THE AVIFAUNA ASSESSMENT FOR THE PROPOSED BUFFELSPOORT SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY

Mooinooi, North West Province

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CLIENT

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake an avifauna impact assessment for the proposed Buffelspoort Solar Photovoltaic (PV) Energy Facility on Portions 75 and 134 of the Farm Buffelspoort 343 JQ, and its associated infrastructure near Mooinooi (Figure 1-1). The proposed facility is located approximately 6 km west of Mooinooi, within jurisdiction of the Rustenburg Local Municipality and the Bojanala Platinum District Municipality in the North West Province.

A Project Area of Influence (PAOI) was created to incorporate the proposed Buffelspoort ESIA development footprint, Substation as well as the Buffelspoort OHL and represents the total area assessed (Figure 1-2).

The assessment approach was informed by the Environmental Impact Assessment Regulations, 2014 (GNR 326, as amended 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The assessment 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", while the animal sensitivity is rated as 'medium. The screening tool provides an avifaunal sensitivity theme. However, this layer is applicable to wind energy developments and for all other projects, the user must evaluate the animal species sensitivity's theme for any avifaunal triggers. The animal theme sensitivity is rated as medium based on the moderate likelihood of Secretarybird (*Sagittarius serpentarius*) occurring here.

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 facility.

1.2 Project

The proposed project will have a contracted capacity of up to 40 MW. The purpose of the Solar PV Energy Facility will be to supply power to a private off-taker by connecting the Facility via a newly proposed ~2.5 km long 88kV single circuit overhead power line that will be routed over Privately owned properties from the onsite Facility substation to the point of interconnection, north of the N4. The development, construction and operation of the Solar PV Energy Facility aims to enable the private off-taker to diversify their energy mix and to reduce their reliance on Eskom supplied power and is a conscious effort for the off-taker to contribute to their sustainability targets and reduce their carbon footprint. A grid connection corridor which varies in width from 200 m to 300 m and is up to 2.5 km in length has been identified for the assessment and suitable placement of the grid connection infrastructure. This corridor will provide for the avoidance of sensitive environment areas and technical constraints. A Development Footprint of up to ~77 ha has been identified within the PAIO by the Buffelspoort Solar Project (Pty) Ltd for the development of the Buffelspoort Solar PV Energy Facility.

Infrastructure associated with the Buffelspoort Solar PV Energy Facility will include the following:

- Solar PV array comprising PV panels and mounting structures;
- Inverters and transformers;
- Cabling between the arrays;
- Onsite facility substation;
- 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed Project Site;

- Battery Energy Storage System (BESS) – to be initiated at a later stage than the Solar PV Energy Facility[1]
- Temporary laydown area;
- Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop;
- Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads; and
- Fencing around the site, including an access gate and a security point.

[1] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the offtaker is currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the offtaker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

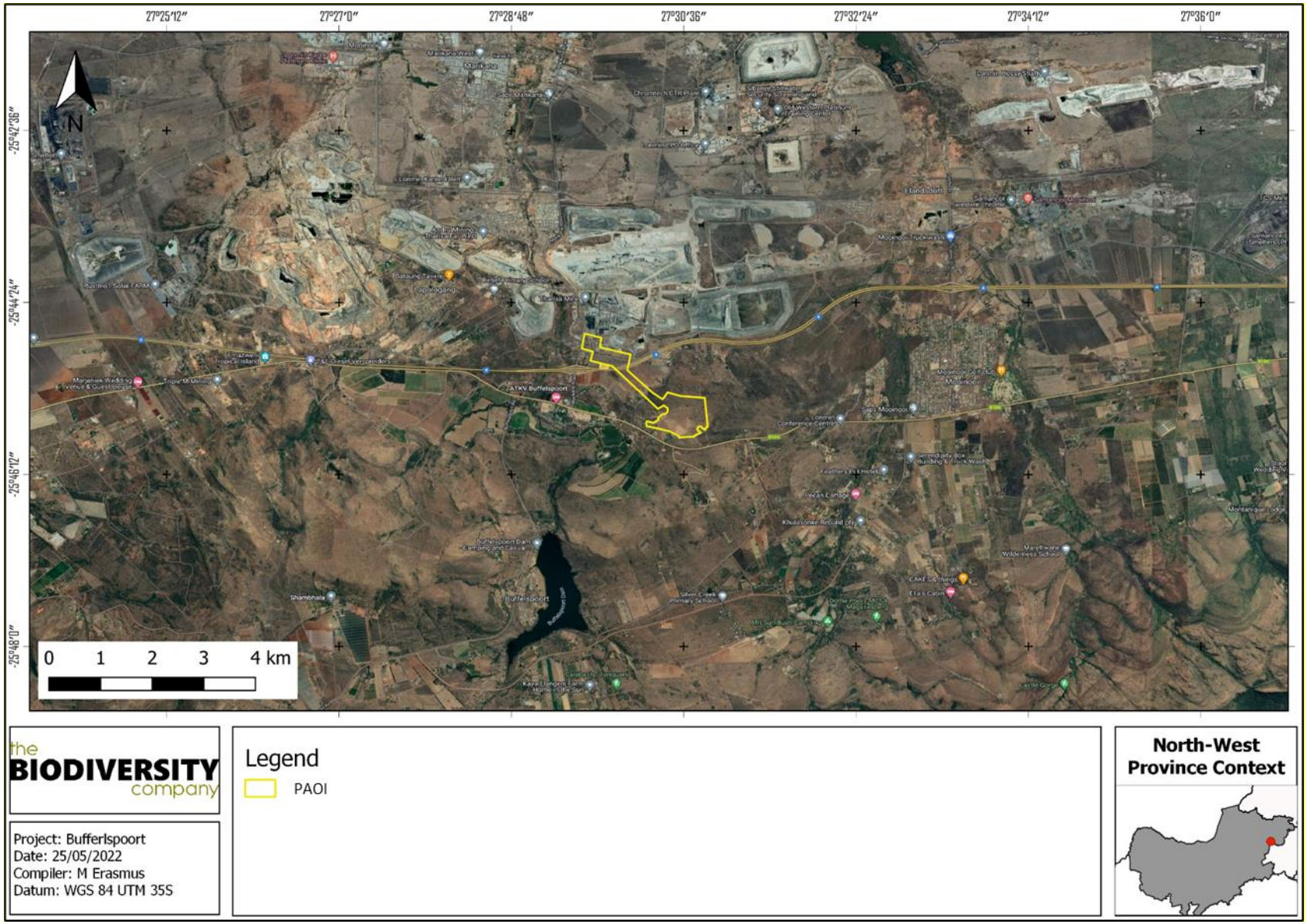
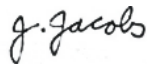


Figure 1-1 Proposed location of the PAOI in relation to the nearby towns

Figure 1-2 The PAOI on a local scale

1.3 Specialist Details

Report Name	**THE AVIFAUNA ASSESSMENT FOR THE PROPOSED BUFFELSPOORT SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY**
Reference	**Buffelspoort Solar PV**
Submitted to	savannah environmental
Report Writer (Desktop)	**Jan Jacobs**  Jan Jacobs completed his BSc Honours degree in Biodiversity and Conservation Biology at the University of the Western Cape in 2016 and completed his Master of Applied Science degree in Nature Conservation at the Tshwane University of Technology in 2022. His Masters thesis is currently under examination, and he is expected to officially graduate in October 2022.
Report Writer and Fieldwork	**Lindi Steyn**  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.
Reviewer	**Andrew Husted**  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 13 years' experience in the environmental consulting field.
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

1.4 Terms of Reference

The assessment was undertaken according to the legislation mentioned in section 1.6 and the best-practice guidelines and principles for avifaunal assessment for solar energy facilities as outlined by Birdlife South Africa ("**BLSA**").

The scope of the avifaunal 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 PAOI; and
- Impact assessment, mitigation measures to prevent or reduce the possible impacts associated with the development on the avifaunal community.

1.5 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The PAOI was based on the spatial data provided by the client and any alterations to the route and/or missing Geographic Information System (GIS) information pertaining to the assessment area would have affected the area surveyed;
- The PAOI was only surveyed during a single site visit and therefore, this assessment does not consider temporal trends;
- The assessment was conducted in early winter; therefore, summer species and migratory species were absent;
- No flight or nest analysis were performed due to the type of assessment which constituted of an avifauna contributions assessment and not a full assessment; and
- The Global Positioning System (GPS) used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by 5 m.

1.6 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 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 1-1 A list of key legislative requirements relevant to the Project

Region	Legislation
National	Constitution of the Republic of South Africa (Act No. 108 of 1996)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989)

	National Protected Areas Expansion Strategy (NPAES)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	National Water Act (NWA) (Act No. 36 of 1998)
	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations and, Alien and Invasive Species List 20142020, published under NEMBA
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
Provincial	North West Biodiversity Sector Plan of 2015 (READ, 2015)
	North West Biodiversity Management Act (Act No. 4 of 2016)

2 Methods

2.1 Desktop Assessment

The desktop assessment was predominantly undertaken using a 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.

2.1.1 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 2018 (Skowno *et al*, 2019) (NBA) - 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 (3) components of biodiversity: genes, species, and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two (2) 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) (DEA, 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 Plan:
    - The North West Department of Development, Environment, Conservation and Tourism (NWDEDECT) as custodian of the environment in the North West, is the primary implementation agent of the Biodiversity Sector Plan. The spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by NWDEDECT. 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 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 (NWDEDECT, 2015). As part of this plan, 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); and
        - Ecological Support Area 2 (ESA2);
    - 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.
- Important Bird and Biodiversity Areas (IBAs) (BirdLife South Africa, 2017) – 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) – The 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.

2.1.2 Desktop Faunal Assessment

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

- Avifauna list, generated from the SABAP2 dataset by looking at pentads 2540_2725; 2540_2730; 2540_2735; 2545_2725; 2545_2730; 2545_2735; 2550_2725; 2550_2730 and 2550_2735).

2.2 Field Assessment

The field survey was undertaken during 30 May 2022. An effort was made to cover all the different habitat types within the limits of time and access. Areas surrounding the PAOI were also surveyed, which included areas on the river and some of the nearby ridges (Figure 2-1).

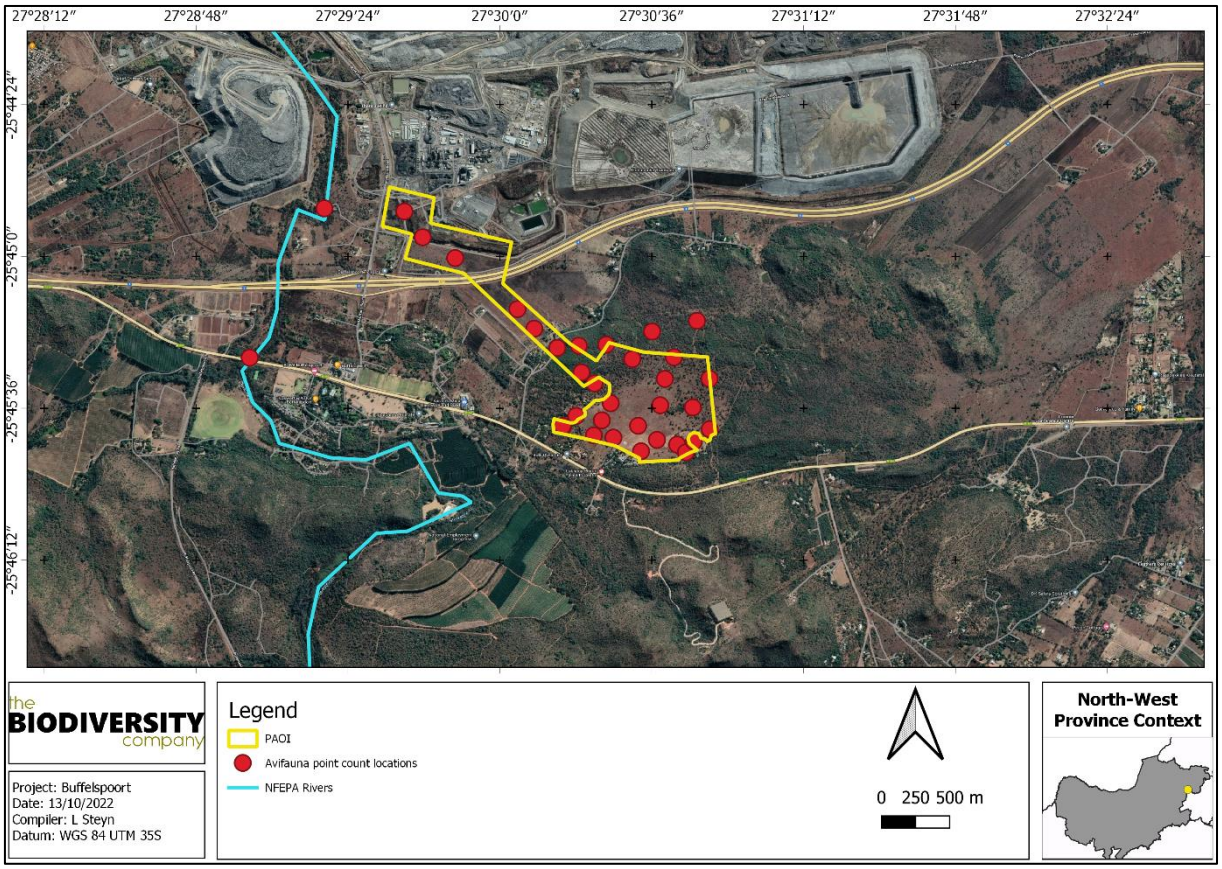


Figure 2-1 Map illustrating the field PAOI

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 5 min period. The horizontal detection limit was set at 50 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 were conducted. This involved the opportunistic sampling of species between point count periods, river scanning and road cruising.

2.2.1 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. This data was first used to distinguish similarities / differences in the species composition between the two (2) identified avifaunal habitats, the matrix was converted into a Bray-Curtis dissimilarity matrix. 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 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. The Shannon Diversity Index (H') was the metric used to estimate diversity. 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 medium upon / within which they most frequently forage (ground, water, foliage, air) and lastly by their activity period (nocturnal or diurnal).

2.3 Terrestrial Site Ecological Importance (SEI)

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

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

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

Table 2-1 Summary of Conservation Importance (CI) criteria

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

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

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

BI can be derived from a simple matrix of CI and FI as provided in Table 2-3

Table 2-3 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 Resource Resilience (RR) are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor as summarised in Table 2-4.

Table 2-4 Summary of Resource Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.

Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 2-5.

Table 2-5 Matrix used to derive Site Ecological Importance (SEI) from Receptor Resilience (RR) and Biodiversity Importance (BI)

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

Interpretation of the SEI in the context of the proposed development activities is provided in Table 2-6.

Table 2-6 Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities

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

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

3 Results & Discussion

3.1 Desktop Assessment

3.1.1 Ecologically Important Landscape Features

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

Table 3-1 Summary of relevance of the proposed Project to ecologically important landscape features.

Desktop Information Considered	Relevant/Irrelevant	Section
Ecosystem Threat Status	Relevant – Overlaps with an Endangered ecosystem and a Least Concern ecosystem.	3.1.1.1
Ecosystem Protection Level	Relevant – Overlaps with a Poorly Protected Ecosystem.	3.1.1.2
Protected Areas	Relevant – The PAOI overlaps with the Magaliesberg Biosphere Reserve.	3.1.1.4
National Protected Areas Expansion Strategy	Relevant – The PAOI overlaps with a NPAES Priority Focus Area.	3.1.1.5
Critical Biodiversity Area	Relevant – The PAOI overlaps with a CBA2, an ESA1 and an ESA2.	3.1.1.3
Important Bird and Biodiversity Areas	Relevant – Overlaps with the Magaliesberg IBA.	3.1.1.6
South African Inventory of Inland Aquatic Ecosystems	Relevant – The PAOI's 500 m regulated zone overlaps with a CR river.	3.1.1.7
National Freshwater Priority Area	Relevant – The PAOI's 500 m regulated zone overlaps with five unclassified NFEPA wetlands.	3.1.1.8
Strategic Water Source Areas	Irrelevant – The PAOI is 130 km from the closest SWSA.	-
REDZ	Irrelevant – Does not overlap with any Renewable Energy Development Zones.	
Strategic Transmission Corridors (EGI)	Irrelevant – Lies 2.6 km North from the Northern EGI Corridor.	
Coordinated Waterbird Count	Irrelevant – lies 18 km from the closest CWAC	3.1.1.9
Coordinated Avifaunal Roadcount	Irrelevant – 20 km away from the closets CAR route	3.1.1.10

3.1.1.1 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 PAOI overlaps mainly with an EN ecosystem, and marginally with a LC ecosystem (Figure 3-1).

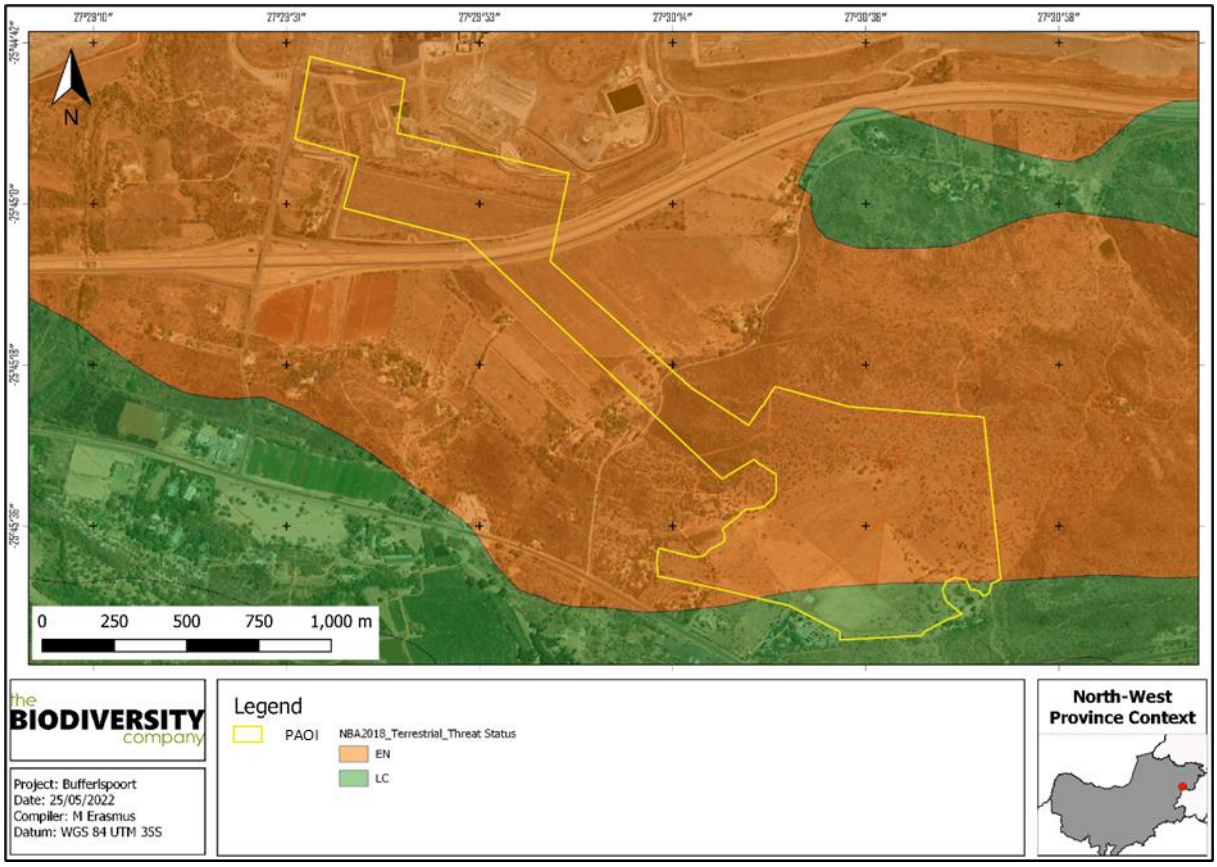


Figure 3-1 Map illustrating the ecosystem threat status associated with the PAOI

3.1.1.2 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 PAOI overlaps with a PP ecosystem (Figure 3-2).

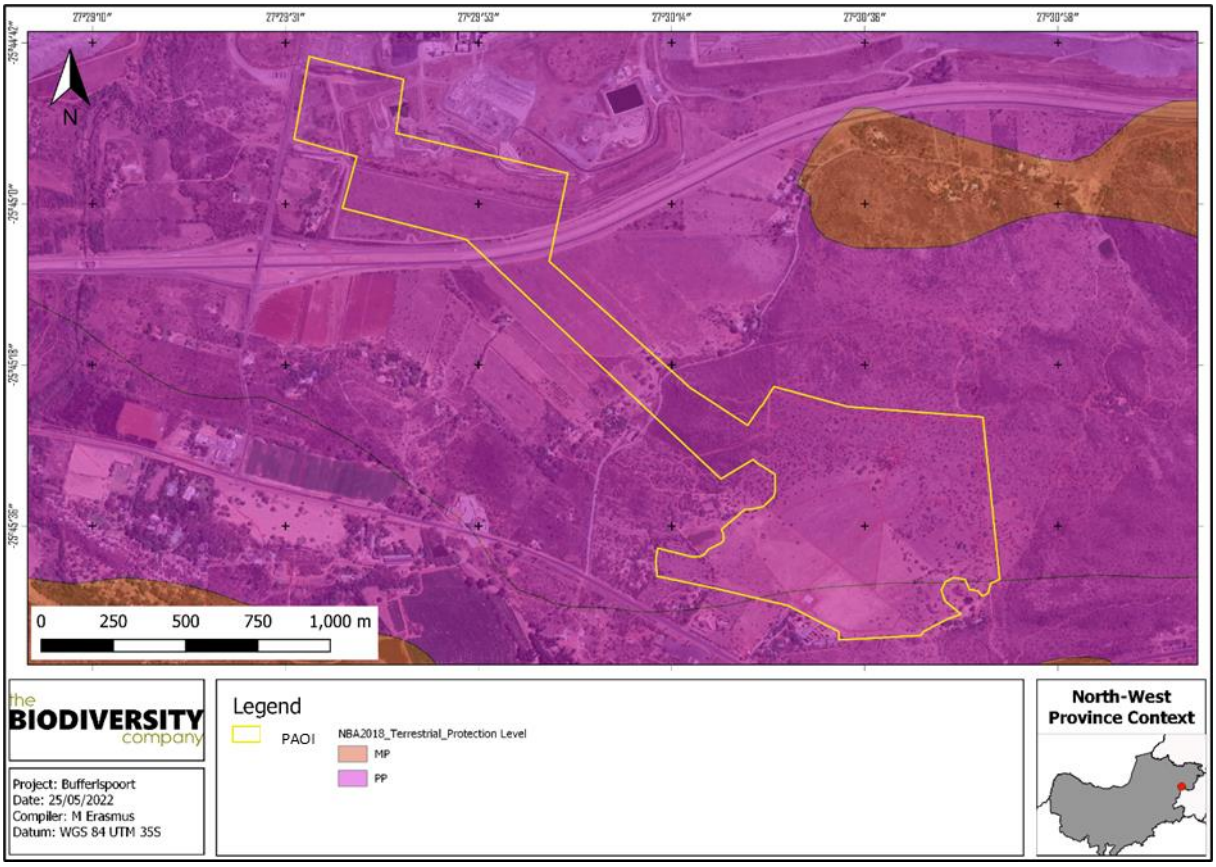


Figure 3-2 Map illustrating the ecosystem protection level associated with the proposed PAOI

3.1.1.3 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 purpose of the North West Biodiversity Sector Plan (NWBSP) (2015) 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 CBA1 areas, CBA2 areas, ESA1 areas and ESA2 areas based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

Figure 3-3 shows the PAOI superimposed on the Terrestrial CBA maps. The PAOI overlaps with a CBA2, an ESA1 and an ESA2.

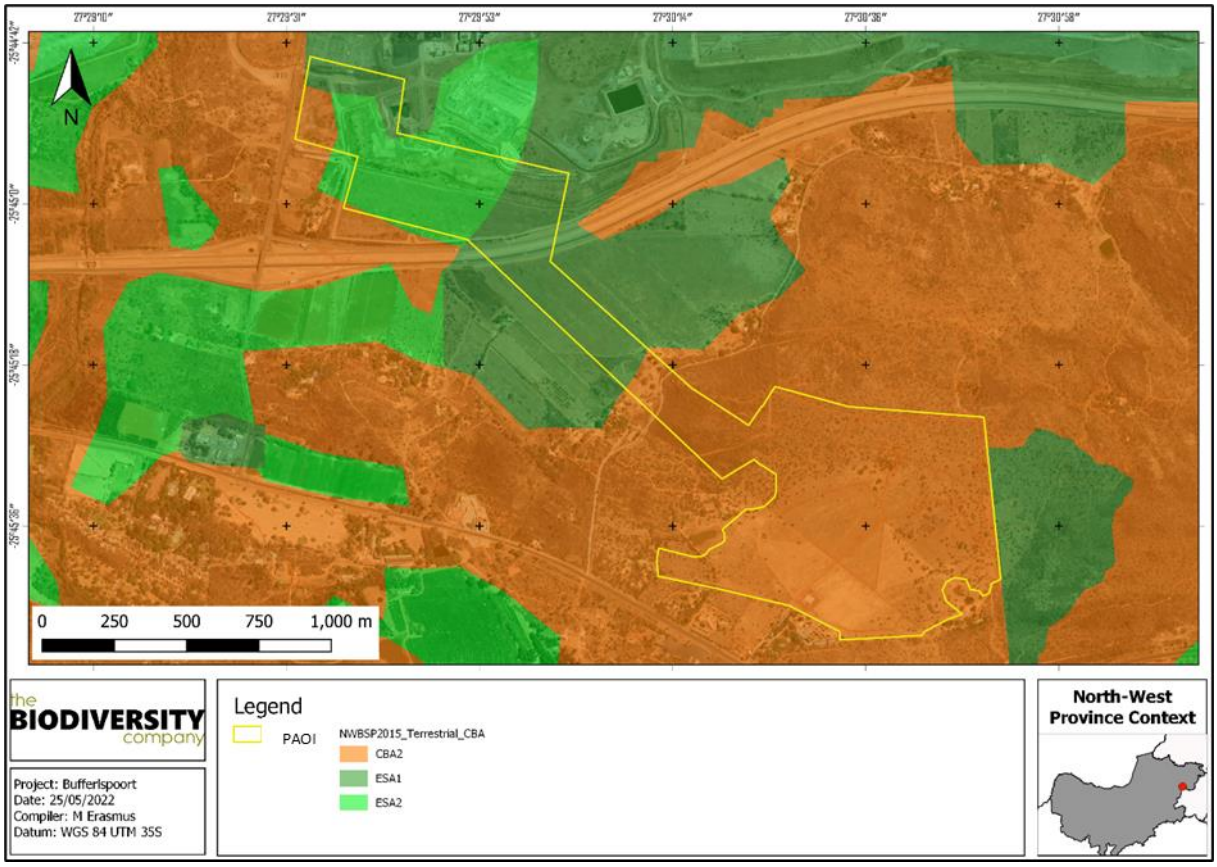


Figure 3-3 Map illustrating the locations of CBAs in the proposed PAOI

3.1.1.4 Protected Areas

According to the protected area spatial datasets from SAPAD (2021) and SACAD (2021), the PAOI overlaps with the Magaliesberg Biosphere Reserve (Figure 3-4), with the Development Footprint encroaching into areas designated as a Buffer Zone and the grid corridor extending into the Transition Area.

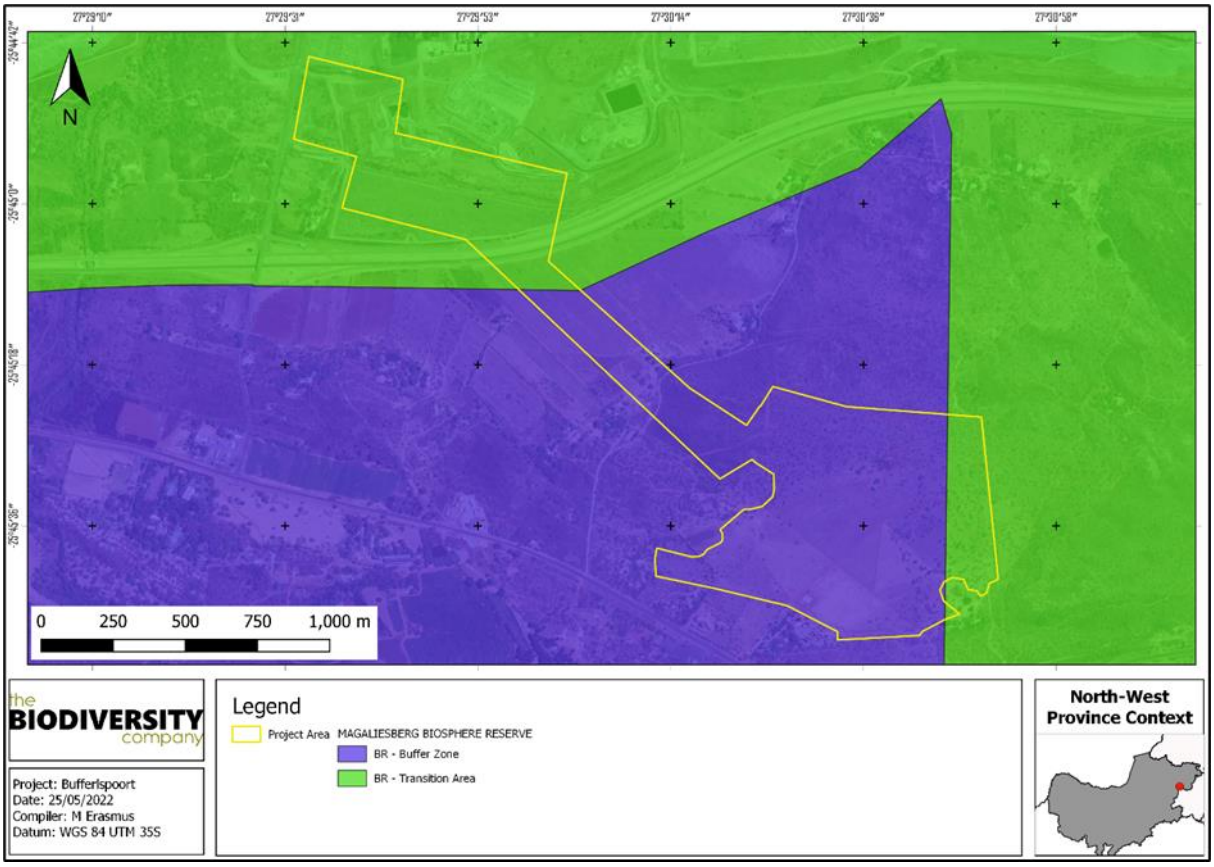


Figure 3-4 The proposed PAOI in relation to the protected areas

3.1.1.5 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 fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2016).

The PAOI overlap with a NPAES Priority Focus Area (Figure 3-5).

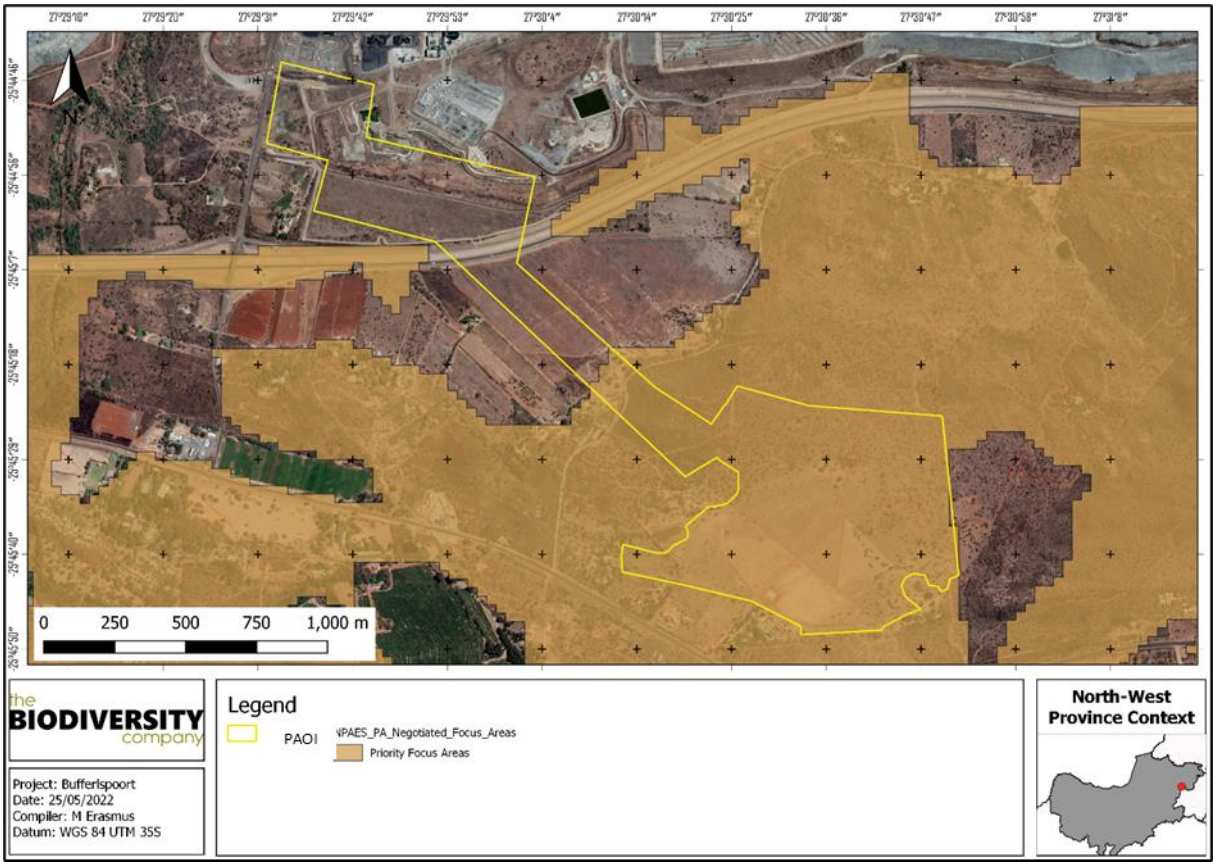


Figure 3-5 The proposed PAOI in relation to the National Protected Area Expansion Strategy

3.1.1.6 Important Bird and Biodiversity Area

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

According to Birdlife South Africa (2017), 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 3-6 shows that the PAOI overlap with the Magaliesberg IBA.

The Magaliesberg IBA was previously known as the Magaliesberg and Witwatersberg IBA, and consists mainly of the Magaliesberg range which extends from the North West of Rustenburg in the West to the N1 in the East near Pretoria (Birdlife South Africa, 2015). Several large rivers have their headwaters in these mountains, such as the Crocodile, Sterkstroom, Magalies and Skeerpoort rivers (Birdlife South Africa, 2015). Three (3) major impoundments have been built along the Magaliesberg, namely the Hartbeespoort Dam in the East, Buffelspoort Dam in the centre and Olifantsnek Dam about 7 km south of Rustenburg (Birdlife South Africa, 2015).

IBA trigger species in the Magaliesberg IBA include two globally threatened species, namely Cape Vulture (*Gyps coprotheres*) and Secretarybird (*Sagittarius serpentarius*), of which the former is considered to be the most important (Birdlife South Africa, 2015). Regionally threatened species include the Lanner Falcon (*Falco biarmicus*), Half-collared Kingfisher (*Alcedo semitorquata*), African Grass Owl (*Tyto capensis*), African Finfoot (*Podica senegalensis*) and Verreaux's Eagle (*Aquila verreauxii*) (Birdlife South Africa, 2015). Biome-restricted species include the White-bellied Sunbird (*Cinnyris talatala*), Kurrichane Thrush

(*Turdus libonyanus*), White-throated Robin-chat (*Cossypha humeralis*), Kalahari Scrub Robin (*Erythropygia paena*) and Barred Wren-Warbler (*Calamonastes fasciolatus*) (Birdlife South Africa, 2015).

Figure 3-6 The proposed PAOI in relation to the Magaliesberg IBA

3.1.1.7 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 Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.,* 2019; Skowno *et al.,* 2019). The 500 m regulated area around the PAOI overlaps with a CR river, the Sterkstroom (Figure 3-7).

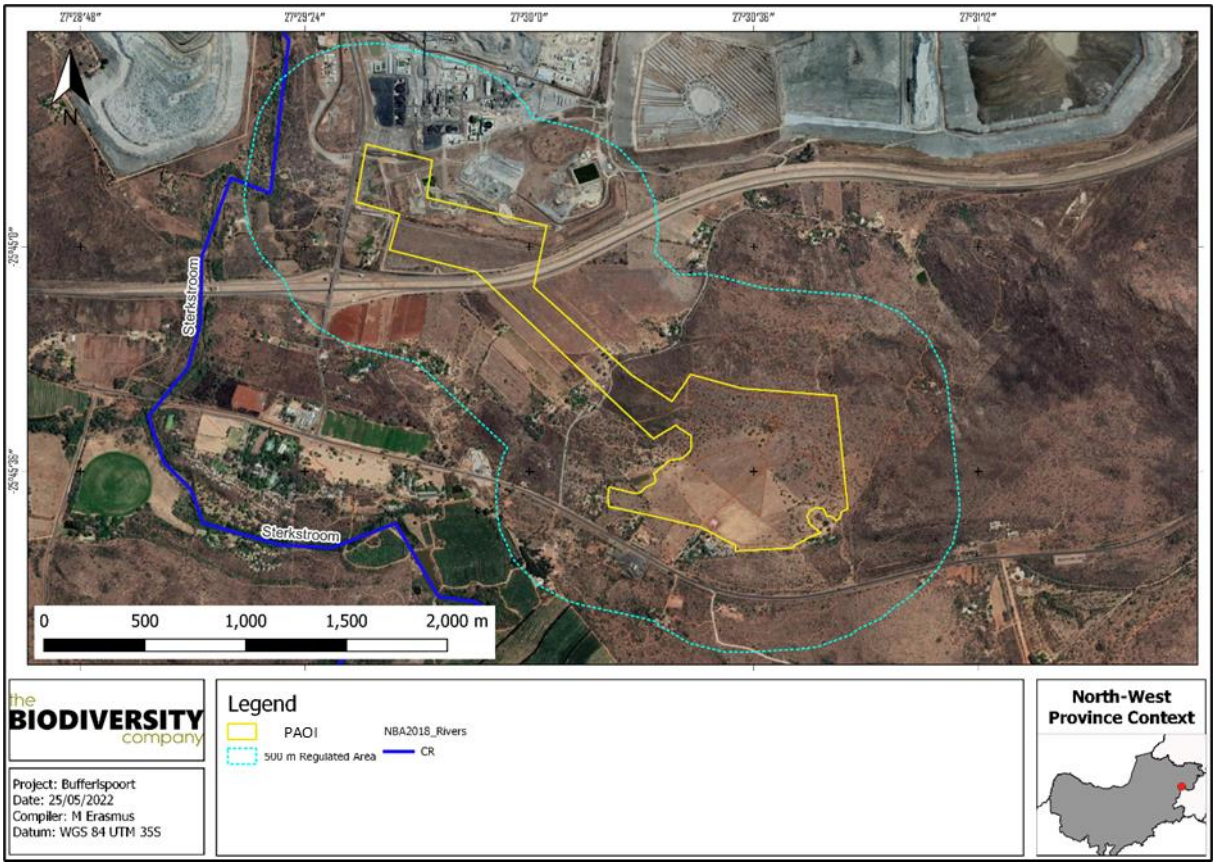


Figure 3-7 Map illustrating ecosystem threat status of rivers and wetland ecosystems in the proposed PAOI

3.1.1.8 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 3-8 shows that the 500 m regulated area of the PAOI overlaps with five (5) unclassified NFEPA wetlands and a 3 PHASE 2 FEPA.

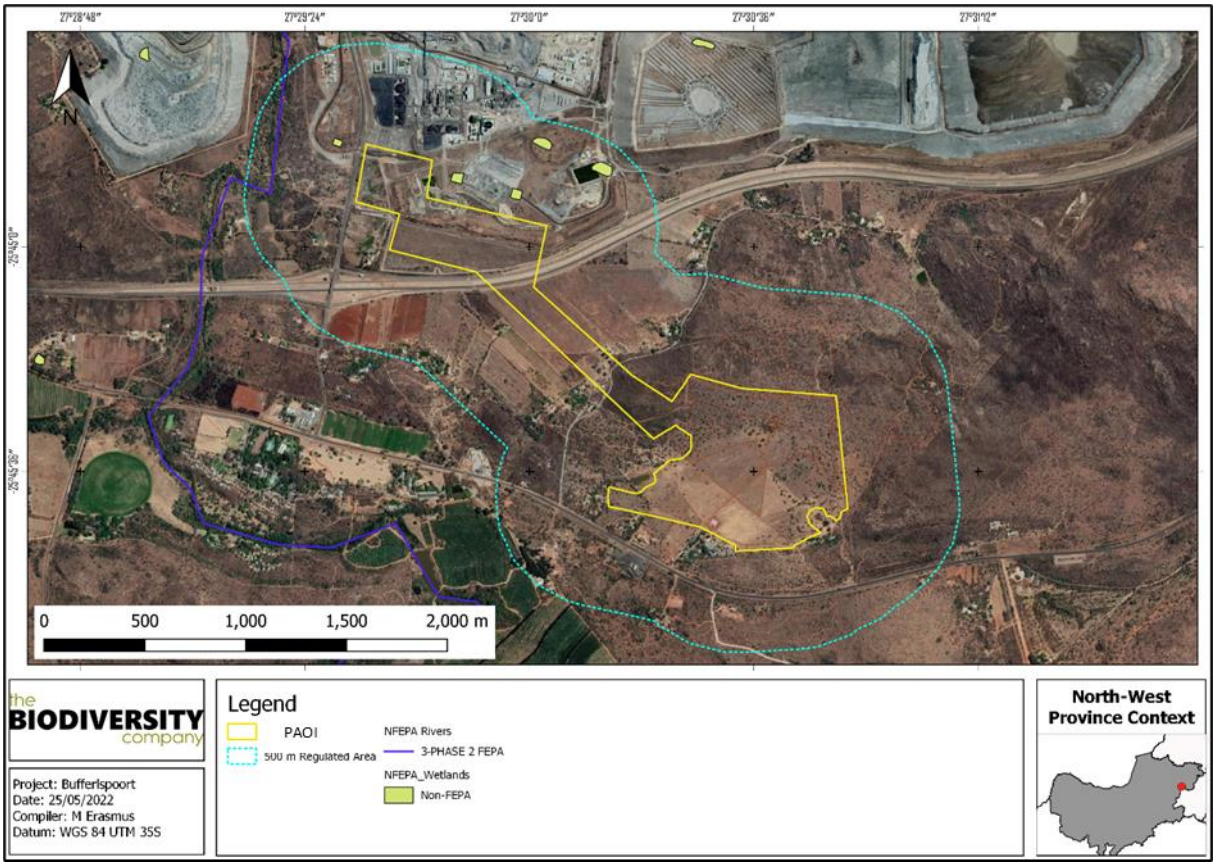


Figure 3-8 The proposed PAOI in relation to the National Freshwater Ecosystem Priority Areas

3.1.1.9 Coordinated Waterbird Counts (CWAC)

The Animal demographic unit launched the Coordinated Waterbird Counts (CWAC) Project in 1992 as part South Africa's commitment to International Waterbird Conservation. Regular mid-summer and mid-winter censuses are done to determine the various features of waterbirds including population size, how waterbirds utilise water sources and determining the heath of wetlands. For a full description of CWAC please refer to http://cwac.birdmap.africa/about.php. The PAOI is 18 km to the east of the Kroondal Dam site (25442718). Fifty-four (54) water birds are regularly observed here (Table 3-2). Even though these exact birds recorded at the dam might not be influenced by the development due to the distance, it does provide a good overview of the waterbird species found in the general area.

Table 3-2 Coordinated water bird count for Kroondal Dam along with their reporting rates

Common name	Taxonomic name	Min	Avg	Max
Ruff	*Calidris pugnax*	3	3.00	3
Hamerkop	*Scopus umbretta*	1	1.50	2
Avocet, Pied	*Recurvirostra avosetta*	2	2.00	2
Bittern, Little	*Ixobrychus minutus*	1	1.00	1
Coot, Red-knobbed	*Fulica cristata*	6	9.00	14
Cormorant, Reed	*Microcarbo africanus*	4	7.00	13
Cormorant, White-breasted	*Phalacrocorax lucidus*	2	2.50	3
Crake, African	*Crecopsis egregia*	1	1.00	1

Crake, Baillon's	*Zapornia pusilla*	1	1.00	1
Crake, Black	*Zapornia flavirostra*	1	2.67	5
Darter, African	*Anhinga rufa*	1	2.25	5
Duck, Fulvous Whistling	*Dendrocygna bicolor*	3	3.00	3
Duck, White-backed	*Thalassornis leuconotus*	1	2.75	7
Duck, White-faced Whistling	*Dendrocygna viduata*	6	27.60	56
Duck, Yellow-billed	*Anas undulata*	2	13.57	36
Egret, Little	*Egretta garzetta*	1	3.83	9
Egret, Western Cattle	*Bubulcus ibis*	2	30.50	103
Goose, Egyptian	*Alopochen aegyptiaca*	3	9.20	16
Goose, Spur-winged	*Plectropterus gambensis*	1	4.75	13
Grebe, Great Crested	*Podiceps cristatus*	1	1.00	1
Grebe, Little	*Tachybaptus ruficollis*	1	8.57	20
Greenshank, Common	*Tringa nebularia*	4	4.00	4
Gull, Grey-headed	*Chroicocephalus cirrocephalus*	5	5.00	5
Heron, Black-crowned Night	*Nycticorax nycticorax*	1	1.20	2
Heron, Black-headed	*Ardea melanocephala*	1	1.89	5
Heron, Grey	*Ardea cinerea*	2	3.40	8
Heron, Purple	*Ardea purpurea*	1	1.50	3
Heron, Squacco	*Ardeola ralloides*	1	2.00	3
Heron, Striated	*Butorides striata*	1	1.50	3
Ibis, African Sacred	*Threskiornis aethiopicus*	1	29.86	123
Ibis, Glossy	*Plegadis falcinellus*	2	17.83	74
Ibis, Hadada	*Bostrychia hagedash*	4	6.50	9
Kingfisher, Pied	*Ceryle rudis*	1	1.33	2
Lapwing, African Wattled	*Vanellus senegallus*	2	4.64	17
Lapwing, Blacksmith	*Vanellus armatus*	1	8.50	24
Moorhen, Common	*Gallinula chloropus*	1	7.00	20
Owl, Marsh	*Asio capensis*	1	2.25	4
Painted-snipe, Greater	*Rostratula benghalensis*	2	2.00	2
Plover, Three-banded	*Charadrius tricollaris*	2	9.60	16
Pochard, Southern	*Netta erythrophthalma*	4	11.75	21
Pratincole, Black-winged	*Glareola nordmanni*	1	1.00	1
Sandpiper, Common	*Actitis hypoleucos*	29	29.00	29
Sandpiper, Marsh	*Tringa stagnatilis*	5	5.00	5
Sandpiper, Wood	*Tringa glareola*	3	3.00	3
Shoveler, Cape	*Spatula smithii*	1	1.00	1
Spoonbill, African	*Platalea alba*	2	4.75	12
Stilt, Black-winged	*Himantopus himantopus*	2	4.80	9
Stint, Little	*Calidris minuta*	19	32.00	45
Stork, Yellow-billed	*Mycteria ibis*	2	5.00	8

Swamphen, African	*Porphyrio madagascariensis*	1	3.75	8
Teal, Red-billed	*Anas erythrorhyncha*	1	5.13	12
Tern, Whiskered	*Chlidonias hybrida*	1	2.50	4
Wagtail, Cape	*Motacilla capensis*	1	2.75	7

3.1.1.10 Coordinated Avifaunal Roadcount (CAR)

The ADU/Cape bird club pioneered avifaunal roadcount of larger birds in 1993 in South Africa. This was originally started to monitor the Blue Crane *Anthropoides paradiseus* and Denham's/Stanley's Bustard *Neotis denhami*. Today it has been expanded to monitor 36 species of large terrestrial birds (cranes, bustards, korhaans, storks, Secretarybird and Southern Bald Ibis) along 350 fixed routes covering over 19 000 km. Twice a year, in mid-summer (the last Saturday in January) and mid-winter (the last Saturday in July), roadcounts are carried out using this standardised method. These counts are important for the conservation of these larger species that are under threat due to loss of habitat through changes in land use, increases in crop agriculture and human population densities, poisoning as well as man-made structures like overhead power lines (CAR, 2020). Figure 3-9 illustrates that the PAOI is ~20km away from the closest route. The CAR route data can not be used to supplement this report as the routes are too far from the PAOI.

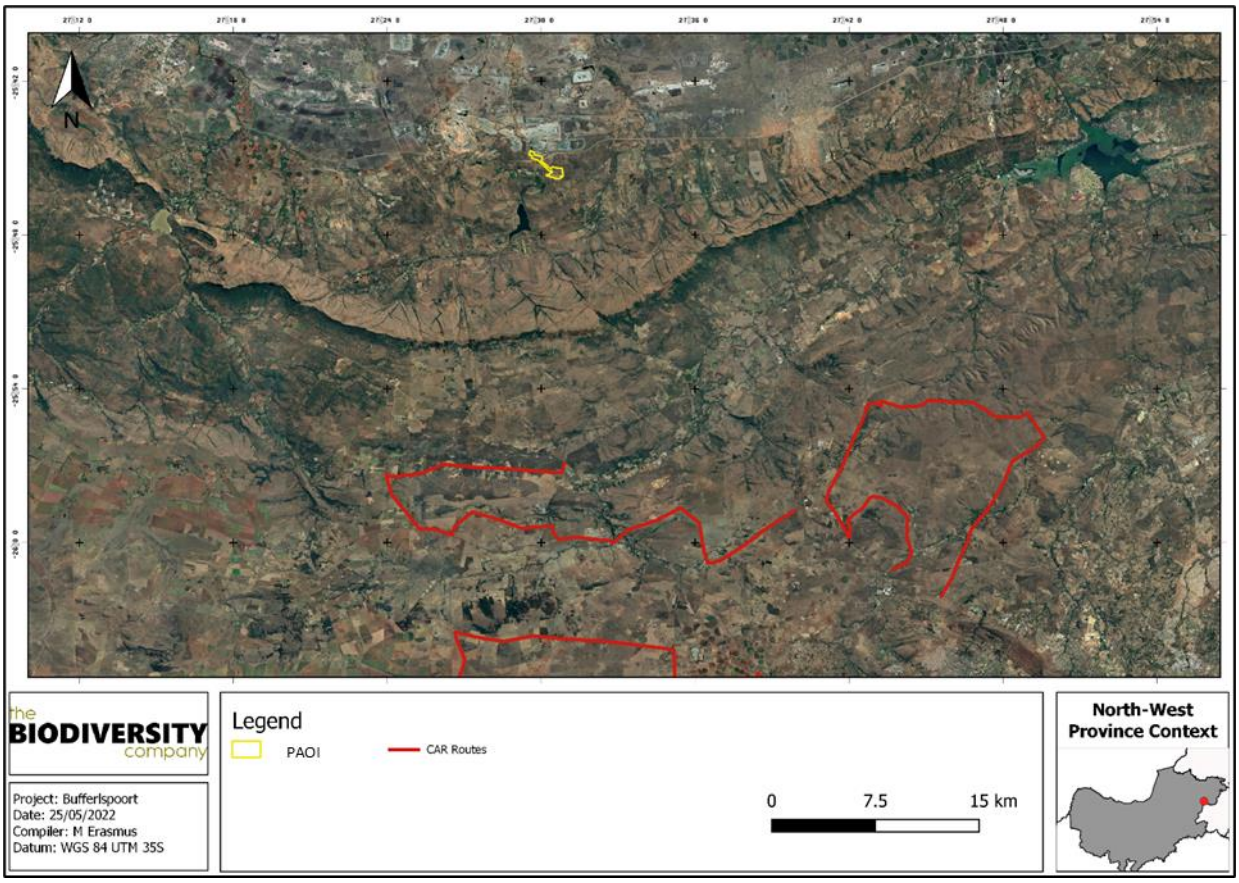


Figure 3-9 The PAOI in relation to the closest CAR route

3.1.1.11 Vegetation Type

The PAOI is situated in the Savanna Biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna Biome include a seasonal precipitation and a sub-tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

The Savanna Biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. The Savanna Biome is characterised by a dominant grass layer, over-topped by a discontinuous, but distinct woody plant layer (Mucina & Rutherford, 2006). At a structural level, Africa's Savanna Biome can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Vachellia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

On a fine-scale vegetation type, the PAOI overlaps with the Marikana Thornveld and Moot Plains Bushveld vegetation types (Figure 3-10).

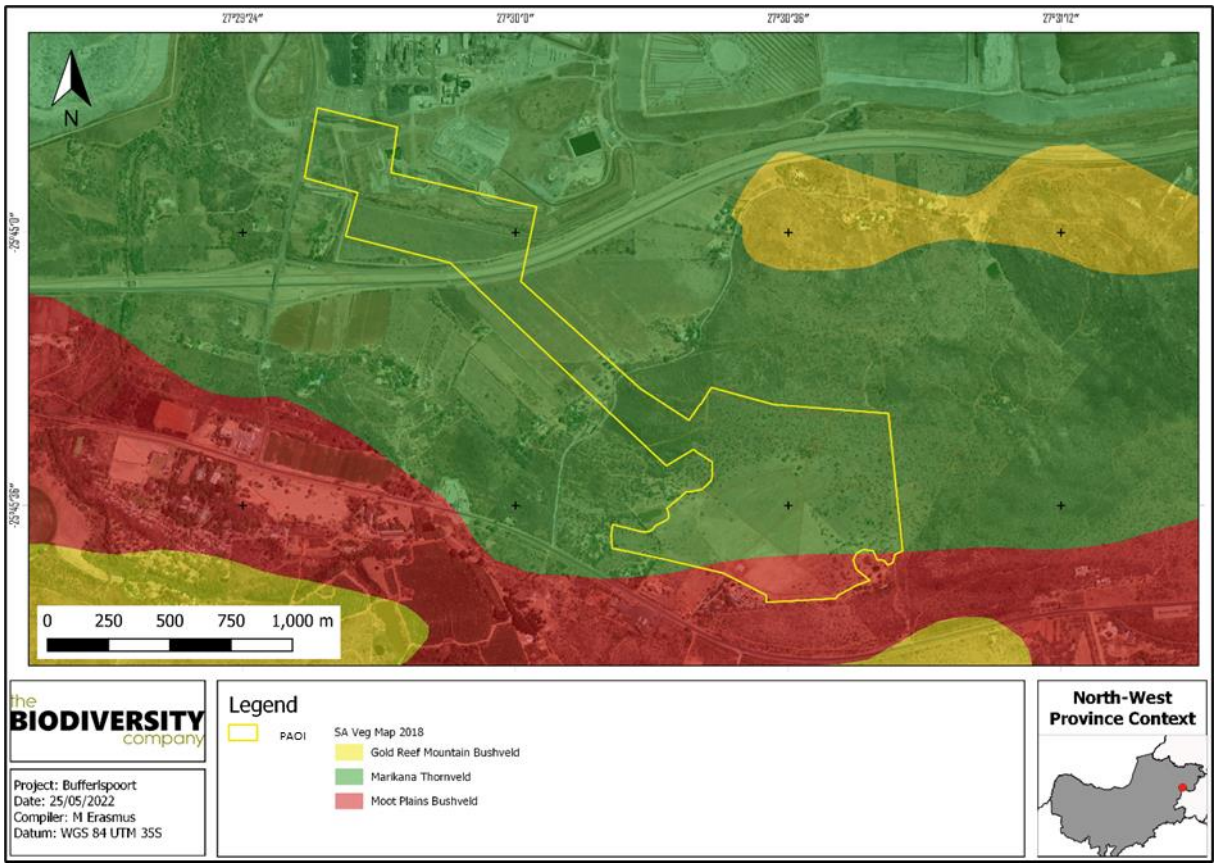


Figure 3-10 Map illustrating the vegetation type associated with the proposed PAOI

3.1.1.11.1 Marikana Thornveld

Marikana Thornveld extends on the broad plains from Rustenburg in the West, through Marikana and Brits, and towards Pretoria in the East (Mucina & Rutherford, 2006). It is characterised by open *Vachellia karroo* woodland, which occurs in valleys and on undulating plains and hills (Mucina & Rutherford, 2006). Fire-protected habitats, such as drainage lines, rocky outcrops and termitaria are typically dominated by denser, shrub-dominated vegetation (Mucina & Rutherford, 2006).

3.1.1.11.2 Moot Plains Bushveld

The main belt of the Moot Plains Bushveld extends from the Selons River Valley south of the Magaliesberg, through Maanhaarrand and the valley bottom of the Magalies River, east of the Hartebeestpoort Dam between the Magaliesberg and Daspoort mountain ranges and to Pretoria (Mucina & Rutherford, 2006). It is characterised by low-lying savanna dominated by *Vachellia* species. occurring on the bottomlands and plains, or woodlands on the lower hillsides vary in height and density (Mucina & Rutherford, 2006). Grasses dominate the herbaceous layer (Mucina & Rutherford, 2006).

3.1.1.12 Avifauna

The SABAP2 Data lists 366 avifauna species that could be expected to occur within the POAI and surrounds (Appendix B). Twenty (20) of these expected species are regarded as threatened (Table 3-3). Two (2) of the species have a low likelihood of occurrence due to lack of suitable habitat and food sources in the PAOI.

Table 3-3 Threatened avifauna species that are expected to occur within the PAOI NT-Near threatened, VU- Vulnerable, EN- Endangered, LC- least Concerned, CR- Critically Endangered .

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Alcedo semitorquata	Half-collared Kingfisher	NT	LC	Moderate
Calidris ferruginea	Curlew Sandpiper	LC	NT	Low
Ciconia ciconia	White Stork	NT	LC	Moderate
Ciconia nigra	Black Stork	VU	LC	Moderate
Coracias garrulus	European Roller	NT	LC	Moderate
Eupodotis senegalensis	White-bellied Bustard	VU	LC	Moderate
Falco biarmicus	Lanner Falcon	VU	LC	High
Falco vespertinus	Red-footed Falcon	NT	VU	Moderate
Gorsachius leuconotus	White-backed Night Heron	VU	LC	High
Gyps africanus	White-backed Vulture	CR	CR	Moderate
Gyps coprotheres	Cape Vulture	EN	EN	High
Mycteria ibis	Yellow-billed Stork	EN	LC	High
Oxyura maccoa	Maccoa Duck	NT	EN	Moderate
Phoeniconaias minor	Lesser Flamingo	NT	NT	Low
Podica senegalensis	African Finfoot	VU	LC	Moderate
Polemaetus bellicosus	Martial Eagle	EN	EN	High
Pterocles gutturalis	Yellow-throated Sandgrouse	NT	LC	High
Sagittarius serpentarius	Secretarybird	VU	EN	High
Torgos tracheliotos	Lappet-faced Vulture	EN	EN	High
Tyto capensis	African Grass Owl	VU	LC	Low

Alcedo semitorquata (Half-collared Kingfisher) is rated as Vulnerable on a regional scale (SANBI, 2016). It occurs in several countries within sub-Saharan Africa, and has a wide range in South Africa, Angola, Zambia, Zimbabwe, Mozambique, Malawi and Tanzania, with patchy distributions in the Democratic Republic of the Congo (DRC), Burundi, Ethiopia, Sudan and South Sudan (IUCN, 2017). It lives in forests, inland freshwater wetlands as well as marine habitats such as estuaries and saline lagoons (IUCN, 2017). The presence of a water body within the PAOI and rivers around the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Calidris ferruginea (Curlew Sandpiper) is a resident of Africa which migrates to the Russian Federation during the breeding season (IUCN, 2017). During the winter, the Curlew Sandpiper prefers a wide variety of coastal habitats such as brackish lagoons, tidal mudflats and sandflats, estuaries, saltmarshes and rocky shores. Inland habitats include the muddy edges of marshes, large rivers and lakes (both saline and freshwater), irrigated land, flooded areas, dams and saltpans (IUCN, 2017). The lack of suitable habitats in the PAOI contributed to a **low likelihood** of occurrence for this species.

Ciconia ciconia (White Stork) is a Palearctic migrant which breeds in several countries in Europe and Asia (IUCN, 2017). It mostly inhabits open areas (IUCN, 2017). During the winter, this species prefers grasslands, steppe, savanna as well as cultivated fields, often gathering near water bodies (IUCN, 2017). The presence of suitable habitats in the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Ciconia nigra (Black Stork) is a Palaearctic migrant with a wide distribution across Africa, Europe and Asia (IUCN, 2017). It is found in old, undisturbed, open forests from sea-level up to mountainous regions and forages mostly in freshwater habitats such as shallow streams, pools, marshes, swampy patches, damp meadows, flood-plains and pools in dry riverbeds but also occasionally grasslands with stands of reeds or long grass (IUCN, 2017). Habitat degradation is the main threat of this species (IUCN, 2017). The presence of suitable foraging habitats in and around the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Coracias garrulous (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). The presence of open areas in the PAOI, which the European Roller prefers to forage in, contributed to a **moderate likelihood** of occurrence for this species.

Eupodotis senegalensis (White-bellied Bustard) is rated as Vulnerable on a regional scale and occurs in sub-Saharan Africa (IUCN, 2017). It occurs in dry savannas, subtropical and tropical dry shrublands, grasslands, inland seasonal riverine wetlands (rivers, creeks and streams), deserts and arable land (IUCN, 2017). The presence of a river near the PAOI as well as the presence of suitable habitat within the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). Their diet is mainly composed of small birds such as pigeons and francolins (IUCN, 2017). The likelihood of occurrence of this species in the PAOI is rated as **high** due to the suitable habitat and the expected presence of many bird species on which Lanner Falcons may predate.

Falco vespertinus (Red-footed Falcon) is a migrant that breeds in eastern Europe as well as west, central and north-central Asia and winters in southern Africa (IUCN, 2017). When they are not breeding, Red-footed Falcons overwinter in the Kalahari region, where it can be found in savannas, grasslands and shrublands (IUCN, 2017). Threats include habitat loss and degradation as well as loss of prey due to poisoning (IUCN, 2017). The presence of suitable overwintering habitats in the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Gorsachius leuconotus (White-backed Night Heron) is a native of sub-Saharan Africa where it occurs in densely vegetated forests and frequents tree-fringed streams, mangroves, islands in large rivers and lakes, wooded margins of marshes and occasionally reedbeds (IUCN, 2017). In southern Africa, it is threatened by habitat loss and degradation (IUCN, 2017). The presence of a river lined with trees near the PAOI contributed to a **high likelihood** of occurrence for this species, the species is also likely to move between the dam in the PAOI and the river.

Gyps africanus (White-backed Vulture) is the most widespread and common vulture species in Africa, with a very wide distribution spanning numerous countries in sub-Saharan Africa (IUCN, 2017). It primarily occupies lowland open wooded savanna, especially areas dominated by *Vachellia* species, where it needs tall trees for nesting but also nests on electricity pylons in South Africa (IUCN, 2017). It largely faces the same types of threats of other African vulture species, such as habitat destruction, loss of food, hunting, persecution and poisoning (IUCN, 2017). The presence of savannas in and around the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Gyps coprotheres (Cape Vulture) is found in southern Africa, where it prefers protected areas and woody vegetation for foraging and steep cliffs for roosting (IUCN, 2017). Various threats are leading to a decline in this species' population numbers, including poisoning (deliberate and accidental), collision with

powerlines, wind farm developments, habitat loss and unsustainable harvesting for traditional uses (IUCN, 2017). The presence of a conservation area overlapping with the PAOI as well as the presence of woody vegetation in and around the PAOI has contributed to a **high likelihood** of occurrence for this species. A vulture restaurant is also found 25 km south east of the PAOI which further supports this rating.

Mycteria ibis (Yellow-billed Stork) is migratory and has a large distributional range which includes much of sub-Saharan Africa (IUCN, 2017). It is typically associated with freshwater ecosystems, especially wetlands and the margins of lakes and dams (IUCN, 2017). The presence of water bodies in and near the PAOI contributed to a **high likelihood** of occurrence for this species.

Oxyura maccoa (Maccoa Duck) has a large range in Africa, divided into a northern population in Eritrea, Ethiopia, Kenya and Tanzania, and a southern population in Angola, Botswana, Namibia, South Africa and Zimbabwe (IUCN, 2017). It breeds in both natural and man-made inland freshwater wetlands, preferring those that are shallow and nutrient-rich and with extensive emergent vegetation such as reeds and cattails (IUCN, 2017). The two (2) main threats are pollution and habitat loss (IUCN, 2017). The presence of suitable breeding habitats in and around the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Phoeniconaias minor (Lesser Flamingo) occurs mainly in sub-Saharan Africa but is also found in the southernmost part of Yemen and several locations in India (IUCN, 2017). It breeds on large, undisturbed alkaline and saline lakes, salt pans or coastal lagoons, usually far out from the shore (IUCN, 2017). The lack of suitable habitat within the PAOI contributed to a **low likelihood** of occurrence for this species.

Podica senegalensis (African Finfoot) occurs in sub-Saharan Africa (IUCN, 2017). It prefers a variety of freshwater habitats, especially those that are well-vegetated along the edge of the water (IUCN, 2017). It is mainly threatened by habitat loss due to the expansion of woody vegetation, human encroachment and the excessive burning of grasslands (IUCN, 2017). The presence of water bodies in and within PAOI contributed to a **moderate likelihood** of occurrence for this species.

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

Pterocles gutturalis (Yellow-throated Sandgrouse) occurs from northern South Africa to Ethiopia, and prefers open grassland to scrub savannas (Sinclair *et al*., 2002; IUCN, 2017). It can also be found in desert, wetlands and habitats modified by humans (IUCN, 2017). The presence of suitable open habitats in the PAOI contributed to a **moderate likelihood** of occurrence for this species.

Sagittarius serpentarius (Secretarybird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna (IUCN, 2017). It is also found in agricultural areas and sub-desert (IUCN, 2017). It mainly eats insects (86% of diet) but will also prey on rodents and other mammals, lizards, snakes, eggs, young birds and amphibians (IUCN, 2017). The likelihood of occurrence for this species is rated as **high** due to the open areas present in the PAOI as well as the expected presence of several prey species.

Torgos tracheliotos (Lappet-faced Vulture) has a wide distribution across sub-Saharan Africa as well as Saudi Arabia, Yemen and Oman (IUCN, 2017). It inhabits dry savanna, arid plains, deserts, and open mountain slopes up to 3,500 m.a.s.l. and ranges widely while foraging (IUCN, 2017). The likelihood of occurrence for this species is rated as **high** due to the savanna areas present in the PAOI.

Tyto capensis (African Grass Owl) is considered to be Vulnerable on a regional scale (SANBI, 2016). Its distribution ranges from Cameroon in the North, extending eastwards to Kenya and westwards to the

north-western coast of Angola and extending southwards into the eastern parts of South Africa (IUCN, 2017). It inhabits dry savanna, subtropical to tropical dry shrublands, grasslands, and inland wetlands (IUCN, 2017). The lack of suitable habitat within the PAOI contributed to a **low likelihood** of occurrence for this species.

3.2 Field Assessment

Fifty-seven (57) bird species were recorded in the point counts of the survey, while 36 species were recorded during incidental observations. 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. None of the species recorded were species of conservation concern (SCC)s.

Table 3-4 provide lists of the dominant species for the survey together with the frequency with which each species appeared in the point count samples. The data shows the Dark-capped Bulbul, Cape-Turtle Dove, Helmeted Guineafowl and Grey Go-away-Birds were the most abundant species during the survey. Figure 3-11 shows some of the birds that were recorded during the survey.

Table 3-4 Dominant avifaunal species within the PAOI during the survey as defined as those species whose relative abundances cumulatively account for more than 77% of the overall abundance shown alongside the frequency with which a species was detected among point counts.

Scientific Name	Common Name	Regional Threat status	International Threat status	Relative abundance	Frequency (%)
Pycnonotus tricolor	Bulbul, Dark-capped	Unlisted	Unlisted	0,151	0,913
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC	0,081	0,696
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC	0,064	0,130
Crinifer concolor	Go-away-bird, Grey	Unlisted	LC	0,057	0,522
Turdoides jardineii	Babbler, Arrow-marked	Unlisted	LC	0,050	0,130
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC	0,044	0,174
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC	0,037	0,435
Estrilda astrild	Waxbill, Common	Unlisted	LC	0,034	0,217
Uraeginthus angolensis	Waxbill, Blue	Unlisted	LC	0,030	0,217
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC	0,027	0,174
Quelea quelea	Quelea, Red-billed	Unlisted	LC	0,027	0,043
Emberiza flaviventris	Bunting, Golden-breasted	Unlisted	LC	0,023	0,130
Crithagra mozambica	Canary, Yellow-fronted	Unlisted	LC	0,023	0,174
Dendroperdix sephaena	Francolin, Crested	Unlisted	LC	0,020	0,087
Colius striatus	Mousebird, Speckled	Unlisted	LC	0,020	0,087
Spilopelia senegalensis	Dove, Laughing	Unlisted	LC	0,017	0,174
Lophoceros nasutus	Hornbill, African Grey	Unlisted	LC	0,017	0,174
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC	0,017	0,043
Urocolius indicus	Mousebird, Red-faced	Unlisted	LC	0,017	0,043
Chalcomitra amethystina	Sunbird, Amethyst	Unlisted	LC	0,017	0,087

Figure 3-11 ***Some of the birds recorded in the PAOI: A) Red-eyed Dove, B) Dark-capped Bulbul, C) Natal Spurfowl, D) Southern Black Flycatcher, E) Red-faces Mousebird, F) Spotted Thick-knee***

3.2.1 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) and omnivores that do not have a set habitat (OMD). The third most prevalent group is granivore species (GGD). Very few water birds and carnivore birds were recorded. The lack of water birds at the onsite dams and the nearby river is of concern based on the species that have been recorded in the CWAC and SABAP assessments and were expected in the area. This is likely an indication of water pollution on site and in the river.

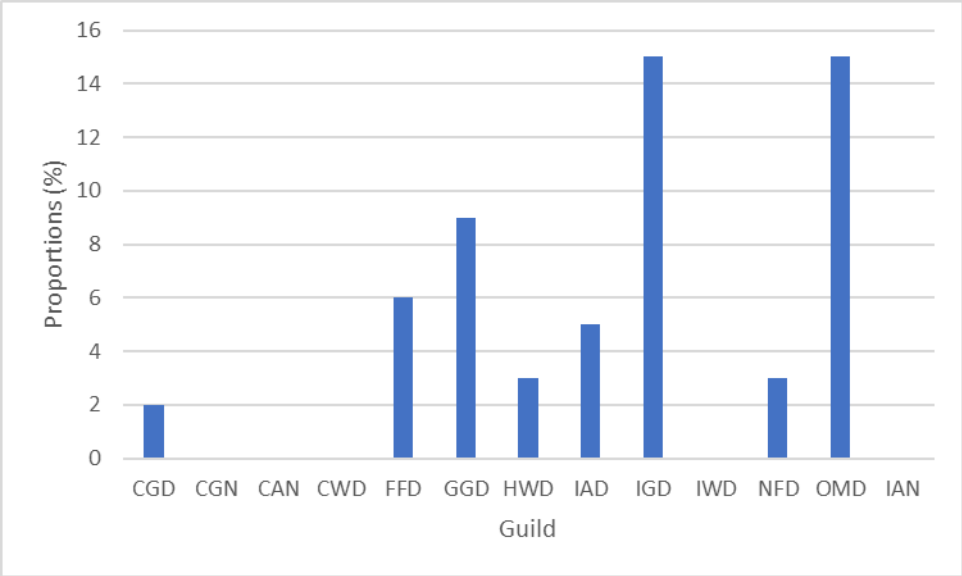


Figure 3-12 ***Avifaunal trophic guilds. CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal, CAN, carnivore air nocturnal, CWD, carnivore water diurnal; FFD, frugivore foliage diurnal; GCD, granivore ground diurnal; HWD, herbivore water diurnal; IAD, insectivore air diurnal; IGD, insectivore ground diurnal; IWD, insectivore water diurnal; NFD, nectivore foliage diurnal; OMD, omnivore multiple diurnal; IAN, Insectivore air nocturnal.***

3.2.2 Risk Species

A number of species were found that would be regarded as high risk species (Table 3-5 and Figure 3-13). Risk species are species that would be 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 does pose a risk. The fence could also pose a collision risk for various species as described in section 5.

Table 3-5 ***At risk species found in the PAOI during the survey.***

Common Name	Scientific Name	Threat Status		Collisions	Electrocution
		Regional	International		
Alopochen aegyptiaca	Egyptian Goose	Unlisted	LC	x	x
Anas undulata	Duck, Yellow-billed	Unlisted	LC	x	x
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC	x	x

Bubulcus ibis	Western Cattle Egret	Unlisted	LC	x	
Corvus albus	Crow, Pied	Unlisted	LC		x
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC		x

Figure 3-13 One of the high collision risk species recorded in the proposed PAOI, Hadeda Ibis

3.3 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 four (4) habitat types namely; Degraded Bushveld, Disturbed, Transformed as well as Water resources (Dam and river). These habitats were based on the species compositions in the various areas. The areas of interests outside of the PAOI were included as these areas could also support species that could be influenced by the construction of the PV and gridlines The habitat in the PAOI is delineated, while the locations alone of areas assessed outside of the PAOI are shown in Figure 3-14.

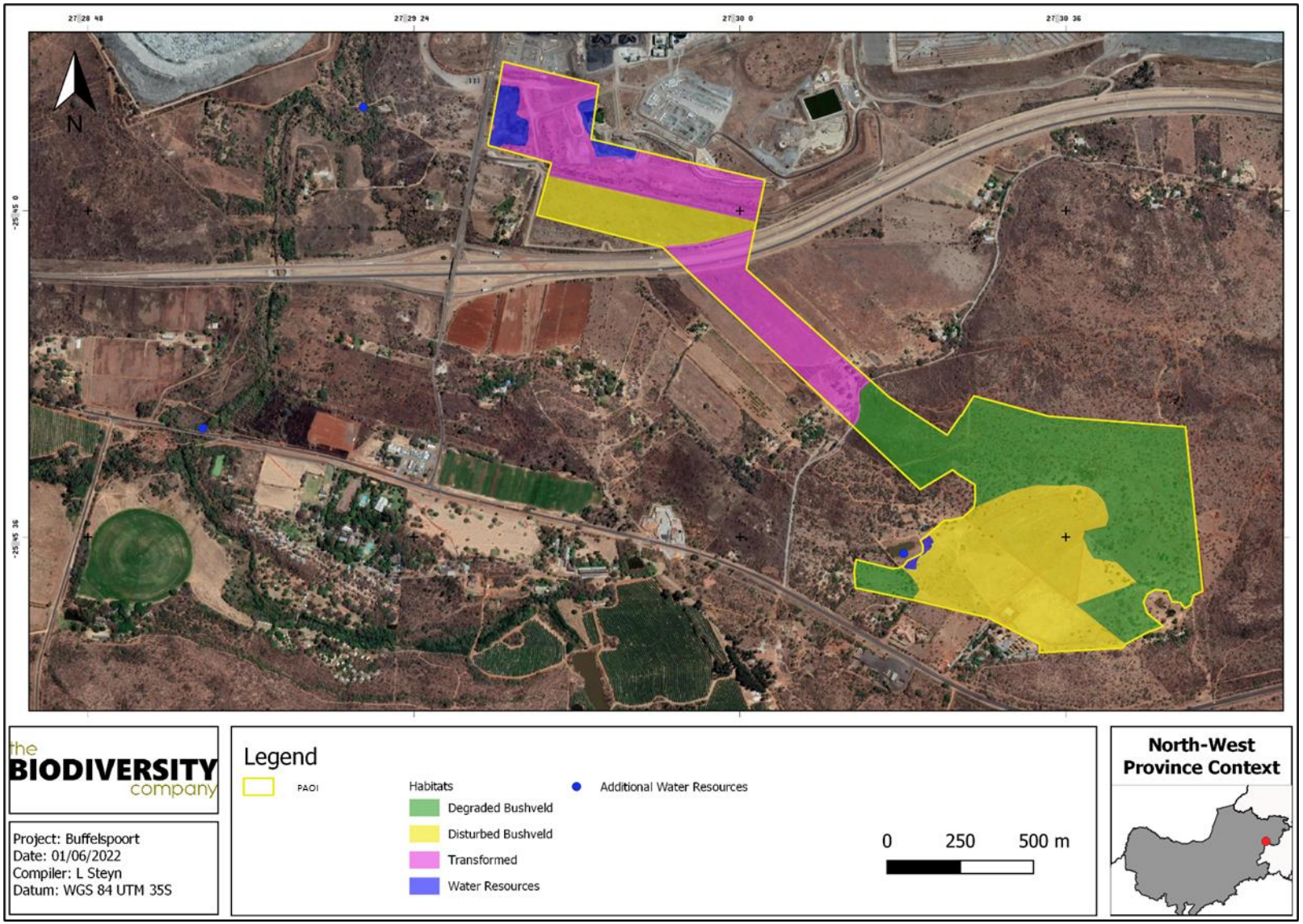


Figure 3-14 The avifauna habitats found in the proposed PAOI

Degraded Bushveld

This habitat type is regarded as semi-natural bushveld, but slightly disturbed due to the presence of roads, mismanagement (overgrazing) and also human infringement as it is being used as a game farm. This habitat represents typical mountain bushveld, with rocky extrusions and/or rocky boulders in certain areas. The current ecological condition of this habitat regarding the main driving forces, are intact, which is evident in the amount and importance of the species recorded in the faunal assessment; and the high species diversity and number of plant species recorded. Current human infringement still occurs throughout, especially in areas close to roads. The difference between this habitat and the disturbed bushveld is the extent of the disturbance in the disturbed bushveld being more severe. Avifauna species found here included Arrow Marked Babblers, Black-headed Oriole, White-bellied Sunbird and Cinnamon-breasted Bunting. An example of the habitat is shown in Figure 3-15.

Figure 3-15 A typical example of degraded Bushveld habitat from the proposed PAOI.

Disturbed Bushveld

This habitat is regarded as areas that have been impacted more by historic land clearing, mismanagement and land use (Figure 3-16). Historical vegetation clearing for what is assumed cultivation has led to an absence of large woody plants and an area dominated by grasses, with current grazing activities by game also taking place within this area. These habitats are not entirely transformed but in a constant disturbed state, as they cannot recover to a more natural state due to ongoing disturbances and impacts received from grazing and mismanagement. Avifauna species recorded here were more grassland type species such as Cape Longclaw, Zitting Cisticola, and Tawny-flanked Prinia.

Figure 3-16 A typical example of disturbed Bushveld habitat from the proposed PAOI .

Transformed

This habitat unit represents all areas of agriculture, mining areas as well as the associated secondary roads (Figure 3-17 and Figure 3-18). The transformed areas have little to no remaining natural vegetation due to land transformation by mining areas, agriculture and roads. These habitats exist in a constant disturbed state as it cannot recover to a more natural state unless through human intervention. Species recorded here included Common Myna, Fiscal Shrike and Pied Crow.

Figure 3-17 Illustration of transformed habitat from the proposed PAOI .

Figure 3-18 Illustration of transformed habitat from the proposed PAOI .

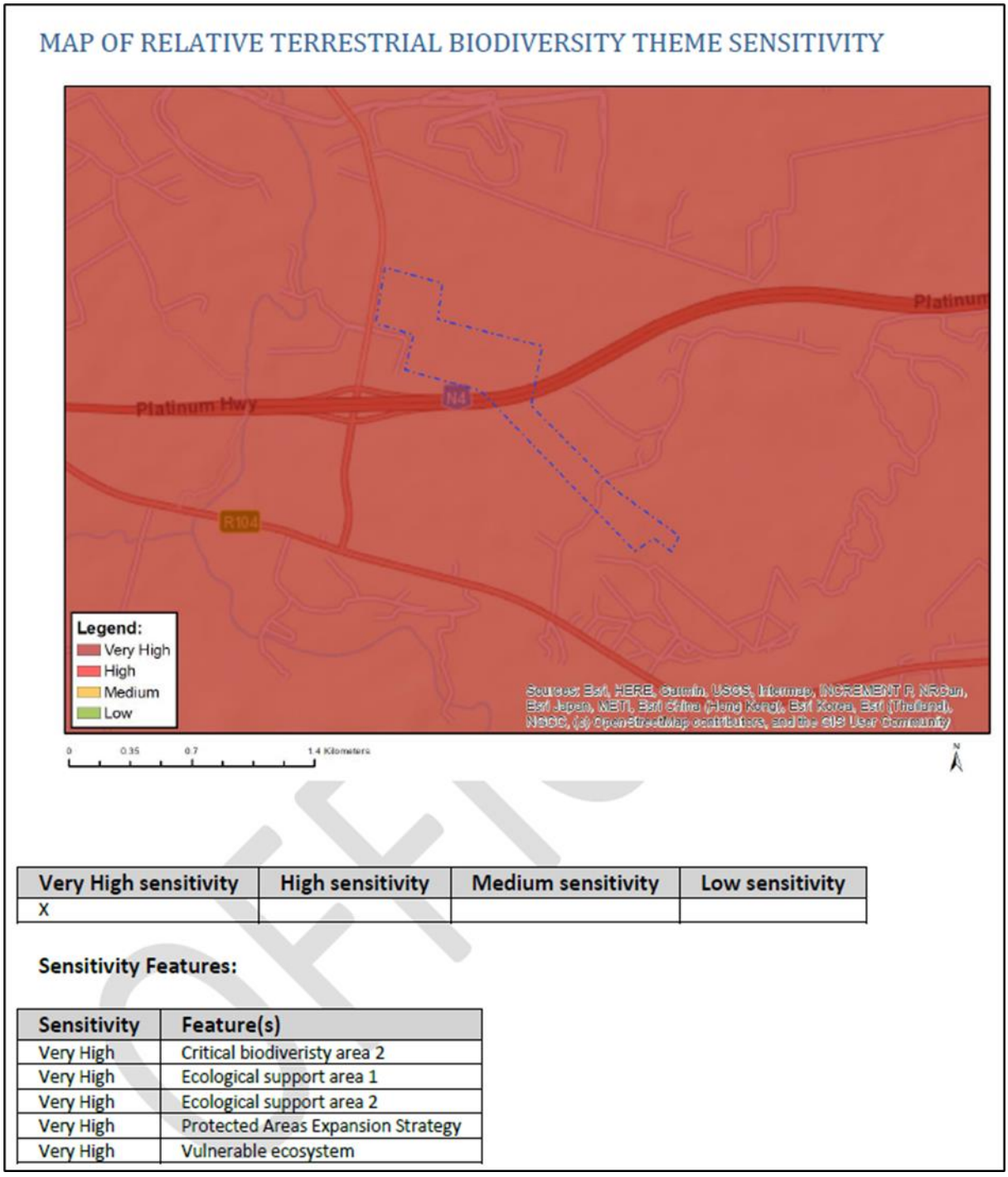
Water Resources

Wetlands are identified in the wetland report (TBC, 2022). Even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system and an important habitat for various avifauna species (Figure 3-19). The Sterkstoom was also included as part of this habitat due to its proximity to the POAI and the likelihood of the waterbirds found there being influenced by the development. Very few water bird species were recorded in the assessment, based on the CWAC and SAPAB datasets a higher number of birds have the potential to occur, this could be an indication of the overall state of the water sources. The three (3) species recorded were Yellow-billed Ducks, Egyptian Goose and Three-banded Plover.

Figure 3-19 Illustration of water resource habitat from the proposed PAOI

4 Site Sensitivity

The biodiversity (terrestrial and aquatic) theme sensitivity, as indicated in the screening report, was derived to be Very High, mainly due to the PAOI being within an CBA 2 and ESA 1 & 2 and NPAES (Figure 4-1), while the animal species theme is classified as medium sensitivity (Figure 4-2). The screening tool provides an avifaunal sensitivity theme. However, this layer is applicable to wind energy developments and for all other Projects, the user must evaluate the animal species sensitivity's theme for any avifaunal triggers. The animal theme sensitivity is rated as medium based on the moderate likelihood of Secretarybird (*Sagittarius serpentarius*) occurring here.

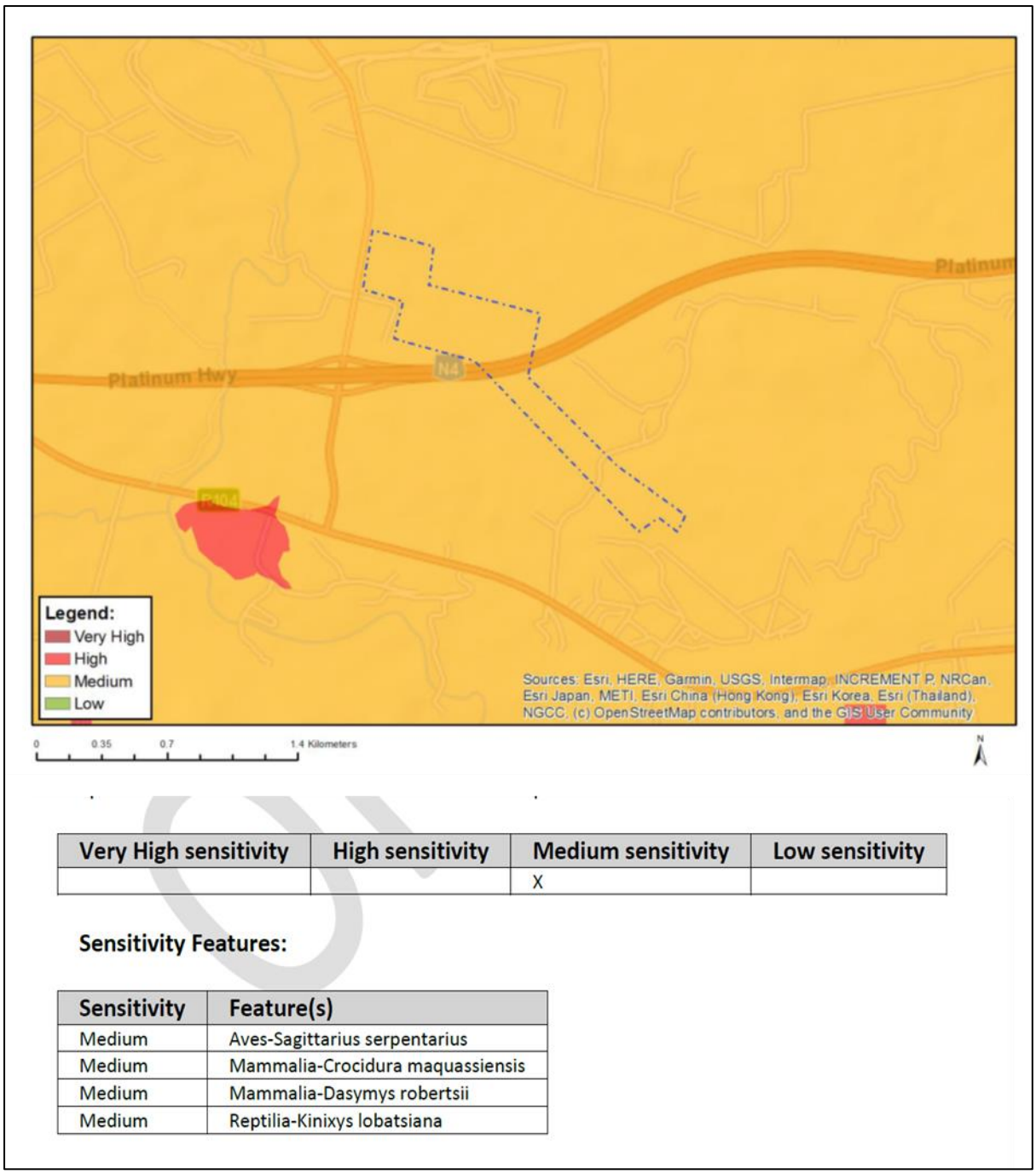


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Critical biodiveristy area 2
Very High	Ecological support area 1
Very High	Ecological support area 2
Very High	Protected Areas Expansion Strategy
Very High	Vulnerable ecosystem

Figure 4-1 Terrestrial Biodiversity Theme Sensitivity, National Web based Environmental Screening Tool.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Aves-Sagittarius serpentarius
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Dasymys robertsii
Medium	Reptilia-Kinixys lobatsiana

Figure 4-2 Fauna Theme Sensitivity, National Web based Environmental Screening Tool.

The sensitivities were compiled for the avifauna study based on the one survey. Based on the criteria provided in Section 3.3 of this report, all habitats within the PAOI were allocated a sensitivity category (Table 4-1). The sensitivities of the habitat types delineated are illustrated in Figure 4-3. These SEI ratings differ to that of the TBC (2022) terrestrial report as this report considers the avifauna species recorded and their conservation statuses found in the various habitats. The water resources in the area are of high ecological importance not only as a source of water but also because of the unique habitat they offer in the area surrounding them. The Degraded Bushveld had a unique assemblage of bird species due to the rocky outcrops found in this area, but as no SCCs were recorded the SEI were rated as **Medium**. The Disturbed Bushveld had a composition of bird species that are adapted to change and disturbance as such the SEI was rated as **Low**.

Table 4-1 SEI Summary of habitat types delineated within field assessment area of PAOI

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Water Resources	Medium	High	Medium	Low	High
Degraded Bushveld	Medium	Medium	Medium	Low	Medium
Disturbed Bushveld	Medium	Low	Low	Medium	Low
Transformed	Very Low	Very Low	Very Low	Low	Very Low

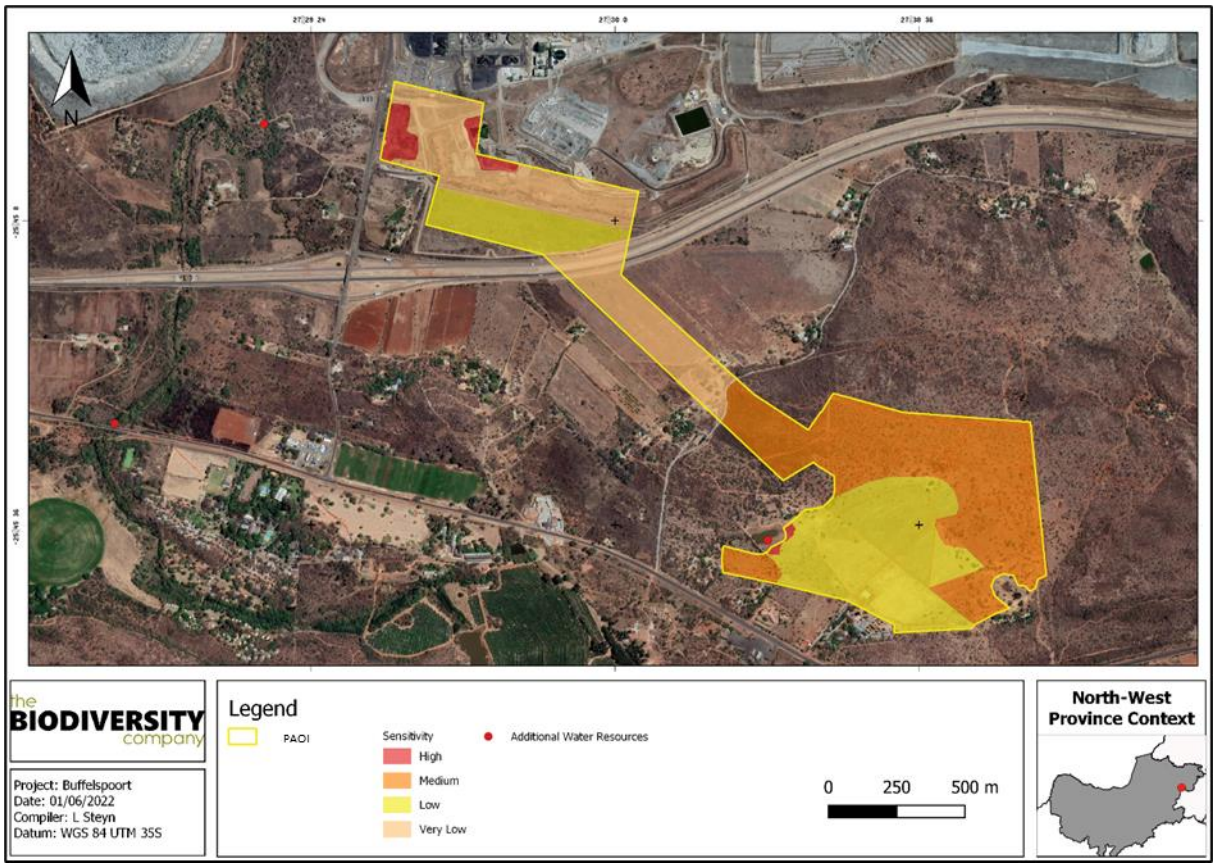


Figure 4-3 Sensitivities based on the avifauna assessment

Interpretation of the SEI in the context of the proposed Project is provided in Table 4-2.

Table 4-2 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.

5 Impact Assessment

Potential impacts were evaluated against the data captured during the fieldwork and from a desktop perspective to identify relevance to the PAOI, specifically the proposed Development Footprint area.

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 (3) broad types of impacts associated with solar energy development:

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

The assessment of impact significance 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.

5.1 Current Impacts

The current impacts observed during the survey are listed below. Photographic evidence of a selection of these impacts is shown in Figure 5-1.

- Mining activities;
- Present energy distribution infrastructure, including powerlines;
- Historical land clearing and land-use;
- Invasive species;
- Roads and associated vehicle traffic and road kills; and

- Fences.

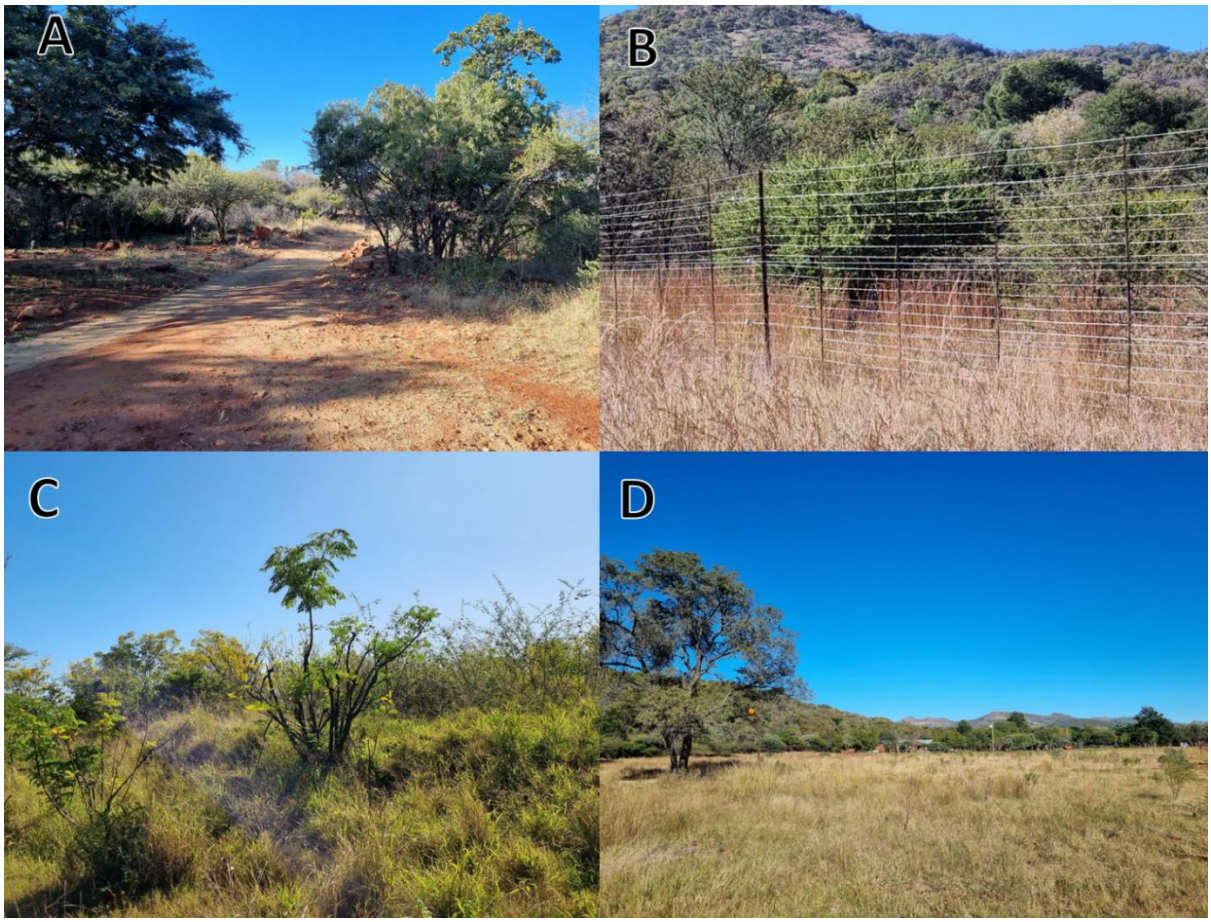


Figure 5-1 Some of the identified impacts within the PAOI; A) Roads, B) Fences, C) Alien Invasive Plants, D) Powerlines

5.2 Avifauna Impact Assessment

This section describes the potential impacts on avifauna associated with the construction and operational phases of the proposed development. During the construction phase vegetation clearing and brush cutting of vegetation for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and 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 chemical stabilisation be applied as dust suppressants, caution is needed as this could lead to pollution. Increased human presence can lead to poaching and the increase in vehicle traffic will potentially lead to roadkill.

The principle impacts of the operational phase are electrocution, collisions, fencing 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 bird's 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.

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.

5.2.1 Alternatives considered

No alternatives were considered in this assessment.

5.2.2 Loss of Irreplaceable Resources

Possible loss of SCCs.

5.3 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.

5.3.1 Construction Phase

The construction of the PV site, Grid line and associated infrastructure has been assessed collectively as their impacts overlap.

The following potential impacts were considered (Table 5-1 till Table 5-4):

- 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 5-1 Construction activities impacts on the avifauna

Nature:		
Destruction, fragmentation and degradation of habitats		
	Without mitigation	**With mitigation**

Extent	Regional (4)	Local area (3)
Duration	Short term (2)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Highly probable (4)
Significance	**Medium**	**Medium**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	To some extent, habitat will still be lost	

Mitigation:

- The loss of habitat in the Development Footprint cannot be negated but can be restricted to some extent by following the listed mitigations below.
- The habitat outside the PAOI can be protected by implementing the following mitigations:
  - Construction activity to only be within the Development Footprint and the area is to be well demarcated.
  - The PAOI must be monitored quarterly for invasive plant encroachment and erosion and must be controlled.
  - All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the Development Footprint.
  - The use of laydown areas within the Development Footprint must be used, to avoid habitat loss and disturbance to adjoining areas.
  - Should any Species of Conservation Concern not move out of the Development Footprint or their nest be found in the Development Footprint a suitably qualified specialist must be consulted to advise on the correct actions to be taken.

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 PAOI.

Table 5-2 Construction activities impacts on the avifauna

Nature:		
Displacement of avifaunal community (Including several SCC) due to disturbance such as noise, light, dust, vibration		
	Without mitigation	**With mitigation**
Extent	Local area (3)	Footprint & surrounding areas (2)
Duration	Moderate term (3)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes, but only to a limited extent. The mitigation of noise pollution during construction is difficult to mitigate against	
Mitigation:		

- Minimize disturbance impact by abbreviating construction time.
- Where possible try and schedule the construction 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.
- Dust management need to be done in the areas where the vegetation will be removed, this includes wetting of the soil and/or chemical stabilisation.

Residual Impacts:

Displacement of endemic and SCC avifauna species.

Table 5-3 Construction activities impacts on the avifauna

Nature:		
Collection of eggs and poaching		
	Without mitigation	With mitigation
Extent	Footprint & surrounding areas (2)	Footprint & surrounding areas (2)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	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 5-4 Construction activities impacts on the avifauna

Nature:		
Roadkill		
	Without mitigation	With mitigation
Extent	Local area (3)	Footprint & surrounding areas (2)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No

Can impacts be mitigated?	Yes

Mitigation:

- All construction vehicles should adhere to clearly defined and demarcated roads. Off-road driving should be prohibited allowed outside of the Development Footprint area, unless necessitated.
- All vehicles (construction or other) accessing the PAOI 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:

Roadkills could still occur

5.3.2 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 inside the PAOI surrounding the direct Development 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 5-5 to Table 5-8):

- Collisions with PV panels, associated grid 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 5-5 Operational activities impacts on the avifauna

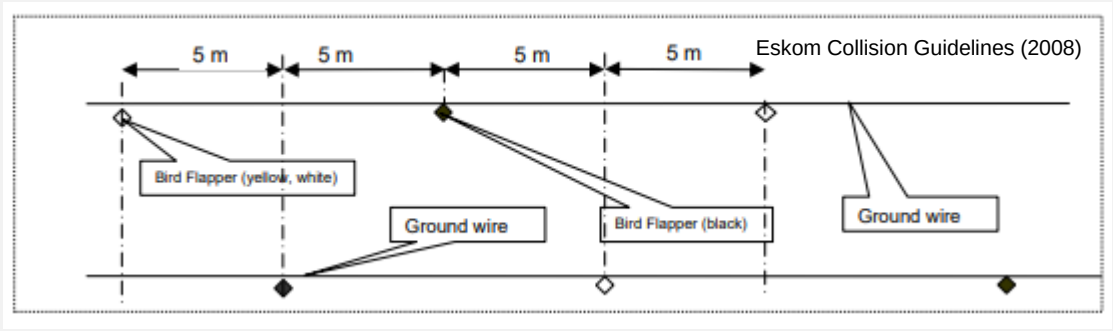
Nature:		
Collisions with PV panels, associated powerlines and connection lines and fences		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**High**	**Medium**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

- The design of the proposed Project 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.

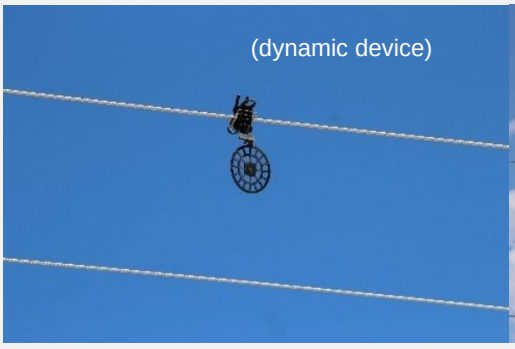
A streamer that bridges the earth plane

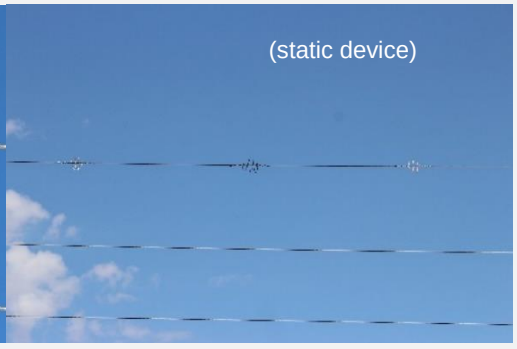
- Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used.
- Where the proposed overhead powerlines crosses over the ridge bird diverters need to be placed on it. The bird diverters must be placed along the lines and not just near the poles as per the figure below of the other lines on the property. Diverters must be placed at 5 m intervals.



Eskom Collision Guidelines (2008)

- Overhead cables/lines must be fitted with industry standard bird flight diverters along the ridge portions in order to make the lines as visible as possible to collision-susceptible species. Shaw *et al* (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.





- Fencing mitigations (Birdlife Fence Guidelines, 2020) :
  - Top 2 strands must be smooth wire
  - Routinely retention loose wires
  - Minimum 30 cm between wires
  - Place markers on fences

Residual Impacts:

Some collisions of SCCs and risk species might still occur regardless of mitigations

Table 5-6 Operational activities impacts on the avifauna

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

Mitigation:

- The design of the proposed Project 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. Ecological design recommendations for this include:
  - The distance between the lines must be 1.8 m to decrease the risk of vulture electrocutions;
  - Insulation: covering energised parts and/or covering grounded parts with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered. The length of insulated chains should be higher than 0.70 m;
  - Install anti-perch devices.
- Infrastructure should be consolidated where possible/practical in order to minimise the amount of ground and air space used.
- Ensure that visual 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 complied 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. This can be completed by technicians but should include photographic evidence of the affected species to allow for identification.
Residual Impacts:	
Electrocutions might still occur regardless of mitigations	

Table 5-7 Operational activities impacts on the avifauna

Nature:		
Roadkill during maintenance procedures		
	Without mitigation	With mitigation
Extent	Local area (3)	Local area (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	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, unless necessary and approved. • All vehicles accessing the PAOI 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 5-8 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
Extent	Regional (4)	Local area (3)
Duration	Long term (4)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**High**	**Medium**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No

Can impacts be mitigated?	**No, the footprint has already been disturbed. The area surrounding the development can be mitigated to some extent**

Mitigation:

- Minimising habitat destruction caused by the maintenance by demarcating the Development Footprint.
- All areas where maintenance (for example grass cutting) must be walked through prior to any activity to ensure no nests or SCC 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.

Residual Impacts:

Migratory routes of avifauna species could change, and the species composition could also change regardless of mitigations

5.3.3 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. Should the plant be decommissioned the associated powerlines must be removed to ensure the collision risk is successfully mitigated.

The following potential impacts were considered (Table 5-9 to Table 5-10):

- Continued fragmentation and degradation of habitats;
- Displacement of faunal community (including SCC) due disturbance (road collisions, noise, dust, vibration);
- Collisions with the powerlines if not removed during decommissioning.

Table 5-9 Decommissioning activities impacts on the avifauna

Nature:

Continued fragmentation and degradation of habitats

	Without mitigation	With mitigation
Extent	Local area (3)	Footprint & surrounding areas (2)
Duration	Long term (4)	Very short term (1)
Magnitude	High (8)	Minor (2)
Probability	Highly probable (4)	Very improbable (1)
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

- Implementation of a rehabilitation plan.
- Implementation of an alien invasive management plan and monitoring on an annual basis for 3 years post construction.
- 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 5-10 Decommissioning activities impacts on the avifauna

Nature:		
Displacement of faunal community (including SCC) due disturbance (road collisions, noise, dust, vibration).		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Local area (3)
Duration	Long term (4)	Moderate term (3)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**High**	**Medium**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
• Minimize disturbance impact by abbreviating decommissioning time • Dust management need to be done in the areas where the infrastructure 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		

Table 5-11 Decommissioning activities impacts on the avifauna

Nature:		
Collisions with the powerlines if not removed during decommissioning.		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Site specific (1)
Duration	Long term (4)	Very short term (1)
Magnitude	High (8)	None (0)
Probability	Highly probable (4)	Very improbable (1)
Significance	**High**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		
If the line is removed after/if the plant is decommissioned, the risk of collisions will be absent.		

Residual Impacts:
No residual impact will remain if the line is removed as part of the decommissioning

5.4 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 as well as mining activity). These include dust deposition, noise and vibration, disruption of corridors or habitat, groundwater drawdown, groundwater and surface water quality, increase in road kills, loss of habitat, increase in collision and electrocutions. Figure 5-2 shows a 30 km area surrounding the PAOI, with the intact habitat, the transformed habitat and the proposed solar developments.

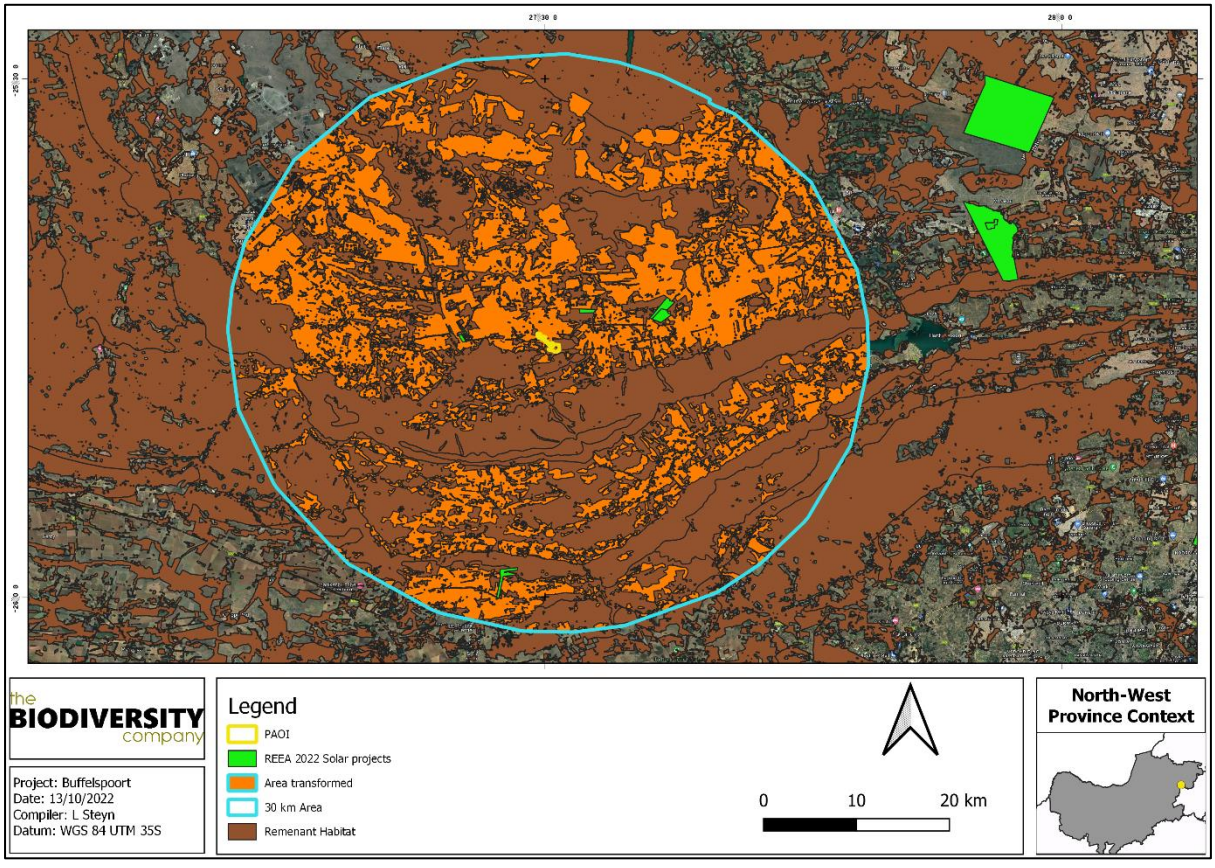


Figure 5-2 The habitat loss, and solar developments in a 30 km radius around the PAOI

Long-term cumulative impacts due to the large number of developments close by 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 powerlines can already be found in the area combined with the extensive

mining activities the habitat has been decreased and degraded (Table 5-12). However, based on the overall disturbed nature of the PAOI the cumulative impact is rated as **Medium**.

Table 5-12 Cumulative impact of the solar facility

Nature:		
Loss of habitat and increase in bird collisions		
	Project in isolation	**Project with adjacent PV projects with associated infrastructure**
Extent	**Local area (3)**	**Regional (4)**
Duration	**Moderate Term (3)**	**Long Term (4)**
Magnitude	**Moderate (6)**	**High (8)**
Probability	**Probable (3)**	**Probable (3)**
Significance	**Medium**	**Medium**
Status (positive or negative)	**Negative**	**Negative**
Reversibility	**None**	**None**
Irreplaceable loss of resources?	**No**	**No**
Can impacts be mitigated?	**No**	
Mitigation:		
Ensure that a rehabilitation plan and IAP management plan are compiled and are effectively implemented. Also ensure all the bird diverters and electrocution mitigations listed above are implemented.		
Residual Impacts:		
Loss of habitat for endemic and SCC. Loss of SCCs due to collisions.		

5.5 Mitigation Measures

The following mitigation measures are applicable in general and must be incorporated along with the impact specific mitigations listed above into the Environmental Management Programme (EMPr):

- The Development Footprint must be used for storage and the contractors' camps as well. This may not be outside the direct footprint to ensure the disturbance area is as small as possible;
- Where possible, existing access routes and walking paths must be made use of;
- 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;
- Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion;
- Erosion control plan and alien invasive management plan must be compiled and implemented;
- Environmentally friendly dust suppressants need to be utilised;
- A fire management plan needs to be compiled and implemented to restrict the impact fire might have on the surrounding areas;
- 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;
- The duration of the construction should be kept to a minimum to avoid disturbing avifauna;
- 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;
- Schedule or limit (where feasible) clearing activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons (June – August);
- All Project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region. This includes mitigations such as the placements of mufflers on large machinery, speed limit implementation, and enclosing of noise emitting infrastructure;
- All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution;
- Use environmentally friendly cleaning and dust suppressant products this includes the cleaning of the panels;
- As far as possible power cables within the PAOI should be thoroughly insulated and preferably buried; and

- Any exposed parts must be covered (insulated) to reduce electrocution risk.

5.6 Recommendations

The following recommendations are proposed for the Project:

- A Summer/Spring survey during the migratory time frames of birds should ideally be done to ensure the species of conservation concern that could be impacted are considered;
- 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 PAOI to document any impacts and this data must be used for improving mitigation measures to reduce the impact on biological resources, particularly avifauna. This can be in the form of collision and electrocution data submissions to Birdlife.

6 Conclusion

From a desktop perspective the PAOI falls across a CBA2, an ESA1 and an ESA2 and falls within the Magaliesberg IBA. Based on the SABAP2 data 366 birds have been recorded in the PAOI and surrounds of these twenty (20) are SCC.

During the field assessment fifty-seven (57) bird species were recorded in the point counts of the survey, while thirty-six (36) species were recorded during incidental observations. None of the species recorded were SCC. The low number of water birds recorded is likely attributed to poor water quality in both the man-made dams on site and in the nearby Sterkstroom river (390 m west of the PAOI). Only three (3) types of water birds were observed at two (2) dams and along two points of the Sterkstroom.

Based on the current types of bird species recorded in the PAOI the proposed development will not have a high residual impact should all the mitigations and recommendations be implemented.

7 Impact Statement

No fatal flaws are evident for the proposed Project. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

8 References

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9 Appendix Items

9.1 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

Terrestrial Ecologist

The Biodiversity Company

June 2022

9.2 Appendix B- Expected species

Species	Common Name	SANBI	IUCN
Accipiter badius	Shikra	Unlisted	LC
Accipiter melanoleucus	Black Sparrowhawk	Unlisted	LC
Accipiter minullus	Little Sparrowhawk	LC	LC
Accipiter ovampensis	Ovambo Sparrowhawk	Unlisted	LC
Accipiter rufiventris	Rufous-breasted Sparrowhawk	LC	LC
Acridotheres tristis	Common Myna	LC	LC
Acrocephalus arundinaceus	Great Reed Warbler	LC	LC
Acrocephalus baeticatus	African Reed Warbler	Unlisted	Unlisted
Acrocephalus gracilirostris	Lesser Swamp Warbler	Unlisted	LC
Acrocephalus palustris	Marsh Warbler	Unlisted	LC
Acrocephalus schoenobaenus	Sedge Warbler	LC	LC
Actitis hypoleucos	Common Sandpiper	Unlisted	LC
Actophilornis africanus	African Jacana	LC	LC
Afrotis afraoides	Northern Black Korhaan	Unlisted	LC
Alcedo semitorquata	Half-collared Kingfisher	NT	LC
Alopochen aegyptiaca	Egyptian Goose	Unlisted	LC
Amadina erythrocephala	Red-headed Finch	Unlisted	LC
Amadina fasciata	Cut-throat Finch	Unlisted	Unlisted
Amandava subflava	Orange-breasted Waxbill	Unlisted	Unlisted
Amblyospiza albifrons	Thick-billed Weaver	LC	LC
Anaplectes rubriceps	Red-headed Weaver	LC	LC
Anas capensis	Cape Teal	Unlisted	LC
Anas erythrorhyncha	Red-billed Teal	Unlisted	LC
Anas hybrid	Hybrid Mallard	Unlisted	Unlisted
Anas platyrhynchos	Mallard	LC	LC
Anas sparsa	African Black Duck	Unlisted	LC
Anas undulata	Yellow-billed Duck	Unlisted	LC
Anhinga rufa	African Darter	LC	LC
Anomalospiza imberbis	Cuckoo Finch	Unlisted	LC
Anser anser	Domestic Goose	Unlisted	LC
Anthus caffer	Bushveld Pipit	LC	LC
Anthus cinnamomeus	African Pipit	Unlisted	LC
Anthus leucophrys	Plain-backed Pipit	Unlisted	LC
Anthus lineiventris	Striped Pipit	Unlisted	LC
Anthus nicholsoni	Nicholson's Pipit	Unlisted	LC
Anthus similis	Long-billed Pipit	LC	LC
Anthus vaalensis	Buffy Pipit	Unlisted	LC

Apalis thoracica	Bar-throated Apalis	Unlisted	LC
Apus affinis	Little Swift	Unlisted	LC
Apus apus	Common Swift	Unlisted	LC
Apus barbatus	African Black Swift	Unlisted	LC
Apus caffer	White-rumped Swift	Unlisted	LC
Apus horus	Horus Swift	Unlisted	LC
Aquila spilogaster	African Hawk-eagle	LC	LC
Aquila verreauxii	Verreaux's Eagle	Unlisted	LC
Ardea alba	Great Egret	Unlisted	LC
Ardea cinerea	Grey Heron	Unlisted	LC
Ardea goliath	Goliath Heron	Unlisted	LC
Ardea intermedia	Intermediate Egret	Unlisted	LC
Ardea melanocephala	Black-headed Heron	Unlisted	LC
Ardea purpurea	Purple Heron	Unlisted	LC
Ardeola ralloides	Squacco Heron	Unlisted	LC
Asio capensis	Marsh Owl	Unlisted	LC
Aviceda cuculoides	African Cuckoo-Hawk	Unlisted	LC
Batis molitor	Chinspot Batis	Unlisted	LC
Bostrychia hagedash	Hadeda Ibis	Unlisted	LC
Bradypterus baboecala	Little Rush Warbler	Unlisted	LC
Brunhilda erythronotos	Black-faced Waxbill	Unlisted	LC
Bubalornis niger	Red-billed Buffalo Weaver	LC	LC
Bubo africanus	Spotted Eagle-Owl	Unlisted	LC
Bubo capensis	Cape Eagle-Owl	LC	LC
Bubulcus ibis	Western Cattle Egret	Unlisted	LC
Buphagus erythrorynchus	Red-billed Oxpecker	Unlisted	Unlisted
Burhinus capensis	Spotted Thick-knee	Unlisted	LC
Buteo buteo	Common Buzzard	Unlisted	LC
Buteo rufofuscus	Jackal Buzzard	Unlisted	LC
Butorides striata	Striated Heron	Unlisted	LC
Calamonastes fasciolatus	Barred Wren-Warbler	LC	LC
Calendulauda africanoides	Fawn-colored Lark	LC	LC
Calendulauda sabota	Sabota Lark	Unlisted	LC
Calidris ferruginea	Curlew Sandpiper	LC	NT
Calidris minuta	Little Stint	LC	LC
Calidris pugnax	Ruff	Unlisted	LC
Camaroptera brevicaudata	Grey-backed Camaroptera	Unlisted	Unlisted
Campephaga flava	Black Cuckooshrike	LC	LC
Campethera abingoni	Golden-tailed Woodpecker	Unlisted	LC

Caprimulgus europaeus	European Nightjar	LC	LC
Caprimulgus pectoralis	Fiery-necked Nightjar	Unlisted	LC
Caprimulgus rufigena	Rufous-cheeked Nightjar	Unlisted	LC
Caprimulgus tristigma	Freckled Nightjar	LC	LC
Cecropis abyssinica	Lesser Striped Swallow	LC	LC
Cecropis cucullata	Greater Striped Swallow	Unlisted	LC
Cecropis semirufa	Red-breasted Swallow	Unlisted	LC
Centropus burchellii	Burchell's Coucal	Unlisted	Unlisted
Cercotrichas leucophrys	White-browed Scrub Robin	LC	LC
Cercotrichas paena	Kalahari Scrub Robin	Unlisted	LC
Certhilauda semitorquata	Eastern Long-billed Lark	LC	LC
Ceryle rudis	Pied Kingfisher	Unlisted	LC
Chalcomitra amethystina	Amethyst Sunbird	Unlisted	LC
Charadrius tricollaris	Three-banded Plover	Unlisted	LC
Chersomanes albofasciata	Spike-heeled Lark	LC	LC
Chlidonias hybrida	Whiskered Tern	Unlisted	LC
Chlidonias leucopterus	White-winged Tern	Unlisted	LC
Chlorocichla flaviventris	Yellow-bellied Greenbul	LC	LC
Chlorophoneus sulfureopectus	Orange-breasted Bushshrike	Unlisted	LC
Chloropicus namaquus	Bearded Woodpecker	Unlisted	LC
Chroicocephalus cirrocephalus	Grey-headed Gull	LC	Unlisted
Chrysococcyx caprius	Diederik Cuckoo	Unlisted	LC
Chrysococcyx klaas	Klaas's Cuckoo	Unlisted	LC
Ciconia abdimii	Abdim's Stork	Unlisted	LC
Ciconia ciconia	White Stork	NT	LC
Ciconia nigra	Black Stork	VU	LC
Cinnyricinclus leucogaster	Violet-backed Starling	LC	LC
Cinnyris afer	Greater Double-collared Sunbird	LC	LC
Cinnyris mariquensis	Marico Sunbird	Unlisted	LC
Cinnyris talatala	White-bellied Sunbird	Unlisted	LC
Circaetus cinereus	Brown Snake Eagle	LC	LC
Circaetus pectoralis	Black-chested Snake Eagle	Unlisted	LC
Cisticola aberrans	Lazy Cisticola	LC	LC
Cisticola aridulus	Desert Cisticola	Unlisted	LC
Cisticola ayresii	Wing-snapping Cisticola	LC	LC
Cisticola chiniana	Rattling Cisticola	Unlisted	LC
Cisticola fulvicapilla	Neddicky	Unlisted	LC
Cisticola juncidis	Zitting Cisticola	Unlisted	LC
Cisticola lais	Wailing Cisticola	LC	LC

Cisticola rufilatus	Tinkling Cisticola	LC	LC
Cisticola textrix	Cloud Cisticola	Unlisted	LC
Cisticola tinniens	Levaillant's Cisticola	Unlisted	LC
Clamator glandarius	Great Spotted Cuckoo	Unlisted	LC
Clamator jacobinus	Jacobin Cuckoo	LC	LC
Clamator levaillantii	Levaillant's Cuckoo	Unlisted	LC
Coccopygia melanotis	Swee Waxbill	LC	LC
Colius colius	White-backed Mousebird	Unlisted	LC
Colius striatus	Speckled Mousebird	Unlisted	LC
Columba arquatrix	African Olive Pigeon	Unlisted	LC
Columba guinea	Speckled Pigeon	Unlisted	LC
Columba livia	Rock Dove	Unlisted	LC
Coracias caudatus	Lilac-breasted Roller	Unlisted	LC
Coracias garrulus	European Roller	NT	LC
Corvus albus	Pied Crow	Unlisted	LC
Corvus capensis	Cape Crow	Unlisted	LC
Corythornis cristatus	Malachite Kingfisher	Unlisted	Unlisted
Cossypha caffra	Cape Robin-Chat	Unlisted	LC
Cossypha humeralis	White-throated Robin-Chat	LC	LC
Coturnix coturnix	Common Quail	Unlisted	LC
Coturnix delegorguei	Harlequin Quail	LC	LC
Creatophora cinerea	Wattled Starling	Unlisted	LC
Crinifer concolor	Grey Go-away-bird	Unlisted	LC
Crithagra atrogularis	Black-throated Canary	Unlisted	LC
Crithagra flaviventris	Yellow Canary	Unlisted	LC
Crithagra gularis	Streaky-headed Seedeater	Unlisted	LC
Crithagra mozambica	Yellow-fronted Canary	LC	LC
Cuculus canorus	Common Cuckoo	LC	LC
Cuculus clamosus	Black Cuckoo	LC	LC
Cuculus solitarius	Red-chested Cuckoo	Unlisted	LC
Curruca subcoerulea	Chestnut-vented Warbler	Unlisted	LC
Cursorius temminckii	Temminck's Courser	Unlisted	LC
Cypsiurus parvus	African Palm Swift	Unlisted	LC
Delichon urbicum	Common House Martin	Unlisted	LC
Dendrocygna viduata	White-faced Whistling Duck	Unlisted	LC
Dendroperdix sephaena	Crested Francolin	Unlisted	LC
Dendropicos fuscescens	Cardinal Woodpecker	Unlisted	LC
Dicrurus adsimilis	Fork-tailed Drongo	Unlisted	LC
Dryoscopus cubla	Black-backed Puffback	LC	LC

Egretta ardesiaca	Black Heron	LC	LC
Egretta garzetta	Little Egret	Unlisted	LC
Elanus caeruleus	Black-shouldered Kite	Unlisted	LC
Emberiza capensis	Cape Bunting	Unlisted	LC
Emberiza flaviventris	Golden-breasted Bunting	LC	LC
Emberiza tahapisi	Cinnamon-breasted Bunting	Unlisted	LC
Eremomela usticollis	Burnt-necked Eremomela	LC	LC
Eremopterix leucotis	Chestnut-backed Sparrow-Lark	LC	LC
Estrilda astrild	Common Waxbill	Unlisted	LC
Euplectes afer	Yellow-crowned Bishop	Unlisted	LC
Euplectes albonotatus	White-winged Widowbird	Unlisted	LC
Euplectes ardens	Red-collared Widowbird	LC	LC
Euplectes orix	Southern Red Bishop	Unlisted	LC
Euplectes progne	Long-tailed Widowbird	Unlisted	LC
Eupodotis senegalensis	White-bellied Bustard	VU	LC
Falco amurensis	Amur Falcon	LC	LC
Falco biarmicus	Lanner Falcon	VU	LC
Falco naumanni	Lesser Kestrel	Unlisted	LC
Falco peregrinus	Peregrine Falcon	Unlisted	LC
Falco rupicoloides	Greater Kestrel	Unlisted	LC
Falco rupicolus	Rock Kestrel	Unlisted	LC
Falco vespertinus	Red-footed Falcon	NT	VU
Fulica cristata	Red-knobbed Coot	Unlisted	LC
Gallinago nigripennis	African Snipe	Unlisted	LC
Gallinula chloropus	Common Moorhen	Unlisted	LC
Glaucidium perlatum	Pearl-spotted Owlet	Unlisted	LC
Gorsachius leuconotus	White-backed Night Heron	VU	LC
Granatina granatina	Violet-eared Waxbill	Unlisted	LC
Gymnoris superciliaris	Yellow-throated Bush Sparrow	Unlisted	LC
Gyps africanus	White-backed Vulture	CR	CR
Gyps coprotheres	Cape Vulture	EN	EN
Halcyon albiventris	Brown-hooded Kingfisher	Unlisted	LC
Halcyon chelicuti	Striped Kingfisher	LC	LC
Halcyon senegalensis	Woodland Kingfisher	Unlisted	LC
Haliaeetus vocifer	African Fish Eagle	Unlisted	LC
Hieraaetus pennatus	Booted Eagle	Unlisted	LC
Hieraaetus wahlbergi	Wahlberg's Eagle	Unlisted	LC
Himantopus himantopus	Black-winged Stilt	Unlisted	LC
Hippolais icterina	Icterine Warbler	Unlisted	LC

Hirundo albigularis	White-throated Swallow	Unlisted	LC
Hirundo dimidiata	Pearl-breasted Swallow	Unlisted	LC
Hirundo rustica	Barn Swallow	Unlisted	LC
Indicator indicator	Greater Honeyguide	Unlisted	LC
Indicator minor	Lesser Honeyguide	Unlisted	LC
Ispidina picta	African Pygmy Kingfisher	Unlisted	LC
Ixobrychus minutus	Little Bittern	Unlisted	LC
Ixobrychus sturmii	Dwarf Bittern	LC	LC
Jynx ruficollis	Red-throated Wryneck	LC	LC
Kaupifalco monogrammicus	Lizard Buzzard	LC	LC
Lagonosticta rhodopareia	Jameson's Firefinch	Unlisted	LC
Lagonosticta rubricata	African Firefinch	LC	LC
Lagonosticta senegala	Red-billed Firefinch	Unlisted	LC
Lamprotornis bicolor	Pied Starling	Unlisted	LC
Lamprotornis nitens	Cape Starling	Unlisted	LC
Laniarius atrococcineus	Crimson-breasted Shrike	Unlisted	LC
Laniarius ferrugineus	Southern Boubou	Unlisted	LC
Lanius collaris	Southern Fiscal	Unlisted	LC
Lanius collurio	Red-backed Shrike	Unlisted	LC
Lanius minor	Lesser Grey Shrike	Unlisted	LC
Lophaetus occipitalis	Long-crested Eagle	LC	LC
Lophoceros nasutus	African Grey Hornbill	Unlisted	LC
Lophotis ruficrista	Red-crested Korhaan	LC	LC
Lybius torquatus	Black-collared Barbet	LC	LC
Macronyx capensis	Cape Longclaw	Unlisted	LC
Malaconotus blanchoti	Grey-headed Bushshrike	Unlisted	LC
Megaceryle maxima	Giant Kingfisher	Unlisted	Unlisted
Melaenornis mariquensis	Marico Flycatcher	Unlisted	LC
Melaenornis pammelaina	Southern Black Flycatcher	LC	LC
Melaenornis silens	Fiscal Flycatcher	Unlisted	LC
Melaniparus cinerascens	Ashy Tit	Unlisted	LC
Melaniparus niger	Southern Black Tit	Unlisted	LC
Merops apiaster	European Bee-eater	Unlisted	LC
Merops bullockoides	White-fronted Bee-eater	Unlisted	LC
Merops pusillus	Little Bee-eater	Unlisted	LC
Microcarbo africanus	Reed Cormorant	Unlisted	LC
Micronisus gabar	Gabar Goshawk	Unlisted	LC
Milvus aegyptius	Yellow-billed Kite	LC	LC
Mirafra africana	Rufous-naped Lark	Unlisted	LC

Mirafra cheniana	Melodious Lark	LC	LC
Mirafra fasciolata	Eastern Clapper Lark	Unlisted	LC
Mirafra passerina	Monotonous Lark	LC	LC
Mirafra rufocinnamomea	Flappet Lark	LC	LC
Monticola brevipes	Short-toed Rock Thrush	Unlisted	LC
Monticola rupestris	Cape Rock Thrush	Unlisted	LC
Motacilla aguimp	African Pied Wagtail	LC	LC
Motacilla capensis	Cape Wagtail	Unlisted	LC
Muscicapa striata	Spotted Flycatcher	LC	LC
Mycteria ibis	Yellow-billed Stork	EN	LC
Myioparus plumbeus	Grey Tit-Flycatcher	LC	LC
Myrmecocichla formicivora	Ant-eating Chat	LC	LC
Myrmecocichla monticola	Mountain Wheatear	Unlisted	LC
Nectarinia famosa	Malachite Sunbird	Unlisted	LC
Netta erythrophthalma	Southern Pochard	Unlisted	LC
Nilaus afer	Brubru	Unlisted	LC
Numida meleagris	Helmeted Guineafowl	Unlisted	LC
Nycticorax nycticorax	Black-crowned Night Heron	LC	LC
Oena capensis	Namaqua Dove	Unlisted	LC
Oenanthe familiaris	Familiar Chat	Unlisted	LC
Oenanthe pileata	Capped Wheatear	Unlisted	LC
Onychognathus morio	Red-winged Starling	Unlisted	LC
Oriolus larvatus	Black-headed Oriole	LC	LC
Ortygospiza atricollis	Quailfinch	Unlisted	LC
Otus senegalensis	African Scops Owl	LC	LC
Oxyura maccoa	Maccoa Duck	NT	EN
Pandion haliaetus	Western Osprey	Unlisted	LC
Paragallinula angulata	Lesser Moorhen	LC	LC
Passer diffusus	Southern Grey-headed Sparrow	Unlisted	LC
Passer domesticus	House Sparrow	Unlisted	LC
Passer melanurus	Cape Sparrow	Unlisted	LC
Passer motitensis	Great Sparrow	LC	LC
Pavo cristatus	Indian Peafowl	Unlisted	LC
Peliperdix coqui	Coqui Francolin	Unlisted	LC
Pernis apivorus	European Honey-buzzard	Unlisted	LC
Petrochelidon spilodera	South African Cliff Swallow	Unlisted	LC
Phalacrocorax lucidus	White-breasted Cormorant	Unlisted	LC
Phoeniconaias minor	Lesser Flamingo	NT	NT
Phoeniculus purpureus	Green Wood Hoopoe	Unlisted	LC

Phylloscopus trochilus	Willow Warbler	Unlisted	LC
Platalea alba	African Spoonbill	Unlisted	LC
Plectropterus gambensis	Spur-winged Goose	Unlisted	LC
Plegadis falcinellus	Glossy Ibis	Unlisted	LC
Plocepasser mahali	White-browed Sparrow-Weaver	Unlisted	LC
Ploceus capensis	Cape Weaver	Unlisted	LC
Ploceus cucullatus	Village Weaver	Unlisted	LC
Ploceus intermedius	Lesser Masked-weaver	Unlisted	LC
Ploceus velatus	Southern Masked Weaver	Unlisted	LC
Podica senegalensis	African Finfoot	VU	LC
Podiceps cristatus	Great Crested Grebe	LC	LC
Pogoniulus chrysoconus	Yellow-fronted Tinkerbird	Unlisted	LC
Polemaetus bellicosus	Martial Eagle	EN	EN
Polyboroides typus	African Harrier-Hawk	Unlisted	LC
Porphyrio madagascariensis	African Swamphen	Unlisted	Unlisted
Prinia flavicans	Black-chested Prinia	Unlisted	LC
Prinia subflava	Tawny-flanked Prinia	Unlisted	LC
Prionops plumatus	White-crested Helmetshrike	Unlisted	LC
Prodotiscus regulus	Brown-backed Honeybird	Unlisted	LC
Pternistis natalensis	Natal Spurfowl	Unlisted	LC
Pternistis swainsonii	Swainson's Spurfowl	Unlisted	LC
Pterocles bicinctus	Double-banded Sandgrouse	LC	LC
Pterocles gutturalis	Yellow-throated Sandgrouse	NT	LC
Ptilopsis granti	Southern White-faced Scops Owl	LC	LC
Ptyonoprogne fuligula	Rock Martin	Unlisted	Unlisted
Pycnonotus nigricans	African Red-eyed Bulbul	Unlisted	LC
Pycnonotus tricolor	Dark-capped Bulbul	Unlisted	Unlisted
Pytilia melba	Green-winged Pytilia	Unlisted	LC
Quelea quelea	Red-billed Quelea	Unlisted	LC
Rallus caerulescens	African Rail	Unlisted	LC
Recurvirostra avosetta	Pied Avocet	Unlisted	LC
Rhinopomastus cyanomelas	Common Scimitarbill	Unlisted	LC
Rhinoptilus chalcopterus	Bronze-winged Courser	LC	LC
Riparia cincta	Banded Martin	Unlisted	LC
Riparia paludicola	Brown-throated Martin	Unlisted	LC
Sagittarius serpentarius	Secretarybird	VU	EN
Sarkidiornis melanotos	Knob-billed Duck	Unlisted	LC
Sarothrura rufa	Red-chested Flufftail	Unlisted	LC
Saxicola torquatus	African Stonechat	LC	LC

Scleroptila gutturalis	Orange River Francolin	Unlisted	LC
Scleroptila levaillantii	Red-winged Francolin	LC	LC
Scleroptila shelleyi	Shelley's Francolin	LC	LC
Scopus umbretta	Hamerkop	Unlisted	LC
Spermestes cucullata	Bronze Mannikin	Unlisted	LC
Sphenoeacus afer	Cape Grassbird	Unlisted	LC
Spilopelia senegalensis	Laughing Dove	Unlisted	LC
Spizocorys conirostris	Pink-billed Lark	LC	LC
Sporopipes squamifrons	Scaly-feathered Weaver	Unlisted	LC
Stenostira scita	Fairy Flycatcher	Unlisted	LC
Streptopelia capicola	Cape Turtle Dove	Unlisted	LC
Streptopelia semitorquata	Red-eyed Dove	Unlisted	LC
Struthio camelus	Common Ostrich	Unlisted	LC
Sylvia borin	Garden Warbler	LC	LC
Sylvietta rufescens	Long-billed Crombec	Unlisted	LC
Tachybaptus ruficollis	Little Grebe	Unlisted	LC
Tachymarptis melba	Alpine Swift	Unlisted	LC
Tchagra australis	Brown-crowned Tchagra	Unlisted	LC
Tchagra senegalus	Black-crowned Tchagra	Unlisted	LC
Telophorus zeylonus	Bokmakierie	Unlisted	LC
Terpsiphone viridis	African Paradise Flycatcher	Unlisted	LC
Thalassornis leuconotus	White-backed Duck	Unlisted	LC
Thamnolaea cinnamomeiventris	Mocking Cliff Chat	Unlisted	LC
Threskiornis aethiopicus	African Sacred Ibis	Unlisted	LC
Tockus leucomelas	Southern Yellow-billed Hornbill	LC	LC
Torgos tracheliotos	Lappet-faced Vulture	EN	EN
Trachyphonus vaillantii	Crested Barbet	Unlisted	LC
Treron calvus	African Green Pigeon	LC	LC
Tricholaema leucomelas	Acacia Pied Barbet	Unlisted	LC
Tringa glareola	Wood Sandpiper	Unlisted	LC
Tringa nebularia	Common Greenshank	Unlisted	LC
Tringa stagnatilis	Marsh Sandpiper	LC	LC
Turdoides jardineii	Arrow-marked Babbler	Unlisted	LC
Turdus libonyana	Kurrichane Thrush	Unlisted	Unlisted
Turdus litsitsirupa	Groundscraper Thrush	Unlisted	Unlisted
Turdus smithi	Karoo Thrush	Unlisted	LC
Turnix sylvaticus	Common Buttonquail	LC	LC
Turtur chalcospilos	Emerald-spotted Wood Dove	Unlisted	LC
Tyto alba	Western Barn Owl	Unlisted	LC

Tyto capensis	African Grass Owl	VU	LC
Upupa africana	African Hoopoe	Unlisted	LC
Uraeginthus angolensis	Blue Waxbill	Unlisted	LC
Urocolius indicus	Red-faced Mousebird	Unlisted	LC
Urolestes melanoleucus	Magpie Shrike	Unlisted	LC
Vanellus armatus	Blacksmith Lapwing	Unlisted	LC
Vanellus coronatus	Crowned Lapwing	Unlisted	LC
Vanellus senegallus	African Wattled Lapwing	Unlisted	LC
Vidua chalybeata	Village Indigobird	LC	LC
Vidua funerea	Dusky Indigobird	LC	LC
Vidua macroura	Pin-tailed Whydah	Unlisted	LC
Vidua paradisaea	Long-tailed Paradise Whydah	Unlisted	LC
Vidua purpurascens	Purple Indigobird	Unlisted	LC
Vidua regia	Shaft-tailed Whydah	LC	LC
Zapornia flavirostra	Black Crake	Unlisted	LC
Zosterops pallidus	Orange River White-eye	LC	LC
Zosterops virens	Cape White-eye	Unlisted	LC

9.3 Appendix C – Observed species during the point counts

Scientific Name	Common Name	SANBI (2016)	IUCN (2021)	Relative abundance	Frequency
Acridotheres tristis	Myna, Common	Unlisted	LC	0,003	0,043
Alopochen aegyptiaca	Goose, Egyptian	Unlisted	LC	0,003	0,043
Amandava subflava	Waxbill, Orange-breasted	Unlisted	Unlisted	0,003	0,043
Anas undulata	Duck, Yellow-billed	Unlisted	LC	0,007	0,043
Batis molitor	Batis, Chinspot	Unlisted	LC	0,003	0,043
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC	0,003	0,043
Bubulcus ibis	Egret, Cattle	Unlisted	LC	0,003	0,043
Burhinus capensis	Thick-knee, Spotted	Unlisted	LC	0,003	0,043
Cercotrichas leucophrys	Scrub-robin, White-browed	Unlisted	LC	0,010	0,087
Chalcomitra amethystina	Sunbird, Amethyst	Unlisted	LC	0,017	0,087
Chlorocichla flaviventris	Greenbul, Yellow-bellied	Unlisted	LC	0,003	0,043
Cinnyris mariquensis	Sunbird, Marico	Unlisted	LC	0,013	0,130
Cinnyris talatala	Sunbird, White-bellied	Unlisted	LC	0,010	0,087
Cisticola juncidis	Cisticola, Zitting	Unlisted	LC	0,010	0,087
Cisticola lais	Cisticola, Wailing	Unlisted	LC	0,003	0,043
Colius striatus	Mousebird, Speckled	Unlisted	LC	0,020	0,087
Columba livia	Dove, Rock	Unlisted	LC	0,003	0,043
Corvus albus	Crow, Pied	Unlisted	LC	0,013	0,130

Crinifer concolor	Go-away-bird, Grey	Unlisted	LC	0,057	0,522
Crithagra mozambica	Canary, Yellow-fronted	Unlisted	LC	0,023	0,174
Dendroperdix sephaena	Francolin, Crested	Unlisted	LC	0,020	0,087
Dendropicos fuscescens	Woodpecker, Cardinal	Unlisted	LC	0,003	0,043
Dicrurus adsimilis	Drongo, Fork-tailed	Unlisted	LC	0,013	0,174
Dryoscopus cubla	Puffback, Black-backed	Unlisted	LC	0,007	0,043
Elanus caeruleus	Kite, Black-shouldered	Unlisted	LC	0,003	0,043
Emberiza flaviventris	Bunting, Golden-breasted	Unlisted	LC	0,023	0,130
Emberiza tahapisi	Bunting, Cinnamon-breasted	Unlisted	LC	0,003	0,043
Estrilda astrild	Waxbill, Common	Unlisted	LC	0,034	0,217
Falco amurensis	Falcon, Amur	Unlisted	LC	0,003	0,043
Laniarius ferrugineus	Boubou, Southern	Unlisted	LC	0,010	0,087
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC	0,037	0,435
Lophoceros nasutus	Hornbill, African Grey	Unlisted	LC	0,017	0,174
Lybius torquatus	Barbet, Black-collared	Unlisted	LC	0,007	0,043
Macronyx capensis	Longclaw, Cape	Unlisted	LC	0,007	0,043
Melaenornis pammelaina	Flycatcher, Southern Black	Unlisted	LC	0,003	0,043
Motacilla capensis	Wagtail, Cape	Unlisted	LC	0,007	0,043
Muscicapa striata	Flycatcher, Spotted	Unlisted	LC	0,003	0,043
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC	0,064	0,130
Oriolus larvatus	Oriole, Black-headed	Unlisted	LC	0,013	0,174
Passer domesticus	Sparrow, House	Unlisted	LC	0,007	0,043
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC	0,044	0,174
Prinia subflava	Prinia, Tawny-flanked	Unlisted	LC	0,003	0,043
Pternistis natalensis	Spurfowl, Natal	Unlisted	LC	0,003	0,043
Pternistis swainsonii	Spurfowl, Swainson's	Unlisted	LC	0,007	0,043
Pycnonotus tricolor	Bulbul, Dark-capped	Unlisted	Unlisted	0,151	0,913
Quelea quelea	Quelea, Red-billed	Unlisted	LC	0,027	0,043
Spilopelia senegalensis	Dove, Laughing	Unlisted	LC	0,017	0,174
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC	0,081	0,696
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC	0,027	0,174
Tchagra australis	Tchagra, Brown-crowned	Unlisted	LC	0,010	0,130
Tockus leucomelas	Hornbill, Southern Yellow-billed	Unlisted	LC	0,007	0,043
Trachyphonus vaillantii	Barbet, Crested	Unlisted	LC	0,007	0,043
Turdoides jardineii	Babbler, Arrow-marked	Unlisted	LC	0,050	0,130
Turdus libonyana	Thrush, Kurrichane	Unlisted	Unlisted	0,003	0,043
Uraeginthus angolensis	Waxbill, Blue	Unlisted	LC	0,030	0,217
Urocolius indicus	Mousebird, Red-faced	Unlisted	LC	0,017	0,043
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC	0,017	0,043

9.4 Appendix D - Incidental Observations

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Acridotheres tristis	Myna, Common	Unlisted	LC
Apalis thoracica	Apalis, Bar-throated	Unlisted	LC
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC
Cercotrichas leucophrys	Scrub-robin, White-browed	Unlisted	LC
Columba livia	Dove, Rock	Unlisted	LC
Corvus albus	Crow, Pied	Unlisted	LC
Corythaixoides concolor	Go-away-bird, Grey	Unlisted	LC
Dendroperdix sephaena	Francolin, Crested	Unlisted	LC
Estrilda astrild	Waxbill, Common	Unlisted	LC
Laniarius ferrugineus	Boubou, Southern	Unlisted	LC
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC
Passer domesticus	Sparrow, House	Unlisted	LC
Passer melanurus	Sparrow, Cape	Unlisted	LC
Ploceus cucullatus	Weaver, Village	Unlisted	LC
Pternistis swainsonii	Swainson's Spurfowl	Unlisted	LC
Pycnonotus tricolor	Bulbul, Dark-capped	Unlisted	Unlisted
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC
Streptopelia senegalensis	Dove, Laughing	Unlisted	LC
Sylvietta rufescens	Crombec, Long-billed	Unlisted	LC
Trachyphonus vaillantii	Barbet, Crested	Unlisted	LC
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC
Struthio camelus	Common Ostrich	Unlisted	LC
Alopochen aegyptiaca	Egyptian Goose	Unlisted	LC
Malaconotus blanchoti	Grey-headed Bushshrike	Unlisted	LC
Phoeniculus purpureus	Green Wood Hoopoe	Unlisted	LC
Cisticola aberrans	Lazy Cisticola	LC	LC
Laniarius atrococcineus	Crimson-breasted Shrike	Unlisted	LC
Lybius torquatus	Black-collared Barbet	LC	LC
Chlorocichla flaviventris	Yellow-bellied Greenbul	LC	LC
Dicrurus adsimilis	Fork-tailed Drongo	Unlisted	LC
Bubulcus ibis	Western Cattle Egret	Unlisted	LC
Plegadis falcinellus	Glossy Ibis	Unlisted	LC
Vanellus armatus	Lapwing, Blacksmith	Unlisted	LC
Charadrius tricollaris	Plover, Three-banded	Unlisted	LC