations.

9 ENVIRONMENTAL SENSITIVITIES

The PAOI contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). SCCs are listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Near Threatened or Vulnerable.

The entire PAOI is a high sensitivity zone from a power line interaction perspective due to the recorded (SABAP2 data and the on-site surveys) and potential presence of EGI sensitive SCC including Blue Crane, Black Harrier, Maccoa Duck and Verreaux's Eagle which could pass through the and/or utilise the whole PAOI for foraging.

The following sensitives were identified from an avifaunal perspective (**Figure 7**). Mitigation in the form of Bird Flight Diverters should therefore be applied to these identified sections of the OHL:

- **High Sensitivity Zones**

Dams and Drainage Lines: The proposed 132kV OHL passes along farm dams and crosses over drainage lines. These areas could attract EGI sensitive avifauna, especially waterbirds, which could put them at risk of colliding with the OHL as they move between dams or up and down drainage lines.

Stands of Trees: There are several stands of alien trees along the proposed route of the 132kV OHL. EGI sensitive avifauna, especially raptors and corvids, could use these trees for roosting, perching, and nesting and would be at risk of colliding with the OHL when taking off from or approaching the trees.

Figure 7 below indicates the identified high sensitivity zones. Refer to **Appendix 4** for more details.

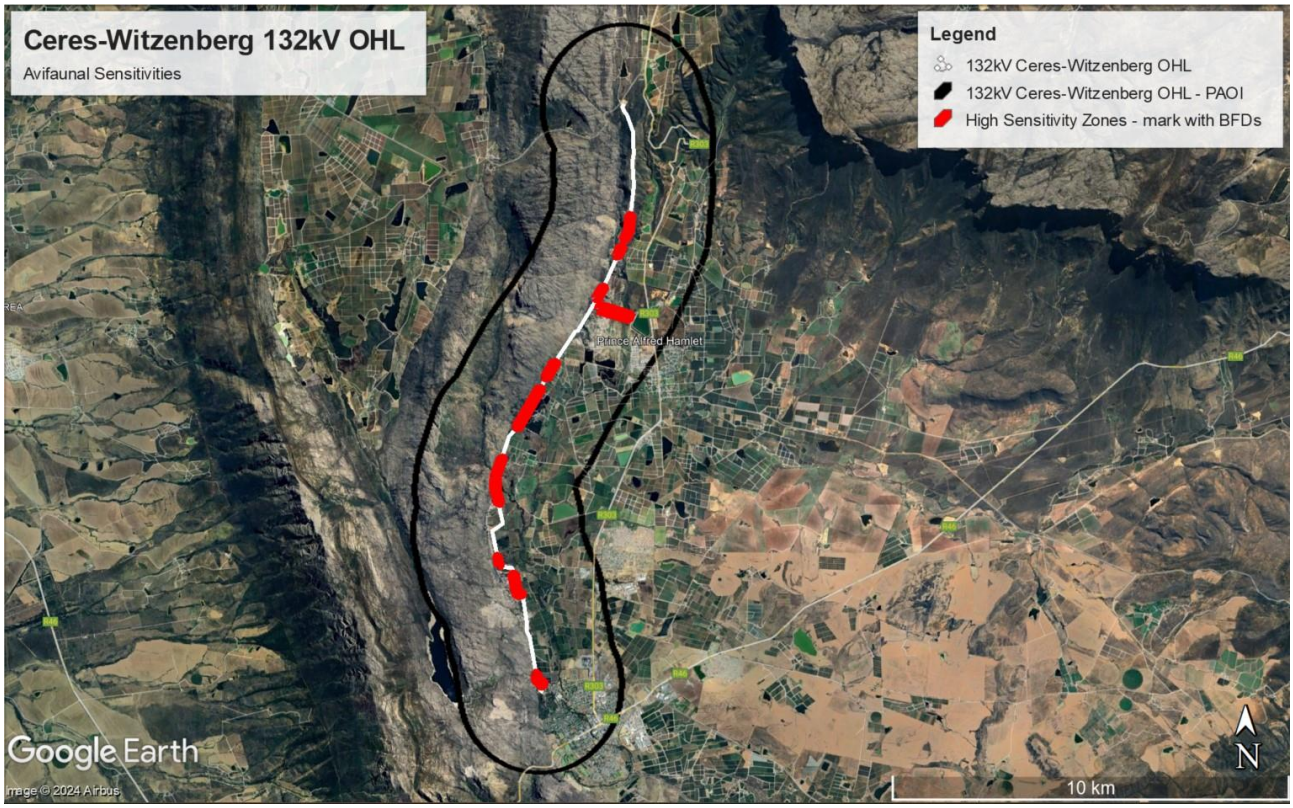

Figure 7: High sensitivity areas identified within the PAOI.

10 CUMULATIVE IMPACTS

The cumulative impacts of the proposed Ceres–Witzenberg 132kV OHL and new Prince Alfred Hamlet substation by **themselves are expected to be low**, for the following reasons:

- The proposed 132kV OHL is only approximately 17km long.
- The proposed 132kV OHL will run next to an existing 66kV line, which will help to make both lines more visible to flying birds, which could reduce the collision risk (**Figure 8**) of these two lines specifically.
- The proposed Prince Alfred Hamlet substation is located in low sensitivity habitat as far as avifauna is concerned.
- No Red Data species is expected to be impacted by the substation.

There are several existing overhead power lines within and near the POAI which cumulatively does increase the collisions risk for birds in the area (**Figure 8**). This overall cumulative impact is expected to be of **medium** significance.

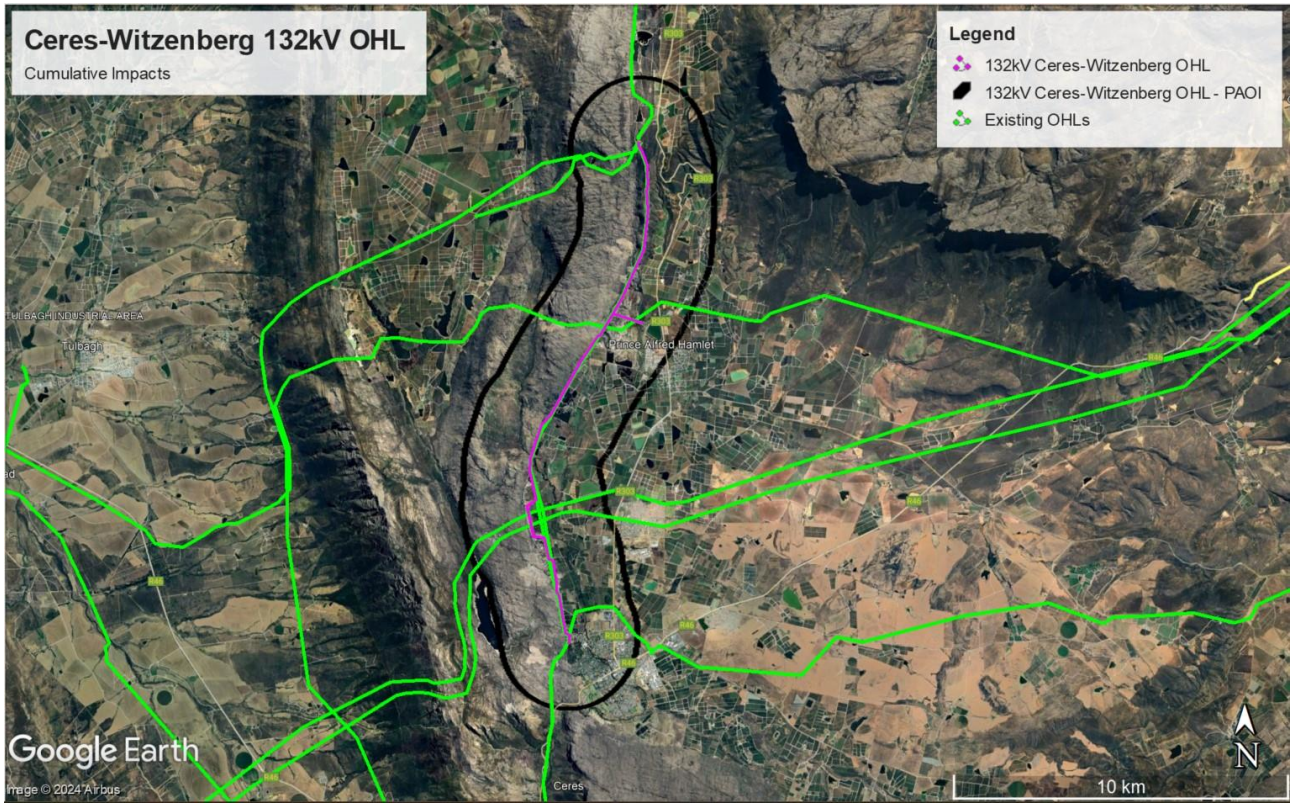

Figure 8: Existing OHLs near the proposed Ceres–Witzenberg 132kV OHL.

11 CONCLUSIONS

The construction of the proposed new 132kV single-circuit overhead power line (OHL) between the Ceres and Witzenberg Substations, and the new Prince Alfred Hamlet 132kV substation is expected to have a range of potential impacts on EGI sensitive avifauna.

The following impacts relative to avifauna have been identified:

Construction Phase

- Displacement due to disturbance associated with the construction of the EGI.
- Displacement due to habitat loss associated with the construction (and presence) of the EGI.

Operational Phase

- Electrocutions at the on-site substations and on the 132kV overhead lines.
- Collisions with the 132kV overhead line (OHL).

Decommissioning Phase

- Displacement due to disturbance associated with the decommissioning of the EGI.

Table 6 below lists a summary of the potential impacts, pre- and post-mitigation.

Table 7: Summary of Impacts

Environmental Parameter	Impact	Significance Rating Pre-Mitigation	Significance Rating Post Mitigation
Avifauna	*Displacement of EGI sensitive avifauna due to disturbance associated with construction of the EGI.*	Low -	Very Low -
	Displacement due to habitat transformation associated with the construction and presence of the EGI.	Low -	Very Low -
	Mortality of EGI sensitive avifauna due to electrocution in the substation yard.	Low -	Very Low -
	Mortality of EGI sensitive avifauna due to collisions with the 132kV overhead line.	Medium -	Low -
	Displacement of EGI sensitive avifauna due to disturbance associated with decommissioning of the EGI.	Low -	Very Low -

The proposed Ceres-Witzenberg Electrical Grid Infrastructure will have anticipated medium and low negative impacts on EGI sensitive avifauna, which is expected to be reduced to low and very low with the appropriate mitigation measures. No fatal flaws were discovered during the on-site investigations. It is recommended that the activity is authorised, on condition that the proposed **mitigation measures** as detailed in the Impact Tables (**Section 7** of the report) and the EMPr (**Appendix 5**) are **strictly implemented**.

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APPENDIX 1: BIRD SPECIES LIST FOR BROADER AREA

*High & Medium sensitivity species classified in DFFE Screening tool

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status
		Full Protocol	Ad Hoc Protocol		
Acacia Pied Barbet	*Tricholaema leucomelas*	1,32	1,06	-	-
African Black Duck	*Anas sparsa*	22,37	6,91	-	-
African Black Swift	*Apus barbatus*	13,16	0,00	-	-
African Darter	*Anhinga rufa*	15,79	5,32	-	-
African Dusky Flycatcher	*Muscicapa adusta*	13,16	0,00	-	-
African Fish Eagle	*Haliaeetus vocifer*	9,21	2,13	-	-
African Goshawk	*Accipiter tachiro*	15,79	3,19	-	-
African Harrier-Hawk	*Polyboroides typus*	5,26	1,06	-	-
African Hoopoe	*Upupa africana*	13,16	1,60	-	-
African Marsh Harrier	*Circus ranivorus*	1,32	0,00	-	EN
African Olive Pigeon	*Columba arquatrix*	1,32	1,06	-	-
African Paradise Flycatcher	*Terpsiphone viridis*	15,79	2,13	-	-
African Pipit	*Anthus cinnamomeus*	22,37	0,53	-	-
African Reed Warbler	*Acrocephalus baeticatus*	7,89	2,13	-	-
African Sacred Ibis	*Threskiornis aethiopicus*	56,58	26,60	-	-
African Snipe	*Gallinago nigripennis*	1,32	1,06	-	-
African Spoonbill	*Platalea alba*	18,42	8,51	-	-
African Stonechat	*Saxicola torquatus*	27,63	5,32	-	-
Alpine Swift	*Tachymarptis melba*	26,32	2,13	-	-
Barn Swallow	*Hirundo rustica*	26,32	2,13	-	-
Bar-throated Apalis	*Apalis thoracica*	23,68	2,66	-	-
Black Crake	*Zapornia flavirostra*	2,63	1,06	-	-
Black Harrier *	*Circus maurus*	6,58	1,60	EN	EN
Black Saw-wing	*Psalidoprocne pristoptera*	6,58	0,00	-	-
Black Sparrowhawk	*Accipiter melanoleucus*	7,89	2,13	-	-
Black-crowned Night Heron	*Nycticorax nycticorax*	6,58	0,53	-	-
Black-headed Canary	*Serinus alario*	1,32	0,00	-	-
Black-headed Heron	*Ardea melanocephala*	32,89	3,72	-	-
Black-necked Grebe	*Podiceps nigricollis*	9,21	0,53	-	-
Blacksmith Lapwing	*Vanellus armatus*	52,63	15,43	-	-
Black-winged Kite	*Elanus caeruleus*	35,53	11,70	-	-
Black-winged Stilt	*Himantopus himantopus*	19,74	4,26	-	-
Blue Crane *	*Grus paradisea*	13,16	4,79	VU	NT
Bokmakierie	*Telophorus zeylonus*	53,95	7,98	-	-

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status
		Full Protocol	Ad Hoc Protocol		
Booted Eagle	*Hieraaetus pennatus*	5,26	0,00	-	-
Brimstone Canary	*Crithagra sulphurata*	1,32	0,00	-	-
Brown-throated Martin	*Riparia paludicola*	31,58	3,19	-	-
Cape Batis	*Batis capensis*	9,21	2,66	-	-
Cape Bulbul	*Pycnonotus capensis*	47,37	6,38	-	-
Cape Bunting	*Emberiza capensis*	34,21	7,45	-	-
Cape Canary	*Serinus canicollis*	76,32	20,74	-	-
Cape Clapper Lark	*Mirafra apiata*	2,63	0,53	-	-
Cape Crow	*Corvus capensis*	2,63	0,53	-	-
Cape Grassbird	*Sphenoeacus afer*	9,21	3,19	-	-
Cape Longclaw	*Macronyx capensis*	17,11	3,19	-	-
Cape Penduline Tit	*Anthoscopus minutus*	0,00	0,53	-	-
Cape Robin-Chat	*Cossypha caffra*	64,47	20,21	-	-
Cape Rock Thrush	*Monticola rupestris*	7,89	2,13	-	-
Cape Rockjumper	*Chaetops frenatus*	3,95	0,53	NT	NT
Cape Shoveler	*Spatula smithii*	25,00	9,04	-	-
Cape Siskin	*Crithagra totta*	19,74	3,72	-	-
Cape Sparrow	*Passer melanurus*	68,42	10,11	-	-
Cape Spurfowl	*Pternistis capensis*	57,89	8,51	-	-
Cape Sugarbird	*Promerops cafer*	39,47	10,11	-	-
Cape Teal	*Anas capensis*	21,05	3,19	-	-
Cape Turtle Dove	*Streptopelia capicola*	88,16	22,87	-	-
Cape Wagtail	*Motacilla capensis*	67,11	15,43	-	-
Cape Weaver	*Ploceus capensis*	75,00	10,11	-	-
Cape White-eye	*Zosterops virens*	72,37	17,55	-	-
Capped Wheatear	*Oenanthe pileata*	5,26	0,53	-	-
Cardinal Woodpecker	*Dendropicos fuscescens*	1,32	0,00	-	-
Common Buzzard	*Buteo buteo*	11,84	1,60	-	-
Common Greenshank	*Tringa nebularia*	1,32	0,00	-	-
Common House Martin	*Delichon urbicum*	3,95	0,53	-	-
Common Moorhen	*Gallinula chloropus*	17,11	5,32	-	-
Common Ostrich	*Struthio camelus*	1,32	0,53	-	-
Common Quail	*Coturnix coturnix*	3,95	0,00	-	-
Common Ringed Plover	*Charadrius hiaticula*	1,32	0,00	-	-
Common Sandpiper	*Actitis hypoleucos*	5,26	0,00	-	-
Common Starling	*Sturnus vulgaris*	61,84	10,11	-	-
Common Waxbill	*Estrilda astrild*	47,37	5,85	-	-

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status
		Full Protocol	Ad Hoc Protocol		
Crowned Lapwing	*Vanellus coronatus*	11,84	0,53	-	-
Diederik Cuckoo	*Chrysococcyx caprius*	1,32	0,00	-	-
Egyptian Goose	*Alopochen aegyptiaca*	81,58	31,38	-	-
Eurasian Reed Warbler	*Acrocephalus scirpaceus*	1,32	0,00	-	-
European Bee-eater	*Merops apiaster*	5,26	0,00	-	-
Familiar Chat	*Oenanthe familiaris*	32,89	5,32	-	-
Fiery-necked Nightjar	*Caprimulgus pectoralis*	0,00	0,53	-	-
Fiscal Flycatcher	*Melaenornis silens*	23,68	3,72	-	-
Fork-tailed Drongo	*Dicrurus adsimilis*	7,89	0,00	-	-
Freckled Nightjar	*Caprimulgus tristigma*	10,53	2,13	-	-
Giant Kingfisher	*Megaceryle maxima*	5,26	1,60	-	-
Glossy Ibis	*Plegadis falcinellus*	19,74	3,72	-	-
Great Crested Grebe	*Podiceps cristatus*	19,74	5,32	-	-
Great Egret	*Ardea alba*	1,32	0,00	-	-
Greater Flamingo	*Phoenicopterus roseus*	5,26	0,00	-	NT
Greater Striped Swallow	*Cecropis cucullata*	46,05	5,85	-	-
Grey Heron	*Ardea cinerea*	39,47	11,17	-	-
Grey-backed Cisticola	*Cisticola subruficapilla*	18,42	2,13	-	-
Grey-backed Sparrow-Lark	*Eremopterix verticalis*	2,63	0,00	-	-
Grey-winged Francolin	*Scleroptila afra*	5,26	2,13	-	-
Ground Woodpecker	*Geocolaptes olivaceus*	3,95	0,53	NT	LC
Hadada Ibis	*Bostrychia hagedash*	77,63	21,28	-	-
Hamerkop	*Scopus umbretta*	6,58	2,66	-	-
Helmeted Guineafowl	*Numida meleagris*	68,42	17,02	-	-
House Sparrow	*Passer domesticus*	59,21	15,96	-	-
Indian Peafowl	*Pavo cristatus*	2,63	0,53	-	-
Intermediate Egret	*Ardea intermedia*	3,95	1,06	-	-
Jackal Buzzard	*Buteo rufofuscus*	23,68	9,57	-	-
Karoo Long-billed Lark	*Certhilauda subcoronata*	1,32	0,00	-	-
Karoo Prinia	*Prinia maculosa*	67,11	11,17	-	-
Karoo Scrub Robin	*Cercotrichas coryphoeus*	14,47	3,19	-	-
Karoo Thrush	*Turdus smithi*	6,58	1,06	-	-
Kittlitz's Plover	*Charadrius pecuarius*	2,63	0,00	-	-
Klaas's Cuckoo	*Chrysococcyx klaas*	1,32	0,53	-	-
Lanner Falcon	*Falco biarmicus*	1,32	0,00	-	VU
Large-billed Lark	*Galerida magnirostris*	6,58	1,60	-	-
Laughing Dove	*Spilopelia senegalensis*	56,58	13,30	-	-

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status
		Full Protocol	Ad Hoc Protocol		
Lesser Kestrel	*Falco naumanni*	5,26	2,13	-	-
Lesser Swamp Warbler	*Acrocephalus gracilirostris*	9,21	1,60	-	-
Levaillant's Cisticola	*Cisticola tinniens*	27,63	0,53	-	-
Little Egret	*Egretta garzetta*	19,74	4,26	-	-
Little Grebe	*Tachybaptus ruficollis*	39,47	10,64	-	-
Little Rush Warbler	*Bradypterus baboecala*	11,84	1,06	-	-
Little Swift	*Apus affinis*	21,05	0,00	-	-
Long-billed Crombec	*Sylvietta rufescens*	2,63	0,53	-	-
Maccoa Duck	*Oxyura maccoa*	14,47	3,72	EN	NT
Malachite Kingfisher	*Corythornis cristatus*	3,95	0,00	-	-
Malachite Sunbird	*Nectarinia famosa*	46,05	10,64	-	-
Mountain Wheatear	*Myrmecocichla monticola*	3,95	0,00	-	-
Namaqua Dove	*Oena capensis*	13,16	3,19	-	-
Neddicky	*Cisticola fulvicapilla*	15,79	1,06	-	-
Olive Thrush	*Turdus olivaceus*	46,05	12,23	-	-
Orange-breasted Sunbird	*Anthobaphes violacea*	26,32	7,98	-	-
Pale Chanting Goshawk	*Melierax canorus*	1,32	0,00	-	-
Peregrine Falcon	*Falco peregrinus*	3,95	1,06	-	-
Pied Avocet	*Recurvirostra avosetta*	2,63	0,53	-	-
Pied Crow	*Corvus albus*	51,32	14,36	-	-
Pied Kingfisher	*Ceryle rudis*	2,63	1,60	-	-
Pied Starling	*Lamprotornis bicolor*	28,95	8,51	-	-
Pin-tailed Whydah	*Vidua macroura*	15,79	2,66	-	-
Protea Canary	*Crithagra leucoptera*	10,53	8,51	NT	NT
Purple Heron	*Ardea purpurea*	0,00	0,53	-	-
Red-billed Teal	*Anas erythrorhyncha*	36,84	11,70	-	-
Red-capped Lark	*Calandrella cinerea*	9,21	1,06	-	-
Red-eyed Dove	*Streptopelia semitorquata*	63,16	12,23	-	-
Red-faced Mousebird	*Urocolius indicus*	11,84	1,60	-	-
Red-knobbed Coot	*Fulica cristata*	55,26	23,40	-	-
Red-winged Starling	*Onychognathus morio*	40,79	9,04	-	-
Reed Cormorant	*Microcarbo africanus*	47,37	13,83	-	-
Rock Dove	*Columba livia*	19,74	2,13	-	-
Rock Kestrel	*Falco rupicolus*	17,11	3,19	-	-
Rock Martin	*Ptyonoprogne fuligula*	30,26	2,13	-	-
Rufous-breasted Sparrowhawk	*Accipiter rufiventris*	3,95	0,00	-	-
Sentinel Rock Thrush	*Monticola explorator*	1,32	0,00	NT	LC

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status
		Full Protocol	Ad Hoc Protocol		
Sombre Greenbul	*Andropadus importunus*	1,32	0,00	-	-
South African Shelduck	*Tadorna cana*	25,00	3,19	-	-
Southern Boubou	*Laniarius ferrugineus*	9,21	2,13	-	-
Southern Double-collared Sunbird	*Cinnyris chalybeus*	47,37	10,11	-	-
Southern Fiscal	*Lanius collaris*	77,63	20,74	-	-
Southern Grey-headed Sparrow	*Passer diffusus*	3,95	0,00	-	-
Southern Masked Weaver	*Ploceus velatus*	43,42	6,91	-	-
Southern Pochard	*Netta erythrophthalma*	9,21	1,06	-	-
Southern Red Bishop	*Euplectes orix*	39,47	10,11	-	-
Speckled Mousebird	*Colius striatus*	13,16	2,13	-	-
Speckled Pigeon	*Columba guinea*	43,42	5,85	-	-
Spotted Eagle-Owl	*Bubo africanus*	9,21	2,13	-	-
Spotted Thick-knee	*Burhinus capensis*	1,32	1,60	-	-
Spur-winged Goose	*Plectropterus gambensis*	26,32	8,51	-	-
Streaky-headed Seedeater	*Crithagra gularis*	18,42	3,72	-	-
Swee Waxbill	*Coccopygia melanotis*	14,47	4,79	-	-
Three-banded Plover	*Charadrius tricollaris*	18,42	3,19	-	-
Verreaux's Eagle *	*Aquila verreauxii*	6,58	3,19	-	VU
Victorin's Warbler	*Cryptillas victorini*	3,95	1,06	-	-
Water Thick-knee	*Burhinus vermiculatus*	0,00	0,53	-	-
Wattled Starling	*Creatophora cinerea*	0,00	0,53	-	-
Western Barn Owl	*Tyto alba*	4,01	0,53	-	-
Western Cattle Egret	*Bubulcus ibis*	59,21	14,89	-	-
Whiskered Tern	*Chlidonias hybrida*	6,58	1,60	-	-
White Stork	*Ciconia ciconia*	1,32	0,00	-	-
White-backed Duck	*Thalassornis leuconotus*	3,95	0,53	-	-
White-backed Mousebird	*Colius colius*	10,53	1,06	-	-
White-breasted Cormorant	*Phalacrocorax lucidus*	27,63	4,79	-	-
White-faced Whistling Duck	*Dendrocygna viduata*	2,63	0,53	-	-
White-necked Raven	*Corvus albicollis*	43,42	14,36	-	-
White-rumped Swift	*Apus caffer*	27,63	2,13	-	-
White-throated Canary	*Crithagra albogularis*	7,89	0,00	-	-
White-throated Swallow	*Hirundo albigularis*	28,95	3,72	-	-
White-winged Tern	*Chlidonias leucopterus*	2,63	1,60	-	-
Yellow Bishop	*Euplectes capensis*	34,21	7,45	-	-
Yellow Canary	*Crithagra flaviventris*	17,11	2,13	-	-

Species Name	Scientific Name	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status
		Full Protocol	Ad Hoc Protocol		
Yellow-billed Duck	*Anas undulata*	59,21	21,28	-	-
Yellow-billed Kite	*Milvus aegyptius*	19,74	4,79	-	-
Zitting Cisticola	*Cisticola juncidis*	10,53	0,00	-	-

APPENDIX 2: BIRD HABITATS IN THE PAOI

Figure 1: Urban and agricultural development in PAOI.

Figure 2: Rocky mountain fynbos in PAOI.

Figure 3: The slopes of the Skurweberg mountains in PAOI.

Figure 4: The habitat (disturbed fynbos) at the site of the proposed Prince Alfred Hamlet substation.

Figure 5: A stand of alien trees.

Figure 6: A farm dam in the PAOI.

Figure 7: Drainage line, in PAOI, showing heavy alien infestation.

Figure 8: Grassy clearing in PAOI.

APPENDIX 3: SITE SENSITIVITY VERIFICATION

RECONNAISSANCE REPORT
(IN TERMS OF PART B OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020 AND GN 43855 ON 30 OCTOBER 2020)

INTRODUCTION

Prior to commencing with the specialist assessment in accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification (SSV) was undertaken to confirm the current land use and environmental sensitivity of the proposed Project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool). NEMA makes provision for the prescription of procedures for the assessment and minimum criteria for reporting on identified environmental themes (Sections 24(5)(a) and (h) and 44) when applying for environmental authorisation. The Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020 is applicable in the case of electrical grid infrastructure developments.

The details of the SSV are noted below:

Date of Site Visit	26–27 February 2024
Supervising Specialist Name	Albert Froneman
Professional Registration Number	MSc Conservation Biology (SACNASP Zoological Science Registration number 400177/09)
Specialist Affiliation / Company	AfriAvian Environmental

SITE SENSITIVITY VERIFICATION

The following methods and information sources were used to compile this report:

- Bird distribution data from the Second Southern African Bird Atlas Project (SABAP2) was obtained (https://sabap2.birdmap.africa/) to ascertain which species occur in the pentads where the proposed EGI Project is located. A pentad grid cell covers 5 minutes of latitude by 5 minutes of longitude (5' × 5'). Each pentad is approximately 9 × 8 km in size. To get a representative impression of the bird species in the area a consolidated dataset was obtained for a total of six (6) pentads some of which intersect and others that are near the PAOI, henceforth referred to as "**the Broader Area**". The six pentad grid cells are: 3310_1915, 3310_1920, 3315_1915, 3320_1915, 3315_1920 and 3320_1920. To date, a total of 76 full protocol checklists (i.e., intensive bird listing surveys lasting at least two hours each) and 188 ad hoc protocol lists (surveys lasting less than two hours but still yielding valuable data) have been completed for the six pentads where the PAOI is located.
- The SABAP2 data was regarded as a reliable reflection of the avifauna that occurs in the Broader Area, but the data was also supplemented with data collected during the on-site surveys (February 2024) and with general knowledge of the area.
- A classification of the vegetation types in the PAOI was obtained from the First Atlas of Southern African Birds (SABAP1) and the National Vegetation Map (2018) compiled by the South African National Biodiversity Institute (Mucina & Rutherford 2006).
- The national threatened status of all EGI sensitive avifauna was determined with the use of the most recent edition of the Red List Book of Birds of South Africa, Lesotho, and Swaziland (Taylor *et al.* 2015), and the latest authoritative summary of southern African bird biology (Hockey *et al.* 2005).
- The global threatened status of all EGI sensitive avifauna was determined by consulting the latest (2023.1) IUCN Red List of Threatened Species (http://www.iucnredlist.org/).

- The Important Bird and Biodiversity Areas of South Africa (Marnewick *et al.* 2015; http://www.birdlife.org.za/conservation/important-bird-areas) was consulted for information on potentially relevant Important Bird Areas (IBAs).
- An intensive internet search was conducted to source information on the impacts of electrical grid infrastructure on avifauna.
- Satellite imagery (Google Earth © 2023) was used to view the broader area on a landscape level and to help identify bird habitat on the ground.
- The South African National Biodiversity BGIS map viewer was used to determine the locality of the PAOI relative to National Protected Areas.
- The DFFE National Screening Tool was used to determine the assigned avian sensitivity of the PAOI.
- The following sources were consulted to determine the investigation protocol that is required for the site:
    - 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 NEMA when applying for Environmental Authorisation (Gazetted October 2020)
    - Guidelines for the Implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for EIAs in South Africa produced by the South African National Biodiversity Institute on behalf of the Department of Environment, Forestry and Fisheries (2020).
- A SSV survey was conducted 26–27 February 2024. The PAOI was inspected with a 4x4 vehicle and on foot. All birds were recorded.
- EGI sensitive species were defined as species which could potentially be impacted by power line collisions or electrocutions (power line or substation yard), based on specific morphological and/or behavioural characteristics. Species classes which fall under these categories are raptors, large terrestrial birds, waterbirds, crows, and certain ground nesting birds (and certain avifauna that would be vulnerable to displacement due to disturbance/habitat loss).

OUTCOME OF SITE RECONNAISSANCE

➢ **Natural Environment**

The PAOI falls within the Fynbos Biome (Harrison *et al.* 1997; Mucina & Rutherford 2006) and is split between the Western Fynbos-Renosterveld Bioregion and Northwest Fynbos Bioregion (VegMap 2018). The two main vegetation types within the PAOI are Winterhoek Sandstone Fynbos and Ceres Shale Renosterveld (VegMap 2018).

It is generally accepted that vegetation structure, rather than the actual plant species, influences bird species distribution and abundance (Harrison *et al.* 1997). In other words, while avifaunal distribution is influenced by primary vegetation divisions (Biomes), avifaunal diversity is more dependent on specific vegetation units within these primary vegetation types.

The natural vegetation types in the PAOI are a variety of fynbos types, consisting of a mixture of Winterhoek Sandstone Fynbos, Breede Shale Fynbos, Ceres Shale Renosterveld, and North Hex Sandstone Fynbos (Mucina & Rutherford 2006). Fynbos is dominated by low shrubs characterised by restioid, erioid and proteoid components (Harrison *et al.* 1997). Fynbos represents most of the natural vegetation in the PAOI. The Fynbos Biome is characterised by a high level of diversity and endemism in its botanical composition, which is not paralleled in its terrestrial avifauna, which is depauperate relative to other southern African biomes. The natural fynbos vegetation in the PAOI has been heavily disturbed in places through alien infestation and burning, but some areas of good quality fynbos habitat remain.

Figure 1: Fynbos vegetation in the PAOI.

The PAOI contains rivers and drainage lines, e.g. the Dwarsrivier, Waboomsrivier and several smaller drainage lines. The rivers and drainage lines have generally been heavily infested with Port Jackson *Acacia saligna* and Black Wattle *Acacia mearnsii*. Due to the degraded state of the rivers, few EGI sensitive avifauna are likely to frequent the river systems in the PAOI (**Figure 2**).

Figure 2: Drainage Line in the PAOI.

Whilst the distribution and abundance of the bird species in and near the PAOI is mostly associated with natural vegetation, it is also necessary to examine the anthropogenic modifications to the environment that have relevance for birds.

➢ **Modified Environment**

The following avifaunal-relevant anthropogenic habitat modifications were recorded within the PAOI:

- **Dams:** The PAOI contains several man-made dams of various sizes (**Figure 3**). The dams could attract many priority waterbird species, with extensive movement between dams to be expected.
- **Alien Trees:** The PAOI contains a variety of alien trees, mostly Port Jackson, Black Wattle, *Pinus* and *Eucalyptus* species (**Figure 4**). In some instances, these trees form dense stands. Alien trees provide important perching, roosting and possible nesting habitat for various bird species including EGI sensitive avifauna.
- **Agriculture:** The PAOI contains several areas of intensive agriculture, mostly fruit orchards and partially encompasses the town of Ceres and Prince Alfred Hamlet (**Figure 5**). These urban and agricultural environments are generally less attractive to EGI sensitive avifauna.

Figure 3: Dam in the PAOI.

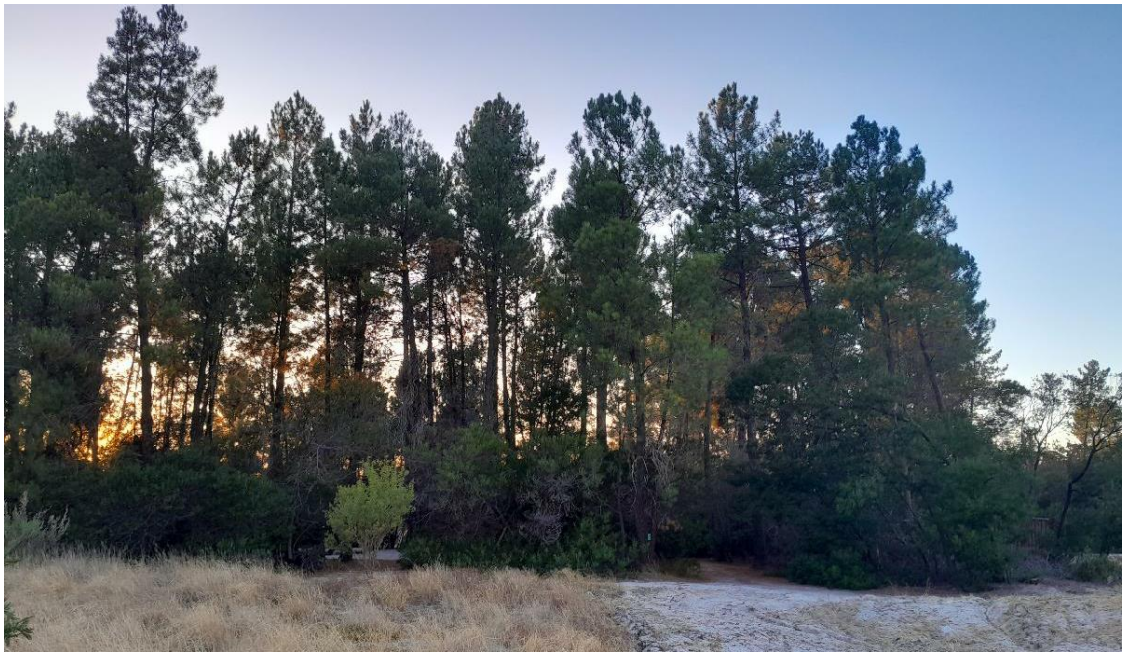


Figure 4: Alien trees in the PAOI.

Figure 5: Agricultural field (fruit orchard) in the PAOI.

- **DFFE Screening Tool**

The PAOI and immediate environment is classified as **HIGH/MEDIUM** sensitivity for avifauna according to the Animal Species Theme (**Figure 6**). The sensitivity classification is linked to the possible occurrence of Verreaux's Eagle *Aquila verreauxii* (Regionally Vulnerable), Black Harrier *Circus maurus* (Globally and Regionally Endangered), Southern Black Korhaan *Afrotis afra* (Globally and Regionally Vulnerable), Striped Flufftail *Sarothrura affinis* (Regionally Vulnerable), Secretarybird *Sagittarius serpentarius* (Globally Endangered and Regionally Vulnerable), and Caspian Tern *Hydroprogne caspia* (Regionally Vulnerable).

The PAOI contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). SCCs are listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Near Threatened or Vulnerable.

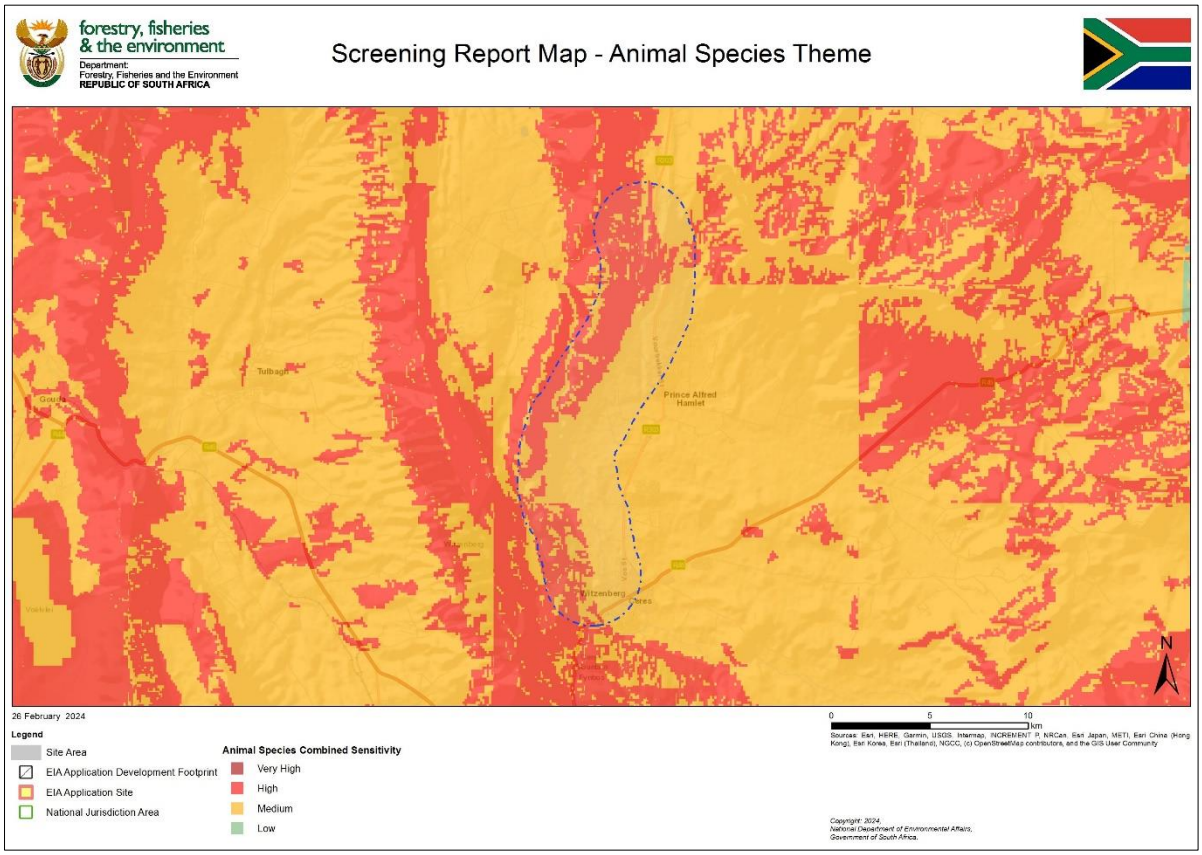


Figure 6: The classification of the Ceres-Witzenberg 132kV OHL and Substation PAOI according to the Animal Species Theme in the DFFE National Screening Tool. The High and Medium sensitivity classification is linked to the possible occurrence of Verreaux's Eagle (Regionally Vulnerable), Black Harrier (Globally and Regionally Endangered), Southern Black Korhaan (Globally and Regionally Vulnerable), Striped Flufftail (Regionally Vulnerable), Secretarybird (Globally Endangered and Regionally Vulnerable), and Caspian Tern (Regionally Vulnerable).

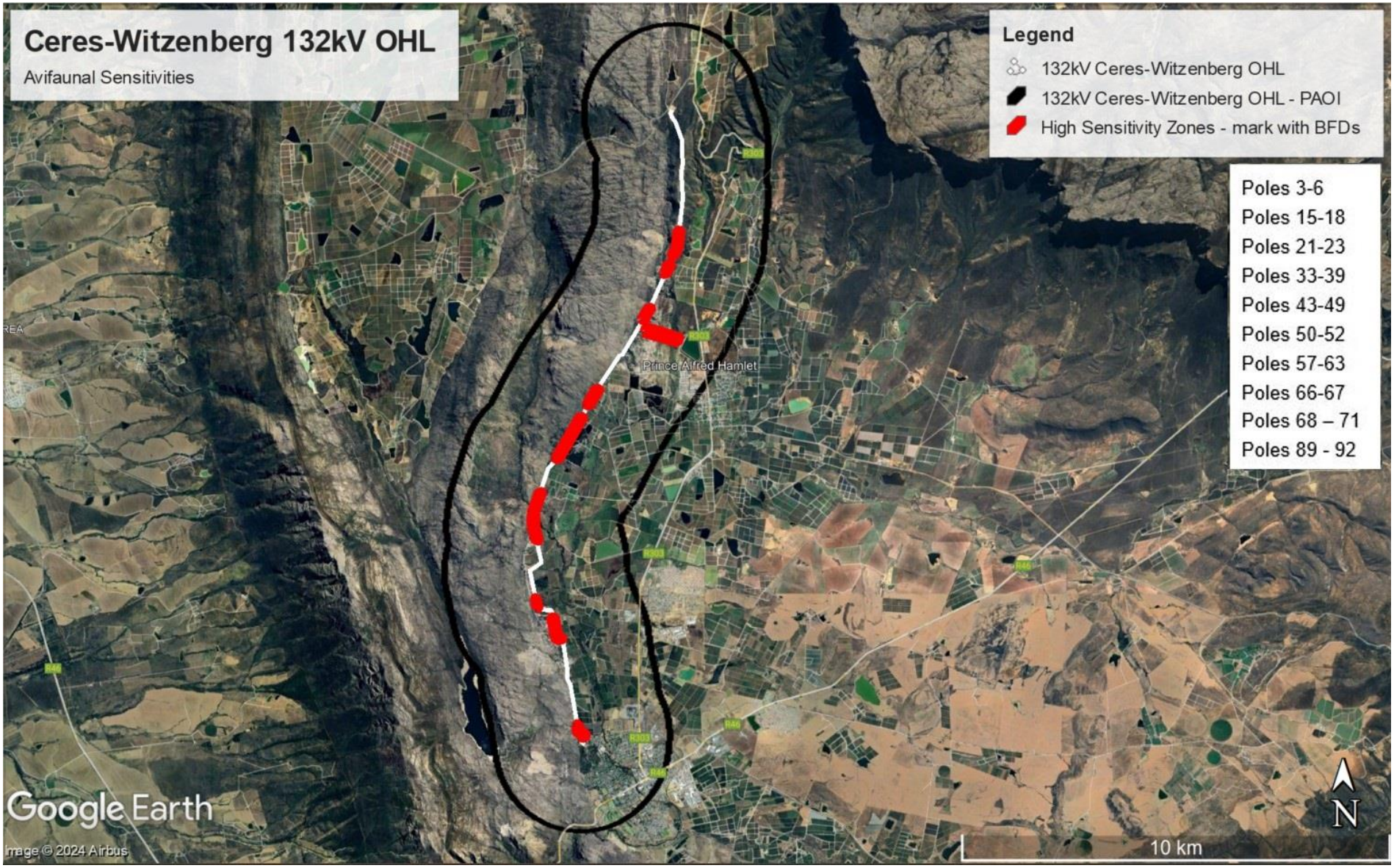
- **Avifauna**

The Southern African Bird Atlas Project (SABAP2) data indicates that a total of 184 bird species could potentially occur within the Broader Area where the PAOI is located – **Appendix 1** provides a comprehensive bird species list. Of these, 61 (33% of) species are classified as EGI sensitive avifauna for Electrical Grid Infrastructure (EGI) developments (i.e. **EGI sensitive avifauna**) and 7 of these are South African Red Listed species (i.e., Species of Conservation Concern – SCC). Of the 61 EGI sensitive avifauna, 47 are likely to occur regularly in or near the Project Area of Influence (PAOI), and 15 EGI sensitive avifauna were recorded during the on-site surveys (26–27 February 2024).

CONCLUSION

The occurrence of SCC in the PAOI was confirmed during the site visit (26–27 February 2024) with observations of Verreaux's Eagle recorded during the survey. The comprehensive SABAP2 data also affirms the occurrence of Blue Crane, Black Harrier (both species classified in the DFFE screening tool), and Maccoa Duck that could pass through the and/or utilise the PAOI for foraging. Based on the SABAP2 data, the confirmed habitat and the field surveys, the classification of **HIGH SENSITIVITY** for avifauna in the Screening Tool is supported.

APPENDIX 4: SENSITIVITY MAP



APPENDIX 5: ENVIRONMENTAL MANAGEMENT PROGRAMME

Management Plan for the Planning and Design Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: DISPLACEMENT DUE TO DISTURBANCE					
Displacement of avifauna due to disturbance during EGI construction activities.	Prevent displacement of avifauna	1. Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible. 2. Any buffer zones as recommended by the Freshwater Specialist should be followed. 3. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifauna. 4. Reduce airborne dust at site through e.g.: a. Damping dust-generating areas with freshwater; b. Use of cloth fences; and c. Covering dumps or stockpiles of lose material with plastic sheeting or netting, especially during windy conditions. 5. Limit noise levels to less than 70 dB(A) at the boundary of the site. 6. Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.	As indicated	Once-off during the planning phase.	Project Developer

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		7. The recommendations of the Botanical Specialist study must be strictly implemented, especially as far as limitation of the construction footprint and habitat restoration are concerned.			
AVIFAUNA: MORTALITY DUE TO ELECTROCUTIONS IN THE SUBSTATION YARDS					
Electrocution of EGI sensitive avifauna in the substation	Prevention of electrocution mortality.	Due to the complicated design of the substation hardware, pro-active mitigation is not a practical option. Instead, the situation must be monitored, and should electrocutions of EGI sensitive avifauna be recorded, reactive mitigation should be applied in the form of insulation of live components.	As indicated.	Reactively as required.	Project Developer

Management Plan for the Construction Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: DISTURBANCE					
The noise and movement associated with the construction activities at the development footprint will be a source of disturbance	Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr.)	A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during	1. Implementation of the CEMPr. Oversee activities to ensure that the CEMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance. 2. Ensure that construction personnel are made aware of	1. On a daily basis 2. Monthly 3. Monthly 4. Monthly 5. Monthly	1. Contractor and ECO 2. Contractor and ECO 3. Contractor and ECO 4. Contractor and ECO 5. Contractor and ECO

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
which would lead to the displacement of avifauna from the area		construction. The CEMPr must specifically include the following: 1. No off-road driving; 2. Maximum use of existing roads, where possible; 3. Reduce airborne dust at site through e.g.: a. Damping dust-generating areas with freshwater; b. Use of cloth fences; and c. Covering dumps or stockpiles of lose material with plastic sheeting or netting, especially during windy conditions. 4. Limit noise levels to less than 70 dB(A) at the boundary of the site; 5. Restricted access to the rest of the property; 6. Strict application of all recommendations in the Terrestrial Biodiversity and Botanical specialist report pertaining to the limitation of the footprint.	the impacts relating to off-road driving. 3. Construction access roads must be demarcated clearly. Undertake site inspections to verify. 4. Monitor the implementation of noise control mechanisms via site inspections and record and report non-compliance. 5. Ensure that the construction area is demarcated clearly and that construction personnel are made aware of these demarcations. Monitor via site inspections and report non-compliance.		
AVIFAUNA: COLLISIONS					
Mortality of EGI sensitive avifauna due to	Prevention of power line collision mortality	Eskom approved bird flight diverters should be installed on the identified sections of the 132kV overhead line according to	Bird Flight Diverters must be installe as soon as the conductors are strung.	Once-off	Contractor and ECO

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
collisions with the 132kV OHLs		the applicable Eskom Engineering Instruction. These devices must be installed as soon as the conductors are strung.			

Management Plan for the Operational Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: DISPLACEMENT DUE TO HABITAT TRANSFORMATION					
Total or partial displacement of avifauna due to habitat transformation associated with the vegetation clearance and the presence of the EGI components.	Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented by an appropriately qualified rehabilitation specialist, according to the recommendations of the botanical specialist study.	1. Develop a Habitat Restoration Plan (HRP). 2. Monitor rehabilitation via site audits and site inspections to ensure compliance. 3. Record and report any non-compliance.	1. Appointment of rehabilitation specialist to develop HRP. 2. Site inspections to monitor progress of HRP. 3. Adaptive management to ensure HRP goals are met.	1. Once-off 2. Once a year 3. As and when required	1. Project Developer 2. Facility Environmental Manager 3. Project Developer and Facility Operational Manager

APPENDIX 6: SPECIALIST CVs

Curriculum Vitae: Albert Froneman

Profession/Specialisation	:	Avifaunal Specialist
Highest Qualification	:	MSc (Conservation Biology)
Nationality	:	South African
Years of experience	:	25 years

Key Qualifications

Albert Froneman **(**Pr.Sci.Nat) has more than 25 years' experience in the management of avifaunal interactions with industrial infrastructure. He holds a M.Sc. degree in Conservation Biology from the University of Cape Town. He managed the Airports Company South Africa (ACSA) – Endangered Wildlife Trust Strategic Partnership from 1999 to 2008 which has been internationally recognized for its achievements in addressing airport wildlife hazards in an environmentally sensitive manner at ACSA's airports across South Africa. Albert is recognized worldwide as an expert in the field of bird hazard management on airports and has worked in South Africa, Swaziland, Botswana, Namibia, Kenya, Israel, and the USA. He has served as the vice chairman of the International Bird Strike Committee and has presented various papers at international conferences and workshops. At present he is consulting to ACSA with wildlife hazard management on all their airports. He also an accomplished specialist ornithological consultant outside the aviation industry and has completed a wide range of bird impact assessment studies. He has co-authored many avifaunal specialist studies and pre-construction monitoring reports for proposed renewable energy developments across South Africa. He also has vast experience in using Geographic Information Systems to analyse and interpret avifaunal data spatially and derive meaningful conclusions. Since 2009 Albert has been a registered Professional Natural Scientist (reg. nr 400177/09) with The South African Council for Natural Scientific Professions, specialising in Zoological Science.

Key Project Experience

Renewable Energy Facilities –avifaunal monitoring projects in association with AfriAvian Environmental

1. Jeffrey's Bay Wind Farm – 12-months preconstruction avifaunal monitoring project
2. Oyster Bay Wind Energy Project – 12-months preconstruction avifaunal monitoring project
3. Ubuntu Wind Energy Project near Jeffrey's Bay – 12-months preconstruction avifaunal monitoring project
4. Bana-ba-Pifu Wind Energy Project near Humansdorp – 12-months preconstruction avifaunal monitoring project
5. Excelsior Wind Energy Project near Caledon – 12-months preconstruction avifaunal monitoring project
6. Laingsburg Spitskopvlakte Wind Energy Project – 12-months preconstruction avifaunal monitoring project
7. Loeriesfontein Wind Energy Project Phase 1, 2 & 3 – 12-months preconstruction avifaunal monitoring project
8. Noupoort Wind Energy Project – 12-months preconstruction avifaunal monitoring project
9. Vleesbaai Wind Energy Project – 12-months preconstruction avifaunal monitoring project
10. Port Nolloth Wind Energy Project – 12-months preconstruction avifaunal monitoring project
11. Langhoogte Caledon Wind Energy Project – 12-months preconstruction avifaunal monitoring project
12. Lunsklip – Stilbaai Wind Energy Project – 12-months preconstruction avifaunal monitoring project
13. Indwe Wind Energy Project – 12-months preconstruction avifaunal monitoring project
14. Zeeland St Helena bay Wind Energy Project – 12-months preconstruction avifaunal monitoring project
15. Wolseley Wind Energy Project – 12-months preconstruction avifaunal monitoring project
16. Renosterberg Wind Energy Project – 12-months preconstruction avifaunal monitoring project
17. De Aar – North (Mulilo) Wind Energy Project – 12-months preconstruction avifaunal monitoring project (2014)
18. De Aar – South (Mulilo) Wind Energy Project – 12-months bird monitoring
19. Namies – Aggenys Wind Energy Project – 12-months bird monitoring

20. Pofadder - Wind Energy Project – 12-months bird monitoring
21. Dwarsrug Loeriesfontein - Wind Energy Project – 12-months bird monitoring
22. Waaihoek – Utrecht Wind Energy Project – 12-months bird monitoring
23. Amathole – Butterworth Utrecht Wind Energy Project – 12-months bird monitoring & EIA specialist study
24. De Aar and Droogfontein Solar PV Pre- and Post-construction avifaunal monitoring
25. Makambako Wind Energy Facility (Tanzania) 12-month bird monitoring & EIA specialist study (Windlab)
26. R355 Wind Energy Facility 12-month bird monitoring (Mainstream)
27. Groenekloof Wind Energy Facility 12-month bird monitoring & EIA specialist study (Mulilo)
28. Tsitsikamma Wind Energy Facility 24-months post-construction monitoring (Cennergi)
29. Noupoort Wind Energy Facility 24-months post-construction monitoring (Mainstream)
30. Kokerboom Wind Energy Facility 12-month bird monitoring & EIA specialist study (Business Venture Investments)
31. Kuruman Wind Energy Facility 12-month bird monitoring & EIA specialist study (Mulilo)
32. Mañhica Wind Energy Facility 12-month bird monitoring & EIA specialist study (Windlab)
33. Kwagga Wind Energy Facility, Beaufort West, 12-months pre-construction monitoring (ABO)
34. Pienaarspoort Wind Energy Facility, Touws River, Western Cape, 12-months pre-construction monitoring (ABO). Koup 1 and 2 Wind Energy Facilities, Beaufort West, Western Cape, 12 months pre-construction monitoring (Genesis Eco-energy)
35. Duiker Wind Energy Facility, Vredendal, Western Cape 12 months pre-construction monitoring (ABO)
36. Perdekraal East Wind Energy Facility, Touws River, Western Cape, 18 months construction phase monitoring (Mainstream).
37. Swellendam Wind Energy Facility, Western Cape, 12-month pre-construction monitoring (Veld Renewables)
38. Lombardskraal Wind Energy Facility, Western Cape, 12-month pre-construction monitoring (Enertrag SA)
39. Mainstream Damlaagte & Heuweltjies Wind Energy Facilities, Western Cape, 12-month pre-construction monitoring (Mainstream)
40. Great Karoo Wind Energy Facility, Northern Cape, 12-month pre-construction monitoring (African Green Ventures).
41. Mpumalanga & Gauteng Wind and Hybrid Energy Facilities (6x), pre-construction monitoring (Enertrag SA)
42. Dordrecht Wind Energy Facilities, Eastern Cape, Screening Report (Enertrag SA)
43. Dordrecht Wind Energy Facilities, Eastern Cape, Screening Report (ACED)
44. Nanibees North & South Wind Energy Facilities, Northern Cape, Screening Report (juwi)
45. Sutherland Wind Energy Facilities, Northern Cape, Screening Report (WKN Windcurrent)
46. Pofadder Wind Energy Facility, Northern Cape, Screening Report (Atlantic Energy)
47. Haga Haga Wind Energy Facility, Eastern Cape, Amendment Report (WKN Windcurrent)
48. Banken Wind Energy Facility, Northern Cape, Screening Report (Atlantic Energy)
49. Hartebeest Wind Energy Facility, Western Cape, 12-month pre-construction monitoring (juwi).

Bird Impact Assessment studies and / or GIS analysis:

1. Aviation Bird Hazard Assessment Study for the proposed Madiba Bay Leisure Park adjacent to Port Elizabeth Airport.
2. Extension of Runway and Provision of Parallel Taxiway at Sir Seretse Khama Airport, Botswana Bird / Wildlife Hazard Management Specialist Study
3. Maun Airport Improvements Bird / Wildlife Hazard Management Specialist Study
4. Bird Impact Assessment Study - Bird Helicopter Interaction – The Bitou River, Western Cape Province South Africa
5. Proposed La Mercy Airport – Bird Aircraft interaction specialists study using bird detection radar to assess swallow flocking behaviour
6. KwaZulu Natal Power Line Vulture Mitigation Project – GIS analysis

7. Perseus-Zeus Powerline EIA – GIS Analysis
8. Southern Region Pro-active GIS Blue Crane Collision Project.
9. Specialist advisor ~ Implementation of a bird detection radar system and development of an airport wildlife hazard management and operational environmental management plan for the King Shaka International Airport
10. Matsapha International Airport – bird hazard assessment study with management recommendations
11. Evaluation of aviation bird strike risk at candidate solid waste disposal sites in the Ekurhuleni Metropolitan Municipality
12. Gateway Airport Authority Limited – Gateway International Airport, Polokwane: Bird hazard assessment; Compile a bird hazard management plan for the airport
13. Bird Specialist Study - Evaluation of aviation bird strike risk at the Mwakirunge Landfill site near Mombasa Kenya
14. Bird Impact Assessment Study - Proposed Weltevreden Open Cast Coal Mine Belfast, Mpumalanga
15. Avian biodiversity assessment for the Mafube Colliery Coal mine near Middelburg Mpumalanga
16. Avifaunal Specialist Study - SRVM Volspruit Mining project – Mokopane Limpopo Province
17. Avifaunal Impact Assessment Study (with specific reference to African Grass Owls and other Red List species) Stone Rivers Arch
18. Airport bird and wildlife hazard management plan and training to Swaziland Civil Aviation Authority (SWACAA) for Matsapha and Sikhupe International Airports
19. Avifaunal Impact Scoping & EIA Study - Renosterberg Wind Farm and Solar PV site
20. Bird Impact Assessment Study - Proposed 60 year Ash Disposal Facility near to the Kusile Power Station
21. Avifaunal pre-feasibility assessment for the proposed Montrose dam, Mpumalanga
22. Bird Impact Assessment Study – Proposed ESKOM Phantom Substation near Knysna, Western Cape
23. Habitat sensitivity map for Denham's Bustard, Blue Crane and White-bellied Korhaan in the Kouga Municipal area of the Eastern Cape Province
24. Swaziland Civil Aviation Authority – Sikhuphe International Airport – Bird hazard management assessment
25. Avifaunal monitoring – extension of Specialist Study - SRVM Volspruit Mining project – Mokopane Limpopo Province
26. Avifaunal Specialist Study – Rooikat Hydro Electric Dam – Hope Town, Northern Cape
27. The Stewards Pan Reclamation Project – Bird Impact Assessment study
28. Airports Company South Africa – Avifaunal Specialist Consultant – Airport Bird and Wildlife Hazard Mitigation

Geographic Information System analysis & maps

1. ESKOM Power line Makgalakwena EIA – GIS specialist & map production
2. ESKOM Power line Benficosa EIA – GIS specialist & map production
3. ESKOM Power line Riversong EIA – GIS specialist & map production
4. ESKOM Power line Waterberg NDP EIA – GIS specialist & map production
5. ESKOM Power line Bulge Toulon EIA – GIS specialist & map production
6. ESKOM Power line Bulge DORSET EIA – GIS specialist & map production
7. ESKOM Power lines Marblehall EIA – GIS specialist & map production
8. ESKOM Power line Grootpan Lesedi EIA – GIS specialist & map production
9. ESKOM Power line Tanga EIA – GIS specialist & map production
10. ESKOM Power line Bokmakierie EIA – GIS specialist & map production
11. ESKOM Power line Rietfontein EIA – GIS specialist & map production
12. Power line Anglo Coal EIA – GIS specialist & map production
13. ESKOM Power line Camcoll Jericho EIA – GIS specialist & map production
14. Hartbeespoort Residential Development – GIS specialist & map production
15. ESKOM Power line Mantsole EIA – GIS specialist & map production
16. ESKOM Power line Nokeng Flourspar EIA – GIS specialist & map production
17. ESKOM Power line Greenview EIA – GIS specialist & map production

18. Derdepoort Residential Development – GIS specialist & map production
19. ESKOM Power line Boynton EIA – GIS specialist & map production
20. ESKOM Power line United EIA – GIS specialist & map production
21. ESKOM Power line Gutshwa & Malelane EIA – GIS specialist & map production
22. ESKOM Power line Ohrigstad EIA – GIS specialist & map production
23. Zilkaatsnek Development Public Participation –map production
24. Belfast – Paarde Power line - GIS specialist & map production
25. Solar Park Solar Park Integration Project Bird Impact Assessment Study – avifaunal GIS analysis.
26. Kappa-Omega-Aurora 765kV Bird Impact Assessment Report – Avifaunal GIS analysis.
27. Gamma – Kappa 2nd 765kV – Bird Impact Assessment Report – Avifaunal GIS analysis.
28. ESKOM Power line Kudu-Dorstfontein Amendment EIA – GIS specialist & map production.
29. Proposed Heilbron filling station EIA – GIS specialist & map production
30. ESKOM Lebatlhane EIA – GIS specialist & map production
31. ESKOM Pienaars River CNC EIA – GIS specialist & map production
32. ESKOM Lemara Phiring Ohrigstad EIA – GIS specialist & map production
33. ESKOM Pelly-Warmbad EIA – GIS specialist & map production
34. ESKOM Rosco-Bracken EIA – GIS specialist & map production
35. ESKOM Ermelo-Uitkoms EIA – GIS specialist & map production
36. ESKOM Wisani bridge EIA – GIS specialist & map production
37. City of Tshwane – New bulkfeeder pipeline projects x3 Map production
38. ESKOM Lebohang Substation and 132kV Distribution Power Line Project Amendment GIS specialist & map production
39. ESKOM Geluk Rural Powerline GIS & Mapping
40. Eskom Kimberley Strengthening Phase 4 Project GIS & Mapping
41. ESKOM Kwaggafontein - Amandla Amendment Project GIS & Mapping
42. ESKOM Lephalale CNC – GIS Specialist & Mapping
43. ESKOM Marken CNC – GIS Specialist & Mapping
44. ESKOM Lethabong substation and powerlines – GIS Specialist & Mapping
45. ESKOM Magopela- Pitsong 132kV line and new substation – GIS Specialist & Mapping

Professional registrations and industrial affiliations

South African Council for Natural Scientific Professions (SACNASP) registered Professional Natural Scientist (reg. nr 400177/09) – specialist field: Zoological Science. Registered since 2009.

- **Member** of the Zoological Society of Southern Africa (ZSSA)

Curriculum Vitae: Megan Loftie-Eaton

Profession/Specialization	:	Avifaunal Specialist
Highest Qualification	:	PhD Biological Sciences
Nationality	:	South African
Years of Experience	:	10 years

Key Qualifications

Megan Loftie-Eaton **(**Pr.Sci.Nat) holds a PhD in Biological sciences from the Avian Demography Unit, University of Cape Town, and has more than 10 years' experience conducting bird research, atlasing, mapping and environmental assessment consulting. Megan was an assistant researcher on the African Penguin EarthWatch Research Team, conducting population surveys on penguins and other seabirds, sustainable agriculture research, biodiversity surveys and ecological monitoring. She has acted as coordinator, Social media manager and communications officer for various programmes including The Biodiversity and Development Institute (OdonataMAP, Citizen Science Projects), LepiMAP, BirdMAP, ADU and Hoedspruit Hub. She is on the Expert Panel for a virtual museum covering several vertebrate taxa. Megan is also very active with the bird atlasing project; she presented and assessed several atlasing workshops in Africa and Europe. She facilitated an assessed Ecology courses and provided training materials for it. She has been involved in Environmental and specifically Avian assessments since 2020 by conducting fieldwork, completing assessments and acting as an environmental assessment practitioner. She has several additional qualifications, including a FGASA Level 1 Nature guide qualification, a First aid level one qualification, snake and scorpion training courses and a course in humane trapping methods. She completed online global environmental management course, and a NQF level 5 outcomes-based assessment course. Megan is an author or co-author on several scientific papers and currently she operates as an Avifaunal specialist working with AfriAvian Environmental.

Key Project Experience

Renewable Energy Facilities – avifaunal monitoring projects in association with AfriAvian Environmental

1. Philipstown Kudu Solar Energy Facilities and associated infrastructure
2. Umsobomvu Solar Energy Facilities and associated infrastructure
3. Ezelsjacht Wind Energy Facility and associated infrastructure
4. Heuweltjies en Kraaltjies Wind Energy Facilities and associated infrastructure
5. Mercury Solar Energy Facilities and associated infrastructure
6. Perdekraal East Wind Energy Facility and associated infrastructure
7. Skilpad Solar Energy Facility and associated infrastructure
8. Oryx Wind Energy Facility and associated infrastructure
9. Sunveld Solar Energy Facility and associated infrastructure

Other Avifaunal Projects

1. Blue Stone Quarry Wall Restoration, Robben Island, Western Cape, South Africa – Avifaunal Impact Assessment

Professional registrations and industrial affiliations

- **Professional Natural Scientist in Ecology (Member #135161)** registered with the South African Council for Natural Scientific Professions (SACNASP)
- **Environmental Assessment Practitioner (Number 2021/3690)** registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA)
- **Member** of the Zoological Society of Southern Africa (ZSSA)

forestry, fisheries
& the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE

BIRD IMPACT ASSESSMENT REPORT
Proposed Eskom Single Circuit (132kV) Overhead Line (OHL) from Ceres Substation to Witzenberg Substation and construction of the proposed Prince Alfred Hamlet substation

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the 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 act, when applying for environmental authorisation - GN 320/2020)*', where applicable.

1. SPECIALIST INFORMATION

Title of Specialist Assessment	Avifaunal Assessment
Specialist Company Name	AfriAvian Environmental
Specialist Name	Albert Froneman
Specialist Identity Number	730815 5080 081
Specialist Qualifications:	M.Sc. Conservation Biology
Professional affiliation/registration:	SACNASP – Zoological Science 400177/09
Physical address:	28 San Henrique 2 Rosewood Rd Broadacres 2055
Postal address:	Box 2676 Fourways 2055
Postal address	Box 2676 Fourways 2055
Telephone	082 901 4016
Cell phone	082 901 4016
E-mail	albert.froneman@gmail.com

2. DECLARATION BY THE SPECIALIST

I, Albert Froneman declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements 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 (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing –
    - any decision to be taken with respect to the application by the competent authority; and;
    - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the NEMA Act.

Signature of the Specialist

AfriAvian Environmental

Name of Company:

06 Mar 2024

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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

Signature of the Specialist

AfriAvian Environmental

Name of Company

06 Mar 2024

Date

Signature of the Commissioner of Oaths

2024 -03- 07

Date