



**AVIFAUNA IMPACT ASSESSMENT FOR THE
PROPOSED NTCSA ARIES-PAULPUTS-
KOKERBOOM 400KV LILO AND SUBSTATION
UPGRADE**

**ZF Mgcawu and Namakwa District Municipalities,
Northern Cape Province, South Africa**

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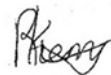

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| Declaration | <p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests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

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1 Introduction

1.1 Background

The Biodiversity Company was appointed by EIMS to conduct an avifaunal assessment for the proposed Aries-Paulputs-Kokerboom 400kv loop-in-loop-out powerline and Paulputs Substation upgrade. The corridor measures approximately 50 km, with a 2 km buffer width on either side of the line, with the objective of the proposed project is to secure supply of electricity in order to cater for proposed developments in the area. The planned transmission line will cover roughly 50 km, passing through a mix of private farms and state-owned lands within the ZF Mgcawu and Namakwa District Municipalities, Northern Cape Province. The proposed powerline runs from the existing Aries-Kokerboom powerline to the Paulputs substation around 31 km northeast of Pofadder (Figure 1-1). The boundaries of the assessment area (1km powerline corridor) – as provided for by the client – with an additional 1 km buffer are referred to as the Project Area of Influence (PAOI) for reporting purposes.

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

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

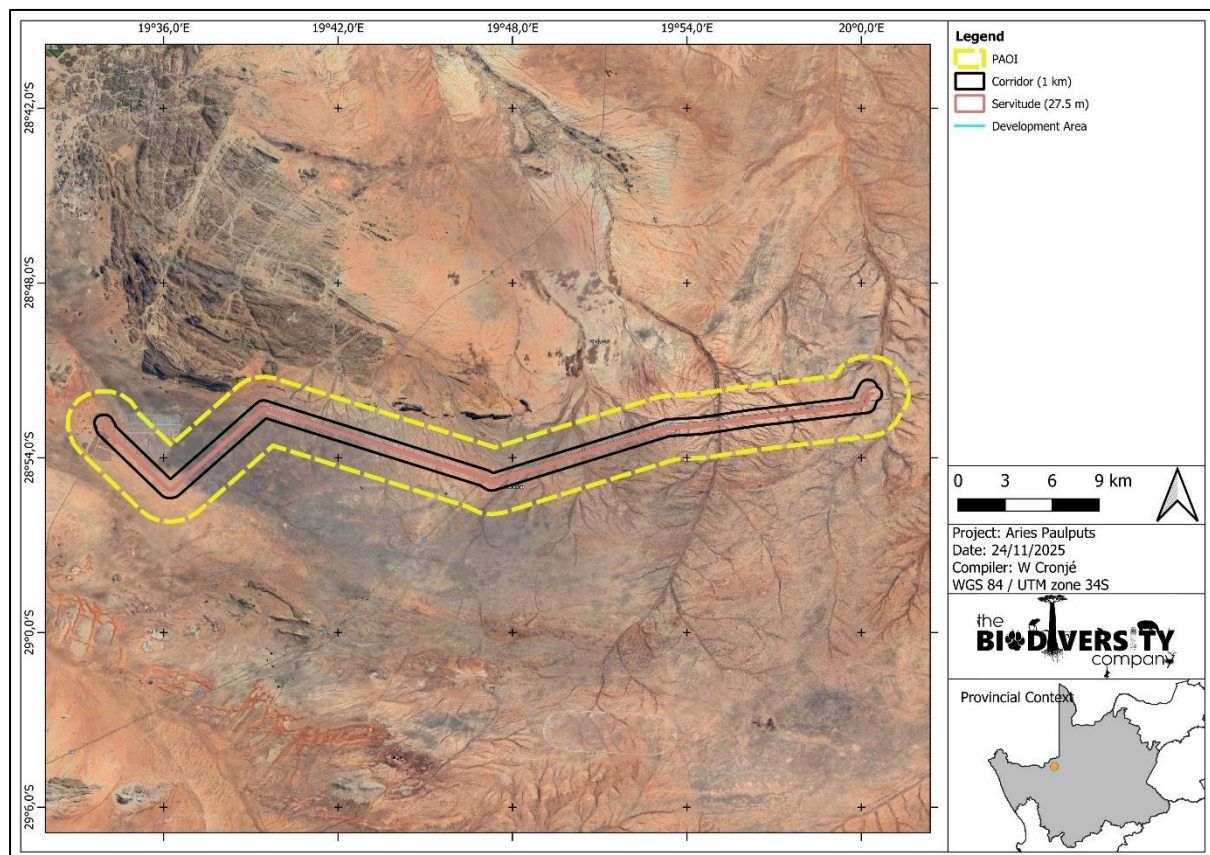


Figure 1-1 Proposed location of the PAOI

1.2 Project Details

According to the Scope of work (provided by EIMS), the project is part of the group of projects identified for the Northern Cape network strengthening requirements in meeting the IRP 2019 renewables generation integration. The installed generation capacity in the Northern Cape already exceeds the peak load in the province. Generation capacity is expected to increase in the province as a result of bulk renewable energy generation capacity allocation due to favourable sun and wind conditions. Therefore, significant network infrastructure is required to enable the integration and evacuation of power from the renewable energy plants anticipated in the province.

To provide future reliability and flexibility in the evacuation of renewable power from Paulputs Substation, an additional 400 kV infeed is proposed via a loop in loop out from the Aries – Kokerboom 400 kV line which is approximately 45 km away. Although there is uncertainty regarding the phasing of IPP integration at the various substations in the province, it is crucial that all project development activities are prioritised and advanced to a stage of execution readiness to ensure timeous integration of the expected renewable generation.

The following is the scope of work as provided by EIMS:

- Loop in loop out the Aries – Kokerboom 400 kV line into Paulputs (~2 x 40 km);
- Establish/Equip 2 x 400 kV feeder bays at Paulputs Substation;
- Install a 100 MVA busbar reactor at Paulputs Substation
- Paulputs-Konkoonsies 33 kV OHL Deviation
- Build new MV OHL with new switchgear and equipment
- -± 1 km of new MV OHL (±800m of 33 kV OHL & ±200m of 19 kV SWER OHL)
- -New 33 kV Recloser
- -New 33 kV CT/VT metering unit
- -New 33/19 kV SWER Transformer
- New SWER 19 kV Single Phase Recloser
- -Disconnect, Decommission & Dismantle old equipment (the existing 33kV and associated infrastructure)

The proposed layout is presented in Figure 1-2 below.

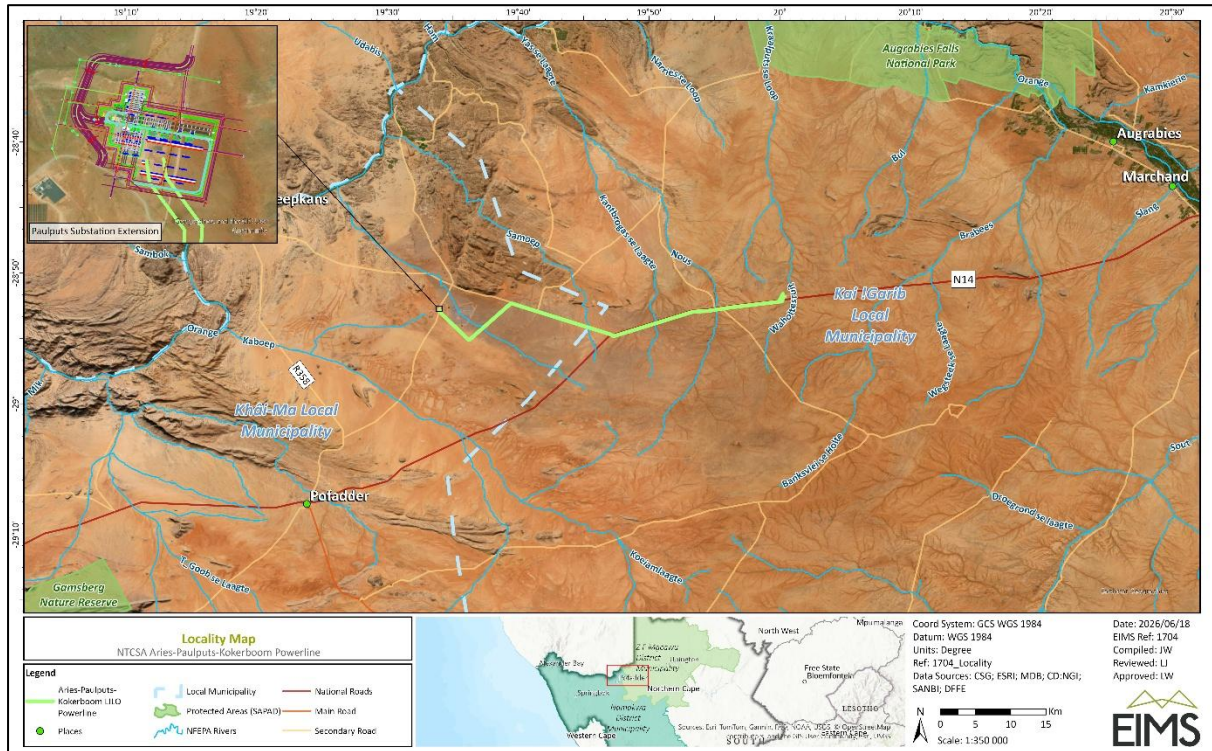


Figure 1-2 *Proposed layout for the Aries-Paulputs-Kokerboom 400 kV LILO project (provided by EIMS, 2025)*

1.3 Scope of Work

The assessment was achieved according to the above-mentioned legislation and the best-practice guidelines and principles for Avifaunal Impact Assessments as outlined by BirdLife South Africa (2017).

The scope of the Avifaunal Impact Assessment included the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the PAOI and the surrounding landscape;
- Desktop assessment to compile an expected species list and possible avifauna Species of Conservation Concern (SCC) that potentially occur within the PAOI;
- Delineate site sensitivity or sensitivities i.e., the Site Ecological Importance (SEI) within the context of the avifauna species assemblage of the PAOI;
- Identify the manner that which the proposed development impacts the avifauna community and evaluate the level of risk of these potential impacts;
- This assessment included a site-specific tower-to-tower walkdown as part of the field work approach; and
- Provide mitigation measures to prevent or reduce the possible impacts.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable to this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- Whilst every effort was made to cover as much of the PAOI as possible it is possible that some species that are present within the PAOI were not recorded during the field investigations due to their secretive behaviour;
- The GPS used in the assessment has an accuracy of 5 m and, consequently, any spatial features delineated may be offset by up to 5 m.

1.5 Key Legislative Requirements

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

Table 1-1 A list of key legislative requirements

| Region | Legislation / Guideline | Comment |
|------------|---|--|
| National | NEMA | Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017), Appendix 6 requirements |
| | The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations | The protection of species and ecosystems that warrant protection |
| | Assessment Protocol (March 2020) | The minimum criteria for reporting. |
| | Assessment Protocol (October 2020) | Protocol for the specialist assessment and minimum report content requirements. |
| | NEMWA | The regulation of waste management to protect the environment. |
| | NWA | The regulation of water uses. |
| | GN 1003 of GG 43726 of 18 Sept 2020 | The regulation and management of alien invasive species. |
| Provincial | Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA) | To provide for control over the utilisation of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants. |
| | Northern Cape Nature Conservation act no. 9 of 2009 | To provide for the management and conservation of the Province's biophysical environment and protected areas (both acts). |
| | Northern Cape Planning and Development Act no. 7 of 1998 | |

2 Fieldwork

2.1 Avifauna Field Assessment

The assessment was undertaken from 4-6 November 2025.

Point Counts

Standardized point counts (Buckland et al., 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilized as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was conducted over a 10-minute period. The horizontal detection limit was set at 150 meters. At each point, the observer would document the date, start time, end time, habitat, numbers of each species, detection method (seen or heard), behavior (perched or flying), and general notes on habitat and nesting suitability for conservation-important species.

Water Resource Assessments

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

Nest Survey

Possible nesting sites such as power lines, stands of trees, marshes and drainage lines, cliffs, and gravel areas were surveyed for nests. All breeding sites were mapped, and the activity at the nests was assessed during all the surveys.

Incidental Observations

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

Figure 2-1 and Figure 2-2 shows the point count locations and walkdown tracks respectively, which were conducted along the proposed development area.

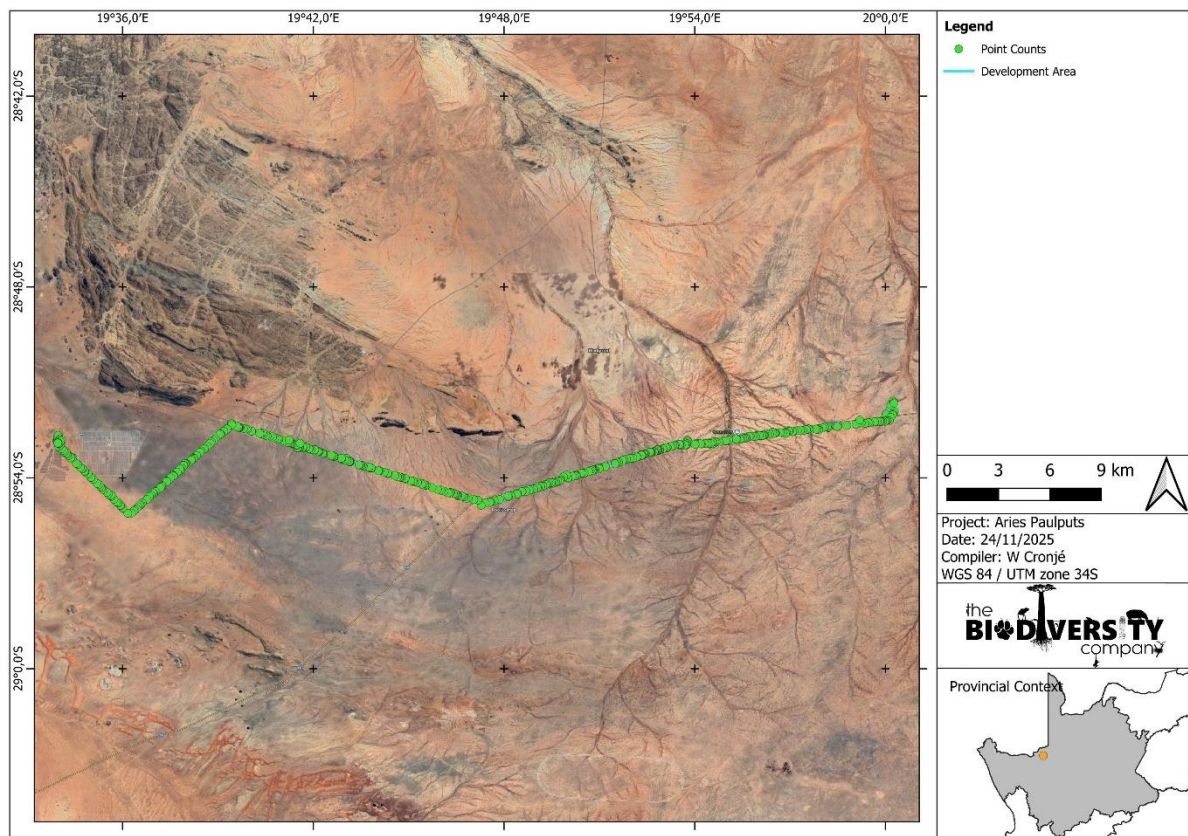


Figure 2-1 Map illustrating the point count locations in the context of the development area

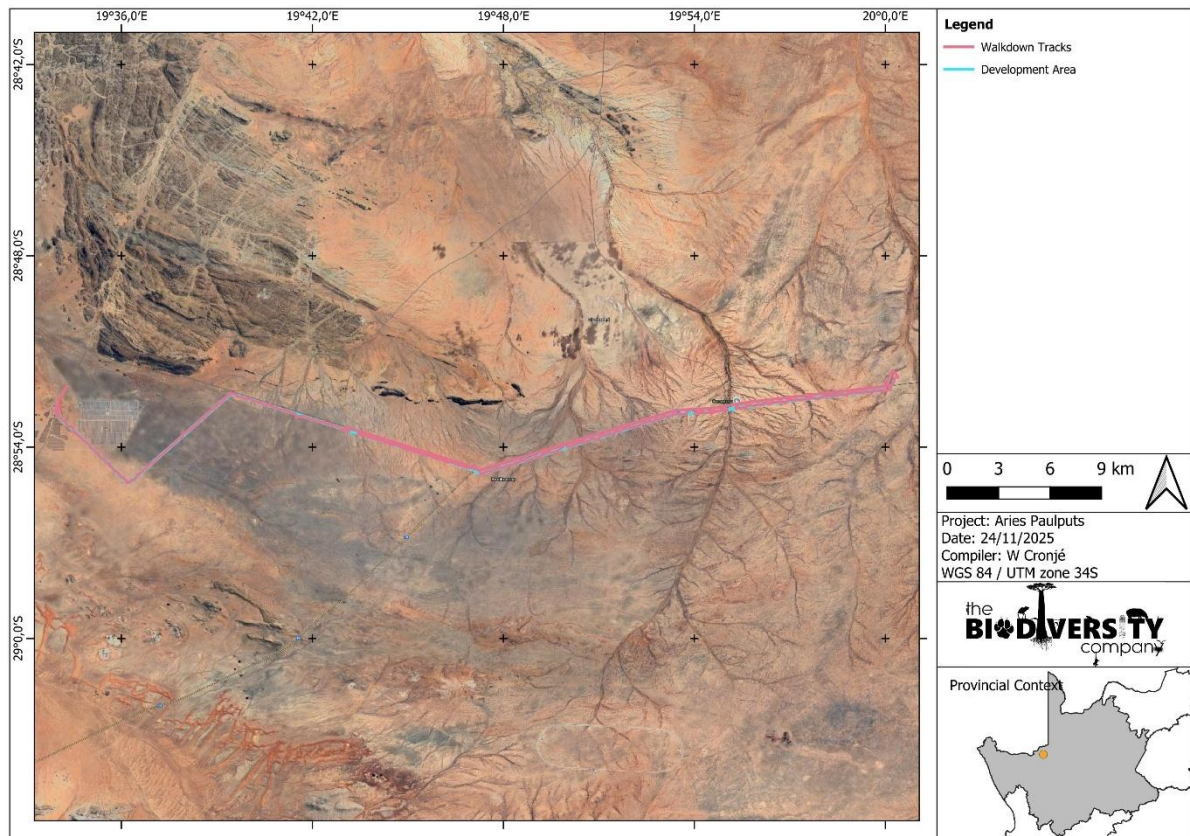


Figure 2-2 Map illustrating the walkdown tracks in the context of the development area

3 Results & Discussion

3.1 Ecologically Important Landscape Features

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

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

| Desktop Information Considered | Relevant/Irrelevant | Section |
|---|---|---------|
| Ecosystem Threat Status | Relevant – Overlaps with “Least Concerned” Ecosystems (RLE, 2021). | 3.1.1 |
| Ecosystem Protection Level | Relevant – The PAOI overlaps with a PP ecosystem | 3.1.2 |
| Provincial Conservation Plan | Relevant – According to the Northern Cape Conservation Plan the PAOI falls across an area classified as CBA1, CBA2 and ESA. | 3.1.3 |
| SAPAD & SACAD | Irrelevant – the PAOI does not overlap with any protected or conservation areas | 3.1.4 |
| National Protected Areas Expansion Strategy | Relevant – The PAOI overlaps with priority focus areas | 3.1.5 |
| Key Biodiversity Areas | Relevant – the PAOI overlaps with the Aggenys – Pella - Pofadder KBA | 3.1.6 |
| South African Inventory of Inland Aquatic Ecosystems (SAIIAE) | Relevant – The PAOI overlaps with CR wetlands and EN and LC rivers | 3.1.7 |
| National Freshwater Priority Area | Relevant – the PAOI overlaps with a non-priority wetland, as well as NFEPA Class B and C rivers | 3.1.8 |
| Strategic Transmission Corridors (EGI) | Relevant – the PAOI overlaps with northern corridor. | 3.1.9 |
| Coordinated Water Bird Count | Irrelevant – no CWAC site is found within 15 km of the PAOI | 3.2.1 |
| Coordinated Avifaunal Road Count | Irrelevant – no CAR route is found within 15 km of the PAOI. | 3.2.2 |

3.1.1 Red List of Ecosystems

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

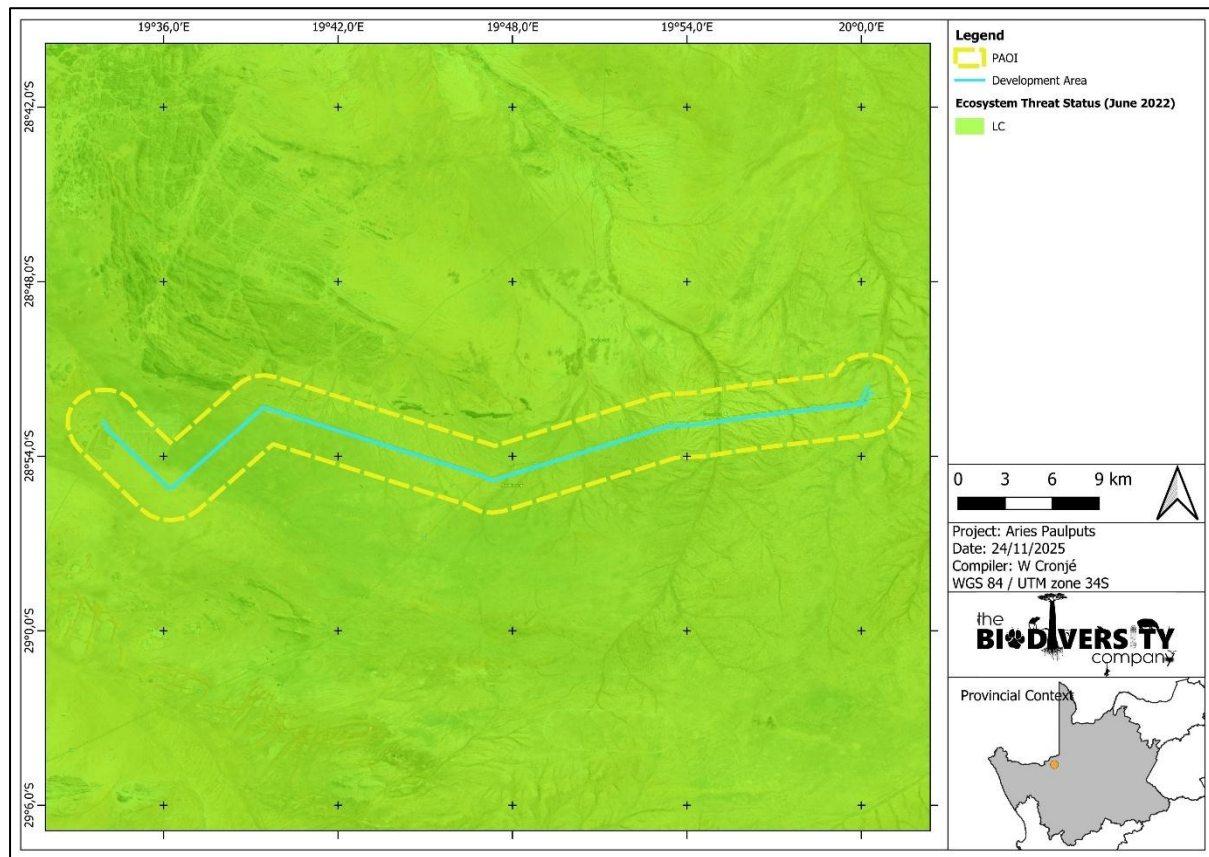


Figure 3-1 Map illustrating the ecosystem threat status associated with the PAOI

3.1.2 Ecosystem Protection Level

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

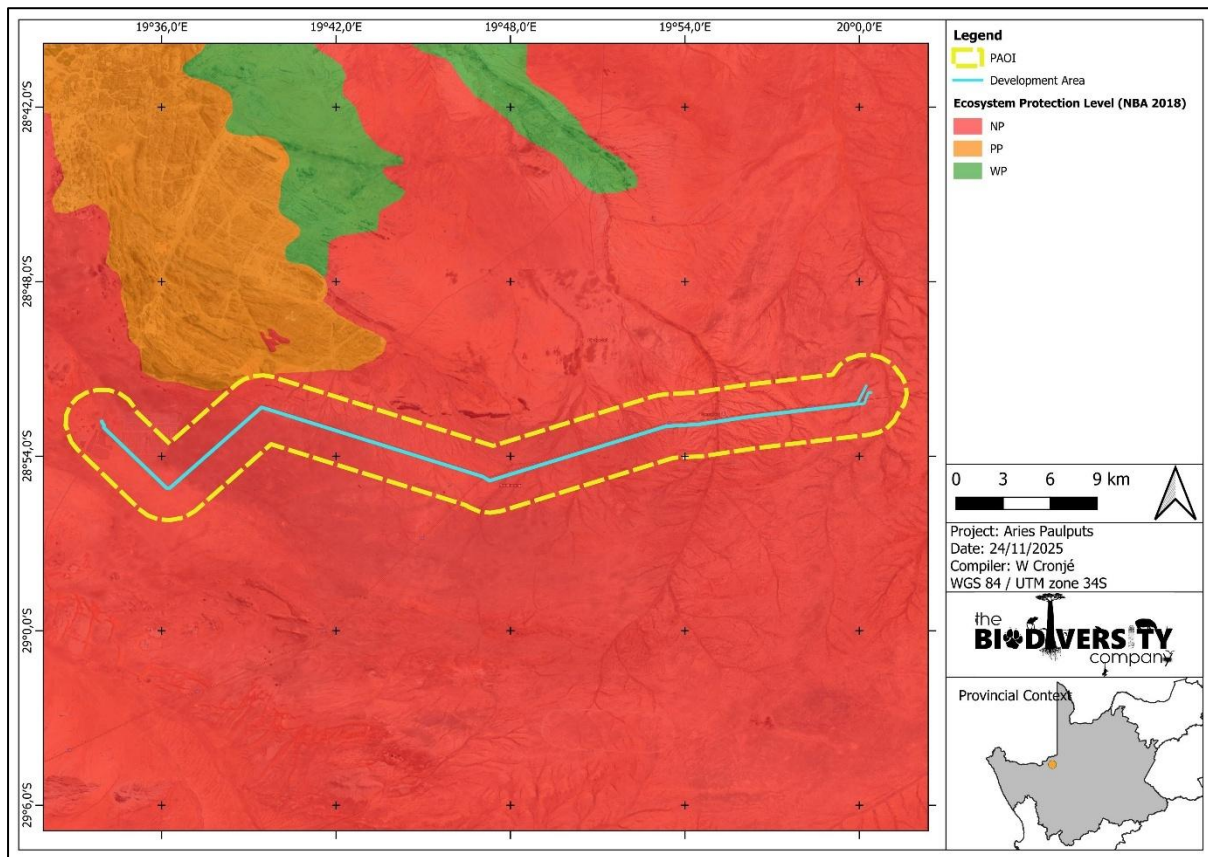


Figure 3-2 Map illustrating the Ecosystem Protection Level associated with the PAOI

3.1.3 Critical Biodiversity Areas and Ecological Support Areas

The Northern Cape Department of Environment and Nature Conservation has developed the Northern Cape CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

The identification of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated.

According to the Conservation Plan the PAOI and development area fall across an area classified as CBA1, CBA2 and ESA (Figure 3-3)

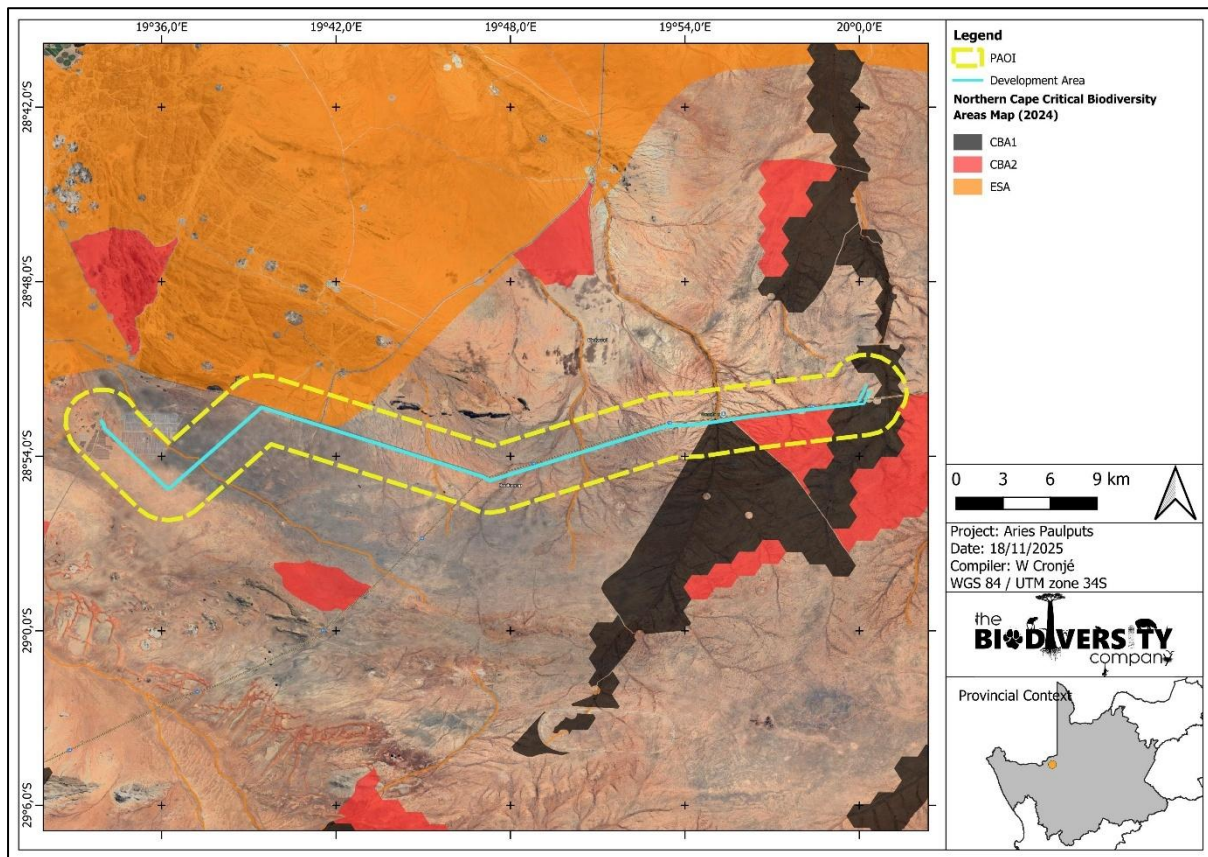


Figure 3-3 Map illustrating the biodiversity spatial plan in relation to the PAOI

3.1.4 Protected Areas

The Department of Environmental Affairs (DFE) maintains a spatial database on Protected Areas and Conservation Areas. The Protected Areas and Conservation Areas (PACA) Database scheme is used for classifying protected areas (South Africa Protected Areas Database-SAPAD) and conservation areas (South Africa Conservation Areas Database-SACAD) into types and sub-types in South Africa.

The definition of protected areas used in these documents follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the “System of Protected Areas”, which consists of the following kinds of protected areas:

- Special nature reserves:
- National parks:
- Nature reserves and
- Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003);
- World heritage sites declared in terms of the World Heritage Convention Act;
- Marine protected areas declared in terms of the Marine Living Resources Act;
- Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and
- Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

The types of conservation areas that are currently included in the database are the following:

- Biosphere reserves;
- Ramsar sites;
- Stewardship agreements (other than nature reserves and protected environments);
- Botanical gardens;
- Transfrontier conservation areas;
- Transfrontier parks;
- Military conservation areas; and
- Conservancies.

Figure 3-4 shows that the PAOI and development area does not overlap with any protected areas.

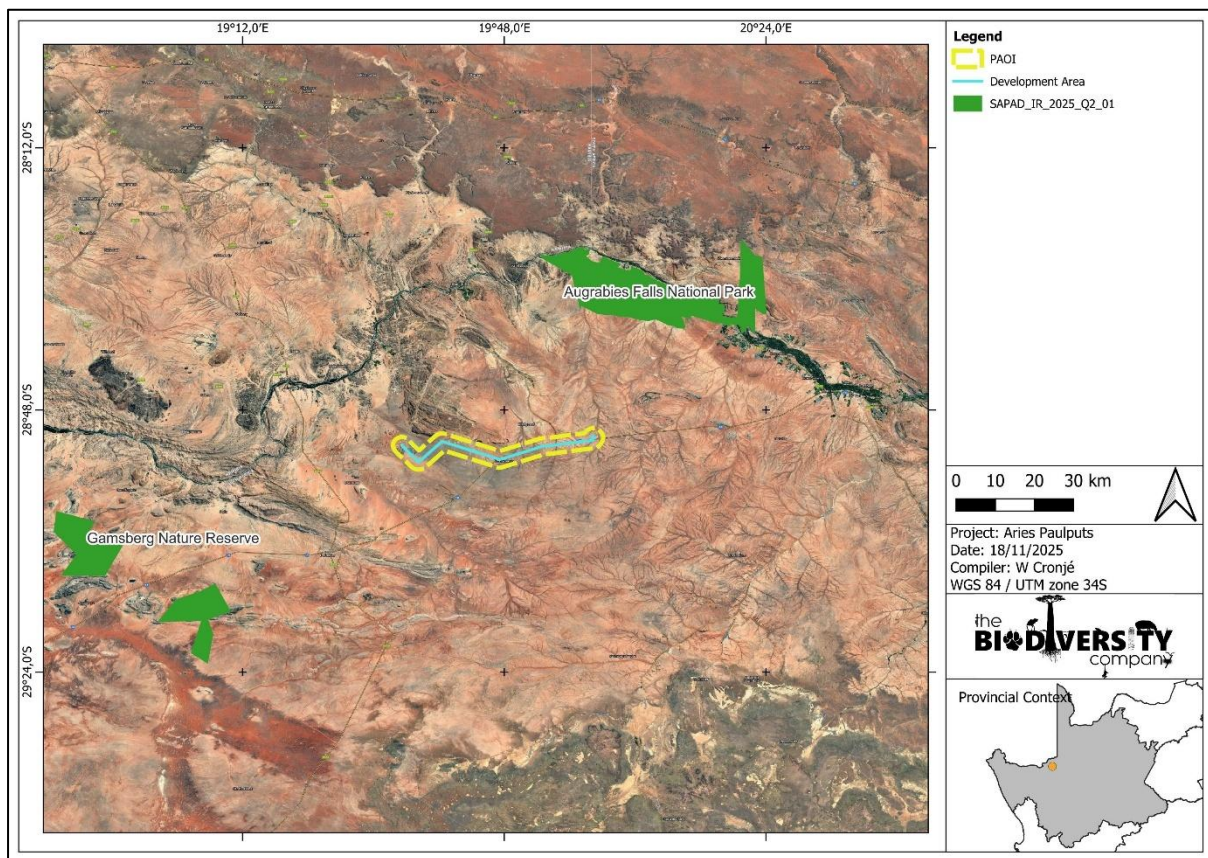


Figure 3-4 The PAOI in relation to the SACAD and SAPAD areas.

3.1.5 National Protected Area Expansion Strategy

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

The PAOI overlaps with priority focus areas (Figure 3-5)

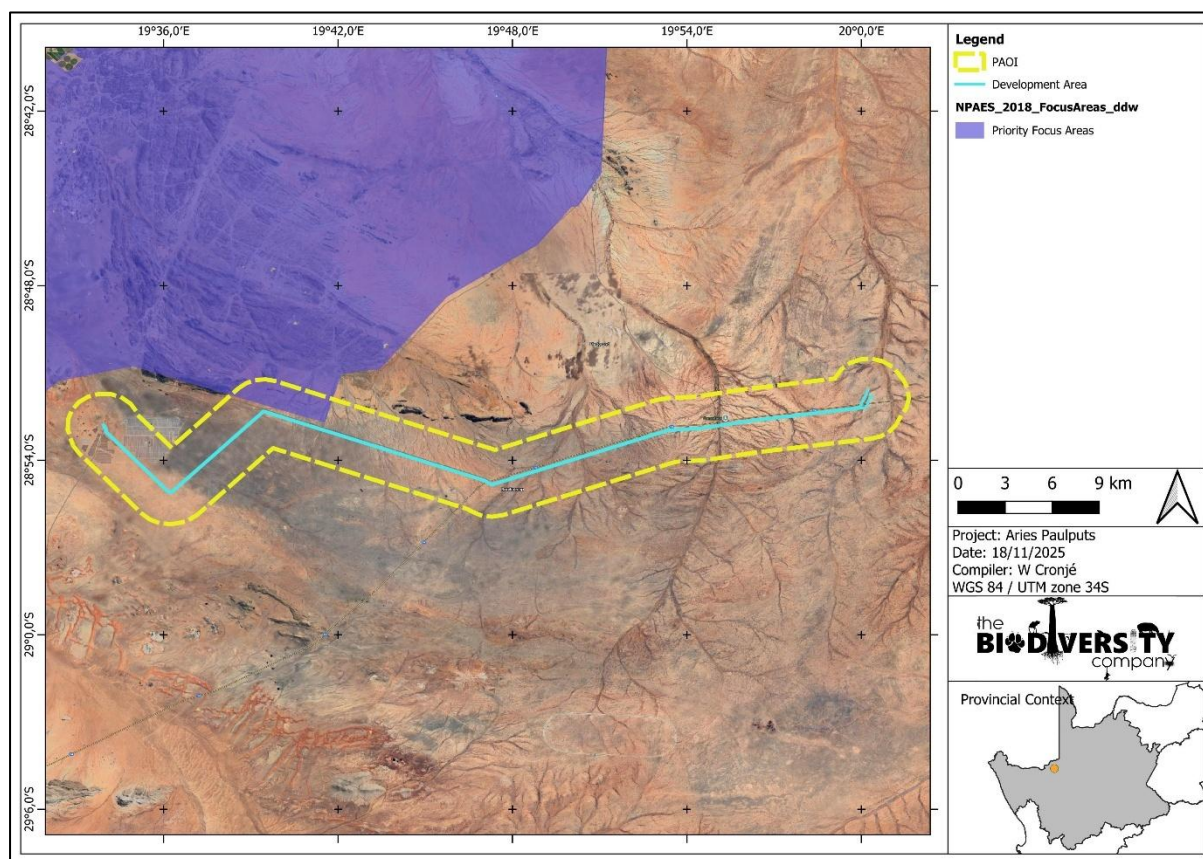


Figure 3-5 The PAOI in relation to the National Protected Area Expansion Strategy

3.1.6 Key Biodiversity Area

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

Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024).

Figure 3-6 shows that the PAOI overlaps with the Aggeneys – Pella – Pofadder KBA.

Table 3-2 Avian species that trigger the KBA

| Taxonomic Group | Scientific Name | Common Name | IUCN category | Year | KBA criteria |
|-----------------|---------------------------|-----------------|---------------|------|--------------|
| Aves | <i>Calendulauda burra</i> | Red Lark | VU | 2024 | A1b, B3b |
| Aves | <i>Eremomela gregalis</i> | Karoo Eremomela | LC | 2024 | B3b |

| | | | | | |
|-------------|--------------------------------|---------------------------|----|------|-----|
| Aves | <i>Eremopterix australis</i> | Black-eared Sparrow-lark | LC | 2024 | B3b |
| Aves | <i>Spizocorys sclateri</i> | Sclater's Lark | NT | 2024 | B3b |
| Aves | <i>Euryptila subcinnamomea</i> | Cinnamon-breasted Warbler | LC | 2024 | B3b |

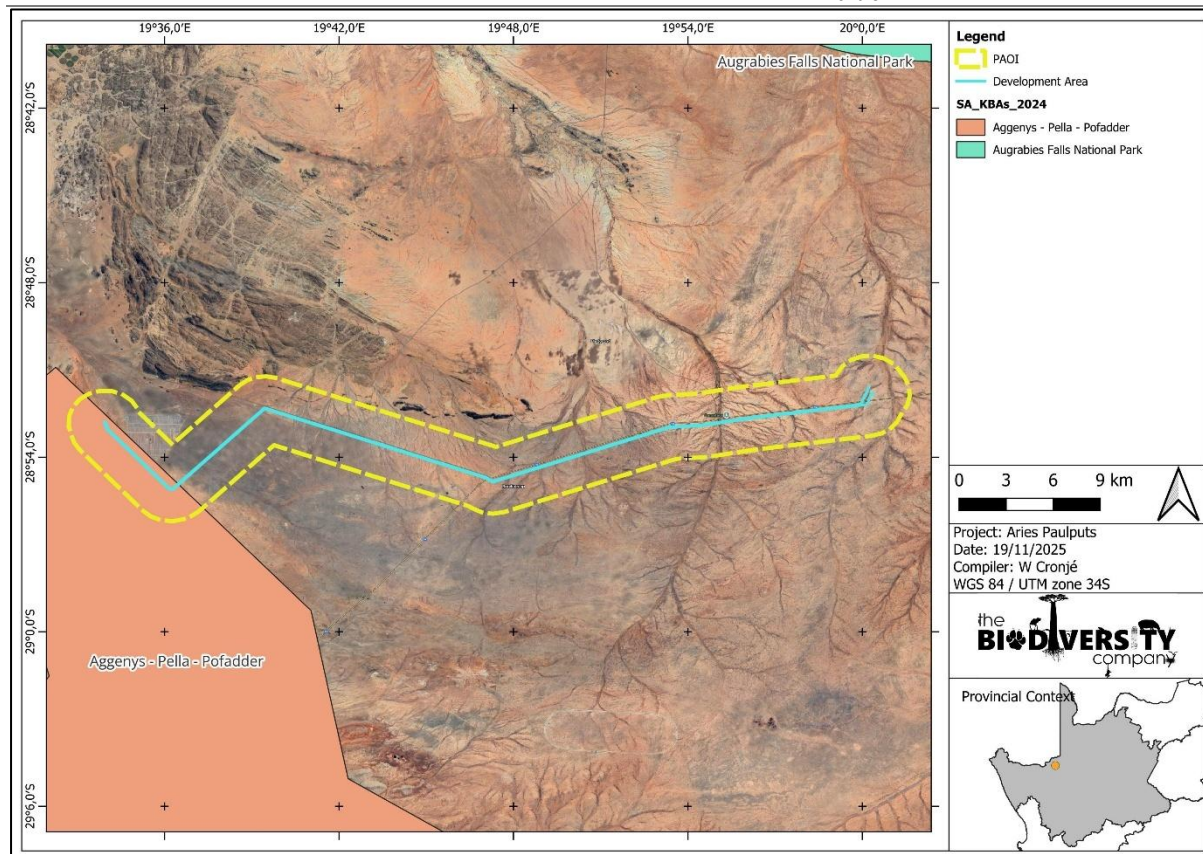


Figure 3-6 The PAOI in relation to the nearest KBAs

3.1.7 South African Inventory of Inland Aquatic Ecosystems

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

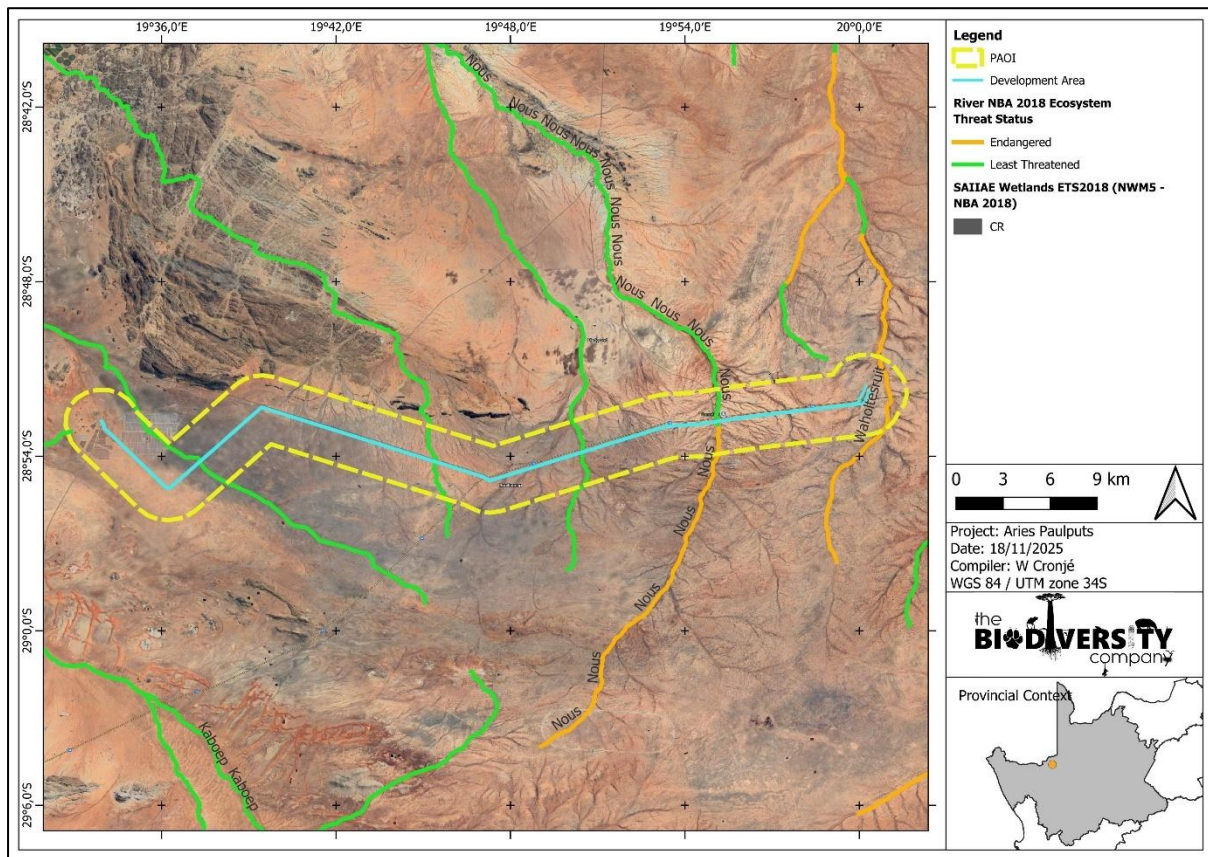


Figure 3-7 Map illustrating the ecosystem threat status of rivers and wetland ecosystems in relation to the PAOI

3.1.8 National Freshwater Ecosystem Priority Area Status

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

Figure 3-8 shows that the PAOI overlaps with a non-priority wetland, as well as largely natural and moderately modified NFEPA rivers.

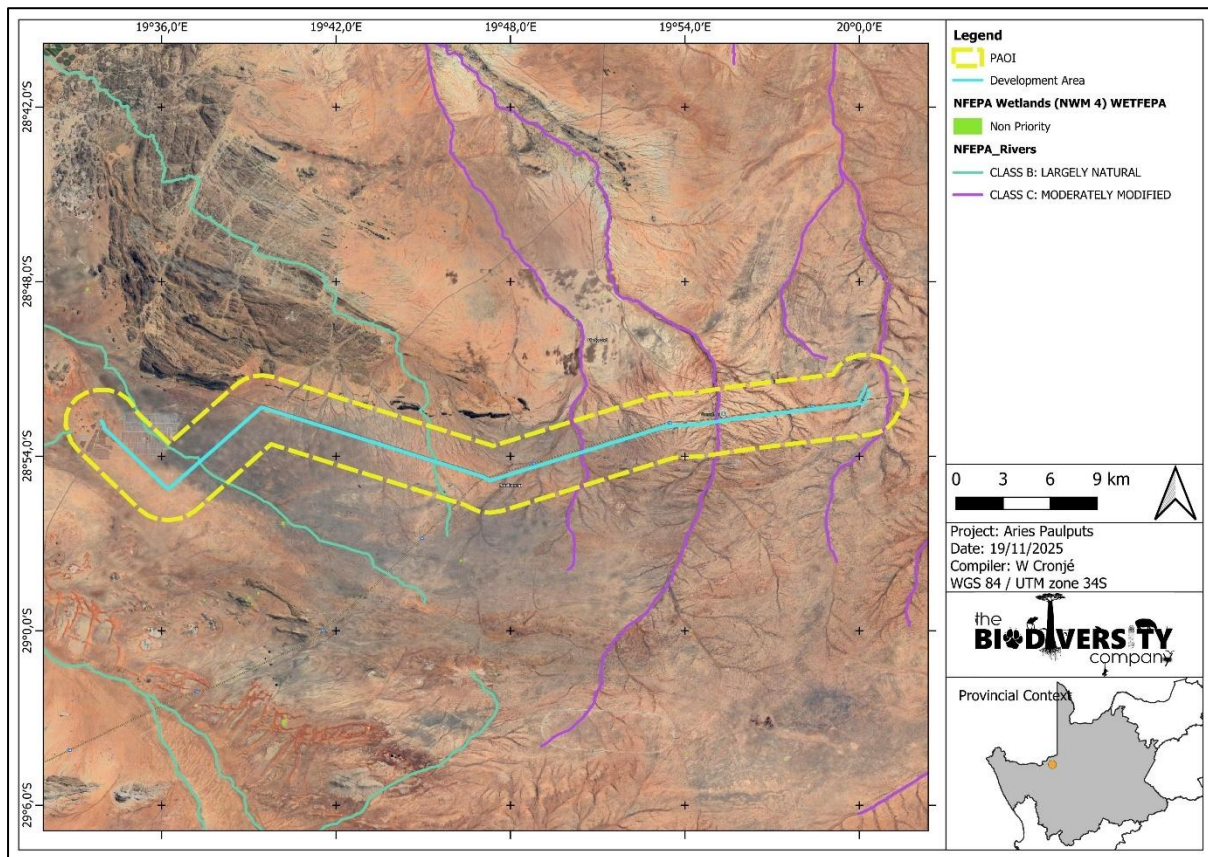


Figure 3-8 The PAOI in relation to the National Freshwater Ecosystem Priority Areas

3.1.9 Strategic Transmission Corridors (EGI)

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

On 29 April 2021, Minister Barbara Dallas Creecy published Government Notice No. 383 in Government Gazette No. 44504, which expanded the eastern and western transmission corridors and gave notice of the applicability of the application procedures identified in Government Notice No. 113, to these expanded corridors. More information on this can be obtained from <https://egis.environment.gov.za/egi>.

Figure 3-9 shows that the PAOI overlaps with the northern corridor.

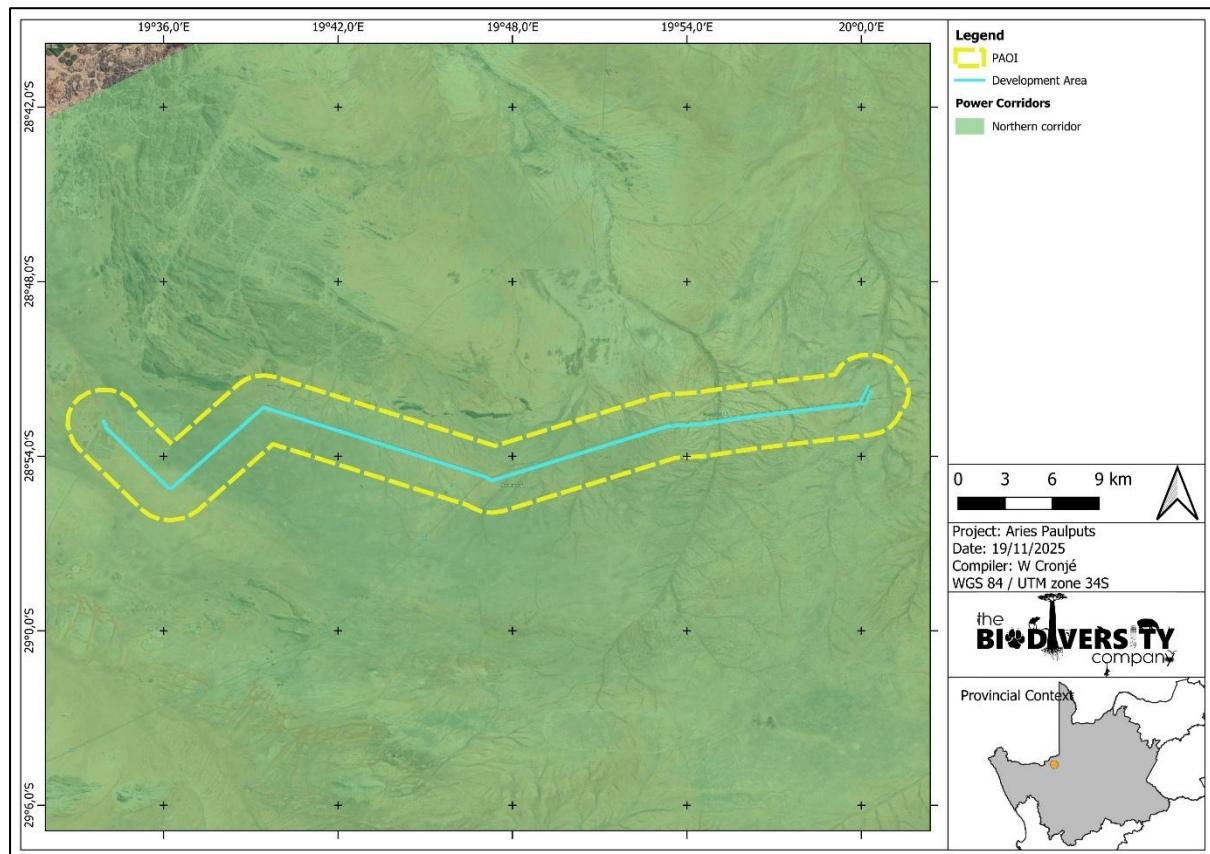


Figure 3-9 *The PAOI in relation to EGI corridors*

3.1.10 Vulture

Based on the Government Gazette no 47632, Consultation on the draft multi-species biodiversity management plan for vultures in South Africa, vulture species can be found in the area and have been known to die due to electrocution (Figure 3-10) and collisions (Figure 3-11). Based on the maps, it can be seen that the area is not a risk for vultures.

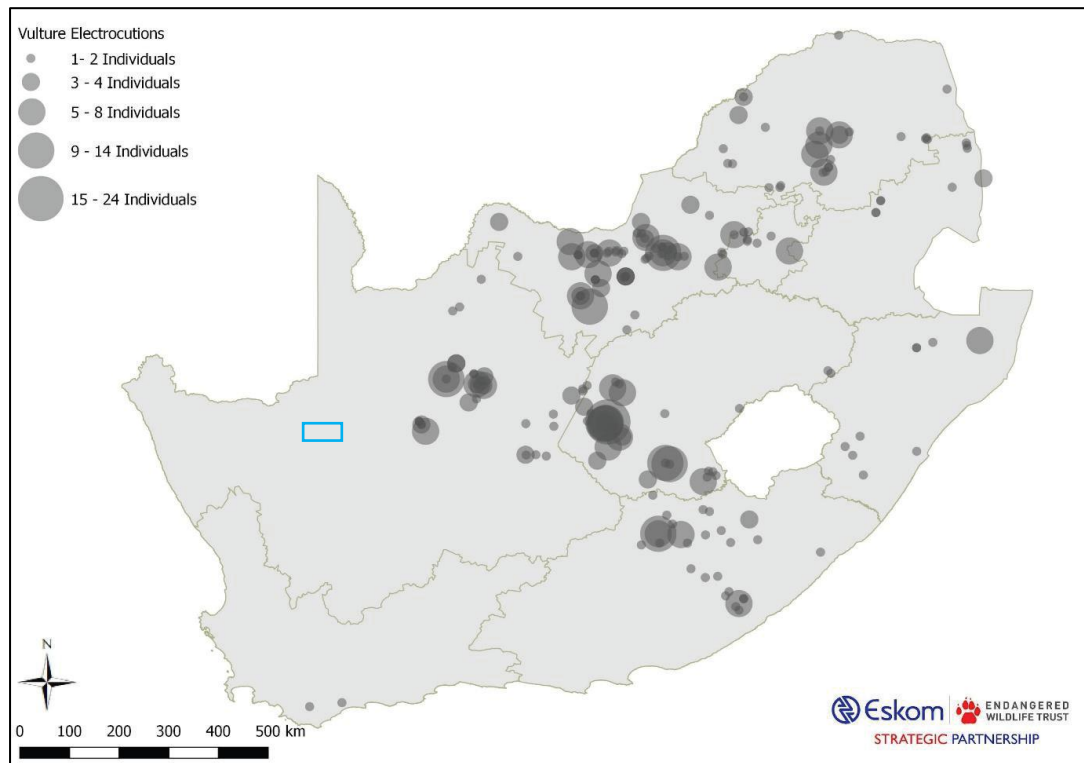


Figure 3-10 Map reflecting power line vulture electrocution incidents in South Africa (Eskom/EWT Strategic Partnership database unpublished 2020). The location and extent of the proposed powerline is indicated in blue.

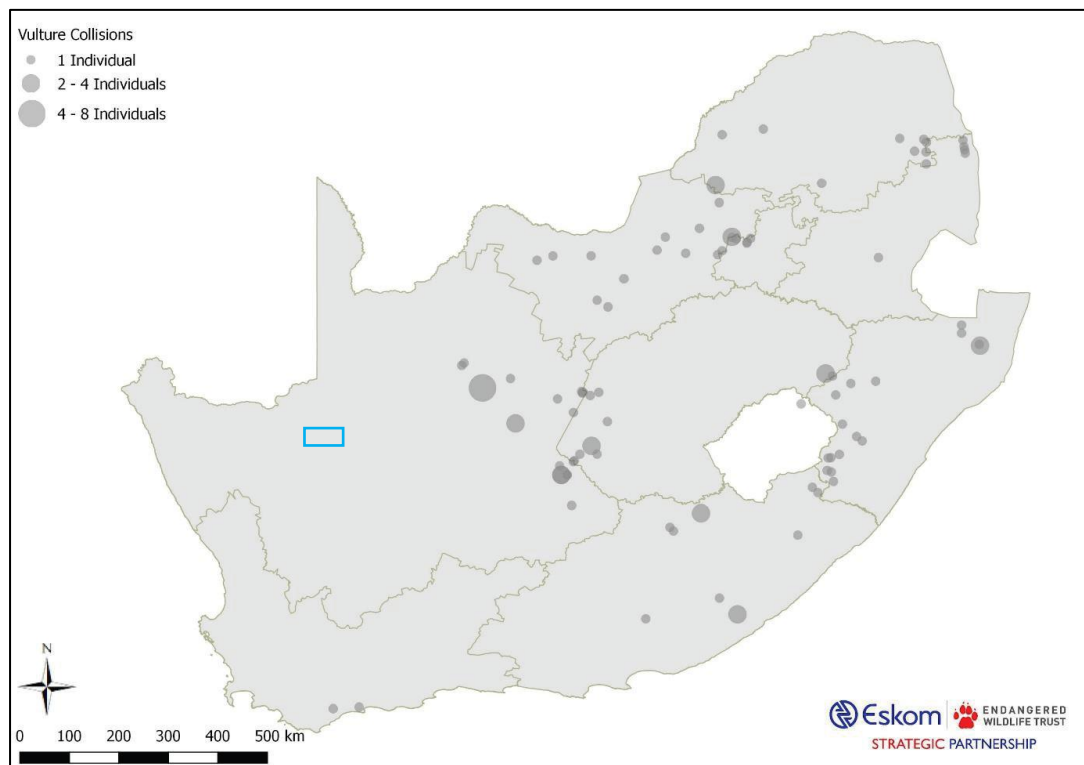


Figure 3-11 Powerline vulture collision incidents in South Africa (Eskom/EWT Strategic Partnership database unpublished 2020). The location and extent of the proposed powerline is indicated in blue.

3.2 Avifauna Expected Species

SABAP2 data indicate that 88 avifauna species are expected for the PAOI and surroundings. Of these, 6 are considered SCC. The likelihood of occurrence within the PAOI is included here.

Table 3-3 *Threatened avifauna species that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

| Common Name | Scientific Name | Regional | Global | Likelihood of Occurrence |
|------------------|---------------------------------|----------|--------|--------------------------|
| Karoo Korhaan | <i>Eupodotis vigorsii</i> | NT | LC | Observed |
| Lanner Falcon | <i>Falco biarmicus</i> | NT | LC | Observed |
| Ludwig's Bustard | <i>Neotis ludwigii</i> | EN | EN | Observed |
| Martial Eagle | <i>Polemaetus bellicosus</i> | EN | EN | High |
| Red Lark | <i>Calendulauda burra</i> | VU | VU | High |
| Sclater's Lark | <i>Spizocorys sclateri</i> | NT | NT | Moderate |
| Secretarybird | <i>Sagittarius serpentarius</i> | VU | EN | High |
| Verreaux's Eagle | <i>Aquila verreauxii</i> | VU | LC | High |

*(Lee *et al.* 2025), + (IUCN 2021)

Eupodotis vigorsii (Karoo Korhaan) is found in dwarf arid shrubland of the Nama Karoo and Succulent Karoo. They are resident and sedentary species which means their movement is restricted to their home range and they do not migrate locally. Their diets consist mainly of invertebrates, reptiles and plant matter, on which they feed while walking along. The pairs are monogamous and often breed in family groups. Helpers can assist in defending the territory or feeding of the young. They nest on the ground with the main egg-laying season being between June and February. Main threats include habitat degradation due to agricultural practices and ecosystem stresses due to climate change (IUCN, 2022). This species was observed in the assessment.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from open grassland to open cleared woodlands and agricultural areas. Global population estimates are more than 30000 breeding pairs, in South Africa it is estimated to be 1400 pairs. They may occur in groups up to 20 individuals, but have also been observed solitary. They are partial and facultative migrants, that breeds from May to early September. Nests are mostly found on cliff ledges, and they may alternate between more than one nest. Their diet is mainly composed of small birds such as pigeons and francolins. Anecdotal evidence suggests these species are susceptible to agrochemicals, another threat to their population is the clearing of grassland habitats (Roberts *et al.*, 2023). The species was recorded in the assessment.

Neotis ludwigii (Ludwig's Bustard) is listed as EN on a global scale (BirdLife International, 2018a). The species has a large range centred on the dry biomes of the Karoo and Namib in southern Africa, being found in the extreme south-west of Angola, western Namibia and South Africa. This species inhabits open lowland and upland plains with grass and light thornbush, sandy open shrub-veld and semi-desert in the arid and semi-arid Namib and Karoo biomes. Ludwig's Bustard is nomadic and a partial migrant, moving to the western winter-rainfall part of its range in winter. The diet includes invertebrates, small vertebrates and vegetable matter. The global population is estimated to be 100 000 – 499 999 individuals. The primary threat to the species is collisions with overhead power lines, with potentially thousands of individuals involved in such collisions each. Collision rates on high voltage transmission lines in the Karoo may exceed one Ludwig's Bustard per kilometre per year. Bustards have limited frontal vision so may not see power lines, even if they are marked. Observed in the PAOI.

Polemaetus bellicosus (Martial Eagle) is listed as EN on a regional scale and EN on a global scale. This species has an extensive range across much of sub-Saharan Africa, but populations are declining due

to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution and collisions with power lines (IUCN, 2017). It inhabits open woodland, wooded savanna, bushy grassland, thorn-bush and, in southern Africa, more open country and even sub-desert (IUCN, 2017). The likelihood of occurrence in the area is high.

Calendulauda burra (Red Lark) is listed as VU both locally and internationally (Lee et al., 2025, IUCN, 2021). Their habitat consists of tropical dry shrubland to dry lowland grassland. This species is threatened by habitat destruction and loss. The likelihood of this species occurring in the project area is high due to the suitable habitat found in the project area.

Spizocorys sclateri (Sclaters Lark) is classified as NT both locally and internationally. This species is native to South Africa and Namibia. It is found in dry shrubland, where its habitat is threatened by increased numbers of livestock in its habitat. The species has a moderate likelihood of occurring.

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

Aquila verreauxii (Verreaux's Eagle) is found in mountainous and rocky cliff habitat. They are usually found in pairs that remain close for up to 95 % of the day. This monogamous pair are solitary nesters with two nests in their territories, a main and an alternative nest. The nest is a stick structure, up to 1.8m in diameter. They mainly breed on steep inaccessible cliffs, but artificial structures and in some instances large trees are also used. Breeding occurs from April to November (Del Hoyo, 1994). Their diet consists of Hyrax (60%), Vervet Monkeys, Chacma Baboons and smaller mammal species. The species is locally persecuted in southern Africa where it coincides with livestock farms, but because the species does not take carrion, is little threatened by poisoned carcasses. Where hyraxes are hunted for food and skins, eagle populations have declined (Ferguson- Lees and Christie, 2001). There is a high likelihood for this species to exist in the PAOI.

3.2.1 Coordinated Waterbird Counts (CWAC)

The Animal demographic unit launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part of South Africa's commitment to International waterbird conservation. Regular mid-summer and mid-winter censuses are done to determine the various features of water birds including population size, how waterbirds utilise water sources and determining the health of wetlands. For a full description of CWAC please refer to <http://cwac.birdmap.africa/about.php>. There are no CWAC sites within 15 km of the PAOI (Figure 3-12).

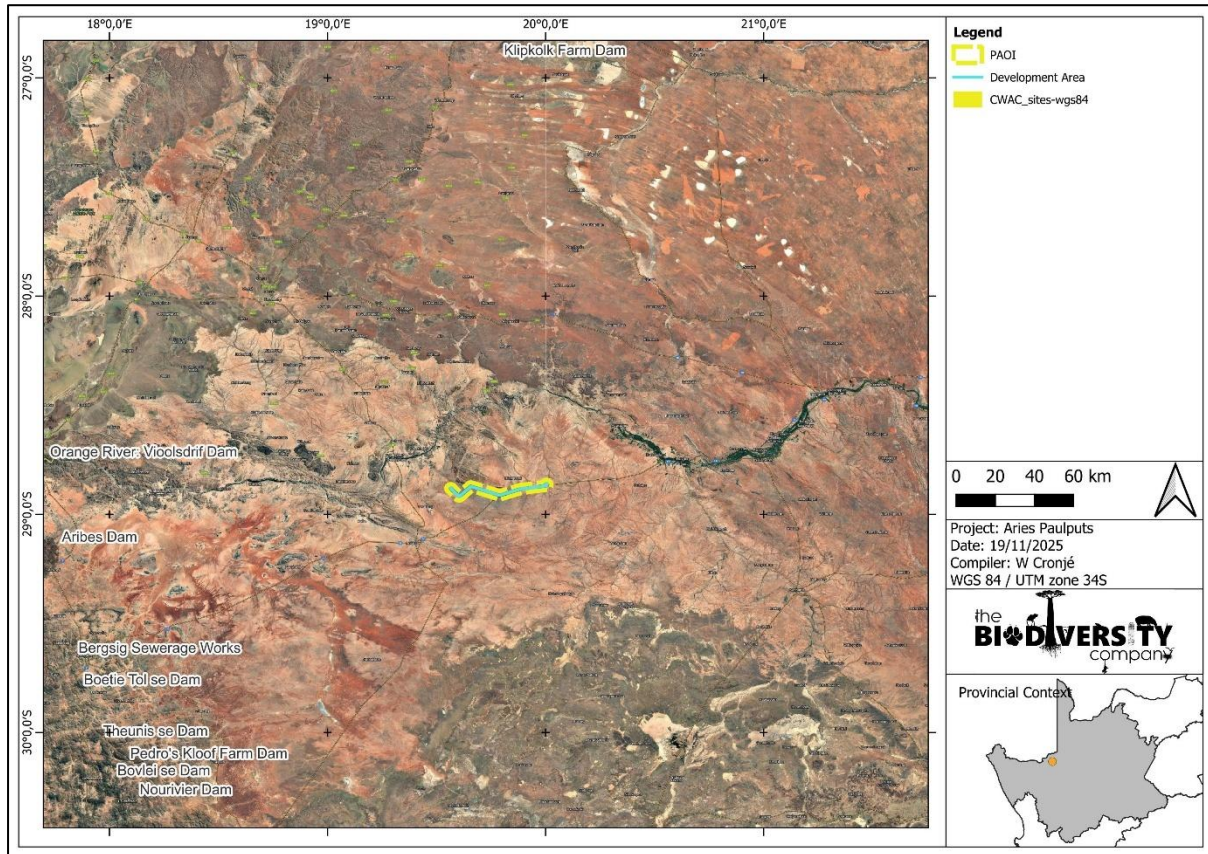


Figure 3-12 The PAOI in relation to the CWAC sites

3.2.2 Coordinated Avifaunal Roadcount (CAR)

The ADU/Cape bird club pioneered avifaunal roadcount of larger birds in 1993 in South Africa. Originally it was started to monitor the Blue Crane *Anthopoides paradiseus* and Denham's Bustard *Neotis denhami*. Today it has been expanded to the monitoring of 36 species of large terrestrial birds (cranes, bustards, korhaans, storks, Secretarybird and Southern Bald Ibis) along 350 fixed routes covering over 19 000 km. Twice a year, in midsummer (the last Saturday in January) and midwinter (the last Saturday in July), roadcounts are carried out using this standardised method. These counts are important for the conservation of these larger species that are under threat due to loss of habitat through changes in land use, increases in crop agriculture and human population densities, poisoning as well as man-made structures like power lines. With the prospect of wind and solar farms to increase, the use of renewable energy sources and monitoring of these species is most important (CAR, 2020). There are no CAR routes within 15 km of the PAOI (Figure 3-13).



Figure 3-13 The CAR routes in relation to the PAOI

3.2.3 Literature Review

Wildskies ecological Services completed an avifaunal assessment in 2017 for the Aggeneis Paulputs 400kv Overhead Power Line. In that study, they confirmed Martial Eagle *Polemaetus bellicosus*; Lanner Falcon *Falco biarmicus* and Karoo Korhaan *Eupodotis vigorsii*. During the study, they also confirmed a Martial Eagle nest, the location of the nest is unknown except that it is on the existing 220kV Aggeneis Paulputs powerline just north of the Paulputs substation. This nest was not confirmed in this assessment.

3.3 Fieldwork Findings

3.3.1 Species List of Field Survey

Every effort was made to cover all the different habitat types, within the limits of time and access. 140 species were recorded, of which 3 were SCC (Table 3-4).

Table 3-4 SCC recorded in the assessment.

| Common Name | Scientific Name | Regional Status | Global Status |
|------------------|---------------------------|-----------------|---------------|
| Karoo Korhaan | <i>Eupodotis vigorsii</i> | NT | LC |
| Lanner Falcon | <i>Falco biarmicus</i> | NT | LC |
| Ludwig's Bustard | <i>Neotis ludwigii</i> | EN | EN |

3.3.1.1 Risk Species

As aforementioned, Priority Species are considered threatened, rare, or prone to impacts from energy development (Ralston Paton *et al*, 2017). Forty (40) of the species observed within the PAOI are regarded as priority species (Table 3-5).

Table 3-5 Summary of Risk Species recorded within and around the proposed development

| Common Name | Scientific Name | Collision - OHL | Electrocution | Habitat Loss |
|------------------------|---------------------------------|-----------------|---------------|--------------|
| Egyptian Goose | <i>Alopochen aegyptiaca</i> | x | x | |
| Greater Kestrel | <i>Falco rupicoloides</i> | | x | |
| Hadada Ibis | <i>Bostrychia hagedash</i> | x | x | |
| Jackal Buzzard | <i>Buteo rufofuscus</i> | x | x | |
| Karoo Korhaan | <i>Eupodotis vigorsii</i> | x | | x |
| Lanner Falcon | <i>Falco biarmicus</i> | x | x | x |
| Ludwig's Bustard | <i>Neotis ludwigii</i> | x | | x |
| Northern Black Korhaan | <i>Afrotis afraoides</i> | x | | x |
| Pygmy Falcon | <i>Polihierax semitorquatus</i> | | x | |
| Rock Kestrel | <i>Falco rupicolus</i> | | x | |

3.3.1.2 Dominant Species

Table 3-6 provides the relative abundance of the dominant species with which each species appeared across the assessment area. The most abundant species was Namaqua Sandgrouse (*Pterocles Namaqua*) with a relative abundance of 0,257 (Table 3-6).

Table 3-6 Relative abundance of occurrence of dominant avifauna species recorded within and around the proposed development during the field survey.

| Common Name | Scientific Name | Family | Relative abundance | Frequency (%) |
|--------------------------|---------------------------------|---------------|--------------------|---------------|
| Namaqua Sandgrouse | <i>Pterocles namaqua</i> | Pteroclididae | 0,257 | 21,429 |
| Sociable Weaver | <i>Philetairus socius</i> | Ploceidae | 0,201 | 21,429 |
| Lark-like Bunting | <i>Emberiza impetuanii</i> | Emberizidae | 0,190 | 78,571 |
| Grey-backed Sparrow-lark | <i>Eremopterix verticalis</i> | Alaudidae | 0,128 | 42,857 |
| Spike-heeled Lark | <i>Chersomanes albofasciata</i> | Alaudidae | 0,050 | 35,714 |
| Bokmakierie | <i>Telophorus zeylonus</i> | Malaconotidae | 0,022 | 14,286 |
| Rufous-eared Warbler | <i>Malcorus pectoralis</i> | Cisticolidae | 0,022 | 28,571 |
| Acacia Pied Barbet | <i>Tricholaema leucomelas</i> | Lybiidae | 0,017 | 21,429 |
| Pied Crow | <i>Corvus albus</i> | Corvidae | 0,011 | 7,143 |
| Yellow-bellied Eremomela | <i>Eremomela icteropygialis</i> | Cisticolidae | 0,011 | 7,143 |
| Egyptian Goose | <i>Alopochen aegyptiaca</i> | Anatidae | 0,011 | 7,143 |
| Greater Kestrel | <i>Falco rupicoloides</i> | Falconidae | 0,011 | 7,143 |
| Northern Black Korhaan | <i>Afrotis afraoides</i> | Otididae | 0,011 | 14,286 |
| Karoo Long-billed Lark | <i>Certhilauda subcoronata</i> | Alaudidae | 0,011 | 14,286 |
| Dusky Sunbird | <i>Cinnyris fuscus</i> | Nectariniidae | 0,011 | 14,286 |
| Scaly-feathered Weaver | <i>Sporopipes squamifrons</i> | Ploceidae | 0,011 | 7,143 |
| Namaqua Dove | <i>Oena capensis</i> | Columbidae | 0,006 | 7,143 |
| Ring-necked Dove | <i>Streptopelia capicola</i> | Columbidae | 0,006 | 7,143 |
| Karoo Korhaan | <i>Eupodotis vigorsii</i> | Otididae | 0,006 | 7,143 |
| Black-chested Prinia | <i>Prinia flavicans</i> | Cisticolidae | 0,006 | 7,143 |

3.3.1.3 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014) who divided avifauna into 13 major groups based on their diet, habitat, and main area of activity. Although species tend to exhibit varied diet with invertivores consuming fruit and frugivores consuming insects, for example, the dominant composition of the diet was considered.

The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by Invertivore Ground Diurnal (IGD), Granivore Ground Diurnal (GGD) Omnivore Ground Diurnal (OGD) (Figure 3-14).

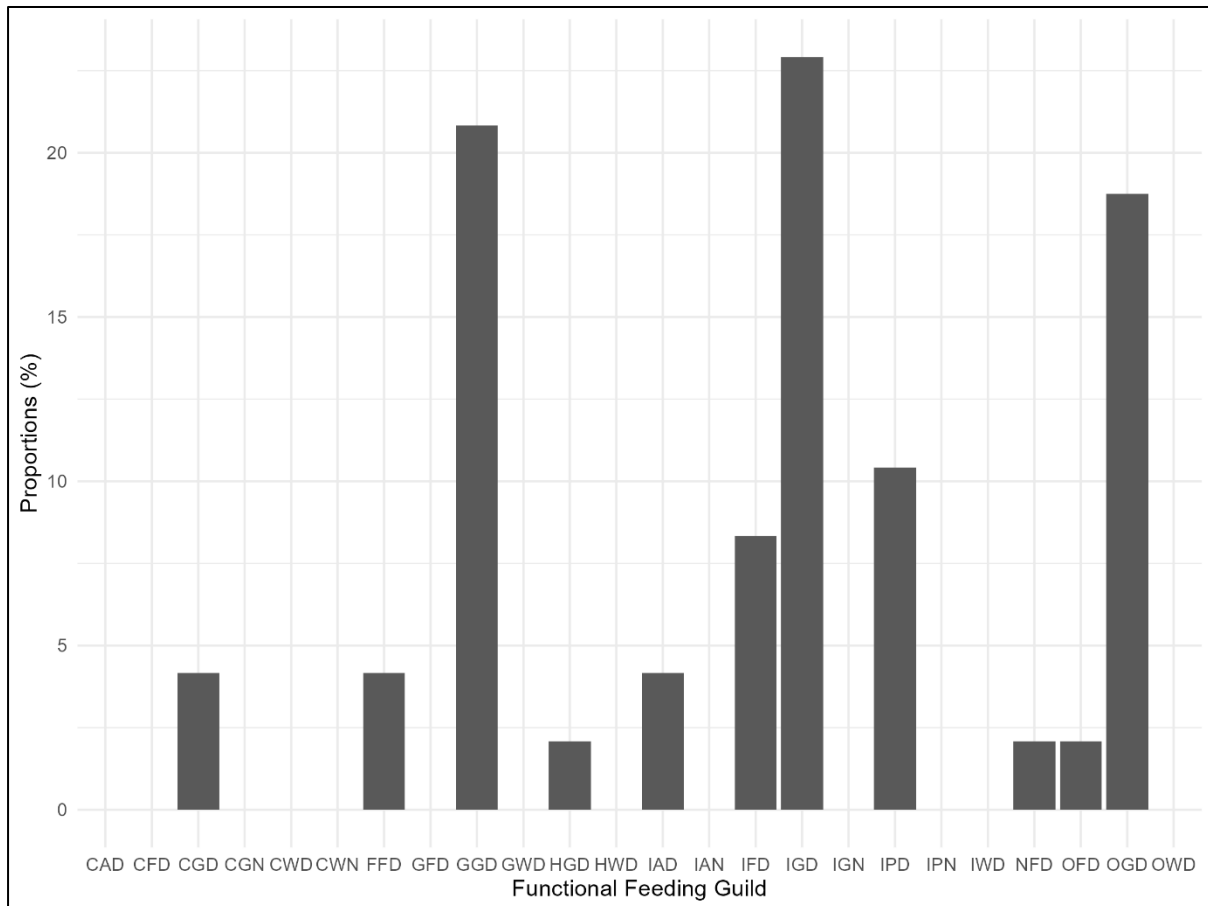


Figure 3-14 Column plot illustrating the proportion of each Functional Feeding Guild to the total abundance. Avifaunal trophic guilds – CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal; CWD, carnivore water diurnal; CWN, carnivore water nocturnal; CFD, carnivore foliage diurnal; CAD, carnivore air nocturnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; GWD, granivore water diurnal; GFD, granivore foliage diurnal; HGD, herbivore ground diurnal; HWD, herbivore water diurnal; IGD, invertivore ground diurnal; IWD, invertivore, water diurnal; IGN, invertivore ground nocturnal; IFD, invertivore foliage diurnal; IPD, invertivore perch diurnal; IPN, invertivore perch nocturnal; IAD, invertivore air diurnal; IAN, invertivore air nocturnal; NFD, nectivore foliage diurnal; OGD, omnivore ground diurnal; OWD, omnivore water diurnal; OFD, omnivore foliage diurnal

3.3.2 Flight and Nest Analysis

Observing and monitoring flight paths and nesting sites of SCC and/or priority species are important in ascertaining habitat sensitivity and evaluating the impact, risk significance of any proposed

development. Flight analysis is also important for species that exhibit dual movement between roosting and foraging sites to prevent the risk of collision with infrastructure. From left to right are the flight paths of a Lanner Falcon, two Egyptian Geese and two Karoo Korhaans respectively (Figure 3-15).

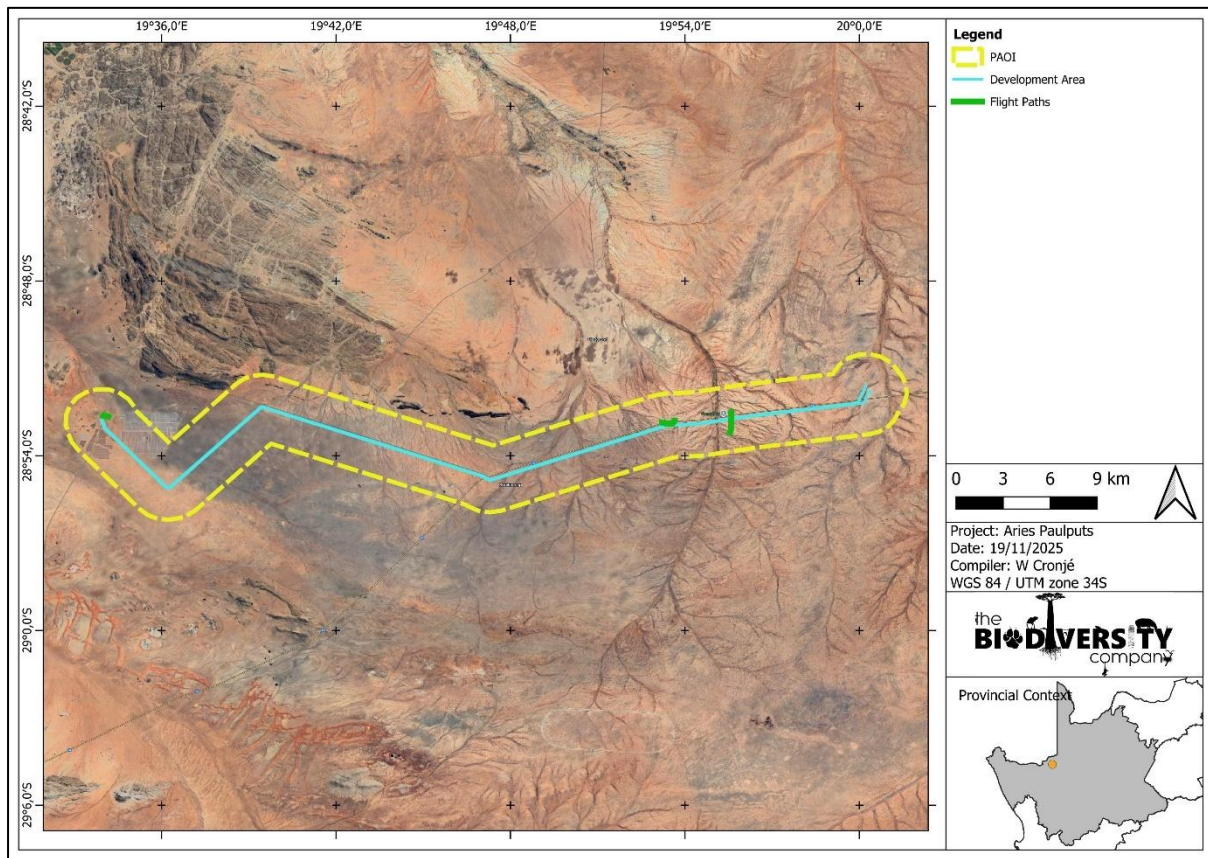


Figure 3-15 Flight paths recorded in the PAOI during the survey

A Sociable Weaver nest occupied by Pygmy Falcon was identified along the existing infrastructure corridor (Figure 3-16, Figure 3-17 and Figure 3-18). Pygmy Falcons rely exclusively on Sociable Weaver nests for breeding. A seasonal 500 m no-go buffer be implemented around the nest during the breeding season in the summer (September to February), rather than rerouting the power line to avoid the buffers. Rerouting would likely result in greater ecological risk, as it could create new linear obstacles and increase the overall collision and electrocution risk for these sensitive species.

Therefore, the proposed route should remain aligned with the existing infrastructure but must be made nest-proof through the installation of appropriate anti-perching and anti-nesting devices. We propose a staggered placement of pylons with existing infrastructure to increase visibility, however, within the buffer zone, pylons need to be in line with the existing infrastructure. This approach balances the need to protect sensitive avifauna with the practicalities of infrastructure development and is considered the most effective strategy to minimize long-term impacts on raptor populations along the route.

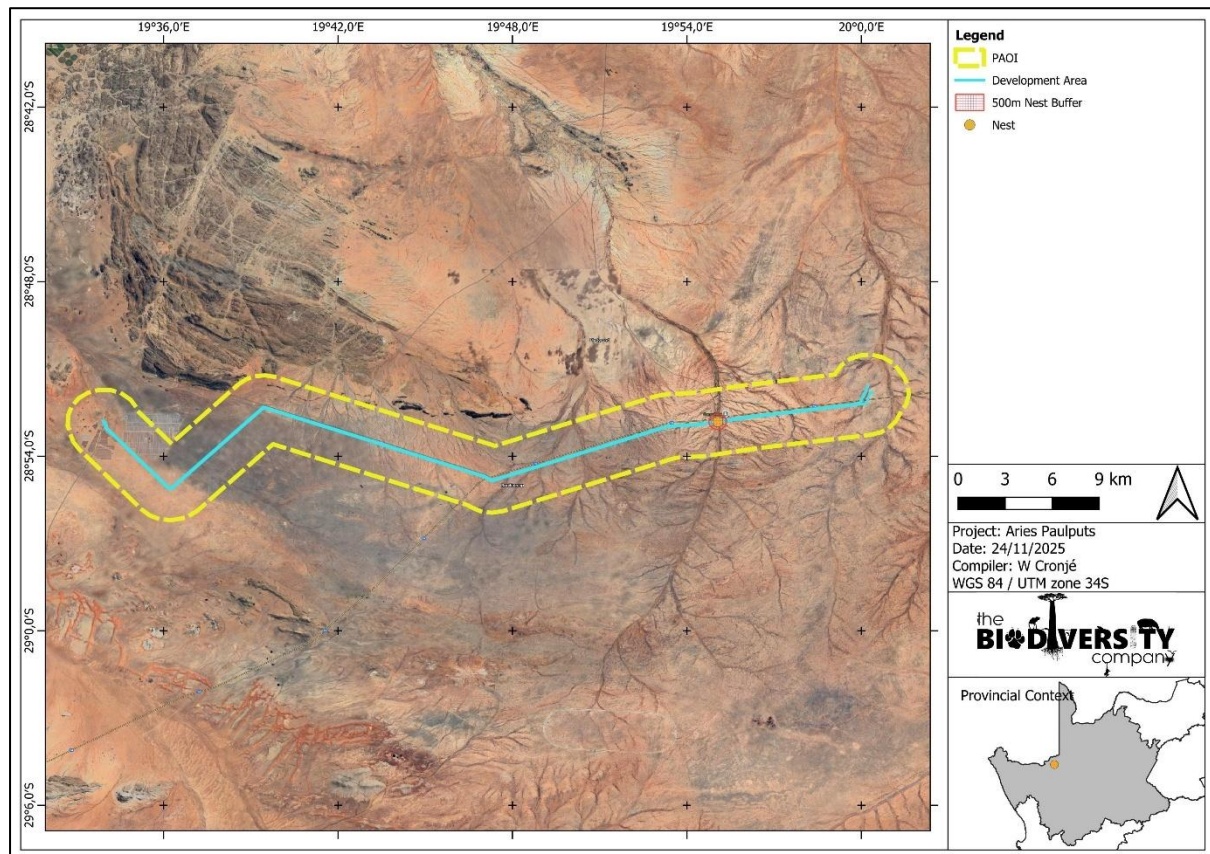


Figure 3-16 Nest 1 representing a Sociable Weaver nest on existing pylons inhabited by breeding Pygmy Falcons, affecting pylons 1 ARI/PAU 252 – 1 ARI/PAU 254 and 1 KOK/PAU 020 – 1KOK/PAU 022 (from afar)

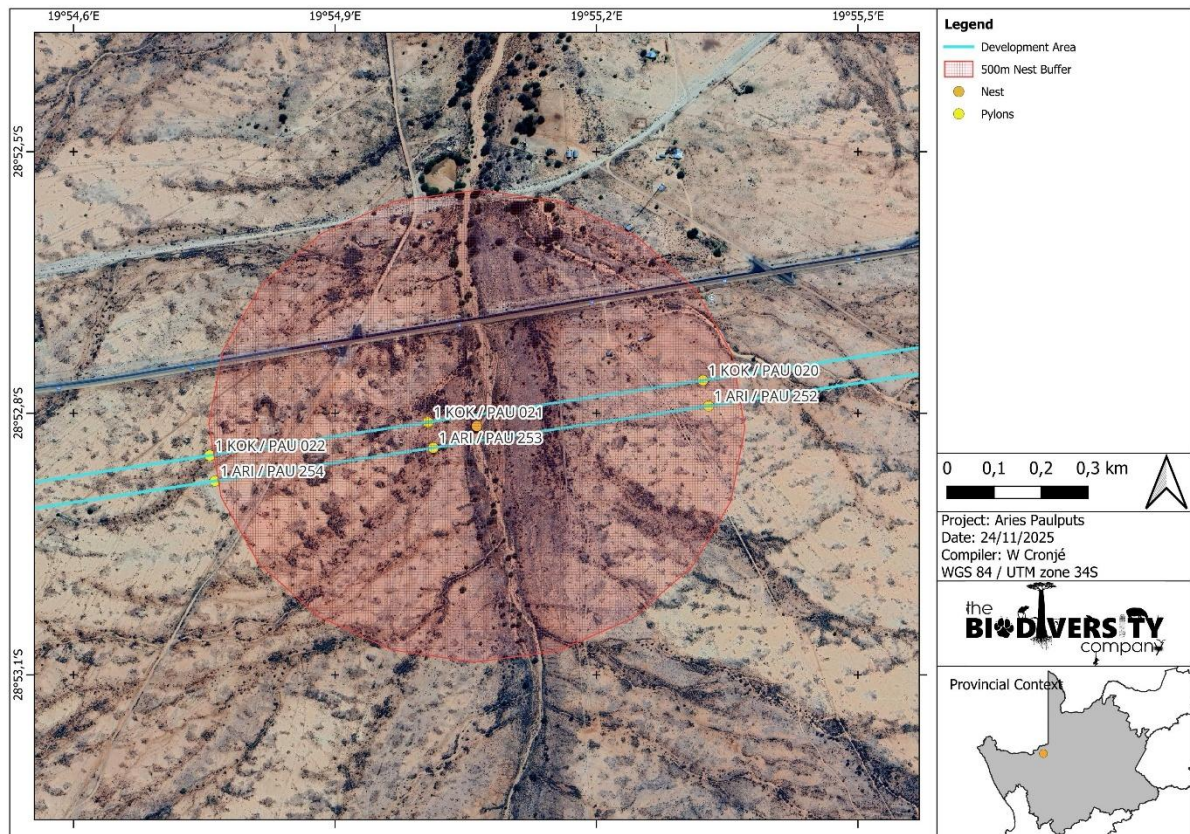


Figure 3-17 Nest 1 representing a Sociable Weaver nest on existing pylons inhabited by breeding Pygmy Falcons, affecting pylons 1 ARI/PAU 252 – 1 ARI/PAU 254 and 1 KOK/PAU 020 – 1 KOK/PAU 022 (magnified)



Figure 3-18 *Photograph representing the Sociable Weaver nest occupied by Pygmy Falcons*

3.4 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Five (5) habitats (Bushmanland Sandy Grassland, Disturbed Bushmanland Arid Grassland, Modified, Natural Bushmanland Arid Grassland as well as Rocky Outcrop) were delineated in total (Figure 3-19). A full description of the habitats is provided below.

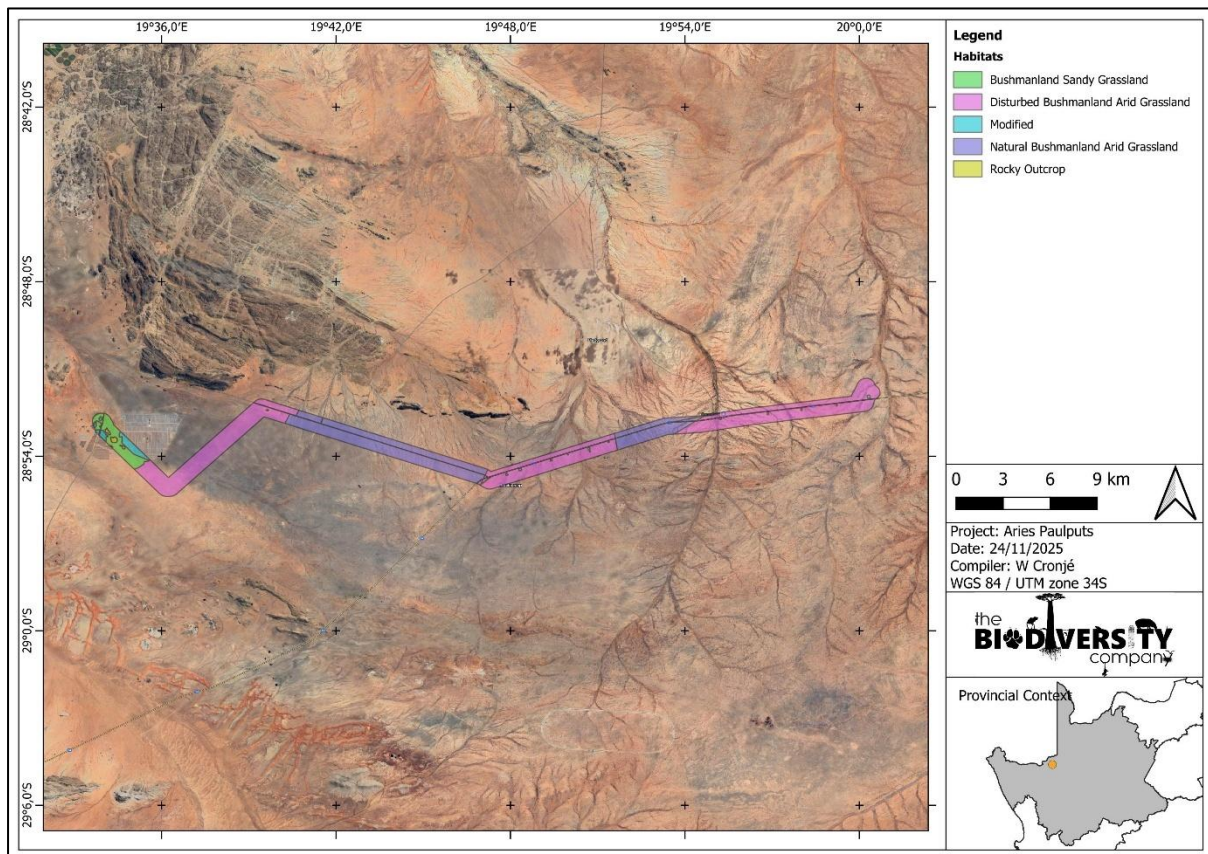


Figure 3-19 Habitats identified within the PAOI

3.4.1 Bushmanland Sandy Grassland

Bushmanland Sandy Grassland (Figure 3-20) comprises of sandy grassland plains and is characterised by white grasses, such as *Stipagrostis* and *Schmidtia* and shrubs resistant to drought (Mucina & Rutherford, 2006). The area has not been transformed extensively and can be useful for foraging, nesting and camouflage (Mucina & Rutherford, 2006).

SCC that can occupy this habitat include Karoo Korhaan, Red Lark, Lanner Falcon, Ludwig Bustard, Martial Eagle and Secretarybird.



Figure 3-20 *An example of the Bushmanland Sandy Grassland habitat at 28°52'48.86"S 19°34'5.02"E*

3.4.2 Disturbed Bushmanland Arid Grassland

The area contains large open patches, along with sparse distributions of grass (refer to Figure 3-21). The habitat is not ideal for nesting due to high exposure to sun, and subsequently food resources will be limited. Although, SCC have been recorded, as they frequent larger spaces. Prey are more exposed, creating an ideal habitat for raptors to hunt.

SCC likely to occur in this habitat: Karoo Korhaan, Lanner Falcon, Ludwig's Bustard, Martial Eagle and Secretarybird.



Figure 3-21 **Example of a Disturbed Bushmanland Arid Grassland at 28°53'45.10"S
19°37'49.80"E**

3.4.3 Natural Bushmanland Arid Grassland

The Bushmanland Arid Grassland (Figure 3-22) comprises of long plains, as well as grasses and shrubs *Stipagrostis* and *Saisola* species respectively, which alter the vegetation structure (Mucina & Rutherford, 2006). Natural drainage is a feature of these habitats (Mucina & Rutherford, 2006).

SCC that likely exist in this habitat include Karoo Korhaan, Red Lark, Sclaters Lark, Lanner Falcon, Ludwig's Bustard, Martial Eagle and Secretarybird.



Figure 3-22 *An example of the Natural Bushmanland Arid Grassland at 28°54'40.82"S 19°47'51.79"E*

3.4.4 Rocky Outcrop

The rocky outcrop (Figure 3-23) adds to the heterogeneity of the PAOI due to the microclimates that exist. The outcrops and shrubs can be used as vantage points, will provide more resources for sheltering of nests, for hunting as well as foraging. It serves as vital habitat for birds with a specialised niche.

SCC likely to occur in this habitat: Karoo Korhaan, Lanner Falcon, Ludwig's Bustard, Martial Eagle, Secretarybird as well as Verreaux's Eagle.

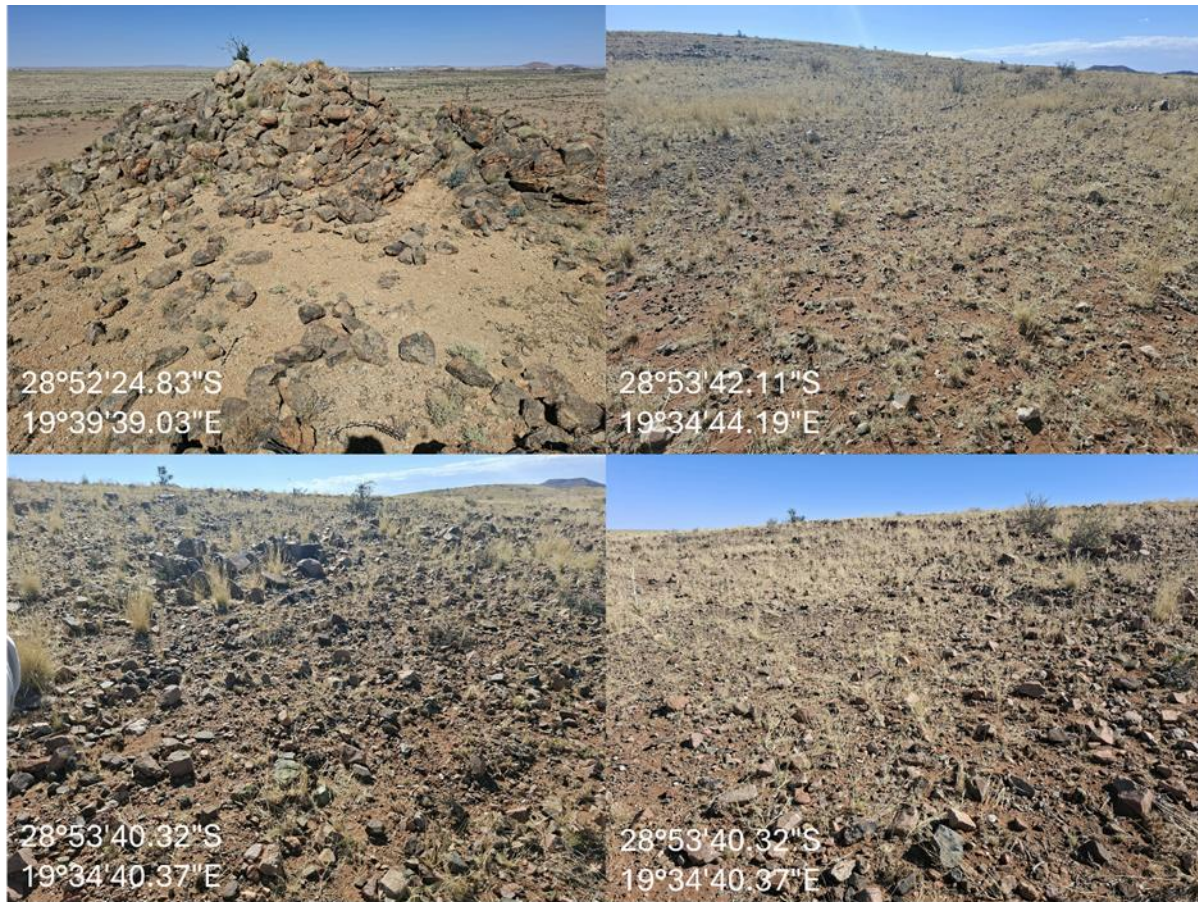


Figure 3-23 *An example of the Rocky Outcrop habitat*

3.4.5 Modified

This area will be tentatively avoided by grassland-dwelling and raptor SCC, as a solar plant and a road is present. The grass adjacent to the development is cut short (Figure 3-24), which will not provide adequate camouflage and other food and nesting resources.



Figure 3-24 *An example of a modified habitat at 28°53'48.80"S 19°34'49.19"E*

3.5 Site Sensitivity Verification

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

Five habitat types were delineated within the PAOI, namely Bushmanland Sandy Grassland, Disturbed Bushmanland Arid Grassland, Modified, Natural Bushmanland Arid Grassland and Rocky Outcrop. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-7.

Table 3-7 Summary of habitat types delineated within the field assessment area

| Habitat Type | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities |
|---|---|--|------------------------------|--|---|
| Bushmanland Sandy Grassland | <u>High</u> Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. | <u>High</u> Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts with no signs of major past disturbance and good rehabilitation potential. | High | <u>Medium</u> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed. | <u>High</u> Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities. |
| Disturbed Bushmanland Arid Grassland | <u>High</u> Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. | <u>Medium</u> Only narrow corridors of good habitat connectivity. | Medium | <u>Medium</u> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition | <u>Medium</u> Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities. |

| Habitat Type | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities |
|---|--|--|------------------------------|---|---|
| | | | | and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed. | |
| Modified | <u>Low</u> No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. | <u>Low</u> Small (> 1 ha but < 5 ha) area. | Low | <u>Very High</u> Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality | <u>Very Low</u> Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required. |
| Natural Bushmanland Arid Grassland | <u>High</u> Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. | <u>High</u> Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches. | High | <u>Medium</u> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality | <u>High</u> Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be |

| Habitat Type | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities |
|------------------------------------|---|---|------------------------------|---|--|
| | | Only minor current negative ecological impacts with no signs of major past disturbance and good rehabilitation potential. | | | required for high impact activities.. |
| Rocky Outcrop | High Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. | Medium Only narrow corridors of good habitat connectivity. | Medium | Low Species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed. | High Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities. |
| 500m Seasonal No Go Buffers | | | | | Very High Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains. |

3.5.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the powerline PAOI, due to the likely occurrence of two avifauna species (Figure 3-24).

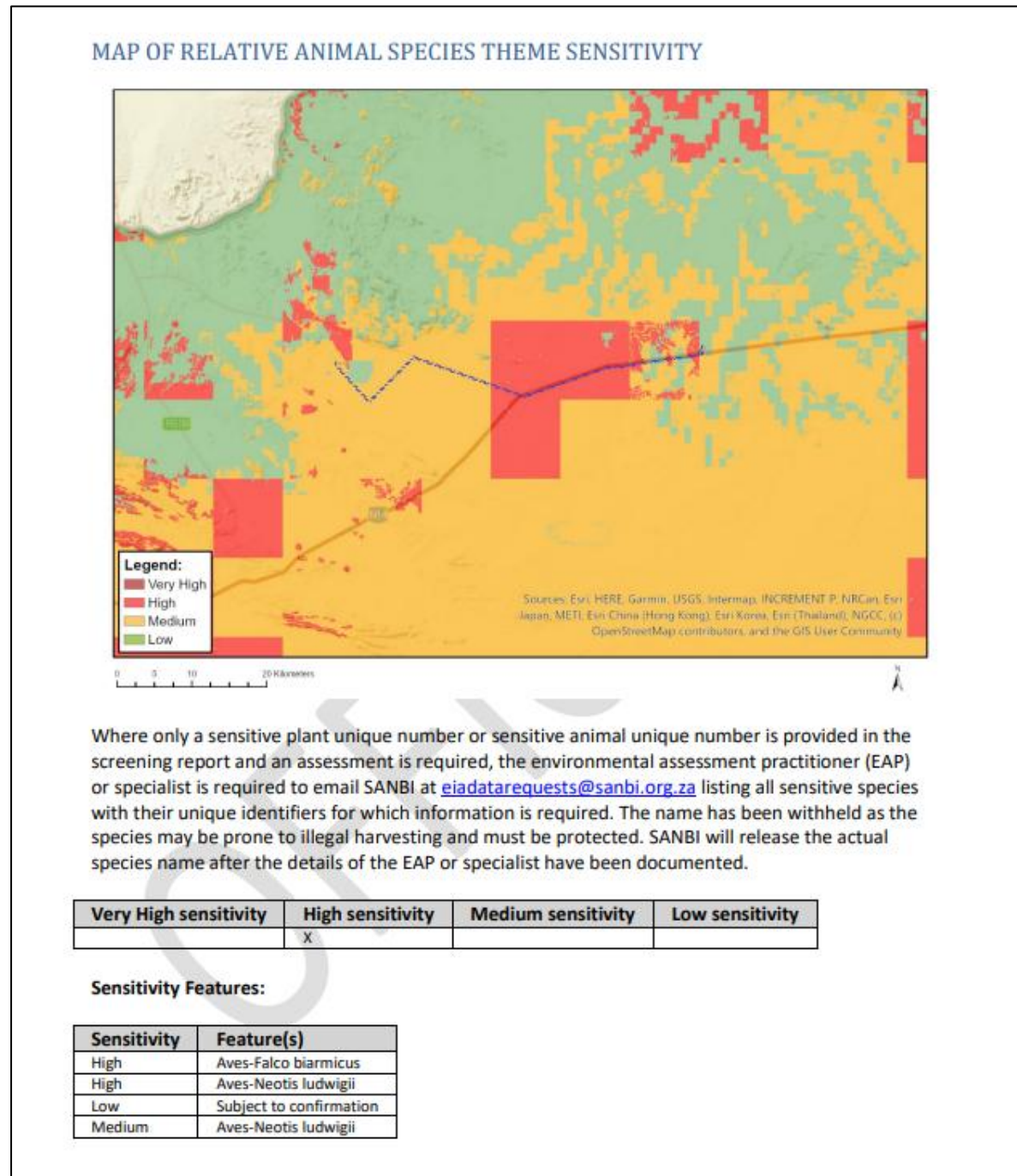


Figure 3-24 Animal Theme Sensitivity

3.5.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-8 below. A summative explanation for each result is provided as relevant.

The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the PAOI are illustrated in Figure 3-25.

Table 3-8 Summary of the screening tool vs specialist-assigned sensitivities

| Screening Tool Theme | Screening Tool | Habitat | Specialist | Tool Validated or Disputed by Specialist - Reasoning |
|----------------------|----------------|--------------------------------------|------------|---|
| Animal Theme | High | Bushmanland Sandy Grassland | High | Validated – Habitat is generally intact with confirmed SCC. The habitat would have medium resilience; if the habitat is disturbed, it will take a significant amount of time for the species to reestablish itself in the area. |
| | | Disturbed Bushmanland Arid Grassland | Medium | Disputed – Even though SCC was confirmed, only narrow habitat corridors exist as the habitat has been disturbed, some areas more than others leading to the medium sensitivity. |
| | | Modified | Very Low | Disputed – Habitat has been altered significantly, with no confirmed SCC. |
| | | Natural Bushmanland Arid Grassland | High | Validated– Habitat is generally intact with confirmed SCC. The habitat would have medium resilience; if the habitat is disturbed, it will take a significant amount of time for the species to reestablish itself in the area. |
| | | Rocky Outcrop | High | Validated- The habitat is unlikely to be able to recover after disturbance, and the species reliant on this specific habitat will be adversely affected |

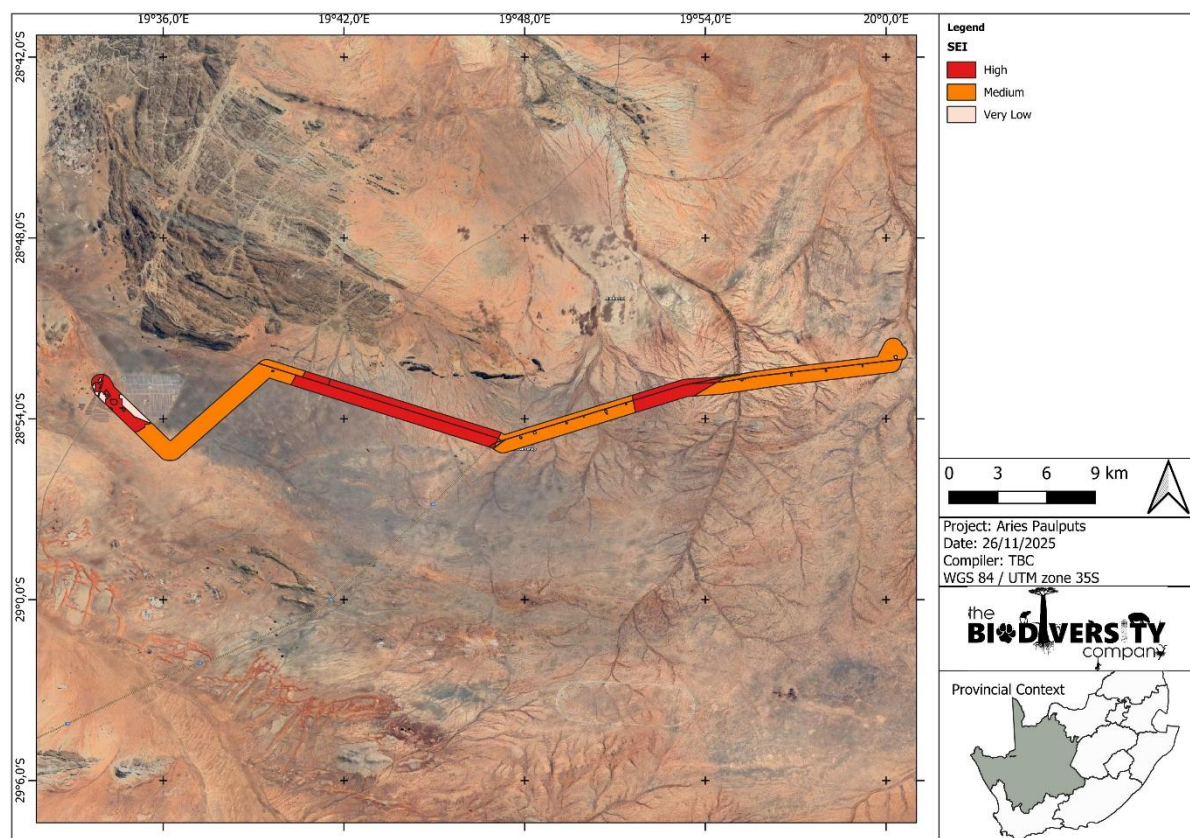


Figure 3-25 Map illustrating the Site Ecological Importance

4 Impact Assessment

4.1 Current Impacts on Biodiversity

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

- Commercial and Subsistence agriculture;
- Present energy distribution infrastructure, including powerlines;
- Historical land clearing and land-use;
- Invasive species; and
- Roads and associated vehicle traffic and road kills.

4.2 Loss of Irreplaceable Resources

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

- Habitat and possible nesting sites for expected and observed avifauna SCC.
- Loss of avifauna due to collisions and electrocutions, including SCCs.

4.3 Quantitative Impact Assessment

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

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

The assessment of impact significance considers pre-mitigation as well as implemented post-mitigation scenarios. Three phases were considered for the impact assessment:

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

The impacts of the substations and powerline were assessed simultaneously as it is believed their impacts would overlap. This mitigation table must be read in conjunction with the Generic Environmental

Management Programme (EMPR) for the development and expansion of substation infrastructure for the transmission and distribution of electricity as per No. 42323 GOVERNMENT GAZETTE, 22 MARCH 2019.

4.3.1 Construction Phase

The following impacts were considered during the construction phase:

- Habitat destruction within the project footprint;
- Destruction, degradation and fragmentation of surrounding habitats;
- Displacement/emigration of avifauna community (including SCC);
- Direct mortality from persecution or poaching of avifauna species and collection of eggs; and
- Direct mortality from increased vehicle and heavy machinery traffic.

The pre- and post-mitigation impact ratings for the construction phase are shown in Table 4-1 and Table 4-2.

Table 4-1 *Impacts associated with the Construction Phase (pre-mitigation)*

| Identifier | Discipline | Impact | Alternative | Phase | Event | Pre-Nature | Pre-Extent | Pre-Duration | Pre-Magnitude | Pre-Reversibility | Consequence | Pre-Probability | Pre-Mitigation Significance Score | Pre-Mitigation Significance |
|------------|------------|--|-------------|--------------|-------|------------|------------|--------------|---------------|-------------------|-------------|-----------------|-----------------------------------|-----------------------------|
| 4.3.1 | | Habitat destruction within the footprint | | Construction | | -1 | 2 | 5 | 4 | 5 | -4 | 5 | -20 | High - |
| 4.3.1 | | Destruction, degradation and fragmentation of surrounding habitats | | Construction | | -1 | 2 | 4 | 4 | 4 | -3,5 | 4 | -14 | High - |
| 4.3.1 | | Displacement/emigration of avifauna community (including SCC) | | Construction | | -1 | 2 | 4 | 4 | 4 | -3,5 | 4 | -14 | High - |
| 4.3.1 | | Direct mortality from persecution or poaching of avifauna species and collection of eggs | | Construction | | -1 | 2 | 5 | 4 | 4 | -3,75 | 4 | -15 | High - |
| 4.3.1 | | Direct mortality from increased vehicle and heavy machinery traffic | | Construction | | -1 | 2 | 5 | 4 | 4 | -3,75 | 4 | -15 | High - |

Table 4-2 Impacts associated with the Construction Phase (post-mitigation)

| Identifier | Discipline | Impact | Alternative | Phase | Event | Post-Nature | Post-Extent | Post-Duration | Post-Magnitude | Post-Reversibility | Consequence2 | Post-Probability | Post-mitigation Significance Score | Post-Mitigation Significance | Confidence |
|------------|------------|--|-------------|--------------|-------|-------------|-------------|---------------|----------------|--------------------|--------------|------------------|------------------------------------|------------------------------|------------|
| 4.3.1 | | Habitat destruction within the footprint | | Construction | | -1 | 2 | 3 | 3 | 4 | -3 | 4 | -12 | Medium high - to | High |
| 4.3.1 | | Destruction, degradation and fragmentation of surrounding habitats | | Construction | | -1 | 2 | 2 | 3 | 4 | -2,75 | 3 | -8,25 | Medium low - to | High |
| 4.3.1 | | Displacement/emigration of avifauna community (including SCC) | | Construction | | -1 | 2 | 2 | 3 | 3 | -2,5 | 3 | -7,5 | Medium low - to | Medium |
| 4.3.1 | | Direct mortality from persecution or poaching of avifauna species and collection of eggs | | Construction | | -1 | 2 | 2 | 2 | 2 | -2 | 3 | -6 | Medium low - to | Medium |
| 4.3.1 | | Direct mortality from increased vehicle and heavy machinery traffic | | Construction | | -1 | 2 | 2 | 2 | 2 | -2 | 3 | -6 | Medium low - to | High |

Corrective Actions (Construction Phase)**Habitat destruction within the footprint**

- A nest walkdown must be performed prior to clearance of the site. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. Active bird nests (i.e. presence of eggs) cannot be destroyed, and necessary permits and appropriate mitigation (e.g. relocation) should be arranged with provincial ordinances and avifaunal specialist.
- Areas identified as suitable for Red Lark during the walkdown should minimise habitat disturbance and should undergo active rehabilitation of these disturbed sites after construction. A detailed rehabilitation plan should be drawn up between a Red Lark avifauna specialist and a qualified botanist, if required by or indicated so during the walkdown assessment.
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further.
- The areas to be developed must be specifically demarcated to prevent movement into surrounding environments.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.
- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.

- Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.
- Leaking equipment and vehicles must be repaired immediately or be removed from the development area to facilitate repair.
- Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.
- Infrastructure must be consolidated where possible to minimise the amount of ground and air space used.
- Use environmentally friendly cleaning and dust suppressant products

Destruction, degradation and fragmentation of surrounding habitats due to noise pollution

- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.
- All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region

Displacement/emigration of avifauna community (including SCC)

- A nest walkdown must be performed prior to clearance of the site. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. Active bird nests (i.e. presence of eggs) cannot be destroyed, and necessary permits and appropriate mitigation (e.g. relocation) should be arranged with provincial ordinances and avifaunal specialist.
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further.
- The duration of the construction must be kept to a minimum to avoid disturbing avifauna.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.
- All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region
- Infrastructure must be consolidated where possible to minimise the amount of ground and air space used.

Direct mortality from persecution or poaching of avifauna species and collection of eggs

- All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs;
- Prior to commencing work each day, two individuals should traverse the working area to disturb any avifauna and so they have a chance to vacate the area; and
- Any avifauna threatened by the construction activities that does not vacate the area should be removed safely by an appropriately qualified environmental officer or avifauna specialist.

Direct mortality from increased vehicle and heavy machinery traffic

- All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.
- Road users and contractors to undergo/receive Environmental Awareness Training. Discussions/training must include:
 - Speed limits
 - General rules of road use, not limited to:
 - Avoiding the widening of the road
 - Environmental sensitivity of surrounding habitat
- Construction activity should be restricted to daylight hours, as nocturnal species are highly dependent on sound and/or vocalisations for behavioural processes. However, low impact and low noise construction activities with minimal light might be considered during night time.

4.3.2 Operation Phase

The following impacts were considered during the operational phase:

- Collisions with gridlines if the line;
- Electrocuting; and
- Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs.

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

Table 4-3 Impacts associated with the Operation Phase (pre-mitigation)

| Identifier | Discipline | Impact | Alternative | Phase | Event | Pre-Nature | Pre-Extent | Pre-Duration | Pre-Magnitude | Pre-Reversibility | Consequence | Pre-Probability | Pre-Mitigation Significance Score | Pre-Mitigation Significance |
|------------|------------|--|-------------|-----------|-------|------------|------------|--------------|---------------|-------------------|-------------|-----------------|-----------------------------------|-----------------------------|
| 4.3.2 | | Collisions with gridlines | | Operation | | -1 | 2 | 4 | 4 | 4 | -3,5 | 4 | -14 | High - |
| 4.3.2 | | Electrocuting | | Operation | | -1 | 2 | 4 | 4 | 4 | -3,5 | 5 | -17,5 | High - |
| 4.3.2 | | Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs | | Operation | | -1 | 3 | 4 | 4 | 5 | -4 | 5 | -20 | High - |

Table 4-4 Impacts associated with the Operation Phase (post-mitigation)

| Identifier | Discipline | Impact | Alternative | Phase | Event | Post-Nature | Post-Extent | Post-Duration | Post-Magnitude | Post-Reversibility | Consequence2 | Post-Probability | Post-mitigation Significance Score | Post-Mitigation Significance | Confidence |
|------------|------------|--|-------------|-----------|-------|-------------|-------------|---------------|----------------|--------------------|--------------|------------------|------------------------------------|------------------------------|------------|
| 4.3.2 | | Collisions with gridlines | | Operation | | -1 | 2 | 3 | 3 | 3 | -2,75 | 4 | -11 | Medium to high - | High |
| 4.3.2 | | Electrocution | | Operation | | -1 | 2 | 3 | 3 | 3 | -2,75 | 4 | -11 | Medium to high - | High |
| 4.3.2 | | Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs | | Operation | | -1 | 2 | 3 | 2 | 2 | -2,25 | 3 | -6,75 | Medium to low - | Medium |

Corrective Actions (Operation Phase)

- o All the parts of the infrastructure must be nest proofed and anti-perched devices placed on areas that can lead to electrocution;
- o All exposed parts must be covered (insulated) to reduce electrocution risk;
- o All conductor wires in the same horizontal plane.
- The air space used by the gridlines /tie in lines must be minimised by placing them underground as far as possible;
- Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. Place pylons and associated infrastructure along existing infrastructure (e.g. roads, other power lines).
- Due to feasibility issues it has been agreed upon that every fourth overhead cables/lines must be fitted with industry standard bird flight diverters to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be. Bird flight diverters (BFDs) are to be spaced at a maximum of 15m apart on the shield wire as per the known technical knowledge or industry standards. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites. The effectiveness needs to be assessed as discussed below.

Electrocution

- Specific mitigation recommendations need to be in line with the EWT/ESKOM partnership Guidelines:
 - o Removal of earth wire or increase wire thickness to make it more visible;
 - o Use 'Self Support' structures and avoid 'Cross Rope' structures;
 - o All the parts of the infrastructure must be nest proofed and anti-perched devices placed on areas that can lead to electrocution;
 - o All exposed parts must be covered (insulated) to reduce electrocution risk;
 - o All conductor wires in the same horizontal plane.

- Insulation where energised parts and/or grounded parts are covered with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered; and
- Perch discouragers can be used such as perch guards or spikes. Considerable success achieved by providing artificial bird safe perches, which are placed at a safe distance from the energised parts (Prinsen et al, 2012).
- The entire line is to be monitored biannually by the NTCSA maintenance team, going along the line to record incidents as they do with other lines. They then send that data to EWT along with the data they collect from other lines, such as Aries-Kokerboom (the 700kV line from the south to Namibia), but collision data will need to be checked by a bird specialist biannually (this can be done remotely). If an incident is reported between the span fitted with diverters, the remaining 3 spans should then be fitted. Monitoring of the bird diverters must be done as per the Eskom standards for the lifetime of the development by the NTCSA maintenance team. All data of fatalities need to be recorded in the national database (CIR), and incidents need to undergo the NTCSA environmental incidents management procedure.

Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs

- All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs;
- Prior to commencing work each day, two individuals should traverse the working area to disturb any avifauna and so they have a chance to vacate the area; and
- Any avifauna threatened by the construction activities that do not vacate the area should be removed safely by an appropriately qualified environmental officer or removal specialist.

4.3.3 Decommissioning Phase

The following impacts were considered during the decommissioning phase:

- Direct mortality due to earthworks, vehicle collisions and persecution;
- Continued habitat degradation due to Invasive Alien Plant encroachment and erosion; and
- Collisions.

The pre- and post-mitigation impact ratings for the construction phase are shown in Table 4-5 and Table 4-6.

Table 4-5 Impacts associated with the Decommissioning Phase (pre-mitigation)

| Identifier | Discipline | Impact | Alternative | Phase | Event | Pre-Nature | Pre-Extent | Pre-Duration | Pre-Magnitude | Pre-Reversibility | Consequence | Pre-Probability | Pre-Mitigation Significance Score | Pre-Mitigation Significance |
|------------|------------|---|-------------|-----------------|-------|------------|------------|--------------|---------------|-------------------|-------------|-----------------|-----------------------------------|-----------------------------|
| 4.3.3 | | Direct mortality due to earthworks, vehicle collisions and persecutions | | Decommissioning | | -1 | 3 | 4 | 4 | 4 | -3,75 | 5 | -18,75 | High - |
| 4.3.3 | | Continued habitat degradation due to Invasive | | Decommissioning | | -1 | 3 | 4 | 4 | 4 | -3,75 | 4 | -15 | High - |

| | | | | | | | | | | | | | | |
|-------|--|--------------------------------------|--|-----------------|--|----|---|---|---|---|------|---|-----|--------|
| | | Alien Plant Encroachment and erosion | | | | | | | | | | | | |
| 4.3.3 | | Collisions | | Decommissioning | | -1 | 2 | 4 | 4 | 4 | -3,5 | 4 | -14 | High - |

Table 4-6 *Impacts associated with the Decommissioning Phase (post-mitigation)*

| Identifier | Discipline | Impact | Alternative | Phase | Event | Post-Nature | Post-Extent | Post-Duration | Post-Magnitude | Post-Reversibility | Consequence2 | Post-Probability | Post-mitigation Significance Score | Post-Mitigation Significance | Confidence |
|------------|------------|--|-------------|-----------------|-------|-------------|-------------|---------------|----------------|--------------------|--------------|------------------|------------------------------------|------------------------------|------------|
| 4.3.3 | | Direct mortality due to earthworks, vehicle collisions and persecutions | | Decommissioning | | -1 | 2 | 2 | 2 | 2 | -2 | 3 | -6 | Medium to low - | Medium |
| 4.3.3 | | Continued habitat degradation due to Invasive Alien Plant Encroachment and erosion | | Decommissioning | | -1 | 2 | 2 | 2 | 2 | -2 | 2 | -4 | Low - | Medium |
| 4.3.3 | | Collisions | | Decommissioning | | -1 | 2 | 2 | 2 | 3 | -2,25 | 3 | -6,75 | Medium to low - | Medium |

Corrective Actions (Decommissioning Phase)**Direct mortality due to earthworks, vehicle collisions and persecution**

- All personnel should undergo environmental awareness training including educating about not harming or collecting avifauna species;
- Prior to commencing work each day, two individuals should traverse the working area in order to disturb any avifauna and so they have a chance to vacate;
- Any avifauna threatened by the construction activities must be removed safely by an appropriately qualified environmental officer or removal specialist;
- All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected;
- All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner;

Continued habitat degradation due to invasive alien plant encroachment and erosion

- The PAOI must be rehabilitated, and a management plan must be in place to ensure that it is done successfully to restore the avifauna community and their associated habitat.

Collisions

- All infrastructure must be removed if the facility is decommissioned.

4.4 Cumulative Impacts

After taking all of the phases into consideration, the cumulative impact rating could be calculated and a final significance produced for each (Table 4-7).

Table 4-7 Overall impacts

| Identifier | Discipline | Impact | Alternative | Phase | Event | Cumulative Impact | Irreplaceable loss | Priority Factor | Final score | Final Significance |
|------------|------------|--|-------------|-----------------|-------|-------------------|--------------------|-----------------|-------------|--------------------|
| 4.1 | | Habitat destruction within the footprint | | Construction | | 3 | 3 | 1,50 | -18,00 | High - |
| 4.1 | | Destruction, degradation and fragmentation of surrounding habitats due to noise pollution | | Construction | | 3 | 2 | 1,38 | -15,13 | High - |
| 4.1 | | Displacement/emigration of avifauna community (including SCC) | | Construction | | 3 | 3 | 1,50 | -11,25 | Medium to high - |
| 4.1 | | Direct mortality from persecution or poaching of avifauna species and collection of eggs | | Construction | | 2 | 2 | 1,25 | -7,50 | Medium to low - |
| 4.1 | | Direct mortality from increased vehicle and heavy machinery traffic | | Construction | | 2 | 2 | 1,25 | -7,50 | Medium to low - |
| 4.2 | | Collisions with gridlines if the line is located away from the existing gridline | | Operation | | 3 | 3 | 1,50 | -12,38 | Medium to high - |
| 4.2 | | Collisions with gridlines if the line is located alongside the existing gridline | | Operation | | 2 | 2 | 1,25 | -5,00 | Medium to low - |
| 4.2 | | Electrocution | | Operation | | 3 | 3 | 1,50 | -16,50 | High - |
| 4.2 | | Direct mortality from roadkill, persecution or poaching of avifauna species and collection of eggs | | Operation | | 2 | 2 | 1,25 | -8,44 | Medium to low - |
| 4.3 | | Direct mortality due to earthworks, vehicle collisions and persecutions | | Decommissioning | | 2 | 1 | 1,13 | -6,75 | Medium to low - |
| 4.3 | | Continued habitat degradation due to Invasive Alien Plant Encroachment and erosion | | Decommissioning | | 1 | 1 | 1,00 | -4,00 | Low - |
| 4.3 | | Collisions | | Decommissioning | | 2 | 2 | 1,25 | -8,44 | Medium to low - |

5 Monitoring

The entire line is to be monitored biannually by the NTCSA maintenance team, going along the line to record incidents as they do with other lines. They then send that data to EWT along with the data they collect from other lines, such as Aries-Kokerboom (the 700kV line from the south to Namibia), but collision data will need to be checked by a bird specialist biannually (this can be done remotely). If an incident is reported between the span fitted with diverters, the remaining 3 spans should then be fitted. Monitoring of the bird diverters must be done as per the Eskom standards for the lifetime of the development by the NTCSA maintenance team. All data of fatalities need to be recorded in the national database (CIR), and incidents need to undergo the NTCSA environmental incidents management procedure.

6 Conclusion

The Proposed NTCSA Aries-Paulputs Kokerboom 400KV loop-in-loop-out powerline traverses a region of significant ecological and avifaunal importance, intersecting habitats that support species of conservation concern, including globally threatened raptors, bustards. The assessment has identified that the primary risks to avifauna are habitat loss, disturbance during construction and operation, electrocution, and especially collisions with overhead lines. These risks are particularly acute for large, slow-flying species and those with established nesting sites along the route.

The implementation of robust mitigation measures, such as the installation of bird flight diverters, nest-proofing infrastructure, and strict adherence to no-go buffers during breeding seasons, will be essential to minimise negative impacts. Ongoing monitoring and adaptive management, as outlined in the report, are critical to ensure that mitigation remains effective and that unforeseen impacts are promptly addressed.

6.1 Impact Statement

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

- Habitat loss and fragmentation;
- Disturbance and displacement caused during the construction and operational phases;
- Electrocutions; and
- Collisions.

The project poses moderate potential risks to avifauna SCC, especially in areas of very high and high ecological sensitivity; these risks can be substantially reduced if all recommended mitigation and monitoring actions are strictly implemented. The project is considered acceptable from an avifaunal perspective only under the condition that these measures are fully adopted and enforced throughout the project lifecycle. This approach will help balance the region's energy infrastructure needs with the imperative to conserve its unique and vulnerable birdlife.

6.2 Specialist Opinion

It is the opinion of the specialist that the development can only be favourably considered should all the mitigations and monitoring requirements are completed.

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8 Appendix Items

8.1 Appendix A: Methodology

8.1.1 Desktop Dataset Assessment

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

8.1.1.1 Expected Species

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

- Avifauna list, generated from the SABAP2 dataset by looking at pentads: 2850_1930; 2850_1935; 2850_1940; 2850_1945; 2850_1950; 2850_1955; 2850_2000; 2855_1935; 2845_1925; 2845_1930; 2855_1930; 2845_1940; 2855_1940; 2845_1945; 2855_1945; 2845_1950; 2850_2005; 2900_1930
- Compilation of a Coordinated Water Bird Count (CWAC) species list if the PAOI was found to be in a vicinity of a CWAC site.

8.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem’s wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.*, 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;
- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.*, 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2024) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the

Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- The Northern Cape Department of Environment and Nature Conservation has developed the Northern Cape CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.
- The identification of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated.
- A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.

Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024); and

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.*, 2018) – A SAIIAE was established during the NBA of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types and pressures on these systems.

8.1.2 Avifauna Survey

Point Counts

Standardized point counts (Buckland *et al.*, 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilized as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was conducted over a 10-minute period. The horizontal detection limit was set at 150 meters. At each point, the observer would document the date, start time, end time, habitat, numbers of each species, detection method (seen or heard), behavior (perched or flying), and general notes on habitat and nesting suitability for conservation-important species.

Water Resource Assessments

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

Nest Survey

Possible nesting sites such as power lines, stands of trees, marshes and drainage lines, cliffs, and gravel areas were surveyed for nests. All breeding sites were mapped, and the activity at the nests was assessed during all the surveys.

Incidental Observations

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

8.2 Appendix B: Site Ecological Importance

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

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

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided Table 8-1 and

Table 8-2, respectively.

Table 8-1 Summary of Conservation Importance (CI) criteria

| Conservation Importance | Fulfilling Criteria |
|-------------------------|---|
| Very High | Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population). |
| High | Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population). |
| Medium | Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. |

| | |
|-----------------|--|
| | > 50% of receptor contains natural habitat with potential to support SCC. |
| Low | No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC. |
| Very Low | No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining. |

Table 8-2 Summary of Functional Integrity (FI) criteria

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

BI can be derived from a simple matrix of CI and FI as provided in Table 8-3.

Table 8-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

| Biodiversity Importance (BI) | | Conservation Importance (CI) | | | | |
|------------------------------|------------------|------------------------------|-----------|----------|----------|----------|
| | | Very high | High | Medium | Low | Very low |
| Functional Integrity (FI) | Very high | Very high | Very high | High | Medium | Low |
| | High | Very high | High | Medium | Medium | Low |
| | Medium | High | Medium | Medium | Low | Very low |
| | Low | Medium | Medium | Low | Low | Very low |
| | Very low | Medium | Low | Very low | Very low | Very low |

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor as summarised in Table 8-4.

Table 8-4 Summary of Resource Resilience (RR) criteria

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

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 8-5.

Table 8-5 *Matrix used to derive Site Ecological Importance (SEI) from Receptor Resilience (RR) and Biodiversity Importance (BI)*

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

Interpretation of the SEI in the context of the proposed development activities is provided in Table 8-6.

Table 8-6 *Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities*

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

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter,

justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

8.3 Appendix C: Impact / Risk Assessment

Impact assessment must take account of the nature, scale, and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact.

8.4 Appendix D: Avifauna Expected Species

| Common Name | Scientific Name | Family Name | Regional | Global | Endemism |
|------------------------------|---------------------------|---------------|----------|--------|----------|
| Acacia Pied Barbet | Tricholaema leucomelas | Lybiidae | | | |
| African Pipit | Anthus cinnamomeus | Motacillidae | | | |
| African Red-eyed Bulbul | Pycnonotus nigricans | Pycnonotidae | | | |
| Ant-eating Chat | Myrmecocichla formicivora | Muscicapidae | | | |
| Ashy Tit | Melaniparus cinerascens | Paridae | | | |
| Barn Swallow | Hirundo rustica | Hirundinidae | | | |
| Black-chested Prinia | Prinia flavicans | Cisticolidae | | | |
| Black-chested Snake Eagle | Circaetus pectoralis | Accipitridae | | | |
| Black-eared Sparrow-lark | Eremopterix australis | Alaudidae | | | NE |
| Bokmakierie | Telophorus zeylonus | Malaconotidae | | | |
| Brubru | Nilaus afer | Malaconotidae | | | |
| Cape Bunting | Emberiza capensis | Emberizidae | | | |
| Cape Penduline Tit | Anthoscopus minutus | Remizidae | | | |
| Cape Robin-chat | Cossypha caffra | Muscicapidae | | | |
| Cape Sparrow | Passer melanurus | Passeridae | | | |
| Cape Starling | Lamprotornis nitens | Sturnidae | | | |
| Capped Wheatear | Oenanthe pileata | Muscicapidae | | | |
| Cardinal Woodpecker | Dendropicos fuscescens | Picidae | | | |
| Chat Flycatcher | Melaenornis infuscatus | Muscicapidae | | | |
| Chestnut-backed Sparrow-lark | Eremopterix leucotis | Alaudidae | | | |
| Chestnut-vented Warbler | Curruca subcoerulea | Sylviidae | | | |

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|---------------------------------|----------------------------------|----------------|----|----|
| Common Scimitarbill | <i>Rhinopomastus cyanomelas</i> | Phoeniculidae | | |
| Common Swift | <i>Apus apus</i> | Apodidae | | |
| Crowned Lapwing | <i>Vanellus coronatus</i> | Charadriidae | | |
| Double-banded Sandgrouse | <i>Pterocles bicinctus</i> | Pteroclididae | | |
| Dusky Sunbird | <i>Cinnyris fuscus</i> | Nectariniidae | | |
| Eastern Clapper Lark | <i>Mirafrasciola fasciolata</i> | Alaudidae | | |
| Familiar Chat | <i>Oenanthe familiaris</i> | Muscicapidae | | |
| Fawn-colored Lark | <i>Calendulauda africanoides</i> | Alaudidae | | |
| Fiscal Flycatcher | <i>Melaenornis silens</i> | Muscicapidae | | NE |
| Fork-tailed Drongo | <i>Dicrurus adsimilis</i> | Dicruridae | | |
| Greater Kestrel | <i>Falco rupicoloides</i> | Falconidae | | |
| Grey-backed Cisticola | <i>Cisticola subruficapilla</i> | Cisticolidae | | |
| Grey-backed Sparrow-lark | <i>Eremopterix verticalis</i> | Alaudidae | | |
| Helmeted Guineafowl | <i>Numida meleagris</i> | Numididae | | |
| House Sparrow | <i>Passer domesticus</i> | Passeridae | | |
| Kalahari Scrub Robin | <i>Cercotrichas paena</i> | Muscicapidae | | |
| Karoo Chat | <i>Emarginata schlegelii</i> | Muscicapidae | | |
| Karoo Korhaan | <i>Eupodotis vigorsii</i> | Otididae | NT | LC |
| Karoo Long-billed Lark | <i>Certhilauda subcoronata</i> | Alaudidae | | |
| Karoo Prinia | <i>Prinia maculosa</i> | Cisticolidae | | |
| Karoo Scrub Robin | <i>Cercotrichas coryphoeus</i> | Muscicapidae | | |
| Lanner Falcon | <i>Falco biarmicus</i> | Falconidae | NT | LC |
| Large Rock Martin | <i>Ptyonoprogne fuligula</i> | Hirundinidae | | |
| Lark-like Bunting | <i>Emberiza impetuanii</i> | Emberizidae | | |
| Laughing Dove | <i>Spilopelia senegalensis</i> | Columbidae | | |
| Layard's Warbler | <i>Curruca layardi</i> | Sylviidae | | NE |
| Little Swift | <i>Apus affinis</i> | Apodidae | | |
| Long-billed Crombec | <i>Sylvietta rufescens</i> | Macrosphenidae | | |
| Ludwig's Bustard | <i>Neotis ludwigii</i> | Otididae | EN | EN |
| Martial Eagle | <i>Polemaetus bellicosus</i> | Accipitridae | EN | EN |
| Mountain Wheatear | <i>Myrmecocichla monticola</i> | Muscicapidae | | |
| Namaqua Dove | <i>Oena capensis</i> | Columbidae | | |
| Namaqua Sandgrouse | <i>Pterocles namaqua</i> | Pteroclididae | | |
| Northern Black Korhaan | <i>Afrotis afraoides</i> | Otididae | | |
| Pale Chanting Goshawk | <i>Melierax canorus</i> | Accipitridae | | |
| Pale-winged Starling | <i>Onychognathus nabouroup</i> | Sturnidae | | |
| Pied Crow | <i>Corvus albus</i> | Corvidae | | |
| Pirit Batis | <i>Batis pirit</i> | Platysteiridae | | |
| Pygmy Falcon | <i>Polihierax semitorquatus</i> | Falconidae | | |

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|-----------------------------|--------------------------|---------------|----|----|
| Red-billed Quelea | Quelea quelea | Ploceidae | | |
| Red-faced Mousebird | Urocolius indicus | Coliidae | | |
| Red-headed Finch | Amadina erythrocephala | Estrinidae | | |
| Ring-necked Dove | Streptopelia capicola | Columbidae | | |
| Rock Kestrel | Falco rupicolus | Falconidae | | |
| Rosy-faced Lovebird | Agapornis roseicollis | Psittaculidae | | |
| Rufous-cheeked Nightjar | Caprimulgus rufigena | Caprimulgidae | | |
| Rufous-eared Warbler | Malcorus pectoralis | Cisticolidae | | |
| Sabota Lark | Calendulauda sabota | Alaudidae | | |
| Scaly-feathered Weaver | Sporopipes squamifrons | Ploceidae | | |
| Secretarybird | Sagittarius serpentarius | Sagittariidae | VU | EN |
| Sickle-winged Chat | Emarginata sinuata | Muscicapidae | | NE |
| Sociable Weaver | Philetairus socius | Ploceidae | | |
| Southern Fiscal | Lanius collaris | Laniidae | | |
| Southern Masked Weaver | Ploceus velatus | Ploceidae | | |
| Speckled Pigeon | Columba guinea | Columbidae | | |
| Spike-heeled Lark | Chersomanes albofasciata | Alaudidae | | |
| Spotted Eagle Owl | Bubo africanus | Strigidae | | |
| Spotted Flycatcher | Muscicapa striata | Muscicapidae | | |
| Stark's Lark | Spizocorys starki | Alaudidae | | |
| Swallow-tailed Bee-eater | Merops hirundineus | Meropidae | | |
| Tractrac Chat | Emarginata tractrac | Muscicapidae | | |
| Verreaux's Eagle | Aquila verreauxii | Accipitridae | VU | LC |
| White-backed Mousebird | Colius colius | Coliidae | | |
| White-browed Sparrow-weaver | Plocepasser mahali | Ploceidae | | |
| White-throated Canary | Crithagra albogularis | Fringillidae | | |
| Yellow Canary | Crithagra flaviventris | Fringillidae | | |
| Yellow-bellied Eremomela | Eremomela icteropygialis | Cisticolidae | | |

8.5 Appendix E: Field results

| Common Name | Scientific Name |
|--------------------------|----------------------------------|
| Acacia Pied Barbet | <i>Tricholaema leucomelas</i> |
| African Pipit | <i>Anthus cinnamomeus</i> |
| African Red-eyed Bulbul | <i>Pycnonotus nigricans</i> |
| Ant-eating Chat | <i>Myrmecocichla formicivora</i> |
| Black-chested Prinia | <i>Prinia flavicans</i> |
| Black-eared Sparrow-lark | <i>Eremopterix australis</i> |
| Bokmakierie | <i>Telophorus zeylonus</i> |
| Cape Sparrow | <i>Passer melanurus</i> |
| Chat Flycatcher | <i>Melaenornis infuscatus</i> |

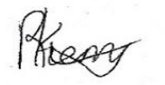
| | |
|--------------------------|----------------------------------|
| Common Quail | <i>Coturnix coturnix</i> |
| Desert Cisticola | <i>Cisticola aridulus</i> |
| Dusky Sunbird | <i>Cinnyris fuscus</i> |
| Egyptian Goose | <i>Alopochen aegyptiaca</i> |
| Fawn-colored Lark | <i>Calendulauda africanoides</i> |
| Greater Kestrel | <i>Falco rupicoloides</i> |
| Grey-backed Cisticola | <i>Cisticola subruficapilla</i> |
| Grey-backed Sparrow-lark | <i>Eremopterix verticalis</i> |
| Hadada Ibis | <i>Bostrychia hagedash</i> |
| Jackal Buzzard | <i>Buteo rufofuscus</i> |
| Karoo Korhaan | <i>Eupodotis vigorsii</i> |
| Karoo Long-billed Lark | <i>Certhilauda subcoronata</i> |
| Lanner Falcon | <i>Falco biarmicus</i> |
| Lark-like Bunting | <i>Emberiza impetuari</i> |
| Long-billed Crombec | <i>Sylvietta rufescens</i> |
| Ludwig's Bustard | <i>Neotis ludwigii</i> |
| Mountain Wheatear | <i>Myrmecocichla monticola</i> |
| Namaqua Dove | <i>Oena capensis</i> |
| Namaqua Sandgrouse | <i>Pterocles namaqua</i> |
| Northern Black Korhaan | <i>Afrotis afraoides</i> |
| Pied Crow | <i>Corvus albus</i> |
| Pirit Batis | <i>Batis pirit</i> |
| Pygmy Falcon | <i>Polihierax semitorquatus</i> |
| Ring-necked Dove | <i>Streptopelia capicola</i> |
| Rock Kestrel | <i>Falco rupicolus</i> |
| Rufous-eared Warbler | <i>Malcorus pectoralis</i> |
| Sabota Lark | <i>Calendulauda sabota</i> |
| Scaly-feathered Weaver | <i>Sporopipes squamifrons</i> |
| Sociable Weaver | <i>Philetairus socius</i> |
| Southern Fiscal | <i>Lanius collaris</i> |
| Southern Masked Weaver | <i>Ploceus velatus</i> |
| Speckled Pigeon | <i>Columba guinea</i> |
| Spike-heeled Lark | <i>Chersomanes albofasciata</i> |
| White-backed Mousebird | <i>Colius colius</i> |
| Yellow-bellied Eremomela | <i>Eremomela icteropygialis</i> |

8.6 Appendix G: Specialist Declaration of Independence

I, Dr Ryno Kemp, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;

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



Dr Ryno Kemp

Avifauna Specialist

The Biodiversity Company

November 2025

8.7 Appendix G: Specialist CVs

Specialists' CV's available on request.