AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 1

Vhembe District Municipality, Limpopo Province, South Africa

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Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 1**	
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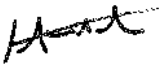
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the Tabor Solar 1 facility. The other facilities and associated gridlines are assessed separately. The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 5 km area around the project footprint provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;

- MV cabling and collector stations;
- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

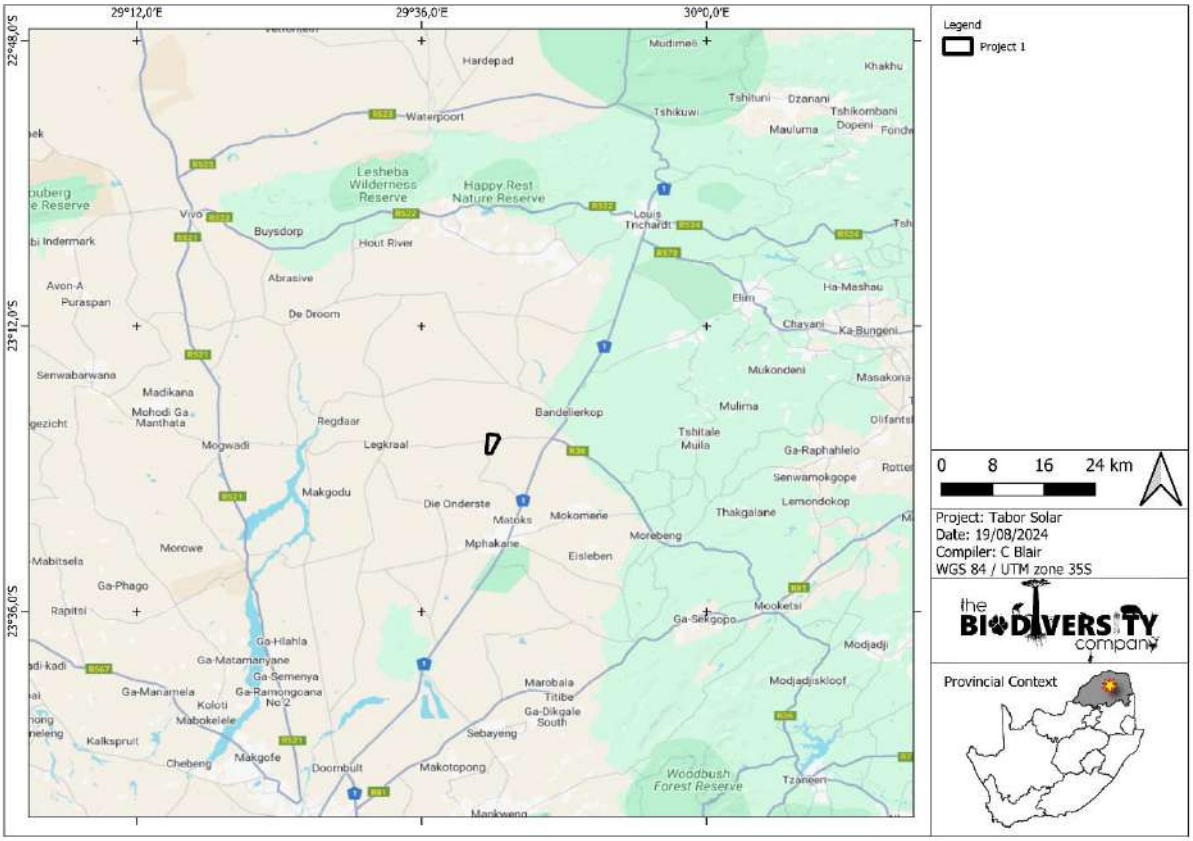

Figure 1-1 Proposed location of the project area in relation to the nearby towns

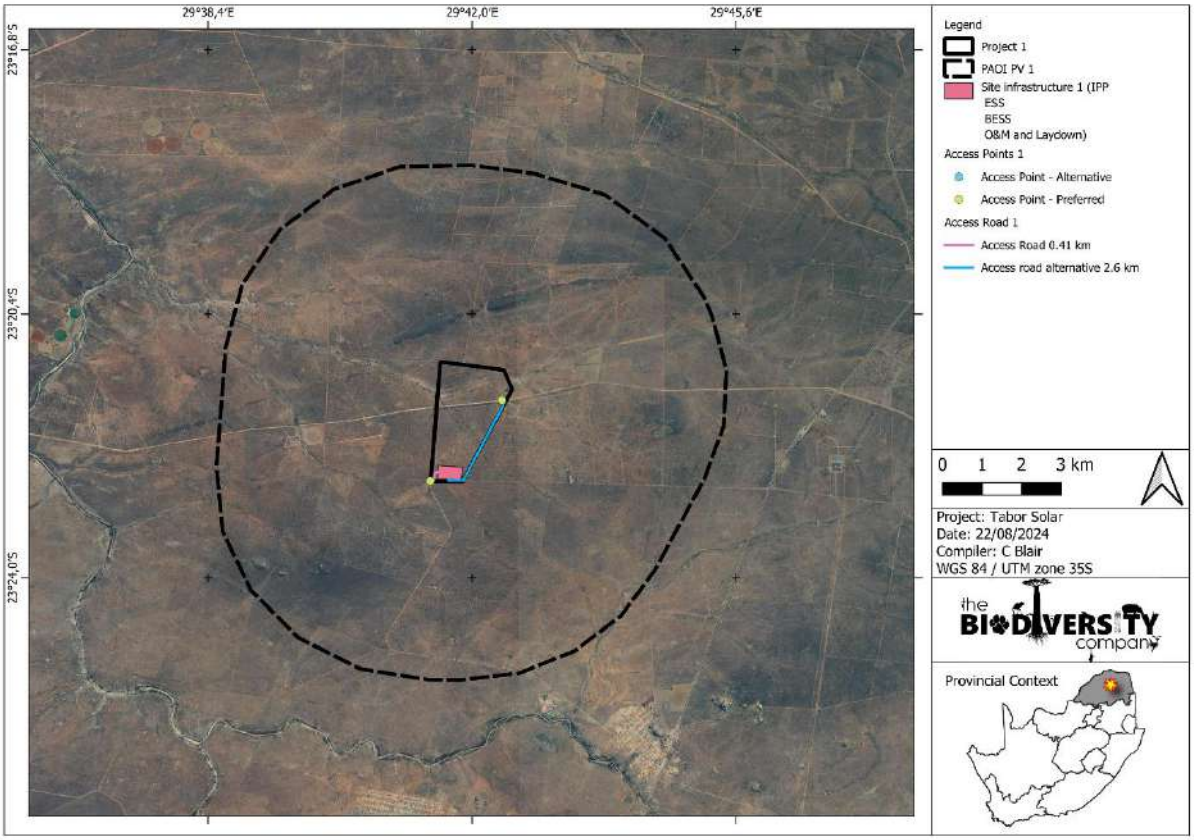

Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey is required for a Regime 2 assessment. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The first avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey. Another survey is required for a Regime 2 assessment, this second survey is scheduled for the upcoming wet season;
- 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; and
- The sensitivities and delineations are preliminary and may change following a 2nd assessment.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The screening tool identifies two additional avifauna SCC, Secretarybird (*Sagittarius serpentarius*) and Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 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
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low
Secretarybird	*Sagittarius serpentarius*	VU	VU	Moderate

Tawny Eagle	*Aquila rapax*	EN	VU	Moderate
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low
White-backed Vulture	*Gyps africanus*	CR	CR	High

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

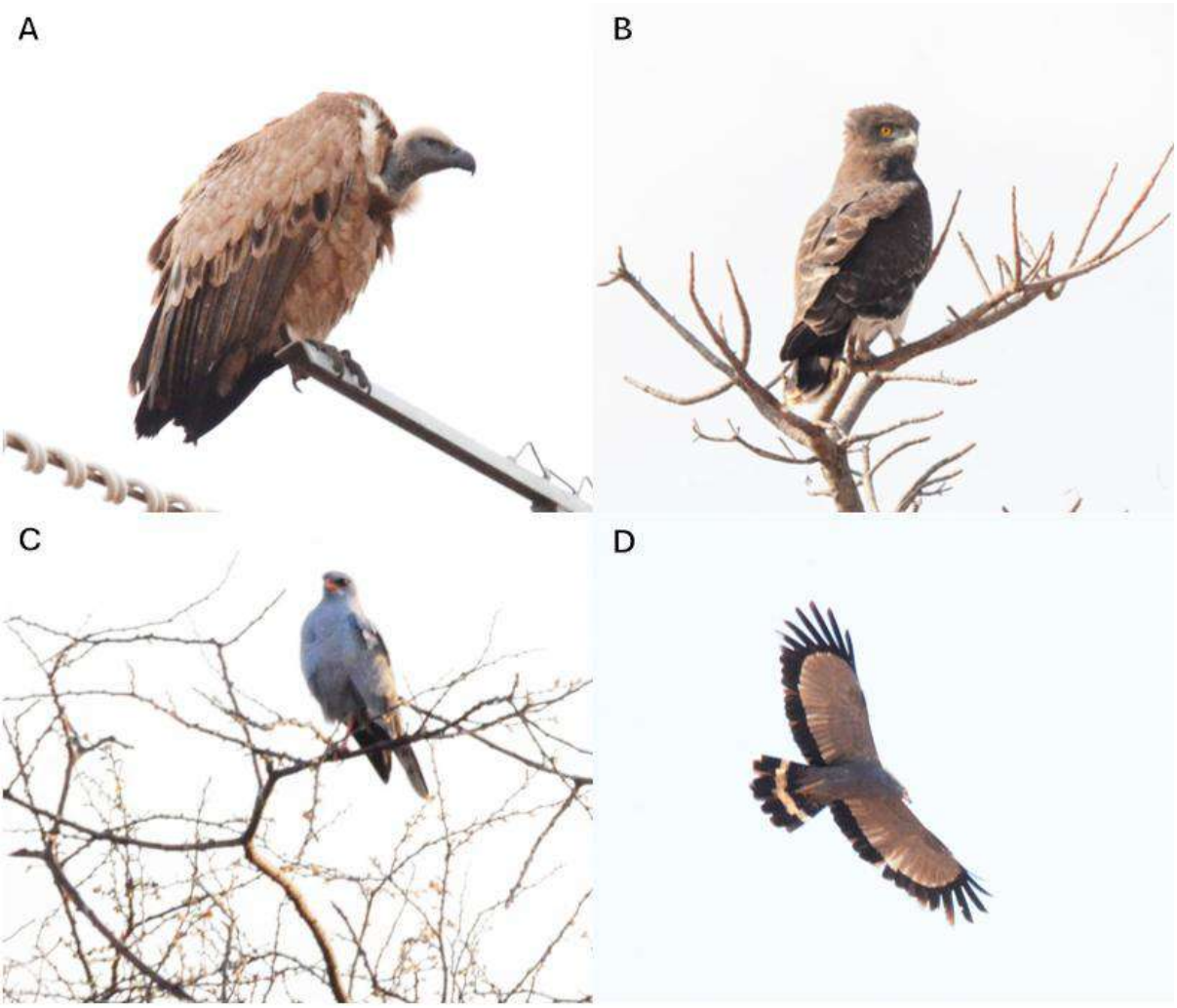

Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Three (3) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

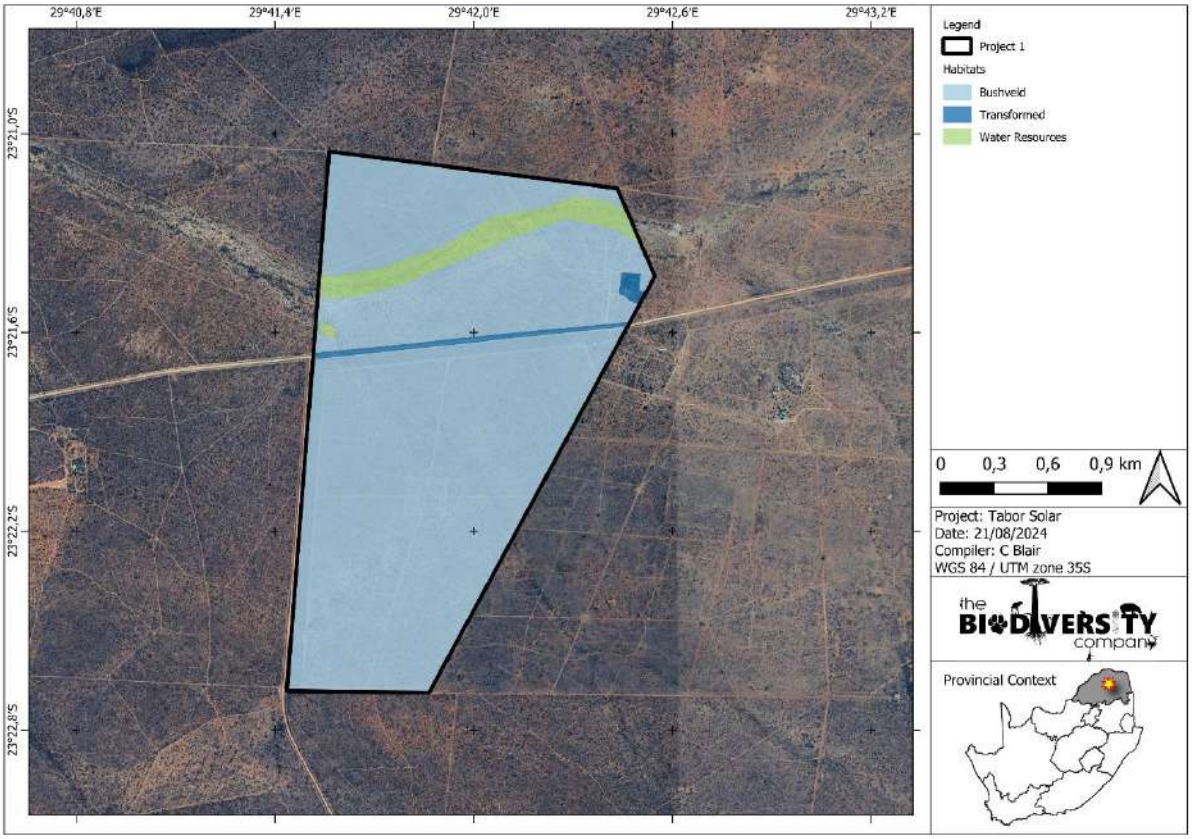

Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'59.13"S, 29°41'58.54"E.

3.2.2 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-4 Transformed Habitat at 23°21'39.39"S, 29°41'43.53"E

3.2.3 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Only one expected SCC is dependent on water resources as a habitat for foraging, Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by this species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

3.3 Site Ecological Importance

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

Three habitat types were delineated within the Project Area, namely Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High**	**Medium**	**Medium**	**Medium** Will recover slowly (~ more than 10 years) to restore >	**Medium** Minimisation and restoration

	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		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.	mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Water Resources	**Low** No confirmed or highly likely populations of SCC.	**Medium** 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**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-5).

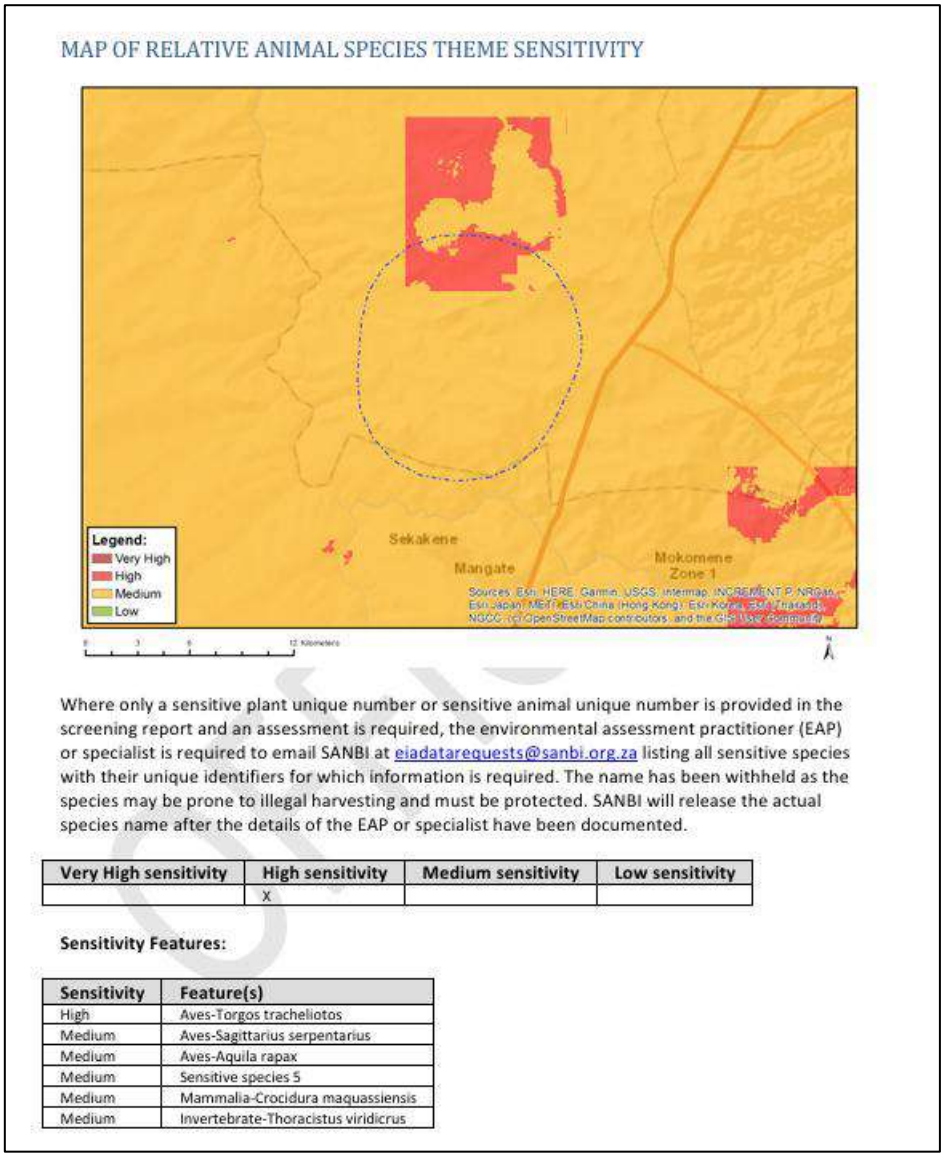

Figure 3-5 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-6.

Table 3-3 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	Bushveld	Medium	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Transformed	Very Low	Disputed – Habitat has been severely altered with limited potential to support SCC.
		Water Resources	Medium	Disputed – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

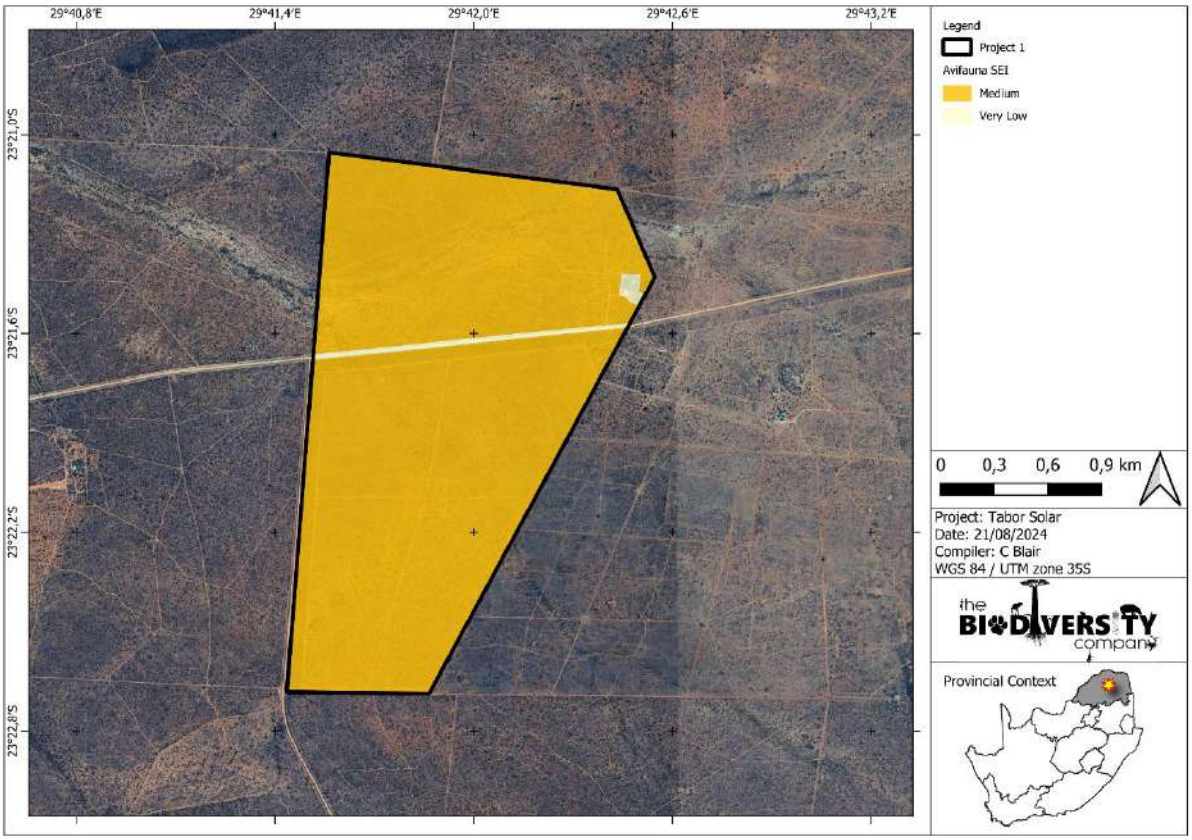

Figure 3-6 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing and brush cutting of vegetation for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and cause dust pollution. If non-environmentally friendly dust suppressants are used, chemical pollution can occur. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

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

Large birds are particularly susceptible to electrocution because, owing to their relatively large bodies, they can touch conductors and ground/earth wires or earthed devices simultaneously. The chances of

electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties.

Fencing of the PV site can influence birds in six ways (Birdlife SA, 2015):

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

Chemical pollution from PV cleaning, if not environmentally friendly, will result in either long term or short-term poisoning. Should this chemical run into the water sources it would also impact the whole bird population and not just species found in and around the PV footprint.

PV sites lead to a significant loss of vegetation, to minimise the risk of fire (Birdlife, 2017), which will result in the displacement of various avifauna species.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures that are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- Compile and implement a Rehabilitation Plan from the onset of the project.
- Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of veld fires around the project site.
- A Solid Waste Management Plan must be developed and implemented to avoid impacts to surrounding habitats.
- Apply covers on phases or grounds where adequate separation is not feasible. Examples of covers include insulator/conductor covers, bushing covers, arrester covers, cutout covers, and jumper wire covers.
- Fencing mitigations:
    - Top 2 strands must be smooth wire.

- Routinely retention loose wires.
- Minimum 30 cm between wires.

- Provide Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed Tabor Solar 1 PV was determined to be 'Medium,' 'Low,' or 'Very Low' depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.
- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.
- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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**
Functionality	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

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Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 2

Vhembe District Municipality, Limpopo Province, South Africa

21 August 2024

Prepared by:

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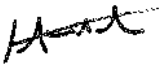
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 2**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar PV 2	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	Dr Lindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the Tabor Solar 2 facility. The other facilities and associated gridlines are assessed separately. The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of the project area provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

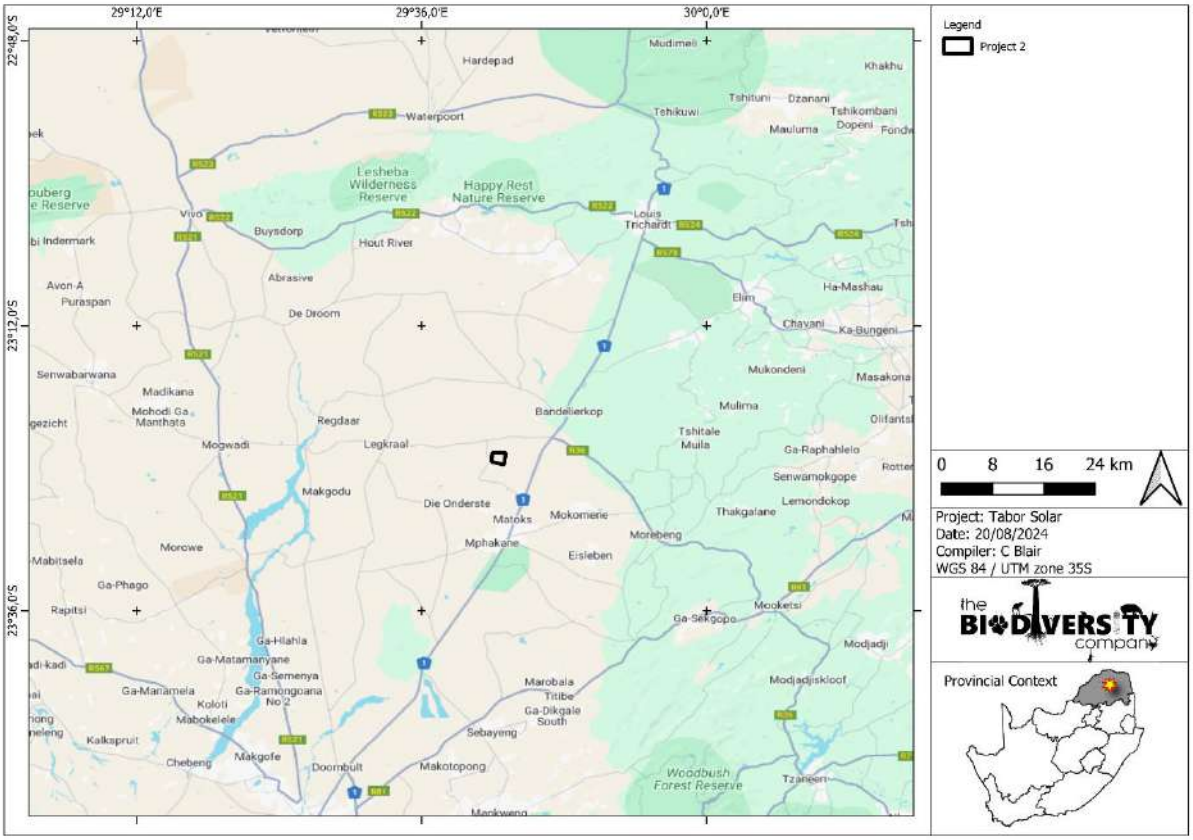


Figure 1-1 Proposed location of the project area in relation to the nearby towns

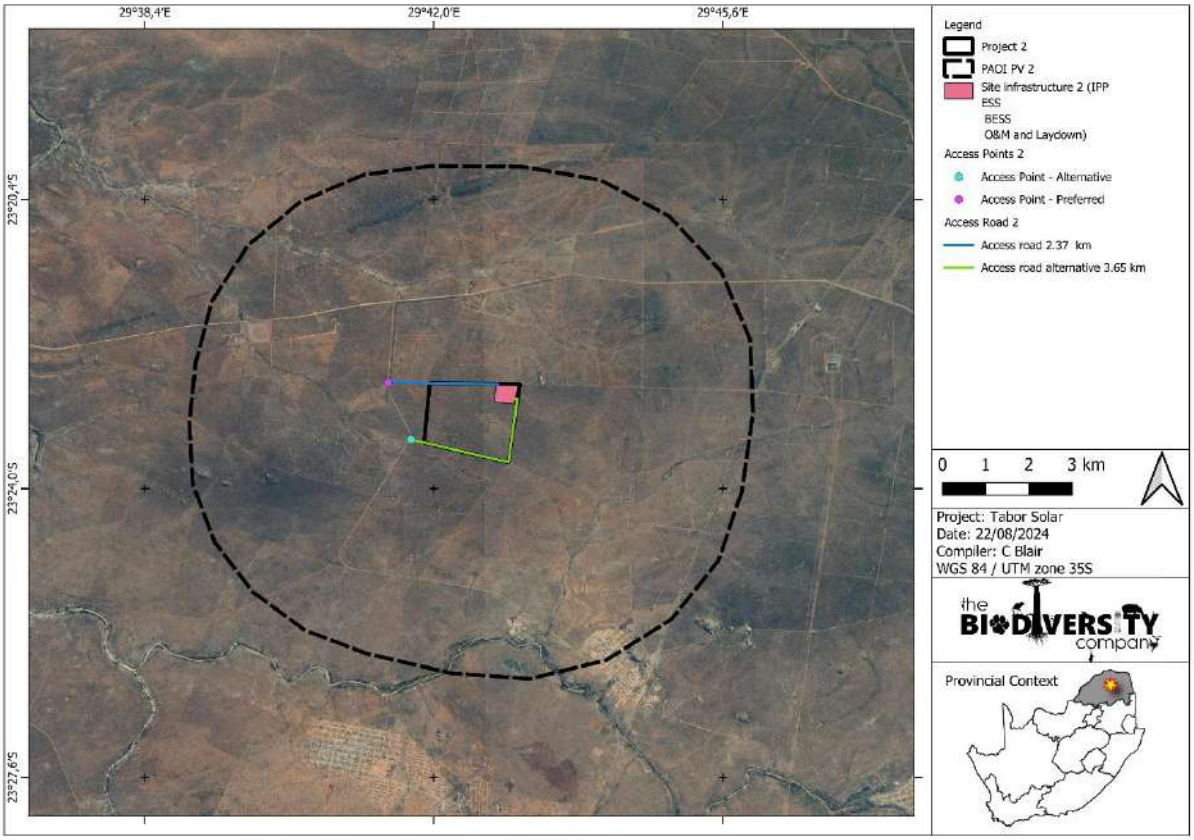


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey is required for a Regime 2 assessment. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The first avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey. Another survey is required for a Regime 2 assessment, this second survey is scheduled for the upcoming wet season;
- 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; and
- The sensitivities and delineations are preliminary and may change following a 2nd assessment.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). Three additional SCC were identified by the screening tool, African Finfoot (*Podica senegalensis*), Secretarybird (*Sagittarius serpentarius*) and Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 Threatened avifauna species that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable

Common Name	Scientific Name	Regional*	Global+	Likelihood of occurrence
African Finfoot	*Podica senegalensis*	VU	LC	Low
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Secretarybird	*Sagittarius serpentarius*	VU	VU	Moderate
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low

Tawny Eagle	*Aquila rapax*	EN	VU	Moderate
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low
White-backed Vulture	*Gyps africanus*	CR	CR	High

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

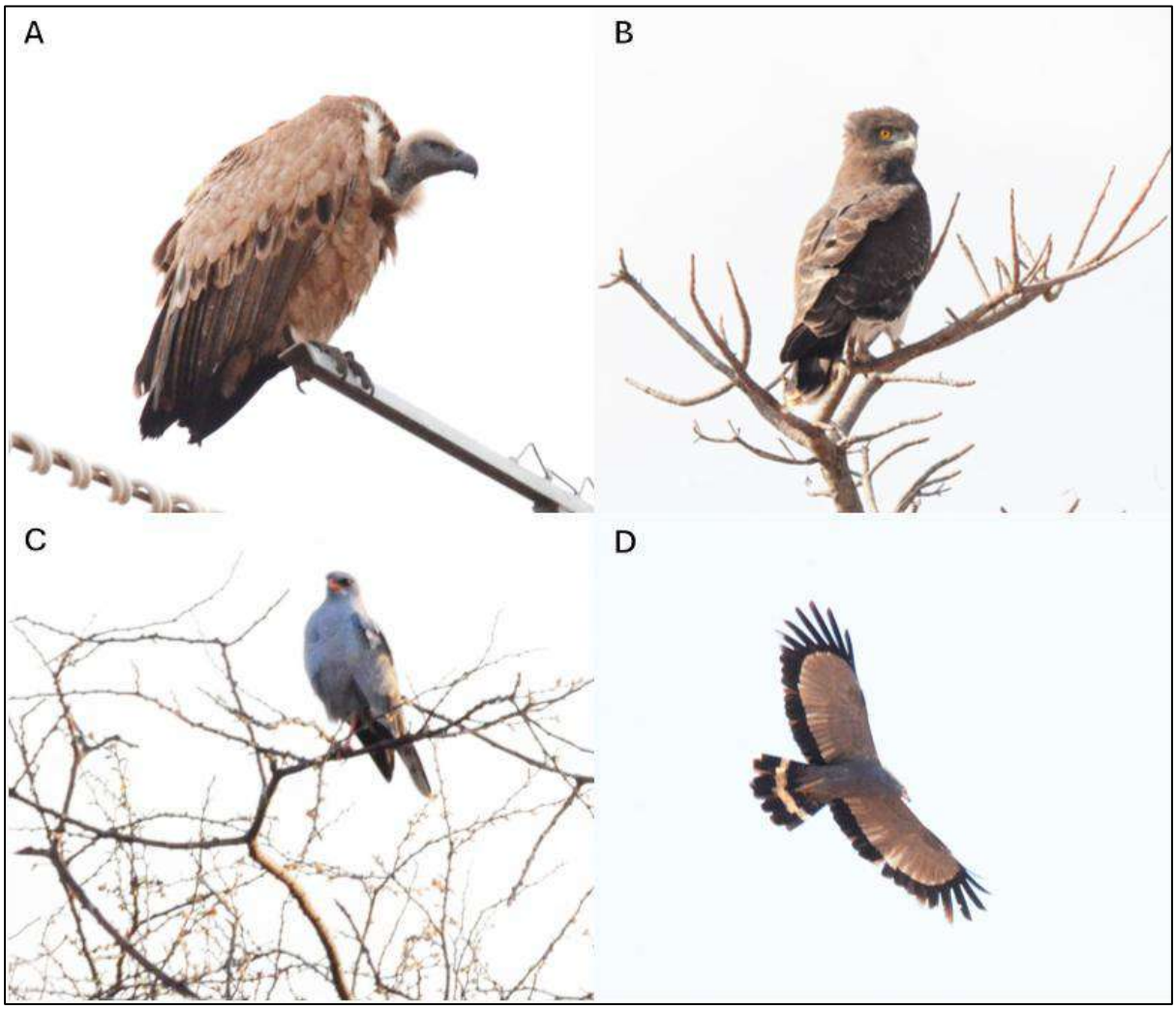


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Three (3) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'27.68"S, 29°40'25.30"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°23'19.72"S, 29°42'42.56"E.

3.2.3 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

3.3 Site Ecological Importance

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

Three habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, and Transformed. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

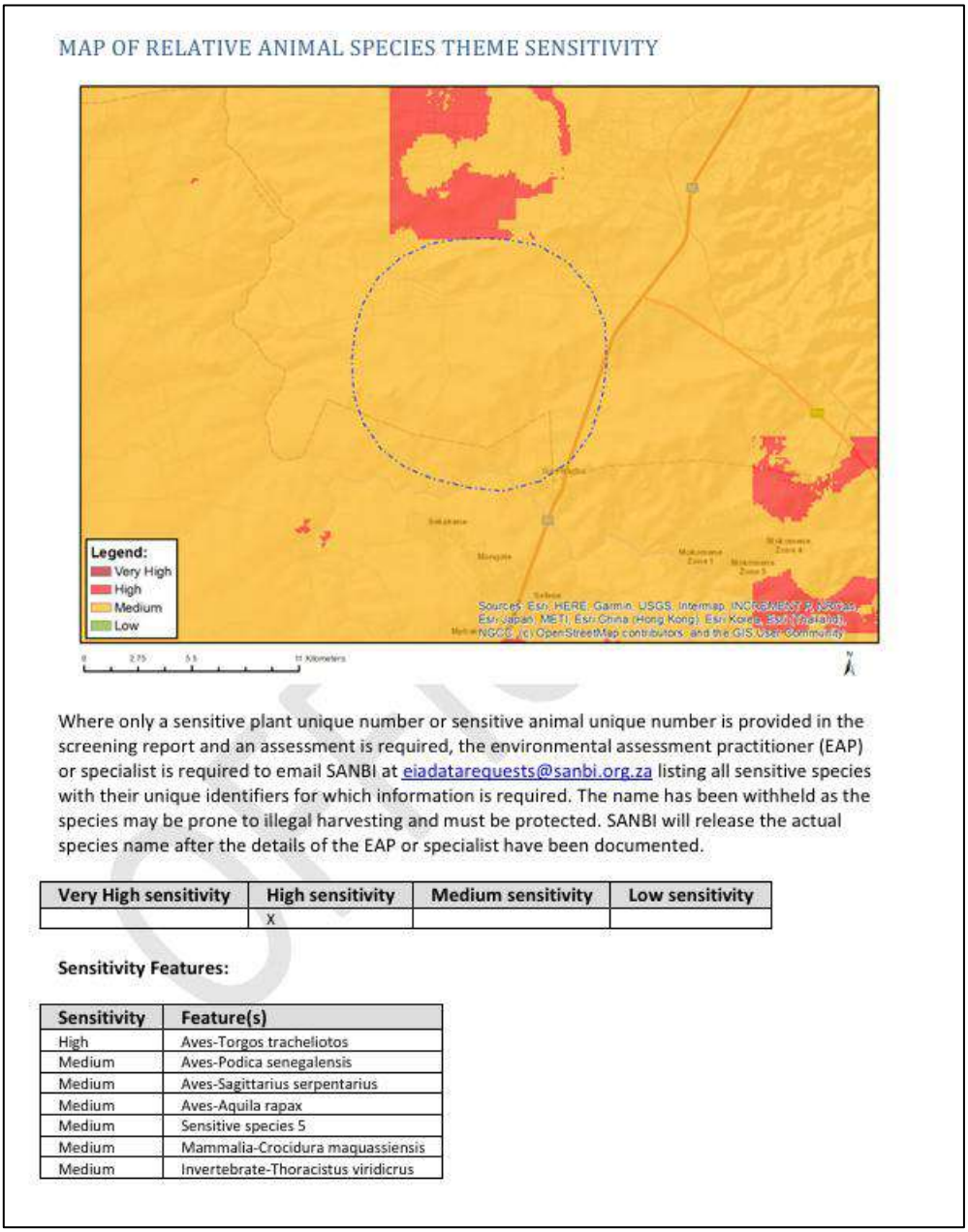
Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

	returning to a site once the disturbance or impact has been removed.	

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-5).



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Torgos tracheliotos
Medium	Aves-Podica senegalensis
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Aquila rapax
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-5 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

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

The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-6.

Table 3-3 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	Bushveld	Medium	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Secondary Bushveld	Low	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
		Transformed	Very Low	Disputed – Habitat has been severely altered with limited potential to support SCC.

Figure 3-6 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing and brush cutting of vegetation for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and cause dust pollution. If non-environmentally friendly dust suppressants are used, chemical pollution can occur. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

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

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

Fencing of the PV site can influence birds in six ways (Birdlife SA, 2015):

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

Chemical pollution from PV cleaning, if not environmentally friendly, will result in either long term or short-term poisoning. Should this chemical run into the water sources it would also impact the whole bird population and not just species found in and around the PV footprint.

PV sites lead to a significant loss of vegetation, to minimise the risk of fire (Birdlife, 2017), which will result in the displacement of various avifauna species.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures that are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- Compile and implement a Rehabilitation Plan from the onset of the project.

- Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of veld fires around the project site.

- A Solid Waste Management Plan must be developed and implemented to avoid impacts to surrounding habitats.

- Apply covers on phases or grounds where adequate separation is not feasible. Examples of covers include insulator/conductor covers, bushing covers, arrester covers, cutout covers, and jumper wire covers.

- Fencing mitigations:

    - Top 2 strands must be smooth wire.

    - Routinely retention loose wires.

    - Minimum 30 cm between wires.

- Provide Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed Tabor Solar 2 PV was determined to be 'Medium', 'Low' or 'Very Low', depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.

- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.

- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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**
Functionality	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 Summary of Resource Resilience (RR) criteria

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

After the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 3

Vhembe District Municipality, Limpopo Province, South Africa

21 August 2024

Prepared by:

The Biodiversity Company

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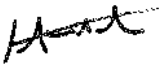
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 3**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar PV 3	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	Dr Lindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the Tabor Solar 3 facility. The other facilities and associated gridlines are assessed separately. The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 5 km area around the project footprint provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

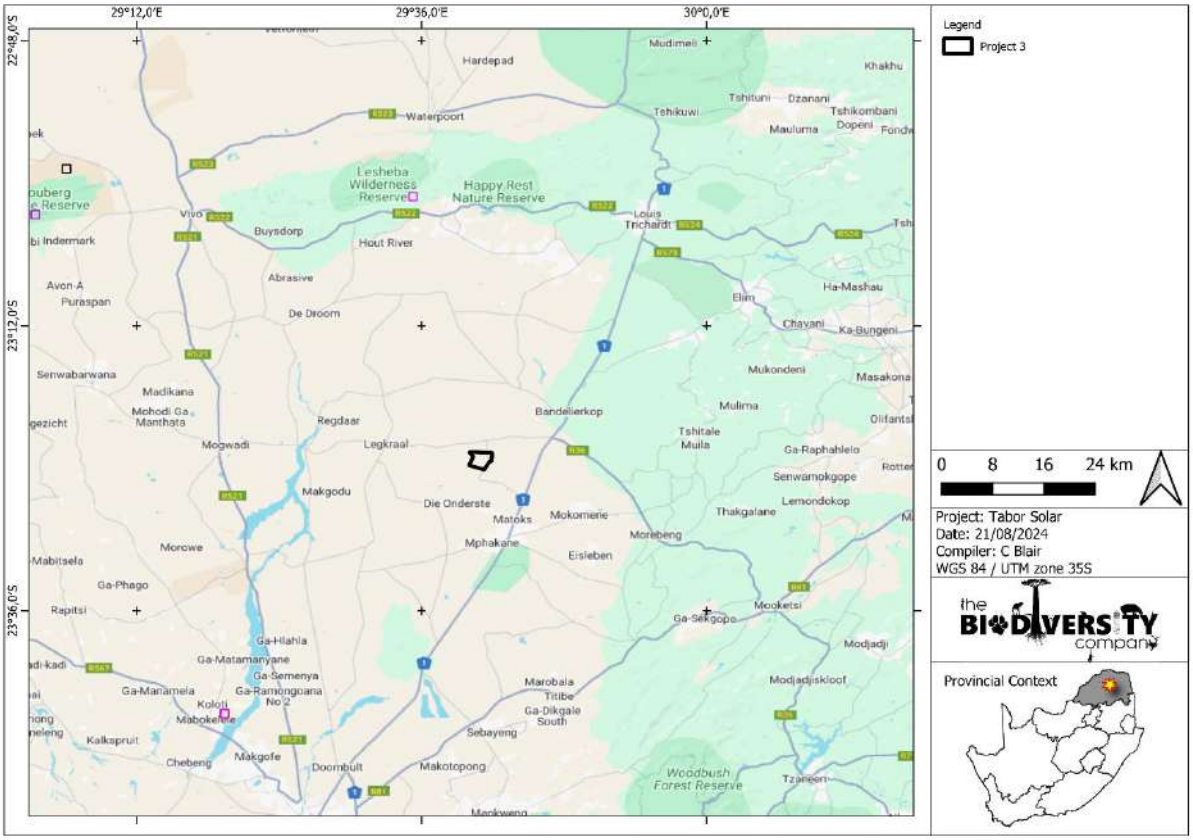


Figure 1-1 Proposed location of the project area in relation to the nearby towns

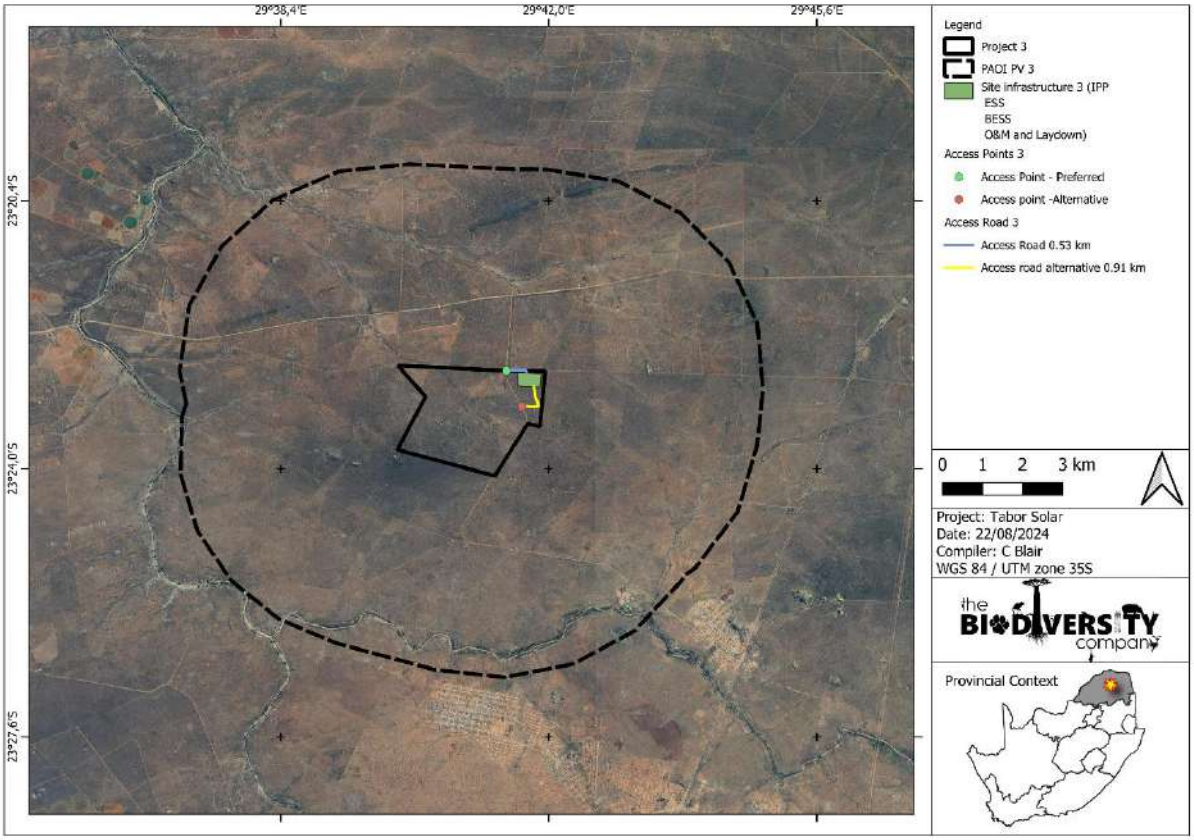


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey is required for a Regime 2 assessment. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The first avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey. Another survey is required for a Regime 2 assessment, this second survey is scheduled for the upcoming wet season;
- 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; and
- The sensitivities and delineations are preliminary and may change following a 2nd assessment.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The screening tool identifies three additional avifauna SCC, African Finfoot (*Podica senegalensis*), Secretarybird (*Sagittarius serpentarius*) and Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 Threatened avifauna species that are expected to occur within the PAOI. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable

Common Name	Scientific Name	Regional*	Global+	Likelihood of occurrence
African Finfoot	*Podica senegalensis*	VU	LC	Low
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Secretarybird	*Sagittarius serpentarius*	VU	VU	Moderate
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low

Tawny Eagle	*Aquila rapax*	EN	VU	Moderate
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low
White-backed Vulture	*Gyps africanus*	CR	CR	High

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

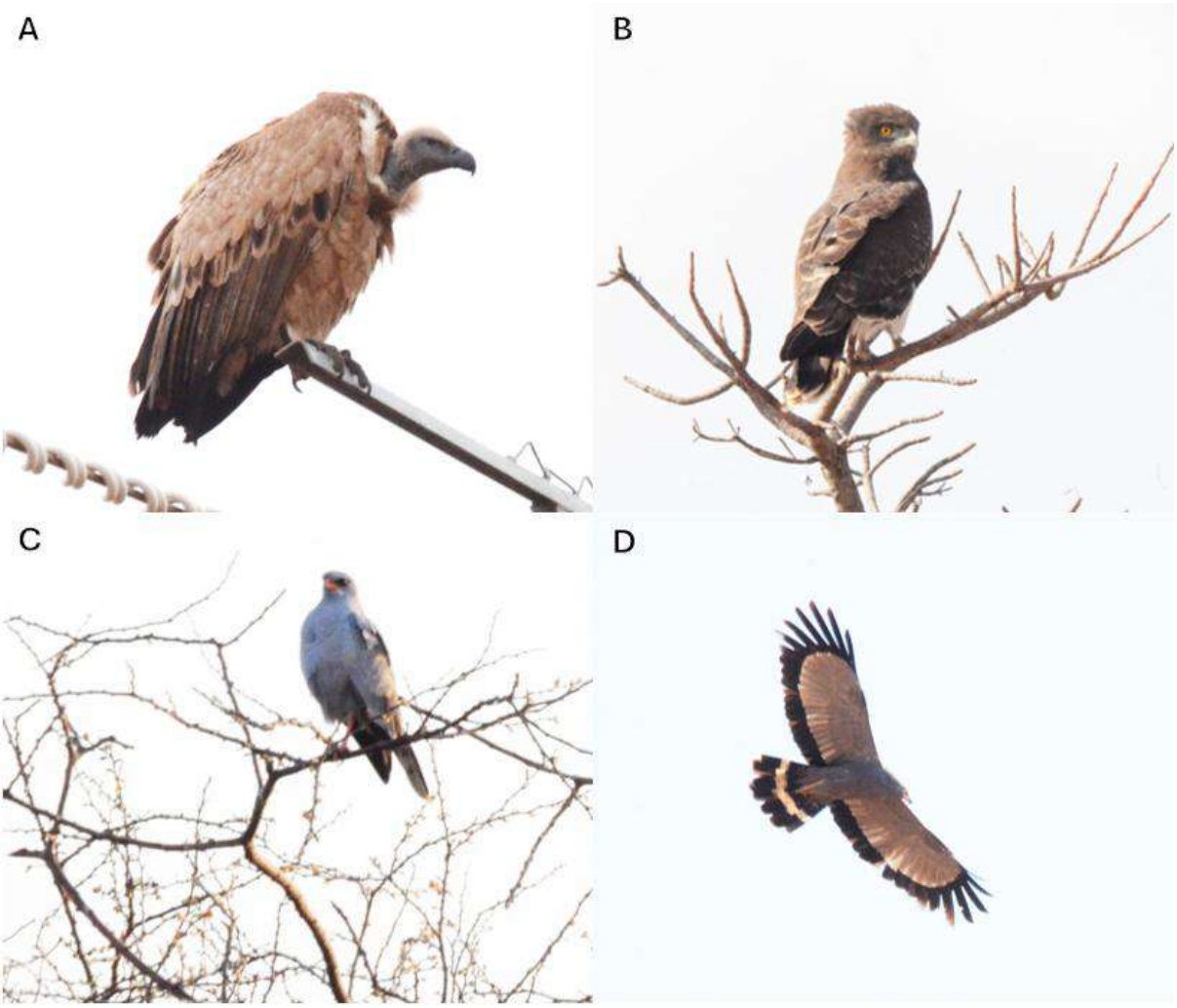


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Five (5) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

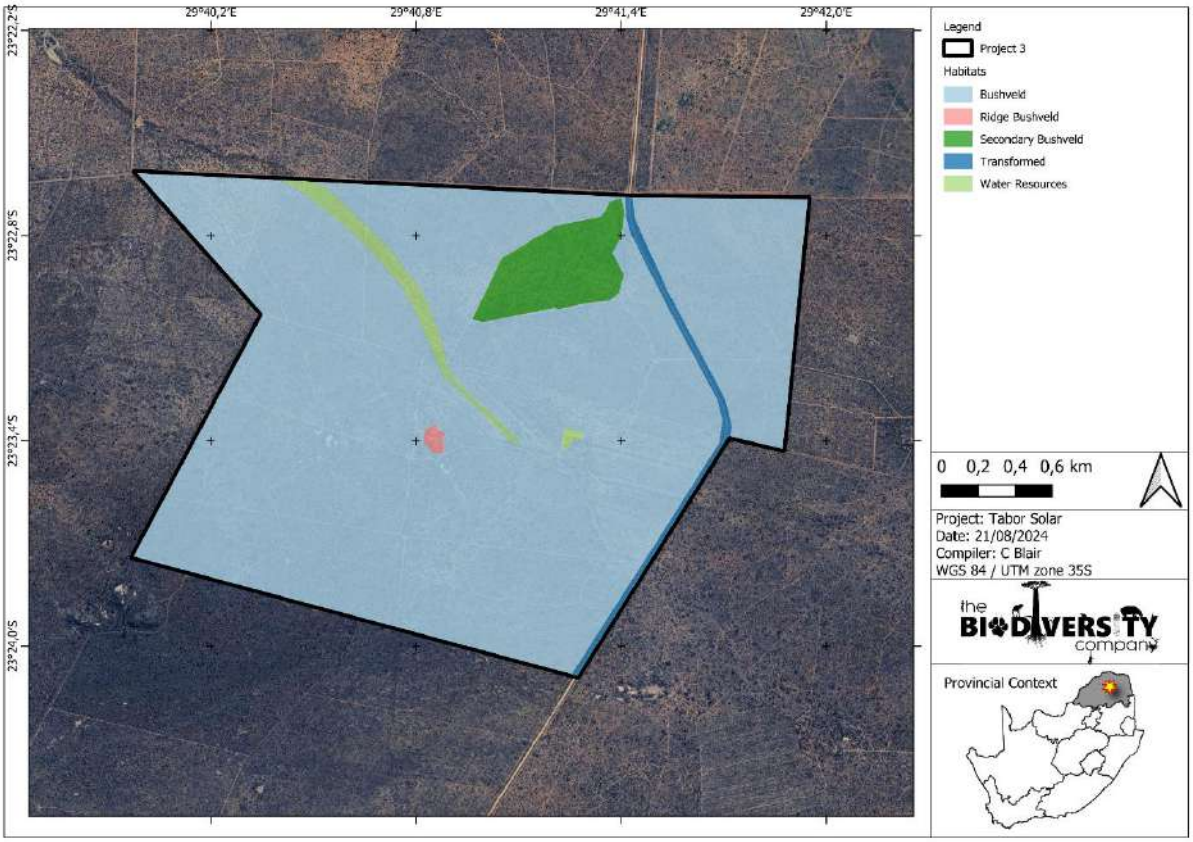


Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°23'2.06"S, 29°40'25.03"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°22'10.36"S, 29°40'38.30"E.

3.2.3 Ridge Bushveld

This habitat is similar in composition to bushveld but is present on rocky ridges and hills. It differs by having large boulders scattered through the habitat and being on a slope. The bird community present in this habitat differs from that in the other bushveld since it includes species that are specialised inhabitants of ridges. The resource resilience and relative scarcity of this habitat in the region make this habitat sensitive.

SCC possible occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-5 Ridge Bushveld Habitat at 23°23'24.07"S, 29°40'49.37"E.

3.2.4 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-6 Transformed Habitat at 23°24'5.16"S, 29°41'15.81"E

3.2.5 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Only one expected SCC is dependent on water resources as a habitat for foraging, Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by this species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

Figure 3-7 Water Resource Habitat at 23°23'23.13"S, 29°41'13.91"E.

3.3 Site Ecological Importance

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

Five habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, Ridge Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

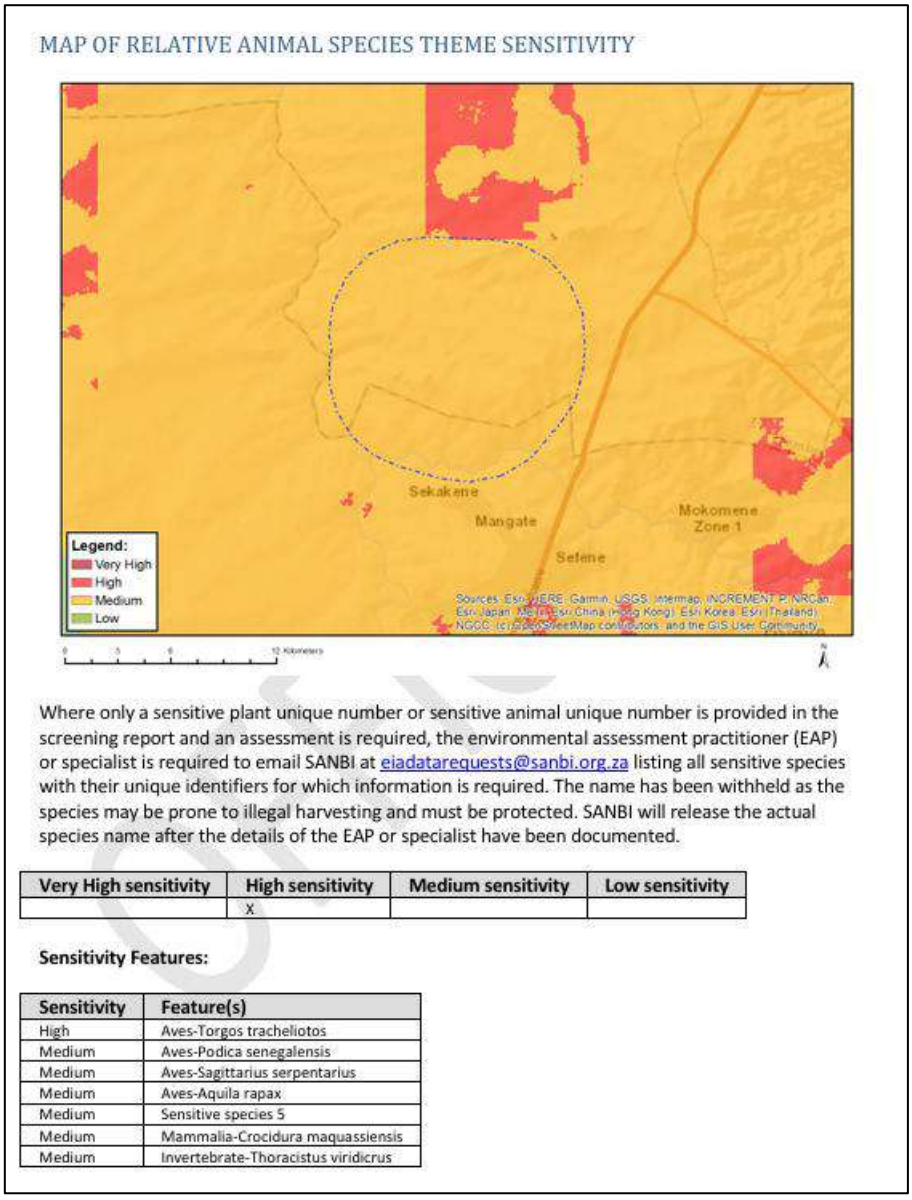
Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Ridge Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate	**Medium**	**Low** Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of	**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

	under any criterion other than A.	rehabilitation potential.		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.	acceptable. Offset mitigation may be required for high impact activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Water Resources	**Low** No confirmed or highly likely populations of SCC.	**Medium** 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**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-8).



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Torgos tracheliotos
Medium	Aves-Podica senegalensis
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Aquila rapax
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-8 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-9.

Table 3-3 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	Bushveld	Medium	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Secondary Bushveld	Low	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
		Ridge Bushveld	High	Validated – Habitat is generally intact, and high likelihood of SCC.

	Transformed	**Very Low**	Disputed – Habitat has been severely altered with limited potential to support SCC.
	Water Resources	**Medium**	Disputed – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

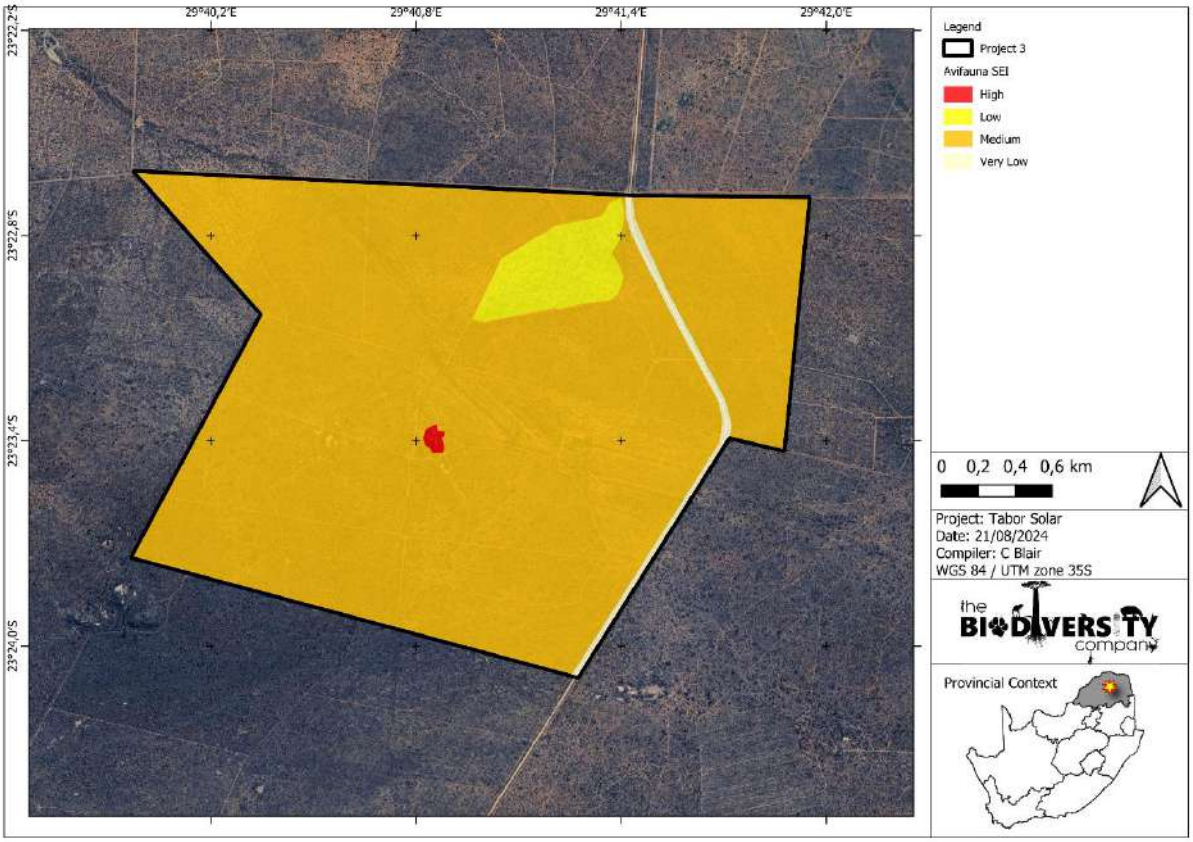


Figure 3-9 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing and brush cutting of vegetation for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and cause dust pollution. If non-environmentally friendly dust suppressants are used, chemical pollution can occur. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution, collisions, fencing, chemical pollution due to chemicals for the cleaning of the PV panels, and habitat loss. Solar panels have been implicated as a potential risk for bird collisions. Collisions are thought to arise when birds (particularly waterbirds) mistake the panels for waterbodies, known as the “lake effect” (Lovich & Ennen, 2011), or when migrating or dispersing birds become disorientated by the polarised light reflected by the panels. This “lake-effect” hypothesis has not been substantiated or refuted to date (Visser et al., 2019). It can however be said that the combination of powerlines, fencing and large infrastructure will influence avifauna species. Visser et al. (2019) performed a study at a utility-scale PV SEF in the Northern Cape and found that most of the species affected by the facility were passerine species. Larger species were

said to be more influenced by the facilities when they were found foraging close by and were disturbed by predators which resulted in collisions.

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

Fencing of the PV site can influence birds in six ways (Birdlife SA, 2015):

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

Chemical pollution from PV cleaning, if not environmentally friendly, will result in either long term or short-term poisoning. Should this chemical run into the water sources it would also impact the whole bird population and not just species found in and around the PV footprint.

PV sites lead to a significant loss of vegetation, to minimise the risk of fire (Birdlife, 2017), which will result in the displacement of various avifauna species.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures that are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- Compile and implement a Rehabilitation Plan from the onset of the project.
- Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of veld fires around the project site.
- A Solid Waste Management Plan must be developed and implemented to avoid impacts to surrounding habitats.
- Apply covers on phases or grounds where adequate separation is not feasible. Examples of covers include insulator/conductor covers, bushing covers, arrester covers, cutout covers, and jumper wire covers.

- Fencing mitigations:
    - Top 2 strands must be smooth wire.
    - Routinely retention loose wires.
    - Minimum 30 cm between wires.
- Provide Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed Tabor Solar 3 PV was determined to be 'High', 'Medium', 'Low' or 'Very Low', depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Avoidance mitigation wherever possible. Minimisation mitigation (High SEI Areas)** – 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.
- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.
- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.
- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 4

Vhembe District Municipality, Limpopo Province, South Africa

21 August 2024

Prepared by:

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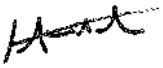
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 4**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar PV 4	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	Dr Lindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the Tabor Solar 4 facility. The other facilities and associated gridlines are assessed separately. The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 5 km area around the project footprint provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

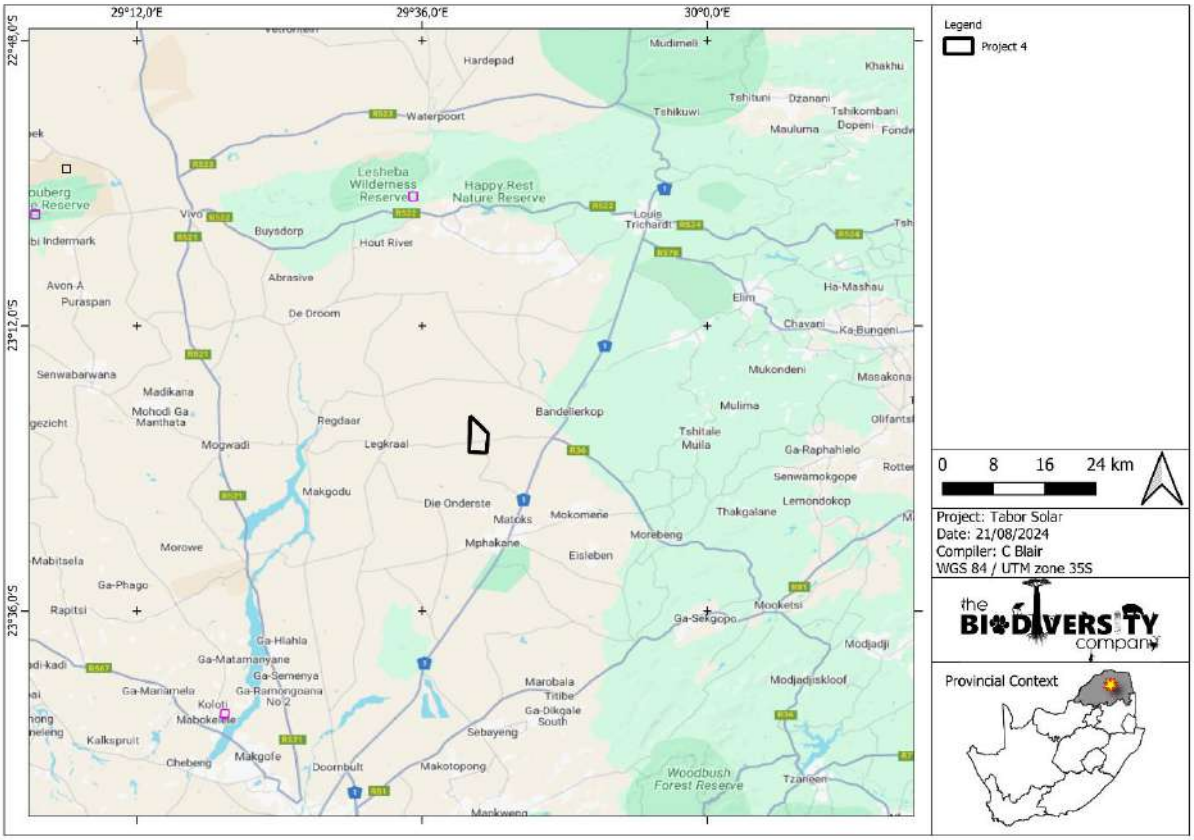


Figure 1-1 Proposed location of the project area in relation to the nearby towns

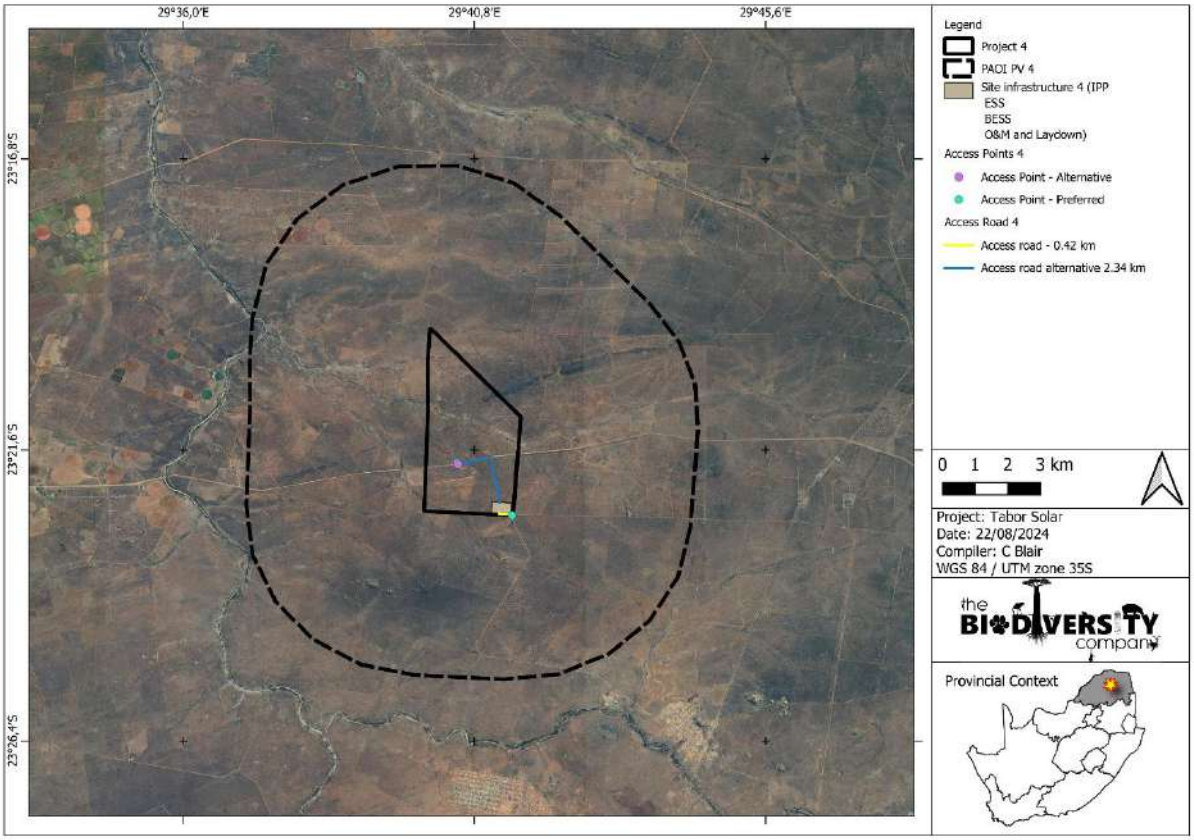


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey is required for a Regime 2 assessment. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The first avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey. Another survey is required for a Regime 2 assessment, this second survey is scheduled for the upcoming wet season;
- 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; and
- The sensitivities and delineations are preliminary and may change following a 2nd assessment.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The screening tool identifies two additional avifauna SCC, Secretarybird (*Sagittarius serpentarius*) and Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 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
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Secretarybird	*Sagittarius serpentarius*	VU	EN	Moderate
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low
Tawny Eagle	*Aquila rapax*	EN	VU	Moderate

Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low
White-backed Vulture	*Gyps africanus*	CR	CR	High

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

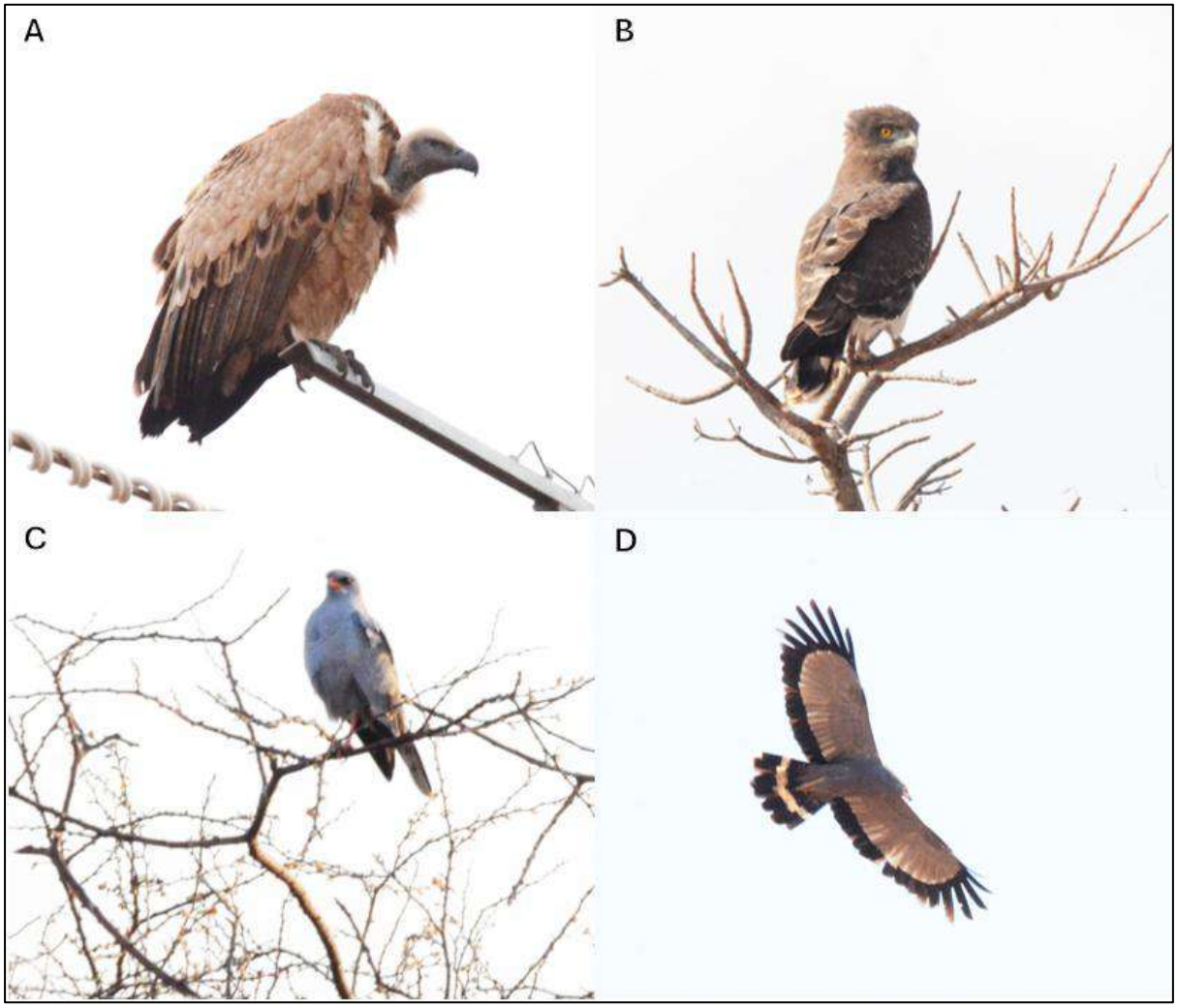


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Five (5) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below. The habitats will be updated after the aquatic assessment has been completed and the delineations are available.

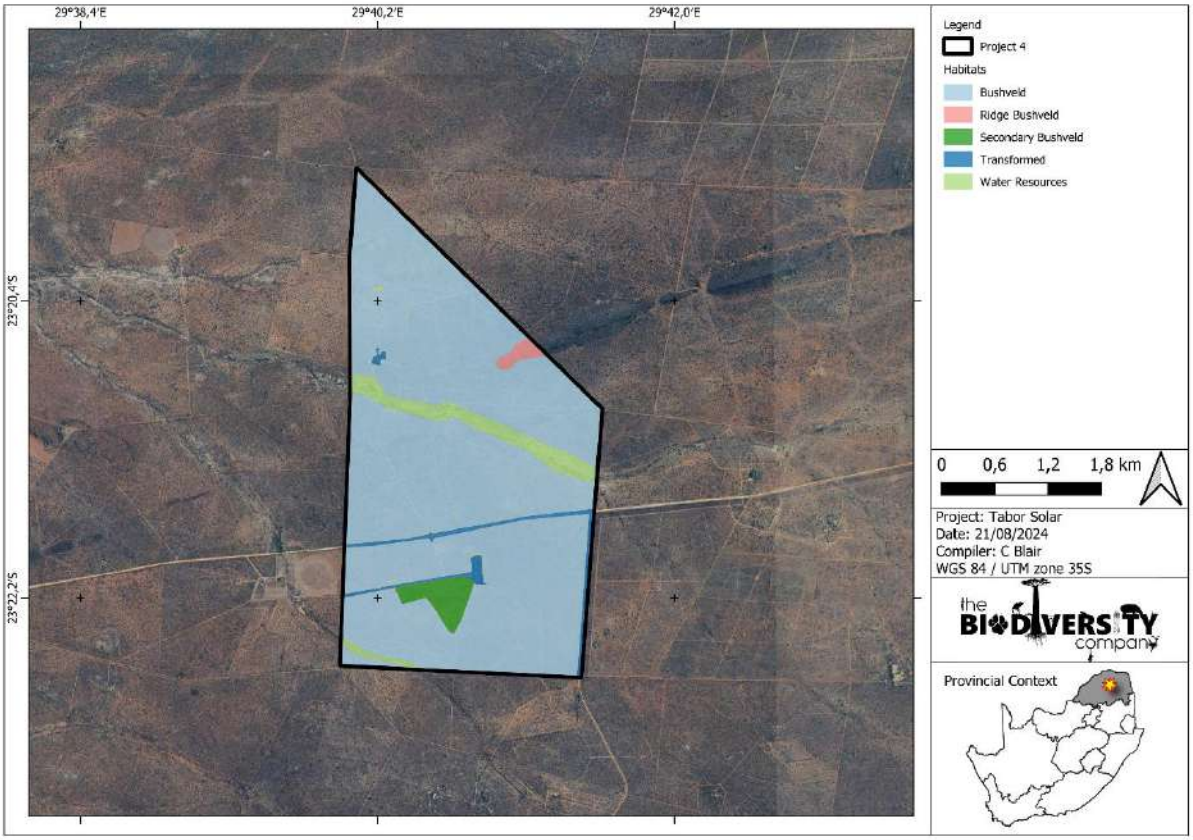


Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'27.68"S, 29°40'25.30"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°22'10.36"S, 29°40'38.30"E.

3.2.3 Ridge Bushveld

This habitat is similar in composition to bushveld but is present on rocky ridges and hills. It differs by having large boulders scattered through the habitat and being on a slope. The bird community present in this habitat differs from that in the other bushveld since it includes species that are specialised inhabitants of ridges. The resource resilience and relative scarcity of this habitat in the region make this habitat sensitive.

SCC possible occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-5 Ridge Bushveld Habitat at 23°20'43.93"S, 29°41'3.35"E.

3.2.4 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-6 Transformed Habitat at 23°20'45.20"S, 29°40'12.83"E

3.2.5 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Only one expected SCC is dependent on water resources as a habitat for foraging, Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by this species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

Figure 3-7 Water Resources Habitat at 23°20'19.05"S, 29°40'14.08"E.

3.3 Site Ecological Importance

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

Five habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, Ridge Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Ridge Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate	**Medium**	**Low** Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of	**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

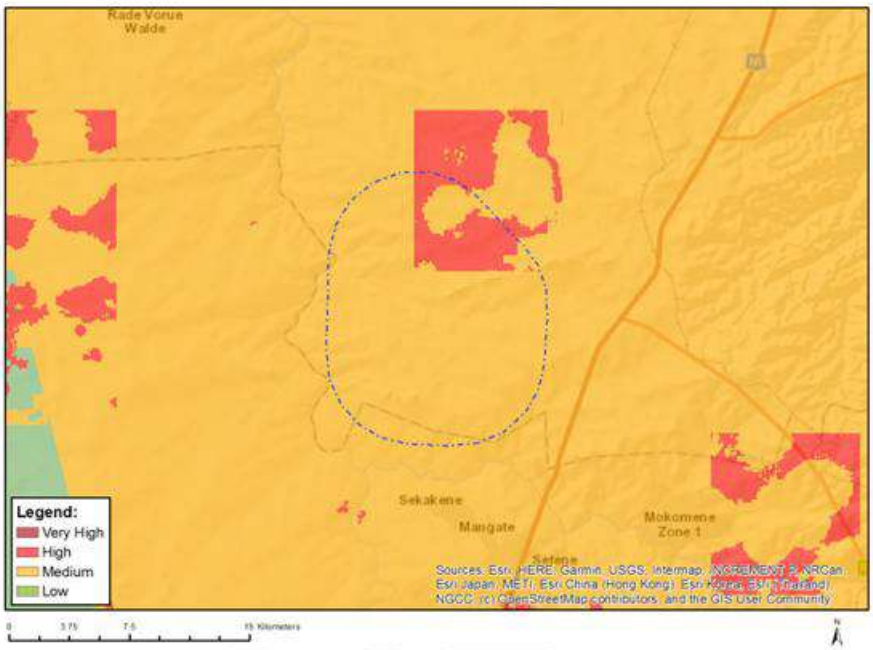
	under any criterion other than A.	rehabilitation potential.		remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	acceptable. Offset mitigation may be required for high impact activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Water Resources	**Low** No confirmed or highly likely populations of SCC.	**Medium** 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**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-8).

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Torgos tracheliotos
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Aquila rapax
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-8 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-9.

Table 3-3 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**	**Bushveld**	**Medium**	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.

	Secondary Bushveld	**Low**	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
	Ridge Bushveld	**High**	Validated – Habitat is generally intact, and high likelihood of SCC.
	Transformed	**Very Low**	Disputed – Habitat has been severely altered with limited potential to support SCC.
	Water Resources	**Medium**	Disputed – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

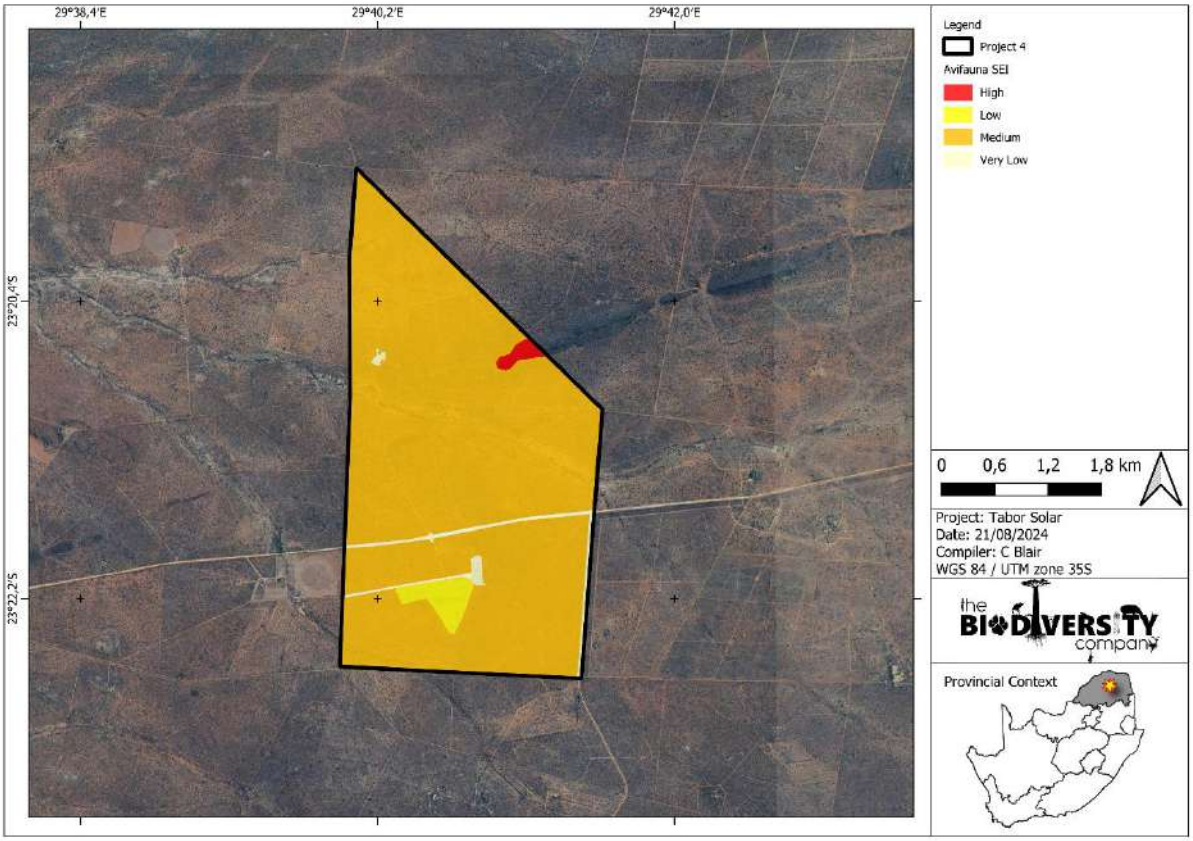


Figure 3-9 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing and brush cutting of vegetation for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and cause dust pollution. If non-environmentally friendly dust suppressants are used, chemical pollution can occur. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution, collisions, fencing, chemical pollution due to chemicals for the cleaning of the PV panels, and habitat loss. Solar panels have been implicated as a potential risk for bird collisions. Collisions are thought to arise when birds (particularly waterbirds) mistake the panels for waterbodies, known as the “lake effect” (Lovich & Ennen, 2011), or when migrating or dispersing birds become disorientated by the polarised light reflected by the panels. This “lake-effect” hypothesis has not been substantiated or refuted to date (Visser et al., 2019). It can

however be said that the combination of powerlines, fencing and large infrastructure will influence avifauna species. Visser et al. (2019) performed a study at a utility-scale PV SEF in the Northern Cape and found that most of the species affected by the facility were passerine species. Larger species were said to be more influenced by the facilities when they were found foraging close by and were disturbed by predators which resulted in collisions.

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

Fencing of the PV site can influence birds in six ways (Birdlife SA, 2015):

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

Chemical pollution from PV cleaning, if not environmentally friendly, will result in either long term or short-term poisoning. Should this chemical run into the water sources it would also impact the whole bird population and not just species found in and around the PV footprint.

PV sites lead to a significant loss of vegetation, to minimise the risk of fire (Birdlife, 2017), which will result in the displacement of various avifauna species.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures that are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- Compile and implement a Rehabilitation Plan from the onset of the project.
- Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of veld fires around the project site.
- A Solid Waste Management Plan must be developed and implemented to avoid impacts to surrounding habitats.

- Apply covers on phases or grounds where adequate separation is not feasible. Examples of covers include insulator/conductor covers, bushing covers, arrester covers, cutout covers, and jumper wire covers.

- Fencing mitigations:

    - Top 2 strands must be smooth wire.

    - Routinely retention loose wires.

    - Minimum 30 cm between wires.

- Provide Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed Tabor Solar 4 PV was determined to be 'High', 'Medium', 'Low' or 'Very Low', depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Avoidance mitigation wherever possible. Minimisation mitigation (High SEI Areas)** – 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.

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.

- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.

- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

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Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 1

Vhembe District Municipality, Limpopo Province, South Africa

16 January 2024

Prepared by:

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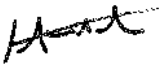
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 1**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar Gridline 1	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	Dr Lindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the gridlines associated with the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the gridline connecting the Tabor Solar 1 facility to the Tabor Main Transmission Substation (MTS). The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 2 km area around the project area provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

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

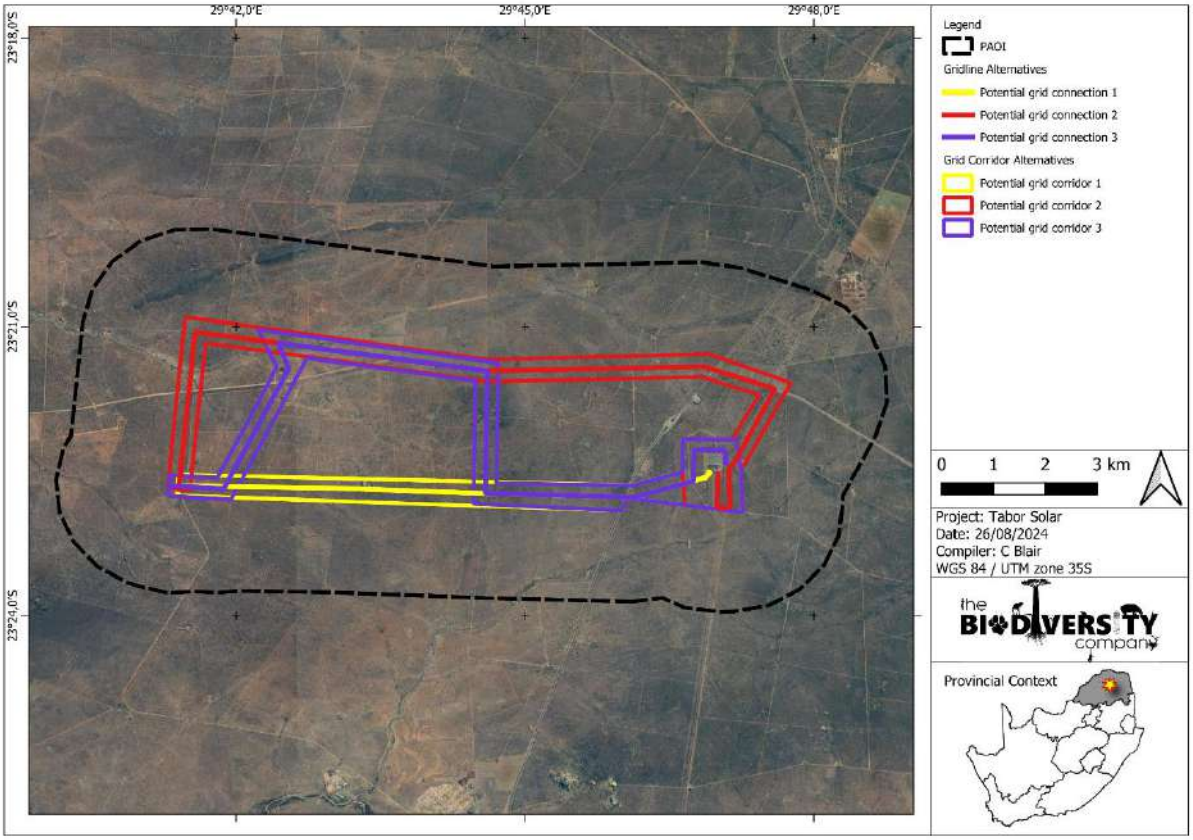


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey will be conducted in the wet season. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The first avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey;
- 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;
- Access was restricted in portions of the line, these areas were assessed from desktop perspective;
- 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.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The screening tool identifies one additional avifauna SCC, Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 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
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low
Tawny Eagle	*Aquila rapax*	EN	VU	Moderate
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low

White-backed Vulture	*Gyps africanus*	CR	CR	High

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

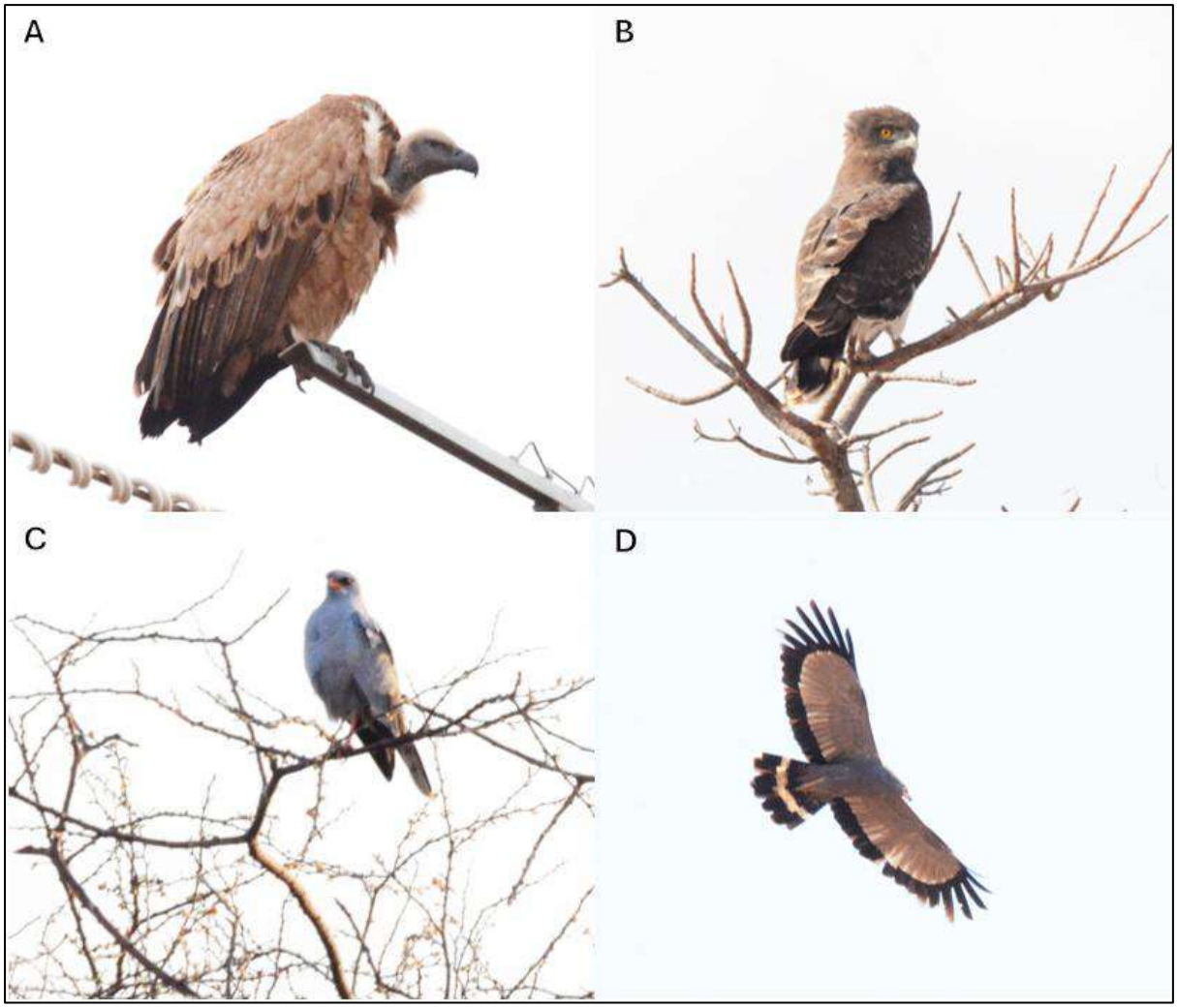


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four (4) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

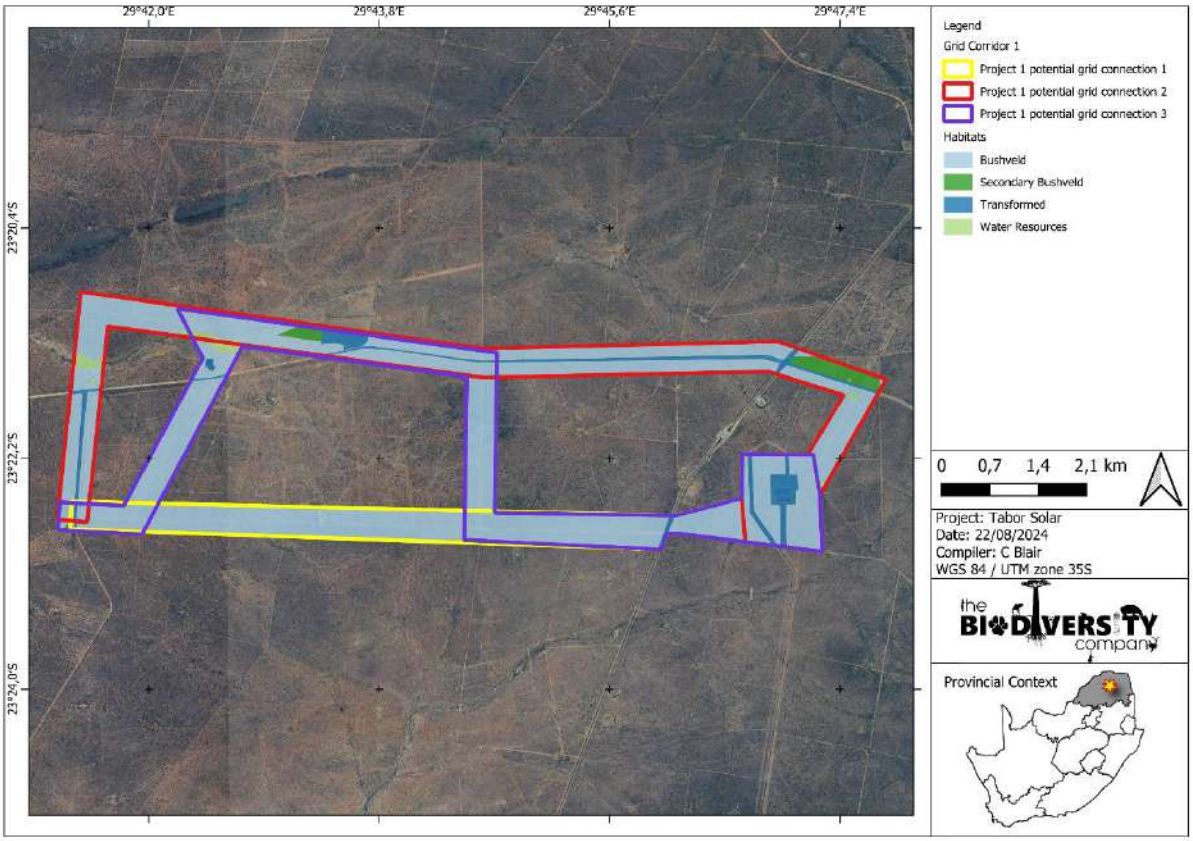


Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'27.68"S, 29°40'25.30"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°21'49.03"S, 29°42'20.07"E.

3.2.3 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-5 Transformed Habitat at 23°21'26.57"S, 29°44'36.67"E

3.2.4 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Two expected SCC are dependent on water resources as a habitat for foraging, African Finfoot (*Podica senegalensis*) and Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by these species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

Figure 3-6 Water Resources Habitat at 23°21'22.41"S, 29°41'13.91"E.

3.3 Site Ecological Importance

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

Four habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

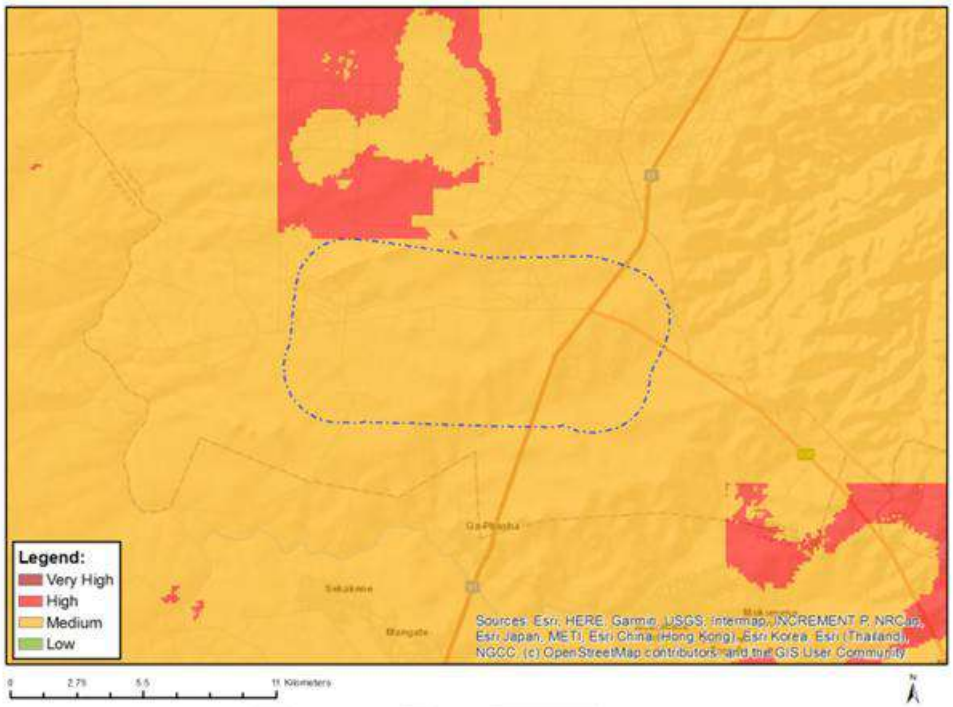
				returning to a site once the disturbance or impact has been removed.	
Water Resources	**Low** No confirmed or highly likely populations of SCC.	**Medium** Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Low**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-7).

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Torgos tracheliotos
Medium	Aves-Aquila rapax
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-7 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-8.

Table 3-3 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**	**Bushveld**	**Medium**	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Secondary Bushveld	**Low**	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
		Transformed	**Very Low**	Disputed – Habitat has been severely altered with limited potential to support SCC.
		Water Resources	**Medium**	Disputed – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

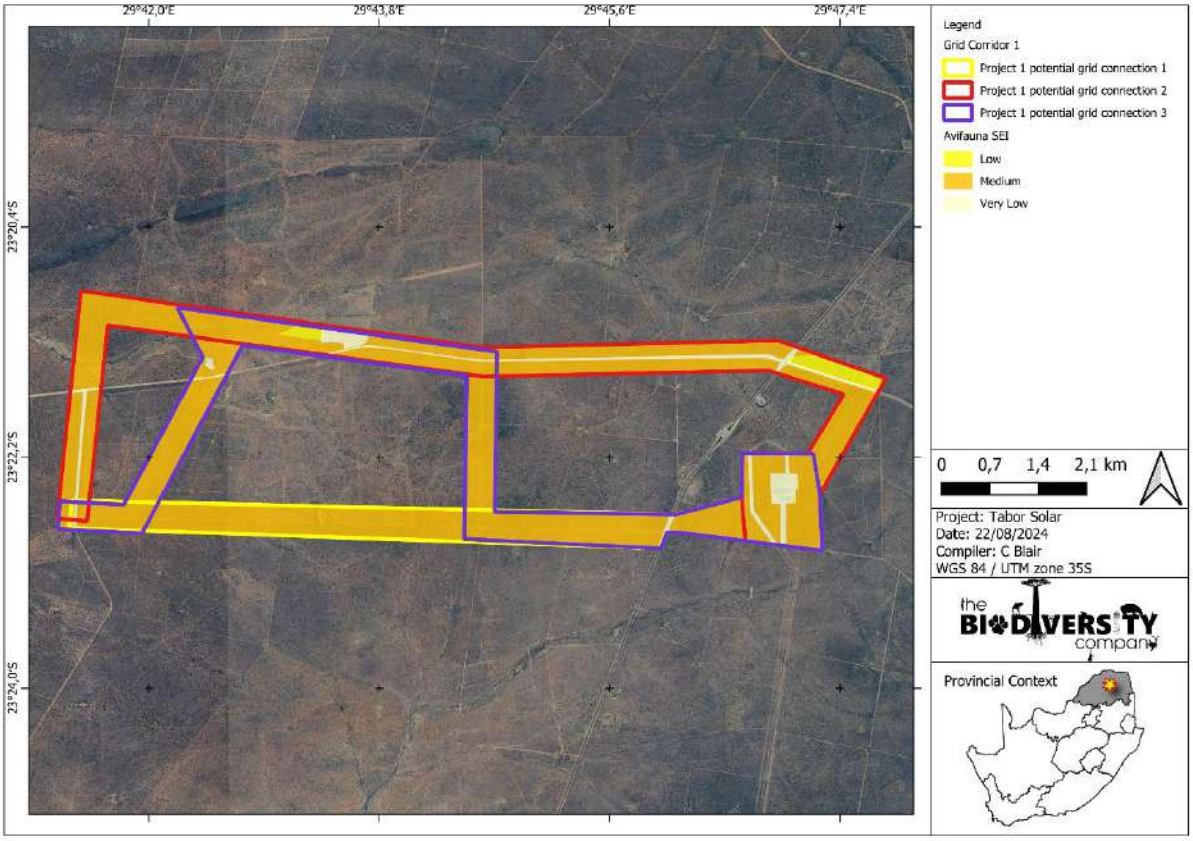


Figure 3-8 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and dust pollution. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution and collisions due to the powerlines. Birds prone to collisions can be divided into five categories; 1) large species with high body weight ratio to wingspan resulting in low manoeuvrability, 2) species that are distracted in flight this include predatory birds and smaller species with areal displays, 3) species flying at high speeds, 4) crepuscular species that are active in low light conditions, and 5) species with limited narrow forward vision (Jenkins et al., 2010; Noguera et al., 2010). Species that tend to fly in flocks also may be influenced more by collisions as the birds flying in the rear will not be able to detect the powerlines. Large passerines are particularly

susceptible to electrocution because owing to their relatively large bodies, they can touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties. Winds parallel or diagonal to cross-arms are the most detrimental, due to exacerbating the difficulty in manoeuvrability during landing or take-off.

The decommissioning phase will cause disturbance due to the removal of associated infrastructure. Furthermore, if the area is not rehabilitated, this will likely result in habitat degradation due to erosion and the encroachment of invasive alien plants.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures the are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities;
- The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). Bird diverters or spirals must be added to the transmission line to reduce fatalities;
- Water resource areas must be spanned, and development may not take place in it; and
- Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed Tabor Solar 1 PV was determined to be ‘Medium,’ ‘Low,’ or ‘Very Low’ depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.
- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.
- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

From an avifauna perspective, all route alternatives are viable, however, potential grid connection 1 is preferred since the line has fewer changes in directions, and is parallel to an existing line, both reducing the probability of collisions.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 2

Vhembe District Municipality, Limpopo Province, South Africa

22 August 2024

Prepared by:

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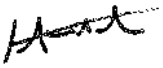
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 2**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar Gridline 2	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	DLindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the gridlines associated with the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the gridline connecting the Tabor Solar 2 facility to the Tabor Main Transmission Substation (MTS). The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 2 km area around the project area provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

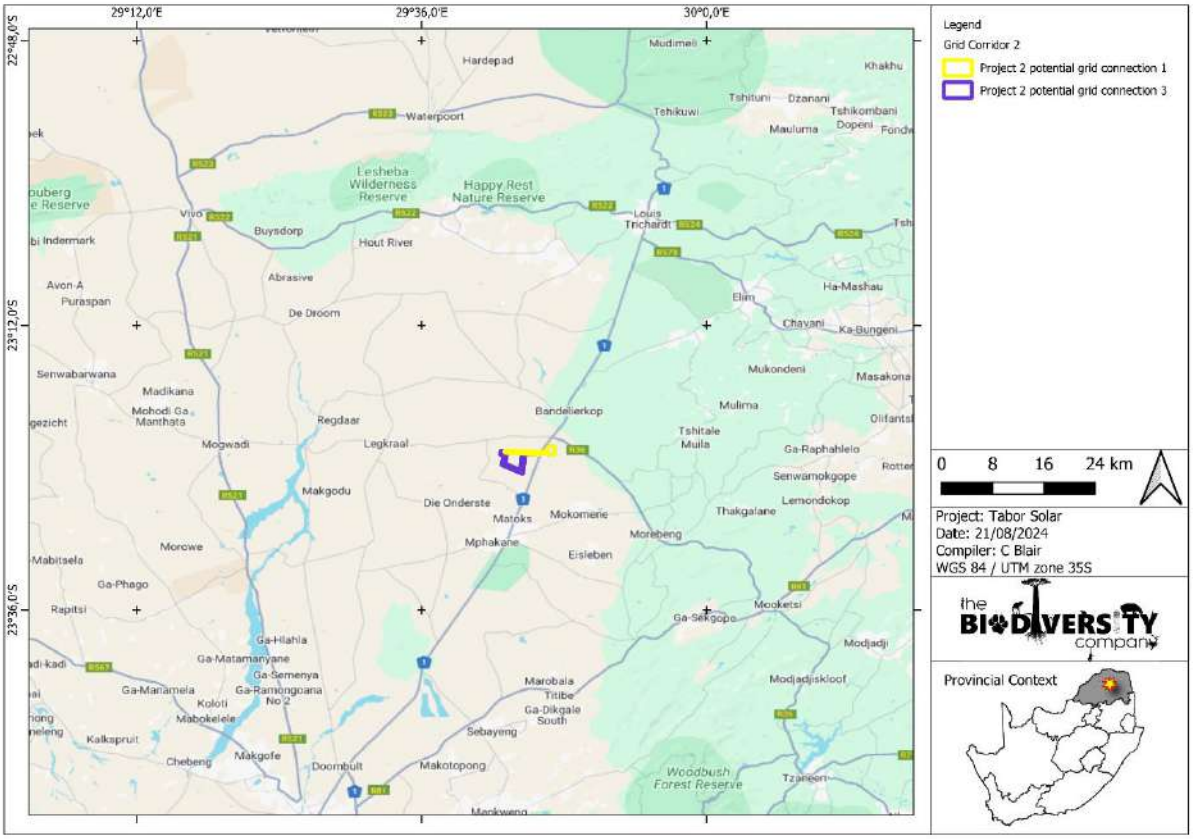


Figure 1-1 Proposed location of the project area in relation to the nearby towns

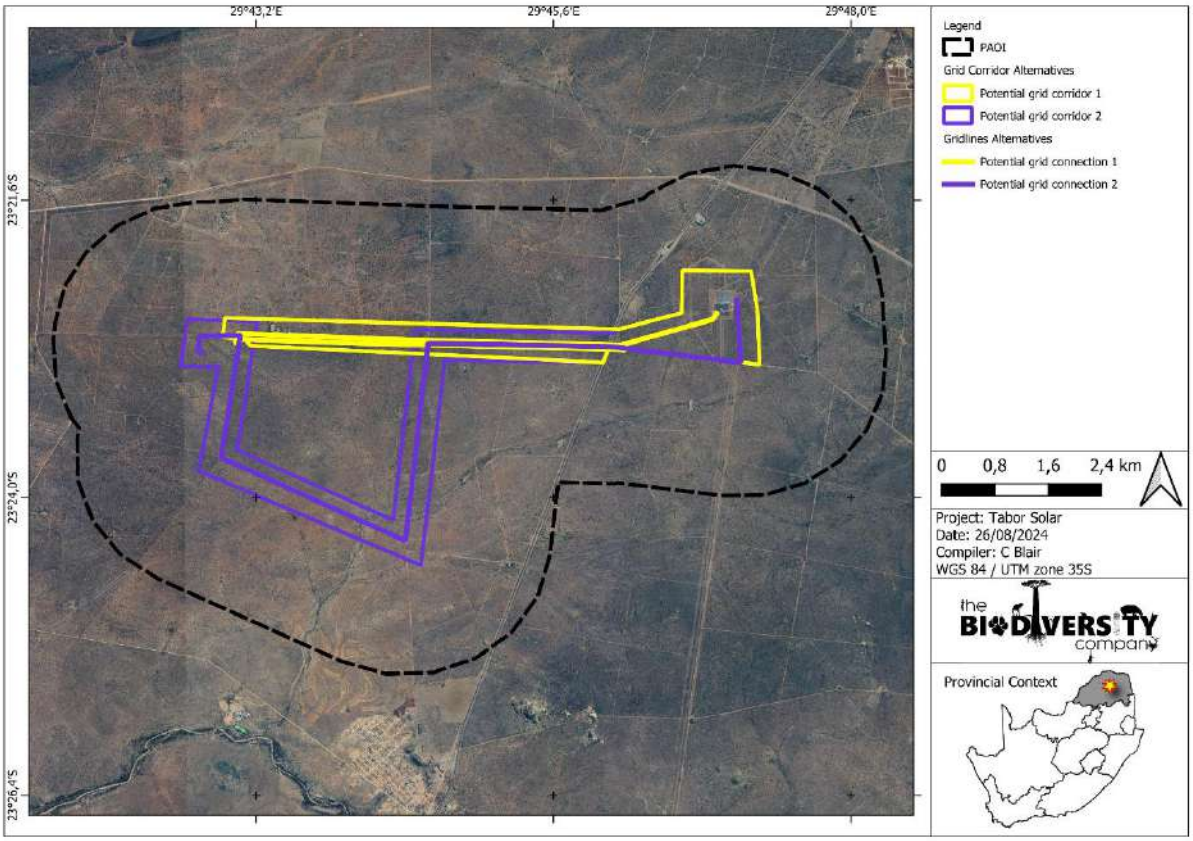


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey will be conducted in the wet season. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report ContAnother survey will be conducted in the wet seasonnt Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey;
- 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;
- Access was restricted in portions of the line, these areas were assessed from desktop perspective.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 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
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	Moderate
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low
White-backed Vulture	*Gyps africanus*	CR	CR	High

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

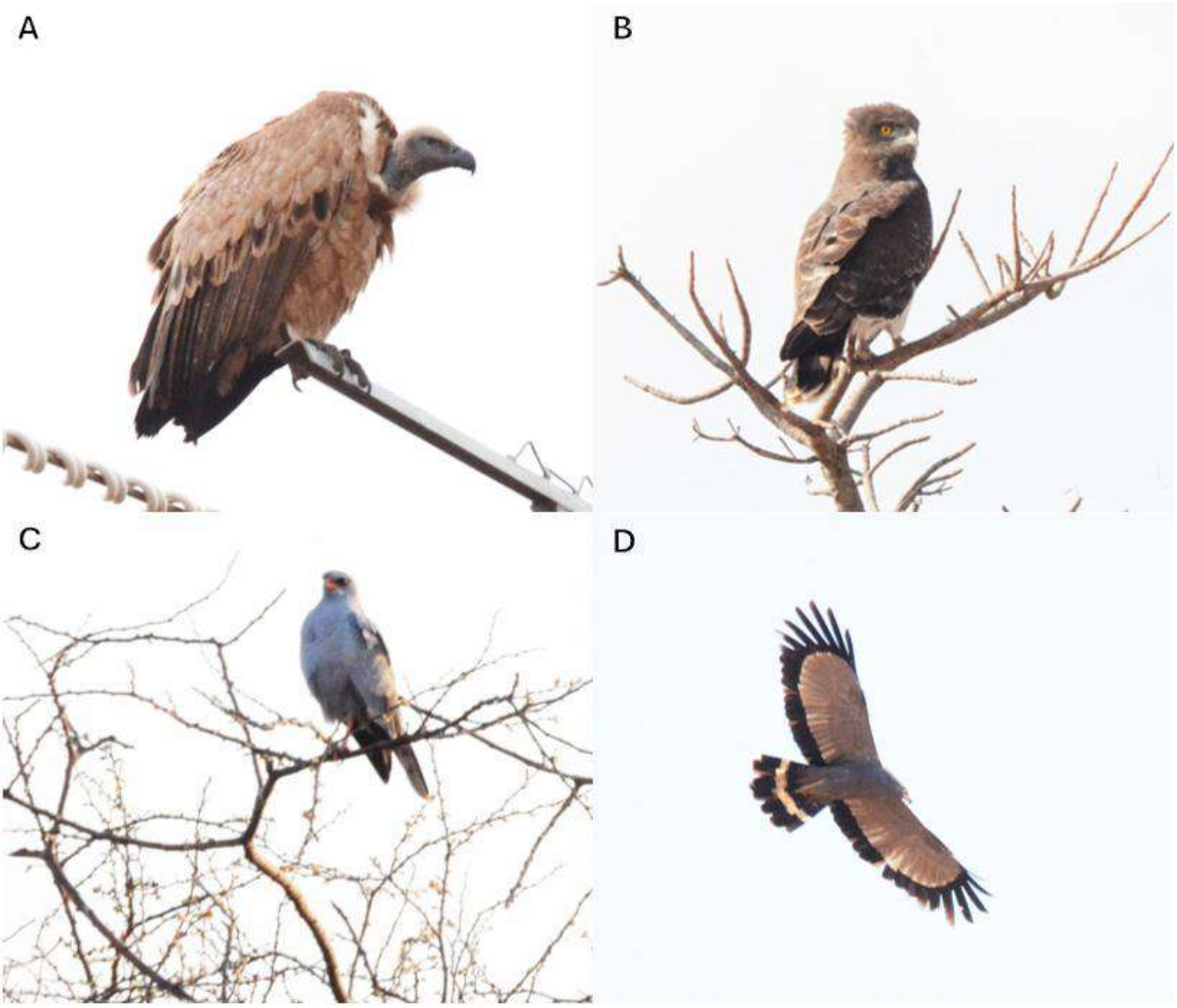


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four (4) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

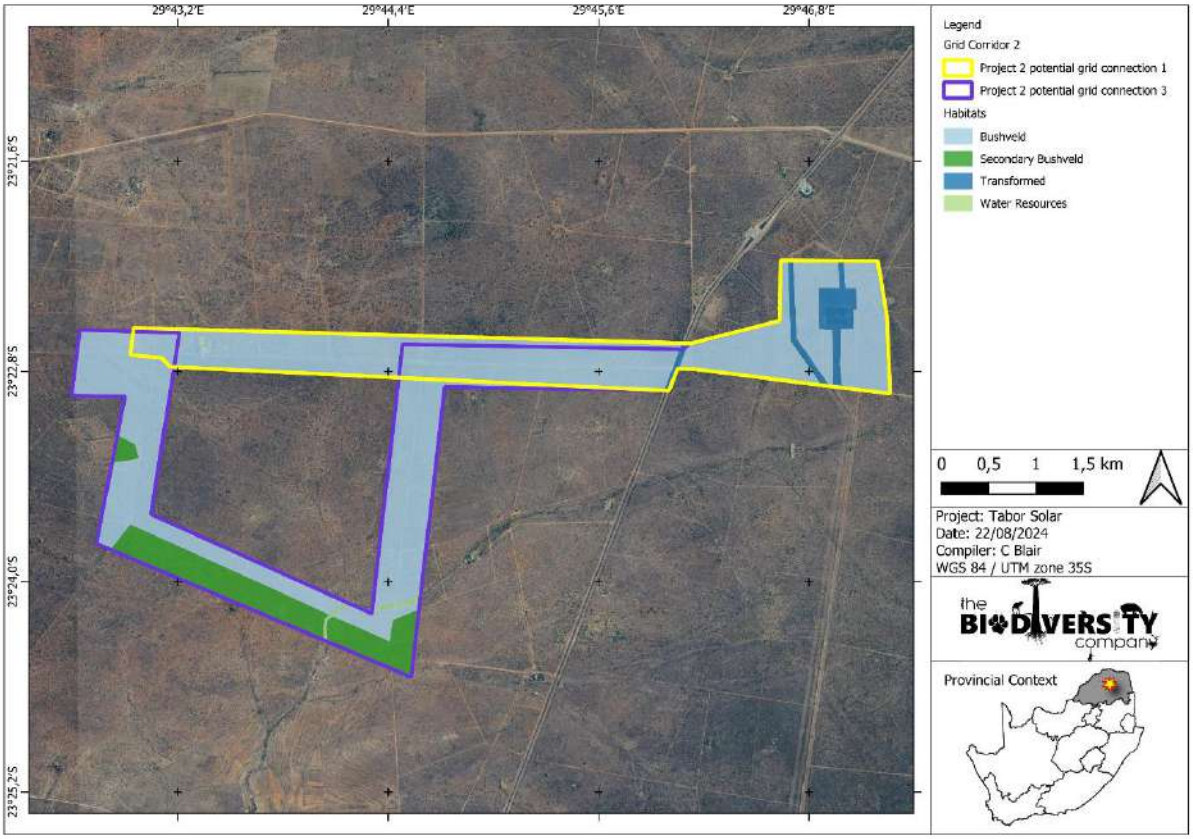


Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'27.68"S, 29°40'25.30"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°21'49.03"S, 29°42'20.07"E.

3.2.3 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-5 Transformed Habitat at 23°21'26.57"S, 29°44'36.67"E

3.2.4 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Two expected SCC are dependent on water resources as a habitat for foraging, African Finfoot (*Podica senegalensis*) and Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by these species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

Figure 3-6 Water Resources Habitat at 23°21'22.41"S, 29°41'13.91"E.

3.3 Site Ecological Importance

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

Four habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

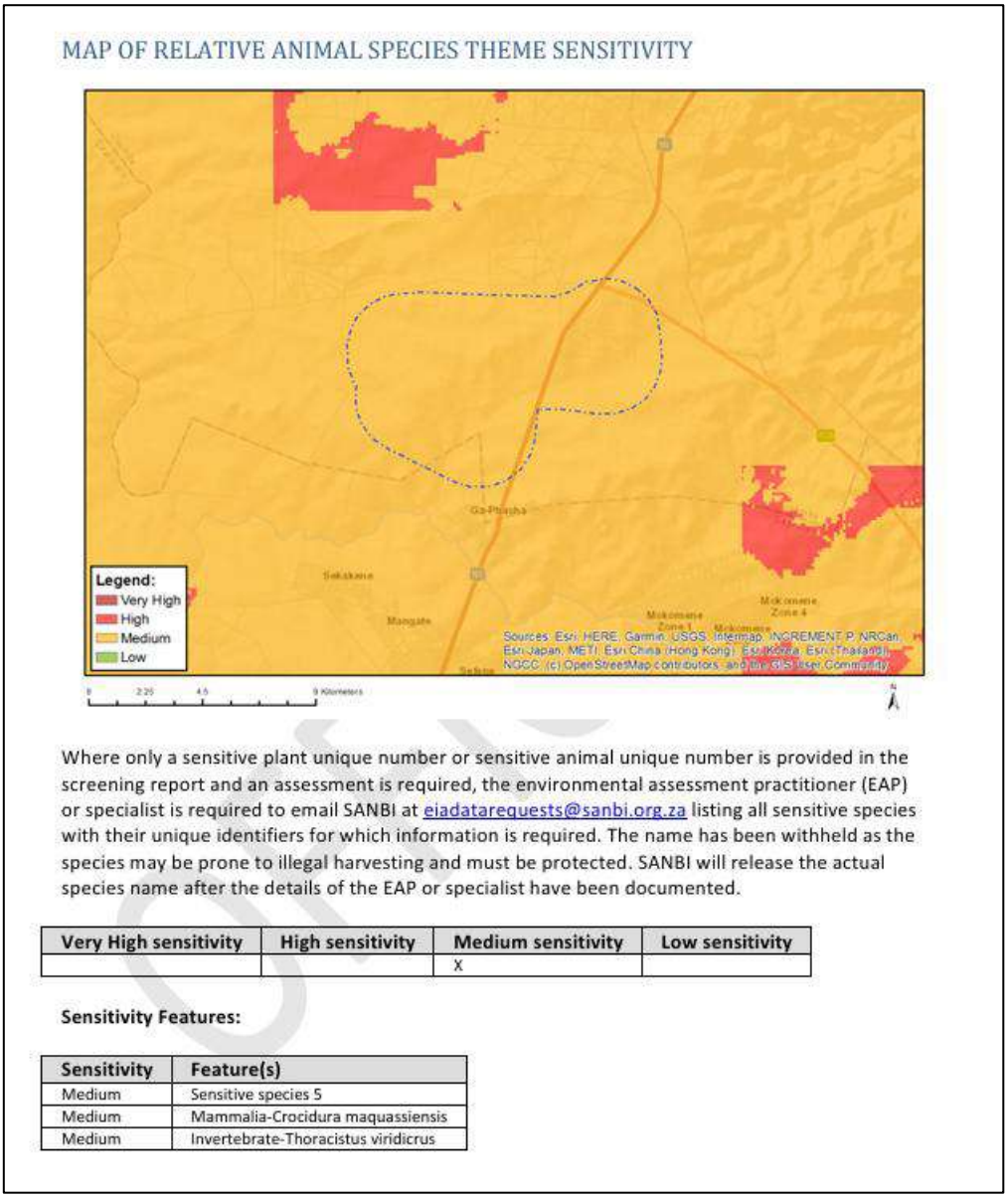
Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

				returning to a site once the disturbance or impact has been removed.	
Water Resources	**Low** No confirmed or highly likely populations of SCC.	**Medium** 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**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

3.3.1 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 'Medium' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-7).



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-7 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-8.

Table 3-3 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	Medium	Bushveld	Medium	Validated – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Secondary Bushveld	Low	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
		Transformed	Very Low	Disputed – Habitat has been severely altered with limited potential to support SCC.

	Water Resources	**Medium**	Validated – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

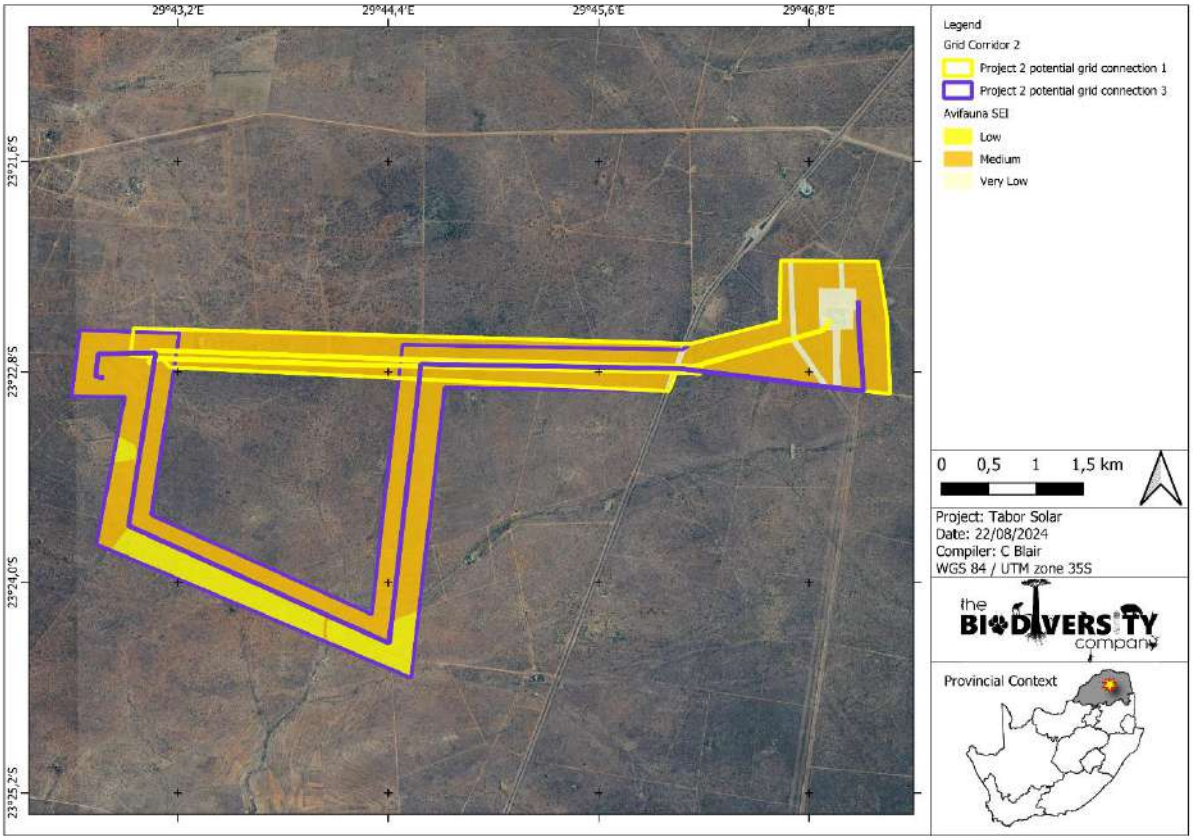


Figure 3-8 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and dust pollution. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution and collisions due to the powerlines. Birds prone to collisions can be divided into five categories; 1) large species with high body weight ratio to wingspan resulting in low manoeuvrability, 2) species that are distracted in flight this include predatory birds and smaller species with areal displays, 3) species flying at high speeds, 4) crepuscular species that are active in low light conditions, and 5) species with limited narrow forward vision (Jenkins et al., 2010; Noguera et al., 2010). Species that tend to fly in flocks also may be influenced more by collisions as the birds flying in the rear will not be able to detect the powerlines. Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they can touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties. Winds parallel or diagonal to cross-arms are the most detrimental, due to exacerbating the difficulty in manoeuvrability during landing or take-off.

The decommissioning phase will cause disturbance due to the removal of associated infrastructure. Furthermore, if the area is not rehabilitated, this will likely result in habitat degradation due to erosion and the encroachment of invasive alien plants.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures the are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities;
- The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). Bird diverters or spirals must be added to the transmission line to reduce fatalities;
- Water resource areas must be spanned, and development may not take place in it; and
- Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed gridline connecting the proposed Tabor Solar 2 facility to the Tabor MTS was determined to be ‘Medium,’ ‘Low,’ or ‘Very Low’ depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.
- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.
- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

From an avifauna perspective, all route alternatives are viable, however, potential grid connection 1 is preferred since the line has fewer changes in directions, and is parallel to an existing line, both reducing the probability of collisions.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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**
Functionality	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 3

Vhembe District Municipality, Limpopo Province, South Africa

22 August 2024

Prepared by:

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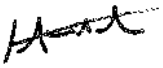
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 3**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar Gridline 3	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	Dr Lindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the gridlines associated with the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the gridline connecting the Tabor Solar 3 facility to the Tabor Main Transmission Substation (MTS). The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 2 km area around the project area provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

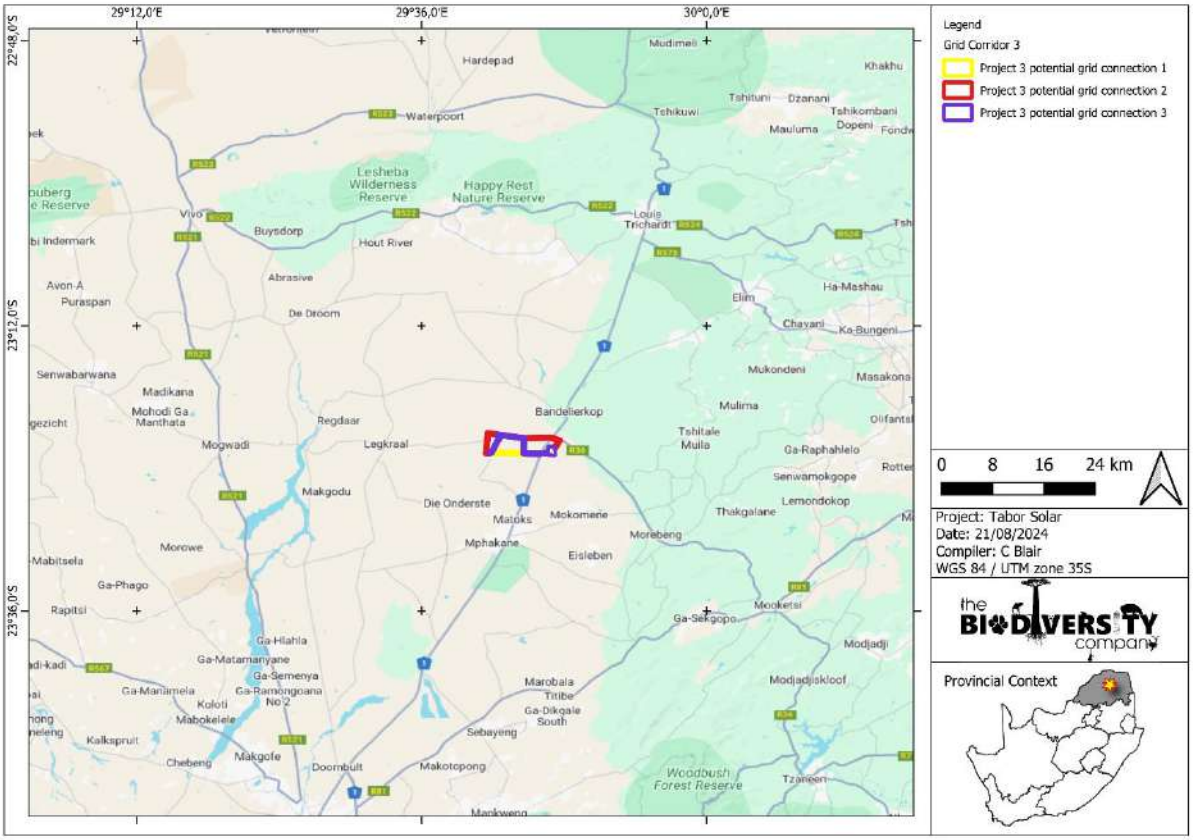


Figure 1-1 Proposed location of the project area in relation to the nearby towns

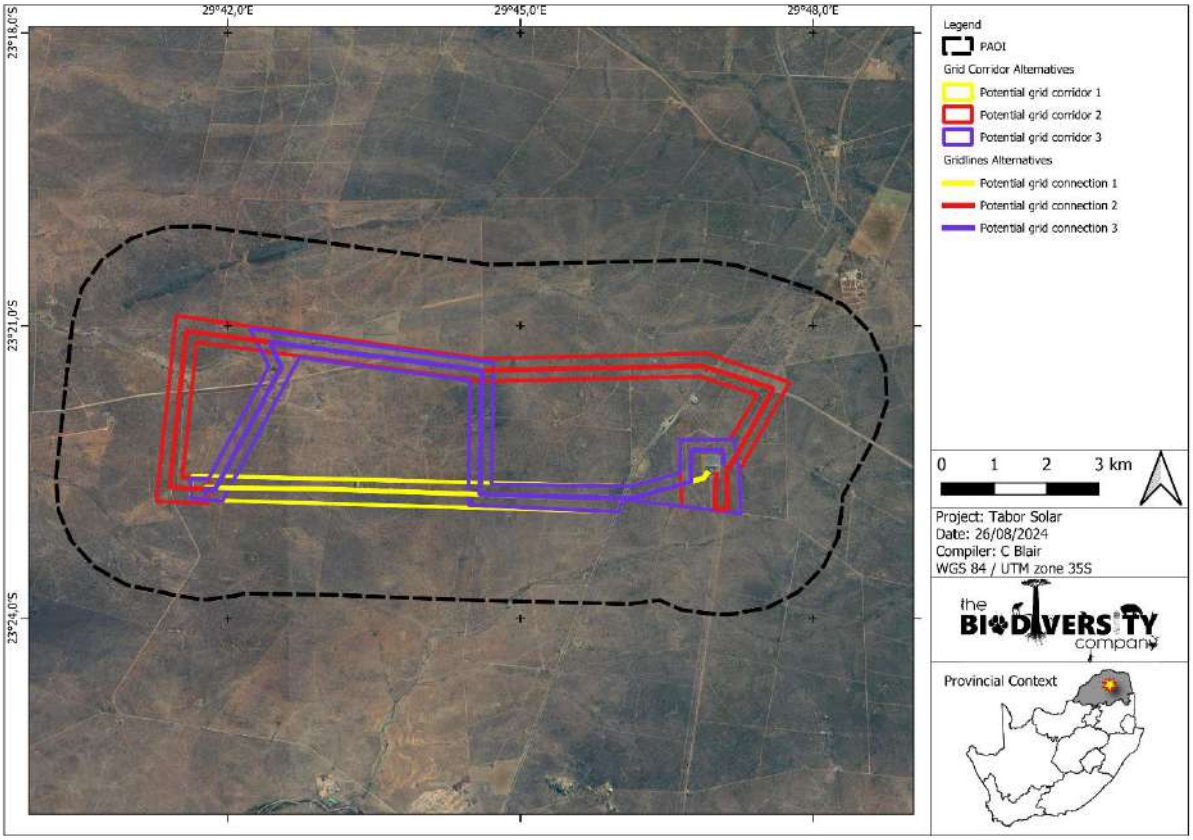


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey will be conducted in the wet season. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey;
- 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;
- Access was restricted in portions of the line, these areas were assessed from desktop perspective.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The screening tool identifies one additional avifauna SCC, Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 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
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low
Tawny Eagle	*Aquila rapax*	EN	VU	Moderate
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low

White-backed Vulture	*Gyps africanus*	CR	CR	High

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

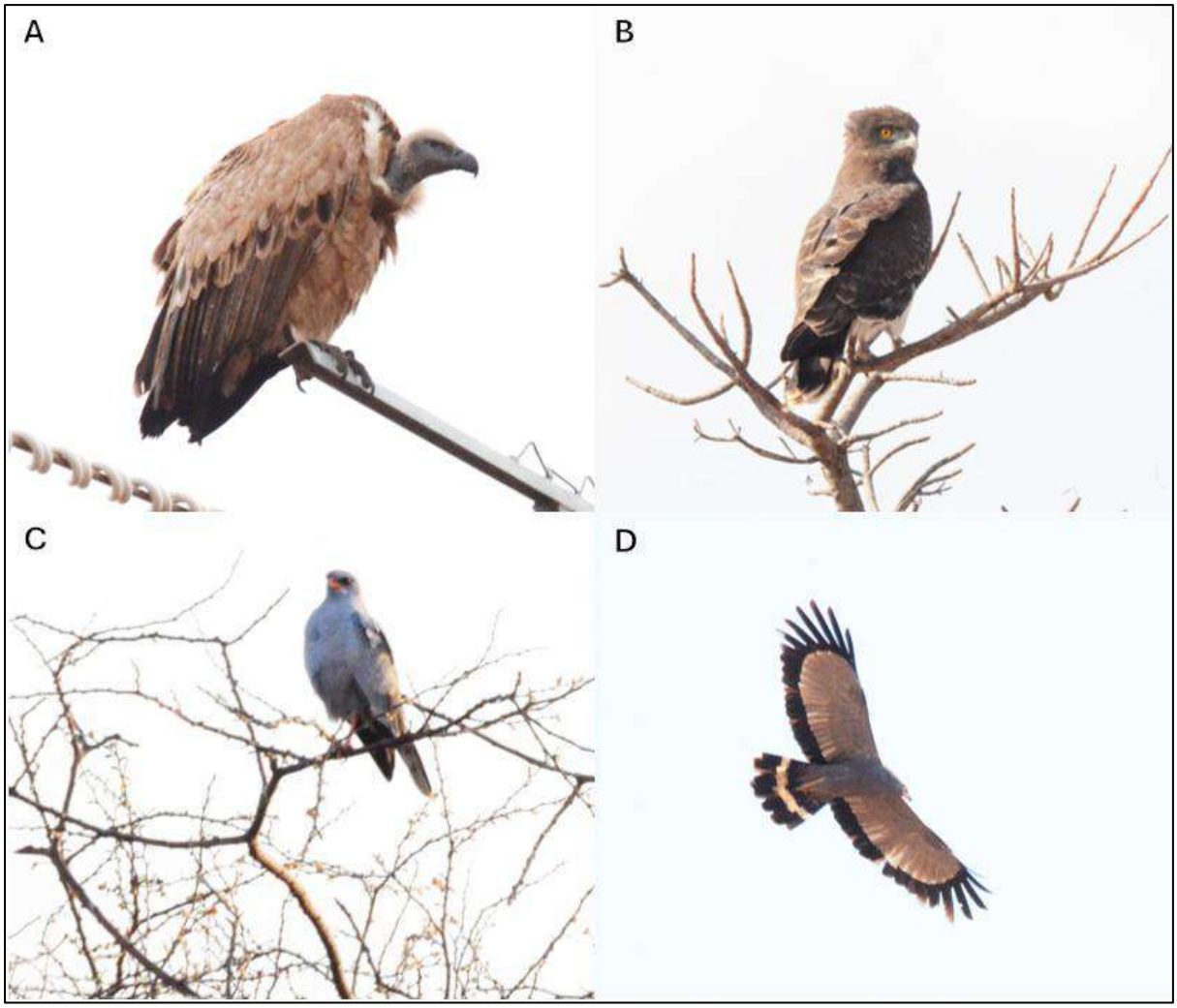


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four (4) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

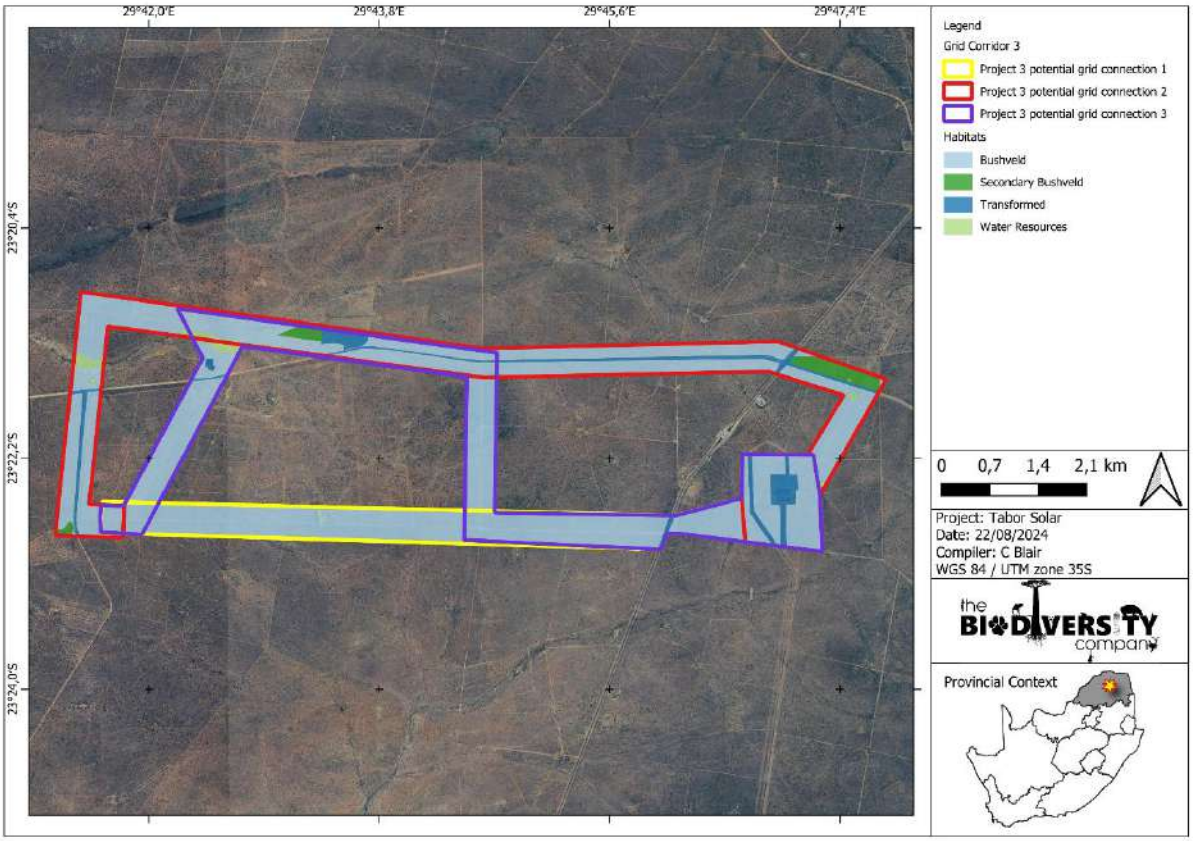


Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'27.68"S, 29°40'25.30"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°21'49.03"S, 29°42'20.07"E.

3.2.3 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-5 Transformed Habitat at 23°21'26.57"S, 29°44'36.67"E

3.2.4 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Two expected SCC are dependent on water resources as a habitat for foraging, African Finfoot (*Podica senegalensis*) and Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by these species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

Figure 3-6 Water Resources Habitat at 23°21'22.41"S, 29°41'13.91"E.

3.3 Site Ecological Importance

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

Four habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

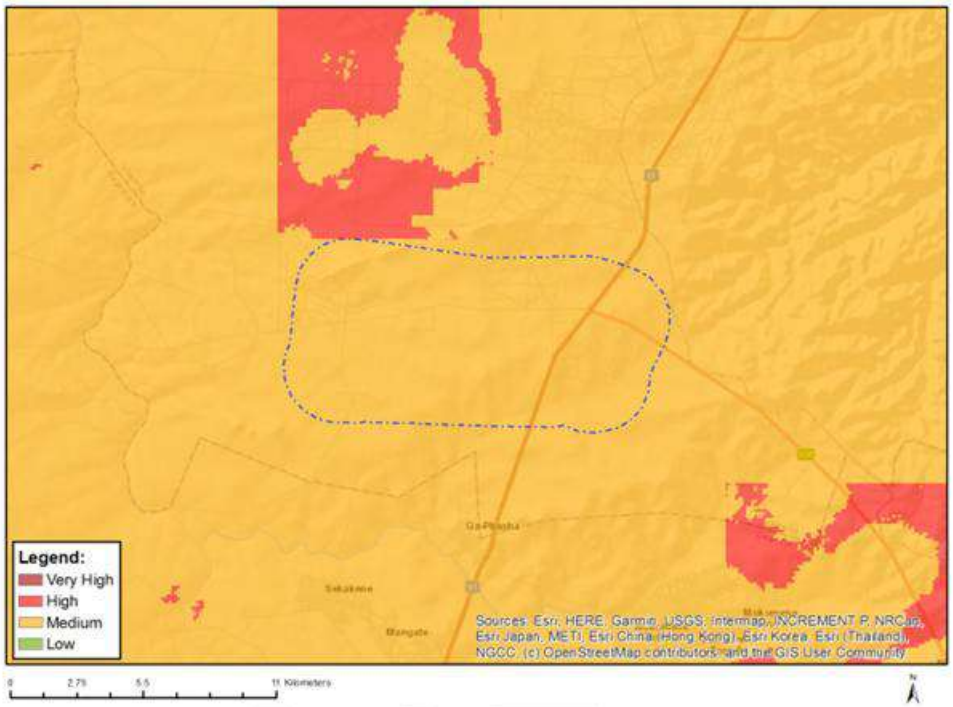
				returning to a site once the disturbance or impact has been removed.	
Water Resources	**Low** No confirmed or highly likely populations of SCC.	**Medium** Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Low**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-7).

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Torgos tracheliotos
Medium	Aves-Aquila rapax
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-7 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-8.

Table 3-3 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**	**Bushveld**	**Medium**	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Secondary Bushveld	**Low**	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
		Transformed	**Very Low**	Disputed – Habitat has been severely altered with limited potential to support SCC.
		Water Resources	**Medium**	Disputed – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

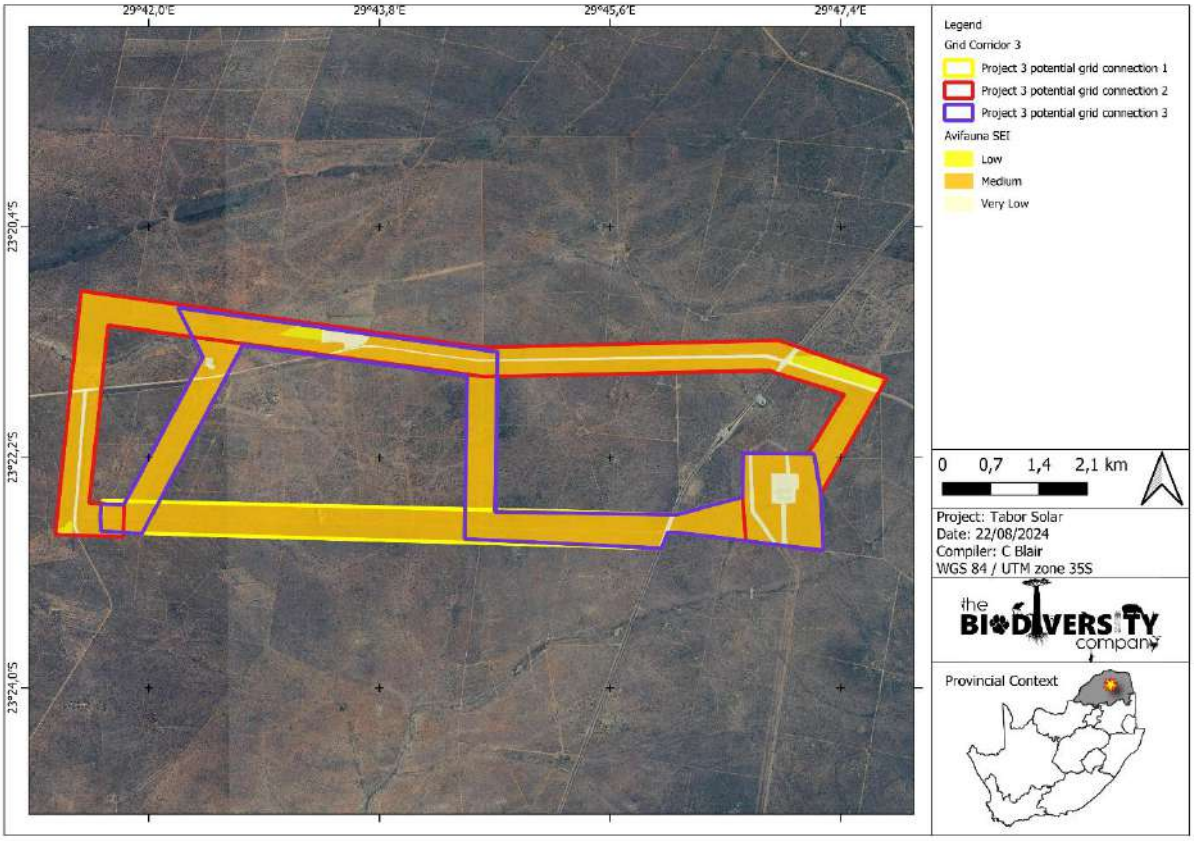


Figure 3-8 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and dust pollution. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution and collisions due to the powerlines. Birds prone to collisions can be divided into five categories; 1) large species with high body weight ratio to wingspan resulting in low manoeuvrability, 2) species that are distracted in flight this include predatory birds and smaller species with areal displays, 3) species flying at high speeds, 4) crepuscular species that are active in low light conditions, and 5) species with limited narrow forward vision (Jenkins et al., 2010; Noguera et al., 2010). Species that tend to fly in flocks also may be influenced more by collisions as the birds flying in the rear will not be able to detect the powerlines. Large passerines are particularly

susceptible to electrocution because owing to their relatively large bodies, they can touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties. Winds parallel or diagonal to cross-arms are the most detrimental, due to exacerbating the difficulty in manoeuvrability during landing or take-off.

The decommissioning phase will cause disturbance due to the removal of associated infrastructure. Furthermore, if the area is not rehabilitated, this will likely result in habitat degradation due to erosion and the encroachment of invasive alien plants.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures the are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities;
- The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). Bird diverters or spirals must be added to the transmission line to reduce fatalities;
- Water resource areas must be spanned, and development may not take place in it; and
- Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed gridline connecting the proposed Tabor Solar 3 facility to the Tabor MTS was determined to be ‘Medium,’ ‘Low,’ or ‘Very Low’ depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.
- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.
- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

From an avifauna perspective, all route alternatives are viable, however, potential grid connection 1 is preferred since the line has fewer changes in directions, and is parallel to an existing line, both reducing the probability of collisions.

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225
Email: andrew@thebiodiversitycompany.com
Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 4

Vhembe District Municipality, Limpopo Province, South Africa

22 August 2024

Prepared by:

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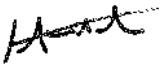
Report Name	**AVIFAUNA SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED GRIDLINE ASSOCIATED WITH THE TABOR SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY 4**	
Specialist Theme	Avifauna Theme	
Project Reference	Tabor Solar Gridline 4	
Report Version	Draft 1 / 24/04/2025	
Environmental Assessment Practitioner	Cape EAPrac	
Report Writer	Cameron Blair (SACNASP 170485 - pending)	
Reviewer	Dr Lindi Steyn (SACNASP 119992)	
Reviewer	Andrew Husted (SACNASP 400213/11)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Site Sensitivity Verification report (SSVR) for the gridlines associated with the proposed Tabor Solar Photovoltaic (PV) Facilities. Four facilities are proposed for the Tabor Solar cluster, with associated grid connection lines for each facility. This report assesses the gridline connecting the Tabor Solar 4 facility to the Tabor Main Transmission Substation (MTS). The proposed Project Area of Influence (PAOI) is located approximately 40 km south of Makhado, and 8.5 km southwest of Bandelierkop (Figure 1-1). The Project Area of Interest (PAOI) consists of a 2 km area around the project area provided (Figure 1-2).

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

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

1.2 Project Description

The Tabor Solar Cluster is to be divided into four (4x) PV projects (average 160MW each), with each project to obtain a standalone Environmental Authorisation. Each solar project will have its own grid connection i.e. four (4x) grid connections, although routing may be similar for parts of the grid lines, to also obtain its own standalone Environmental Authorisation. The environmental application process will therefore consist of eight (8x) applications consisting of four (4x) Environmental Impact Assessments (EIAs) for the solar facilities and four (4x) Basic Assessments (BAs) for the grid connections. Basic preliminary design details for each of the four Solar PV project include:

- Solar Field
    - Solar Arrays: PV modules;
    - Single axis tracking technology maximum height of 5m (aligned north-south);
    - Solar module mounting structures comprised of galvanised steel and aluminium;
    - Foundations which will likely be drilled and concreted into the ground;
    - Solar measurement and weather stations;
    - Central/string Inverters and MV transformers in in field;
    - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters;
        - Lithium Ion battery Cells, Modules, Racks and containers;
        - Power Conversion Equipment;

        - Battery Management System; and
        - Energy Management System.

- Associated Infrastructure
    - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
    - MV Collector stations;
    - Access road;
    - Internal gravel roads;
    - Fencing;
    - General maintenance area;
    - Storm water channels and berms;
    - Water storage tanks and pipelines;
    - Temporary work area during the construction phase (i.e. laydown area); and
    - O&M buildings, store.
- Project IPP Substation;
    - 132kV substation 200m x 200m;
    - HV transformer;
    - Substation Control Building;
    - HV metering, Scada and protection building;
    - MV collector switchgear buildings;
    - Compensation equipment (Filters capacitors reactors statcoms);
- AC coupled BESS installation (400m x 400m) at project substation and laydown area:
    - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS);
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop; and
- Fire Protection systems.

The four (4x) grid connection corridors for each project (which will be handed over to Eskom post-construction, may include:

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS; and
- Maintenance access road below or adjacent to the power line.

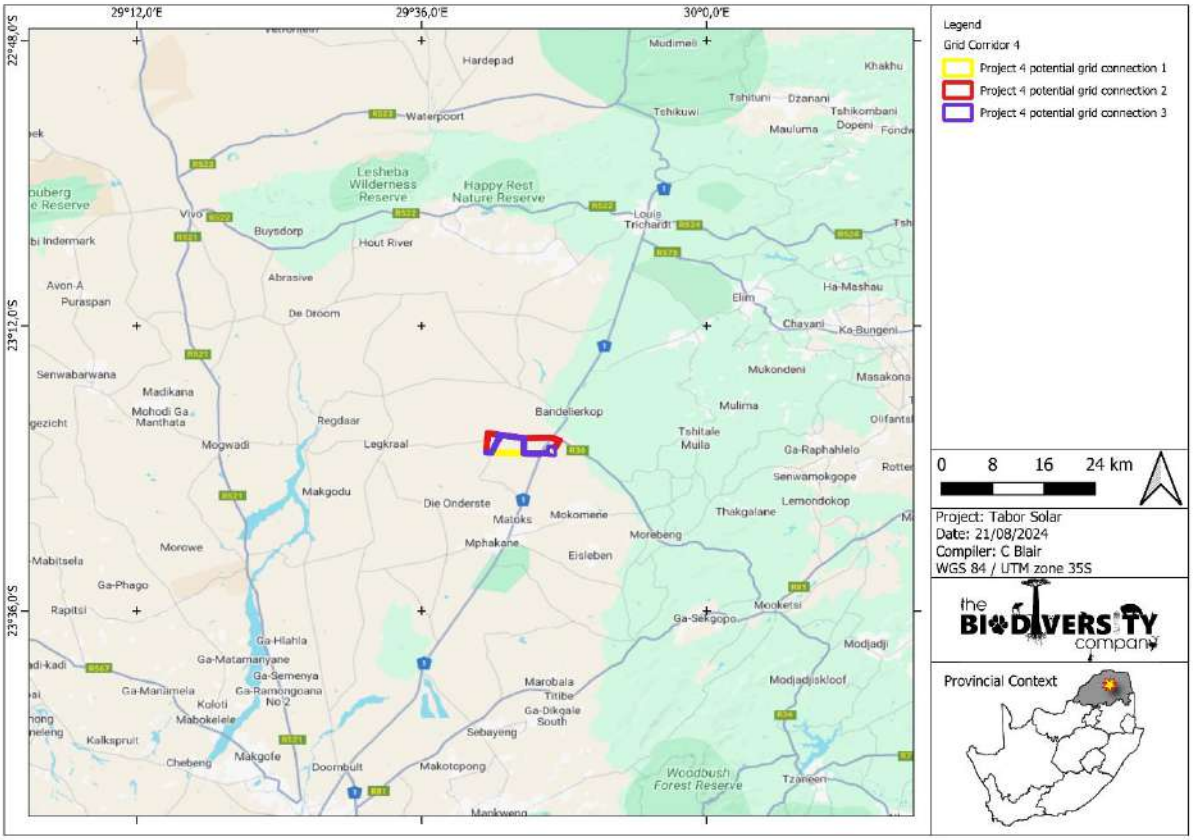


Figure 1-1 Proposed location of the project area in relation to the nearby towns

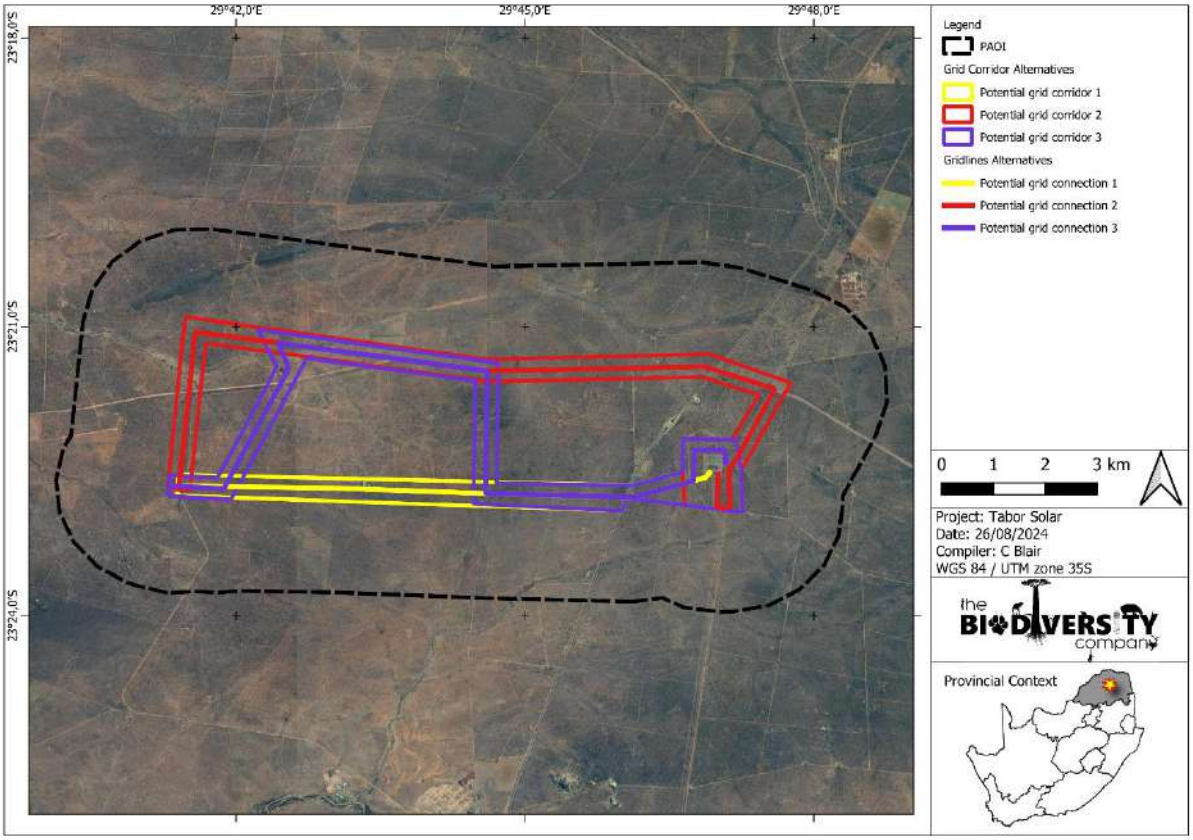


Figure 1-2 Project area of influence

2 Approach

The first survey took place from 6th to the 8th of August 2024 (dry season survey) to determine the presence and relative abundance of avifauna species within the project area, as well as likelihood of occurrence within the assessed area. Another survey will be conducted in the wet season. A CV and specialist declaration are provided in the appendices. A verification report has been prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (Government Notice 320, dated 20 March 2020).

2.1 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the project footprint area as provided by the client. Any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and, hence the results of this assessment;
- The avifaunal field survey was conducted from the 6th to the 8st of August 2024. This constitutes a dry season survey;
- 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;
- Access was restricted in portions of the line, these areas were assessed from desktop perspective;
- 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.

3 Results of Site Sensitivity Verification

3.1 Species of Conservation Concern (SCC)

SABAP2 data indicate that 207 avifauna species are expected for the PAOI and surrounds. Of these, 8 are considered SCC (Table 3-1). The screening tool identifies one additional avifauna SCC, Tawny Eagle (*Aquila rapax*). The likelihoods of occurrence within the POAI are included here. One (1) SCC was recorded during the assessment, Cape Vulture (*Gyps coprotheres*).

Table 3-1 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
Black Stork	*Ciconia nigra*	VU	LC	Low
Cape Vulture	*Gyps coprotheres*	EN	VU	Confirmed
European Roller	*Coracias garrulus*	NT	LC	Moderate
Lanner Falcon	*Falco biarmicus*	VU	LC	Moderate
Lappet-faced Vulture	*Torgos tracheliotos*	EN	EN	High
Short-clawed Lark	*Certhilauda chuana*	NT	LC	Low
Tawny Eagle	*Aquila rapax*	EN	VU	Moderate
Verreaux's Eagle	*Aquila verreauxii*	NA	LC	Low

White-backed Vulture	*Gyps africanus*	CR	CR	High

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

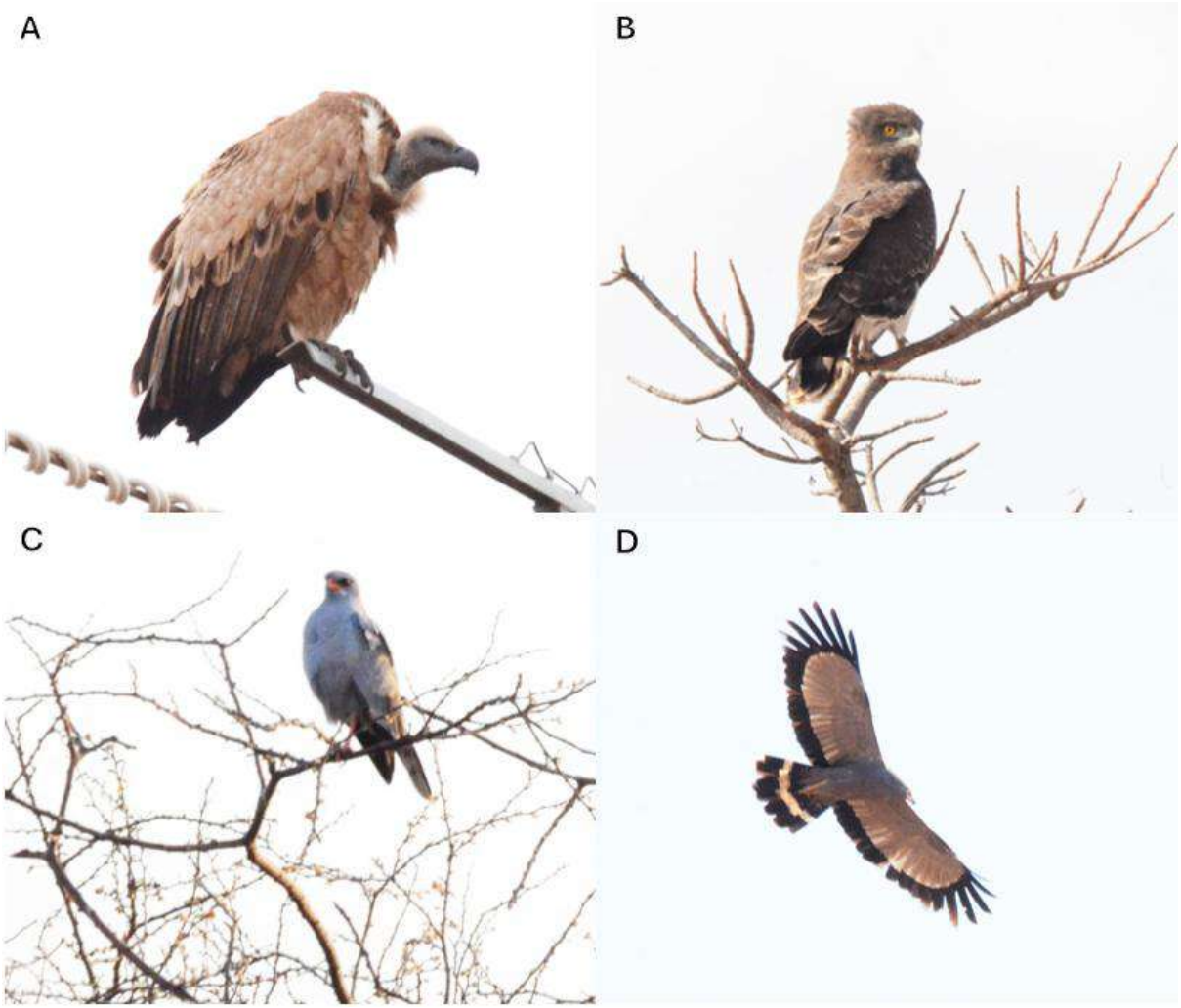


Figure 3-1 ***SCC and Priority Species recorded during the field assessment: A) Cape Vulture (Gyps coprotheres), B) Black-chested Snake Eagle (Circaetus pectoralis), C) Pale Chanting Goshawk (Melierax canorus), and (D) African Harrier Hawk (Polyboroides typus).***

3.2 Habitat Assessment

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

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four (4) habitats were delineated in total (Figure 3-2), a full description of the habitats is provided below.

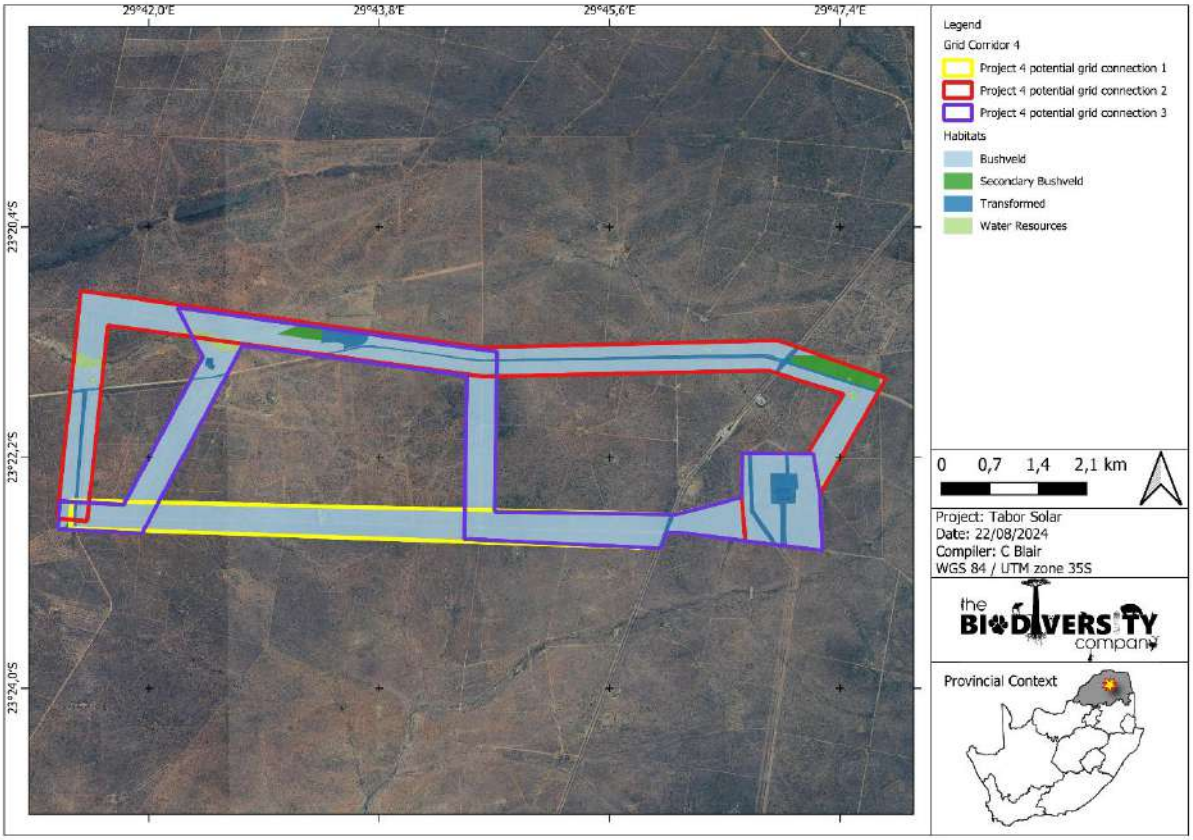


Figure 3-2 Habitats identified within the assessment areas

3.2.1 Bushveld

This habitat consists of savannah with dominance of both trees and grass, with various densities of trees. This habitat is somewhat disturbed by grazing by livestock and game. This habitat provides breeding and foraging habitat for most of the expected SCC.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-3 Bushveld Habitat at 23°21'27.68"S, 29°40'25.30"E.

3.2.2 Secondary Bushveld

This habitat is like bushveld habitat but has been affected by historical and current effects such as clearing for agriculture and is in a secondary successional state. Despite these effects, similar SCC are likely to occur in this habitat, both for breeding and nesting.

SCC possibly occupying this habitat: Cape Vulture, European Roller, Lanner Falcon, Lappet-faced Vulture, Tawny Eagle and White-backed Vulture.

Figure 3-4 Secondary Bushveld Habitat at 23°21'49.03"S, 29°42'20.07"E.

3.2.3 Transformed

The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current housing, roads and electrical infrastructure. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

Figure 3-5 Transformed Habitat at 23°21'26.57"S, 29°44'36.67"E

3.2.4 Water Resources

This habitat provides crucial habitat for waterbirds. In the project area these consist of artificial water holes and drainage lines which are temporarily inundated. Two expected SCC are dependent on water resources as a habitat for foraging, African Finfoot (*Podica senegalensis*) and Black Stork (*Ciconia nigra*). However, the water resources on the site are unlikely to be inhabited by these species. The water resources may be used by other SCC as a source of drinking water, but not as a habitat for foraging or breeding.

Figure 3-6 Water Resources Habitat at 23°21'22.41"S, 29°41'13.91"E.

3.3 Site Ecological Importance

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

Four habitat types were delineated within the Project Area, namely Bushveld, Secondary Bushveld, Transformed, and Water Resources. Their respective SEI and the corresponding mitigation guidelines are summarised in Table 3-2.

Table 3-2 Summary of habitat types delineated within field assessment area

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Medium** Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium**	**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.	**Medium** Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Secondary Bushveld	**High** Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	**Low** Several minor and major current negative ecological impacts.	**Medium**	**High** Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	**Low** Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Transformed	**Very Low** No natural habitat remaining.	**Very Low** Several major current negative ecological impacts.	**Very Low**	**Very High** Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of	**Very Low** Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

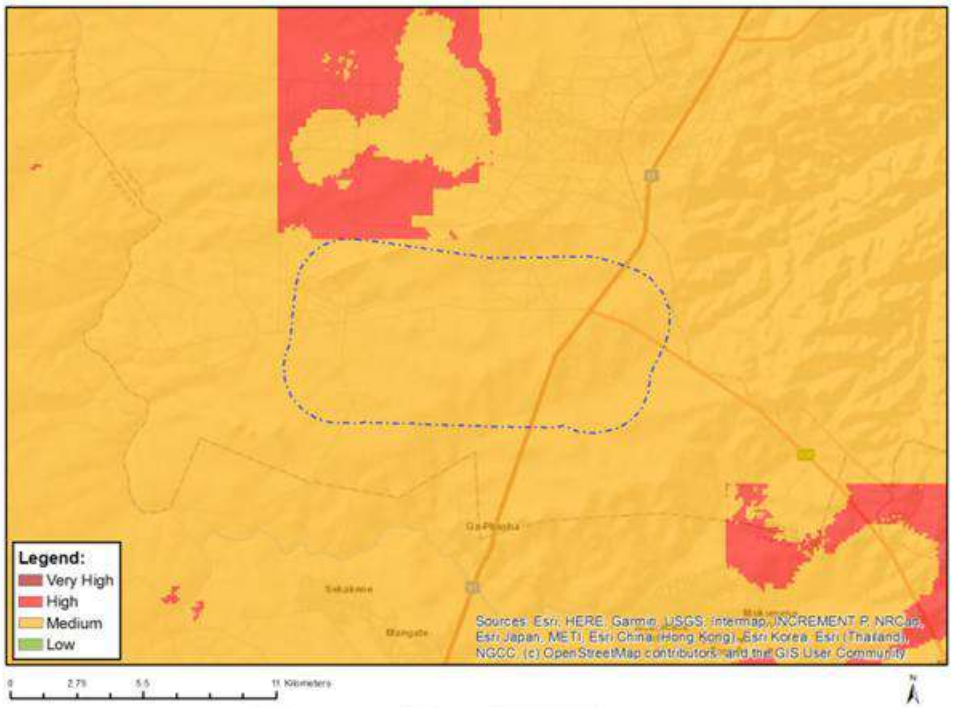
	returning to a site once the disturbance or impact has been removed.	

3.3.1 Desktop Ecological Sensitivity

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

- Animal Species Theme sensitivity is 'High' for the PAOI, with the possibility of Avifauna Species of Conservation Concern (SCC) being present (Figure 3-7).

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Torgos tracheliotos
Medium	Aves-Aquila rapax
Medium	Sensitive species 5
Medium	Mammalia-Crocidura maquassiensis
Medium	Invertebrate-Thoracistus viridicrus

Figure 3-7 Animal Species Theme Sensitivity

3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The sensitivities delineated for the project area is illustrated in Figure 3-8.

Table 3-3 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	Bushveld	Medium	Disputed – Habitat shows some negative impacts, but still provide suitable habitat for SCC.
		Secondary Bushveld	Low	Disputed – Habitat has been severely altered, but still has the potential to support SCC.
		Transformed	Very Low	Disputed – Habitat has been severely altered with limited potential to support SCC.
		Water Resources	Medium	Disputed – Habitat has limited potential to host SCC but provides important ecological function and has little resource resilience.

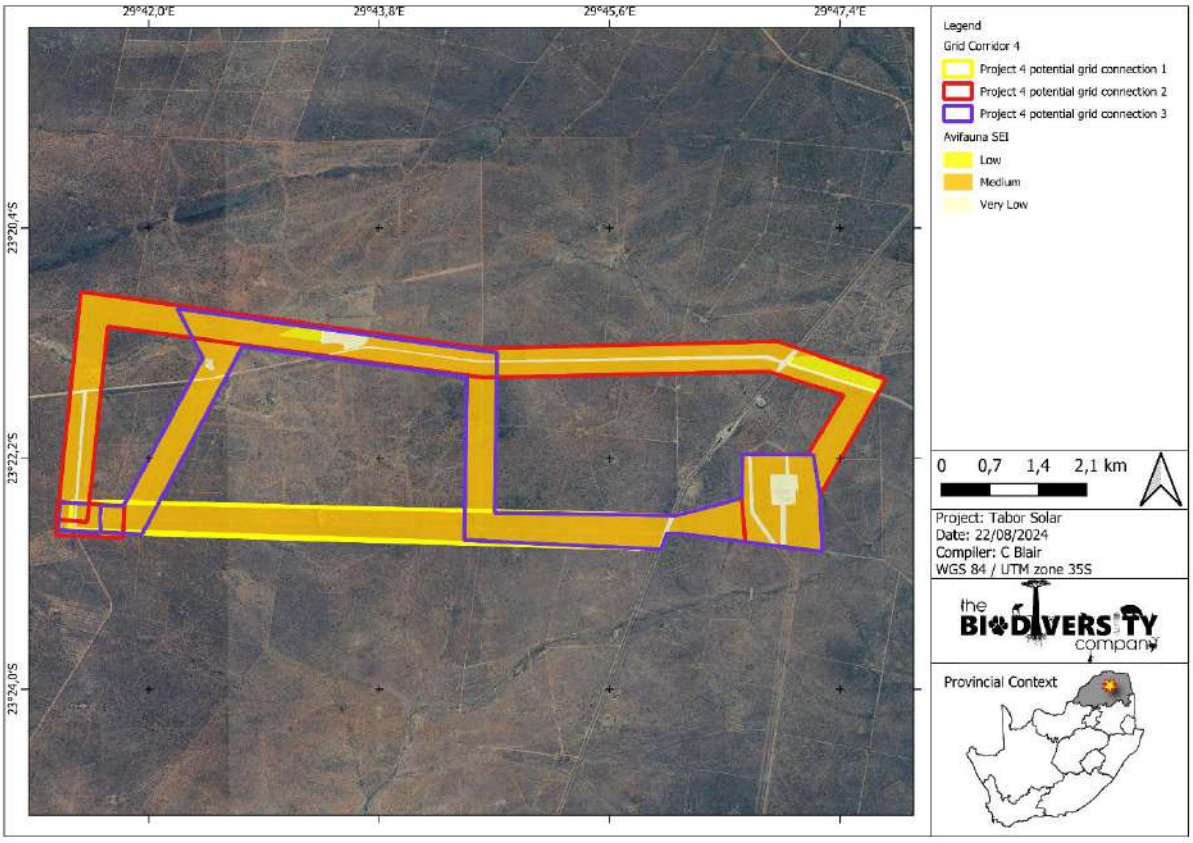


Figure 3-8 Site ecological importance of the project area

4 Impact Assessment

4.1 Potential Impacts to Biodiversity

This section describes the potential impacts on avifauna associated with the construction, operational and decommissioning phases of the proposed development. During the construction phase vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create

a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and dust pollution. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution and collisions due to the powerlines. Birds prone to collisions can be divided into five categories; 1) large species with high body weight ratio to wingspan resulting in low manoeuvrability, 2) species that are distracted in flight this include predatory birds and smaller species with areal displays, 3) species flying at high speeds, 4) crepuscular species that are active in low light conditions, and 5) species with limited narrow forward vision (Jenkins et al., 2010; Noguera et al., 2010). Species that tend to fly in flocks also may be influenced more by collisions as the birds flying in the rear will not be able to detect the powerlines. Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they can touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties. Winds parallel or diagonal to cross-arms are the most detrimental, due to exacerbating the difficulty in manoeuvrability during landing or take-off.

The decommissioning phase will cause disturbance due to the removal of associated infrastructure. Furthermore, if the area is not rehabilitated, this will likely result in habitat degradation due to erosion and the encroachment of invasive alien plants.

4.2 Management & Mitigation Measures

This section provides the management and mitigation measures the are deemed applicable for the proposed development. Note that this is not a complete list of mitigation measures for the proposed development but those considered to be pertinent. Further mitigation measures may be provided within the Impact Assessment report upon identification of further impacts. Appropriate mitigation measures include:

- Indigenous herbaceous and graminoid vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion. Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities;

- The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). Bird diverters or spirals must be added to the transmission line to reduce fatalities;

- Water resource areas must be spanned, and development may not take place in it; and

- Environmental Awareness Training for all staff and contractors. Hunting of species must be made a punishable offence. This is especially pertinent to avifauna SCC.

5 Conclusion

The avifauna SEI for the proposed gridline connecting the proposed Tabor Solar 4 facility to the Tabor MTS was determined to be ‘Medium,’ ‘Low,’ or ‘Very Low’ depending on the habitat. Accordingly, the following guidelines are considered relevant to the proposed development activity:

- **Minimisation and restoration mitigation (Medium SEI Areas)** – Any development activities of medium impact acceptable followed by appropriate restoration be activities.

- **Minimisation and restoration mitigation (Low SEI Areas)** – development activities of medium to high impact acceptable followed by appropriate restoration activities.

- **Minimisation mitigation (Very Low SEI Habitats)** – development activities of medium to high impact acceptable and restoration activities may not be required.

From an avifauna perspective, all route alternatives are viable, however, potential grid connection 1 is preferred since the line has fewer changes in directions, and is parallel to an existing line, both reducing the probability of collisions.

6 References

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7 Appendix Items

7.1 Appendix A: Methodology

7.1.1 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.

7.1.1.1 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 2315_2935; 2315_2940; 2315_2945; 2320_2935; 2320_2940; 2320_2945; 2325_2935; 2325_2940; and 2325_2945.

7.1.1.2 Ecologically Important Landscape Features

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

- Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram *et al.,* 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022;

- Ecosystem Protection level (EPL) informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.

- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus

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

- The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:

    - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

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

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

    - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017).

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

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

7.1.2 Avifauna Survey

Sampling took place from 6th to the 8th of August 2024. Sampling consisted of standardized point counts as well as random diurnal incidental surveys. Standardised point counts (Buckland *et al,* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardized point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was run over a 10 min period. The horizontal detection limit was set at 150 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal and nocturnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, random meandering and road cruising. Effort was made to cover all the different habitat types within the limits of time and access.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

7.2 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 7-1 and Table 7-2, respectively.

Table 7-1 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 7-2 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 7-3.

Table 7-3 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**
Functionality	**Very high**	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 7-4.

Table 7-4 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 7-5.

Table 7-5 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 7-6.

Table 7-6 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.

7.3 Appendix C: Specialist Declaration of Independence

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

August 2024

7.4 Appendix D – Specialist CVs

Andrew Husted

M.Sc Aquatic Health (*Pr Sci Nat*)

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Identity Number: 7904195054081
Date of birth: 19 April 1979

Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

Country Experience

Botswana, Cameroon

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia,

Senegal, Serbia, Sierra Leone, South Africa

Tanzania

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

German - Basic

Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams