



# environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

## DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

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Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

### PROJECT TITLE

Ndau 1 Solar Energy Facility

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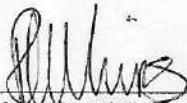
**1. SPECIALIST INFORMATION**

Specialist Company Name:	Cossypha Ecological		
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**2. DECLARATION BY THE SPECIALIST**

I, Robyn Phillips, 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 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

Cossypha Ecological

Name of Company:

31 May 2023

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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

*R Phillips*  
Signature of the Specialist

Cossypha Ecological  
Name of Company

31 May 2023  
Date

*M. J. ...*  
Signature of the Commissioner of Oaths

2023-05-31  
Date



# Proposed ABO Ndaou Solar Photovoltaic Facility 1 near Polokwane in the Capricorn District, Limpopo Province

## Preliminary Avifaunal Assessment & Site Sensitivity Verification

Project Reference: 220707A\_Ndaou & Nyala S&EIA



Compiled for



By



June 2023

## REPORT PRODUCTION

Specialist	Role	Project Component	Qualifications and Professional Registration
Robyn Phillips	Terrestrial Ecologist (Avifaunal Specialist)	Field work (data collection) and report compilation	MSc (Zoology) UNP SACNASP: <i>Pr.Sci.Nat.</i> 400401/12 Fields: Zoological and Ecological


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## SPECIALIST DECLARATION OF INDEPENDENCE

I, **Robyn Phillips**, in my capacity as a specialist consultant, hereby declare that I –

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998);
- Do not have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the Competent Authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Will provide the Competent Authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability;
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field; and
- Undertake to have my work peer reviewed on a regular basis by a competent specialist in the field of study for which I am registered.



**Robyn Phillips** *Pr.Sci.Nat.*  
Terrestrial Ecologist  
SACNASP Reg. No. 400401/12

19 July 2023

Date

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## ABBREVIATIONS

BA	Basic Assessment
BIRP	Birds in Reserves Project
CAR	Co-ordinated Avifaunal Road Counts
CR	Critically Endangered
CWAC	Co-ordinated Wetland Counts
DEA	Department of Environmental Affairs (now DFFE)
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EN	Endangered
EWT	Endangered Wildlife Trust
GBIF	Global Biodiversity Information Facility
GN	General Notice
IUCN	International Union for Conservation of Nature
kV	Kilovolts
LC	Least Concern
MW	Megawatt
NEMA	National Environmental Management Act 107 of 1998
NT	Near Threatened
PV	Photovoltaic
QDGC	Quarter Degree Grid Cell
SABAP	South African Bird Atlas Project
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SEF	Solar Energy Facility
VU	Vulnerable



## 1. INTRODUCTION AND PROJECT DESCRIPTION

ABO Nda Solar Energy Facility 1 (Pty) Ltd proposes to develop the Nda 1 photovoltaic (PV) solar energy generation facility (SEF), of up to 120 MWac in capacity, and associated infrastructure near Polokwane in Limpopo Province. Praxos 373 (Pty) Ltd (Praxos) has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Scoping and Environmental Impact Reporting (S&EIR) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA), and the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R982, as amended by GN R326). Cossypha Ecological was appointed to conduct an Avifaunal Impact Assessment for the proposed development to inform the S&EIR process.

### 1.1. PROJECT DESCRIPTION

The Nda 1 PV SEF is located on Portion 19 of the Farm Rietvley No. 13, about 27 km south-west of Polokwane in Limpopo Province and will have up to 120 MWac capacity. The site is located within the International Strategic Transmission Corridor. A project area of 190.7 ha was identified within a greater study area of ~1 110 ha for the proposed development. Within this a development footprint calculated at ~136 ha will be defined after taking the environmental sensitivities present on the affected property into consideration. The proposed facility would comprise the following:

- Solar Field/Solar Arrays (noting that the foundations, mounting structures, and module types would be confirmed during detail design phase, however would remain within the proposed development footprint and be up to approximately 3.5 m in height)
- Internal access roads (noting that existing farm roads would be used as far as possible, and that the maximum road width would be up to approximately 10 m)
- A main access road (noting that existing farm roads would be used as far as possible, and the road width would be up to approximately 10 m)
- Internal electrical reticulation (i.e. low- and medium-voltage lines) to be placed underground where feasible
- An on-site substation hub and associated infrastructure (such as substation, transformation infrastructure, collector infrastructure, step-up infrastructure, battery energy storage system etc.) including auxiliary buildings (such as operation and maintenance buildings, admin buildings, workshops, gatehouse, security building, offices, visitor centre, warehouses, etc.) contained within up to approximately 5 ha footprint; and
- Perimeter fencing.

A temporary laydown area would be established during the construction phase that would remain within the development footprint i.e. within the fenced area allocated for development. The laydown area would move as required while construction is underway.

The proposed facility would be accessed from the north via an existing unnamed gravel road. The detailed design of the proposed access and road upgrade requirements would be as per the recommendations of the Transport Impact Assessment, which is being undertaken as part of the environmental impact assessment process.

Application for grid connection will be made through a separate process and assessed accordingly. An on-site grid connection to integrate into the national network via a 132 kV or 275 kV line is under consideration.

## 1.2. THE PURPOSE OF THIS REPORT

An environmental site sensitivity report was generated for the project on 06/10/2022 using the Department of Forestry, Fisheries, and the Environment (DFFE) National Web-Based Environmental Screening Tool. Based on the environmental sensitivities of the proposed development footprint, the screening tool suggested the following specialist assessment for inclusion in the EIA report:

- Avian Impact Assessment.

The assessment must be compiled in accordance with the requirements of the *Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes when Applying for EA* (GN R320 of 2020) and comply with the following gazetted protocol, which replaces the requirements of Appendix 6 of the EIA Regulations, 2014 (as amended) in terms of NEMA:

- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species, published in GN 1150 of 30 October 2020.

According to the above-mentioned protocol, the report must follow the Species Environmental Assessment Guidelines (SANBI, 2020), which prescribes the Best Practice Guidelines: Birds & Solar Energy (Jenkins *et al.*, 2017) for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa, established by BirdLife South Africa and the Wildlife and Energy Programme of the Endangered Wildlife Trust (EWT).

This Report covers **Stage 1** of the methodology prescribed by the Guidelines and entails the Preliminary Avifaunal Assessment as well as a Site Sensitivity Verification of the DFFE Environmental Screening Report outcomes.

## 1.3. TERMS OF REFERENCE

The overall Terms of Reference were to:

- Undertake a field survey of the greater study area (~1 110 ha) to identify and map areas of opportunity and constraint within the property to inform the location and layout of the PV facility.
- Compile a photographic record of the characteristics of the greater study area, including major habitats and sensitive areas.
- Compile a Preliminary Avifaunal Assessment Report (this Report) that provides an overview of the ecological context, likely impacts, and potential red flags to development, from an avifaunal perspective.
- Provide maps and shapefiles based on the findings, to identify a potential development footprint.
- Include a Site Sensitivity Verification of the DFFE Environmental Screening Report outcomes in the Preliminary Report.
- Conduct avifaunal baseline data collection within the greater study area according to the applicable sampling regime for the development site as specified by the Best Practice Guidelines for Birds & Solar Energy (Jenkins *et al.*, 2017).
- Assess the significance of the potential impact of the proposed project alternatives and related activities – with and without mitigation – on avifaunal species and communities (with regards to

potential disturbance, displacement, habitat loss and mortality through collision), including consideration of the spatial and temporal extent of these impacts.

- Compile an Avifaunal Impact Assessment Report according to the Best Practice Guidelines for Birds & Solar Energy (Jenkins *et al.*, 2017).
- Inform actions that should be taken to prevent or, if prevention is not feasible, to mitigate negative impacts during the planning, construction, and operational phases of the development.

This report covers the Preliminary Avifaunal Assessment for the Ndau 1 PV SEF only.

## 2. METHODOLOGY

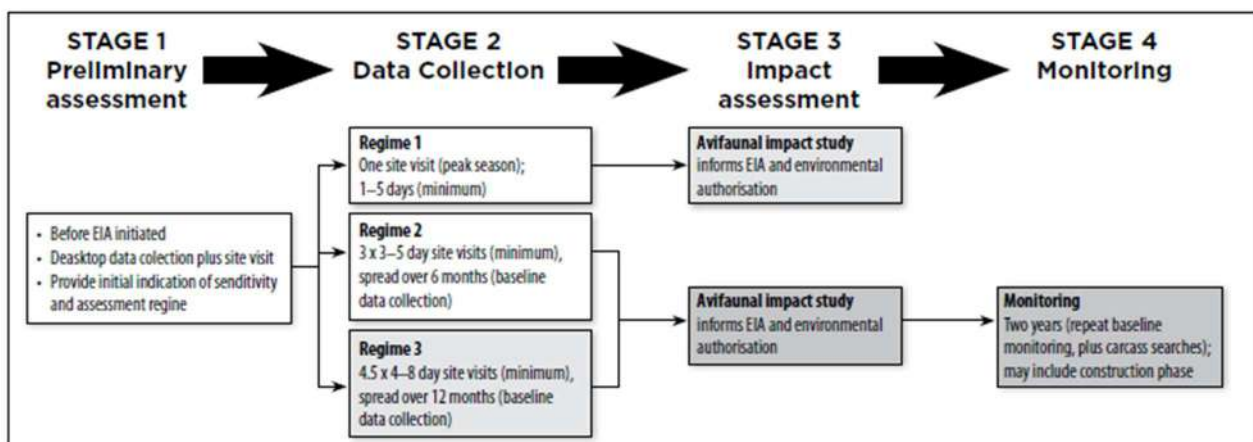
The solar energy industry is expanding rapidly in southern Africa, and the nature and implications of potential negative effects on birds, through the destruction of habitat, the displacement of populations from preferred habitat, and collision and burn mortality associated with the solar infrastructure, are poorly understood. To fully understand and avoid and minimise the possible impacts of solar energy on the region’s birds, it is essential that sufficient, project- and site-specific data are gathered to both inform the avifaunal impact assessment process and build our understanding of the impacts and potential mitigation measures (Jenkins *et al.*, 2017). According to the Best Practice Guidelines: Birds & Solar Energy (Jenkins *et al.*, 2017) for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa, an avifaunal impact assessment for SEFs must follow a tiered process that follows pre-determined stages depending on the conditions of the site:

**Stage 1 – Preliminary Assessment:** part of planning for an EIA application (i.e. pre-application). This provides an overview of the ecological context, likely impacts and potential red flags to development, identify alternatives and determine the appropriate assessment regime.

**Stage 2 – Data Collection:** an in-depth study including structured and repeated data collection on which to base the impact assessment report and provide a baseline against which post-construction monitoring can be compared.

**Stage 3 – Impact Assessment:** informed by the data collected during Stage 2.

**Stage 4 – Monitoring and Mitigation:** during construction and post-construction monitoring to inform mitigation, informed by the data collected during Stage 2 (regime 2 and 3 only).



**This document reports information and results for stage 1.**

## 2.1. STAGE 1: PRELIMINARY ASSESSMENT

According to Jenkins *et al.* (2017) the preliminary assessment should yield a preliminary avifaunal assessment report, which describes the relative sensitivity of the study area, highlights any red flags to development, and determines whether additional baseline data collection is necessary to fully inform the Avifaunal Impact Assessment Report. The preliminary assessment is based on desk-top review and a site survey conducted over the entire ~1 110 ha property in the summer season from the 13<sup>th</sup> to the 16<sup>th</sup> of December 2022. The findings are incorporated into a report aimed to characterise the greater study area in terms of habitats present, the overall site sensitivity, and delineate areas that are potentially highly sensitive and no-go areas that may need to be avoided by the development. Preliminary assessment of impacts and general recommendations are also provided.

Prior to the site visit, a comprehensive list of bird species occurring in the area was compiled using electronic databases within Roberts VII Multimedia Birds of Southern Africa (SA Birding, 2011) where distribution maps have been interpreted and updated from the Atlas of Southern African Birds (Harrison *et al.*, 1997). The search was confined to the quarter degree grid cell (QDGC) in which the study area falls (i.e. atlas area of 15' × 15' – roughly 24 × 27 km) to get a comprehensive list of species for the region. The data was supplemented with current Southern African Bird Atlas Project 2 (SABAP2, 2022) data, which is recorded per pentad (a 5' x 5' coordinate spatial grid reference – one QDGC comprises of nine pentads). Species of conservation concern (SCC) that could potentially occur in the greater study area were noted and their habitat requirements determined by consulting the relevant literature. Bird names follow Hockey *et al.* (2005) while conservation status follows Taylor *et al.* (2015). Other online databases such as Co-ordinated Wetland Counts (CWAC), Co-ordinated Avifaunal Road Counts (CAR), Birds in Reserves Project (BIRP), Global Biodiversity Information Facility (GBIF), and iNaturalist were searched for avifaunal SCC potentially occurring in the area.

Survey techniques included on-site meander searches, observations for priority species, and focussed counts at habitats such as wetlands, dams, and koppies. During meander searches through the study area, changes in land cover and habitat, as well as avifauna present in the study area were observed and recorded. Landscape features that were considered of high ecological importance were mapped.

## 3. DESKTOP ASSESSMENT RESULTS

### 3.1. STUDY AREA

#### 3.1.1. LOCATION

The greater study area is located ~23 km north-east of the town of Mokopane and ~27 km south-west of the city of Polokwane along the N1 highway, within the Polokwane Local Municipality in the Capricorn District of Limpopo Province (**Figure 1**). The greater study area encompasses ~1 110 ha with a preliminary buildable area (Ndau 1 Project Area) selected following a desktop screening assessment calculated at ~191 ha. A proposed development footprint calculated at ~136 ha has been selected within this project area.

The Ndau 1 project area occurs within Portion 19 of the Remaining Extent of the Farm Rietvley 13. The site falls within Quarter Degree Grid Cell (QDGC) 2429AA and lies between 24°02'38.90" and 24°03'22.18" south and 29°12'50.45" and 29°13'54.98" east. The study area is gently undulating with a range in altitude from around 1421 to 1496 m above mean sea level (a.m.s.l.).

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### 3.1.2. CLIMATE

The study area lies in the north-eastern parts of the country with warm summer rainfall and cool, dry winters. The region receives approximately 600 mm of rain per year, with the highest rainfall occurring in December / January and the lowest falling in July. Maximum temperatures for Polokwane reach around 33°C in summer and minimum temperatures can drop to 5°C in winter (Mucina and Rutherford, 2006).

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### 3.1.3. LAND USES OF THE STUDY AREA AND SURROUNDING

The landscape of the area is rural in nature with the greater study area comprised mostly of natural savanna bushveld vegetation used predominantly for cattle and wildlife grazing. A few drainage lines cross the study area, which are severely eroded in places, and a few farm dams and small impoundments occur on the drainage lines (**Figure 2**). Modified areas within the greater study area are few and include farm buildings, dirt roads, a railway line (which crosses the southern section of the farm in an east-west orientation), a small sub-station, and a high voltage power line servitude, which traverses the land in a north-westerly direction. Another power line servitude occurs on the north-western boundary.

The surrounding areas to the north, east, and south comprise privately owned land with natural bushveld used for cattle and wildlife grazing. The Percy Fyfe Nature Reserve, which is also comprised of natural savanna bushveld and granite outcrops, occurs adjacent to the site on the west side (**Figure 3**). A number of mountainous ridges occur ~2.5 km to the south and ~6.4 km to the east of the study area. The N1 highway, and the R101 regional road occur ~350 m and ~3 km respectively to the south-east of the site (**Figure 3**).

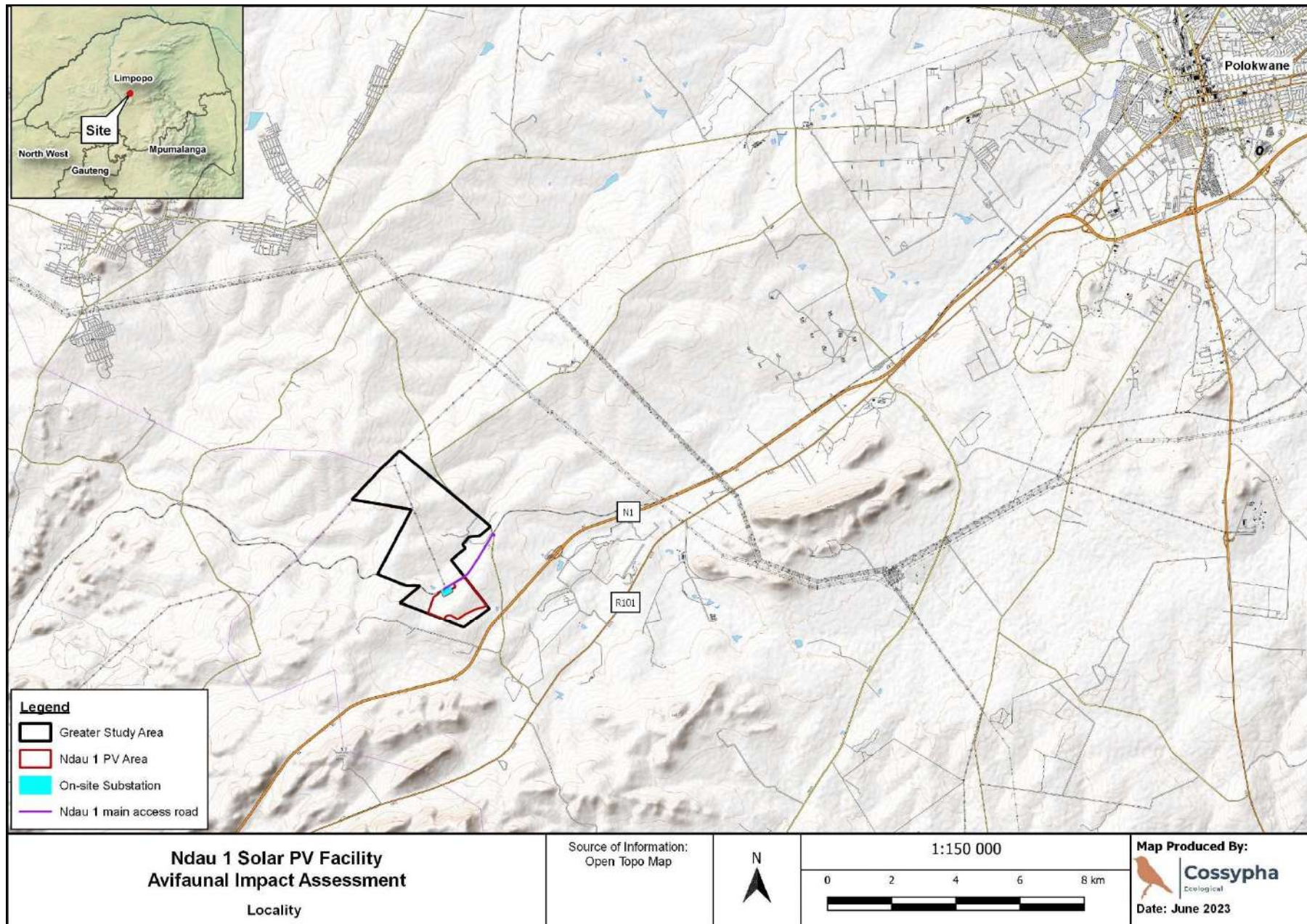


Figure 1: Location of the greater study area and the proposed Ndaou 2 PV SEF

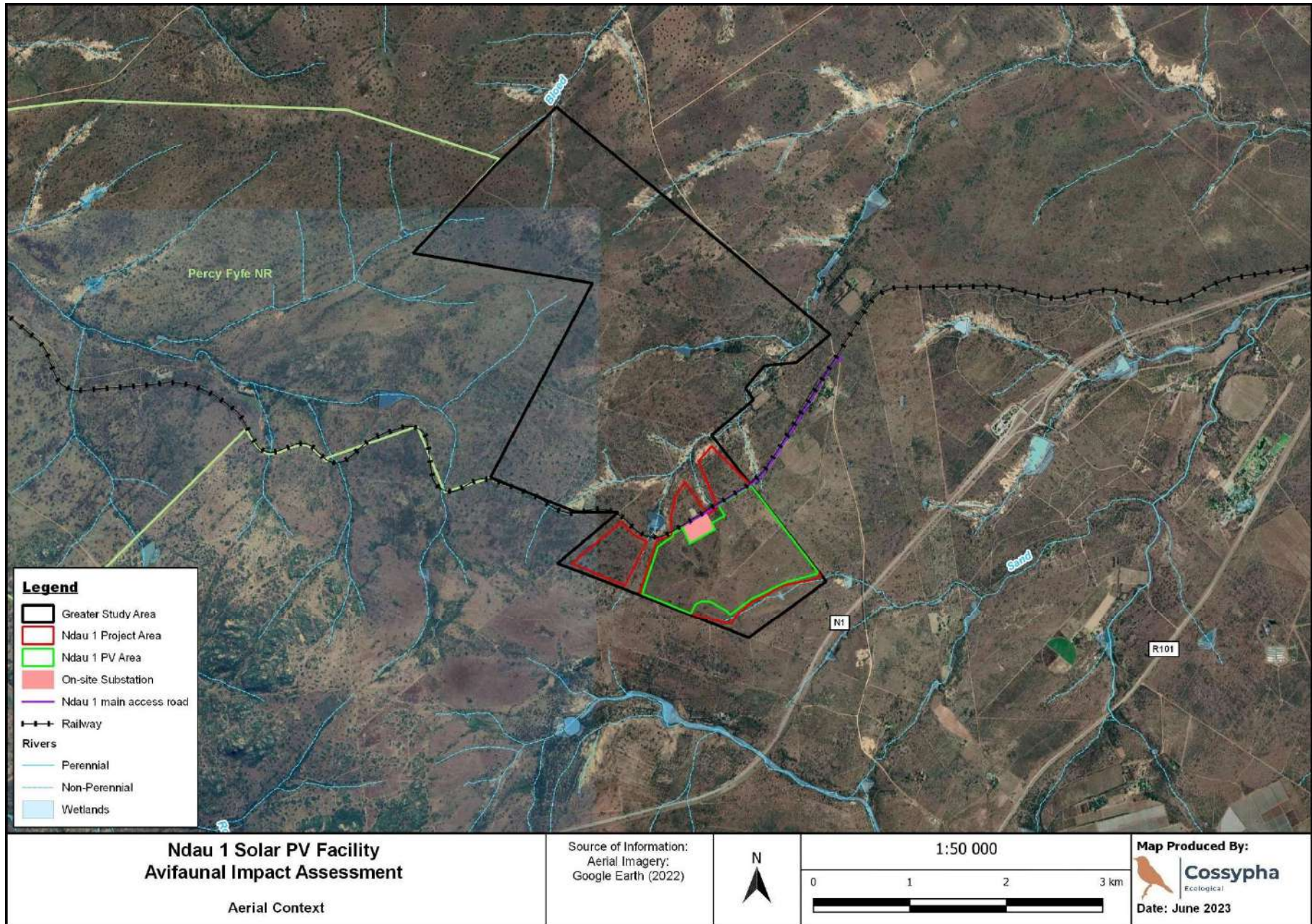


Figure 2: Aerial overview of the greater study area and surrounds

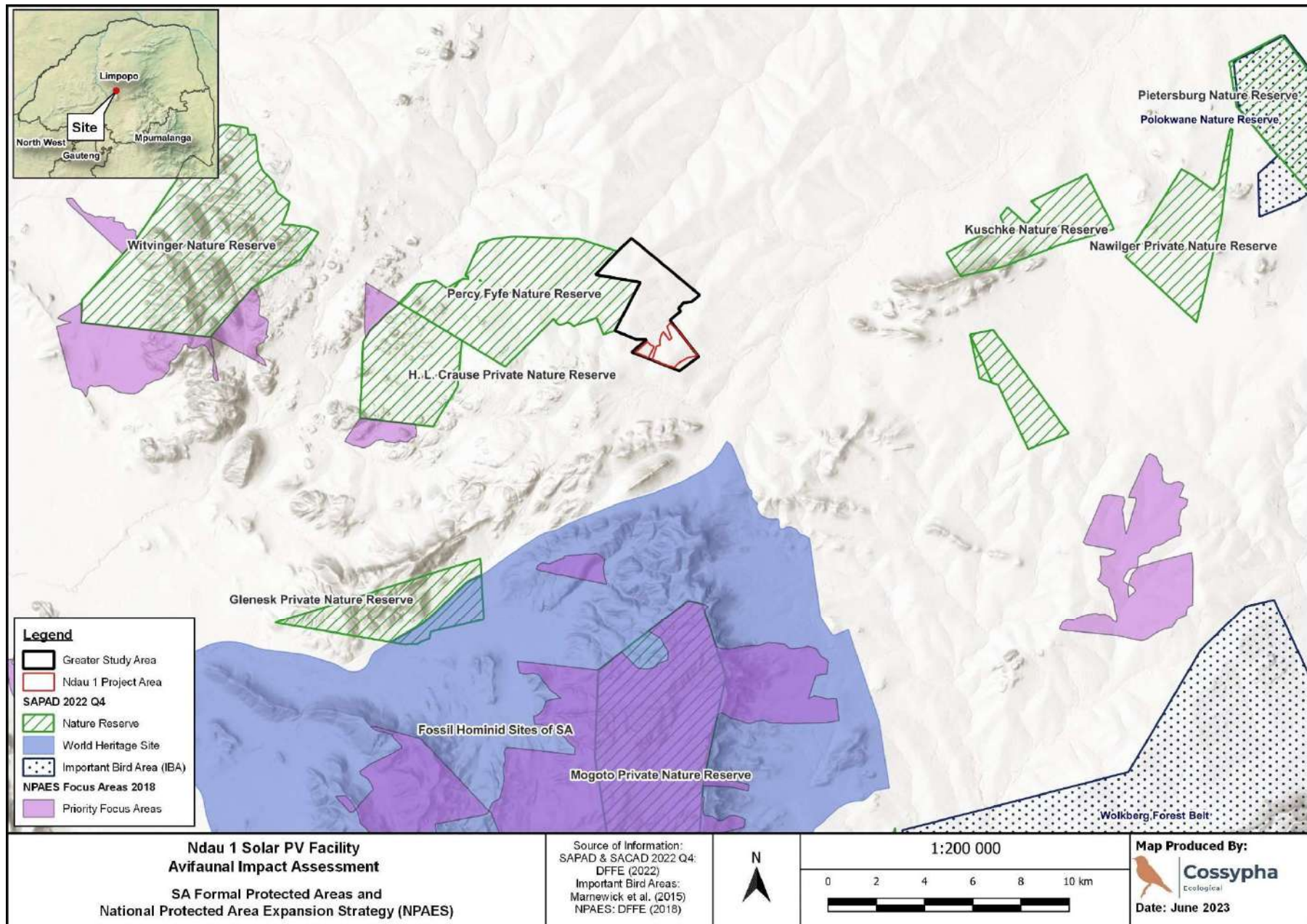


Figure 3: The greater study area and the Nda 1 project area in relation to national Protected Areas



### 3.2. DISTRIBUTION OF AVIFAUNA IN THE STUDY AREA

The region is high in avifaunal diversity with around 414 bird species known to occur within the QDGC (an atlas area of 15' × 15' – roughly 24 × 27 km) that the greater study area falls within, according to the distribution maps in Roberts VII Multimedia Birds of Southern Africa (SA Birding, 2011). Approximately 95% of the total species in the QDGCs are associated with a savanna / farmland mosaic, including rocky areas, and inland water habitats, which is the character of the study area. This demonstrates that the available habitats within the greater study area are able to support the majority of bird species found within the QDGC.

The Southern African Bird Atlas Project (SABAP2) has been collecting data since 2007 and includes data from the previous SABAP1 (1987-1991). SABAP2 aims to map the distribution and relative abundance of birds in southern Africa. SABAP2 data is recorded per pentad (a 5' × 5' coordinate spatial grid reference and a subset of the QDGC – one QDGC comprises of nine pentads. 5' × 5' = roughly 8 × 9 km) and therefore represents a more focussed search. Reporting rates are expressed as a percentage of the number of times a species was seen in a pentad divided by the number of times the pentad was surveyed. According to SABAP2 data, 178 species have been recorded in the pentad in which the greater study area falls (pentad 2400\_2910), three of which are species of conservation concern (SCC) and 22 are endemic to southern Africa.

Priority species in terms of sensitivity to solar PV energy development impacts include any Red List (SCC) and range-restricted species, small passerines that congregate in large numbers, and large-bodied species such as waterfowl, herons, gamebirds, and raptors (including owls and vultures) (Jenkins *et al.*, 2017). Error! Not a valid bookmark self-reference. lists priority species that have been recorded within the pentad, as well as the SABAP2 reporting rate. The higher the reporting rate, the higher the likelihood of the species occurring in the study area if suitable habitat exists.

**Table 1: Avifaunal priority species occurring within pentad 2400\_2910 including Reporting Rate (RR). Birds listed in red are SCC and those in green are endemic to southern Africa**

Common Name	Scientific Name	Priority Species	Threat Status (RSA / IUCN)	SABAP2 RR (%)
Coqui Francolin	<i>Peliperdix coqui</i>	Gamebird	LC / LC	25
Crested Francolin	<i>Dendroperdix sephaena</i>	Gamebird	LC / LC	69.8
Natal Spurfowl	<i>Pternistis natalensis</i>	Gamebird	LC / LC	58.1
Swainson's Spurfowl	<i>Pternistis swainsonii</i>	Gamebird	LC / LC	79.1
Helmeted Guineafowl	<i>Numida meleagris</i>	Gamebird	LC / LC	95.3
Egyptian Goose	<i>Alopochen aegyptiaca</i>	Waterfowl	LC / LC	72.1
Red-billed Teal	<i>Anas erythrorhyncha</i>	Waterfowl	LC / LC	55.8
European Roller	<i>Coracias garrulus</i>	SCC	NT / LC	12.5
Common Moorhen	<i>Gallinula chloropus</i>	Waterfowl	LC / LC	72.1
Lesser Moorhen	<i>Paragallinula angulata</i>	Waterfowl	LC / LC	12.5
Red-knobbed Coot	<i>Fulica cristata</i>	Waterfowl	LC / LC	11.6
Spotted Thick-knee	<i>Burhinus capensis</i>	Waterfowl	LC / LC	14
Blacksmith Lapwing	<i>Vanellus armatus</i>	Waterfowl	LC / LC	93
African Wattled Lapwing	<i>Vanellus senegallus</i>	Waterfowl	LC / LC	48.8
Crowned Lapwing	<i>Vanellus coronatus</i>	Waterfowl	LC / LC	53.5
Black-shouldered Kite	<i>Elanus caeruleus</i>	Raptor	LC / LC	76.7
Yellow-billed Kite	<i>Milvus aegyptius</i>	Raptor	LC / LC	12.5
African Fish-Eagle	<i>Haliaeetus vocifer</i>	Raptor	LC / LC	41.9

Common Name	Scientific Name	Priority Species	Threat Status (RSA / IUCN)	SABAP2 RR (%)
Cape Vulture	<i>Gyps coprotheres</i>	SCC	EN / VU	72.1
Black-chested Snake-Eagle	<i>Circaetus pectoralis</i>	Raptor	LC / LC	37.5
Brown Snake-Eagle	<i>Circaetus cinereus</i>	Raptor	LC / LC	7
Gabar Goshawk	<i>Micronisus gabar</i>	Raptor	LC / LC	30.2
Steppe Buzzard	<i>Buteo buteo</i>	Raptor	LC / LC	50
Wahlberg's Eagle	<i>Hieraaetus wahlbergi</i>	Raptor	LC / LC	2.3
African Hawk-eagle	<i>Aquila spilogaster</i>	Raptor	LC / LC	7
Long-crested Eagle	<i>Lophaetus occipitalis</i>	Raptor	LC / LC	27.9
Greater Kestrel	<i>Falco rupicoloides</i>	Raptor	LC / LC	0
Amur Falcon	<i>Falco amurensis</i>	Raptor	LC / LC	25
Little Grebe	<i>Tachybaptus ruficollis</i>	Waterfowl	LC / LC	46.5
Reed Cormorant	<i>Microcarbo africanus</i>	Waterfowl	LC / LC	37.5
Grey Heron	<i>Ardea cinerea</i>	Waterfowl	LC / LC	51.2
Black-headed Heron	<i>Ardea melanocephala</i>	Waterfowl	LC / LC	76.7
Cattle Egret	<i>Bubulcus ibis</i>	Waterfowl	LC / LC	83.7
Green-backed Heron	<i>Butorides striata</i>	Waterfowl	LC / LC	12.5
Hamerkop	<i>Scopus umbretta</i>	Waterfowl	LC / LC	25
Hadeda Ibis	<i>Bostrychia hagedash</i>	Gamebird	LC / LC	81.4
White Stork	<i>Ciconia ciconia</i>	Gamebird	LC / LC	12.5
Marabou Stork	<i>Leptoptilos crumenifer</i>	SCC	NT / LC	83.7
Cape Sparrow	<i>Passer melanurus</i>	Gregarious Passerine	LC / LC	72.1
Southern Grey-headed Sparrow	<i>Passer diffusus</i>	Gregarious Passerine	LC / LC	87.5
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	Gregarious Passerine	LC / LC	95.3
Lesser Masked-weaver	<i>Ploceus intermedius</i>	Gregarious Passerine	LC / LC	12.5
Cape Weaver	<i>Ploceus capensis</i>	Gregarious Passerine	LC / LC	25
Southern Masked-Weaver	<i>Ploceus velatus</i>	Gregarious Passerine	LC / LC	87.5
Village Weaver	<i>Ploceus cucullatus</i>	Gregarious Passerine	LC / LC	32.6
Red-billed Quelea	<i>Quelea quelea</i>	Gregarious Passerine	LC / LC	69.8
Yellow-crowned Bishop	<i>Euplectes afer</i>	Gregarious Passerine	LC / LC	12.5
Southern Red Bishop	<i>Euplectes orix</i>	Gregarious Passerine	LC / LC	53.5
White-winged Widowbird	<i>Euplectes albonotatus</i>	Gregarious Passerine	LC / LC	50
Red-billed Firefinch	<i>Lagonosticta senegala</i>	Gregarious Passerine	LC / LC	41.9
African Firefinch	<i>Lagonosticta rubricata</i>	Gregarious Passerine	LC / LC	12.5
Jameson's Firefinch	<i>Lagonosticta rhodopareia</i>	Gregarious Passerine	LC / LC	18.6
Blue Waxbill	<i>Uraeginthus angolensis</i>	Gregarious Passerine	LC / LC	100
Violet-eared Waxbill	<i>Granatina granatina</i>	Gregarious Passerine	LC / LC	37.5
Common Waxbill	<i>Estrilda astrild</i>	Gregarious Passerine	LC / LC	62.8
Black-faced Waxbill	<i>Brunhilda erythronotos</i>	Gregarious Passerine	LC / LC	50
African Quailfinch	<i>Ortygospiza atricollis</i>	Gregarious Passerine	LC / LC	41.9
Bronze Mannikin	<i>Spermestes cucullata</i>	Gregarious Passerine	LC / LC	25
Pin-tailed Whydah	<i>Vidua macroura</i>	Gregarious Passerine	LC / LC	48.8
Black-throated Canary	<i>Crithagra atrogularis</i>	Gregarious Passerine	LC / LC	65.1
Yellow-fronted Canary	<i>Crithagra mozambica</i>	Gregarious Passerine	LC / LC	79.1

EN = Endangered; NT = Near Threatened; LC = Least Concern

\*Non-breeding migrant

## 4. FIELD RESULTS

### 4.1. SITE DESCRIPTION

The Ndau 1 project area occurs within the southern portion of an active farm comprised of natural bushveld used predominantly for grazing cattle and wildlife. Stocked wildlife such as Greater Kudu *Tragelaphus strepsiceros*, Impala *Aepyceros melampus*, and Burchell's Zebra *Equus quagga burchellii* occur in the northern sections of the farm (north of the railway line), while only small, naturally occurring species (such as Steenbok) and cattle utilise the portion south of the railway line.



**The greater study area is comprised mostly of natural bushveld**

The Ndau 1 project area is comprised predominantly of natural bushveld, which has been disturbed in the past by bush clearing or ploughing or farming activities including cattle grazing. The bushveld has been left to regenerate is characterised by open bushveld with a more dominant grassy layer and patches or clumps of trees (**Figure 4**). A watercourse, which is a tributary of the Sand River (which occurs further to the east), occurs in the southern portion of the site that feeds a series of small farm dams. A few smaller impoundments and wetlands occur around the study area, while a relatively large farm dam occurs to the north of the site (on the northern side of the railway line). A small rocky outcrop occurs on the southern boundary of the site.



## Open grassy bushveld in the Ndau 1 project area with the rocky outcrop in the foreground

### 4.2. AVIFAUNAL HABITATS IN THE STUDY AREA AND SURROUNDS

The most important habitats for avifauna occurring in the Ndau 1 project area include the natural bushveld vegetation, the small farm dams situated on the drainage lines associated with the Sand River, and the rocky outcrop on the southern boundary. The extensive natural bushveld vegetation in the study area and surroundings supports the terrestrial species found in the region, including priority species such as gamebirds, raptors, and gregarious passerines. The natural bushveld in the general study area can be split into categories depending on the level of disturbance experienced in the past. The bushveld found on the Ndau 1 site is relatively disturbed by past bush clearing and grazing activities, however, does not appear to have been ploughed in the past. This open grassy bushveld is the main habitat for the avifauna on the site.



Disturbed, open, grassy bushveld on the Ndau 1 PV SEF site

Certain features within the bushveld vegetation provide habitat heterogeneity and variation within the vegetation structure. These include rocky patches scattered around the farm, the small rocky outcrop on the southern border (**Figure 4**). These features represent important natural habitat for birds in the study area and provide habitat heterogeneity to the landscape facilitating species diversity.



Small rocky outcrop on the southern boundary of the site

The farm dams and wetlands provide important habitat for waterfowl and other wetland associated species. The wet areas provide surface water and hygrophilous vegetation such as sedges and restios that attract birds such as egrets, herons, and ducks etc., as well as tall, dense vegetation for wetland nesting species such as bishops and widowbirds.

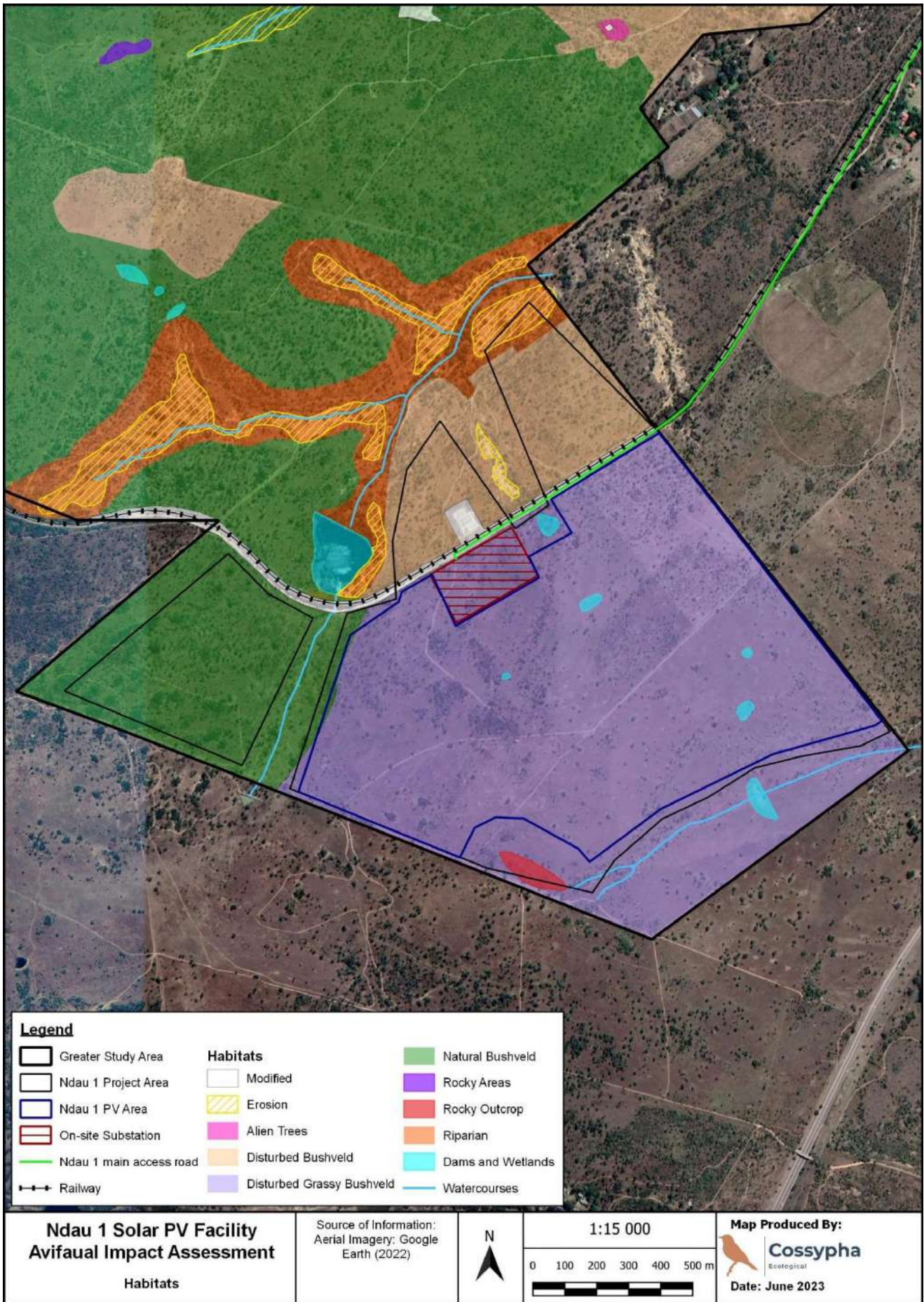


Figure 4: Habitat features of the Ndau 1 project area

### 4.3. BIRD SPECIES OCCURRENCE IN THE STUDY AREA

#### 4.3.1. BIRD OBSERVATIONS

The site was diverse with bird life with 131 species recorded on the site and immediate surrounding areas during the preliminary field survey. Birds were identified either by direct observation (sighting and/or call) or by field signs such as tracks or feathers. These are listed in **Appendix A** along with their national (Taylor *et al.*, 2015) and global (IUCN Red List of Threatened Species, 2022) conservation status.

Bird species observed in the general study area included mainly typical bushveld savanna species such as francolin, barbets, hornbills, shrikes, tchagras, robin-chats, babblers, prinias, waxbills, and many raptors. A few species more typical of grassland habitats such as cisticolas, pipits, longclaw, quelea, and widowbirds were observed in the southern and northern parts of the farm where the habitat is more open. Many generalist species such as doves, guinea fowl, lapwings, canaries, and sparrows were also recorded in and around the study area. Birds recorded at the dams and wetlands included White-faced Duck *Dendrocygna viduata*, Yellow-billed Duck *Anas undulata*, Red-billed Teal *Anas erythrorhyncha*, Egyptian Goose *Alopochen aegyptiaca*, Spur-winged Goose *Plectropterus gambensis*, Little Grebe *Tachybaptus ruficollis*, Red-knobbed Coot *Fulica cristata*, Lesser Moorhen *Gallinula angulata*, Reed Cormorant *Microcarbo africanus*, Grey Heron *Ardea cinerea*, Little Egret *Egretta garzetta*, and Hamerkop *Scopus umbrette*.



Some of the bird species recorded in the study area (top left to bottom right) Southern Yellow-billed Hornbill (*Tockus leucomelas*), Sabota Lark (*Calendulauda sabota*), European Roller (*Coracias garrulus*), Bushveld Pipit (*Anthus caffer*), White-faced Whistling Duck (*Dendrocygna viduata*), and Zitting Cisticola (*Cisticola juncidis*)

#### 4.3.2. BIRDS OF CONSERVATION CONCERN

Bird SCC observed during the preliminary field survey included White-backed Vulture *Gyps africanus*, which is currently listed as Critically Endangered (CR) at the national level and global level, and Lanner Falcon *Falco biarmicus*, which is currently listed as Vulnerable (VU) at a national level. White-backed Vulture were recorded circling over-head and one was observed sitting on a power line on the northern boundary of the greater study area. European Roller *Coracias garrulus*, which is a non-breeding migrant to the area that is currently listed as Near Threatened (NT) at a national level and global level was also recorded in the greater study area. In addition, 17 species that are endemic to the southern African region were recorded in and around the study area.



White-backed Vulture *Gyps africanus* recorded on a power line on the northern border of the greater study area

#### 4.3.3. PRIORITY SPECIES

Preliminary assessment of species recorded during the field surveys show that there are numerous bird species that may be susceptible to the impacts of solar PV development occurring in the greater study area and surrounds. These include large-bodied and ground-welling species such as francolin, spurfowl, waterfowl and other species that are attracted to waterbodies such as ducks, lapwings, and cormorants, and raptors such as kites, falcons, sparrowhawks, eagles, and vultures; and gregarious passerines such as finches, bishop, queleas, and widowbirds. These and other priority species recorded in the study area are listed in **Table 2** along with their national and global (IUCN) conservation status, and the type of species. Gamebirds, waterfowl, and raptors appear to make up the majority of the priority species recorded in the study area during the preliminary survey.



Some raptor species recorded in the study area (left to right) Black-shouldered Kite (*Elanus caeruleus*), Gabar Goshawk (*Micronisus gabar*), and African Hawk-Eagle (*Aquila spilogaster*)

Table 2: Priority species recorded in the greater study area listed in taxonomic order. SCC are highlighted in red and endemic species in green

Scientific Name	Common Name	National Status	Global Status	Type of Species
<i>Peliperdix coqui</i>	Coqui Francolin	LC	LC	Gamebird
<i>Dendroperdix sephaena</i>	Crested Francolin	LC	LC	Gamebird
<i>Scleroptila shelleyi</i>	Shelley's Francolin	LC	LC	Gamebird
<i>Pternistis natalensis</i>	Natal Spurfowl	LC; En	LC	Gamebird
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	LC; En	LC	Gamebird
<i>Coturnix coturnix</i>	Common Quail	LC	LC	Gamebird
<i>Numida meleagris</i>	Helmeted Guineafowl	LC	LC	Gamebird
<i>Dendrocygna viduata</i>	White-faced Duck	LC	LC	Waterfowl
<i>Alopochen aegyptiaca</i>	Egyptian Goose	LC	LC	Waterfowl

Scientific Name	Common Name	National Status	Global Status	Type of Species
<i>Plectropterus gambensis</i>	Spur-winged Goose	LC	LC	Waterfowl
<i>Sarkidiornis melanotos</i>	Comb Duck	LC	LC	Waterfowl
<i>Anas undulata</i>	Yellow-billed Duck	LC	LC	Waterfowl
<i>Anas erythrorhyncha</i>	Red-billed Teal	LC	LC	Waterfowl
<i>Coracias garrulus</i>	European Roller	NT; NBM	NT	SCC
<i>Gallinula angulata</i>	Lesser Moorhen	LC	LC	Waterfowl
<i>Fulica cristata</i>	Red-knobbed Coot	LC	LC	Waterfowl
<i>Burhinus capensis</i>	Spotted Thick-Knee	LC	LC	Waterfowl
<i>Vanellus armatus</i>	Blacksmith Lapwing	LC	LC	Waterfowl
<i>Vanellus senegallus</i>	African Wattled Lapwing	LC	LC	Waterfowl
<i>Vanellus coronatus</i>	Crowned Lapwing	LC	LC	Waterfowl
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC	LC	Raptor
<i>Milvus parasitus</i>	Yellow-billed Kite	LC	LC	Raptor
<i>Gyps africanus</i>	White-backed Vulture	CR	CR	SCC
<i>Polyboroides typus</i>	African Harrier-Hawk	LC	LC	Raptor
<i>Micronisus gabar</i>	Gabar Goshawk	LC	LC	Raptor
<i>Accipiter melanoleucus</i>	Black Sparrowhawk	LC	LC	Raptor
<i>Buteo buteo</i>	Steppe Buzzard	LC	LC	Raptor
<i>Hieraetus wahlbergi</i>	Wahlberg's Eagle	LC	LC	Raptor
<i>Aquila spilogaster</i>	African Hawk-Eagle	LC	LC	Raptor
<i>Hieraetus pennatus</i>	Booted Eagle	LC	LC	Raptor
<i>Falco biarmicus</i>	Lanner Falcon	VU	LC	SCC
<i>Tachybaptus ruficollis</i>	Little Grebe	LC	LC	Waterfowl
<i>Microcarbo africanus</i>	Reed Cormorant	LC	LC	Waterfowl
<i>Ardea cinerea</i>	Grey Heron	LC	LC	Waterfowl
<i>Scopus umbretta</i>	Hamerkop	LC	LC	Waterfowl
<i>Bostrychia hagedash</i>	Hadedda Ibis	LC	LC	Gamebird
<i>Passer melanurus</i>	Cape Sparrow	LC; En	LC	Gregarious Passerine
<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	LC; En	LC	Gregarious Passerine
<i>Plocepasser mahali</i>	White-browed Sparrow-Weaver	LC	LC	Gregarious Passerine
<i>Ploceus intermedius</i>	Lesser Masked-Weaver	LC	LC	Gregarious Passerine
<i>Ploceus velatus</i>	Southern Masked-Weaver	LC	LC	Gregarious Passerine
<i>Quelea quelea</i>	Red-billed Quelea	LC	LC	Gregarious Passerine
<i>Euplectes orix</i>	Southern Red Bishop	LC	LC	Gregarious Passerine
<i>Lagonosticta senegala</i>	Red-billed Firefinch	LC	LC	Gregarious Passerine
<i>Uraeginthus angolensis</i>	Blue Waxbill	LC	LC	Gregarious Passerine
<i>Uraeginthus granatinus</i>	Violet-eared Waxbill	LC	LC	Gregarious Passerine
<i>Estrilda astrild</i>	Common Waxbill	LC	LC	Gregarious Passerine
<i>Ortygospiza fuscocrissa</i>	African Quailfinch	LC	LC	Gregarious Passerine
<i>Vidua macroura</i>	Pin-tailed Whydah	LC	LC	Gregarious Passerine
<i>Crithagra atrogularis</i>	Black-throated Canary	LC	LC	Gregarious Passerine
<i>Crithagra mozambica</i>	Yellow-fronted Canary	LC	LC	Gregarious Passerine
<i>Crithagra flaviventris</i>	Yellow Canary	LC; En	LC	Gregarious Passerine

CR = Critically Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; En = Endemic; NBM = Non-breeding Migrant



#### 4.4. KEY HABITATS AND PRELIMINARY SITE SENSITIVITY

The extensive natural bushveld vegetation found in the greater study area to the north of the Ndau 1 site and in the surrounding areas supports the terrestrial species found in the region, including priority species such as gamebirds, raptors, and gregarious passerines. This vegetation is considered to be of medium sensitivity, with features that provide habitat heterogeneity and variation within the vegetation structure, such as rocky areas being highly sensitive. These relatively undisturbed areas should be avoided by the proposed development. The small, natural rocky outcrop on the southern boundary must be avoided with a 100 m buffer. The more disturbed, open bushveld on the Ndau 1 site in the southern sections of the greater study area is considered to be of low sensitivity and although provided habitat for some avifauna, is preferred for the development compared to the natural bushveld to the north (**Figure 5**).

Natural wetland areas and farm dams provide suitable habitat for waterfowl and other wetland associated species and are considered to be highly sensitive habitats that must also be avoided by the proposed development. The buffer specified by the wetland specialist must be applied in this case. Eroded riparian areas are highly sensitive to development and need rehabilitation, however are degraded habitat for birds. Clumps of alien trees are not favourable and should be cleared, however provide roosting and nesting sites for birds. These are considered to be of low sensitivity.

The adjacent Percy Fyfe Nature Reserve provides protected habitat for many priority species such as Cape Vulture *Gyps coprotheres* and it is recommended that a suitable buffer that remains undeveloped be applied along the western boundary of the site. The Species Environmental Assessment Guidelines (SANBI, 2020) recommend that for developments that produce low intensity disturbance, such as renewable energy projects (other than wind turbines and concentrated solar towers), a minimum buffer of 200 m should be applied for species such as breeding raptors within formally proclaimed conservation areas.

**Table 3: Summary of sensitivity categories**

Site Feature	Description and Recommendation	Sensitivity Rating
Wetlands, dams, watercourses, and riparian areas	Natural wetland areas and small farm dams that provide important habitat for fauna. No-go. Must be avoided by the development by the buffer specified by the wetland specialist	Very High
Rocky outcrop	Small, natural rocky outcrop on the southern boundary must be avoided with a 100m buffer	Very High
Eroded riparian areas	Eroded riparian areas are highly sensitive to development and need rehabilitation, however are degraded habitat for birds	High
Natural / Near-natural Bushveld	Natural bushveld that has been grazed to varying degrees but with no recent past (within the last ~30 years) disturbance such as clearing or ploughing. This extensive natural bushveld provides the main habitat for the avifauna found in the area	Medium
Disturbed Bushveld	Areas of natural bushveld that have been disturbed in the past by bush clearing or ploughing. These areas provide habitat for some avifauna, however, are preferred sites for the development compared to natural bushveld	Low
Alien Trees	Alien trees are not favourable and should be cleared, however provide roosting and nesting sites for birds	Low
Modified – farm buildings, roads, railway line, sub-station	Habitat that has been modified or transformed by farm activities, roads, and railway line. No natural vegetation occurs in these areas	Very Low

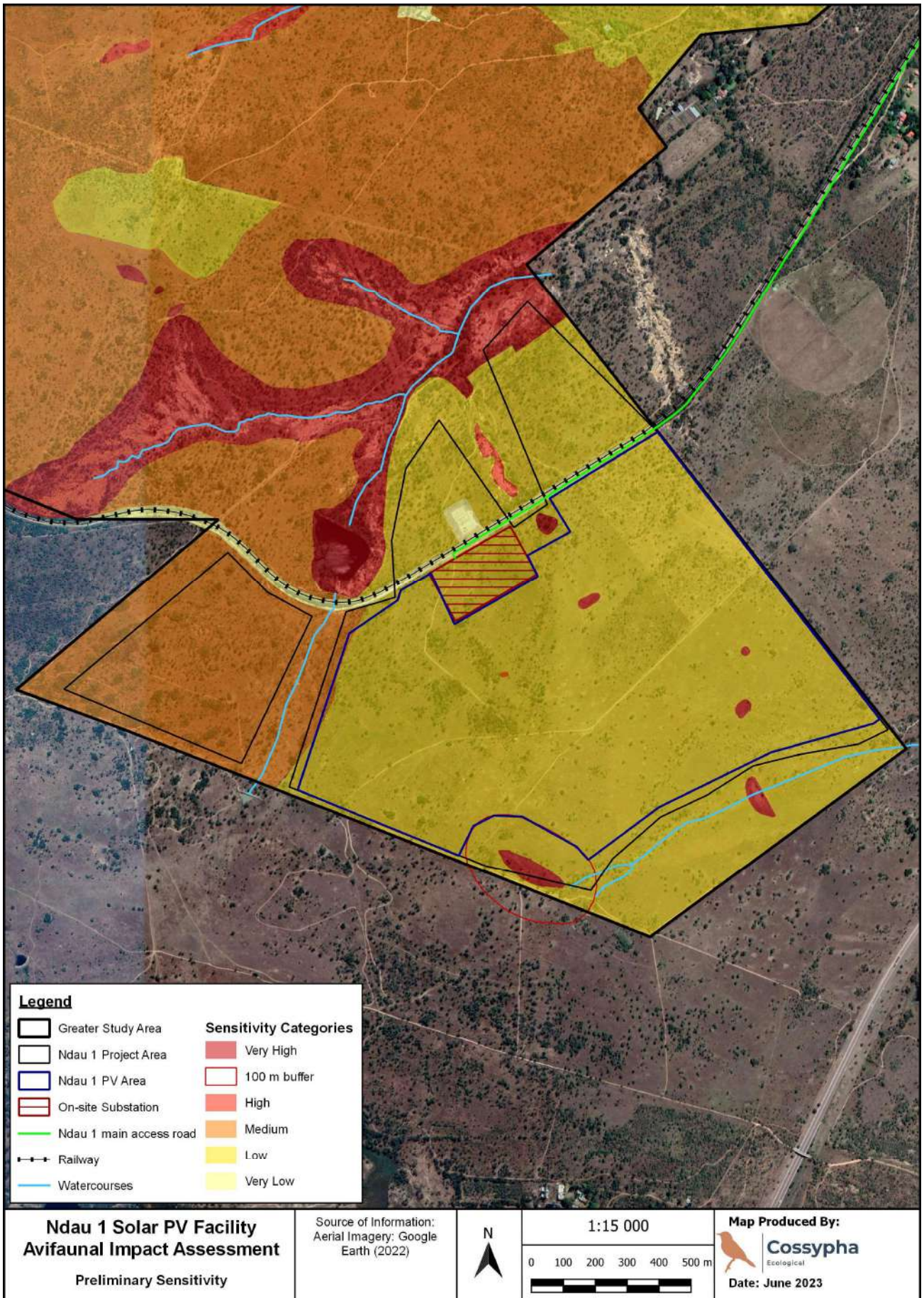


Figure 5: Preliminary avifaunal habitat sensitivity of the Ndau 1 project area

## 5. PRELIMINARY IMPACTS

The overall environmental impacts of solar energy developments are poorly understood globally. Unlike wind energy developments, there is presently no clear pattern in the types of birds negatively affected by solar plants, and collision casualties recorded to date include a wide variety of avian guilds (Jenkins *et al.*, 2017). Widely accepted impacts of solar PV include permanent habitat destruction, fragmentation, and the associated bird displacement (particularly for range restricted species), as well as collision with reflective panels as birds mistake large panel arrays for wetlands, otherwise known as the “lake effect” (Lovich and Ennen, 2011; Smit, 2012; DeVault *et al.*, 2014; Visser, 2016; Kosciuch *et al.*, 2020; Chock *et al.*, 2021). Other general impacts documented to date include noise and disturbance caused by construction activities, attraction of novel species through the creation of artificial nest sites and shade, and chemical pollution from panel cleaning (Lovich and Ennen, 2011; DeVault *et al.*, 2014; Chock *et al.*, 2021). The impacts of additional infrastructure associated with solar energy developments, such as roads, power lines, and substations, must also be considered. These include, habitat destruction, fragmentation, threat of collision, and electrocution (Jenkins *et al.*, 2017).

Possible impacts on avifauna during the construction and operational phases and their sources associated with the proposed development are provided in **Table 4**. The installation of the solar PV facility and ancillary infrastructure will require clearance of disturbed open bushveld habitat during the construction phase. While this vegetation is relatively disturbed, it appears to be in state of regeneration and does provide natural habitat for avifauna. The main impact relating to avifauna will therefore be loss of habitat and displacement of many terrestrial species including small passerines and larger game species. Nevertheless, the more disturbed bushveld in the southern section of the greater study area (where the proposed Ndau 1 site is located) is preferred for the development compared to natural bushveld to the north. Impacts on highly sensitive habitats can be avoided or minimised by the project layout avoiding areas classified as High and Very High sensitivity. Other possible direct impacts include possible collisions with panels and power lines during the operational phase. Possible indirect impacts include spread of invasive alien vegetation due to disturbance to the soil, and contamination of the soil from chemicals used in cleaning of the panels.

**Table 4: Possible impacts arising from the proposed development**

Possible Impact	Source of Impact	Area and Species to be Affected	Development Phase	Nature of Impact
Loss of vegetation and avifaunal habitat	Clearing vegetation for installation of solar panels, roads, and buildings	Near- natural bushveld; Terrestrial savanna species; Large-bodied, ground-dwelling gamebirds, raptors	Construction	Direct
Collision of avifauna with reflective surfaces of solar panels leading to injury or death	Solar panels perceived to be water body by avifauna	Solar PV development site; Gamebirds, waterfowl; raptors	Operation	Direct
Collision and/or electrocution of avifauna with associated power lines	Power lines	Power line route; Gamebirds, waterfowl; raptors	Operation	Direct
Contamination of the environment by hazardous materials	Cleaning of solar panels during operation	Solar PV development site; All species	Construction and Operation	Indirect
Spread of invasive alien plant species	Disturbance to soil and clearing of vegetation	Study area and surroundings	Construction	Indirect
Disturbance and displacement of resident bird species	Clearing of site and construction activities; Operational and maintenance activities;	Site and immediate surroundings; Small terrestrial species; Common ground-dwelling	Construction and Operation	Indirect

Possible Impact	Source of Impact	Area and Species to be Affected	Development Phase	Nature of Impact
	attraction of novel species	gamebirds		
Habitat fragmentation	Clearing vegetation and installation of solar panels, roads, and buildings	Study area	Operation	Indirect
Increased human disturbance; Gradual environmental degradation	<ul style="list-style-type: none"> <li>Disturbance to the study area, adding to existing pressures in the landscape (farming)</li> <li>Adding to cumulative pressures in the landscape caused by other approved or proposed renewable energy projects</li> </ul>	Study area and surrounding natural areas	Operation	Cumulative

## 6. SUMMARY AND PRE-CONSTRUCTION MONITORING REQUIREMENTS

The greater study area is mostly comprised of natural bushveld that represents the most important habitat for birds in the study area and is considered to be of medium sensitivity (according to the preliminary assessment). The site for the proposed Nda 1 PV SEF is located within more disturbed, open bushveld that is considered to be of low sensitivity. There are key habitats in the greater study area that are considered highly sensitive. These include wetlands, dams, and rocky areas. As such, the nature of the landscape supports many priority species (bird species that may be susceptible to the impacts of solar PV development), which have been confirmed to occur in the greater study area and surrounds. It is therefore important to conduct pre-construction monitoring according to the Best Practice Guidelines: Birds & Solar Energy (Jenkins *et al.*, 2017) for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa. This will take the avifaunal assessment to **Stage 2 – Data Collection**, which includes structured and repeated data collection on which to base the impact assessment report and provide a baseline against which post-construction monitoring can be compared. The duration and scope of data collection is guided by the size of the proposed development (> 150 ha / >50 MW) and the results of the preliminary assessment, which verifies the sensitivity of avifauna potentially affected by the proposed development. For the Nda 1 site assessment **Regime 2** is appropriate (refer to

**Table 5** for large solar facilities), and sampling over a minimum of two seasons must be conducted, with one survey falling within the peak (summer) season.

Based on the habitats observed in the project area and surrounds, the following sampling must be incorporated into the data collection for each season:

- Abundance estimates for small terrestrial birds through point count or walked linear transect surveys.
- Counts for large terrestrial birds and raptors, through driven road transects and vantage point monitoring.
- Flight behaviour of priority species flying over or near the proposed development area and associated risk of collision.
- Bird numbers at focal wetlands such as the farm dams and local movements between waterbodies.
- Details of any incidental sightings of priority species.

Table 5: Recommended avifaunal assessment regimes (Jenkins *et al.*, 2017)

Type	Size	Avifaunal Sensitivity*		
		Low	Medium	High
All solar technologies except Concentrated Solar Power (CSP)	Small (<30 ha / <10 MW)	<b>Regime 1</b> One site visit of 1-5 days	<b>Regime 1</b> One site visit of 1-5 days	<b>Regime 2</b> 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches
	Medium (30-150 ha / 10-50 MW)	<b>Regime 1</b> One site visit of 1-5 days	<b>Regime 2</b> 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches	<b>Regime 2</b> 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches
	Large (>150 ha / >50 MW)	<b>Regime 2</b> 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches	<b>Regime 2</b> 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches	<b>Regime 3</b> 4-5 seasonal visits of 4-8 days over 12 months Pre- & post-con monitoring mortality searches
CSP	All	<b>Regime 3</b> 4-5 seasonal visits of 4-8 days over 12 months Pre- & post-con monitoring mortality searches		

\* The avifaunal sensitivity is based on the number of priority species present, or potentially present, the regional, national, or global importance of the affected area for these species (both individually and collectively), and the perceived susceptibility of these species (both individually and collectively) to the anticipated impacts of development

## 7. RECOMMENDATIONS

The following recommendations are intended to guide the preliminary positioning of the proposed infrastructure and layout:

- A suitable buffer for the Percy Fyfe Nature Reserve must be applied with no infrastructure being placed within a certain distance of the border of the site. As no information regarding a buffer zone is contained within the management plan for the reserve, this will need to be discussed with the Conservation Authorities. The Species Environmental Assessment Guidelines (SANBI, 2020) recommend that for developments that produce low intensity disturbance, such as renewable energy projects (other than wind turbines and concentrated solar towers), a minimum buffer of 200 m should be applied for species such as breeding raptors within formally proclaimed conservation areas. The proposed site for the Ndau 1 PV SEF does adequately avoid the 200 m buffer for the Nature Reserve.
- All drainage lines, wetlands, and dams must be avoided, including the buffer recommended by the aquatic and/or wetland specialist.
- The southern section of the project area, i.e. south of the railway line, appears to be the most suitable area for placement of the proposed infrastructure. The proposed site for the Ndau 1 PV SEF does fall within this area.

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## 9. APPENDICES

### APPENDIX A: SPECIES LIST

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
1	<i>Peliperdix coqui</i>	Coqui Francolin	LC	LC
2	<i>Dendroperdix sephaena</i>	Crested Francolin	LC	LC
3	<i>Scleroptila shelleyi</i>	Shelley's Francolin	LC	LC
4	<i>Pternistis natalensis</i>	Natal Spurfowl	LC; En	LC
5	<i>Pternistis swainsonii</i>	Swainson's Spurfowl	LC; En	LC
6	<i>Coturnix coturnix</i>	Common Quail	LC	LC
7	<i>Numida meleagris</i>	Helmeted Guineafowl	LC	LC
8	<i>Dendrocygna viduata</i>	White-faced Duck	LC	LC
9	<i>Alopochen aegyptiaca</i>	Egyptian Goose	LC	LC
10	<i>Plectropterus gambensis</i>	Spur-winged Goose	LC	LC
11	<i>Sarkidiornis melanotos</i>	Comb Duck	LC	LC
12	<i>Anas undulata</i>	Yellow-billed Duck	LC	LC
13	<i>Anas erythrorhyncha</i>	Red-billed Teal	LC	LC
14	<i>Indicator indicator</i>	Greater Honeyguide	LC	LC
15	<i>Campethera abingoni</i>	Golden-tailed Woodpecker	LC	LC
16	<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	LC; En	LC
17	<i>Lybius torquatus</i>	Black-collared Barbet	LC	LC
18	<i>Trachyphonus vaillantii</i>	Crested Barbet	LC	LC
19	<i>Tockus leucomelas</i>	Southern Yellow-billed Hornbill	LC; En	LC
20	<i>Upupa africana</i>	African Hoopoe	LC	LC
21	<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe	LC	LC
22	<i>Coracias garrulus</i>	European Roller	NT; NBM	NT
23	<i>Halcyon senegalensis</i>	Woodland Kingfisher	LC	LC
24	<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	LC	LC
25	<i>Merops apiaster</i>	European Bee-Eater	LC	LC
26	<i>Urocolius indicus</i>	Red-faced Mousebird	LC	LC
27	<i>Clamator jacobinus</i>	Jacobin Cuckoo	LC	LC
28	<i>Clamator levallantii</i>	Levallant's Cuckoo	LC	LC
29	<i>Cuculus solitarius</i>	Red-chested Cuckoo	LC	LC
30	<i>Cuculus clamosus</i>	Black Cuckoo	LC	LC
31	<i>Chrysococcyx caprius</i>	Diederik Cuckoo	LC	LC
32	<i>Centropus burchellii</i>	Burchell's Coucal	LC	LC
33	<i>Cypsiurus parvus</i>	African Palm-Swift	LC	LC
34	<i>Apus caffer</i>	White-rumped Swift	LC	LC
35	<i>Corythaixoides concolor</i>	Grey Go-Away-Bird	LC	LC
36	<i>Spilopelia senegalensis</i>	Laughing dove	LC	LC
37	<i>Streptopelia capicola</i>	Cape Turtle-Dove	LC	LC
38	<i>Streptopelia semitorquata</i>	Red-eyed Dove	LC	LC
39	<i>Turtur chalcospilos</i>	Emerald-Spotted Wood-Dove	LC	LC

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
40	<i>Gallinula angulata</i>	Lesser Moorhen	LC	LC
41	<i>Fulica cristata</i>	Red-knobbed Coot	LC	LC
42	<i>Burhinus capensis</i>	Spotted Thick-Knee	LC	LC
43	<i>Vanellus armatus</i>	Blacksmith Lapwing	LC	LC
44	<i>Vanellus senegallus</i>	African Wattled Lapwing	LC	LC
45	<i>Vanellus coronatus</i>	Crowned Lapwing	LC	LC
46	<i>Elanus caeruleus</i>	Black-shouldered Kite	LC	LC
47	<i>Milvus parasitus</i>	Yellow-billed Kite	LC	LC
48	<i>Gyps africanus</i>	White-backed Vulture	CR	CR
49	<i>Polyboroides typus</i>	African Harrier-Hawk	LC	LC
50	<i>Micronisus gabar</i>	Gabar Goshawk	LC	LC
51	<i>Accipiter melanoleucus</i>	Black Sparrowhawk	LC	LC
52	<i>Buteo buteo</i>	Steppe Buzzard	LC	LC
53	<i>Hieraetus wahlbergi</i>	Wahlberg's Eagle	LC	LC
54	<i>Aquila spilogaster</i>	African Hawk-Eagle	LC	LC
55	<i>Hieraetus pennatus</i>	Booted Eagle	LC	LC
56	<i>Falco biarmicus</i>	Lanner Falcon	VU	LC
57	<i>Tachybaptus ruficollis</i>	Little Grebe	LC	LC
58	<i>Microcarbo africanus</i>	Reed Cormorant	LC	LC
59	<i>Ardea cinerea</i>	Grey Heron	LC	LC
60	<i>Scopus umbretta</i>	Hamerkop	LC	LC
61	<i>Bostrychia hagedash</i>	Hadeda Ibis	LC	LC
62	<i>Lanius collurio</i>	Red-backed Shrike	LC	LC
63	<i>Lanius collaris</i>	Common Fiscal	LC	LC
64	<i>Urolestes melanoleucus</i>	Magpie Shrike	LC	LC
65	<i>Corvus albus</i>	Pied Crow	LC	LC
66	<i>Oriolus larvatus</i>	Black-headed Oriole	LC	LC
67	<i>Campephaga flava</i>	Black Cuckooshrike	LC	LC
68	<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	LC	LC
69	<i>Nilaus afer</i>	Brubru	LC	LC
70	<i>Dryoscopus cubla</i>	Black-backed Puffback	LC	LC
71	<i>Tchagra senegalus</i>	Black-crowned Tchagra	LC	LC
72	<i>Laniarius ferrugineus</i>	Southern Boubou	LC; En	LC
73	<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike	LC; En	LC
74	<i>Chlorophoneus sulfureopectus</i>	Orange-breasted Bush-Shrike	LC	LC
75	<i>Malaconotus blanchoti</i>	Grey-headed Bush-Shrike	LC	LC
76	<i>Batis molitor</i>	Chin-spot Batis	LC	LC
77	<i>Psophocichla litsitsirupa</i>	Groundscraper Thrush	LC	LC
78	<i>Bradornis mariquensis</i>	Marico Flycatcher	LC; En	LC
79	<i>Melaenornis pammelaina</i>	Southern Black Flycatcher	LC	LC
80	<i>Muscicapa striata</i>	Spotted Flycatcher	LC	LC
81	<i>Cossypha caffra</i>	Cape Robin-Chat	LC	LC

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
82	<i>Cossypha humeralis</i>	White-throated Robin-Chat	LC; En	LC
83	<i>Erythropygia leucophrys</i>	White-browed Scrub-Robin	LC	LC
84	<i>Onychognathus morio</i>	Red-winged Starling	LC	LC
85	<i>Lamprotornis nitens</i>	Cape Glossy Starling	LC	LC
86	<i>Parus niger</i>	Southern Black Tit	LC	LC
87	<i>Parus cinerascens</i>	Ashy Tit	LC; En	LC
88	<i>Hirundo rustica</i>	Barn Swallow	LC	LC
89	<i>Hirundo albigularis</i>	White-throated Swallow	LC	LC
90	<i>Cecropis semirufa</i>	Red-breasted Swallow	LC	LC
91	<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	LC	LC
92	<i>Andropadus importunus</i>	Sombre Greenbul	LC	LC
93	<i>Cisticola chiniana</i>	Rattling Cisticola	LC	LC
94	<i>Cisticola fulvicapilla</i>	Neddicky	LC	LC
95	<i>Cisticola juncidis</i>	Zitting Cisticola	LC	LC
96	<i>Cisticola aridulus</i>	Desert Cisticola	LC	LC
97	<i>Prinia subflava</i>	Tawny-flanked Prinia	LC	LC
98	<i>Prinia flavicans</i>	Black-chested Prinia	LC; En	LC
99	<i>Apalis flavida</i>	Yellow-breasted Apalis	LC	LC
100	<i>Camaroptera brevicaudata</i>	Grey-backed Camaroptera	LC	LC
101	<i>Zosterops capensis</i>	Cape White-eye	LC; En	LC
102	<i>Eremomela icteropygialis</i>	Yellow-bellied Eremomela	LC	LC
103	<i>Sylvietta rufescens</i>	Long-billed Crombec	LC	LC
104	<i>Phylloscopus trochilus</i>	Willow Warbler	LC	LC
105	<i>Turdoides jardineii</i>	Arrow-marked Babbler	LC	LC
106	<i>Curruca subcoerulea</i>	Chestnut-vented Tit-Babbler	LC; En	LC
107	<i>Mirafraga africana</i>	Rufous-naped Lark	LC	LC
108	<i>Calendulauda sabota</i>	Sabota Lark	LC; En	LC
109	<i>Cinnyris talatala</i>	White-bellied Sunbird	LC	LC
110	<i>Cinnyris mariquensis</i>	Marico Sunbird	LC	LC
111	<i>Passer melanurus</i>	Cape Sparrow	LC; En	LC
112	<i>Macronyx capensis</i>	Cape Longclaw	LC; En	LC
113	<i>Anthus cinnamomeus</i>	African Pipit	LC	LC
114	<i>Anthus caffer</i>	Bushveld Pipit	LC	LC
115	<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	LC; En	LC
116	<i>Plocepasser mahali</i>	White-browed Sparrow-Weaver	LC	LC
117	<i>Ploceus intermedius</i>	Lesser Masked-Weaver	LC	LC
118	<i>Ploceus velatus</i>	Southern Masked-Weaver	LC	LC
119	<i>Quelea quelea</i>	Red-billed Quelea	LC	LC
120	<i>Euplectes orix</i>	Southern Red Bishop	LC	LC
121	<i>Pytilia melba</i>	Green-winged Pytilia	LC	LC
122	<i>Lagonosticta senegala</i>	Red-billed Firefinch	LC	LC
123	<i>Uraeginthus angolensis</i>	Blue Waxbill	LC	LC

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
124	<i>Uraeginthus granatinus</i>	Violet-eared Waxbill	LC	LC
125	<i>Estrilda astrild</i>	Common Waxbill	LC	LC
126	<i>Ortygospiza fuscocrissa</i>	African Quailfinch	LC	LC
127	<i>Vidua macroura</i>	Pin-tailed Whydah	LC	LC
128	<i>Crithagra atrogularis</i>	Black-throated Canary	LC	LC
129	<i>Crithagra mozambica</i>	Yellow-fronted Canary	LC	LC
130	<i>Crithagra flaviventris</i>	Yellow Canary	LC; En	LC
131	<i>Emberiza flaviventris</i>	Golden-breasted Bunting	LC	LC

CR = Critically Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; En = Endemic; NBM = Non-breeding Migrant

## APPENDIX B: ABRIDGED CV OF THE SPECIALIST

Name and Surname	:	Robyn Phillips
Date of Birth	:	28 08 1975
Company Name	:	Cossypha Ecological
Field of Expertise	:	Terrestrial Ecologist and Avifaunal Specialist
SACNASP Registration	:	<i>Pr.Sci.Nat.</i> 400401/12 (Zoological and Ecological Sciences)
Highest Qualification	:	MSc (Zoology) <i>cum laude</i>
Years of Experience	:	21
Contact Number	:	084 695 1648
Email	:	robyn@cossypha.co.za

The first half of my professional career was spent working in ecological research at the University of KwaZulu-Natal. Since starting in consulting in 2011, I have been involved in many projects requiring biodiversity surveys and ecological assessments as part of the legislated requirements for the Environmental Impact Assessment (EIA) process. These studies include field assessment of habitat, species occurrence (especially those of conservation concern), assessment of ecological importance and sensitivity of floral and faunal communities and habitat, as well as assessment of impacts. Tasks also include making recommendations and prescribing mitigation measures after applying the mitigation hierarchy, aimed at minimising impacts.

Following is a selection of similar projects undertaken:

- Terrestrial Biodiversity and Faunal Assessment for the proposed Springhaas Solar Cluster Development and Grid Connection near Dealesville, Free State (GIBB Environmental) – 2021 to present
- Avifaunal Impact Assessment, Terrestrial Fauna Compliance Statement, and Terrestrial Biodiversity Impact Assessment for the proposed Oceana 10 MW Solar PV Facility near St Helena Bay, Western Cape (SRK) – 2021 to present.
- Terrestrial Biodiversity (including fauna and flora) and Avifaunal Impact Assessment for the Waterkloof Solar IPP Programme, North West (GIBB Environmental) – 2020 to 2021.
- Avifaunal Assessment for the Proposed Development of a Battery Energy Storage System (BESS) and Associated Infrastructure at the Cuprum Substation located at Copperton, near the town of Prieska, Northern Cape Province (AECOM) – 2021.
- Terrestrial Biodiversity Assessment (including flora and fauna) for the KwaZulu-Natal Automotive Supplier Park (ASP) and Township Establishment, including power lines, Illovo South, Durban, KwaZulu-Natal (Dube TradePort) – 2018 to 2021.
- Terrestrial Biodiversity Assessment (including flora, fauna, and avifauna) for the Askham Solar Energy Facility, Northern Cape (Komani San) – 2018 to 2019.
- Avifaunal Assessment for the Westgate and Randfontein Power lines, Gauteng (Eskom) – 2017.
- Terrestrial Biodiversity (fauna) and Avifaunal Assessment for the Teebus Hydroscheme: Bulhoek Power Line, Eastern Cape (Eskom) – 2016 to 2017
- Terrestrial Biodiversity (fauna) and Avifaunal Assessment for the Ngqeleni Rural Electrification Project, Eastern Cape (Eskom) – 2016.
- Faunal and Avifaunal Assessments for various solar farms in the Northern Cape (SEF) – 2011 to 2012.
- Strategic Environmental Assessments (avifaunal sensitivity) of the Polokwane, Tzaneen, and Nelspruit-Kanyamazane Eskom Field Service Areas Networks, Limpopo and Mpumalanga (Eskom) – 2011.