



# AVIFAUNA ASSESSMENTS FOR THE PROPOSED SBPM SOLAR FACILITIES FOR SIYANDA BAKGATLA PLATINUM MINE

## Northam, Limpopo & North West Provinces

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environmental

Prepared by:

**The Biodiversity Company**

Cell: +27 81 319 1225

Fax: +27 86 527 1965

[info@thebiodiversitycompany.com](mailto:info@thebiodiversitycompany.com)

[w.thebiodiversitycompany.com](http://w.thebiodiversitycompany.com)



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|             |   |    |
|-------------|---|----|
|             | foliage diurnal; GGD, granivore ground diurnal; HWD, herbivore water diurnal; IAD, insectivore air diurnal; IGD, insectivore ground diurnal; IWD, insectivore water diurnal; NFD, nectivore foliage diurnal; OMD, omnivore multiple diurnal; IAN, Insectivore air nocturnal.....  | 28 |
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## 1 Introduction

### 1.1 Background

The Biodiversity Company was appointed to undertake an Avifauna Assessment for the proposed SBPM & SCSC Solar Facilities for Siyanda Bakgatla Platinum Mine in Northam, Limpopo Province. The project infrastructure is located in both the Limpopo and also North West provinces. The project is located 6.5 km west from Northam. The Northam focus area has been identified for the construction and operation of solar and battery facilities consisting of the following affected properties:

- SCSC (273 Ha); and
- SBPM (251 Ha) (Figure 1-2).

Although the fieldwork for the facilities was undertaken simultaneously, this report only details the findings of the SBPM component. 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). The National Web based Environmental Screening Tool has characterised the terrestrial theme sensitivity of the project area as “Very High”. The animal sensitivity is rated as “Moderate”.

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

### 1.2 Project Description

#### 1.2.1 SBPM PV RE project, Limpopo Province

Main Street 1886 Proprietary Limited proposes the development of the Solar PV facility and associated infrastructure on a site bordering the eastern end of the Siyanda Bakgatla Platinum Mine area near Northam. The solar PV facility will comprise several arrays of PV panels, a Battery Energy Storage System (BESS), and associated infrastructure with a contracted capacity of up to 100MW.

The purpose of the proposed project is to generate electricity for exclusive use by the Siyanda Mine, following which any excess power produced will be distributed to the national grid, if applicable. The construction of the PV facility aims to reduce the Siyanda Mine’s dependency on direct supply from Eskom’s national grid for operation activities, while simultaneously decreasing the mine’s carbon footprint.

A preferred project site with an extent of ~1138 ha and a development area of 574 ha has been identified by Main Street 1886 Proprietary Limited as a technically suitable area for the development of the Solar PV Facility. The study area is located on Portion 4 of Farm Grootkuil 409. The project site falls within the Thabazimbi Local Municipality within the Waterberg District Municipality in the Limpopo Province. The site is located ~6.5 km west of the town of Northam and is accessible via the Swartklip Road which branches off the R510 provincial route.

Infrastructure associated with the solar PV facility will include:

- 100 MW Solar PV array comprising PV modules and mounting structures;
- Inverters and transformers;
- Cabling between the project components;

- Battery Energy Storage System;
- On-site facility substation and power lines between the solar PV facility and the Mine and Eskom substation;
- Site offices, Security office, operations and control, and maintenance and storage laydown areas; and
- Access roads, internal distribution roads.

**Grid connection solution.**

To evacuate the generated power to the Siyanda Mine, the grid connection solution consisting of the following is proposed:

The power generated by the solar PV facility will be transferred to the three step up transformers at the on-site/plant substation. Power will then be delivered from each step-up transformer as follows:

- Two 6.6 km, 33 kV transmission lines to the Mortimer substation with four step down transformers (33/6.6 kV; 10 MVA);
- Two 4.7 km, 33 kV transmission lines to the Fridge substation with two step down transformers (33/6.6 kV; 10 MVA); and
- Two 2.9 km, 33 kV transmission lines to the Ivan substation with three step down transformers (33/11 kV; 10 MVA).

The grid connection is proposed on the following properties:

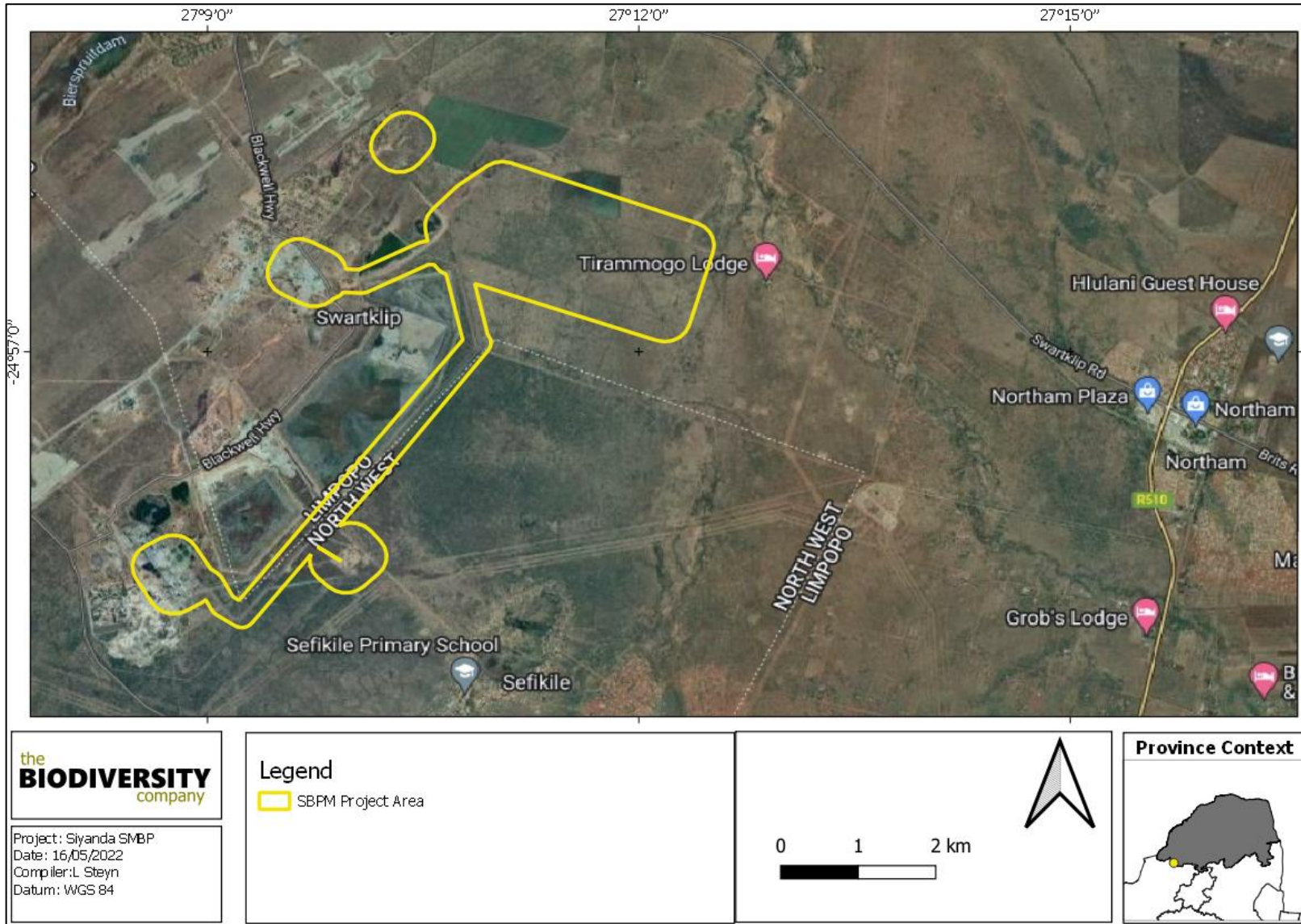
- Portion 3 of Farm Grootkuil 409;
- Portion 4 of Farm Grootkuil 409; and
- Portion 5 of Farm Grootkuil 409.

The development area of 574 ha is larger than the area needed for the construction of a 100 MW PV facility and will provide the opportunity for the optimal placement of the infrastructure, ensuring avoidance of major identified environmental sensitivities by the development footprint of ~240 ha<sup>1</sup>. To avoid areas of potential sensitivity and to ensure that potential detrimental environmental impacts are minimised as far as possible, the full extent of the larger development area will be considered in the Scoping Phase, and a development footprint within which the infrastructure of the PV facility and associated infrastructures will be located will be fully assessed during the EIA Phase.

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<sup>1</sup> The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for Solar PV will be planned to be constructed. This will be the actual footprint of the facility, and the area which would be disturbed. The extent of the development footprint will be determined in the EIA Phase.





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

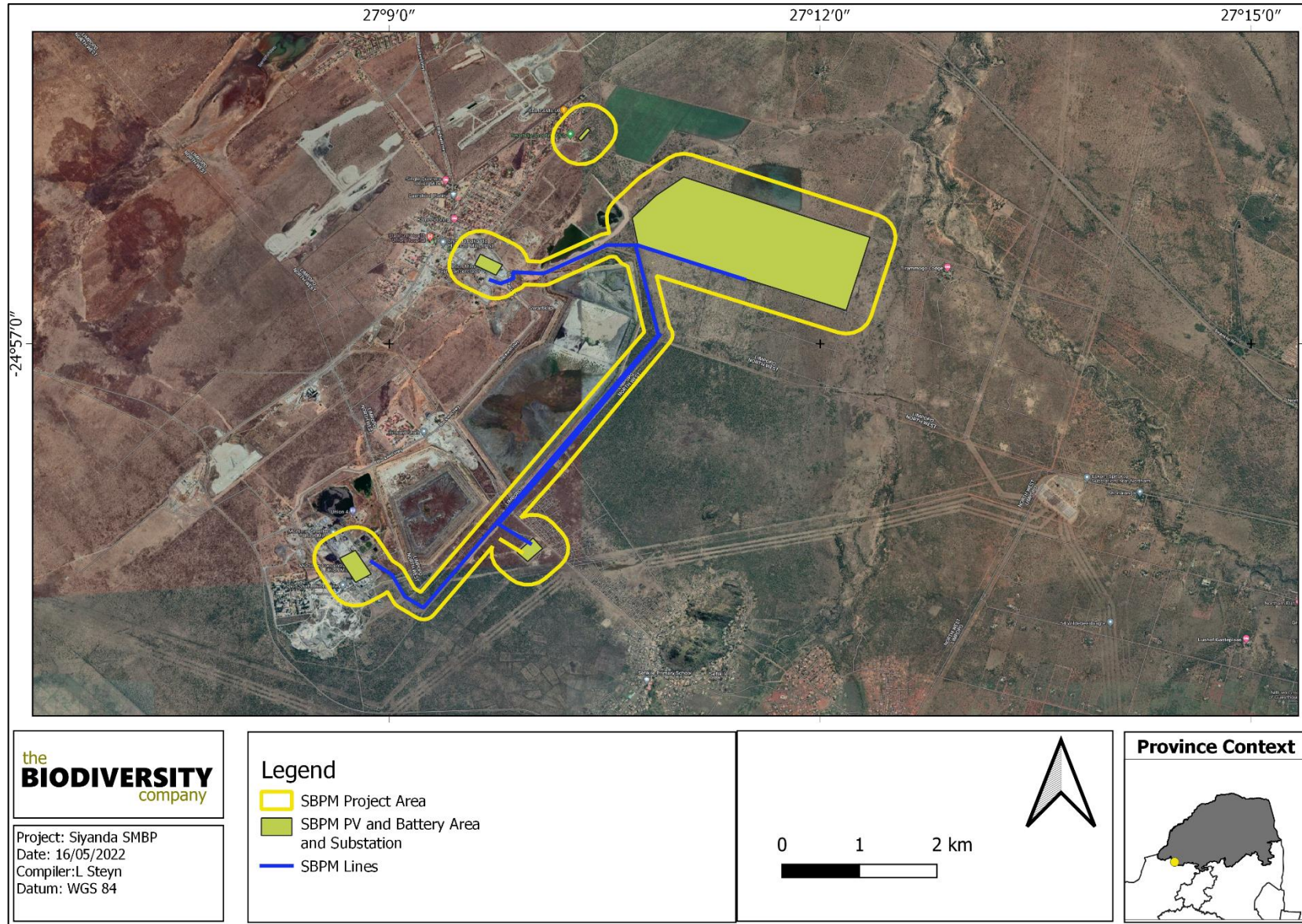





Figure 1-2 The various components of the project

**1.3 Specialist Details**

|               |  |
|---------------|--|
| Report Name   | <b>AVIFAUNA ASSESSMENTS FOR THE PROPOSED SBPM SOLAR FACILITIES FOR SIYANDA BAKGATLA PLATINUM MINE</b>  |
| Reference     | <b>SBPM/Siyanda PV</b>   |
| Submitted to  |    |
| Report Writer | <p><b>Lindi Steyn</b> </p> <p>Dr Lindi Steyn has completed her PhD in Biodiversity and Conservation from the University of Johannesburg. Lindi is a terrestrial ecologist with a special interest in ornithology. She has completed numerous studies ranging from basic Assessments to Environmental Impact Assessments following IFC standards.</p>  |
| Reviewer      | <p><b>Andrew Husted</b> </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.</p>  |
| Declaration   | <p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p> |

## 2 Scope of Work

The assessment was achieved according to the above-mentioned legislation and the best-practice guidelines and principles for avifaunal impact assessments within the context of solar energy facilities as outlined by Birdlife South Africa.

The scope of the Avifaunal Impact Assessment included the following:

- Description of the baseline avifaunal community;
- Identification of present or potentially occurring Species of Conservation Concern (SCC);
- Sensitivity assessment and map to identify sensitive areas in the project site; and
- Impact assessment, mitigation measures to prevent or reduce the possible impacts.

## 3 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 3-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

**Table 3-1** *A list of key legislative requirements relevant to biodiversity and conservation in the Limpopo and North West Provinces*

| Region  | Legislation / Guideline  |
|---|--|
| <b>International</b>                            | Convention on Biological Diversity (CBD, 1993)   |
|   | The Convention on Wetlands (RAMSAR Convention, 1971)   |
|   | The United Nations Framework Convention on Climate Change (UNFCCC, 1994)   |
|   | The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)   |
|   | The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)  |
| <b>National</b>                                 | Constitution of the Republic of South Africa (Act No. 108 of 1996)   |
|   | The National Environmental Management Act (NEMA) (Act No. 107 of 1998)   |
|   | The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)  |
|   | The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations  |
|   | Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)    |
|   | Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020) |
|   | The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);   |
|   | The Environment Conservation Act (Act No. 73 of 1989)  |
|   | National Protected Areas Expansion Strategy (NPAES)  |
|   | Natural Scientific Professions Act (Act No. 27 of 2003)  |
|   | National Biodiversity Framework (NBF, 2009)  |
|   | National Forest Act (Act No. 84 of 1998)   |
|   | National Veld and Forest Fire Act (101 of 1998)  |
|   | National Water Act (NWA) (Act No. 36 of 1998)  |
| National Spatial Biodiversity Assessment (NSBA) |  |

|            |  |
|------------|--|
|            | World Heritage Convention Act (Act No. 49 of 1999)   |
|            | Municipal Systems Act (Act No. 32 of 2000)   |
|            | Alien and Invasive Species Regulations and, Alien and Invasive Species List 2014/2020, published under NEMBA |
|            | South Africa's National Biodiversity Strategy and Action Plan (NBSAP)  |
|            | Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)                                     |
|            | Sustainable Utilisation of Agricultural Resources (Draft Legislation).                                       |
|            | White Paper on Biodiversity  |
|            | Limpopo Conservation Plan (2018)   |
| Provincial | Limpopo Environmental Management Act (2003)  |
|            | North-West Biodiversity Sector Plan of 2015 (READ, 2015).  |
|            | The North West Biodiversity Management Amendment Bill, 2017  |

## 4 Methods

### 4.1 Desktop 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.

#### 4.1.1 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:

- National Biodiversity Assessment (NBA) 2018 (Skowno *et al*, 2019) - The purpose of the NBA is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species, and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
  - *Ecosystem Threat Status* – 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.
  - *Ecosystem Protection Level* – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas - South Africa Protected Areas Database (SAPAD) (DFFE, 2021) – 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, 2016) – 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.
- Conservation/Biodiversity Sector Plans:

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 Area 1 (CBA1);
- Critical Biodiversity Area 2 (CBA2);
- Ecological Support Area 1 (ESA1);
- Ecological Support Area 2 (ESA2);
- Other Natural Area (ONA);
- Protected Area (PA); and
- No Natural Remaining (NNR).

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).

The **North-West Department of Rural, Environment, and Agricultural Development (READ)**, as custodian of the environment in the North West, is the primary implementing agent of the Biodiversity Sector Plan. The spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by READ. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on

biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land use planning and decision-making guidelines (READ, 2015).

- Important Bird and Biodiversity Areas (IBAs) (BirdLife South Africa, 2015) – IBAs constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; 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.

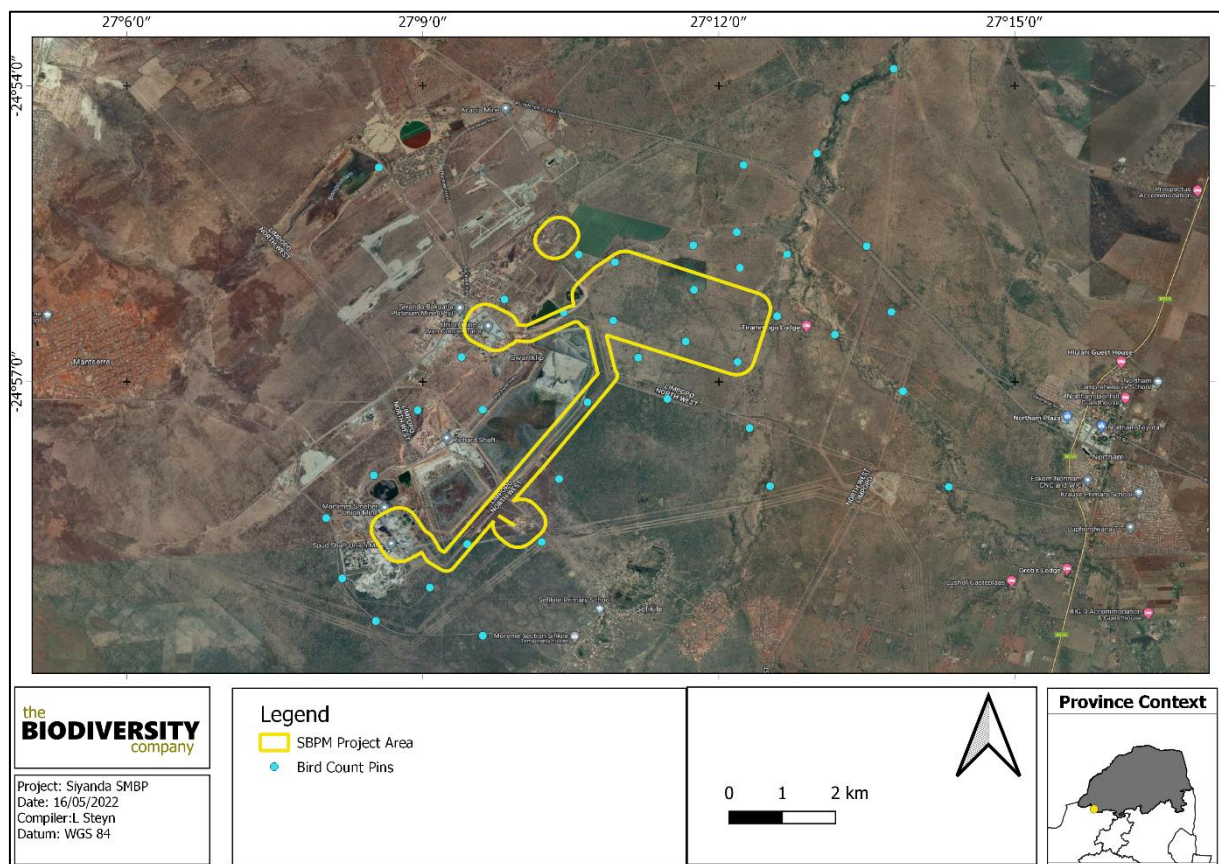
**4.1.2 Desktop Avifaunal Assessment**

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

- Avifauna list, generated from the SABAP2 dataset by looking at pentads 2450\_2700; 2450\_2705; 2455\_2700; 2455\_2700; 2455\_2705; 2455\_2710; 2500\_2700\_2500\_2705).

**4.2 Field Assessment**

The first field survey was undertaken during 4-8 April 2022 (Autumn), while the second survey was conducted from 27-30 June 2022 (Winter) to determine the presence of SCC. Effort was made to cover all the different habitat types within the limits of time and access. Areas surrounding the project area were also surveyed, this included areas on the river and some of the nearby ridges due to the mobility of avifauna species and home range sizes of larger species (Figure 4-1).



**Figure 4-1** Map illustrating the field survey area

Sampling consisted of standardized point counts as well as random diurnal incidental surveys and vantage point surveys. Standardized point counts (following Buckland *et al.* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. Each point count was run over a 10 min period. The horizontal detection limit was set at 500 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 incidental searches and one nocturnal search were conducted. This involved the opportunistic sampling of species between point count periods, river scanning and road cruising.

#### 4.2.1 Data analysis

Point count data was arranged into a matrix with point count samples in rows and species in columns. The table formed the basis of the various subsequent statistical analyses. In order to ascertain the differences in the structure of the species assemblage between habitats, a Bray-Curtis dissimilarity matrix was used. The data was subject to fourth-root transformation to downscale the contribution of very abundant species while upscaling the influence of less abundant species. However, the effect of species abundance was negligible and ultimately the raw data proved more informative. Thirdly, raw count data was converted to relative abundance values and used to establish dominant species and calculate the diversity of each habitat using the Shannon Diversity Index ( $H'$ ). Lastly, present, and potentially occurring species were assigned to 13 major trophic guilds loosely based on the classification system developed by González-Salazar *et al.* (2014). Species were first classified by their dominant diet (carnivore, herbivore, granivore, frugivore, nectarivore, omnivore), then by the strata matrix within which they most frequently forage (ground, water, foliage, air) and lastly by their diel activity period (nocturnal or diurnal).

#### 4.3 Site Ecological Importance (SEI)

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

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

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 4-1 and Table 4-2, respectively.

**Table 4-1 Summary of Conservation Importance (CI) criteria**

| Conservation Importance | Fulfilling Criteria   |
|-------------------------|---|
| Very High               | Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EEO) of < 10 km <sup>2</sup> .<br>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.<br>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 EEO of > 10 km <sup>2</sup> . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.<br>If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.<br>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.<br>Presence of Rare species.<br>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.<br>Presence of range-restricted species.<br>> 50% of receptor contains natural habitat with potential to support SCC.                |
| <b>Low</b>      | No confirmed or highly likely populations of SCC.<br>No confirmed or highly likely populations of range-restricted species.<br>< 50% of receptor contains natural habitat with limited potential to support SCC. |
| <b>Very Low</b> | No confirmed and highly unlikely populations of SCC.<br>No confirmed and highly unlikely populations of range-restricted species.<br>No natural habitat remaining.   |

**Table 4-2 Summary of Functional Integrity (FI) criteria**

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

BI can be derived from a simple matrix of CI and FI as provided in Table 4-3.

**Table 4-3 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 4-4.

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

| Resilience       | Fulfilling Criteria   |
|------------------|---|
| <b>Very High</b> | Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed. |

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

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 4-5.

**Table 4-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)**

| Site Ecological Importance |           | Biodiversity Importance (BI) |           |          |          |          |
|----------------------------|-----------|------------------------------|-----------|----------|----------|----------|
|                            |           | Very high                    | High      | Medium   | Low      | Very low |
| 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 project is provided in Table 4-6.

**Table 4-6 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities**

| Site Ecological Importance | Interpretation in relation to proposed development activities  |
|----------------------------|--|
| <b>Very High</b>           | 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. |
| <b>High</b>                | 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.   |
| <b>Medium</b>              | Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.   |
| <b>Low</b>                 | Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.   |
| <b>Very Low</b>            | 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.

**4.4 Assumptions and Limitations**

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

- Information relating to project activities, spatial data and infrastructure locations for the proposed development was obtained from information provided by the client. The potential impacts and recommendations described in this report apply specifically to the provided information;
- Although considerable time has been spent to ensure that information utilised in this report is verified. It is assumed that all third-party information utilised in the compilation of this report is correct at the time of compilation (e.g., spatial data, online databases, and species lists); and
- No field survey was undertaken during Spring and Summer and therefore, migratory species that may utilise the area would not have been recorded. This may potentially affect the severity of the impact

## 5 Results & Discussion

### 5.1 Desktop Assessment

#### 5.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features is summarised in Table 5-1.

**Table 5-1** *Summary of relevance of the proposed project to ecologically important landscape features*

| Desktop Information Considered                       | Relevant/Irrelevant   | Section |
|--|---|---------|
| Ecosystem Threat Status                              | Irrelevant – Overlaps with a Least Concern ecosystem  | 5.1.1.1 |
| Ecosystem Protection Level                           | Relevant – Overlaps with a Moderately Protected Ecosystem   | 5.1.1.2 |
| Protected Areas                                      | Relevant – The project area overlaps with the Rustenburg Platinum Mines (Union Section) Private Nature Reserve and is located within the 5 km buffer of surrounding protected areas | 5.1.1.4 |
| Renewable Energy Development Zones                   | Irrelevant - The project area is 167 km from the closest REDZ   | -       |
| Powerline Corridor                                   | Irrelevant- The project area falls 88 km from the Northern Corridor   | -       |
| National Protected Areas Expansion Strategy          | Relevant – The project area overlaps with a NPAES protected area  | 5.1.1.5 |
| Critical Biodiversity Area                           | Relevant – The project area overlaps with CBA2, ESA1, NNR and ONA classified areas  | 5.1.1.3 |
| Important Bird and Biodiversity Areas                | Relevant – Located adjacent to the Northern Turf Thornveld IBA  | 5.1.1.6 |
| South African Inventory of Inland Aquatic Ecosystems | Relevant - The project area borders on a CR NBA river and a CR wetland  | 5.1.1.7 |
| National Freshwater Priority Area                    | Relevant – The project area overlaps with an unclassified FEPA wetland and an unclassified FEPA river   | 5.1.1.8 |
| Strategic Water Source Areas                         | Irrelevant- The project area is 57 km from the closest SWSA   | -       |
| Coordinated Waterbird Count                          | Relevant – 106 km from a CWAC site  | -       |
| Coordinated Avifaunal Road Count                     | Relevant – 112 km from the closest CAR route  | -       |

##### 5.1.1.1 Ecosystem Threat Status

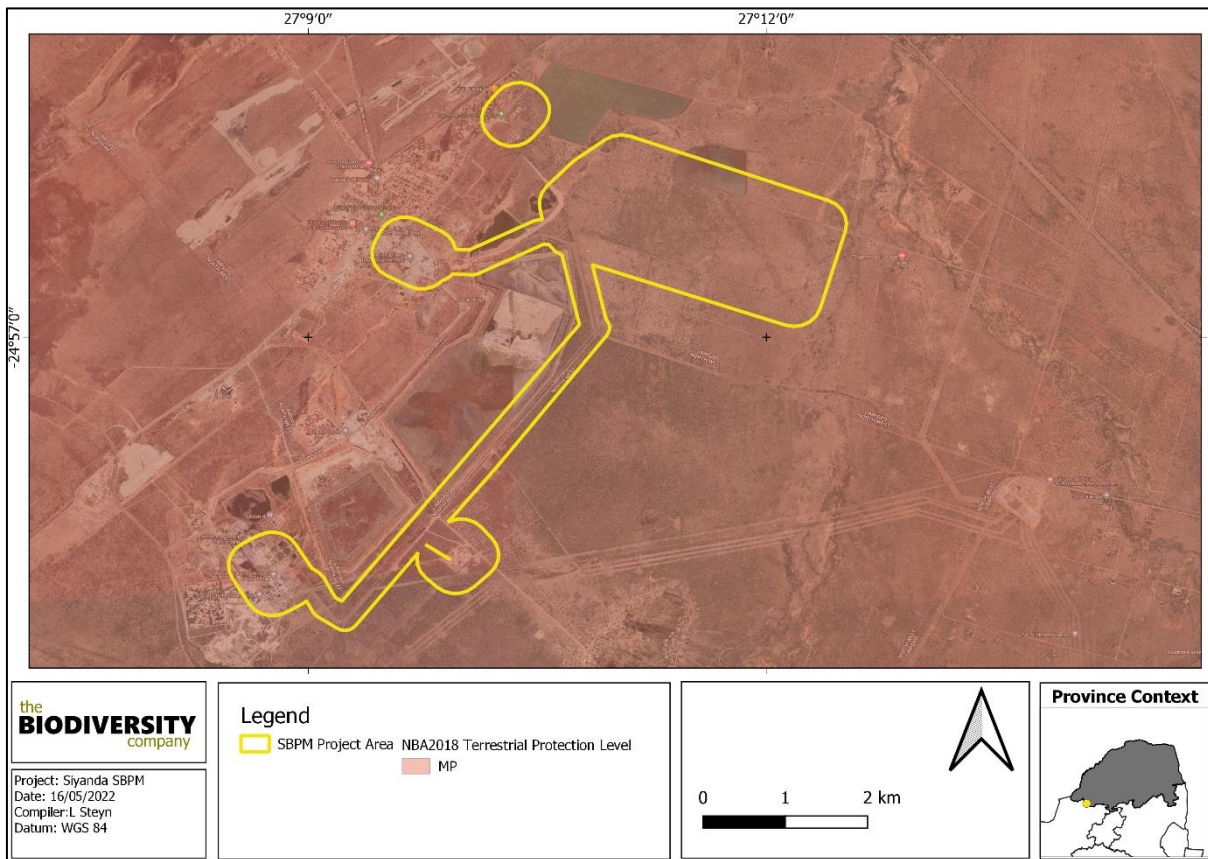
The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the proposed project overlaps with a LC ecosystem (Figure 5-1).



**Figure 5-1** Map illustrating the ecosystem threat status associated with the project area.

### 5.1.1.2 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project overlaps with a MP ecosystem (Figure 5-2).



**Figure 5-2** Map illustrating the ecosystem protection level associated with the project area

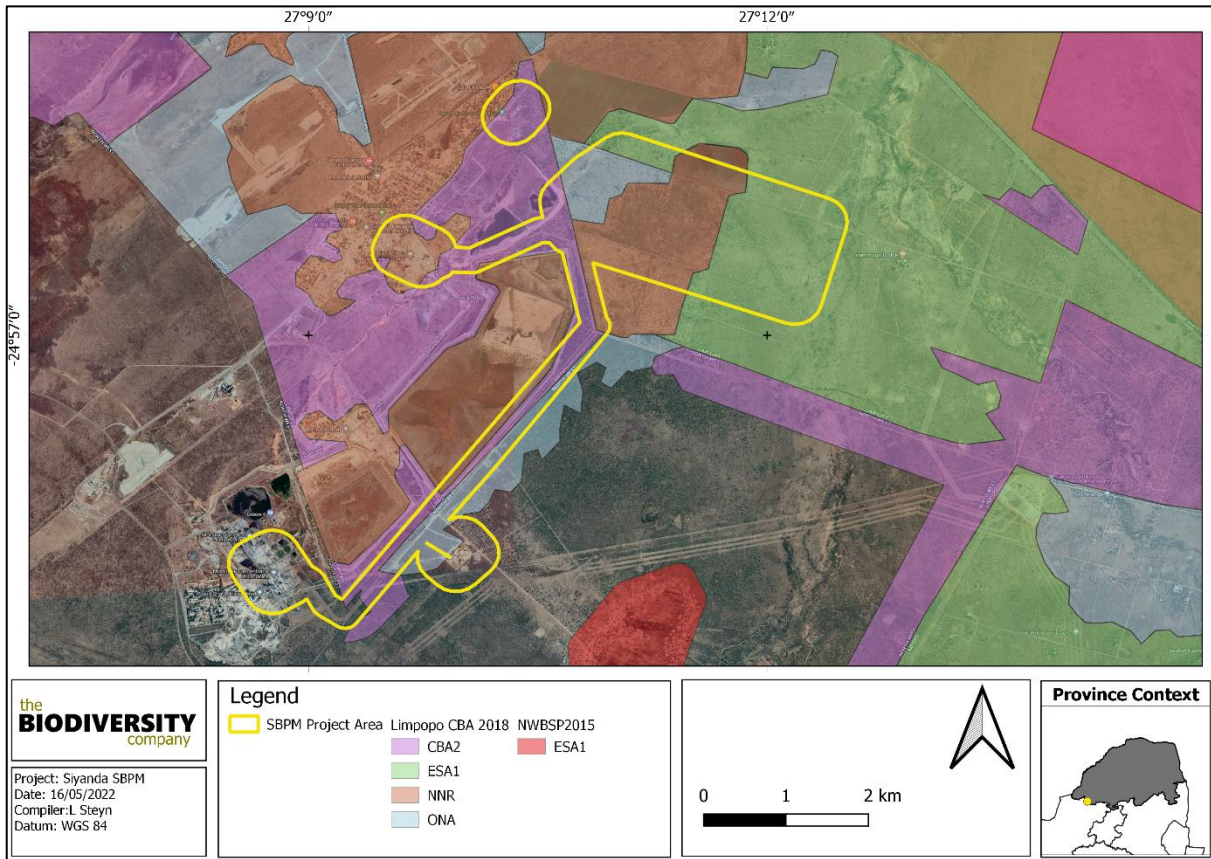
### 5.1.1.3 Critical Biodiversity Areas and Ecological Support Areas

The conservation of CBAs is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

The provincial CBA spatial data for the North West province indicates that both feasibility areas don't traverse any CBA nor Ecological Support Areas (ESAs) and Other Natural Areas (ONAs). Based on the Limpopo Conservation Plan the SCSC feasibility area traverses ESA1 and NNR areas, whereas the SBPM feasibility area traverses ESA1, NNR and ONA area.

The purpose of the Limpopo C-Plan (2018) is to inform land-use planning and development on a provincial scale and to aid in natural resource management. One of the outputs is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely Protected Areas, CBA1 areas, CBA2 areas, ESA1 areas, ESA2 areas, Other Natural Areas (ONAs) and areas with No Natural Habitat Remaining (NNR) based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

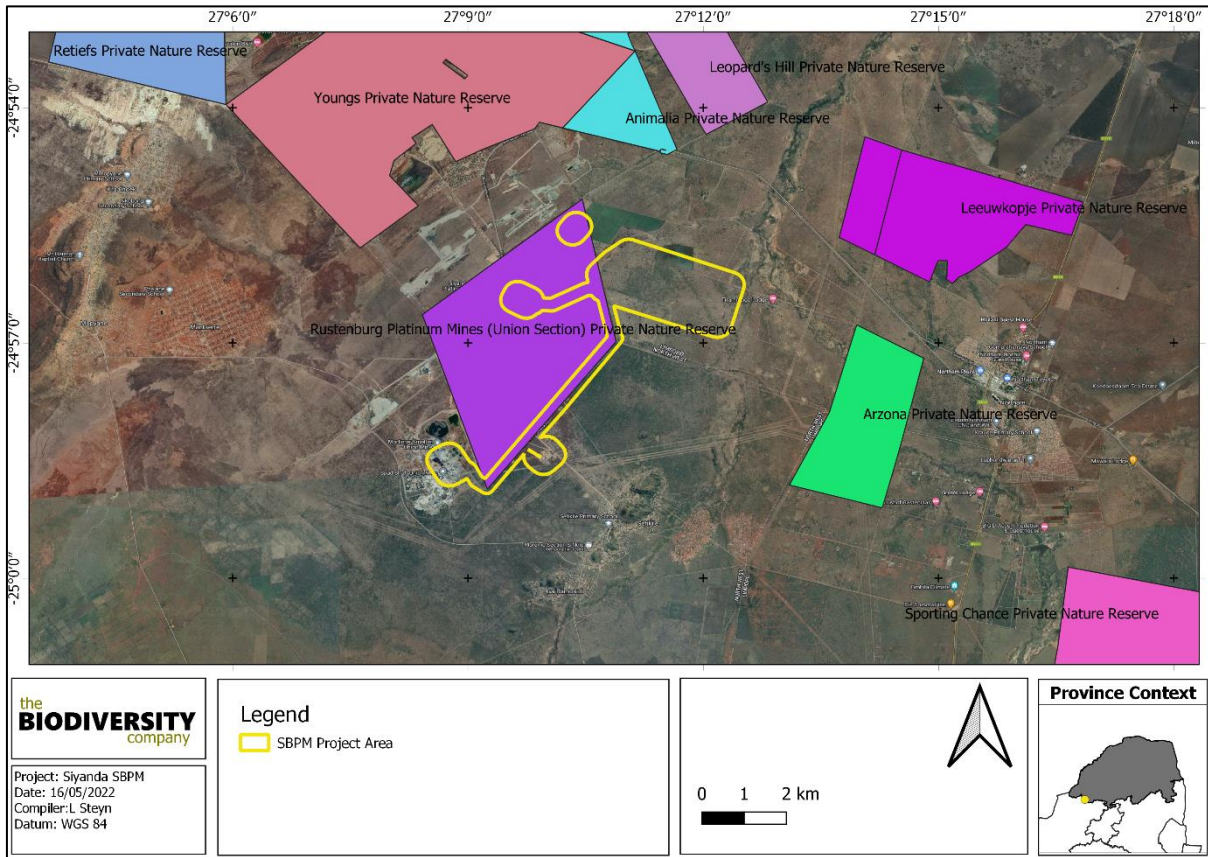
Figure 5-3 shows the project area superimposed on the Terrestrial CBA maps. The project area overlaps with CBA2, ESA1, NNR and ONA classified areas. Development in these areas is feasible, but developments other than the preferred biodiversity-compatible land-uses should be investigated in detail and the mitigation hierarchy applied.



**Figure 5-3** Map illustrating the locations of CBAs in the project area

**5.1.1.4 Protected areas**

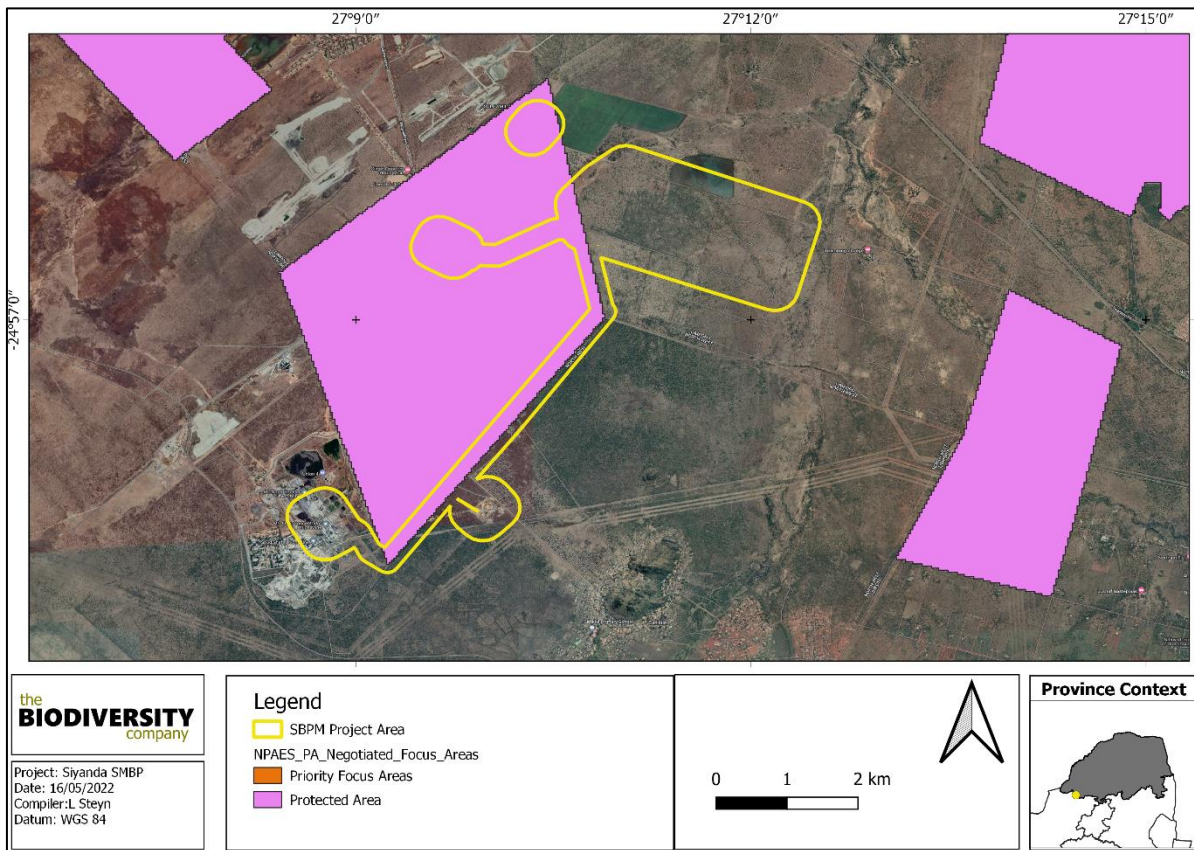
According to the protected area spatial datasets from SAPAD (2021), the project area overlaps with the Rustenburg Platinum Mines (Union Section) Private Nature Reserve (Figure 5-4). From the imagery, and confirmed by the site visit, the portion of the reserve in which the project area is located is comprised of an old tailings dam in various stages of rehabilitation and is therefore not considered ecologically sensitive. Several additional private nature reserves are in close proximity to the project area. These are the Leopard Hills, Animalia, Youngs and Leeuwkopje private nature reserves. All of these reserves are within 5 km of the project area which means that the project area is within the buffer zone of the nature reserves.



**Figure 5-4** The project area in relation to the protected areas

**5.1.1.5 National Protected Area Expansion Strategy**

National Protected Area Expansion Strategy 2016 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for finescale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2016). The project area overlaps with an NPAES protected area as can be seen in Figure 5-5. Developments in these areas must be mitigated to an acceptable level.



**Figure 5-5 The project area in relation to the National Protected Area Expansion Strategy**

**5.1.1.6 Important Bird and Biodiversity Areas**

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

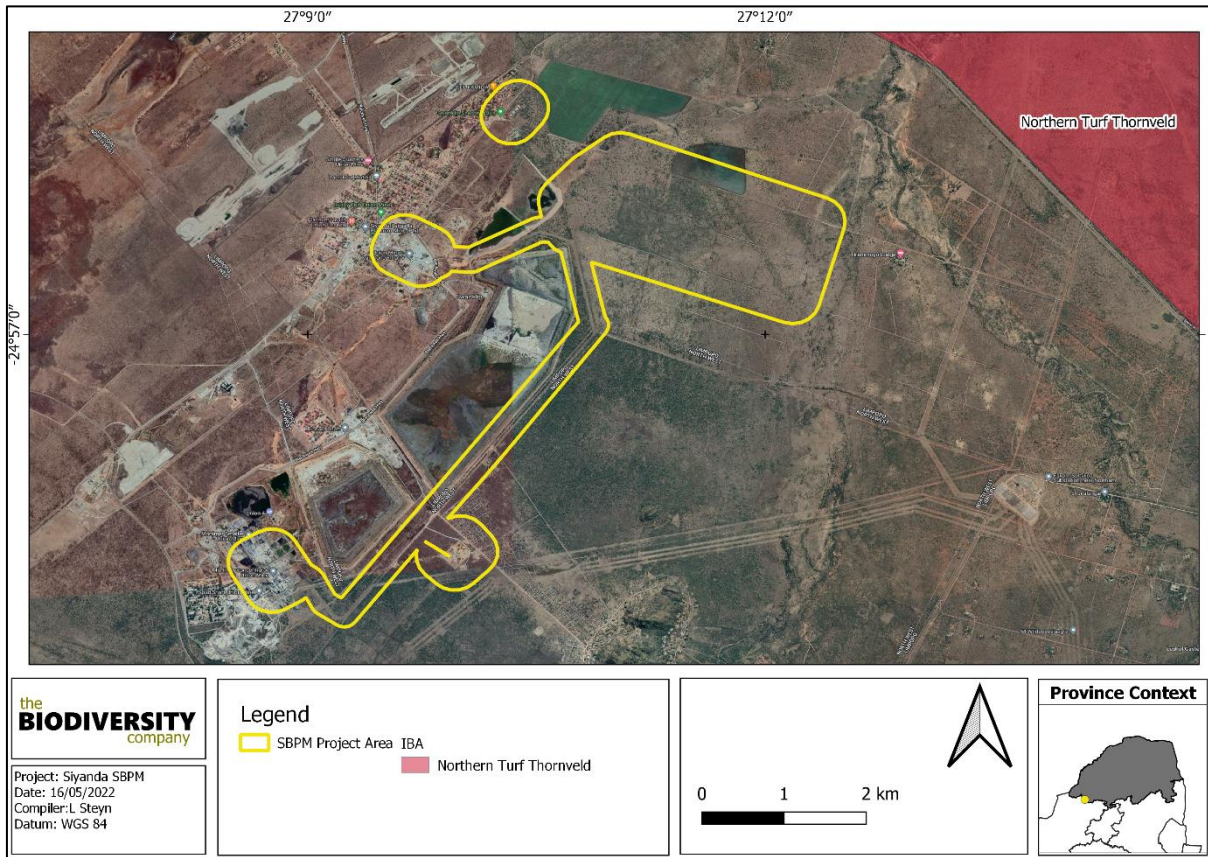
According to Birdlife International (2017), the selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels. Figure 5-6 shows the project area is adjacent to the Northern Turf Thornveld IBA.

The Northern Turf Thornveld IBA consists of a group of privately owned farms that forms a triangle delineated roughly by the Crocodile River in the east and the Bierspruit River in the west; the confluence of these two rivers is approximately 3 km south-west of Thabazimbi. This IBA is important as it is home to the Yellow-throated Sandgrouse *Pterocles gutturalis* and is regarded as the core range of the resident South African population (Birdlife South Africa, 2015B).

Other important birds in the IBA include the Secretarybird *Sagittarius serpentarius*, Kori Bustard *Ardeotis kori*, Lanner Falcon *Falco biarmicus* and Black-winged Pratincole *Glareola nordmanni*.

Common biome-restricted species found within this IBA include Kurrichane Thrush *Turdus libonyanus*, White-throated Robin-Chat *Cossypha humeralis*, Burchell's Starling *Lamprotornis australis*, White-bellied Sunbird *Cinnyris talatala* and the fairly common Kalahari Scrub Robin *Erythropygia paena* (Birdlife South Africa, 2015B).

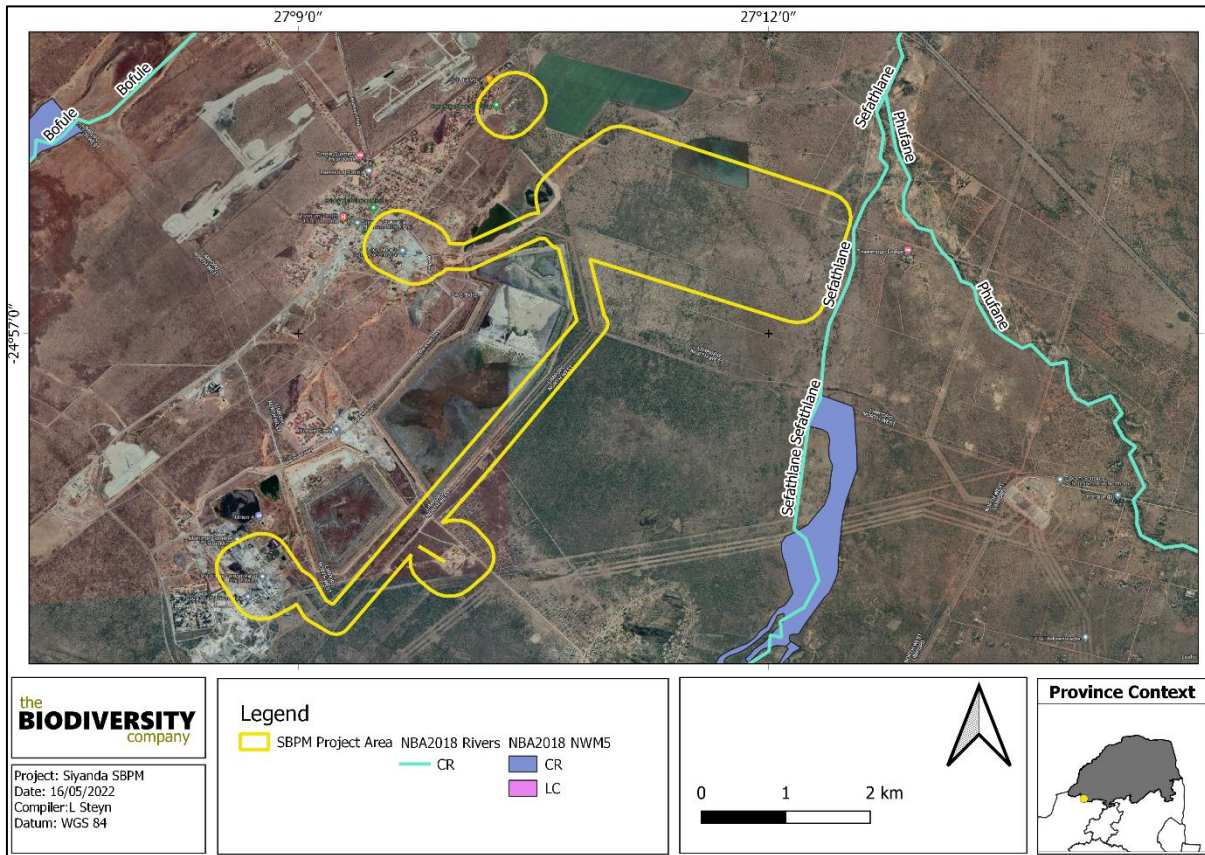




**Figure 5-6** The project area in relation to the Northern turf thornveld IBA

**5.1.1.7 Hydrological Setting**

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as ‘threatened’ (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019). The project area borders on a CR river and a CR wetland (Figure 5-7).

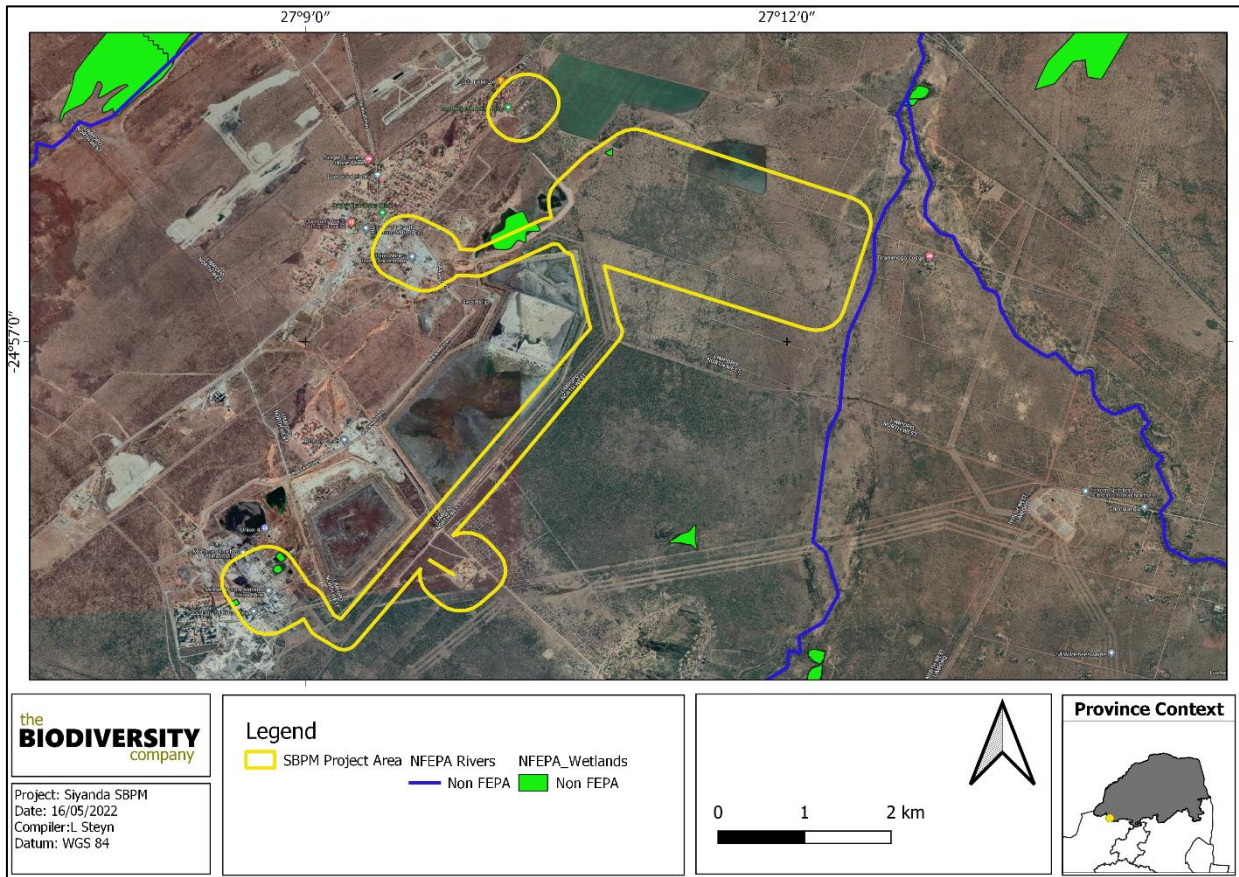


**Figure 5-7** Map illustrating ecosystem threat status of rivers and wetland ecosystems in the project area

### 5.1.1.8 National Freshwater Ecosystem Priority Area Status

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

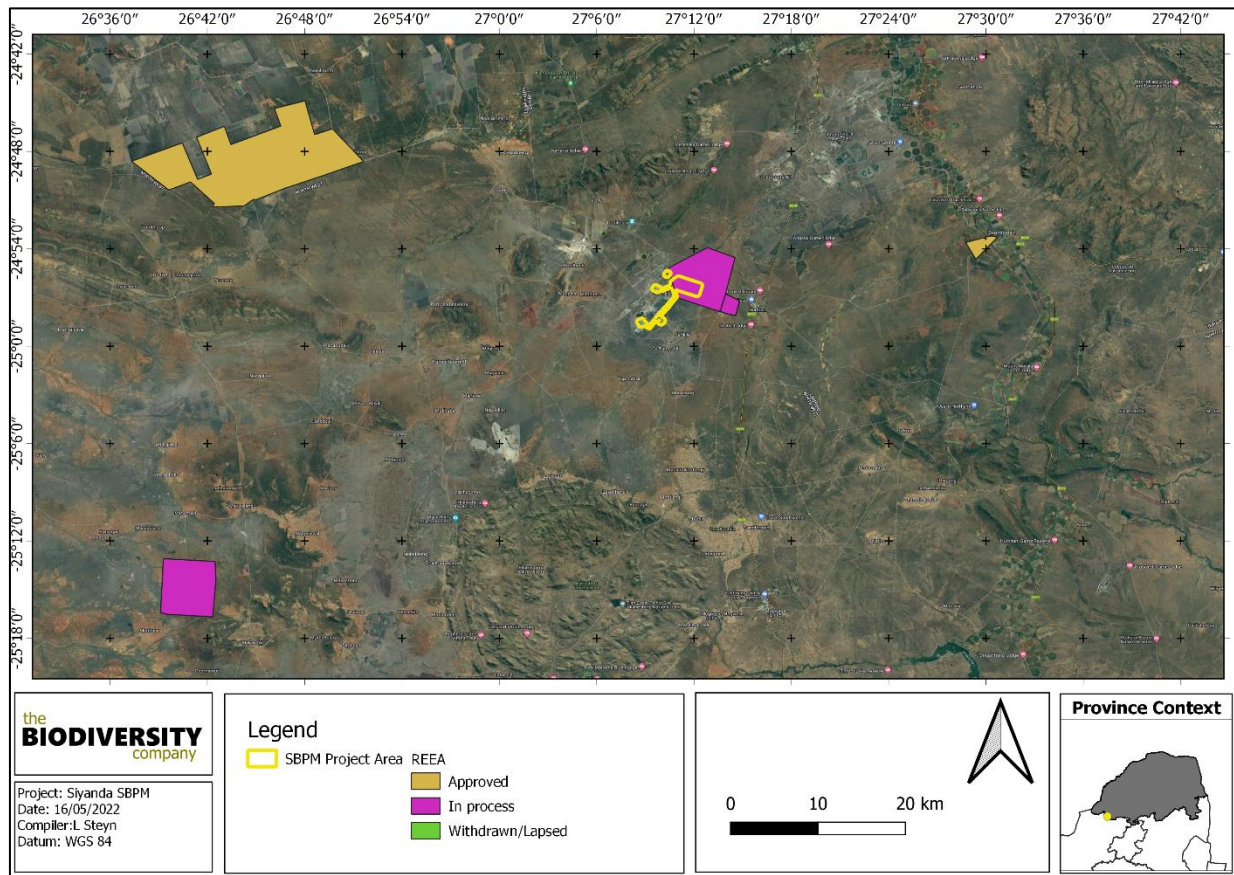
Figure 5-8 shows the project area overlaps with unclassified FEPA wetlands and unclassified FEPA rivers.



**Figure 5-8** The project area in relation to the National Freshwater Ecosystem Priority Areas.

**5.1.1.9** Nearby solar PV plants planned

There are several solar energy facilities within the surrounding landscape that have been approved or are presently in the application process. The project area forms a part of a PV facility that is in the application process, while there are two approved projects within the surrounding area (Figure 5-9).



**Figure 5-9** Map illustrating the SBPM Project Area in relation to nearby PV facilities

**5.1.2 Review of previous reports**

In 2019 TBC completed a terrestrial study for the modernization of the nearby Amandelbult Complex. In that study we delineated four primary habitats: Degraded Thornveld, Fragmented Thornveld, Wetland and Transformed in which a total of 42 tree, shrub and herbaceous plant species were recorded. No avifauna SCCs were recorded.

Scientific Aquatic Services (2020 a, b) conducted a basic assessment on Amandelbult during which they found three avifauna SCC, namely; *Gyps coprotheres* (Cape Vulture, EN), *Leptoptilos crumeniferus* (Marabou Stork, NT) and *Falco biarmicus* (Lanner Falcon, VU). They identified four habitat types in their study: Transformed habitat, Thornveld Habitat Unit, Freshwater Habitat Unit, and Broad-leaf Savanna.

Scientific Terrestrial Services (2019), identified the Bierspruit which splits into the Brakspruit and Bofule river on either side of the project area as an important habitat in the area with a high sensitivity. During the assessment no SCCs were recorded, however *Pterocles gutturalis* (Yellow-throated Sandgrouse, Threatened) were considered to have a high likelihood of occurrence.

In April 2021 TBC conducted an avifauna assessment for a nearby PV in Northam. During the three-day size visit, a total of 102 bird species were recorded. Of these, 58 species were recorded during the standardised point counts. No SCC were recorded during that assessment however, Cape Vulture (*Gyps coprotheres*) was detected during the screening assessment of the project.

The ENVASS assessment for the Siyanda Bakgatla development that was conducted in 2020 is based on a 2006 baseline study performed by Engelbrecht and Grosel (2006) where they recorded 237 bird species in and around their project area. Of the 237 avifaunal species that have been recorded within the area, one (1) was Critically Endangered, namely *Gyps africanus* (White-backed Vulture), two (2) Endangered, two (2) Vulnerable and one (1) Near Threatened species (Table 5-2).

**Table 5-2** *List of species recorded by Engelbrecht and Grosel (2006) as described in the ENVASS 2020 report. CR = Critically Endangered, EN = Endangered, NT = Near Threatened and VU = Vulnerable*

| Scientific Name                 | Common Name          | Conservation Status |
|---------------------------------|----------------------|---------------------|
| <i>Ardeotis kori</i>            | Kori Bustard         | NT                  |
| <i>Gyps africanus</i>           | White-backed Vulture | CR                  |
| <i>Gyps coprotheres</i>         | Cape Vulture         | EN                  |
| <i>Polemaetus bellicosus</i>    | Martial Eagle        | VU                  |
| <i>Sagittarius serpentarius</i> | Secretarybird        | VU                  |
| <i>Torgos tracheliotus</i>      | Lappet-faced Vulture | EN                  |

### 5.1.3 Faunal Assessment

#### 5.1.3.1 Avifauna

The SABAP2 Data lists 306 avifauna species that could be expected to occur within the area (Appendix B). Ten (10) of these expected species are regarded as SCC (Table 5-3). Three of the species have a low likelihood of occurrence due to lack of suitable habitat and food sources in the project area. The likelihood of occurrence is also related to the disturbed nature of portions of the project area.

**Table 5-3** *Threatened avifauna species that are expected to occur within the project area. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

| Species Name                    | Common Name                 | Conservation Status    |               | Likelihood of occurrence |
|---------------------------------|-----------------------------|------------------------|---------------|--------------------------|
|                                 |                             | Regional (SANBI, 2016) | Global (IUCN) |                          |
| <i>Ardeotis kori</i>            | Bustard, Kori               | NT                     | NT            | Low                      |
| <i>Ciconia nigra</i>            | Stork, Black                | VU                     | LC            | Low                      |
| <i>Coracias garrulus</i>        | Roller, European            | NT                     | LC            | Moderate                 |
| <i>Falco biarmicus</i>          | Falcon, Lanner              | VU                     | LC            | High                     |
| <i>Glareola nordmanni</i>       | Pratincole, Black-winged    | NT                     | NT            | Low                      |
| <i>Mycteria ibis</i>            | Stork, Yellow-billed        | EN                     | LC            | Moderate                 |
| <i>Polemaetus bellicosus</i>    | Eagle, Martial              | EN                     | EN            | High                     |
| <i>Pterocles gutturalis</i>     | Sandgrouse, Yellow-throated | NT                     | LC            | Observed                 |
| <i>Sagittarius serpentarius</i> | Secretarybird               | VU                     | EN            | High                     |
| <i>Tyto capensis</i>            | Grass-owl, African          | VU                     | LC            | High                     |

*Coracias garrulus* (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller has a preference for bushy plains and dry savannah areas (IUCN, 2017). There is a moderate chance of this species occurring in the project area as they prefer to forage in open areas.

*Falco biarmicus* (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals but have also been observed solitary. Their diet is mainly composed of small birds such as pigeons and francolins. The likelihood of incidental records of this species in the project area is rated as high due to the natural veld condition and the presence of many bird species on which Lanner Falcons may predate.

*Mycteria ibis* (Yellow-billed Stork) is listed as EN on a regional scale and LC on a global scale. This species is migratory and has a large distributional range which includes much of sub-Saharan Africa. It is

typically associated with freshwater ecosystems, especially wetlands and the margins of lakes and dams (IUCN, 2017). The presence of some water bodies within the project area creates a high possibility that this species may occur there.

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

*Sagittarius serpentarius* (Secretarybird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2017). The likelihood of occurrence is rated as high due to the extensive grasslands and wetland areas present in the project area.

*Tyto capensis* (African Grass-owl) is rated as VU on a regional basis. The distribution of the species includes the eastern parts of South Africa. The species is generally solitary, but it does also occur in pairs in moist grasslands where it roosts (IUCN, 2017). This species specifically has a preference for nesting in dense stands of the grass species *Imperata cylindrica*. Wetlands with suitable habitat can be found in the project area therefore the likelihood of occurrence is rated as high.

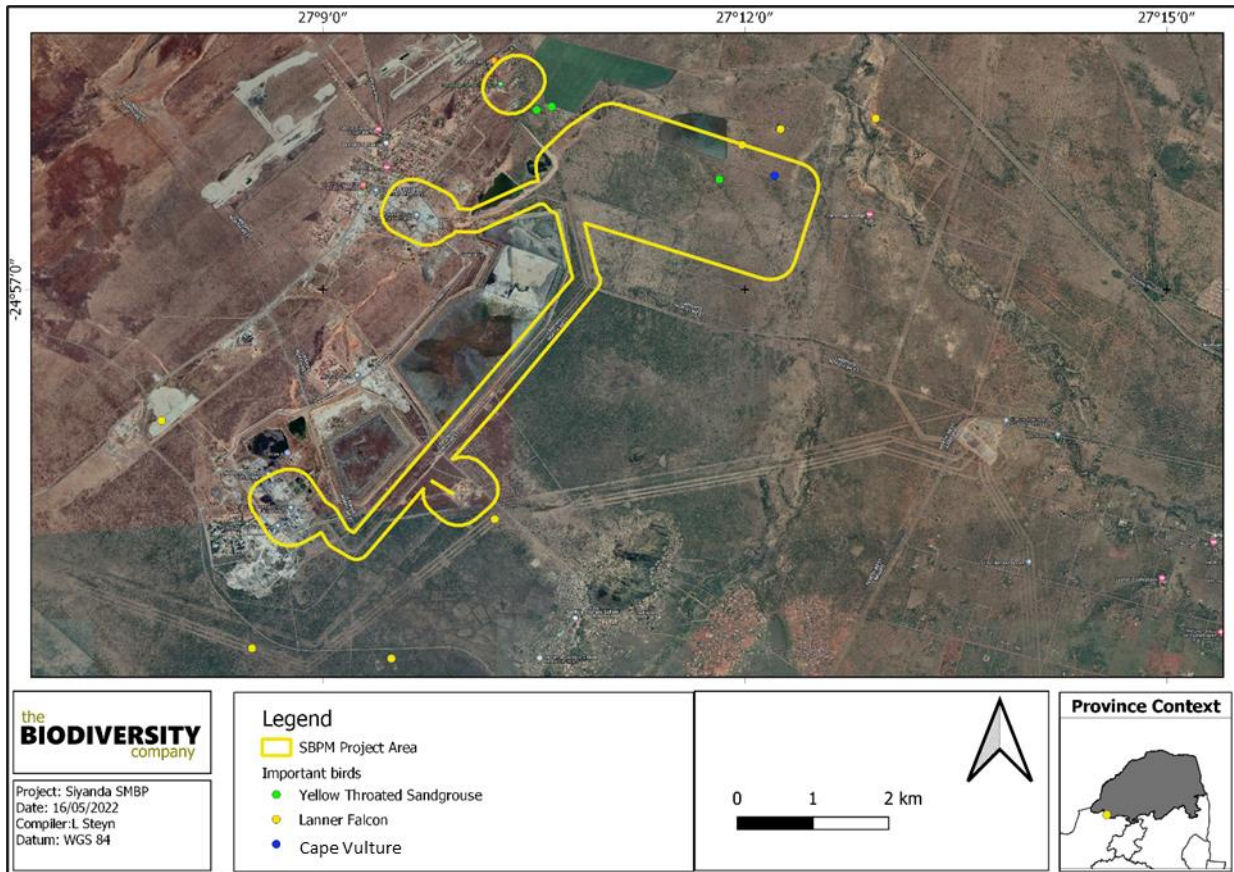
## 6 Field Assessment

### 6.1 First Assessment

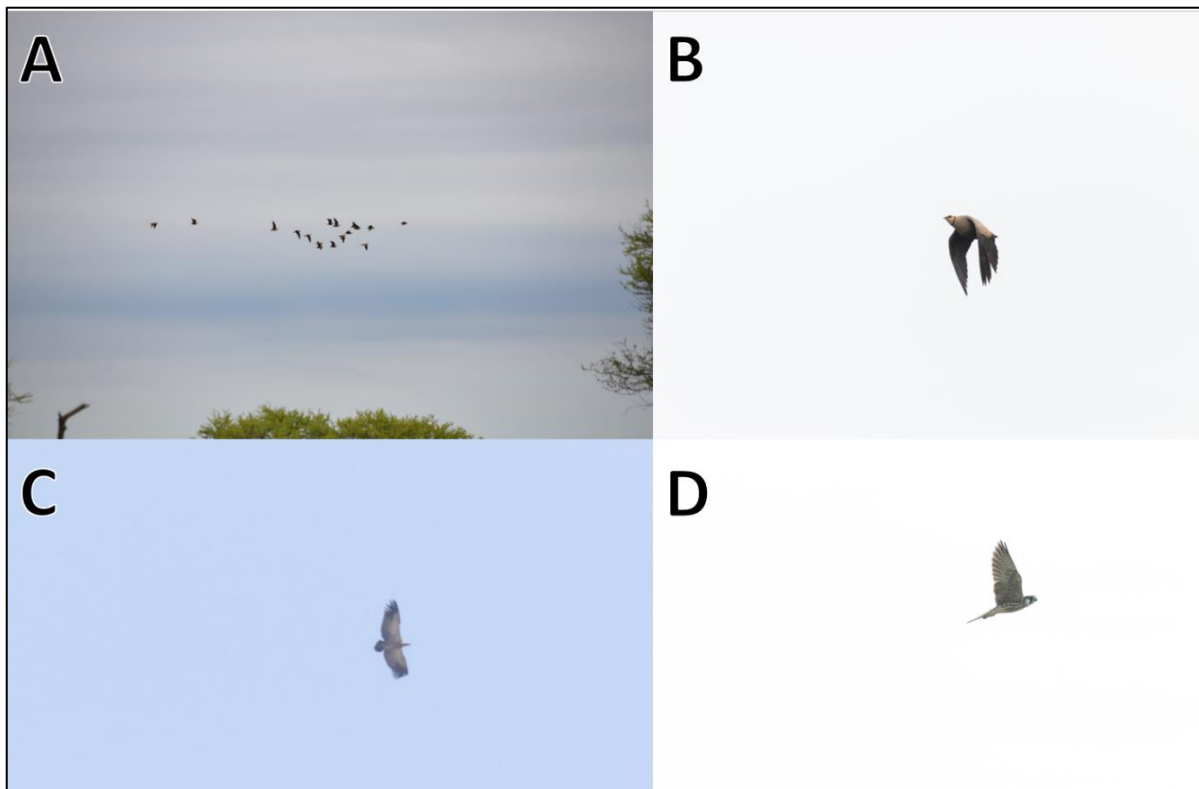
One hundred and thirty-four (134) bird species were recorded in the first survey. The full list of species recorded, their threat status, guild and location observed is shown in Appendix C. A list of the species incidentally recorded moving between point count locations are provided in Appendix D. Three of the species recorded were SCCs on a national or international scale. The Lanner Falcon were observed on four occasions, while the Yellow-throated Sandgrouse were observed twice and the Cape Vulture once (Figure 6-1, Figure 6-2 and Table 6-1). The Yellow-throated Sandgrouse *Pterocles gutturalis* and is regarded as one of the core residents of the Northern Turf Thornveld IBA area (Birdlife South Africa, 2015B).

**Table 6-1** *Species of conservation concern observed during the first field survey. EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

| Common Name                | Scientific Name             | Conservation Status |        |
|----------------------------|-----------------------------|---------------------|--------|
|                            |                             | Regional            | Global |
| Lanner Falcon              | <i>Falco biarmicus</i>      | VU                  | LC     |
| Cape Vulture               | <i>Gyps coprotheres</i>     | EN                  | EN     |
| Yellow-throated Sandgrouse | <i>Pterocles gutturalis</i> | NT                  | LC     |



**Figure 6-1** The location of the recordings of the species of conservation concern



**Figure 6-2** Photographs of the recorded species, A & B) *Pterocles gutturalis* (Yellow-Throated Sandgrouse), C) *Gyps coprotheres* (Cape Vulture) and D) *Falco biarmicus* (Lanner Falcon)

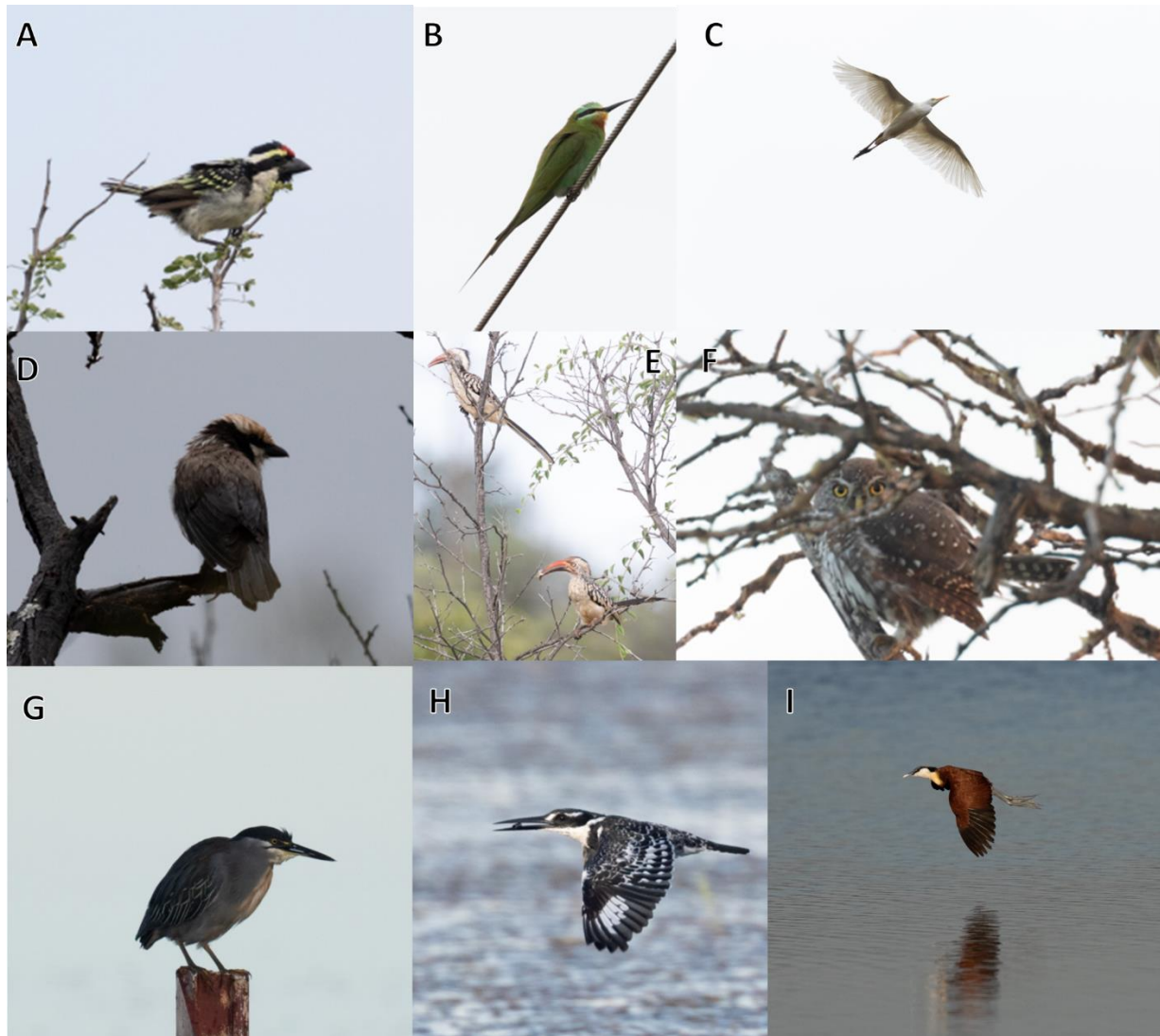
### 6.1.1 Dominant Species

Table 6-2 provide lists of the dominant species for the first survey together with the frequency with which each species appeared in the point count samples. The data shows that *Quelea quelea* (Red-billed Quelea), *Apus affinis* (Little Swift), *Uraeginthus angolensis* (Blue Waxbill) and *Sarkidiornis melanotos* (Knob-billed Duck) were the most abundant species recorded during the survey. Figure 6-3 shows some of the bird species that were recorded during the survey.

**Table 6-2** *Dominant avifaunal species within the project site during the first survey as defined as those species whose relative abundances cumulatively account for more than 79% of the overall abundance shown alongside the frequency with which a species was detected among point counts.*

| Common Name                    | Scientific Name                | Relative abundance | Frequency (%) |
|--------------------------------|--------------------------------|--------------------|---------------|
| Red-billed Quelea              | <i>Quelea quelea</i>           | 0,471              | 52,632        |
| Little Swift                   | <i>Apus affinis</i>            | 0,143              | 21,053        |
| Blue Waxbill                   | <i>Uraeginthus angolensis</i>  | 0,025              | 50,000        |
| Knob-billed Duck               | <i>Sarkidiornis melanotos</i>  | 0,024              | 5,263         |
| Magpie Shrike                  | <i>Urolestes melanoleucus</i>  | 0,017              | 28,947        |
| Cape Turtle (Ring-necked) Dove | <i>Streptopelia capicola</i>   | 0,017              | 60,526        |
| Helmeted Guineafowl            | <i>Numida meleagris</i>        | 0,014              | 15,789        |
| Blue-cheeked Bee-eater         | <i>Merops persicus</i>         | 0,013              | 15,789        |
| Southern Masked Weaver         | <i>Ploceus velatus</i>         | 0,013              | 18,421        |
| Barn Swallow                   | <i>Hirundo rustica</i>         | 0,011              | 21,053        |
| Natal Spurfowl                 | <i>Pternistis natalensis</i>   | 0,010              | 36,842        |
| Western Cattle Egret           | <i>Bubulcus ibis</i>           | 0,010              | 10,526        |
| Lazy Cisticola                 | <i>Cisticola aberrans</i>      | 0,009              | 28,947        |
| Red-faced Mousebird            | <i>Urocolius indicus</i>       | 0,008              | 13,158        |
| Spur-winged Goose              | <i>Plectropterus gambensis</i> | 0,008              | 5,263         |

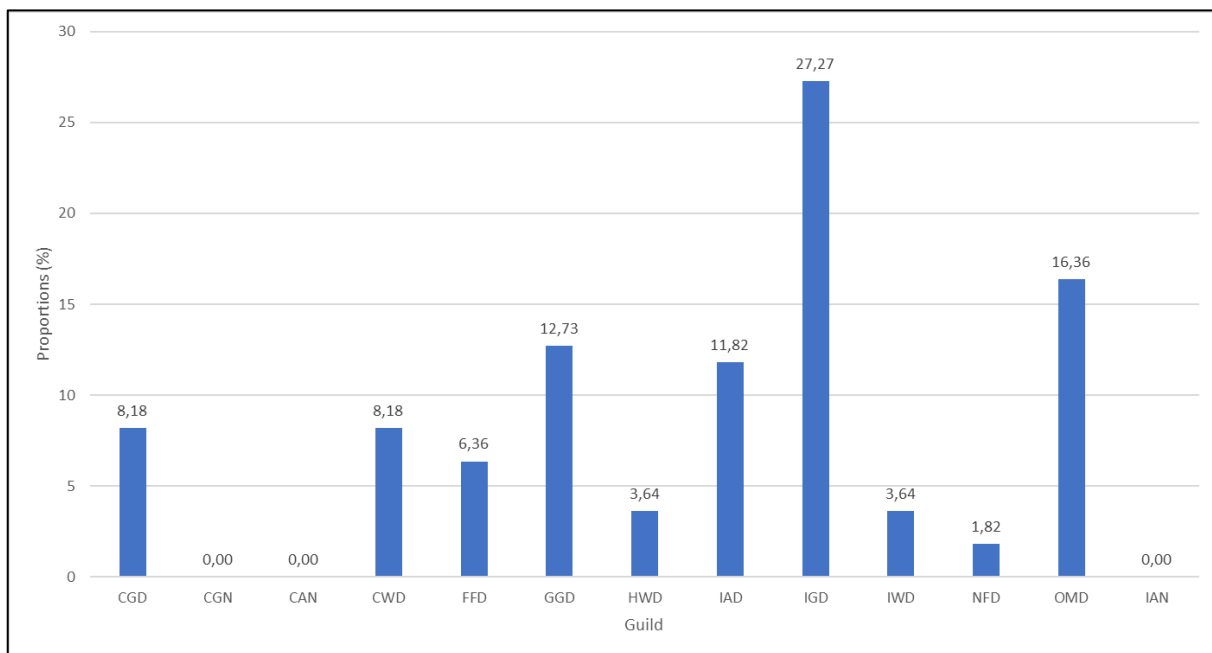




**Figure 6-3** Some of the birds recorded in the project area: A) Acacia Pied Barbet B) Blue-cheeked Bee-eater, C) Cattle Egret, D) Southern White-crowned Shrike, E) Southern Red-billed Hornbill, F) Pearl-spotted Owlet, G) Green-backed (Striated) Heron, H) Pied Kingfisher, and I) African Jacana

### 6.1.2 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014); they divided avifauna into 13 major groups based on their diet, habitat, and main area of activity. The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by insectivorous birds that feed on the ground during the day, i.e., Invertivore Ground Diurnal (IGD) (27%) (Figure 6-4). Omnivores that do not have a set habitat Omnivore Multiple Diurnal (OMD) made up the second highest group (16%), followed by Granivore Ground Diurnal (GGD) species (13%). . As illustrated in Figure 6-4, the project area supports a diverse functional feeding guild assemblage, including carnivorous and frugivorous species.



**Figure 6-4** Avifaunal trophic guilds. CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal, CAN, carnivore air nocturnal, CWD, carnivore water diurnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; HWD, herbivore water diurnal; IAD, insectivore air diurnal; IGD, insectivore ground diurnal; IWD, insectivore water diurnal; NFD, nectivore foliage diurnal; OMD, omnivore multiple diurnal; IAN, Insectivore air nocturnal.

### 6.1.3 Risk Species

A number of species were found during the survey that would be regarded as ‘high risk’ species (Table 6-3 and Figure 6-5). High risk species are species that would be sensitive to habitat loss, that are regarded as collision prone species and species that would have a high electrocution risk. Species recorded at the nearby river and dam were included as they could very likely be influenced should they be moving between water sources. Even though the panels do not pose an extensive collision risk for larger birds, powerlines associated with the infrastructure, guidelines (anchor lines) and connection lines do pose a risk. The fence could also pose a collision risk for various species as described in section 8.2.

**Table 6-3** At risk species found in the survey.

| Common Name                   | Scientific Name             | Conservation Status (Regional, Global) | Collision | Electrocution | Habitat Loss |
|-------------------------------|-----------------------------|--|-----------|---------------|--------------|
| African Darter                | <i>Anhinga rufa</i>         |  | x         |               | x            |
| African Fish Eagle            | <i>Haliaeetus vocifer</i>   |  | x         | x             |              |
| African Hawk Eagle            | <i>Aquila spilogaster</i>   |  | x         | x             |              |
| Black-chested Snake Eagle     | <i>Circaetus pectoralis</i> |  |           | x             |              |
| Black-headed Heron            | <i>Ardea melanocephala</i>  |  | x         | x             |              |
| Egyptian Goose                | <i>Alopochen aegyptiaca</i> |  | x         | x             |              |
| Gabar Goshawk                 | <i>Micronisus gabar</i>     |  | x         |               |              |
| Glossy Ibis                   | <i>Plegadis falcinellus</i> |  | x         | x             |              |
| Green-backed (Striated) Heron | <i>Butorides striata</i>    |  | x         |               |              |
| Hadeda (Hadada) Ibis          | <i>Bostrychia hagedash</i>  |  | x         | x             |              |
| Hamerkop                      | <i>Scopus umbretta</i>      |  | x         |               |              |

| Common Name                | Scientific Name                | Conservation Status<br>(Regional, Global) | Collision | Electrocution | Habitat<br>Loss |
|----------------------------|--------------------------------|---|-----------|---------------|-----------------|
| Helmeted Guineafowl        | <i>Numida meleagris</i>        |   |           | x             |                 |
| Lanner Falcon              | <i>Falco biarmicus</i>         | VU, LC                                    | x         |               | x               |
| Marsh Owl                  | <i>Asio capensis</i>           |   | x         | x             | x               |
| Spur-winged Goose          | <i>Plectropterus gambensis</i> |   | x         | x             |                 |
| Cape Vulture               | <i>Gyps coprotheres</i>        | EN, EN                                    | x         | x             | x               |
| White-faced Whistling Duck | <i>Dendrocygna viduata</i>     |   | x         | x             |                 |
| Yellow-throated Sandgrouse | <i>Pterocles gutturalis</i>    | NT, LC                                    |           |               | x               |



**Figure 6-5** Two of the high collision risk species recorded on site: A) Spur-winged Geese and B) Black-headed Heron

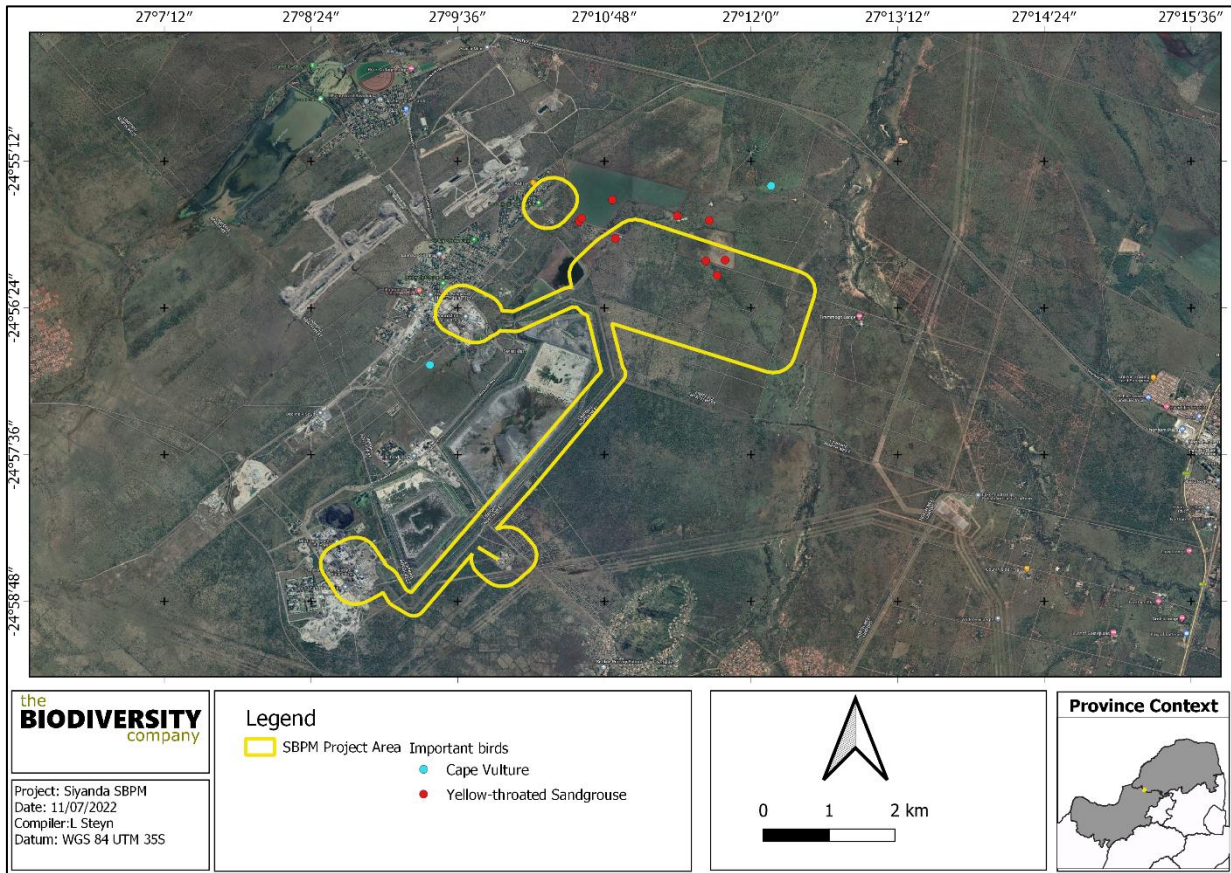
## 6.2 Second Assessment

One hundred and eight (108) bird species were recorded during the second survey. The full list of species recorded, their threat status, guild and location observed is provided in Appendix E, incidental records are listed in Appendix F. Two of the species recorded were SCC on a national or international scale. One individual Cape Vulture was found circling north of the project area and an additional 6 individuals of this species was observed west of the project area. A total of 31 Yellow-throated Sandgrouse were observed in various parts of the project area.

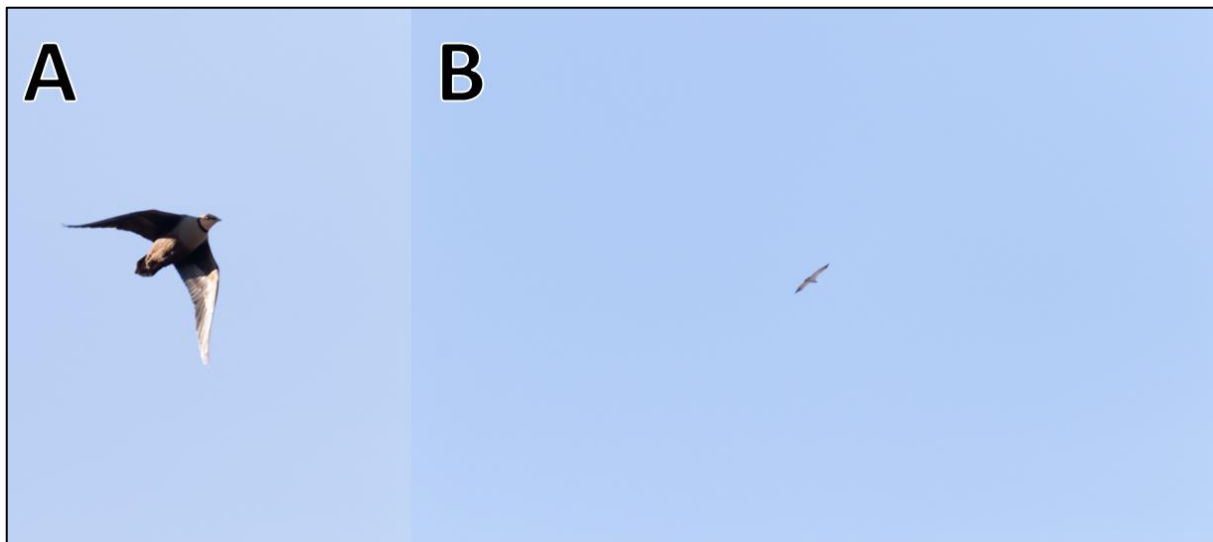
Table 6-4 lists the species as well as their threatened status, Figure 6-6 shows the locations where the species were observed and Figure 6-7 provides photographs of these recorded SCC.

**Table 6-4** Species of conservation concern observed during the survey (EN Endangered; NT, Near Threatened)

| Common Name                | Scientific Name             | Conservation Status |        |
|----------------------------|-----------------------------|---------------------|--------|
|                            |                             | Regional            | Global |
| Cape Vulture               | <i>Gyps coprotheres</i>     | EN                  | EN     |
| Yellow-throated Sandgrouse | <i>Pterocles gutturalis</i> | NT                  | LC     |



**Figure 6-6** The location of the recordings of the species of conservation concern



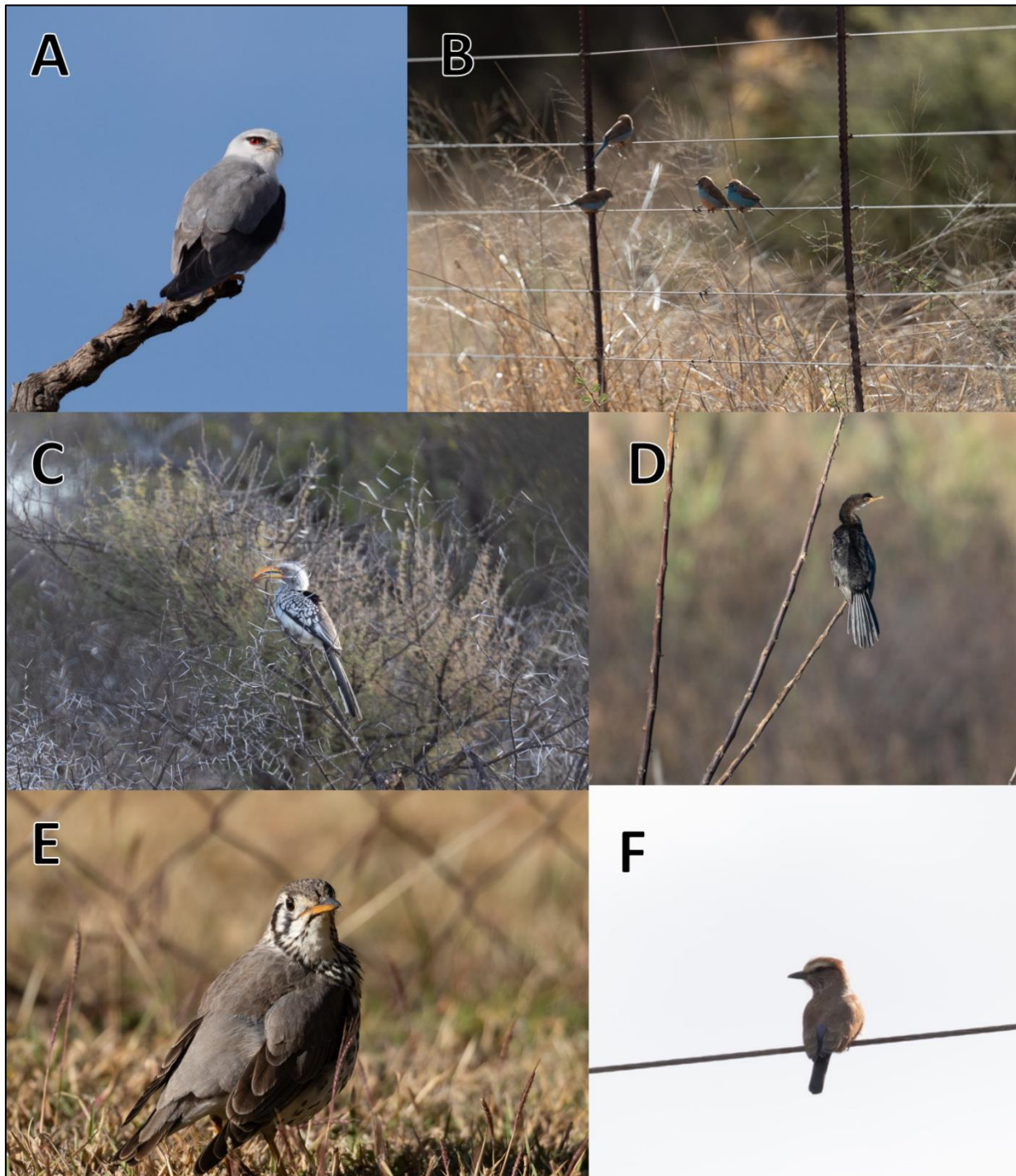
**Figure 6-7** Photographs of the recorded species, A) *Pterocles gutturalis* (Yellow-throated Sandgrouse) and B) *Gyps coprotheres* (Cape Vulture)

### 6.2.1 Dominant Species

Table 6-5 lists the dominant species for the second survey together with the frequency with which each species appeared in the point count samples. The data shows the Red-billed Quelea, Red-knobbed Coot, Helmeted Guineafowl, African Palm Swift and Blue Waxbill were the most abundant species during the survey. Figure 6-8 shows some of the birds that were recorded during the survey.

**Table 6-5** *Dominant avifaunal species within the project site during the winter survey as defined as those species whose relative abundances cumulatively account for more than 78% of the overall abundance shown alongside the frequency with which a species was detected among point counts.*

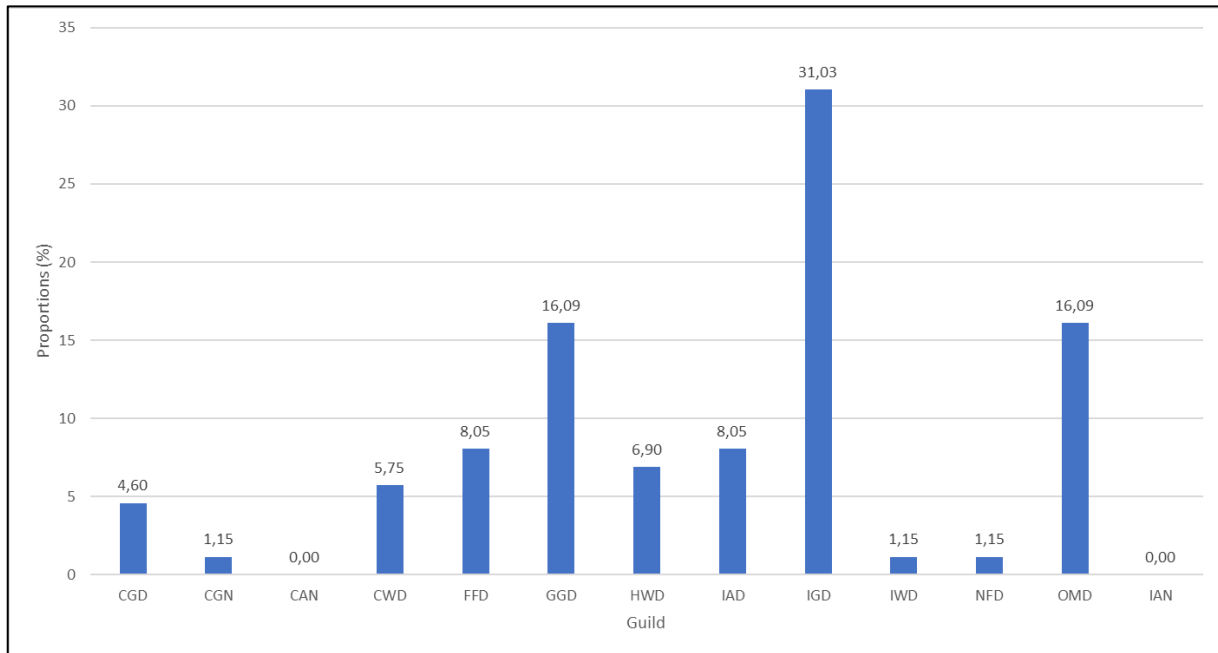
| Common Name                           | Scientific Name                | Conservation Status    |             | Guild code | Relative abundance | Frequency (%) |
|---------------------------------------|--------------------------------|------------------------|-------------|------------|--------------------|---------------|
|                                       |                                | Regional (SANBI, 2016) | IUCN (2017) |            |                    |               |
| Red-billed Quelea                     | <i>Quelea quelea</i>           | Unlisted               | LC          | GGD        | 0,169              | 10,811        |
| Red-knobbed coot                      | <i>Fulica cristata</i>         | Unlisted               | LC          | HWD        | 0,102              | 2,703         |
| Helmeted Guineafowl                   | <i>Numida meleagris</i>        | Unlisted               | LC          | OMD        | 0,089              | 13,514        |
| African Palm Swift                    | <i>Cypsiurus parvus</i>        | Unlisted               | LC          | IAD        | 0,070              | 18,919        |
| Blue Waxbill                          | <i>Uraeginthus angolensis</i>  | Unlisted               | LC          | GGD        | 0,066              | 62,162        |
| White-faced Whistling Duck            | <i>Dendrocygna viduata</i>     | Unlisted               | LC          | HWD        | 0,051              | 2,703         |
| Cape Turtle (Ring-necked) Dove        | <i>Streptopelia capicola</i>   | Unlisted               | LC          | GGD        | 0,032              | 72,973        |
| Yellow-throated Sandgrouse            | <i>Pterocles gutturalis</i>    | NT                     | LC          | GGD        | 0,032              | 16,216        |
| Magpie Shrike                         | <i>Urolestes melanoleucus</i>  | Unlisted               | LC          | IAD        | 0,027              | 32,432        |
| Long-billed Crombec                   | <i>Sylvietta rufescens</i>     | Unlisted               | LC          | IGD        | 0,017              | 37,838        |
| Chestnut-vented Tit-Babbler (Warbler) | <i>Curruca subcoerulea</i>     | Unlisted               | LC          | IGD        | 0,015              | 37,838        |
| Rattling Cisticola                    | <i>Cisticola chiniana</i>      | Unlisted               | LC          | IGD        | 0,014              | 35,135        |
| Burchell's Starling                   | <i>Lamprotornis australis</i>  | Unlisted               | LC          | IGD        | 0,013              | 21,622        |
| Pied Crow                             | <i>Corvus albus</i>            | Unlisted               | LC          | OMD        | 0,012              | 29,730        |
| Grey Go-away-bird                     | <i>Corythaixoides concolor</i> | Unlisted               | LC          | FFD        | 0,011              | 21,622        |
| Green-winged Pytilia                  | <i>Pytilia melba</i>           | Unlisted               | LC          | GGD        | 0,010              | 18,919        |
| Marico Flycatcher                     | <i>Melaenornis mariquensis</i> | Unlisted               | LC          | IAD        | 0,010              | 18,919        |
| Red-faced Mousebird                   | <i>Urocolius indicus</i>       | Unlisted               | LC          | FFD        | 0,010              | 8,108         |
| Reed Cormorant                        | <i>Microcarbo africanus</i>    | Unlisted               | LC          | CWD        | 0,010              | 2,703         |
| Swainson's Spurfowl                   | <i>Pternistis swainsonii</i>   | Unlisted               | LC          | OMD        | 0,010              | 18,919        |
| White-breasted Cormorant              | <i>Phalacrocorax lucidus</i>   | Unlisted               | LC          | CWD        | 0,010              | 2,703         |
| Red-billed Buffalo Weaver             | <i>Bubalornis niger</i>        | Unlisted               | LC          | GGD        | 0,009              | 2,703         |
| Yellow-billed Duck                    | <i>Anas undulata</i>           | Unlisted               | LC          | HWD        | 0,009              | 2,703         |



**Figure 6-8** Some of the birds recorded in the project site: A) Black Shouldered Kite, B) Blue Waxbill, C) Yellow-billed Hornbill, D) White-breasted Cormorant, E) Groundscraper Thrush, and F) Purple Roller.

### 6.2.2 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014); they divided avifauna into 13 major groups based on their diet, habitat, and main area of activity. The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by insectivorous birds that feed on the ground during the day (IGD) (31%) (Figure 6-4Figure 6-9). Granivores that feed on the ground (GGD) and the omnivorous species (OMD) (16 %) made up the second highest groups.



**Figure 6-9 Avifaunal trophic guilds. CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal, CAN, carnivore air nocturnal, CWD, carnivore water diurnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; HWD, herbivore water diurnal; IAD, insectivore air diurnal; IGD, insectivore ground diurnal; IWD, insectivore water diurnal; NFD, nectivore foliage diurnal; OMD, omnivore multiple diurnal; IAN, Insectivore air nocturnal.**

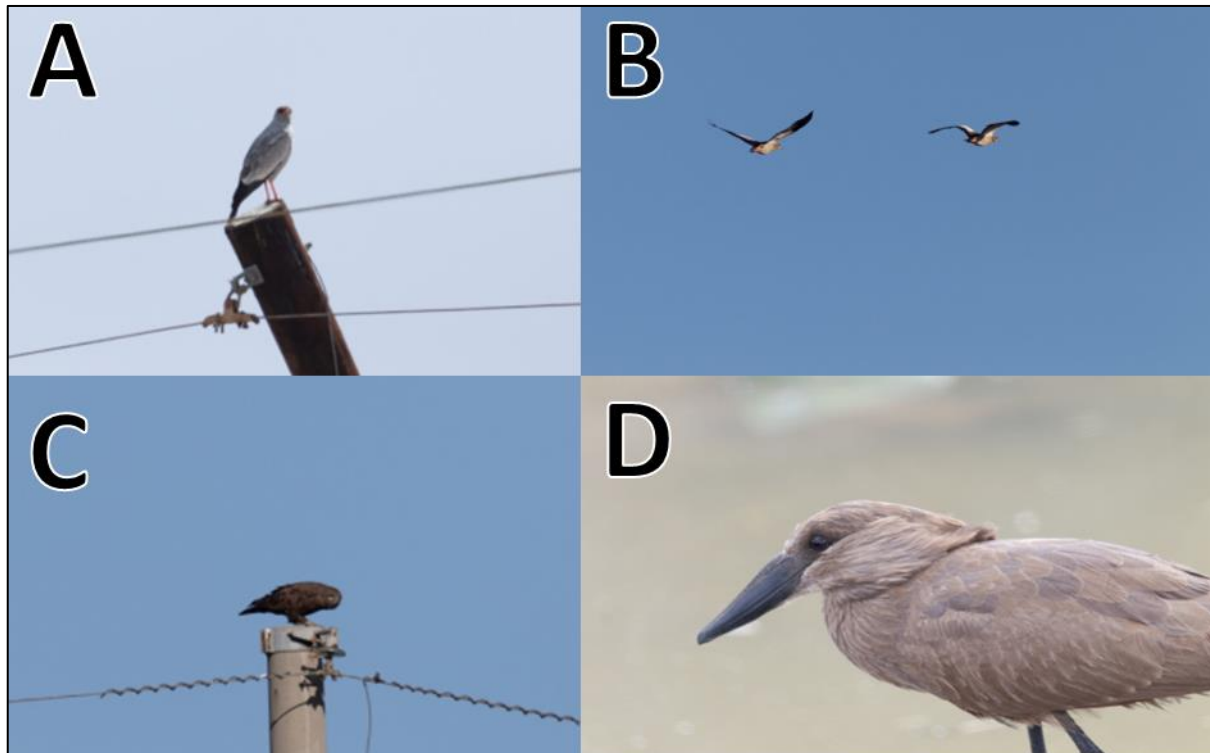
**6.2.3 Risk Species**

A number of species were found that would be regarded as ‘high risk’ species (Table 6-6 and Figure 6-10). High risk species are species that would be sensitive to habitat loss, that are regarded as collision prone species and species that would have a high electrocution risk.

**Table 6-6 At risk species found in the survey.**

| Common Name           | Scientific Name               | Conservation Status (Regional, Global) | Collision | Electrocution | Habitat Loss |
|-----------------------|-------------------------------|--|-----------|---------------|--------------|
| African Darter        | <i>Anhinga rufa</i>           |  | x         |               | x            |
| African Fish Eagle    | <i>Haliaeetus vocifer</i>     |  | x         | x             |              |
| African Hawk Eagle    | <i>Aquila spilogaster</i>     |  | x         | x             |              |
| Black-headed Heron    | <i>Ardea melanocephala</i>    |  | x         | x             |              |
| Black-winged Kite     | <i>Elanus caeruleus</i>       |  |           | x             |              |
| Brown Snake Eagle     | <i>Circaetus cinereus</i>     |  |           | x             |              |
| Cape Shoveler         | <i>Spatula smithii</i>        |  | x         | x             |              |
| Cape Vulture          | <i>Gyps africanus</i>         | EN, EN                                 | x         | x             | x            |
| Egyptian Goose        | <i>Alopochen aegyptiaca</i>   |  | x         | x             |              |
| Hadeda (Hadada) Ibis  | <i>Bostrychia hagedash</i>    |  |           | x             | x            |
| Hamerkop              | <i>Scopus umbretta</i>        |  |           | x             |              |
| Helmeted Guineafowl   | <i>Numida meleagris</i>       |  |           | x             |              |
| Knob-billed Duck      | <i>Sarkidiornis melanotos</i> |  | x         | x             |              |
| Pale Chanting Goshawk | <i>Melierax canorus</i>       |  | x         |               |              |

| Common Name                | Scientific Name             | Conservation Status (Regional, Global) | Collision | Electrocution | Habitat Loss |
|----------------------------|-----------------------------|--|-----------|---------------|--------------|
| Pied Crow                  | <i>Corvus albus</i>         |  | x         | x             |              |
| Red-billed Teal            | <i>Anas erythrorhyncha</i>  |  | x         | x             |              |
| Western Cattle Egret       | <i>Bubulcus ibis</i>        |  | x         | x             |              |
| White-faced Whistling Duck | <i>Dendrocygna viduata</i>  |  | x         | x             |              |
| Yellow-throated Sandgrouse | <i>Pterocles gutturalis</i> | NT, LC                                 |           |               | x            |

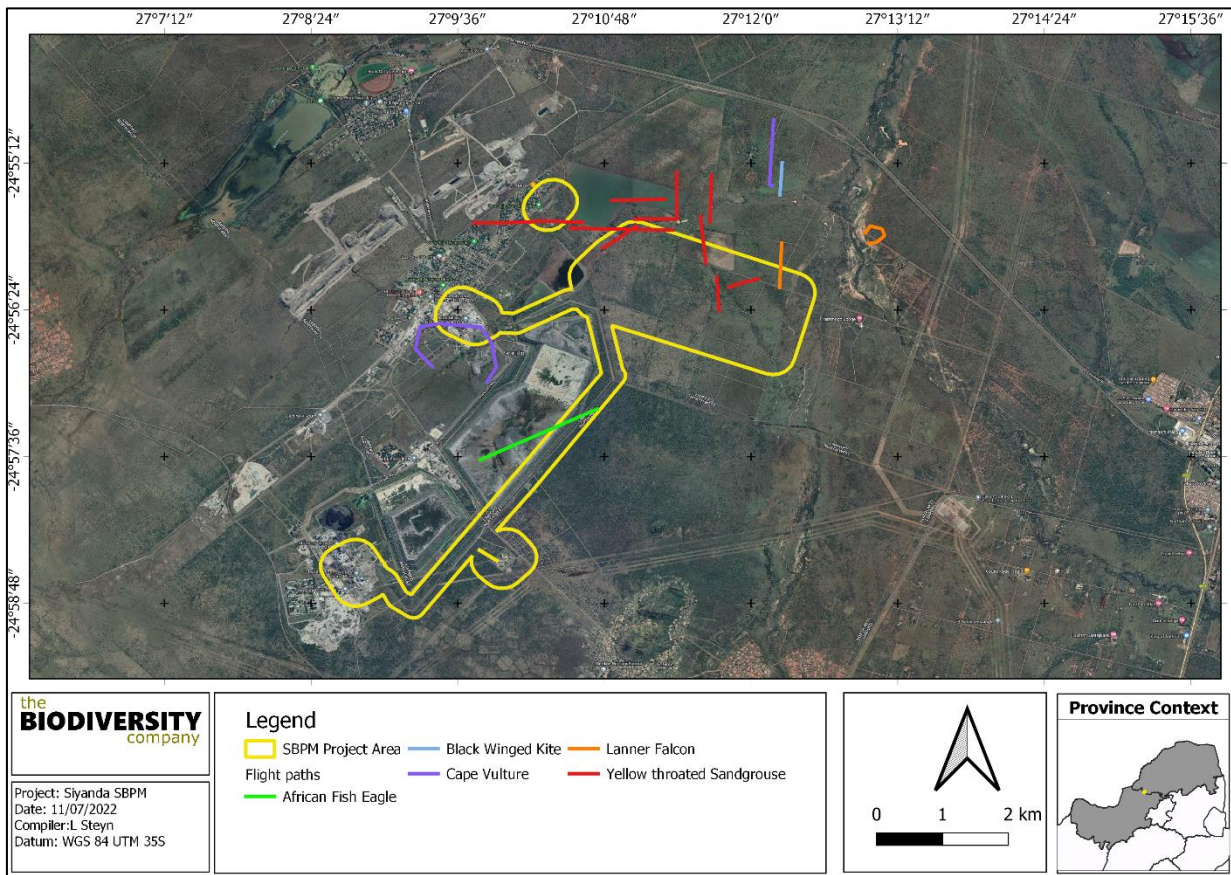


**Figure 6-10** Some of the high collision risk species recorded on site: A) Pale Chanting Goshawk, B) Egyptian Goose, C) Brown Snake Eagle and D) Hamerkop

### 6.3 Flight and Nest Analysis

Observing and monitoring flight paths and nesting sites are important in ascertaining habitat sensitivity and evaluating the impact risk significance of any proposed development. During the field survey recording flight-paths and nesting sites were undertaken for certain species. However, given the limited time available the results of this section must be interpreted with caution, as each species movement is likely to be more extensive and there may have been nesting sites that were not observed. No nest of species of conservation concern were observed. What was however noted was that the Yellow Throated Sandgrouse use the wetlands on site extensively (high density areas of occurrence on Figure 6-11) and these wetland areas must thus be avoided during development. Figure 6-11 further shows the flight path of an African Fish Eagle crossing the transmission line.





**Figure 6-11** Flight paths of some of the risk species in the project area and surrounds

## 7 Fine-Scale Habitat Use

Fine-scale habitats within the landscape are important in supporting a diverse avifauna community as they provide differing nesting, foraging and reproductive opportunities. The assessment area overlapped with five habitat types namely, Degraded Bushveld, Disturbed, Fragmented Bushveld, Transformed as well as Wetlands and other water resources (Dam and river) (Figure 7-2). These habitats were based on the species compositions in the various areas. The areas of interests outside of the direct footprint were included as these areas could also support species that could be influenced by the development. Habitat types delineated within the direct project footprint and adjacent survey areas are illustrated Figure 7-1.

Degraded Bushveld comprised of a number of woody species which provide suitable perching and nesting locations for species such as Black-Winged Kites, Black-chested Snake Eagles and African Hawk Eagles. The present impacts to this habitat unit were found to be limited and it presented a healthy combination of insect, seed and fruit eaters as well as numerous carnivorous species.

The Disturbed habitat is regarded as areas that have been impacted by historic overgrazing, mismanagement and land use. These habitats are not entirely transformed but in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives from grazing and mismanagement. Grass species were mostly prevalent in this habitat, therefore a number of granivores species were found here. These species included Red-billed Queleas, Blue Waxbills and Southern- Masked Weavers.

Transformed habitat included areas where mining previously took place as well as the areas where agriculture is currently taking place. Species found here included Red-faced Mousebirds and Cape-Turtle Doves.

Fragmented Bushveld consisted of areas that were isolated from the other areas, this was mainly due to fences or roads. Some portions of this habitat would previously have been described as disturbed but as

it is now allowed to recover, its general ecological state is in a better condition. It is however still exposed to edge effects. Species found here also included a high number of carnivores species due to the larger tree species found here.

Wetlands and Other Water Resources consisted of the onsite wetlands as well as the nearby, Sefathlane, Brakspruit, Phufane rivers as well as the dam found on the Bofule river. Some of the rivers/portions of the rivers were dry during the first survey they did however still have plant growth on the edge that are restricted to water sources. The birds utilising these habitats included Woodlands Kingfisher, White-faced Whistling Duck, Green-backed (Striated) Heron, White-winged Tern, African Darter, Lesser Swamp Warbler and Squacco Heron. The wetlands found in the project area is utilised by the Yellow-throated Sandgrouse as water sources and is thus considered to be sensitive.

The general physiognomy of the afore-described habitat types is illustrated in Figure 7-2 below.

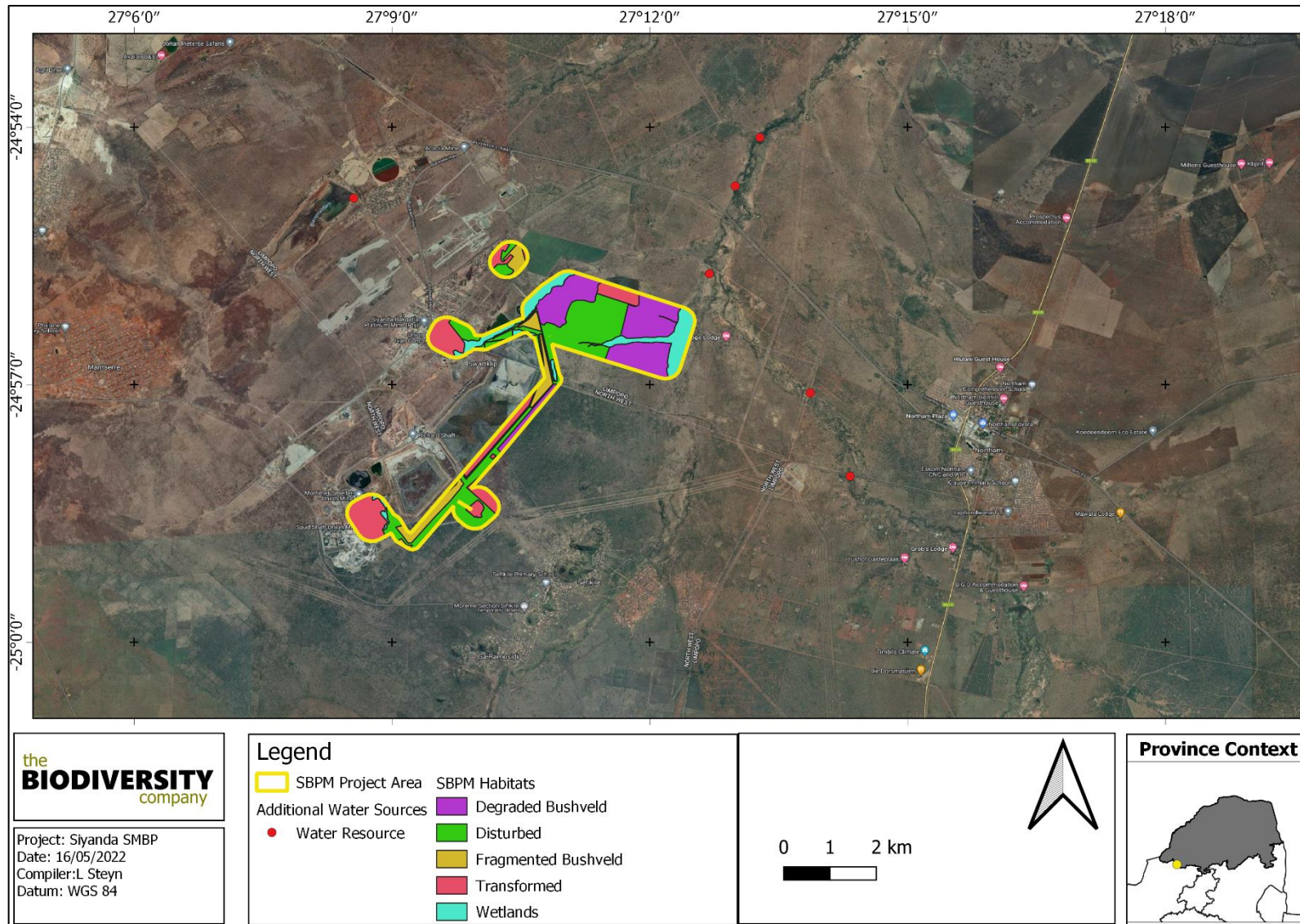
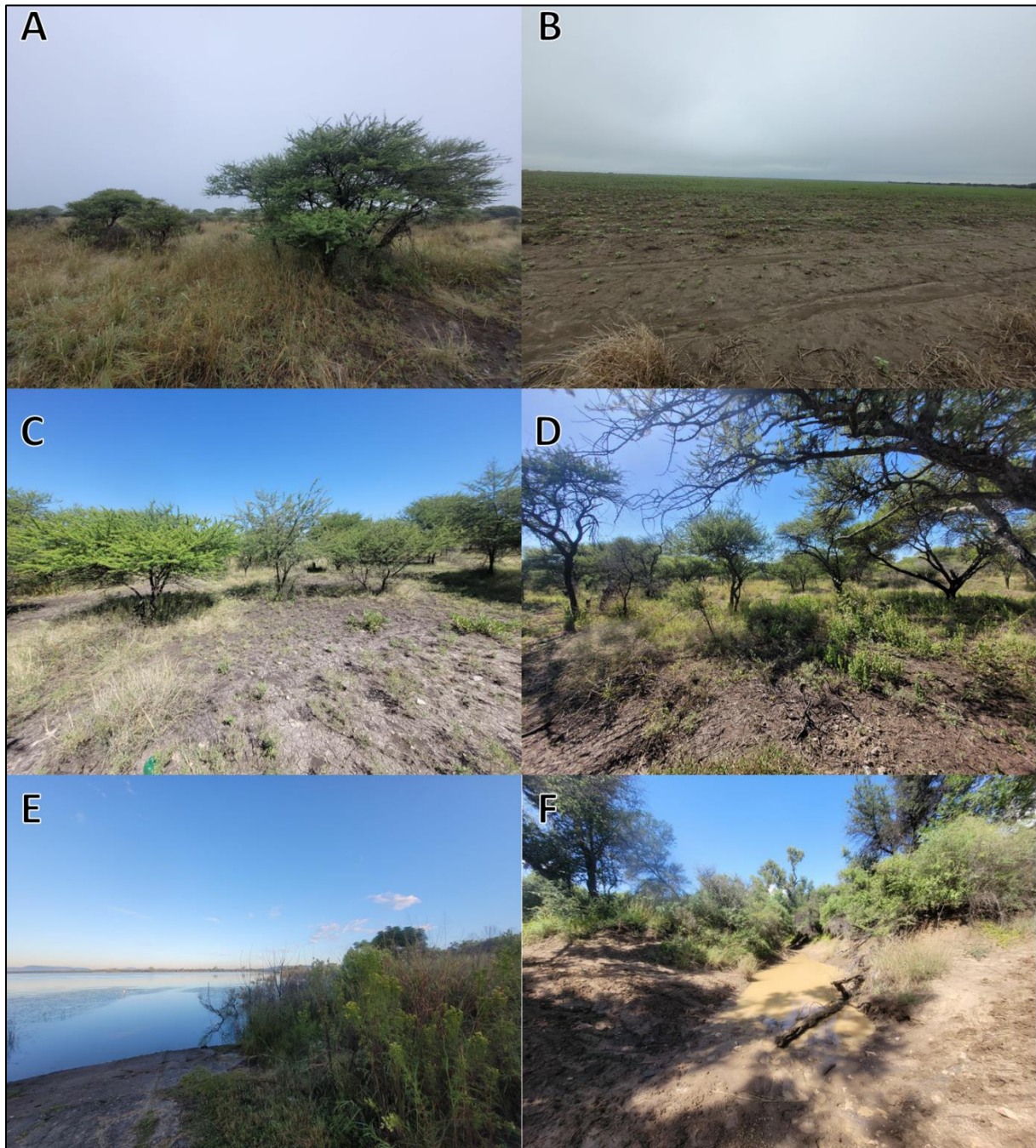


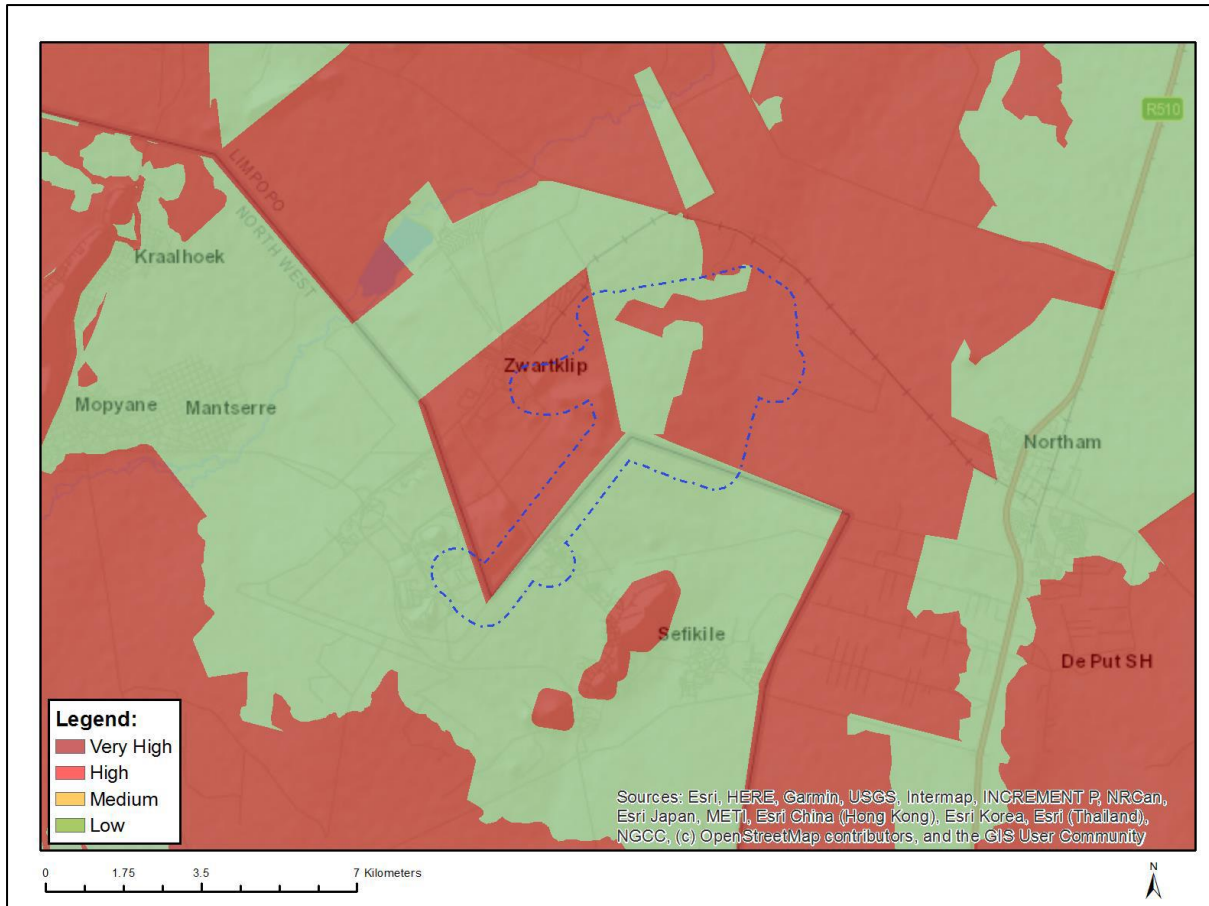
Figure 7-1 The avifauna habitats found in the project site.



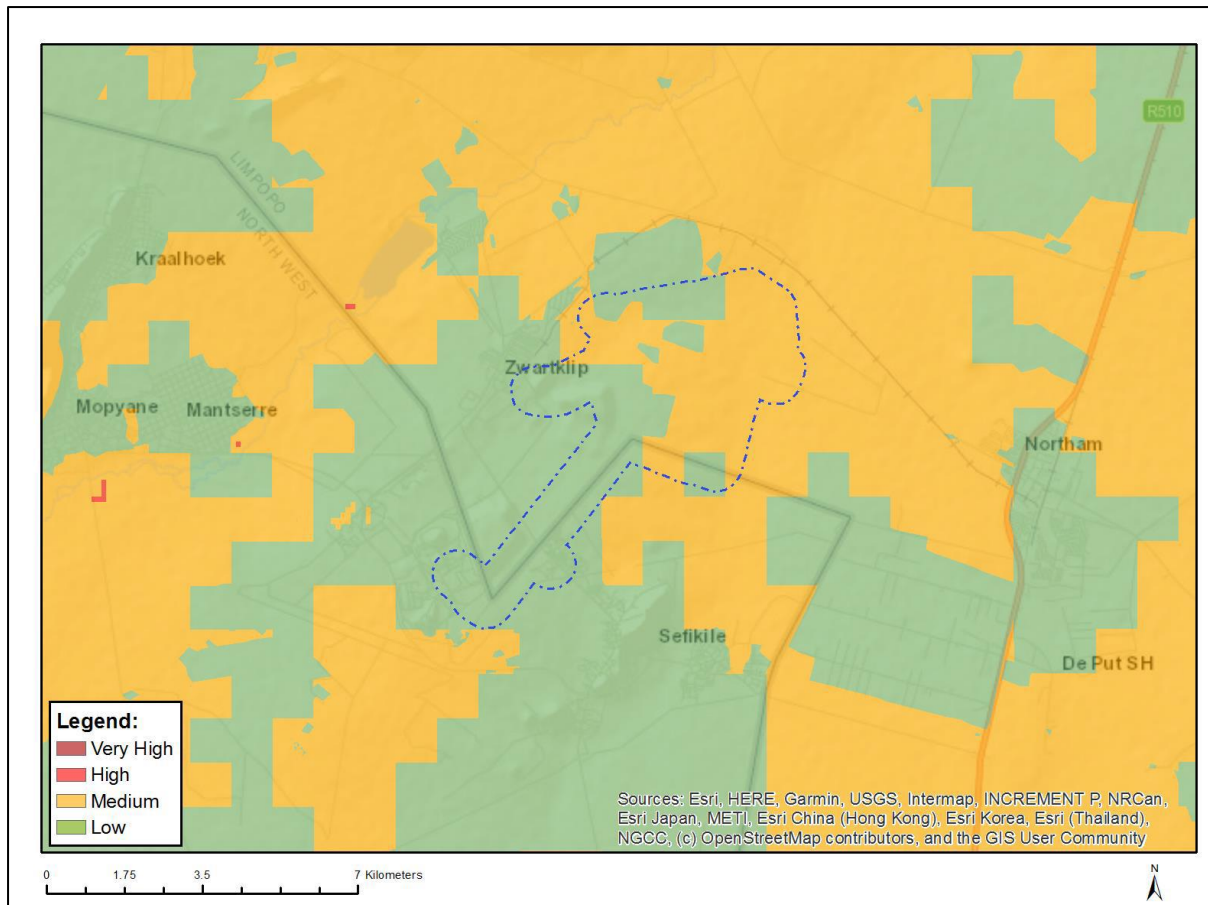
**Figure 7-2** *Photographs illustrating the habitats identified during the assessments: A) Degraded Bushveld, B) Transformed, C) Disturbed, D) Fragmented Bushveld and E & F) Wetlands and Water Resources*

## 8 Site Sensitivity

The biodiversity theme sensitivity, as indicated in the screening report, was derived to be Very High, (Figure 8-1) while the fauna sensitivity was rated as 'Moderate' (Figure 8-2). The very high terrestrial sensitivity was due to the CBA2 and ESA1 status of the project area as well as the Rustenburg Platinum Mines Private Nature Reserve with which the project area overlaps.



**Figure 8-1** *Terrestrial Biodiversity Theme Sensitivity, National Web based Environmental Screening Tool*

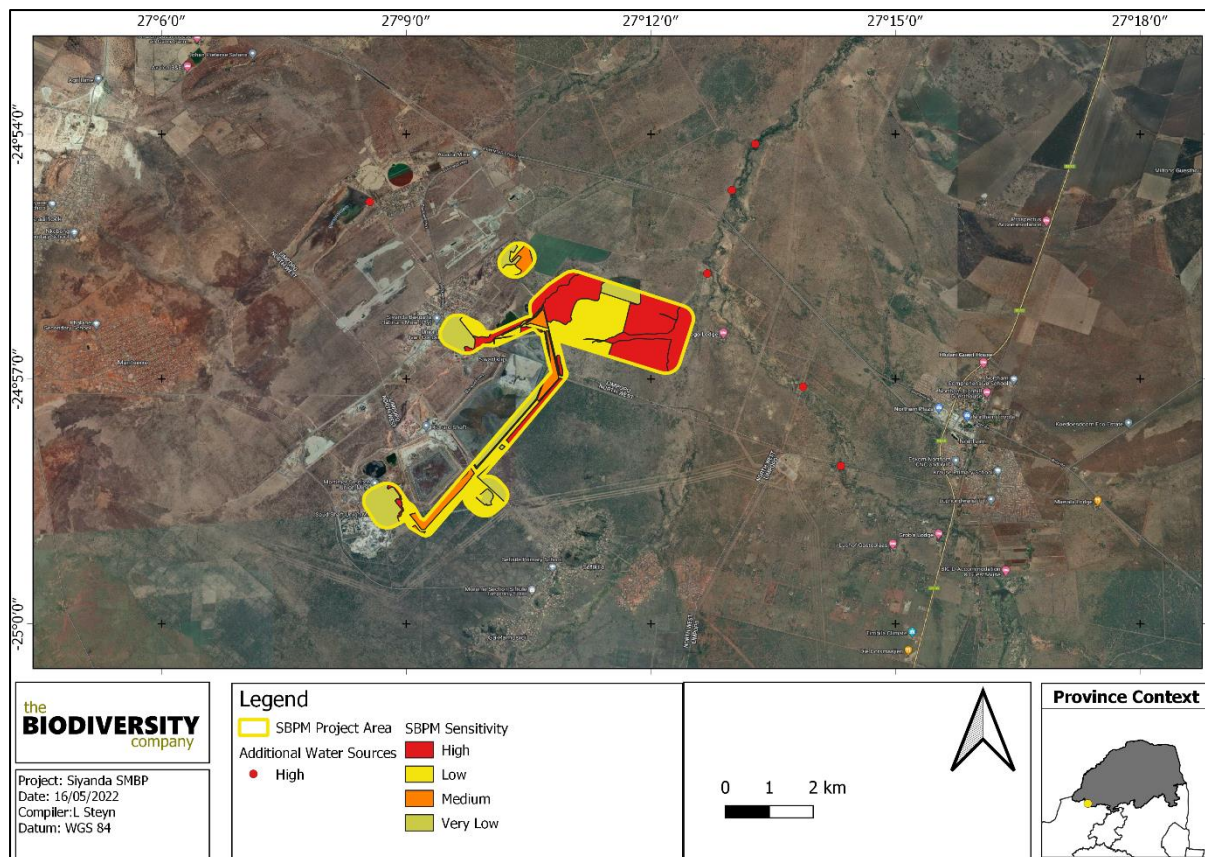


**Figure 8-2 Fauna Theme Sensitivity, National Web based Environmental Screening Tool**

Sensitivities were compiled for the avifauna study based on the field results and desktop information. Based on the criteria provided in Section 4.3 of this report, all habitats (final description of the habitats to be provided after the second survey) within the assessment area of the proposed project were allocated a sensitivity category (Table 8-1). The sensitivities of the habitat types delineated are illustrated in Figure 8-3. The Wetlands and Degraded Bushveld were given a high sensitivity based on the importance of these areas for the Yellow-throated Sandgrouse as well as a number of risk species that would utilise this area for both foraging, as water source and nesting.

**Table 8-1 SEI Summary of habitat types delineated within field assessment area of project area**

| Habitat             | Conservation Importance | Functional Integrity | Biodiversity Importance | Receptor Resilience | Site Ecological Importance |
|---------------------|-------------------------|----------------------|-------------------------|---------------------|----------------------------|
| Wetlands            | High                    | High                 | High                    | Medium              | High                       |
| Degraded Bushveld   | High                    | High                 | High                    | Medium              | High                       |
| Disturbed Bushveld  | Low                     | Low                  | Low                     | Medium              | Low                        |
| Fragmented Bushveld | Medium                  | Medium               | Medium                  | Medium              | Medium                     |
| Transformed         | Very Low                | Very Low             | Very Low                | High                | Very Low                   |



**Figure 8-3 Avifauna sensitivities**

Interpretation of the SEI in the context of the proposed project is provided in Table 8-2.

**Table 8-2 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities**

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

## 9 Impact Assessment

Potential impacts were evaluated against the data captured during the fieldwork and from a desktop perspective to identify relevance to the project site, specifically the proposed development footprint area.

The assessment of the significance of direct, indirect and cumulative impacts was undertaken using the method as developed by Savannah Environmental (Pty) Ltd.

Bennun *et al* (2021) describes three broad types of impacts associated with solar energy development:

- Direct impacts – Impacts that result from project activities or operational decisions that can be predicted based on planned activities and knowledge of local biodiversity, such as habitat loss

under the project footprint, habitat fragmentation as a result of project infrastructure and species disturbance or mortality as a result of project operations.

- Indirect impacts – Impacts induced by, or ‘by-products’ of, project activities within a project’s area of influence.
- Cumulative impacts – Impacts that result from the successive, incremental and/or combined effects of existing, planned and/or reasonably anticipated future human activities in combination with project development impacts.

The assessment of impact significance was undertaken in consideration of the following:

- Extent of impact;
- Duration of impact;
- Magnitude of impact;
- Probability of impact; and
- Reversibility.

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

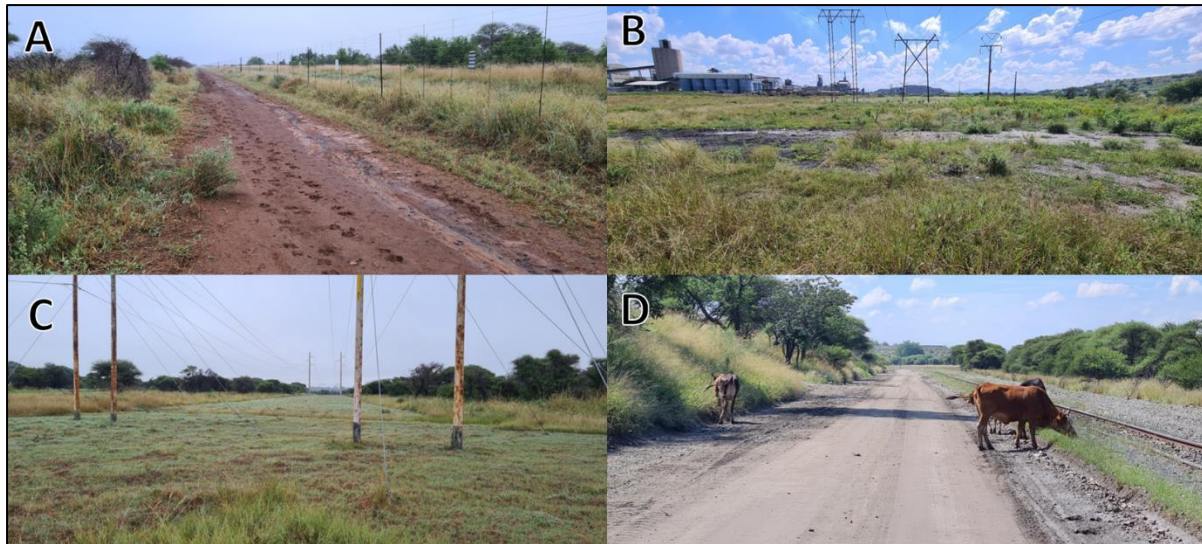
- Construction Phase;
- Operational Phase; and
- Closure/Rehabilitation Phase.

### **9.1 Current Impacts**

The current impacts observed during the survey are listed below. Photographic evidence of a selection of these impacts is shown in Figure 9-1.

- Multiple high voltage powerlines;
- Grazing and trampling of natural vegetation by livestock;
- Farm roads and main roads (and associated traffic and wildlife road mortalities); and
- Fences.





**Figure 9-1** Some of the identified impacts within the project site; A) Fences and roads, B) Mining activities, C) Power lines, D) Livestock

## 9.2 Avifauna Impact Assessment

This section describes the potential impacts on avifauna associated with the construction and operational phases of the proposed development and is only relevant to the PV site and associated infrastructure and does not consider the powerline grid system. 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 will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise and cause dust pollution. Should non-environmentally friendly dust suppressants be used, chemical pollution can take place. 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 chemical 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 photovoltaic solar energy facility 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 passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they are able to touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties.

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

1. Snagging: Occurs when a body part is impaled on one or more barbs or razor points of a fence.
2. Snaring: When a birds foot/leg becomes trapped between two overlapping wires.
3. Impact injuries: birds flying into a fence, the impact may kill or injure the bird.

4. Snarling: When birds try and push through a mesh or wire stands, ultimately becoming trapped (uncommon).
5. Electrocution: Electrified fence can kill or severely injure birds.
6. 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 require the overall removal of vegetation, this is a measure that is implemented to restrict the risk of fire (Birdlife, 2017). The removal of vegetation results in the loss of habitat for a number of species in this case it would be displacing grassland, tree dwellers from the alien clumps and waterfowl.

### 9.2.1 Alternatives considered

No alternative was provided.

### 9.2.2 Loss of Irreplaceable Resources

Loss of habitat of three SCCs, Cape Vulture, Yellow-throated Sandgrouse and Lanner Falcon.

## 9.3 Assessment of Impact Significance

The assessment of impact significance considers pre-mitigation as well as implemented of post-mitigation scenarios. Although different species and groups will react differently to the development, the risk assessment was undertaken bearing in mind the potential impacts to the priority species listed in this report. More mitigations can be seen in section 9.

### 9.3.1 Construction Phase

The construction of the associated infrastructure (Including BESS) and the PV site has been assessed collectively as their impacts overlap.

The following potential impacts were considered (Table 9-1 till Table 9-4):

- Destruction, fragmentation and degradation of habitats;
- Displacement of avifaunal community (Including several SCC) due to disturbance such as noise, light, dust, vibration;
- Collection of eggs and poaching;
- Roadkill.

**Table 9-1 Construction activities impacts on the avifauna**

| <i>Nature:</i>  |                     |                 |
|---|---------------------|-----------------|
| Destruction, fragmentation and degradation of habitats; |                     |                 |
|   | Without mitigation  | With mitigation |
| <b>Extent</b>   | Regional (4)        | Local Area (3)  |
| <b>Duration</b>   | Short term (2)      | Short term (2)  |
| <b>Magnitude</b>  | High (8)            | Moderate (6)    |
| <b>Probability</b>                                      | Highly probable (4) | Probable (3)    |
| <b>Significance</b>                                     | <b>Medium</b>       | <b>Medium</b>   |
| <b>Status (positive or negative)</b>                    | Negative            | Negative        |

|   |  |     |
|---|--|-----|
| <b>Reversibility</b>                    | Low  | Low |
| <b>Irreplaceable loss of resources?</b> | Yes  | Yes |
| <b>Can impacts be mitigated?</b>        | To some extent, habitat will still be lost |     |

**Mitigation:**

- The loss of habitat in the project footprint cannot be negated but can be restricted to some extent. The loss of habitat will result in the loss of territory, feeding area, nesting sites and prey availability for numerous species.
- The habitat outside the footprint can be protected by implementing the following mitigations:
- Construction activity to only be within the project footprint and the area is to be well demarcated.
- Areas where vegetation has been cleared must be re-vegetated within local indigenous plant species.
- The affected area must be monitored for invasive plant encroachment and erosion and must be controlled.
- The use of laydown areas within the development footprint must be used, to avoid habitat loss and disturbance to adjoining areas.
- All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the area.
- Should any Species of Conservation Concern not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.
- The wetland areas must be avoided during development. This is especially pertinent to the wetland on the western side of the PV where the Yellow-throated Sandgrouse is known to utilise the water source.

**Residual Impacts:**

The loss of habitat is a residual impact that is unavoidable. The disturbance may also cause some erosion and invasive alien plant encroachment. Movement corridors will be disrupted in the area.

**Table 9-2 Construction activities impacts on the avifauna**

|   |   |                        |
|---|---|------------------------|
| <b>Nature:</b>  |   |                        |
| <b>Displacement of avifaunal community (Including several SCC) due to disturbance such as noise, light, dust, vibration</b> |   |                        |
|   | <b>Without mitigation</b>   | <b>With mitigation</b> |
| <b>Extent</b>   | Regional (4)  | Local Area (3)         |
| <b>Duration</b>   | Short term (2)  | Short term (2)         |
| <b>Magnitude</b>  | High (8)  | Moderate (6)           |
| <b>Probability</b>  | Highly probable (4)   | Improbable (2)         |
| <b>Significance</b>   | <b>Medium</b>   | <b>Low</b>             |
| <b>Status (positive or negative)</b>  | Negative  | Negative               |
| <b>Reversibility</b>  | Low   | Low                    |
| <b>Irreplaceable loss of resources?</b>   | Yes   | Yes                    |
| <b>Can impacts be mitigated?</b>  | Yes, but only to a limited extent. The mitigation of noise pollution during construction is difficult to mitigate against |                        |
| <b>Mitigation:</b>  |   |                        |

- Minimize disturbance impact by abbreviating construction time. Schedule the activities to avoid breeding and movement time.
- Ensure lights are kept to a minimum, lights must be red or green and not white to reduce confusion for nocturnal migrants. Lights should be placed so that they face downward onto working areas and not straight or upward to reduce the sky glow effect.
- Dust management need to be done in the areas where the vegetation will be removed, this includes wetting of the soil.

**Residual Impacts:**

Displacement of endemic and SCC avifauna species.

**Table 9-3 Construction activities impacts on the avifauna**

**Nature:**

**Collection of eggs and poaching**

|   | Without mitigation  | With mitigation                     |
|---|---------------------|-------------------------------------|
| <b>Extent</b>                           | Regional (4)        | Footprint and surrounding areas (2) |
| <b>Duration</b>                         | Short term (2)      | Short term (2)                      |
| <b>Magnitude</b>                        | Moderate (6)        | Low (4)                             |
| <b>Probability</b>                      | Highly probable (4) | Improbable (2)                      |
| <b>Significance</b>                     | <b>Medium</b>       | <b>Low</b>                          |
| <b>Status (positive or negative)</b>    | Negative            | Negative                            |
| <b>Reversibility</b>                    | Low                 | High                                |
| <b>Irreplaceable loss of resources?</b> | Yes                 | No                                  |
| <b>Can impacts be mitigated?</b>        | Yes                 |                                     |

**Mitigation:**

- All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting or hunting terrestrial species (e.g., guineafowl and francolin), and owls, which are often persecuted out of superstition.
- Signs must be put up stating that should any person be found poaching any species they will be fined.

**Residual Impacts:**

There is a possibility that the eggs to be poached could be that of an SCC with decreasing numbers

**Table 9-4 Construction activities impacts on the avifauna**

**Nature:**

**Roadkill**

|                    | Without mitigation  | With mitigation                     |
|--------------------|---------------------|-------------------------------------|
| <b>Extent</b>      | Local (3)           | Footprint and Surrounding areas (2) |
| <b>Duration</b>    | Short term (2)      | Short term (2)                      |
| <b>Magnitude</b>   | Moderate (6)        | Minor (2)                           |
| <b>Probability</b> | Highly probable (4) | Improbable (2)                      |

| <b>Significance</b>  | <b>Medium</b> | <b>Low</b> |
|--|---------------|------------|
| <b>Status (positive or negative)</b>   | Negative      | Negative   |
| <b>Reversibility</b>   | Low           | Low        |
| <b>Irreplaceable loss of resources?</b>  | Yes           | No         |
| <b>Can impacts be mitigated?</b>   | Yes           |            |
| <b>Mitigation:</b>   |               |            |
| <ul style="list-style-type: none"> <li>All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the construction area.</li> <li>All vehicles (construction or other) accessing the site should adhere to a low speed limit on site (40 km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g., nightjars and owls) which sometimes forage or rest on roads, especially at night.</li> </ul> |               |            |
| <b>Residual Impacts:</b>   |               |            |
| Roadkills could still occur  |               |            |

### 9.3.2 Operational Phase

The operational phase of the impact of daily activities is anticipated to lead to collisions and electrocutions. Moving vehicles don't only cause sensory disturbances to avifauna, affecting their life cycles and movement, but will lead to direct mortalities due to collisions. The area surrounding the direct footprint will be maintained to prevent uncontrolled events such as fire, this practice will however result in the disturbance and displacement of breeding and non-breeding species.

The following potential impacts were considered (Table 9-5 to Table 9-8):

- Collisions with PV panels, BESS, associated powerlines and connection lines and fences;
- Electrocution with solar plant connections;
- Roadkill during maintenance procedures; and
- Habitat degradation and displacement of resident, visiting and breeding species (as well as SCCs).

**Table 9-5 Operational activities impacts on the avifauna**

| <b>Nature:</b>  |                     |                                     |
|---|---------------------|-------------------------------------|
| <b>Collisions with PV panels, BESS, associated powerlines and connection lines and fences</b> |                     |                                     |
|   | Without mitigation  | With mitigation                     |
| <b>Extent</b>   | Regional (4)        | Footprint and Surrounding areas (2) |
| <b>Duration</b>   | Long term (4)       | Long term (4)                       |
| <b>Magnitude</b>  | High (8)            | Moderate (6)                        |
| <b>Probability</b>  | Highly probable (4) | Probable (3)                        |
| <b>Significance</b>   | <b>High</b>         | <b>Medium</b>                       |
| <b>Status (positive or negative)</b>  | Negative            | Negative                            |
| <b>Reversibility</b>  | Low                 | Low                                 |

|   |     |    |
|---|-----|----|
| <b>Irreplaceable loss of resources?</b> | Yes | No |
| <b>Can impacts be mitigated?</b>        | Yes |    |

**Mitigation:**

- The design of the proposed solar plant must be of a type or similar structure as endorsed by the Eskom-Endangered Wildlife Trust (EWT) Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.
- Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. This would involve using existing/approved pylons and associated infrastructure for different lines.
- White strips must be placed on the edge of the solar panels to reduce reflection and prevent collisions. This is especially pertinent to *Pterocles gutturalis* (Yellow-throated Sandgrouse), as the species exhibits daily movement between water resources and feeding/nesting areas. The species may recognise the panel array as water bodies (lake effect as described above) and collide with the panels, causing mortality.
- If any powerlines/connection lines are to be placed above ground, they must be marked with industry standard bird flight diverters.
- Fencing mitigations:
  - Top 2 strands must be smooth wire
  - Routinely retention loose wires
  - Minimum 30cm between wires
  - Place markers on fences

**Residual Impacts:**

Some collisions of SCCs might still occur regardless of mitigations

**Table 9-6 Operational activities impacts on the avifauna**

| <b>Nature:</b>  |                     |                                     |
|---|---------------------|-------------------------------------|
| <b>Electrocution with solar plant connections and powerline</b> |                     |                                     |
|   | Without mitigation  | With mitigation                     |
| <b>Extent</b>   | Regional (4)        | Footprint and Surrounding areas (2) |
| <b>Duration</b>   | Long term (4)       | Long term (4)                       |
| <b>Magnitude</b>  | High (8)            | Moderate (6)                        |
| <b>Probability</b>  | Highly probable (4) | Improbable (2)                      |
| <b>Significance</b>   | <b>High</b>         | <b>Low</b>                          |
| <b>Status (positive or negative)</b>                            | Negative            | Negative                            |
| <b>Reversibility</b>  | Low                 | High                                |
| <b>Irreplaceable loss of resources?</b>                         | Yes                 | No                                  |
| <b>Can impacts be mitigated?</b>                                | Yes                 |                                     |

**Mitigation:**

- The design of the proposed solar plant and grid lines must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.
- Infrastructure should be consolidated where possible/practical in order to minimise the amount of ground and air space used. This would involve using the existing/approved pylons and associated infrastructure for different lines.

- Ensure that monitoring is sufficiently frequent to detect electrocutions reliably and that any areas where electrocutions occurred are repaired as soon as possible.
- During the first year of operation quarterly reports, summarizing interim findings should be compiled and submitted to BirdLife South Africa. If the findings indicate that electrocutions have not occurred or are minimal with no red-listed species, an annual report can be submitted.

**Residual Impacts:**

Electrocutions might still occur regardless of mitigations

**Table 9-7 Operational activities impacts on the avifauna****Nature:****Roadkill during maintenance procedures**

|   | Without mitigation | With mitigation |
|---|--------------------|-----------------|
| <b>Extent</b>                           | Local (3)          | Local (3)       |
| <b>Duration</b>                         | Long term (4)      | Long term (4)   |
| <b>Magnitude</b>                        | Moderate (6)       | Low (4)         |
| <b>Probability</b>                      | Probable (3)       | Improbable (2)  |
| <b>Significance</b>                     | <b>Medium</b>      | <b>Low</b>      |
| <b>Status (positive or negative)</b>    | Negative           | Negative        |
| <b>Reversibility</b>                    | Low                | Low             |
| <b>Irreplaceable loss of resources?</b> | Yes                | No              |
| <b>Can impacts be mitigated?</b>        | Yes                |                 |

**Mitigation:**

- All personnel should undergo environmental induction with regards to avifauna and their behaviour on roads.
- All vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed.
- All vehicles accessing the site should adhere to a low speed limit on site (40 km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g., nightjars and owls) which sometimes forage or rest on roads, especially at night.

**Residual Impacts:**

Road collisions can still occur regardless of mitigations

**Table 9-8 Operational activities impacts on the avifauna****Nature:****Habitat degradation and displacement of resident, visiting and breeding species (as well as SCCs).**

|                     | Without mitigation  | With mitigation |
|---------------------|---------------------|-----------------|
| <b>Extent</b>       | Regional (4)        | Local (3)       |
| <b>Duration</b>     | Long term (4)       | Short term (2)  |
| <b>Magnitude</b>    | High (8)            | Moderate (6)    |
| <b>Probability</b>  | Highly probable (4) | Probable (3)    |
| <b>Significance</b> | <b>High</b>         | <b>Medium</b>   |

|   |   |          |
|---|---|----------|
| <b>Status (positive or negative)</b>  | Negative  | Negative |
| <b>Reversibility</b>  | Low   | Low      |
| <b>Irreplaceable loss of resources?</b>   | Yes   | No       |
| <b>Can impacts be mitigated?</b>  | <b>No, the footprint has already been disturbed. The area surrounding the development can be mitigated to some extent</b> |          |
| <b>Mitigation:</b>  |   |          |
| <ul style="list-style-type: none"> <li>Minimising habitat destruction caused by the maintenance by demarcating the footprint so that it does not increase yearly.</li> <li>All areas where maintenance must be for example grass cutting walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.</li> </ul> |   |          |
| <b>Residual Impacts:</b>  |   |          |
| Migratory routes of avifauna species could change, and the species composition could also change regardless of mitigations  |   |          |

### 9.3.3 Decommissioning Phase

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

The following potential impacts were considered (Table 9-9 to Table 9-10):

- Continued fragmentation and degradation of habitats;
- Displacement of faunal community (including SCC) due disturbance (road collisions, noise, dust, vibration).

**Table 9-9 Decommissioning activities impacts on the avifauna**

|  |                     |                                     |
|--|---------------------|-------------------------------------|
| <b>Nature:</b>   |                     |                                     |
| <b>Continued fragmentation and degradation of habitats</b>   |                     |                                     |
|  | Without mitigation  | With mitigation                     |
| <b>Extent</b>  | Local (3)           | Footprint and surrounding areas (2) |
| <b>Duration</b>  | Long term (4)       | Very short term (1)                 |
| <b>Magnitude</b>   | High (8)            | Minor (2)                           |
| <b>Probability</b>   | Highly probable (4) | Very improbable (1)                 |
| <b>Significance</b>  | <b>Medium</b>       | <b>Low</b>                          |
| <b>Status (positive or negative)</b>   | Negative            | Negative                            |
| <b>Reversibility</b>   | Low                 | Low                                 |
| <b>Irreplaceable loss of resources?</b>  | Yes                 | No                                  |
| <b>Can impacts be mitigated?</b>   | Yes                 |                                     |
| <b>Mitigation:</b>   |                     |                                     |
| <ul style="list-style-type: none"> <li>Implementation of a rehabilitation plan.</li> <li>Implementation of an alien invasive management plan and monitoring on an annual basis for 3 years post construction.</li> </ul> |                     |                                     |



- There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous flora.

**Residual Impacts:**

No significant residual risks are expected, although IAP encroachment and erosion might still occur but would have a negligible impact if effectively managed.

**Table 9-10 Decommissioning activities impacts on the avifauna**

**Nature:**

Displacement of faunal community (including SCC) due disturbance (road collisions, noise, dust, vibration).

|   | Without mitigation  | With mitigation   |
|---|---------------------|-------------------|
| <b>Extent</b>                           | Regional (4)        | Local (3)         |
| <b>Duration</b>                         | Long term (4)       | Moderate term (3) |
| <b>Magnitude</b>                        | High (8)            | Moderate (6)      |
| <b>Probability</b>                      | Highly probable (4) | Improbable (2)    |
| <b>Significance</b>                     | <b>High</b>         | <b>Low</b>        |
| <b>Status (positive or negative)</b>    | Negative            | Negative          |
| <b>Reversibility</b>                    | Low                 | Low               |
| <b>Irreplaceable loss of resources?</b> | Yes                 | No                |
| <b>Can impacts be mitigated?</b>        | Yes                 |                   |

**Mitigation:**

- Minimize disturbance impact by abbreviating construction time
- Schedule the activities to avoid breeding and movement times report
- Dust management need to be done in the areas where the vegetation will be removed, this includes wetting of the soil. This area must be rehabilitated as soon as possible.
- All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the decommissioning area.
- All vehicles (construction or other) accessing the site should adhere to a low speed limit on site (40 km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g., nightjars and owls) which sometimes forage or rest on roads, especially at night.

**Residual Impacts:**

If this is mitigated and monitored correctly no residual impacts should be present

## 9.4 Cumulative Impacts

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts in an area or region, it is appropriate to consider the cumulative effects of development. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a point in time may represent a significant change from the original state of the system. This section describes the potential impacts of the project that are cumulative for terrestrial fauna and flora.

Localised cumulative impacts include the cumulative effects from operations that are close enough to potentially cause additive effects on the environment or sensitive receivers (such as the nearby existing solar facility and the existing powerlines). These include dust deposition, noise and vibration, disruption of corridors or habitat, groundwater drawdown, groundwater and surface water quality, and transport.

Long-term cumulative impacts due to the large number of development close by (Section 5.3) can lead to the loss of endemic and threatened species, loss of habitat and vegetation types and even degradation of well conserved areas. A number of solar plants and powerlines can already be found in the project site, this combination of obstacles increases the risk of bird collisions and habitat loss as well as territorial disputes (species forced out of the one area to just again be forced out) (Table 9-11). The table below assumes that the impacts has been mitigated and the risk reduced. In the light of all above, the expected cumulative impact is expected to be highly detrimental.

**Table 9-11 Cumulative impact of the solar facility**

| <b>Nature:</b>   |                             |   |
|--|-----------------------------|---|
| <b>Loss of habitat and increase in bird collisions</b>   |                             |   |
|  | <b>Project in isolation</b> | <b>Project with adjacent PV projects with associated infrastructure</b> |
| <b>Extent</b>  | Local (3)                   | Regional (4)  |
| <b>Duration</b>  | Moderate Term (3)           | Long Term (4)   |
| <b>Magnitude</b>   | Moderate (6)                | Moderate (6)  |
| <b>Probability</b>   | Probable (3)                | Probable (3)  |
| <b>Significance</b>  | <b>Medium</b>               | <b>Medium</b>   |
| <b>Status (positive or negative)</b>   | Negative                    | Negative  |
| <b>Reversibility</b>   | None                        | None  |
| <b>Irreplaceable loss of resources?</b>  | Yes                         | Yes   |
| <b>Can impacts be mitigated?</b>   | No                          |   |
| <b>Mitigation:</b>   |                             |   |
| Even though collisions can be mitigated to some extent for individual lines/solar plants their combined densities will increase the rate of collisions. Monitoring of the implementation of mitigation measures needs to be done to ensure the cumulative impact does not become high. |                             |   |
| <b>Residual Impacts:</b>   |                             |   |
| Loss of habitat for endemic and SCC. Loss of SCC due to collisions.  |                             |   |

## 10 Specialist Management Plan

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

Table 10-1 presents the recommended mitigation measures and the respective timeframes, targets, and performance indicators for the avifaunal study.

**Table 10-1 Summary of management outcomes pertaining to impacts to avifauna and their habitats**

| Impact Management Actions  | Implementation                     |   | Monitoring  |   |
|--|------------------------------------|---|---|---|
|  | Phase                              | Responsible Party                       | Aspect  | Frequency                                       |
| <b>Management outcome: Habitats</b>  |                                    |   |   |   |
| Areas outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible.  | Life of operation                  | Project manager, Environmental Officer  | Areas of indigenous vegetation  | Ongoing   |
| The wetland areas must be avoided during development. This is especially pertinent to the wetland on the western side of the PV where the Yellow-throated Sandgrouse is known to utilise the water source.                                     | Life of operation                  | Project manager, Environmental Officer  | Wetland areas   | Ongoing   |
| The development footprint must be used for storage and the contractors' camps as well. This may not be outside the direct project area to ensure the disturbance area is as small as possible.   | Construction                       | Project manager, Environmental Officer  | Project footprint   | During Stage                                    |
| Where possible, existing access routes and walking paths must be made use of.  | Construction/Operational Phase     | Environmental Officer & Design Engineer | Roads and paths used  | Ongoing   |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.           | Closure Phase/Rehabilitation phase | Environmental Officer & Contractor      | Assess the state of rehabilitation and encroachment of alien vegetation | Quarterly for up to two years after the closure |
| Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.  | Closure Phase/ Post Closure Phase  | Environmental Officer & Contractor      | Road edges and project site footprint                                   | During Phase                                    |
| Rehabilitation of the disturbed areas existing in the project site must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. | Operational/Closure Phase          | Environmental Officer & Contractor      | Road edges and footprint  | During Phase                                    |
| Erosion control and alien invasive management plan must be compiled.   | Life of operation                  | Environmental Officer & Contractor      | Erosion and alien invasive species                                      | Ongoing   |
| Environmentally friendly dust suppressants need to be utilised   | Operational phase                  | Environmental Officer & Contractor      | Water pollution   | During Phase                                    |
| A fire management plan needs to be compiled and implemented to restrict  | Life of operation                  | Environmental Officer & Contractor      | Fire Management   | During Phase                                    |

the impact fire might have on the surrounding areas.

| Management outcome: Avifauna  |  |  |  |              |
|---|--|--|--|--------------|
| Impact Management Actions   | Implementation                             |  | Monitoring   |              |
|   | Phase                                      | Responsible Party  | Aspect   | Frequency    |
| The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments. Signs must be put up to enforce this.   | Construction/Operational Phase             | Project manager, Environmental Officer                   | Infringement into these areas                          | Ongoing      |
| All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species (e.g., guineafowl and francolin), and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.   | Life of operation                          | Environmental Officer                                    | Evidence of trapping etc                               | Ongoing      |
| The duration of the construction should be kept to a minimum to avoid disturbing avifauna.  | Construction/Operational Phase             | Project manager, Environmental Officer & Design Engineer | Construction/Closure Phase                             | During Phase |
| Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (red/green) lights should be used wherever possible.   | Construction/Operational Phase             | Project manager, Environmental Officer & Design Engineer | Light pollution and period of light.                   | During Phase |
| All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.   | Life of operation                          | Health and Safety Officer                                | Compliance to the training.                            | Ongoing      |
| Schedule or limit (where feasible) activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons (June – August)   | Construction/Operational Phase             | Project manager, Environmental Officer & Design Engineer | Activities should take place during the day in winter. | During Phase |
| All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region  | Construction/Operational Phase             | Project manager, Environmental Officer                   | Noise  | During Phase |
| All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the area. Should any Species of Conservation Concern be found and not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken. | Planning, Construction and Decommissioning | Project manager, Environmental Officer                   | Presence of Nests and faunal species                   | During Phase |
| The BESS must be enclosed, and the outside surface must be non-reflective to ensure fire is not a risk and that bird collisions does not take place   | Planning and construction                  | Environmental Officer & Contractor, Engineer             | Presence of fire or bird strikes                       | During Phase |

|  |                                       |  |   |              |
|--|---------------------------------------|--|---|--------------|
| The design of the proposed PV and grid lines must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins <i>et al.</i> , 2015). | Planning and construction             | Environmental Officer & Contractor, Engineer | Presence of electrocuted birds or bird strikes                            | During Phase |
| Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used.   | Planning and construction             | Environmental Officer & Contractor, Engineer | Presence of bird collisions   | During phase |
| All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution   | Planning and construction             | Environmental Officer & Contractor, Engineer | Presence of electrocuted birds  | During phase |
| Use environmentally friendly cleaning and dust suppressant products  | Construction and operation            | Environmental Officer & Contractor, Engineer | Presence of chemicals in and around the project site                      | During phase |
| Fencing mitigations: <ul style="list-style-type: none"> <li>• Top 2 strands must be smooth wire</li> <li>• Routinely retention loose wires</li> <li>• Minimum 30 cm between wires</li> <li>• Place markers on fences</li> </ul>  | Planning, construction, and operation | Environmental Officer & Contractor, Engineer | Presence of birds stuck /dead in fences<br>Monitor fences for slack wires | During phase |
| As far as possible power cables within the project site should be thoroughly insulated and preferably buried.  | Planning and construction             | Environmental Officer & Contractor, Engineer | Exposed cables  | During phase |
| Any exposed parts must be covered (insulated) to reduce electrocution risk   | Planning and construction             | Environmental Officer & Contractor, Engineer | Presence of electrocuted birds  | During phase |
| White strips should be placed along the edges of the panels, to reduce similarity to water and deter birds and insects (Horvath <i>et al.</i> , 2010). Consider the use of bird deterrent devices to limit collision risk.   | Planning and construction             | Environmental Officer & Contractor, Engineer | Presence of dead birds in the project site                                | During phase |

## 11 Monitoring

Should the development be authorised SCC monitoring must be done to determine the effect of the development on these species, this would also allow for more available data for future projects.

Monitoring must be done prior to the construction phase, at time of construction and for 3 consecutive years after construction. Standard methods as per the species protocols must be followed.

## 12 Recommendations

The following recommendations are proposed for the project:

- As very little is known about the impacts of solar facilities on birds in South Africa, a construction monitoring regime is recommended for the proposed project area to document any impacts and this data must be used for improving mitigation measures to reduce the impact on biological resources, particularly avifauna; and
- A follow-up assessment on avian biodiversity and species abundance within the project area and surrounding areas must be conducted within one year after the facility has been in operation and should be repeated every 3-5 years.

### 13 Conclusion

From a desktop perspective the project area overlaps CBA2 and ESA1 classified areas and falls within the Northern Turf Thornveld IBA. This IBA is important as it is home to the Yellow-throated Sandgrouse *Pterocles gutturalis* and is regarded as the core range of the resident South African population. Other important birds in the IBA include the Secretarybird *Sagittarius serpentarius*, Kori Bustard *Ardeotis kori*, Lanner Falcon *Falco biarmicus* and Black-winged Pratincole *Glareola nordmanni*. Common biome-restricted species found within this IBA include Kurrichane Thrush *Turdus libonyanus*, White-throated Robin-Chat *Cossypha humeralis*, Burchell's Starling *Lamprotornis australis*, White-bellied Sunbird *Cinnyris talatala* and the fairly common Kalahari Scrub Robin *Erythropgyia paena* (Birdlife South Africa, 2015B).

During the first field assessment 134 bird species were recorded of which three are SCCs on a national or international scale. The Lanner Falcon *Falco biarmicus* (VU- regionally), were observed on four occasions, while the Yellow-throated Sandgrouse *Pterocles gutturalis* (NT- regionally) were observed twice and the Cape Vulture *Gyps coprotheres* (EN-regionally and internationally) once. The Yellow-throated Sandgrouse is regarded as one of the core residents of the Northern Turf Thornveld IBA area. Of the 134 species, 18 species (13%) were identified as 'high risk' species. High risk species are those that would be at greater risk to powerline collisions, electrocutions or habitat loss due to the development. In the second survey 108 species were recorded, of which two were SCC, Yellow-throated Sandgrouse *Pterocles gutturalis* and Cape Vulture *Gyps coprotheres* (EN-regionally and internationally).

Any development in the medium-high sensitivity areas will lead to the direct destruction and loss of portions of functional ESA and CBA areas, and therefore, will also negatively impact the avifaunal species that utilise this habitat. Thus, if these areas are not maintained in a natural or near natural state, destroyed or fragmented, then meeting targets for biodiversity features will not be achieved. The mitigations, management and associated monitoring regarding these operational impacts will be the most important factor of this project and must be considered by the issuing authority.

### 14 Impact Statement

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

- Habitat loss and fragmentation;
- Electrocutions; and
- Collisions resulting in mortalities of amongst other SCCs.

Mitigation measures as described in this report can be implemented to reduce the significance of the risk to an acceptable residual risk level. Considering the above-mentioned information and that the facility is required for power supply to an existing mine, it is the opinion of the specialist that the project may be favourably considered, on condition that all the mitigation and recommendations are followed.

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## 16 Appendix Items

### 16.1 Appendix A: Specialist Declaration of Independence

I, Lindi Steyn, declare that:

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



Lindi Steyn

Biodiversity Specialist

The Biodiversity Company

July 2022

### 16.2 Appendix B: Expected species

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| Species | Common Name | Conservation Status |
|---------|-------------|---------------------|
|---------|-------------|---------------------|

|                                    |                                     | Regional (SANBI, 2016) | IUCN (2021) |
|------------------------------------|-------------------------------------|------------------------|-------------|
| <i>Accipiter badius</i>            | Shikra                              | Unlisted               | LC          |
| <i>Accipiter minullus</i>          | Sparrowhawk, Little                 | Unlisted               | LC          |
| <i>Acridotheres tristis</i>        | Myna, Common                        | Unlisted               | LC          |
| <i>Acrocephalus arundinaceus</i>   | Reed-warbler, Great                 | Unlisted               | LC          |
| <i>Acrocephalus baeticatus</i>     | Reed-warbler, African               | Unlisted               | Unlisted    |
| <i>Acrocephalus gracilirostris</i> | Swamp-warbler, Lesser               | Unlisted               | LC          |
| <i>Actitis hypoleucos</i>          | Sandpiper, Common                   | Unlisted               | LC          |
| <i>Actophilornis africanus</i>     | Jacana, African                     | Unlisted               | LC          |
| <i>Afrotis afraoides</i>           | Korhaan, Northern Black             | Unlisted               | LC          |
| <i>Alopochen aegyptiaca</i>        | Goose, Egyptian                     | Unlisted               | LC          |
| <i>Amadina erythrocephala</i>      | Finch, Red-headed                   | Unlisted               | LC          |
| <i>Amadina fasciata</i>            | Finch, Cut-throat                   | Unlisted               | Unlisted    |
| <i>Amandava subflava</i>           | Waxbill, Orange-breasted            | Unlisted               | Unlisted    |
| <i>Amblyospiza albifrons</i>       | Weaver, Thick-billed                | Unlisted               | LC          |
| <i>Anaplectes rubriceps</i>        | Weaver, Red-headed                  | Unlisted               | LC          |
| <i>Anas capensis</i>               | Teal, Cape                          | Unlisted               | LC          |
| <i>Anas erythrorhyncha</i>         | Teal, Red-billed                    | Unlisted               | LC          |
| <i>Anas sparsa</i>                 | Duck, African Black                 | Unlisted               | LC          |
| <i>Anas undulata</i>               | Duck, Yellow-billed                 | Unlisted               | LC          |
| <i>Anhinga rufa</i>                | Darter, African                     | Unlisted               | LC          |
| <i>Anthoscopus minutus</i>         | Penduline-tit, Cape                 | Unlisted               | LC          |
| <i>Anthus cinnamomeus</i>          | Pipit, African                      | Unlisted               | LC          |
| <i>Anthus leucophrys</i>           | Pipit, Plain-backed                 | Unlisted               | LC          |
| <i>Anthus nicholsoni</i>           | Nicholson's pipit                   | Unlisted               | LC          |
| <i>Apalis thoracica</i>            | Apalis, Bar-throated                | Unlisted               | LC          |
| <i>Apus affinis</i>                | Swift, Little                       | Unlisted               | LC          |
| <i>Apus</i>                        | Swift, Common                       | Unlisted               | LC          |
| <i>Apus barbatus</i>               | Swift, African Black                | Unlisted               | LC          |
| <i>Apus caffer</i>                 | Swift, White-rumped                 | Unlisted               | LC          |
| <i>Apus horus</i>                  | Swift, Horus                        | Unlisted               | LC          |
| <i>Aquila rapax</i>                | Eagle, Tawny                        | EN                     | VU          |
| <i>Aquila spilogaster</i>          | Hawk-eagle, African                 | Unlisted               | LC          |
| <i>Ardea alba</i>                  | Egret, Great                        | Unlisted               | LC          |
| <i>Ardea cinerea</i>               | Heron, Grey                         | Unlisted               | LC          |
| <i>Ardea goliath</i>               | Heron, Goliath                      | Unlisted               | LC          |
| <i>Ardea intermedia</i>            | Egret, Yellow-billed (Intermediate) | Unlisted               | LC          |
| <i>Ardea melanocephala</i>         | Heron, Black-headed                 | Unlisted               | LC          |
| <i>Ardea purpurea</i>              | Heron, Purple                       | Unlisted               | LC          |

|                                     |                              |          |          |
|-------------------------------------|------------------------------|----------|----------|
| <i>Ardeola ralloides</i>            | Heron, Squacco               | Unlisted | LC       |
| <i>Ardeotis kori</i>                | Bustard, Kori                | NT       | NT       |
| <i>Asio capensis</i>                | Owl, Marsh                   | Unlisted | LC       |
| <i>Batis molitor</i>                | Batis, Chinspot              | Unlisted | LC       |
| <i>Bostrychia hagedash</i>          | Ibis, Hadedda                | Unlisted | LC       |
| <i>Bradypterus baboecala</i>        | Rush-warbler, Little         | Unlisted | LC       |
| <i>Brunhilda erythronotos</i>       | Waxbill, Black Cheeked       | Unlisted | LC       |
| <i>Bubalornis niger</i>             | Buffalo-weaver, Red-billed   | Unlisted | LC       |
| <i>Bubo africanus</i>               | Eagle-owl, Spotted           | Unlisted | LC       |
| <i>Bubulcus ibis</i>                | Egret, Cattle                | Unlisted | LC       |
| <i>Buphagus erythrorhynchus</i>     | Oxpecker, Red-billed         | Unlisted | Unlisted |
| <i>Burhinus capensis</i>            | Thick-knee, Spotted          | Unlisted | LC       |
| <i>Buteo</i>                        | Buzzard, Common (Steppe)     | Unlisted | LC       |
| <i>Butorides striata</i>            | Heron, Green-backed          | Unlisted | LC       |
| <i>Calamonastes fasciolatus</i>     | Wren-warbler, Barred         | Unlisted | LC       |
| <i>Calandrella cinerea</i>          | Lark, Red-capped             | Unlisted | LC       |
| <i>Calendulauda sabota</i>          | Lark, Sabota                 | Unlisted | LC       |
| <i>Calidris minuta</i>              | Stint, Little                | LC       | LC       |
| <i>Calidris pugnax</i>              | Ruff                         | Unlisted | LC       |
| <i>Camaroptera brevicaudata</i>     | Camaroptera, Grey-backed     | Unlisted | Unlisted |
| <i>Campephaga flava</i>             | Cuckoo-shrike, Black         | Unlisted | LC       |
| <i>Campethera abingoni</i>          | Woodpecker, Golden-tailed    | Unlisted | LC       |
| <i>Caprimulgus pectoralis</i>       | Nightjar, Fiery-necked       | Unlisted | LC       |
| <i>Cecropis abyssinica</i>          | Swallow, Lesser Striped      | Unlisted | LC       |
| <i>Cecropis cucullata</i>           | Swallow, Greater Striped     | Unlisted | LC       |
| <i>Cecropis semirufa</i>            | Swallow, Red-breasted        | Unlisted | LC       |
| <i>Centropus burchellii</i>         | Coucal, Burchell's           | Unlisted | Unlisted |
| <i>Cercotrichas leucophrys</i>      | Scrub-robin, White-browed    | Unlisted | LC       |
| <i>Cercotrichas paena</i>           | Scrub-robin, Kalahari        | Unlisted | LC       |
| <i>Ceryle rudis</i>                 | Kingfisher, Pied             | Unlisted | LC       |
| <i>Chalcomitra amethystina</i>      | Sunbird, Amethyst            | Unlisted | LC       |
| <i>Charadrius pecuarius</i>         | Plover, Kittlitz's           | Unlisted | LC       |
| <i>Charadrius tricollaris</i>       | Plover, Three-banded         | Unlisted | LC       |
| <i>Chlidonias hybrida</i>           | Tern, Whiskered              | Unlisted | LC       |
| <i>Chlidonias leucopterus</i>       | Tern, White-winged           | Unlisted | LC       |
| <i>Chlorocichla flaviventris</i>    | Greenbul, Yellow-bellied     | Unlisted | LC       |
| <i>Chlorophoneus sulfureopectus</i> | Bush-Shrike, Orange-breasted | Unlisted | LC       |
| <i>Chloropicus namaquus</i>         | Woodpecker, Bearded          | Unlisted | LC       |
| <i>Chrysococcyx caprius</i>         | Cuckoo, Diderick             | Unlisted | LC       |

|                                   |                              |          |          |
|-----------------------------------|------------------------------|----------|----------|
| <i>Chrysococcyx klaas</i>         | Cuckoo, Klaas's              | Unlisted | LC       |
| <i>Ciconia</i>                    | Stork, White                 | Unlisted | LC       |
| <i>Ciconia nigra</i>              | Stork, Black                 | VU       | LC       |
| <i>Cinnyricinclus leucogaster</i> | Starling, Violet-backed      | Unlisted | LC       |
| <i>Cinnyris mariquensis</i>       | Sunbird, Marico              | Unlisted | LC       |
| <i>Cinnyris talatala</i>          | Sunbird, White-bellied       | Unlisted | LC       |
| <i>Circaetus cinereus</i>         | Snake-eagle, Brown           | Unlisted | LC       |
| <i>Circaetus pectoralis</i>       | Snake-eagle, Black-chested   | Unlisted | LC       |
| <i>Cisticola aberrans</i>         | Cisticola, Lazy              | Unlisted | LC       |
| <i>Cisticola aridulus</i>         | Cisticola, Desert            | Unlisted | LC       |
| <i>Cisticola chiniana</i>         | Cisticola, Rattling          | Unlisted | LC       |
| <i>Cisticola fulvicapilla</i>     | Neddicky, Neddicky           | Unlisted | LC       |
| <i>Cisticola juncidis</i>         | Cisticola, Zitting           | Unlisted | LC       |
| <i>Cisticola textrix</i>          | Cisticola, Cloud             | Unlisted | LC       |
| <i>Cisticola tinniens</i>         | Cisticola, Levallant's       | Unlisted | LC       |
| <i>Clamator glandarius</i>        | Cuckoo, Great Spotted        | Unlisted | LC       |
| <i>Clamator jacobinus</i>         | Cuckoo, Jacobin              | Unlisted | LC       |
| <i>Clamator levallantii</i>       | Cuckoo, Levallant's          | Unlisted | LC       |
| <i>Colius colius</i>              | Mousebird, White-backed      | Unlisted | LC       |
| <i>Colius striatus</i>            | Mousebird, Speckled          | Unlisted | LC       |
| <i>Columba guinea</i>             | Pigeon, Speckled             | Unlisted | LC       |
| <i>Columba livia</i>              | Dove, Rock                   | Unlisted | LC       |
| <i>Coracias caudatus</i>          | Roller, Lilac-breasted       | Unlisted | LC       |
| <i>Coracias garrulus</i>          | Roller, European             | NT       | LC       |
| <i>Coracias naevius</i>           | Roller, Purple               | Unlisted | LC       |
| <i>Corvus albus</i>               | Crow, Pied                   | Unlisted | LC       |
| <i>Corvus capensis</i>            | Crow, Cape                   | Unlisted | LC       |
| <i>Corythornis cristatus</i>      | Kingfisher, Malachite        | Unlisted | Unlisted |
| <i>Cossypha humeralis</i>         | Robin-chat, White-throated   | Unlisted | LC       |
| <i>Coturnix delegorguei</i>       | Quail, Harlequin             | Unlisted | LC       |
| <i>Creatophora cinerea</i>        | Starling, Wattled            | Unlisted | LC       |
| <i>Crinifer concolor</i>          | Go-away-bird, Grey           | Unlisted | LC       |
| <i>Crithagra atrogularis</i>      | Canary, Black-throated       | Unlisted | LC       |
| <i>Crithagra flaviventris</i>     | Canary, Yellow               | Unlisted | LC       |
| <i>Crithagra gularis</i>          | Seedeater, Streaky-headed    | Unlisted | LC       |
| <i>Crithagra mozambica</i>        | Canary, Yellow-fronted       | Unlisted | LC       |
| <i>Cuculus clamosus</i>           | Cuckoo, Black                | Unlisted | LC       |
| <i>Cuculus solitarius</i>         | Cuckoo, Red-chested          | Unlisted | LC       |
| <i>Curruca subcoerulea</i>        | Tit-babbler, Chestnut-vented | Unlisted | Unlisted |

|                                 |                                |          |    |
|---------------------------------|--------------------------------|----------|----|
| <i>Cursorius temminckii</i>     | Cursorer, Temminck's           | Unlisted | LC |
| <i>Cypsiurus parvus</i>         | Palm-swift, African            | Unlisted | LC |
| <i>Delichon urbicum</i>         | House-martin, Common           | Unlisted | LC |
| <i>Dendrocygna bicolor</i>      | Duck, Fulvous                  | Unlisted | LC |
| <i>Dendrocygna viduata</i>      | Duck, White-faced Whistling    | Unlisted | LC |
| <i>Dendroperdix sephaena</i>    | Francolin, Crested             | Unlisted | LC |
| <i>Dendropicos fuscescens</i>   | Woodpecker, Cardinal           | Unlisted | LC |
| <i>Dicrurus adsimilis</i>       | Drongo, Fork-tailed            | Unlisted | LC |
| <i>Dryoscopus cubla</i>         | Puffback, Black-backed         | Unlisted | LC |
| <i>Egretta ardesiaca</i>        | Heron, Black                   | Unlisted | LC |
| <i>Egretta garzetta</i>         | Egret, Little                  | Unlisted | LC |
| <i>Elanus caeruleus</i>         | Kite, Black-shouldered         | Unlisted | LC |
| <i>Emberiza capensis</i>        | Bunting, Cape                  | Unlisted | LC |
| <i>Emberiza flaviventris</i>    | Bunting, Golden-breasted       | Unlisted | LC |
| <i>Emberiza tahapisi</i>        | Bunting, Cinnamon-breasted     | Unlisted | LC |
| <i>Eremomela icteropygialis</i> | Eremomela, Yellow-bellied      | Unlisted | LC |
| <i>Eremomela usticollis</i>     | Eremomela, Burnt-necked        | Unlisted | LC |
| <i>Eremopterix leucotis</i>     | Sparrowlark, Chestnut-backed   | Unlisted | LC |
| <i>Estrilda astrild</i>         | Waxbill, Common                | Unlisted | LC |
| <i>Euplectes afer</i>           | Bishop, Yellow-crowned         | Unlisted | LC |
| <i>Euplectes albonotatus</i>    | Widowbird, White-winged        | Unlisted | LC |
| <i>Euplectes orix</i>           | Bishop, Southern Red           | Unlisted | LC |
| <i>Eurocephalus anguitemens</i> | Shrike, Southern White-crowned | Unlisted | LC |
| <i>Falco amurensis</i>          | Falcon, Amur                   | Unlisted | LC |
| <i>Falco biarmicus</i>          | Falcon, Lanner                 | VU       | LC |
| <i>Falco naumanni</i>           | Kestrel, Lesser                | Unlisted | LC |
| <i>Falco peregrinus</i>         | Falcon, Peregrine              | Unlisted | LC |
| <i>Falco rupicoloides</i>       | Kestrel, Greater               | Unlisted | LC |
| <i>Falco rupicolus</i>          | Kestrel, Rock                  | Unlisted | LC |
| <i>Fulica cristata</i>          | Coot, Red-knobbed              | Unlisted | LC |
| <i>Gallinago nigripennis</i>    | Snipe, African                 | Unlisted | LC |
| <i>Gallinula chloropus</i>      | Moorhen, Common                | Unlisted | LC |
| <i>Glareola nordmanni</i>       | Pratincole, Black-winged       | NT       | NT |
| <i>Glaucidium perlatum</i>      | Owlet, Pearl-spotted           | Unlisted | LC |
| <i>Granatina granatina</i>      | Waxbill, Violet-eared          | Unlisted | LC |
| <i>Gymnoris superciliaris</i>   | Petronia, Yellow-throated      | Unlisted | LC |
| <i>Gyps africanus</i>           | Vulture, White-backed          | CR       | CR |
| <i>Gyps coprotheres</i>         | Vulture, Cape                  | EN       | EN |
| <i>Halcyon albiventris</i>      | Kingfisher, Brown-hooded       | Unlisted | LC |

|                                 |                                 |          |          |
|---------------------------------|---------------------------------|----------|----------|
| <i>Halcyon senegalensis</i>     | Kingfisher, Woodland            | Unlisted | LC       |
| <i>Haliaeetus vocifer</i>       | Fish-eagle, African             | Unlisted | LC       |
| <i>Hieraetus wahlbergi</i>      | Eagle, Wahlberg's               | Unlisted | LC       |
| <i>Himantopus</i>               | Stilt, Black-winged             | Unlisted | LC       |
| <i>Hippolais icterina</i>       | Warbler, Icterine               | Unlisted | LC       |
| <i>Hirundo albigularis</i>      | Swallow, White-throated         | Unlisted | LC       |
| <i>Hirundo dimidiata</i>        | Swallow, Pearl-breasted         | Unlisted | LC       |
| <i>Hirundo rustica</i>          | Swallow, Barn                   | Unlisted | LC       |
| <i>Indicator</i>                | Honeyguide, Greater             | Unlisted | LC       |
| <i>Indicator minor</i>          | Honeyguide, Lesser              | Unlisted | LC       |
| <i>Ixobrychus minutus</i>       | Bittern, Little                 | Unlisted | LC       |
| <i>Ixobrychus sturmii</i>       | Bittern, Dwarf                  | Unlisted | LC       |
| <i>Lagonosticta rhodopareia</i> | Firefinch, Jameson's            | Unlisted | LC       |
| <i>Lagonosticta rubricata</i>   | Firefinch, African              | Unlisted | LC       |
| <i>Lagonosticta senegala</i>    | Firefinch, Red-billed           | Unlisted | LC       |
| <i>Lamprotornis australis</i>   | Starling, Burchell's            | Unlisted | LC       |
| <i>Lamprotornis nitens</i>      | Starling, Cape Glossy           | Unlisted | LC       |
| <i>Laniarius atrococcineus</i>  | Shrike, Crimson-breasted        | Unlisted | LC       |
| <i>Laniarius ferrugineus</i>    | Boubou, Southern                | Unlisted | LC       |
| <i>Lanius collaris</i>          | Fiscal, Common (Southern)       | Unlisted | LC       |
| <i>Lanius collurio</i>          | Shrike, Red-backed              | Unlisted | LC       |
| <i>Lanius minor</i>             | Shrike, Lesser Grey             | Unlisted | LC       |
| <i>Leptoptilos crumenifer</i>   | Stork, Marabou                  | Unlisted | LC       |
| <i>Lophoceros nasutus</i>       | Hornbill, African Grey          | Unlisted | LC       |
| <i>Lophotis ruficrista</i>      | Korhaan, Red-crested            | Unlisted | LC       |
| <i>Lybius torquatus</i>         | Barbet, Black-collared          | Unlisted | LC       |
| <i>Malaconotus blanchoti</i>    | Bush-shrike, Grey-headed        | Unlisted | LC       |
| <i>Megaceryle maxima</i>        | Kingfisher, Giant               | Unlisted | Unlisted |
| <i>Melaenornis mariquensis</i>  | Flycatcher, Marico              | Unlisted | LC       |
| <i>Melaenornis pallidus</i>     | Flycatcher, Pale                | Unlisted | LC       |
| <i>Melaenornis pammelaina</i>   | Flycatcher, Southern Black      | Unlisted | LC       |
| <i>Melaenornis silens</i>       | Flycatcher, Fiscal              | Unlisted | LC       |
| <i>Melaniparus cinerascens</i>  | Tit, Ashy                       | Unlisted | LC       |
| <i>Melaniparus niger</i>        | Tit, Southern Black             | Unlisted | Unlisted |
| <i>Melierax canorus</i>         | Goshawk, Southern Pale Chanting | Unlisted | LC       |
| <i>Merops apiaster</i>          | Bee-eater, European             | Unlisted | LC       |
| <i>Merops bullockoides</i>      | Bee-eater, White-fronted        | Unlisted | LC       |
| <i>Merops persicus</i>          | Bee-eater, Blue-cheeked         | Unlisted | LC       |
| <i>Merops pusillus</i>          | Bee-eater, Little               | Unlisted | LC       |

|                                |                               |          |          |
|--------------------------------|-------------------------------|----------|----------|
| <i>Microcarbo africanus</i>    | Cormorant, Reed               | Unlisted | LC       |
| <i>Micronisus gabar</i>        | Goshawk, Gabar                | Unlisted | LC       |
| <i>Milvus aegyptius</i>        | Kite, Yellow-billed           | Unlisted | Unlisted |
| <i>Mirafra africana</i>        | Lark, Rufous-naped            | Unlisted | LC       |
| <i>Mirafra fasciolata</i>      | Lark, Eastern Clapper         | Unlisted | LC       |
| <i>Mirafra passerina</i>       | Lark, Monotonous              | Unlisted | LC       |
| <i>Mirafra rufocinnamomea</i>  | Lark, Flappet                 | Unlisted | LC       |
| <i>Motacilla aguimp</i>        | Wagtail, African Pied         | Unlisted | LC       |
| <i>Motacilla capensis</i>      | Wagtail, Cape                 | Unlisted | LC       |
| <i>Muscicapa striata</i>       | Flycatcher, Spotted           | Unlisted | LC       |
| <i>Mycteria ibis</i>           | Stork, Yellow-billed          | EN       | LC       |
| <i>Myioparus plumbeus</i>      | Tit-flycatcher, Grey          | Unlisted | LC       |
| <i>Netta erythrophthalma</i>   | Pochard, Southern             | Unlisted | LC       |
| <i>Nilaus afer</i>             | Brubru                        | Unlisted | LC       |
| <i>Numida meleagris</i>        | Guineafowl, Helmeted          | Unlisted | LC       |
| <i>Nycticorax nycticorax</i>   | Night-Heron, Black-crowned    | Unlisted | LC       |
| <i>Oena capensis</i>           | Dove, Namaqua                 | Unlisted | LC       |
| <i>Oenanthe familiaris</i>     | Chat, Familiar                | Unlisted | LC       |
| <i>Oenanthe pileata</i>        | Wheatear, Capped              | Unlisted | LC       |
| <i>Onychognathus morio</i>     | Starling, Red-winged          | Unlisted | LC       |
| <i>Oriolus larvatus</i>        | Oriole, Black-headed          | Unlisted | LC       |
| <i>Ortygospiza atricollis</i>  | Quailfinch, African           | Unlisted | LC       |
| <i>Otus senegalensis</i>       | Scops-owl, African            | Unlisted | LC       |
| <i>Passer diffusus</i>         | Sparrow, Southern Grey-headed | Unlisted | LC       |
| <i>Passer domesticus</i>       | Sparrow, House                | Unlisted | LC       |
| <i>Passer melanurus</i>        | Sparrow, Cape                 | Unlisted | LC       |
| <i>Passer motitensis</i>       | Sparrow, Great                | Unlisted | LC       |
| <i>Pavo cristatus</i>          | Peacock, Common               | Unlisted | LC       |
| <i>Peliperdix coqui</i>        | Francolin, Coqui              | Unlisted | LC       |
| <i>Phalacrocorax lucidus</i>   | Cormorant, White-breasted     | Unlisted | LC       |
| <i>Phoeniculus purpureus</i>   | Wood-hoopoe, Green            | Unlisted | LC       |
| <i>Phylloscopus trochilus</i>  | Warbler, Willow               | Unlisted | LC       |
| <i>Platalea alba</i>           | Spoonbill, African            | Unlisted | LC       |
| <i>Plectropterus gambensis</i> | Goose, Spur-winged            | Unlisted | LC       |
| <i>Plegadis falcinellus</i>    | Ibis, Glossy                  | Unlisted | LC       |
| <i>Plocepasser mahali</i>      | Sparrow-weaver, White-browed  | Unlisted | LC       |
| <i>Ploceus cucullatus</i>      | Weaver, Village               | Unlisted | LC       |
| <i>Ploceus intermedius</i>     | Masked-weaver, Lesser         | Unlisted | LC       |
| <i>Ploceus velatus</i>         | Masked-weaver, Southern       | Unlisted | LC       |

|                                   |                                 |          |          |
|-----------------------------------|---------------------------------|----------|----------|
| <i>Podiceps cristatus</i>         | Grebe, Great Crested            | Unlisted | LC       |
| <i>Pogoniulus chrysoconus</i>     | Tinkerbird, Yellow-fronted      | Unlisted | LC       |
| <i>Poicephalus meyeri</i>         | Parrot, Meyer's                 | Unlisted | LC       |
| <i>Polemaetus bellicosus</i>      | Eagle, Martial                  | EN       | EN       |
| <i>Porphyrio madagascariensis</i> | Swamphen, African Purple        | Unlisted | Unlisted |
| <i>Prinia flavicans</i>           | Prinia, Black-chested           | Unlisted | LC       |
| <i>Prinia subflava</i>            | Prinia, Tawny-flanked           | Unlisted | LC       |
| <i>Prodotiscus regulus</i>        | Honeybird, Brown-backed         | Unlisted | LC       |
| <i>Pternistis natalensis</i>      | Spurfowl, Natal                 | Unlisted | LC       |
| <i>Pternistis swainsonii</i>      | Spurfowl, Swainson's            | Unlisted | LC       |
| <i>Pterocles bicinctus</i>        | Sandgrouse, Double-banded       | Unlisted | LC       |
| <i>Pterocles gutturalis</i>       | Sandgrouse, Yellow-throated     | NT       | LC       |
| <i>Ptilopsis granti</i>           | Scops-owl, Southern White-faced | Unlisted | Unlisted |
| <i>Ptyonoprogne fuligula</i>      | Martin, Rock                    | Unlisted | Unlisted |
| <i>Pycnonotus nigricans</i>       | Bulbul, African Red-eyed        | Unlisted | LC       |
| <i>Pycnonotus tricolor</i>        | Bulbul, Dark-capped             | Unlisted | Unlisted |
| <i>Pytilia melba</i>              | Pytilia, Green-winged           | Unlisted | LC       |
| <i>Quelea</i>                     | Quelea, Red-billed              | Unlisted | LC       |
| <i>Recurvirostra avosetta</i>     | Avocet, Pied                    | Unlisted | LC       |
| <i>Rhinopomastus cyanomelas</i>   | Scimitarbill, Common            | Unlisted | LC       |
| <i>Riparia paludicola</i>         | Martin, Brown-throated          | Unlisted | LC       |
| <i>Sagittarius serpentarius</i>   | Secretarybird                   | VU       | EN       |
| <i>Sarkidiornis melanotos</i>     | Duck, Comb                      | Unlisted | LC       |
| <i>Saxicola torquatus</i>         | Stonechat, African              | Unlisted | LC       |
| <i>Scopus umbretta</i>            | Hamerkop, Hamerkop              | Unlisted | LC       |
| <i>Spatula smithii</i>            | Shoveler, Cape                  | Unlisted | LC       |
| <i>Spermestes cucullata</i>       | Mannikin, Bronze                | Unlisted | LC       |
| <i>Spilopelia senegalensis</i>    | Dove, Laughing                  | Unlisted | LC       |
| <i>Sporopipes squamifrons</i>     | Finch, Scaly-feathered          | Unlisted | LC       |
| <i>Stenostira scita</i>           | Flycatcher, Fairy               | Unlisted | LC       |
| <i>Streptopelia capicola</i>      | Turtle-dove, Cape               | Unlisted | LC       |
| <i>Streptopelia semitorquata</i>  | Dove, Red-eyed                  | Unlisted | LC       |
| <i>Struthio camelus</i>           | Ostrich, Common                 | Unlisted | LC       |
| <i>Sylvia borin</i>               | Warbler, Garden                 | Unlisted | LC       |
| <i>Sylvietta rufescens</i>        | Crombec, Long-billed            | Unlisted | LC       |
| <i>Tachybaptus ruficollis</i>     | Grebe, Little                   | Unlisted | LC       |
| <i>Tachymarpis melba</i>          | Swift, Alpine                   | Unlisted | LC       |
| <i>Tchagra australis</i>          | Tchagra, Brown-crowned          | Unlisted | LC       |
| <i>Tchagra senegalus</i>          | Tchagra, Black-crowned          | Unlisted | LC       |



|                                 |                                  |          |          |
|---------------------------------|----------------------------------|----------|----------|
| <i>Terpsiphone viridis</i>      | Paradise-flycatcher, African     | Unlisted | LC       |
| <i>Thalassornis leuconotus</i>  | Duck, White-backed               | Unlisted | LC       |
| <i>Threskiornis aethiopicus</i> | Ibis, African Sacred             | Unlisted | LC       |
| <i>Tockus leucomelas</i>        | Hornbill, Southern Yellow-billed | Unlisted | LC       |
| <i>Tockus rufirostris</i>       | Hornbill, Southern Red-billed    | Unlisted | Unlisted |
| <i>Trachyphonus vaillantii</i>  | Barbet, Crested                  | Unlisted | LC       |
| <i>Treron calvus</i>            | Green-pigeon, African            | Unlisted | LC       |
| <i>Tricholaema leucomelas</i>   | Barbet, Acacia Pied              | Unlisted | LC       |
| <i>Tringa glareola</i>          | Sandpiper, Wood                  | Unlisted | LC       |
| <i>Tringa nebularia</i>         | Greenshank, Common               | Unlisted | LC       |
| <i>Tringa stagnatilis</i>       | Sandpiper, Marsh                 | Unlisted | LC       |
| <i>Turdoides bicolor</i>        | Babbler, Southern Pied           | Unlisted | LC       |
| <i>Turdoides jardineii</i>      | Babbler, Arrow-marked            | Unlisted | LC       |
| <i>Turdus libonyana</i>         | Thrush, Kurrichane               | Unlisted | Unlisted |
| <i>Turdus litsitsirupa</i>      | Thrush, Groundscraper            | Unlisted | Unlisted |
| <i>Turdus smithi</i>            | Thrush, Karoo                    | Unlisted | LC       |
| <i>Turnix sylvaticus</i>        | Buttonquail, Kurrichane          | Unlisted | LC       |
| <i>Turtur chalcospilos</i>      | Wood-dove, Emerald-spotted       | Unlisted | LC       |
| <i>Tyto alba</i>                | Owl, Barn                        | Unlisted | LC       |
| <i>Tyto capensis</i>            | Grass-owl, African               | VU       | LC       |
| <i>Upupa africana</i>           | Hoopoe, African                  | Unlisted | LC       |
| <i>Uraeginthus angolensis</i>   | Waxbill, Blue                    | Unlisted | LC       |
| <i>Urocolius indicus</i>        | Mousebird, Red-faced             | Unlisted | LC       |
| <i>Urolestes melanoleucus</i>   | Shrike, Magpie                   | Unlisted | LC       |
| <i>Vanellus armatus</i>         | Lapwing, Blacksmith              | Unlisted | LC       |
| <i>Vanellus coronatus</i>       | Lapwing, Crowned                 | Unlisted | LC       |
| <i>Vanellus senegallus</i>      | Lapwing, African Wattled         | Unlisted | LC       |
| <i>Vidua chalybeata</i>         | Indigobird, Village              | Unlisted | LC       |
| <i>Vidua funerea</i>            | Indigobird, Dusky                | Unlisted | LC       |
| <i>Vidua macroura</i>           | Whydah, Pin-tailed               | Unlisted | LC       |
| <i>Vidua paradisaea</i>         | Paradise-whydah, Long-tailed     | Unlisted | LC       |
| <i>Vidua regia</i>              | Whydah, Shaft-tailed             | Unlisted | LC       |
| <i>Zapornia flavirostra</i>     | Crake, Black                     | Unlisted | LC       |
| <i>Zosterops virens</i>         | White-eye, Cape                  | Unlisted | LC       |

### 16.3 Appendix C: Observed species during the point counts

| Common Name                   | Scientific Name                    | Guild code | Relative abundance | Frequency (%) |
|-------------------------------|------------------------------------|------------|--------------------|---------------|
| Shikra                        | <i>Accipiter badius</i>            | CGD        | 0,001              | 5,263         |
| Common Myna                   | <i>Acridotheres tristis</i>        | OMD        | 0,002              | 5,263         |
| Lesser Swamp Warbler          | <i>Acrocephalus gracilirostris</i> | IGD        | 0,001              | 2,632         |
| African Jacana                | <i>Actophilornis africanus</i>     | IWD        | 0,001              | 2,632         |
| Egyptian Goose                | <i>Alopochen aegyptiaca</i>        | HWD        | 0,002              | 5,263         |
| African Darter                | <i>Anhinga rufa</i>                | CWD        | 0,001              | 2,632         |
| Little Swift                  | <i>Apus affinis</i>                | IAD        | 0,143              | 21,053        |
| African Hawk Eagle            | <i>Aquila spilogaster</i>          | CGD        | 0,001              | 2,632         |
| Black-headed Heron            | <i>Ardea melanocephala</i>         | CGD        | 0,001              | 2,632         |
| Squacco Heron                 | <i>Ardeola ralloides</i>           | CWD        | 0,001              | 2,632         |
| Chinspot Batis                | <i>Batis molitor</i>               | IGD        | 0,005              | 23,684        |
| Hadedda (Hadada) Ibis         | <i>Bostrychia hagedash</i>         | OMD        | 0,002              | 5,263         |
| Western Cattle Egret          | <i>Bubulcus ibis</i>               | IGD        | 0,010              | 10,526        |
| Red-billed Oxpecker           | <i>Buphagus erythrorhynchus</i>    | IGD        | 0,001              | 2,632         |
| Green-backed (Striated) Heron | <i>Butorides striata</i>           | CWD        | 0,001              | 2,632         |
| Grey-backed Camaroptera       | <i>Camaroptera brevicaudata</i>    | IGD        | 0,003              | 13,158        |
| Golden-tailed Woodpecker      | <i>Campethera abingoni</i>         | IGD        | 0,001              | 2,632         |
| Greater Striped Swallow       | <i>Cecropis cucullata</i>          | IAD        | 0,001              | 5,263         |
| White-browed Scrub Robin      | <i>Cercotrichas leucophrys</i>     | IGD        | 0,005              | 21,053        |
| Pied Kingfisher               | <i>Ceryle rudis</i>                | CWD        | 0,001              | 2,632         |
| Three-banded Plover           | <i>Charadrius tricollaris</i>      | IWD        | 0,001              | 2,632         |
| Whiskered Tern                | <i>Chlidonias hybrida</i>          | CWD        | 0,001              | 2,632         |
| White-winged Tern             | <i>Chlidonias leucopterus</i>      | CWD        | 0,006              | 2,632         |
| Diederik Cuckoo               | <i>Chrysococcyx caprius</i>        | IGD        | 0,001              | 2,632         |
| Marico Sunbird                | <i>Cinnyris mariquensis</i>        | NFD        | 0,001              | 2,632         |
| White-bellied Sunbird         | <i>Cinnyris talatala</i>           | NFD        | 0,001              | 5,263         |
| Black-chested Snake Eagle     | <i>Circaetus pectoralis</i>        | CGD        | 0,001              | 5,263         |
| Lazy Cisticola                | <i>Cisticola aberrans</i>          | IGD        | 0,009              | 28,947        |
| Rattling Cisticola            | <i>Cisticola chiniana</i>          | IGD        | 0,002              | 5,263         |
| Tinkling Cisticola            | <i>Cisticola rufilatus</i>         | IGD        | 0,002              | 2,632         |
| Speckled Mousebird            | <i>Colius striatus</i>             | FFD        | 0,001              | 2,632         |
| Speckled Pigeon               | <i>Columba guinea</i>              | FFD        | 0,003              | 7,895         |
| Lilac-breasted Roller         | <i>Coracias caudatus</i>           | IAD        | 0,002              | 7,895         |
| Pied Crow                     | <i>Corvus albus</i>                | OMD        | 0,005              | 21,053        |
| Grey Go-away-bird             | <i>Corythaixoides concolor</i>     | FFD        | 0,005              | 18,421        |
| White-throated Robin-chat     | <i>Cossypha humeralis</i>          | IGD        | 0,001              | 2,632         |
| Black-throated Canary         | <i>Crithagra atrogularis</i>       | OMD        | 0,001              | 2,632         |

|  |                                 |     |       |        |
|--|---------------------------------|-----|-------|--------|
| <b>Chestnut-vented Tit-Babbler (Warbler)</b> | <i>Curruca subcoerulea</i>      | IGD | 0,007 | 31,579 |
| <b>African Palm Swift</b>                    | <i>Cypsiurus parvus</i>         | IAD | 0,002 | 7,895  |
| <b>Fulvous Whistling Duck</b>                | <i>Dendrocygna bicolor</i>      | HWD | 0,005 | 2,632  |
| <b>White-faced Whistling Duck</b>            | <i>Dendrocygna viduata</i>      | HWD | 0,001 | 2,632  |
| <b>Crested Francolin</b>                     | <i>Dendroperdix sephaena</i>    | OMD | 0,002 | 7,895  |
| <b>Fork-tailed Drongo</b>                    | <i>Dicrurus adsimilis</i>       | IAD | 0,003 | 7,895  |
| <b>Black-backed Puffback</b>                 | <i>Dryoscopus cubla</i>         | OMD | 0,001 | 2,632  |
| <b>Black-winged Kite</b>                     | <i>Elanus caeruleus</i>         | CGD | 0,002 | 10,526 |
| <b>Cinnamon-breasted Bunting</b>             | <i>Emberiza tahapisi</i>        | GGD | 0,002 | 2,632  |
| <b>Burnt-necked Eremomela</b>                | <i>Eremomela usticollis</i>     | IGD | 0,007 | 23,684 |
| <b>Southern White-crowned Shrike</b>         | <i>Eurocephalus anguitimens</i> | IGD | 0,003 | 5,263  |
| <b>Lanner Falcon</b>                         | <i>Falco biarmicus</i>          | CGD | 0,003 | 10,526 |
| <b>Cape Vulture</b>                          | <i>Gyps coprotheres</i>         | CGD | 0,003 | 2,632  |
| <b>Brown-hooded Kingfisher</b>               | <i>Halcyon albiventris</i>      | CWD | 0,002 | 7,895  |
| <b>Woodland Kingfisher</b>                   | <i>Halcyon senegalensis</i>     | CWD | 0,001 | 5,263  |
| <b>African Fish Eagle</b>                    | <i>Haliaeetus vocifer</i>       | CGD | 0,002 | 7,895  |
| <b>Barn Swallow</b>                          | <i>Hirundo rustica</i>          | IAD | 0,011 | 21,053 |
| <b>Jameson's Firefinch</b>                   | <i>Lagonosticta rhodopareia</i> | GGD | 0,001 | 2,632  |
| <b>African Firefinch</b>                     | <i>Lagonosticta rubricata</i>   | GGD | 0,002 | 5,263  |
| <b>Burchell's Starling</b>                   | <i>Lamprotornis australis</i>   | IGD | 0,001 | 2,632  |
| <b>Cape Glossy (Cape) Starling</b>           | <i>Lamprotornis nitens</i>      | IGD | 0,001 | 2,632  |
| <b>Crimson-breasted Shrike</b>               | <i>Laniarius atrococcineus</i>  | IGD | 0,004 | 15,789 |
| <b>Lesser Grey Shrike</b>                    | <i>Lanius minor</i>             | IGD | 0,005 | 18,421 |
| <b>African Grey Hornbill</b>                 | <i>Lophoceros nasutus</i>       | IGD | 0,001 | 5,263  |
| <b>Black-collared Barbet</b>                 | <i>Lybius torquatus</i>         | FFD | 0,002 | 5,263  |
| <b>Marico flycatcher</b>                     | <i>Melaenornis mariquensis</i>  | IAD | 0,003 | 13,158 |
| <b>Fiscal Flycatcher</b>                     | <i>Melaenornis silens</i>       | OMD | 0,001 | 2,632  |
| <b>European Bee-eater</b>                    | <i>Merops apiaster</i>          | IAD | 0,003 | 7,895  |
| <b>White-fronted Bee-eater</b>               | <i>Merops bullockoides</i>      | IAD | 0,006 | 5,263  |
| <b>Blue-cheeked Bee-eater</b>                | <i>Merops persicus</i>          | IAD | 0,013 | 15,789 |
| <b>Little Bee-eater</b>                      | <i>Merops pusillus</i>          | IAD | 0,003 | 7,895  |
| <b>Reed Cormorant</b>                        | <i>Microcarbo africanus</i>     | CWD | 0,002 | 2,632  |
| <b>Gabar Goshawk</b>                         | <i>Micronisus gabar</i>         | CGD | 0,002 | 7,895  |
| <b>Cape Wagtail</b>                          | <i>Motacilla capensis</i>       | IGD | 0,001 | 2,632  |
| <b>Spotted flycatcher</b>                    | <i>Muscicapa striata</i>        | IAD | 0,001 | 2,632  |
| <b>Helmeted Guineafowl</b>                   | <i>Numida meleagris</i>         | OMD | 0,014 | 15,789 |
| <b>Namaqua Dove</b>                          | <i>Oena capensis</i>            | GGD | 0,001 | 5,263  |
| <b>Black-headed Oriole</b>                   | <i>Oriolus larvatus</i>         | OMD | 0,001 | 2,632  |
| <b>cape sparrow</b>                          | <i>Passer melanurus</i>         | GGD | 0,001 | 5,263  |

|  |                                  |     |       |        |
|--|----------------------------------|-----|-------|--------|
| <b>African Spoonbill</b>               | <i>Platalea alba</i>             | IWD | 0,001 | 2,632  |
| <b>Spur-winged Goose</b>               | <i>Plectropterus gambensis</i>   | OMD | 0,008 | 5,263  |
| <b>White-browed Sparrow-Weaver</b>     | <i>Plocepasser mahali</i>        | OMD | 0,002 | 2,632  |
| <b>Southern Masked Weaver</b>          | <i>Ploceus velatus</i>           | GGD | 0,013 | 18,421 |
| <b>Yellow-fronted Tinkerbird</b>       | <i>Pogoniulus chrysoconus</i>    | FFD | 0,001 | 2,632  |
| <b>Black-chested Prinia</b>            | <i>Prinia flavicans</i>          | IGD | 0,007 | 23,684 |
| <b>Tawny-flanked Prinia</b>            | <i>Prinia subflava</i>           | IGD | 0,002 | 7,895  |
| <b>Natal Spurfowl</b>                  | <i>Pternistis natalensis</i>     | OMD | 0,010 | 36,842 |
| <b>Swainson's Spurfowl</b>             | <i>Pternistis swainsonii</i>     | OMD | 0,007 | 23,684 |
| <b>Yellow-throated Sandgrouse</b>      | <i>Pterocles gutturalis</i>      | GGD | 0,006 | 5,263  |
| <b>Dark-capped Bulbul</b>              | <i>Pycnonotus tricolor</i>       | OMD | 0,002 | 5,263  |
| <b>Green-winged Pytilia</b>            | <i>Pytilia melba</i>             | GGD | 0,001 | 2,632  |
| <b>Red-billed Quelea</b>               | <i>Quelea quelea</i>             | GGD | 0,471 | 52,632 |
| <b>Knob-billed Duck</b>                | <i>Sarkidiornis melanotos</i>    | HWD | 0,024 | 5,263  |
| <b>Laughing Dove</b>                   | <i>Spilopelia senegalensis</i>   | GGD | 0,002 | 10,526 |
| <b>Scaly-feathered Finch (Weaver)</b>  | <i>Sporopipes squamifrons</i>    | GGD | 0,002 | 7,895  |
| <b>Cape Turtle (Ring-necked) Dove</b>  | <i>Streptopelia capicola</i>     | GGD | 0,017 | 60,526 |
| <b>Red-eyed Dove</b>                   | <i>Streptopelia semitorquata</i> | GGD | 0,003 | 10,526 |
| <b>Common Ostrich</b>                  | <i>Struthio camelus</i>          | OMD | 0,001 | 2,632  |
| <b>Long-billed crombec</b>             | <i>Sylvietta rufescens</i>       | IGD | 0,007 | 26,316 |
| <b>Southern Yellow-billed Hornbill</b> | <i>Tockus leucomelas</i>         | IGD | 0,003 | 13,158 |
| <b>Southern Red-billed Hornbill</b>    | <i>Tockus rufirostris</i>        | IGD | 0,001 | 5,263  |
| <b>Crested Barbet</b>                  | <i>Trachyphonus vaillantii</i>   | FFD | 0,001 | 2,632  |
| <b>Acacia Pied Barbet</b>              | <i>Tricholaema leucomelas</i>    | OMD | 0,003 | 15,789 |
| <b>Common Greenshank</b>               | <i>Tringa nebularia</i>          | IWD | 0,001 | 2,632  |
| <b>Arrow-marked Babbler</b>            | <i>Turdoides jardineii</i>       | IGD | 0,002 | 2,632  |
| <b>Emerald-spotted Wood Dove</b>       | <i>Turtur chalcospilos</i>       | OMD | 0,001 | 2,632  |
| <b>Blue Waxbill</b>                    | <i>Uraeginthus angolensis</i>    | GGD | 0,025 | 50,000 |
| <b>Red-faced Mousebird</b>             | <i>Urocolius indicus</i>         | FFD | 0,008 | 13,158 |
| <b>Magpie Shrike</b>                   | <i>Urolestes melanoleucus</i>    | IAD | 0,017 | 28,947 |
| <b>Blacksmith Lapwing</b>              | <i>Vanellus armatus</i>          | IGD | 0,001 | 2,632  |
| <b>Crowned Lapwing</b>                 | <i>Vanellus coronatus</i>        | IGD | 0,005 | 7,895  |
| <b>African Wattled Lapwing</b>         | <i>Vanellus senegallus</i>       | IGD | 0,002 | 2,632  |
| <b>Black Crake</b>                     | <i>Zapornia flavirostra</i>      | OMD | 0,001 | 2,632  |

## 16.4 Appendix D: Incidental Observations

These are species observed moving between point counts. This list is included to provide a list of species that might not have been observed through the point count method.

| Common Name                     | Scientific Name                |
|---------------------------------|--------------------------------|
| Southern Yellow-billed Hornbill | <i>Tockus leucomelas</i>       |
| Green Wood-hoopoe               | <i>Phoeniculus purpureus</i>   |
| Chinspot Batis                  | <i>Batis molitor</i>           |
| Pied Crow                       | <i>Corvus albus</i>            |
| Lilac-breasted Roller           | <i>Coracias caudatus</i>       |
| Southern White-crowned Shrike   | <i>Eurocephalus anguimans</i>  |
| Fork-tailed Drongo              | <i>Dicrurus adsimilis</i>      |
| Swainson's Spurfowl             | <i>Pternistis swainsonii</i>   |
| Crested Francolin               | <i>Dendroperdix sephaena</i>   |
| Namaqua Dove                    | <i>Oena capensis</i>           |
| Natal Spurfowl                  | <i>Pternistis natalensis</i>   |
| Lazy Cisticola                  | <i>Cisticola aberrans</i>      |
| Cape Turtle (Ring-necked) Dove  | <i>Streptopelia capicola</i>   |
| Blacksmith Lapwing              | <i>Vanellus armatus</i>        |
| Acacia Pied Barbet              | <i>Tricholaema leucomelas</i>  |
| European Bee-eater              | <i>Merops apiaster</i>         |
| Lanner Falcon                   | <i>Falco biarmicus</i>         |
| Speckled Mousebird              | <i>Colius striatus</i>         |
| African Firefinch               | <i>Lagonosticta rubricata</i>  |
| Brown-crowned Tchagra           | <i>Tchagra australis</i>       |
| White-throated Robin-chat       | <i>Cossypha humeralis</i>      |
| Diederik Cuckoo                 | <i>Chrysococcyx caprius</i>    |
| Tawny-flanked Prinia            | <i>Prinia subflava</i>         |
| Southern Red-billed Hornbill    | <i>Tockus rufirostris</i>      |
| African Palm Swift              | <i>Cypsiurus parvus</i>        |
| African Grey Hornbill           | <i>Lophoceros nasutus</i>      |
| Red-backed Shrike               | <i>Lanius collurio</i>         |
| Grey Go-away-bird               | <i>Corythaixoides concolor</i> |
| Sabota Lark                     | <i>Calendulauda sabota</i>     |
| Shaft-tailed Whydah             | <i>Vidua regia</i>             |
| Southern Grey-headed Sparrow    | <i>Passer diffusus</i>         |
| Helmeted Guineafowl             | <i>Numida meleagris</i>        |
| White-browed Sparrow-Weaver     | <i>Plocepasser mahali</i>      |
| Glossy Ibis                     | <i>Plegadis falcinellus</i>    |
| Purple Roller                   | <i>Coracias naevius</i>        |

|                                      |                                |
|--------------------------------------|--------------------------------|
| <b>Burchell's Coucal</b>             | <i>Centropus burchellii</i>    |
| <b>Crested Francolin</b>             | <i>Dendroperdix sephaena</i>   |
| <b>Black-headed Heron</b>            | <i>Ardea melanocephala</i>     |
| <b>Southern Black Tit</b>            | <i>Melaniparus niger</i>       |
| <b>Greater Striped Swallow</b>       | <i>Cecropis cucullata</i>      |
| <b>Little Swift</b>                  | <i>Apus affinis</i>            |
| <b>Speckled Pigeon</b>               | <i>Columba guinea</i>          |
| <b>White-bellied Sunbird</b>         | <i>Cinnyris talatala</i>       |
| <b>Brown-throated Martin</b>         | <i>Riparia paludicola</i>      |
| <b>Horus Swift</b>                   | <i>Apus horus</i>              |
| <b>Marico Sunbird</b>                | <i>Cinnyris mariquensis</i>    |
| <b>Common Myna</b>                   | <i>Acridotheres tristis</i>    |
| <b>Red-billed Oxpecker</b>           | <i>Buphagus erythrorynchus</i> |
| <b>Black-throated Canary</b>         | <i>Crithagra atrogularis</i>   |
| <b>Yellow-fronted Tinkerbird</b>     | <i>Pogoniulus chrysoconus</i>  |
| <b>Long-tailed Paradise Whydah</b>   | <i>Vidua paradisaea</i>        |
| <b>Golden-tailed Woodpecker</b>      | <i>Campethera abingoni</i>     |
| <b>Pearl-spotted Owlet</b>           | <i>Glaucidium perlatum</i>     |
| <b>African Darter</b>                | <i>Anhinga rufa</i>            |
| <b>Green-backed (Striated) Heron</b> | <i>Butorides striata</i>       |
| <b>Malachite Kingfisher</b>          | <i>Corythornis cristatus</i>   |
| <b>White-breasted Cormorant</b>      | <i>Phalacrocorax lucidus</i>   |
| <b>African Paradise Flycatcher</b>   | <i>Terpsiphone viridis</i>     |
| <b>Squacco Heron</b>                 | <i>Ardeola ralloides</i>       |
| <b>Village Indigobird</b>            | <i>Vidua chalybeata</i>        |
| <b>Southern Grey-headed Sparrow</b>  | <i>Passer diffusus</i>         |
| <b>Violet-eared Waxbill</b>          | <i>Granatina granatina</i>     |
| <b>Village Indigobird</b>            | <i>Vidua chalybeata</i>        |
| <b>Hamerkop</b>                      | <i>Scopus umbretta</i>         |
| <b>Pin-tailed Whydah</b>             | <i>Vidua macroura</i>          |
| <b>Marsh Owl</b>                     | <i>Asio capensis</i>           |
| <b>Southern White-faced Owl</b>      | <i>Ptilopsis granti</i>        |

## 16.5 Appendix E: Observations during the second survey

| Common Name                           | Scientific Name                | Relative abundance | Frequency (%) |
|---------------------------------------|--------------------------------|--------------------|---------------|
| Red-billed Quelea                     | <i>Quelea quelea</i>           | 0,169              | 10,811        |
| Red-knobbed coot                      | <i>Fulica cristata</i>         | 0,102              | 2,703         |
| Helmeted Guineafowl                   | <i>Numida meleagris</i>        | 0,089              | 13,514        |
| African Palm Swift                    | <i>Cypsiurus parvus</i>        | 0,070              | 18,919        |
| Blue Waxbill                          | <i>Uraeginthus angolensis</i>  | 0,066              | 62,162        |
| White-faced Whistling Duck            | <i>Dendrocygna viduata</i>     | 0,051              | 2,703         |
| Cape Turtle (Ring-necked) Dove        | <i>Streptopelia capicola</i>   | 0,032              | 72,973        |
| Yellow-throated Sandgrouse            | <i>Pterocles gutturalis</i>    | 0,032              | 16,216        |
| Magpie Shrike                         | <i>Urolestes melanoleucus</i>  | 0,027              | 32,432        |
| Long-billed Crombec                   | <i>Sylvietta rufescens</i>     | 0,017              | 37,838        |
| Chestnut-vented Tit-Babbler (Warbler) | <i>Curruca subcoerulea</i>     | 0,015              | 37,838        |
| Rattling Cisticola                    | <i>Cisticola chiniana</i>      | 0,014              | 35,135        |
| Burchell's Starling                   | <i>Lamprotornis australis</i>  | 0,013              | 21,622        |
| Pied Crow                             | <i>Corvus albus</i>            | 0,012              | 29,730        |
| Grey Go-away-bird                     | <i>Corythaixoides concolor</i> | 0,011              | 21,622        |
| Green-winged Pytilia                  | <i>Pytilia melba</i>           | 0,010              | 18,919        |
| Marico Flycatcher                     | <i>Melaenornis mariquensis</i> | 0,010              | 18,919        |
| Red-faced Mousebird                   | <i>Urocolius indicus</i>       | 0,010              | 8,108         |
| Reed Cormorant                        | <i>Microcarbo africanus</i>    | 0,010              | 2,703         |
| Swainson's Spurfowl                   | <i>Pternistis swainsonii</i>   | 0,010              | 18,919        |
| White-breasted Cormorant              | <i>Phalacrocorax lucidus</i>   | 0,010              | 2,703         |
| Red-billed Buffalo Weaver             | <i>Bubalornis niger</i>        | 0,009              | 2,703         |
| Yellow-billed Duck                    | <i>Anas undulata</i>           | 0,009              | 2,703         |
| Egyptian Goose                        | <i>Alopochen aegyptiaca</i>    | 0,008              | 8,108         |
| Speckled Mousebird                    | <i>Colius striatus</i>         | 0,008              | 2,703         |
| Black-winged Kite                     | <i>Elanus caeruleus</i>        | 0,007              | 16,216        |
| Vulture, Cape                         | <i>Gyps coprotheres</i>        | 0,007              | 5,405         |
| Natal Spurfowl                        | <i>Pternistis natalensis</i>   | 0,007              | 13,514        |
| Southern Masked Weaver                | <i>Ploceus velatus</i>         | 0,007              | 5,405         |
| Black-throated Canary                 | <i>Crithagra atrogularis</i>   | 0,006              | 2,703         |
| Crowned Lapwing                       | <i>Vanellus coronatus</i>      | 0,006              | 8,108         |
| Arrow-marked Babbler                  | <i>Turdoides jardineii</i>     | 0,005              | 2,703         |
| Crested Francolin                     | <i>Dendroperdix sephaena</i>   | 0,005              | 5,405         |
| Laughing Dove                         | <i>Spilopelia senegalensis</i> | 0,005              | 10,811        |
| Little Bee-eater                      | <i>Merops pusillus</i>         | 0,005              | 13,514        |
| Southern Pied Babbler                 | <i>Turdoides bicolor</i>       | 0,005              | 2,703         |
| African Pipit                         | <i>Anthus cinnamomeus</i>      | 0,004              | 8,108         |

|                                 |                                 |       |        |
|---------------------------------|---------------------------------|-------|--------|
| Burnt-necked Eremomela          | <i>Eremomela usticollis</i>     | 0,004 | 8,108  |
| Crimson-breasted Shrike         | <i>Laniarius atrococcineus</i>  | 0,004 | 10,811 |
| Fork-tailed Drongo              | <i>Dicrurus adsimilis</i>       | 0,004 | 10,811 |
| Sabota Lark                     | <i>Calendulauda sabota</i>      | 0,004 | 8,108  |
| Violet-eared Waxbill            | <i>Granatina granatina</i>      | 0,004 | 8,108  |
| Western Cattle Egret            | <i>Bubulcus ibis</i>            | 0,004 | 8,108  |
| Acacia Pied Barbet              | <i>Tricholaema leucomelas</i>   | 0,003 | 8,108  |
| African Darter                  | <i>Anhinga rufa</i>             | 0,003 | 2,703  |
| African Grey Hornbill           | <i>Lophoceros nasutus</i>       | 0,003 | 8,108  |
| Blacksmith Lapwing              | <i>Vanellus armatus</i>         | 0,003 | 8,108  |
| Cape Glossy (Cape) Starling     | <i>Lamprotornis nitens</i>      | 0,003 | 5,405  |
| Chin-spot Batis                 | <i>Batis molitor</i>            | 0,003 | 8,108  |
| Dark-capped Bulbul              | <i>Pycnonotus tricolor</i>      | 0,003 | 5,405  |
| Grey-backed Camaroptera         | <i>Camaroptera brevicaudata</i> | 0,003 | 8,108  |
| Little Swift                    | <i>Apus affinis</i>             | 0,003 | 2,703  |
| Red-billed Firefinch            | <i>Lagonosticta senegala</i>    | 0,003 | 8,108  |
| Red-billed Teal                 | <i>Anas erythrorhyncha</i>      | 0,003 | 2,703  |
| Tawny-flanked Prinia            | <i>Prinia subflava</i>          | 0,003 | 8,108  |
| White-browed Sparrow-Weaver     | <i>Plocepasser mahali</i>       | 0,003 | 5,405  |
| Black-chested Prinia            | <i>Prinia flavicans</i>         | 0,002 | 5,405  |
| Common Moorhen                  | <i>Gallinula chloropus</i>      | 0,002 | 2,703  |
| Gabar Goshawk                   | <i>Micronisus gabar</i>         | 0,002 | 5,405  |
| Lilac-breasted Roller           | <i>Coracias caudatus</i>        | 0,002 | 5,405  |
| Pearl-spotted Owlet             | <i>Glaucidium perlatum</i>      | 0,002 | 2,703  |
| Southern Pochard                | <i>Netta erythrophthalma</i>    | 0,002 | 5,405  |
| Southern Red-billed Hornbill    | <i>Tockus rufirostris</i>       | 0,002 | 5,405  |
| Southern White-crowned Shrike   | <i>Eurocephalus anguitimens</i> | 0,002 | 2,703  |
| Southern Yellow-billed Hornbill | <i>Tockus leucomelas</i>        | 0,002 | 5,405  |
| White-browed Scrub Robin        | <i>Cercotrichas leucophrys</i>  | 0,002 | 5,405  |
| African Fish Eagle              | <i>Haliaeetus vocifer</i>       | 0,001 | 2,703  |
| African Hawk Eagle              | <i>Aquila spilogaster</i>       | 0,001 | 2,703  |
| African Stonechat               | <i>Saxicola torquatus</i>       | 0,001 | 2,703  |
| African Wattled Lapwing         | <i>Vanellus senegallus</i>      | 0,001 | 2,703  |
| Black-backed Puffback           | <i>Dryoscopus cubla</i>         | 0,001 | 2,703  |
| Black-collared Barbet           | <i>Lybius torquatus</i>         | 0,001 | 2,703  |
| Brown-crowned Tchagra           | <i>Tchagra australis</i>        | 0,001 | 2,703  |
| Brown-hooded Kingfisher         | <i>Halcyon albiventris</i>      | 0,001 | 2,703  |
| Cape Shoveler                   | <i>Spatula smithii</i>          | 0,001 | 2,703  |
| Crested Barbet                  | <i>Trachyphonus vaillantii</i>  | 0,001 | 2,703  |



|                                       |                                    |       |       |
|---------------------------------------|------------------------------------|-------|-------|
| <b>Hadedda (Hadada) Ibis</b>          | <i>Bostrychia hagedash</i>         | 0,001 | 2,703 |
| <b>Kalahari Scrub Robin</b>           | <i>Cercotrichas paena</i>          | 0,001 | 2,703 |
| <b>Knob-billed Duck</b>               | <i>Sarkidiornis melanotos</i>      | 0,001 | 2,703 |
| <b>Lesser Swamp Warbler</b>           | <i>Acrocephalus gracilirostris</i> | 0,001 | 2,703 |
| <b>Little Grebe</b>                   | <i>Tachybaptus ruficollis</i>      | 0,001 | 2,703 |
| <b>Long-tailed Widowbird</b>          | <i>Euplectes progne</i>            | 0,001 | 2,703 |
| <b>Neddicky</b>                       | <i>Cisticola fulvicapilla</i>      | 0,001 | 2,703 |
| <b>Pin-tailed Whydah</b>              | <i>Vidua macroura</i>              | 0,001 | 2,703 |
| <b>Purple Roller</b>                  | <i>Coracias naevius</i>            | 0,001 | 2,703 |
| <b>Red-eyed Dove</b>                  | <i>Streptopelia semitorquata</i>   | 0,001 | 2,703 |
| <b>Red-headed Weaver</b>              | <i>Anaplectes rubriceps</i>        | 0,001 | 2,703 |
| <b>Scaly-feathered Finch (Weaver)</b> | <i>Sporopipes squamifrons</i>      | 0,001 | 2,703 |
| <b>Speckled Pigeon</b>                | <i>Columba guinea</i>              | 0,001 | 2,703 |
| <b>Striped Kingfisher</b>             | <i>Halcyon chelicuti</i>           | 0,001 | 2,703 |
| <b>Three-banded Plover</b>            | <i>Charadrius tricollaris</i>      | 0,001 | 2,703 |
| <b>White-bellied Sunbird</b>          | <i>Cinnyris talatala</i>           | 0,001 | 2,703 |
| <b>Yellow-fronted Tinkerbird</b>      | <i>Pogoniulus chrysoconus</i>      | 0,001 | 2,703 |

## 16.6 Appendix F: Incidental observations second survey

| Common Name                           | Scientific Name                |
|---------------------------------------|--------------------------------|
| Blue Waxbill                          | <i>Uraeginthus angolensis</i>  |
| Long-billed Crombec                   | <i>Sylvietta rufescens</i>     |
| Chestnut-vented Tit-Babbler (Warbler) | <i>Curruca subcoerulea</i>     |
| Green-winged Pytilia                  | <i>Pytilia melba</i>           |
| Black-winged Kite                     | <i>Elanus caeruleus</i>        |
| Crimson-breasted Shrike               | <i>Laniarius atrococcineus</i> |
| Marico flycatcher                     | <i>Melaenornis mariquensis</i> |
| Tawny-flanked Prinia                  | <i>Prinia subflava</i>         |
| White-browed Sparrow-Weaver           | <i>Plocepasser mahali</i>      |
| Burchell's Starling                   | <i>Lamprotornis australis</i>  |
| Grey Go-away-bird                     | <i>Corythaixoides concolor</i> |
| Southern Red-billed Hornbill          | <i>Tockus rufirostris</i>      |
| Kalahari Scrub Robin                  | <i>Cercotrichas paena</i>      |
| Rattling Cisticola                    | <i>Cisticola chiniana</i>      |
| African Pipit                         | <i>Anthus cinnamomeus</i>      |
| Namaqua Dove                          | <i>Oena capensis</i>           |
| Swainson's Spurfowl                   | <i>Pternistis swainsonii</i>   |
| Red-billed Quelea                     | <i>Quelea quelea</i>           |
| Red-billed Firefinch                  | <i>Lagonosticta senegala</i>   |
| Brown-hooded Kingfisher               | <i>Halcyon albiventris</i>     |
| Cape Glossy (Cape) Starling           | <i>Lamprotornis nitens</i>     |
| Southern Yellow-billed Hornbill       | <i>Tockus leucomelas</i>       |
| Southern Masked Weaver                | <i>Ploceus velatus</i>         |
| Crowned Lapwing                       | <i>Vanellus coronatus</i>      |
| Helmeted Guineafowl                   | <i>Numida meleagris</i>        |
| Red-billed Buffalo Weaver             | <i>Bubalornis niger</i>        |
| Crested Francolin                     | <i>Dendroperdix sephaena</i>   |
| Brown Snake Eagle                     | <i>Circaetus cinereus</i>      |
| Arrow-marked Babbler                  | <i>Turdoides jardineii</i>     |
| African Pipit                         | <i>Anthus cinnamomeus</i>      |
| Yellow-throated Sandgrouse            | <i>Pterocles gutturalis</i>    |
| Red-billed Teal                       | <i>Anas erythrorhyncha</i>     |
| Lazy Cisticola                        | <i>Cisticola aberrans</i>      |
| Pin-tailed Whydah                     | <i>Vidua macroura</i>          |
| Little Bee-eater                      | <i>Merops pusillus</i>         |
| Desert Cisticola                      | <i>Cisticola aridulus</i>      |
| Lilac-breasted Roller                 | <i>Coracias caudatus</i>       |

|                                     |                                 |
|-------------------------------------|---------------------------------|
| <b>Bennett's Woodpecker</b>         | <i>Campethera bennettii</i>     |
| <b>African Sacred Ibis</b>          | <i>Threskiornis aethiopicus</i> |
| <b>Southern White-faced Owl</b>     | <i>Ptilopsis granti</i>         |
| <b>Burnt-necked Eremomela</b>       | <i>Eremomela usticollis</i>     |
| <b>Common Ostrich</b>               | <i>Struthio camelus</i>         |
| <b>White-bellied Sunbird</b>        | <i>Cinnyris talatala</i>        |
| <b>Hamerkop</b>                     | <i>Scopus umbretta</i>          |
| <b>Southern Grey-headed Sparrow</b> | <i>Passer diffusus</i>          |
| <b>Yellow Canary</b>                | <i>Crithagra flaviventris</i>   |
| <b>Southern Red Bishop</b>          | <i>Euplectes orix</i>           |
| <b>Groundscraper Thrush</b>         | <i>Turdus litsitsirupa</i>      |
| <b>Black-headed Heron</b>           | <i>Ardea melanocephala</i>      |