

**Proposed ABO Nyala Solar Energy Facility 2 and
associated infrastructure in the Thabazimbi Local
Municipality, Waterberg District, Limpopo Province**

**Preliminary Avifaunal Assessment &
Site Sensitivity Verification**

Project Reference: 220707A_Ndau & Nyala S&EIA

Compiled for



June 2023

REPORT PRODUCTION

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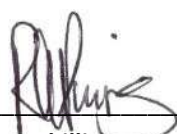
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SPECIALIST DECLARATION OF INDEPENDENCE

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
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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 Nyala Solar Energy Facility 2 (Pty) Ltd proposes to develop the Nyala 2 photovoltaic (PV) solar energy generation facility (SEF) and associated infrastructure near the town of Northam in Thabazimbi Local Municipality, Waterberg District. 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 Nyala 2 PV SEF is located on the Remaining Extent of the Farm De Deur 419 KQ and Portion 2 of the Farm De Deur 419 KQ about 4.2 km north-east of Northam within the Limpopo Province and will have up to 120 MWac in capacity. The site is located within the International Strategic Transmission Corridor. Following a desktop screening assessment, a project area of around 261 ha was identified within a greater study area of ~1 739 ha. Within this project area, a development footprint calculated at ~114 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 8 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. Two access roads are proposed; 1) a primary road which will allow for access from the west and 2) a construction road which will access the site at the same access point but from the north. The detail design of the proposed accesses 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. Connecting via a new overhead line to a nearby substation or a loop-in-loop-out (LILO) connection on neighbouring land into an existing 132 kV overhead line are alternatives under consideration.

1.2. THE PURPOSE OF THIS REPORT

An environmental site sensitivity report was generated for the project on 14/07/2022 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 (~1 739 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 Nyala 2 PV SEF only.

2. METHODOLOGY

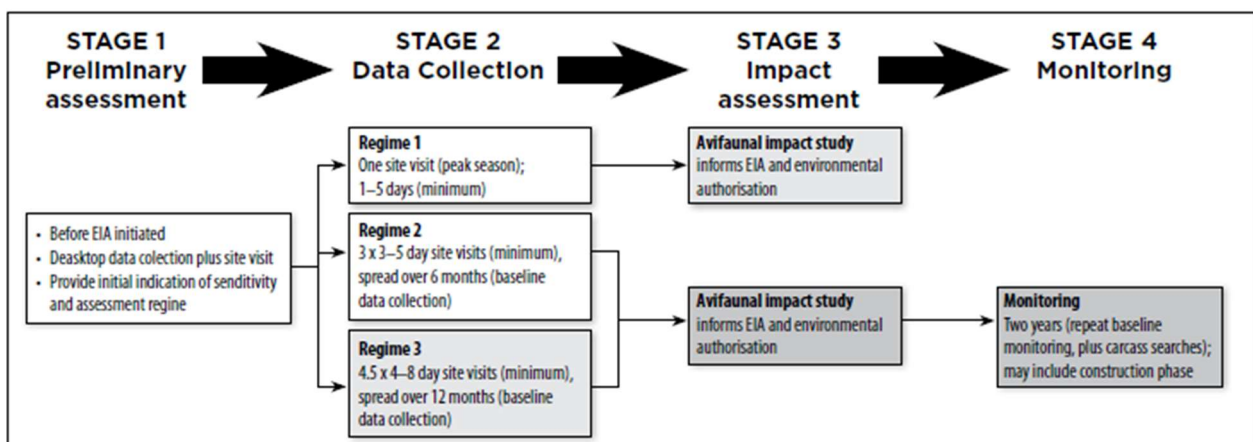
The solar energy industry is expanding rapidly in southern Africa, and the nature and implications of potential negative effects on birds, through the destruction of habitat, the displacement of populations from preferred habitat, and collision and burn mortality associated with the solar infrastructure, 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 for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa (Jenkins *et al.*, 2017), an avifaunal impact assessment for a solar energy facility (SEF) 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 ~1 739 ha property in the summer season from the 6th to the 10th of February 2023. 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' × 5' coordinate spatial grid reference – one QDGC comprises of nine pentads). Species of conservation concern (SCC) that could potentially occur in the 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 on-site and in the surroundings. 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 Nyala 2 site is located on the east side of the regional route R510 to the north-east of the town of Northam within the Thabazimbi Local Municipality in the Waterberg District of Limpopo Province (**Figure 1**). The greater study area encompasses ~1 739 ha with a preliminary buildable area (Nyala 2 Project Area) selected following a desktop screening assessment calculated at ~261 ha. A proposed development footprint calculated at ~114 ha has been selected within this project area.

The Nyala 2 project area occurs on the Remaining Extent of the Farm De Deur 419 KQ and Portion 2 of the Farm De Deur 419 KQ. The site falls within Quarter Degree Grid Cell (QDGC) 2427CD and lies between 24°54'32.60" and 24°56'11.85" south and 27°17'53.61" and 27°19'10.94" east. The greater study area is relatively flat with a range in altitude from around 1007 m to 1016 m above mean sea level (a.m.s.l).

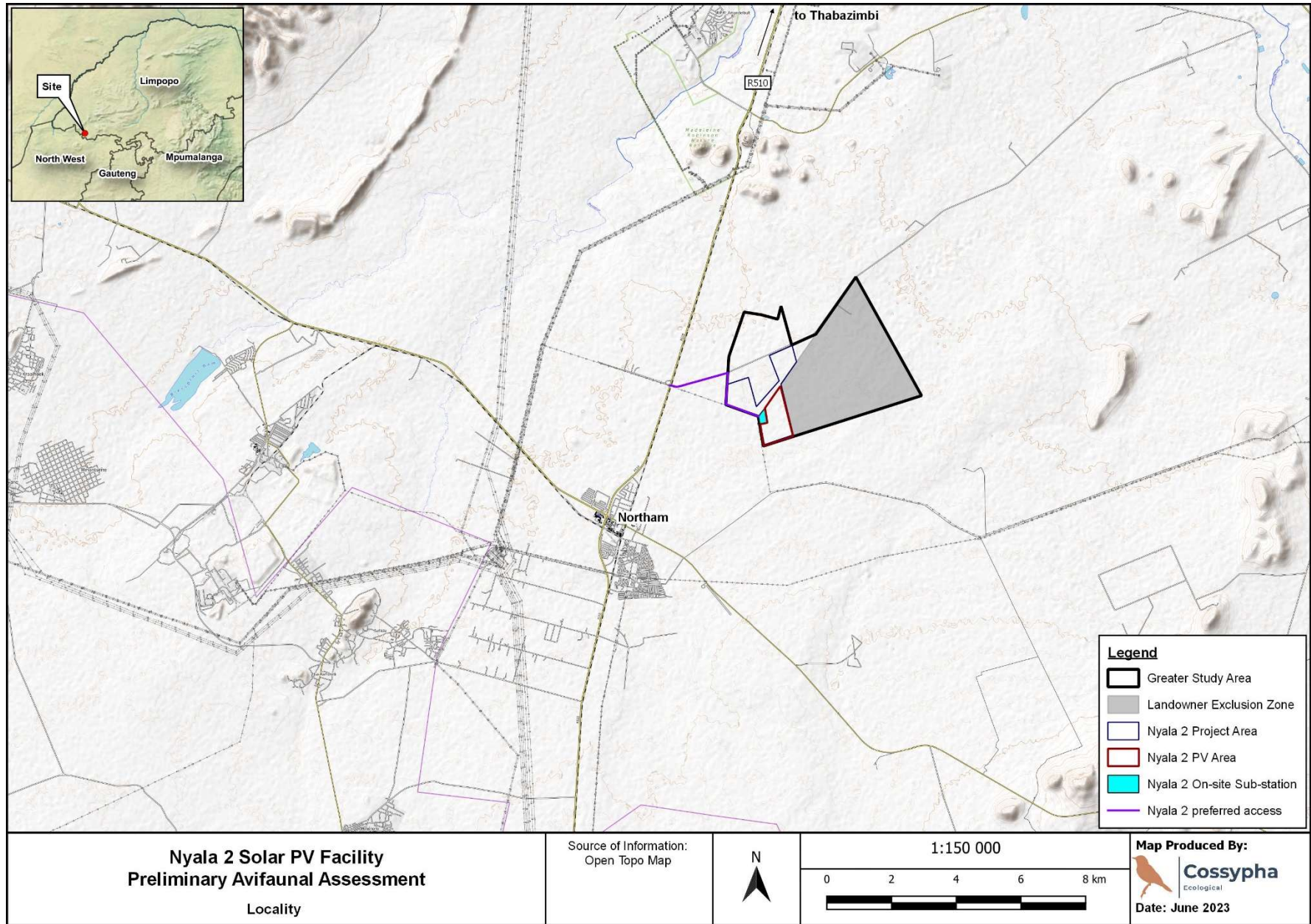


Figure 1: Location of the greater study area, Nyala 2 Project Area, and the proposed Nyala 2 PV SEF

3.1.2. CLIMATE

The study area lies in the north-eastern parts of the country with warm summer rainfall and cool, very dry winters. The region receives between 500 and 600 mm of rain per year, with the highest rainfall occurring in December / January and the lowest in June / July. Maximum temperatures for Northam reach around 38°C during the day in summer and minimum temperatures can drop below 0°C overnight in winter when frost is fairly frequent (Mucina and Rutherford, 2006).

3.1.3. LAND USES OF THE STUDY AREA AND SURROUNDING

The landscape of the greater study area is rural in nature comprised of a farmland mosaic where cultivated fields are interspersed with natural thornveld, with rocky koppies and ridges occurring in the extreme north. The town of Northam and associated residential areas occur ~4.2 km to the south-east of the site. Extensive cultivated fields (predominantly sunflowers) occur to the north of the site, with mostly natural thornveld to the south, east and west. High voltage power line servitudes that form part of the possible grid connection corridors are situated to the west of the site, and the regional road the R510 is situated ~3 km to the west (**Figure 2**).

The surrounding areas are comprised of privately owned land with natural thornveld used for cattle and wildlife grazing and cultivated fields. The areas to the east of the Nyala 2 project area are mostly comprised of natural thornveld habitat and are part of the Angassii Game Farm (game and hunting area), which forms part of the greater study area. Two guesthouses also occur in the vicinity of the site. The Leeuwkopje Private Nature Reserve occurs ~3 km to the west and the Sharpe, Koerooi, and Tortoiseshell Private Nature Reserves occur ~4 km to the east of the site (**Figure 3**).

The greater study area also falls within the Northern Turf Thornveld Important Bird Area (IBA SA009), which consists of a group of privately owned farms used for wheat, maize, sunflower, and livestock farming with some natural patches of thornveld scattered throughout the farmland (**Figure 3**). This Sub-regional IBA was declared under Category C1 (nationally threatened species) and is currently unprotected. The area holds the core of the remaining resident South African population of Yellow-throated Sandgrouse *Pterocles gutturalis* (Near Threatened). The sandgrouse inhabit short, open grassy thornveld, fallow fields, and recently burnt veld, particularly on relatively moist, cotton-clay-like soils, usually near seasonal rivers or swamps, or on seasonal flood plains (Tarboton et al., 1999; Marnewick et al., 2015).

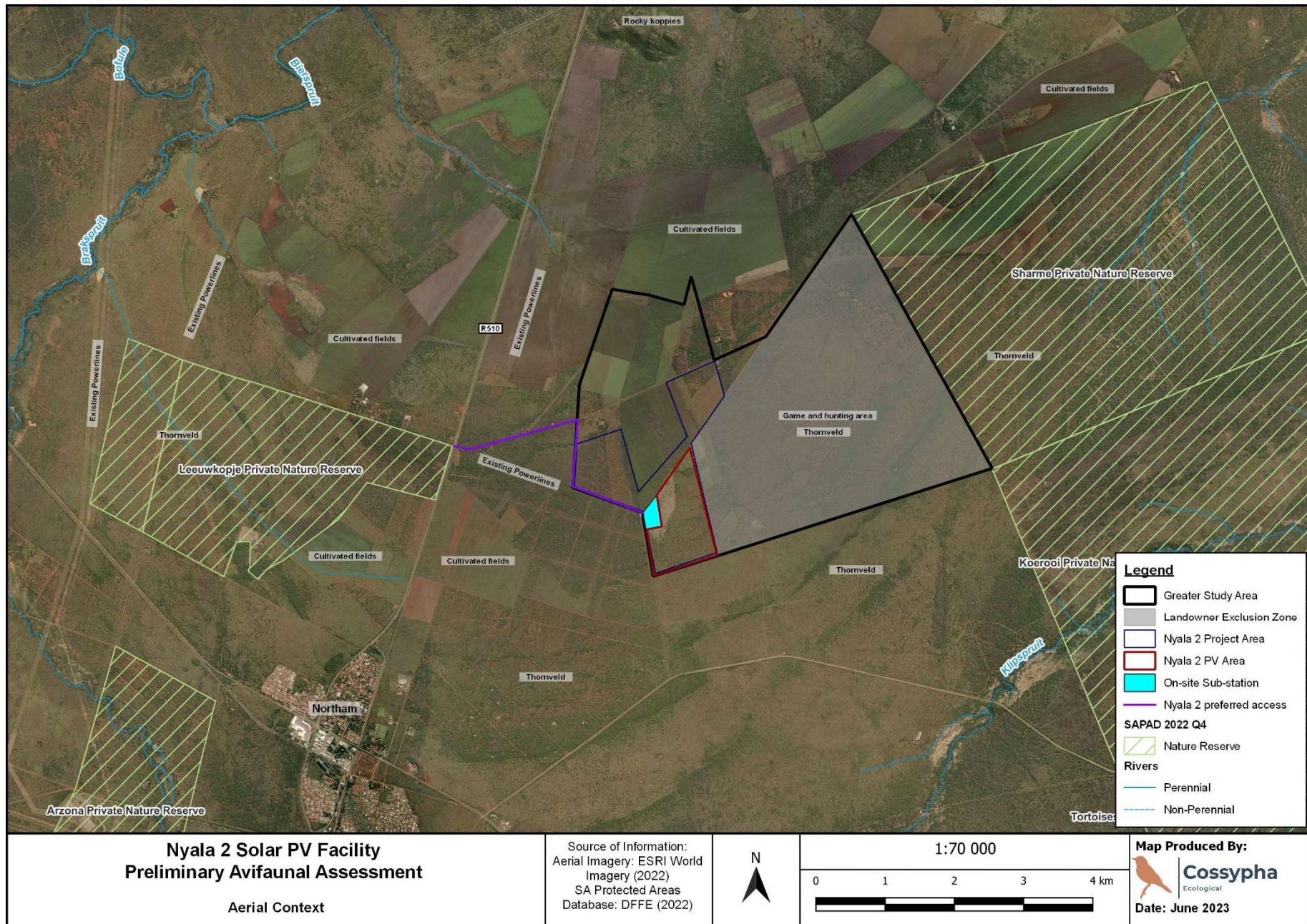


Figure 2: Aerial overview of the greater study area and surrounds

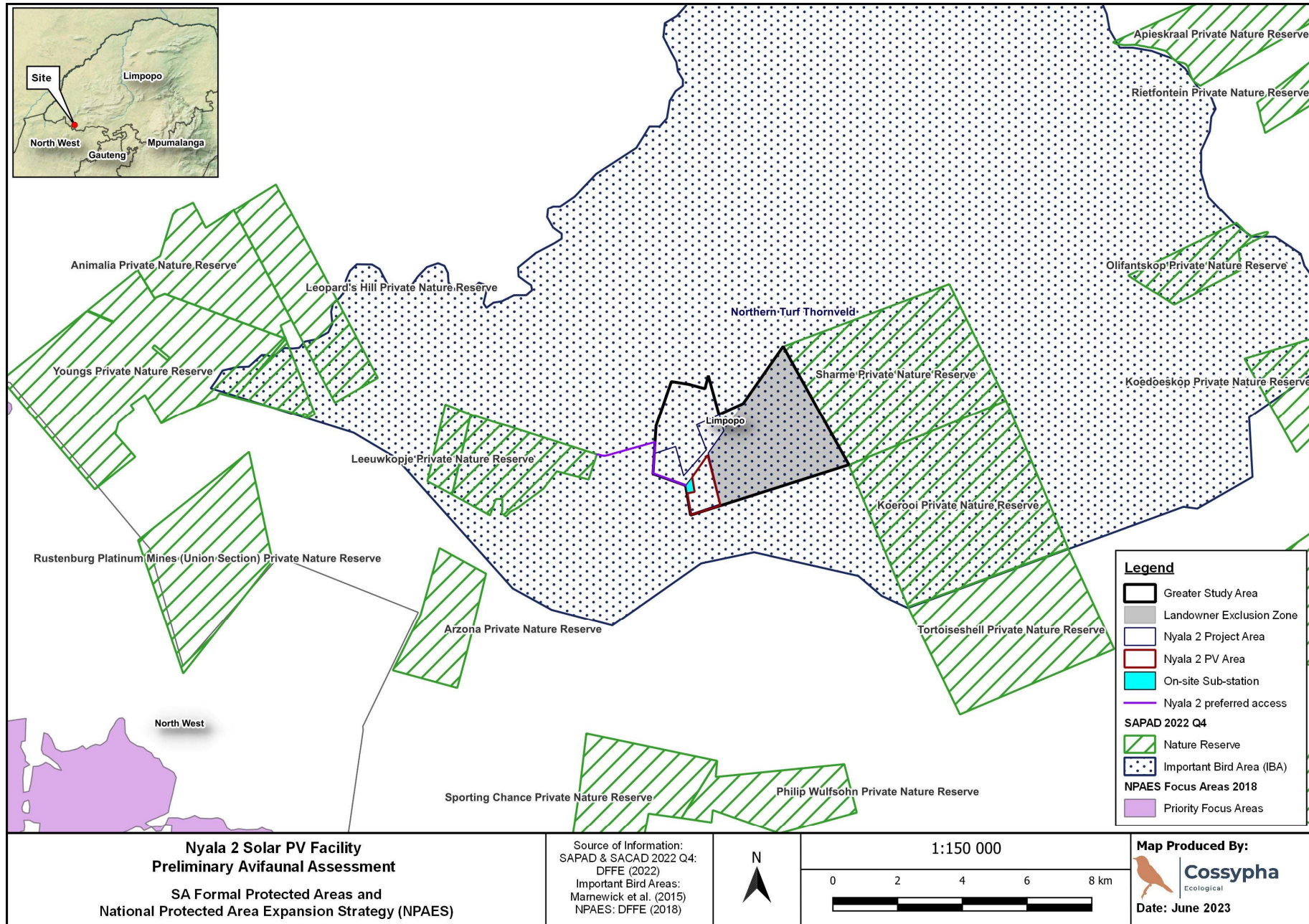


Figure 3: The greater study area and the Nyala 2 project area in relation to national Protected Areas

3.2. DISTRIBUTION OF AVIFAUNA IN THE STUDY AREA

The region is high in avifaunal diversity with around 400 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; 2023). Approximately 96% 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, 251 species have been recorded in the pentads in which the greater study area falls (pentads 2450_2715, 2455_2710, and 2455_2715), nine of which are species of conservation concern (SCC) and 30 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). **Table 1** lists priority species that have been recorded within the pentads, 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 pentads 2450_2715, 2455_2710, and 2455_2715 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 (%)
Crested Francolin	<i>Dendroperdix sephaena</i>	Gamebird	LC / LC	70
Natal Spurfowl	<i>Pternistis natalensis</i>	Gamebird	LC / LC	60
Swainson's Spurfowl	<i>Pternistis swainsonii</i>	Gamebird	LC / LC	75
Helmeted Guineafowl	<i>Numida meleagris</i>	Gamebird	LC / LC	70
White-faced Duck	<i>Dendrocygna viduata</i>	Waterfowl	LC / LC	41.7
Egyptian Goose	<i>Alopochen aegyptiaca</i>	Waterfowl	LC / LC	58.3
Spur-winged Goose	<i>Plectropterus gambensis</i>	Waterfowl	LC / LC	10
Cape Teal	<i>Anas capensis</i>	Waterfowl	LC / LC	8.3
African Black Duck	<i>Anas sparsa</i>	Waterfowl	LC / LC	4.3
Yellow-billed Duck	<i>Anas undulata</i>	Waterfowl	LC / LC	8.7
Red-billed Teal	<i>Anas erythrorhyncha</i>	Waterfowl	LC / LC	30
European Roller*	<i>Coracias garrulus</i>	SCC	NT / LC	13
Barn Owl	<i>Tyto alba</i>	Raptor	LC / LC	20
Southern White-faced Scops-Owl	<i>Ptilopsis granti</i>	Raptor	LC / LC	10
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>	Raptor	LC / LC	4.3
Pearl-spotted Owlet	<i>Glaucidium perlatum</i>	Raptor	LC / LC	50
Marsh Owl	<i>Asio capensis</i>	Raptor	LC / LC	20
Red-crested Korhaan	<i>Lophotis ruficrista</i>	Gamebird	LC / LC	0
Northern Black Korhaan	<i>Afrotis afraoides</i>	Gamebird	LC / LC	41.7
Black Crake	<i>Zapornia flavirostra</i>	Waterfowl	LC / LC	10
Common Moorhen	<i>Gallinula chloropus</i>	Waterfowl	LC / LC	33.3

Common Name	Scientific Name	Priority Species	Threat Status (RSA / IUCN)	SABAP2 RR (%)
Red-knobbed Coot	<i>Fulica cristata</i>	Waterfowl	LC / LC	16.7
Double-banded Sandgrouse	<i>Pterocles bicinctus</i>	Gamebird	LC / LC	13
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Waterfowl	LC / LC	20
Common Greenshank	<i>Tringa nebularia</i>	Waterfowl	LC / LC	10
Wood Sandpiper	<i>Tringa glareola</i>	Waterfowl	LC / LC	41.7
Common Sandpiper	<i>Actitis hypoleucos</i>	Waterfowl	LC / LC	20
Little Stint	<i>Calidris minuta</i>	Waterfowl	LC / LC	25
Ruff	<i>Calidris pugnax</i>	Waterfowl	LC / LC	41.7
Spotted Thick-knee	<i>Burhinus capensis</i>	Waterfowl	LC / LC	20
Black-winged Stilt	<i>Himantopus himantopus</i>	Waterfowl	LC / LC	41.7
Kittlitz's Plover	<i>Charadrius pecuarius</i>	Waterfowl	LC / LC	4.3
Three-banded Plover	<i>Charadrius tricollaris</i>	Waterfowl	LC / LC	41.7
Blacksmith Lapwing	<i>Vanellus armatus</i>	Waterfowl	LC / LC	75
African Wattled Lapwing	<i>Vanellus senegallus</i>	Waterfowl	LC / LC	20
Crowned Lapwing	<i>Vanellus coronatus</i>	Waterfowl	LC / LC	91.7
White-winged Tern	<i>Chlidonias leucopterus</i>	Waterfowl	LC / LC	10
Black-shouldered Kite	<i>Elanus caeruleus</i>	Raptor	LC / LC	66.7
Yellow-billed Kite	<i>Milvus aegyptius</i>	Raptor	LC / LC	0
African Fish-Eagle	<i>Haliaeetus vocifer</i>	Raptor	LC / LC	10
White-backed Vulture	<i>Gyps africanus</i>	SCC	CR / CR	0
Cape Vulture	<i>Gyps coprotheres</i>	SCC	EN / VU	26.1
Black-chested Snake-Eagle	<i>Circaetus pectoralis</i>	Raptor	LC / LC	8.7
Brown Snake-Eagle	<i>Circaetus cinereus</i>	Raptor	LC / LC	0
Southern Pale Chanting Goshawk	<i>Melierax canorus</i>	Raptor	LC / LC	4.3
Gabar Goshawk	<i>Micronisus gabar</i>	Raptor	LC / LC	10
Shikra	<i>Accipiter badius</i>	Raptor	LC / LC	4.3
Steppe Buzzard	<i>Buteo buteo</i>	Raptor	LC / LC	10
Verreaux's Eagle	<i>Aquila verreauxii</i>	SCC	VU / LC	0
African Hawk-eagle	<i>Aquila spilogaster</i>	Raptor	LC / LC	4.3
Secretarybird	<i>Sagittarius serpentarius</i>	SCC	VU / EN	8.7
Lesser Kestrel	<i>Falco naumanni</i>	Raptor	LC / LC	4.3
Greater Kestrel	<i>Falco rupicoloides</i>	Raptor	LC / LC	10
Lanner Falcon	<i>Falco biarmicus</i>	SCC	VU / LC	10
Little Grebe	<i>Tachybaptus ruficollis</i>	Waterfowl	LC / LC	41.7
African Darter	<i>Anhinga rufa</i>	Waterfowl	LC / LC	20
Reed Cormorant	<i>Microcarbo africanus</i>	Waterfowl	LC / LC	25
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>	Waterfowl	LC / LC	16.7
Black Heron	<i>Egretta ardesiaca</i>	Waterfowl	LC / LC	30
Little Egret	<i>Egretta garzetta</i>	Waterfowl	LC / LC	30
Grey Heron	<i>Ardea cinerea</i>	Waterfowl	LC / LC	41.7
Black-headed Heron	<i>Ardea melanocephala</i>	Waterfowl	LC / LC	41.7
Goliath Heron	<i>Ardea goliath</i>	Waterfowl	LC / LC	30
Purple Heron	<i>Ardea purpurea</i>	Waterfowl	LC / LC	20
Great Egret	<i>Ardea alba</i>	Waterfowl	LC / LC	10
Yellow-billed Egret	<i>Ardea intermedia</i>	Waterfowl	LC / LC	8.3
Cattle Egret	<i>Bubulcus ibis</i>	Waterfowl	LC / LC	66.7
Green-backed Heron	<i>Butorides striata</i>	Waterfowl	LC / LC	30
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Waterfowl	LC / LC	0
Little Bittern	<i>Ixobrychus minutus</i>	Waterfowl	LC / LC	10
Hamerkop	<i>Scopus umbretta</i>	Waterfowl	LC / LC	16.7

Common Name	Scientific Name	Priority Species	Threat Status (RSA / IUCN)	SABAP2 RR (%)
Glossy Ibis	<i>Plegadis falcinellus</i>	Gamebird	LC / LC	16.7
Hadedda Ibis	<i>Bostrychia hagedash</i>	Gamebird	LC / LC	75
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	Gamebird	LC / LC	75
African Spoonbill	<i>Platalea alba</i>	Waterfowl	LC / LC	16.7
Yellow-billed Stork*	<i>Mycteria ibis</i>	SCC	EN / LC	16.7
Abdim's Stork	<i>Ciconia abdimii</i>	SCC	NT / LC	0
Marabou Stork	<i>Leptoptilos crumenifer</i>	SCC	NT / LC	20
Cape Sparrow	<i>Passer melanurus</i>	Gregarious Passerine	LC / LC	58.3
Scaly-feathered Finch	<i>Sporopipes squamifrons</i>	Gregarious Passerine	LC / LC	70
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	Gregarious Passerine	LC / LC	70
Lesser Masked-weaver	<i>Ploceus intermedius</i>	Gregarious Passerine	LC / LC	41.7
Southern Masked-Weaver	<i>Ploceus velatus</i>	Gregarious Passerine	LC / LC	100
Village Weaver	<i>Ploceus cucullatus</i>	Gregarious Passerine	LC / LC	41.7
Red-billed Quelea	<i>Quelea quelea</i>	Gregarious Passerine	LC / LC	58.3
Yellow-crowned Bishop	<i>Euplectes afer</i>	Gregarious Passerine	LC / LC	10
Southern Red Bishop	<i>Euplectes orix</i>	Gregarious Passerine	LC / LC	30
White-winged Widowbird	<i>Euplectes albonotatus</i>	Gregarious Passerine	LC / LC	50
Long-tailed Widowbird	<i>Euplectes progne</i>	Gregarious Passerine	LC / LC	4.3
Red-billed Firefinch	<i>Lagonosticta senegala</i>	Gregarious Passerine	LC / LC	58.3
African Firefinch	<i>Lagonosticta rubricata</i>	Gregarious Passerine	LC / LC	10
Jameson's Firefinch	<i>Lagonosticta rhodopareia</i>	Gregarious Passerine	LC / LC	56.5
Blue Waxbill	<i>Uraeginthus angolensis</i>	Gregarious Passerine	LC / LC	100
Violet-eared Waxbill	<i>Granatina granatina</i>	Gregarious Passerine	LC / LC	39.1
Common Waxbill	<i>Estrilda astrild</i>	Gregarious Passerine	LC / LC	43.5
Black-faced Waxbill	<i>Brunhilda erythronotos</i>	Gregarious Passerine	LC / LC	34.8
African Quailfinch	<i>Ortygospiza atricollis</i>	Gregarious Passerine	LC / LC	4.3
Bronze Mannikin	<i>Spermestes cucullata</i>	Gregarious Passerine	LC / LC	10
Cut-throat Finch	<i>Amadina fasciata</i>	Gregarious Passerine	LC / LC	20
Village Indigobird	<i>Vidua chalybeata</i>	Gregarious Passerine	LC / LC	10
Shaft-tailed Whydah	<i>Vidua regia</i>	Gregarious Passerine	LC / LC	21.7
Pin-tailed Whydah	<i>Vidua macroura</i>	Gregarious Passerine	LC / LC	26.1
Long-tailed Paradise-Whydah	<i>Vidua paradisaea</i>	Gregarious Passerine	LC / LC	20
Black-throated Canary	<i>Crithagra atrogularis</i>	Gregarious Passerine	LC / LC	41.7
Yellow-fronted Canary	<i>Crithagra mozambica</i>	Gregarious Passerine	LC / LC	4.3

EN = Endangered; NT = Near Threatened; LC = Least Concern *Non-breeding migrant

4. FIELD RESULTS

4.1. SITE DESCRIPTION

The eastern section of the greater study area (which falls within the landowner exclusion zone), is comprised of natural thornveld that is managed as a game farm, with wildlife such as Wildebeest *Connochaetes taurinus*, Greater Kudu *Tragelaphus strepsiceros*, Impala *Aepyceros melampus*, Giraffe *Giraffa camelopardalis giraffa*, Blesbok *Damaliscus pygargus phillipsi*, and Burchell's Zebra *Equus quagga burchellii*. The Nyala 2 project area is situated within the south-western portion of the greater study site, which is comprised of a mosaic of cultivated and fallow fields, and patches of disturbed natural thornveld. The proposed site for the Nyala 2 PV SEF is situated adjacent to a cultivated field and is comprised of disturbed natural thornveld (~60%) and old fields where thornveld is slowly re-establishing (~40%).



Natural thornveld in the eastern section of the greater study area



Old fields with open grassy thornveld vegetation in the Nyala 2 Project Area



Disturbed thornveld on the Nyala 2 PV site



Cultivated and fallow fields within the Nyala 2 Project Area

4.2. AVIFAUNAL HABITATS IN THE STUDY AREA AND SURROUNDS

The most important habitat for avifauna occurring in the greater study area includes the natural thornveld vegetation that is located within the landowner exclusion zone (**Figure 4**). The extensive thorny bushveld vegetation in the greater study area and in the surrounding areas supports the terrestrial savanna bird species found in the region, including priority species such as gamebirds, raptors, and gregarious passerines. This natural thornveld appears to have had no major disturbance such as clearing or ploughing in the recent past (within the last 30-40 years) and provides the main savanna habitat for the avifauna found in the area. Disturbed thornveld, which is natural to near-natural savanna habitat that has experienced some disturbance in the past (but not complete clearing or ploughing), comprises ~60% of the Nyala 2 PV site and also supports the bird species found in the area.



Relatively undisturbed natural thornveld in the eastern section of the greater study area (left) and more disturbed thornveld on the Nyala 2 PV site

Old fields and fallow fields tend to have a predominantly grassy ground cover and fewer trees and support a lower diversity of birds (compared to the natural thornveld) that are more adapted to grassy habitats. Cultivated and fallow fields also provide foraging habitat for many bird species. In the study area, large flocks of Yellow-throated Sandgrouse *Pterocles gutturalis* are known to utilise the fields for foraging, and old fields or fallow fields (usually left for at least a year) are often utilised for breeding where nests are made as a shallow scrape in the soil (Tarboton et al., 1999). The sandgrouse inhabit short, open grassy thornveld, fallow fields, and recently burnt veld, particularly on relatively moist, cotton-clay-like soils, usually near seasonal rivers or swamps, or on seasonal flood plains (Tarboton et al., 1999; Marnewick *et al.*, 2015). Flocks of sandgrouse were observed foraging in the cultivated fields to the north and to the west of the Nyala 2 project area.



Old fields with open grassy thornveld vegetation

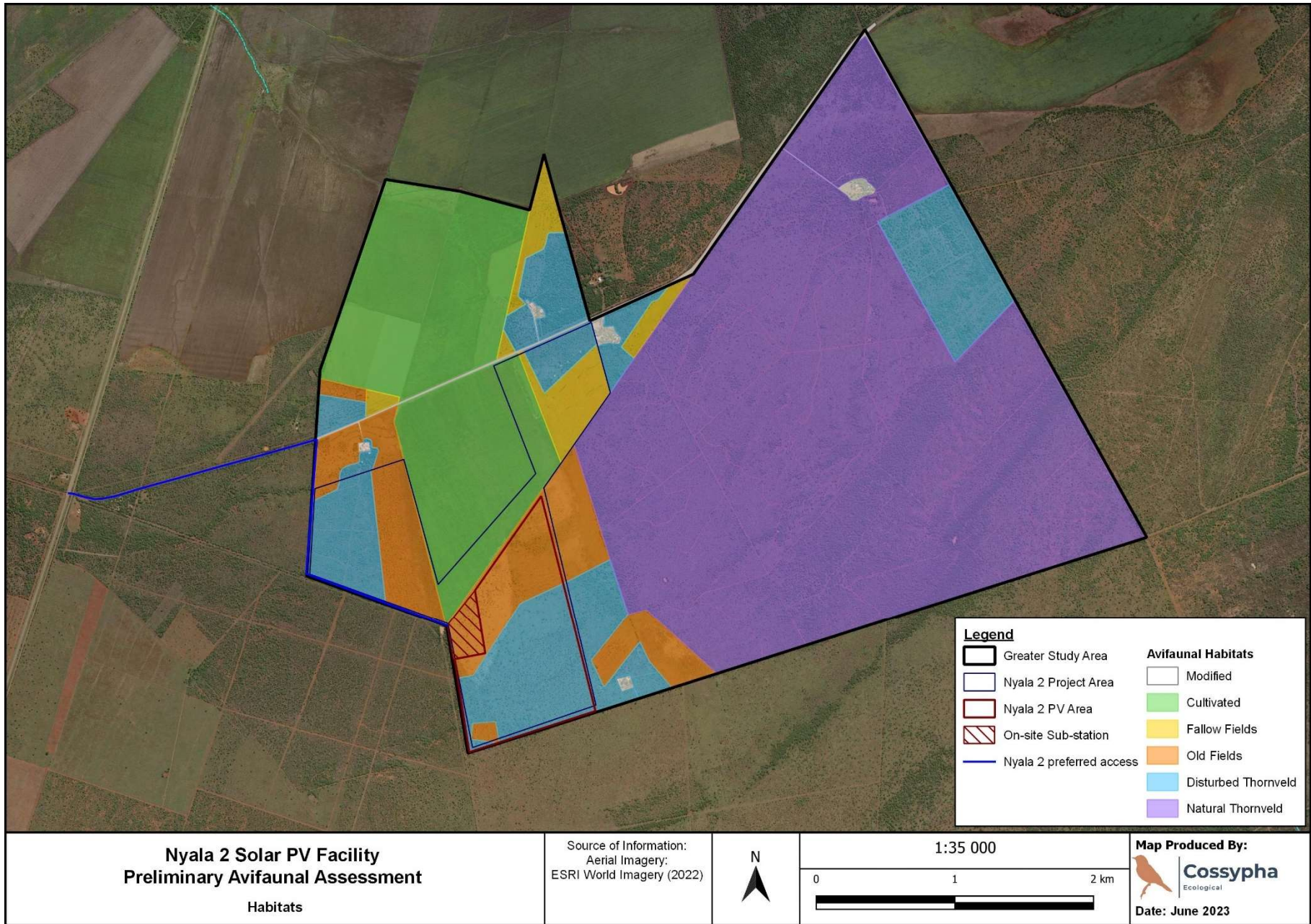


Figure 4: Habitat features within the greater study area



Cultivated fields with relatively moist, cotton-clay-like soils



Yellow-throated Sandgrouse *Pterocles gutturalis* foraging in a cultivated field

While no prominent watercourses and waterbodies occur within the Nyala 2 project area, a few small farm dams occur within the surroundings.

4.3. BIRD SPECIES OCCURRENCE IN THE STUDY AREA

4.3.1. BIRD OBSERVATIONS

The area is diverse with bird life with 148 species recorded in the greater study area 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 greater study area included mainly typical bushveld savanna species such as francolin, barbets, hornbills, rollers, shrikes, starlings, tchagras, robin-chats, babblers, prinias, waxbills, crombecs, and many raptors. A few species more typical of grassland habitats such as cisticolas, pipits, finches, quelea, and widowbirds were observed in the fallow and old fields where the habitat is more open. Some generalist species such as pigeons, doves, guineafowl, lapwings, canaries, and sparrows were also recorded in and around the study area.



Some of the terrestrial savanna bird species recorded in the study area included (top left to bottom right) Burchell's Coucal *Centropus burchellii*, Burchell's Starling *Lamprotornis australis*, African Grey Hornbill *Lophoceros nasutus*, Cape Penduline-Tit *Anthoscopus minutus*, Lilac-breasted Roller *Coracias caudatus*, Sabota Lark *Calendulauda sabota*, Magpie Shrike *Urolestes melanoleucus*, Red-billed Oxpecker *Buphagus erythrorhynchus*, and Shaft-tailed Whydah *Vidua regia*

4.3.2. BIRDS OF CONSERVATION CONCERN

Bird SCC observed during the preliminary field assessment included White-backed Vulture *Gyps africanus*, which is currently listed as Critically Endangered (CR) at the national level and global level, Cape Vulture *Gyps coprotheres*, which is currently listed as Endangered (EN) at the national level and Vulnerable (VU) at the global level, Steppe Eagle *Aquila nipalensis*, which is currently listed as EN at the global level, and Lanner Falcon *Falco biarmicus*, which is currently listed as VU at the national level. White-backed Vulture and Cape Vulture were recorded circling over-head over the broader study area.

Yellow-throated Sandgrouse *Pterocles gutturalis* and Greater Painted-snipe *Rostratula benghalensis*, both resident species currently listed as Near Threatened (NT) at the national level, and European Roller *Coracias garrulus*, a non-breeding migrant to the area that is currently listed as Near Threatened (NT) at a national level, were also recorded in the study area. In addition, 19 species that are endemic to the southern African region were recorded in and around the study area.



Bird SCC recorded in the study area include (from top left to bottom right) Cape Vulture *Gyps coprotheres* (EN), Lanner Falcon *Falco biarmicus* (VU), Greater Painted-snipe *Rostratula benghalensis* (NT), and Yellow-throated Sandgrouse *Pterocles gutturalis* (NT). Photos by David Allan

4.3.3. PRIORITY SPECIES

Preliminary assessment of species recorded in during the preliminary 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 surroundings. 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. These species may also be affected by habitat loss and includes displacement of gregarious passerines such as finches, bishops, queleas, and widowbirds. These and other priority species recorded in the greater study area and surroundings 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 during the preliminary survey.

Table 2: Priority species recorded in the greater study area and surroundings 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>Ortygornis sephaena</i>	Crested 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>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
<i>Anas erythrorhyncha</i>	Red-billed Teal	LC	LC	Waterfowl

Scientific Name	Common Name	National Status	Global Status	Type of Species
<i>Coracias garrulus</i>	European Roller	NT	LC	SCC
<i>Tyto alba</i>	Barn Owl	LC	LC	Raptors and Owls
<i>Glaucidium perlatum</i>	Pearl-spotted Owlet	LC	LC	Raptors and Owls
<i>Lophotis ruficrista</i>	Red-crested Korhaan	LC; En	LC	Gamebird
<i>Gallinula chloropus</i>	Common Moorhen	LC	LC	Waterfowl
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	NT	LC	SCC
<i>Tringa nebularia</i>	Common Greenshank	LC	LC	Waterfowl
<i>Tringa glareola</i>	Wood Sandpiper	LC	LC	Waterfowl
<i>Calidris minuta</i>	Little Stint	LC	LC	Waterfowl
<i>Rostratula benghalensis</i>	Greater Painted-Snipe	NT	LC	SCC
<i>Actophilornis africanus</i>	African Jacana	LC	LC	Waterfowl
<i>Burhinus capensis</i>	Spotted Thick-knee	LC	LC	Waterfowl
<i>Charadrius tricollaris</i>	Three-banded Plover	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	Raptors and Owls
<i>Milvus aegyptius</i>	Yellow-billed Kite	LC	LC	Raptors and Owls
<i>Gyps africanus</i>	White-backed Vulture	CR	CR	SCC
<i>Gyps coprotheres</i>	Cape Vulture	EN	VU	SCC
<i>Circaetus pectoralis</i>	Black-chested Snake-Eagle	LC	LC	Raptors and Owls
<i>Circaetus cinereus</i>	Brown Snake-Eagle	LC	LC	Raptors and Owls
<i>Micronisus gabar</i>	Gabar Goshawk	LC	LC	Raptors and Owls
<i>Buteo buteo</i>	Steppe Buzzard	LC	LC	Raptors and Owls
<i>Aquila nipalensis</i>	Steppe Eagle	LC	EN	SCC
<i>Hieraetus wahlbergi</i>	Wahlberg's Eagle	LC	LC	Raptors and Owls
<i>Falco naumanni</i>	Lesser Kestrel	LC	LC	Raptors and Owls
<i>Falco amurensis</i>	Amur Falcon	LC	LC	Raptors and Owls
<i>Falco biarmicus</i>	Lanner Falcon	VU	LC	SCC
<i>Tachybaptus ruficollis</i>	Little Grebe	LC	LC	Waterfowl
<i>Ardea melanocephala</i>	Black-headed Heron	LC	LC	Waterfowl
<i>Bubulcus ibis</i>	Cattle Egret	LC	LC	Waterfowl
<i>Butorides striata</i>	Green-backed Heron	LC	LC	Waterfowl
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	LC	LC	Waterfowl
<i>Ixobrychus sturmii</i>	Dwarf Bittern	LC	LC	Waterfowl
<i>Plegadis falcinellus</i>	Glossy Ibis	LC	LC	Waterfowl
<i>Bostrychia hagedash</i>	Hadeda Ibis	LC	LC	Waterfowl
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	LC	LC	Waterfowl
<i>Eremopterix leucotis</i>	Chestnut-backed Sparrowlark	LC	LC	Gregarious Passerine
<i>Passer melanurus</i>	Cape Sparrow	LC; En	LC	Gregarious Passerine
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	LC	LC	Gregarious Passerine
<i>Gymnoris supercilialis</i>	Yellow-throated Petronia	LC	LC	Gregarious Passerine
<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	LC; En	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 albonotatus</i>	White-winged Widowbird	LC	LC	Gregarious Passerine
<i>Pytilia melba</i>	Green-winged Pytilia	LC	LC	Gregarious Passerine
<i>Lagonosticta senegala</i>	Red-billed Firefinch	LC	LC	Gregarious Passerine
<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch	LC	LC	Gregarious Passerine

Scientific Name	Common Name	National Status	Global Status	Type of Species
<i>Uraeginthus angolensis</i>	Blue Waxbill	LC	LC	Gregarious Passerine
<i>Estrilda astrild</i>	Common Waxbill	LC	LC	Gregarious Passerine
<i>Brunhilda erythronotos</i>	Black-faced Waxbill	LC	LC	Gregarious Passerine
<i>Ortygospiza atricollis</i>	African Quailfinch	LC	LC	Gregarious Passerine
<i>Amadina fasciata</i>	Cut-throat Finch	LC	LC	Gregarious Passerine
<i>Vidua regia</i>	Shaft-tailed Whydah	LC; En	LC	Gregarious Passerine
<i>Vidua macroura</i>	Pin-tailed Whydah	LC	LC	Gregarious Passerine
<i>Vidua paradisaea</i>	Long-tailed Paradise-Whydah	LC	LC	Gregarious Passerine
<i>Crithagra atrogularis</i>	Black-throated Canary	LC	LC	Gregarious Passerine

CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; En = Endemic

4.4. KEY HABITATS AND PRELIMINARY SITE SENSITIVITY

The extensive natural thornveld vegetation in the greater study area and surroundings supports the terrestrial savanna species found in the region, including priority species such as gamebirds, raptors, and gregarious passerines. Where this vegetation is relatively undisturbed, it represents the most important habitat for birds in the area as it is an intact and functional ecosystem that supports a diversity of avifauna representing all trophic levels. This vegetation is considered to be of high sensitivity and appears to have been adequately avoided by the proposed development. The more disturbed thornveld or areas where thornveld is re-establishing in the study area, are considered to be of medium sensitivity and although provide habitat for avifauna, are preferred sites for the development compared to natural thornveld. Natural wetland areas and farm dams provide suitable habitat for waterfowl and other wetland associated species and are also considered to be highly sensitive habitats. None of these habitats will be impacted by the proposed development.

Cultivated fields and fallow fields are considered to be of low sensitivity due to the modified and transient nature of the habitat, even though they provide important habitat for certain bird species such as the Yellow-throated Sandgrouse *Pterocles gutturalis*. The extensive fields and the surrounding fallow areas in the region provide suitable foraging and potential nesting habitat for these birds. No cultivated fields fall within the Nyala 2 PV area (Figure 5).

Table 3: Summary of sensitivity categories for the greater study area

Site Feature	Description and Recommendation	Sensitivity Rating
Natural thornveld	Intact and functional natural thornveld vegetation providing important habitat for avifauna. Must be avoided by the development	High
Near-natural but disturbed thornveld	Natural bushveld that has received mild disturbance but with no recent past (within the last 30-40 years) disturbance such as ploughing or extensive clearing	Medium
Old fields where thornveld is re-establishing	Areas that have been disturbed in the past by bush clearing or ploughing and now have natural thornveld re-establishing. These areas provide habitat for some avifauna, however, are preferred sites for the development compared to natural thornveld	Medium-low
Cultivated and fallow fields	Areas that have been ploughed and cultivated, currently or in the recent past	Low
Modified – farm buildings, guest farm buildings, roads	Habitat that has been modified or transformed by farm activities and roads. No natural vegetation occurs in these areas	Very Low

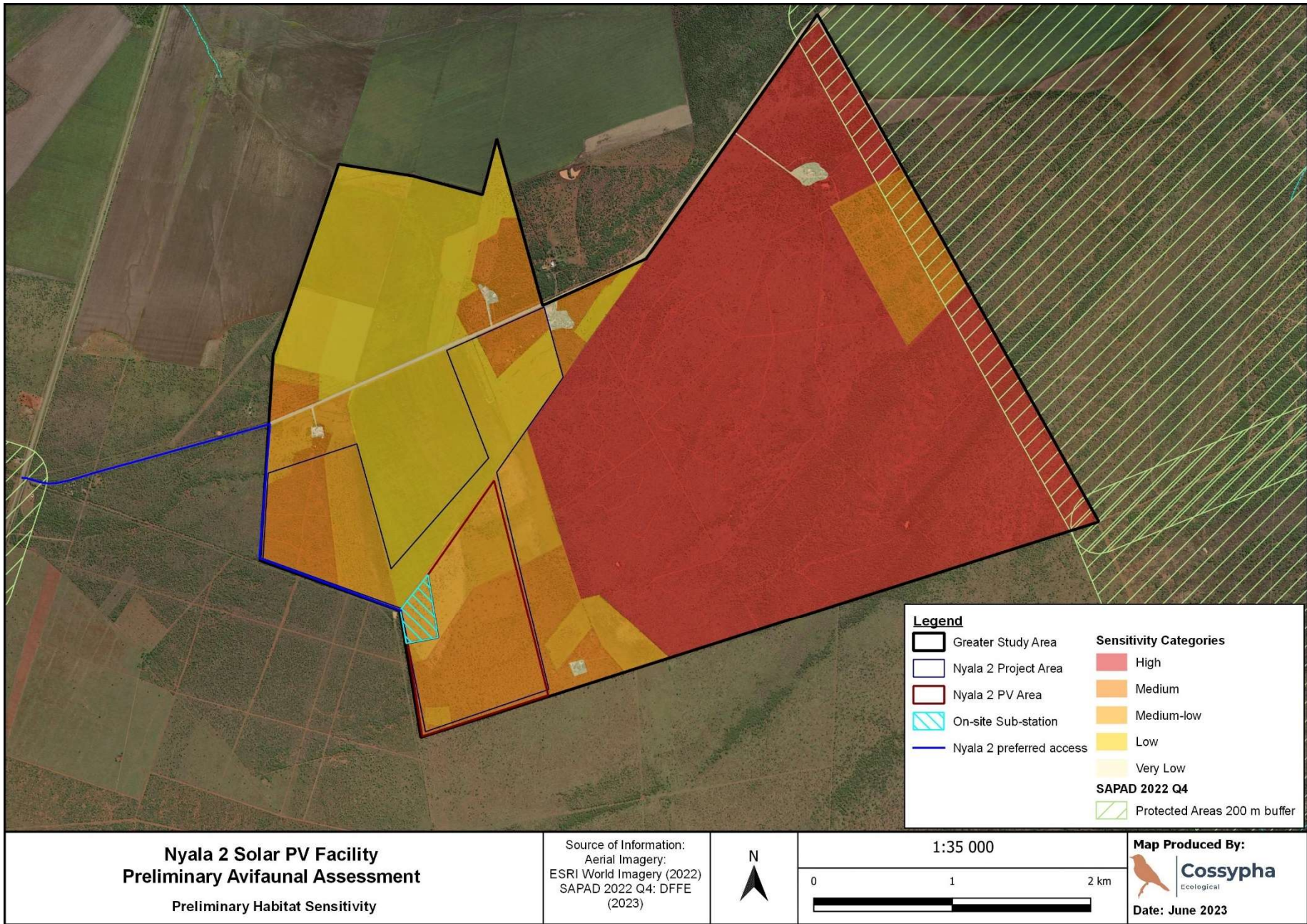


Figure 5: Preliminary avifaunal habitat sensitivity of the greater study area

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 or water bodies, 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 vegetation during the construction phase. 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. Ideally the natural thornveld vegetation should be avoided by the development, and the more disturbed areas of the site are preferred sites for the development compared to natural thornveld. Impacts on highly sensitive habitats can be avoided or minimised by the project layout avoiding areas classified as highly 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	Natural thornveld; 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	Site and immediate surroundings; Small terrestrial species;	Construction and Operation	Indirect

Possible Impact	Source of Impact	Area and Species to be Affected	Development Phase	Nature of Impact
	maintenance activities; attraction of novel species	Common ground-dwelling 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"> Disturbance to the study area, adding to existing pressures in the landscape (farming) Adding to cumulative pressures in the landscape caused by other approved or proposed renewable energy projects 	Study area and surrounding natural areas	Operation	Cumulative

6. SUMMARY AND PRE-CONSTRUCTION MONITORING REQUIREMENTS

The greater study area is largely comprised of natural thornveld habitat that represents the most important habitat for birds in the area and is considered to be of medium to high sensitivity (according to the preliminary assessment). 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 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 Nyala 2 project area, 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 key habitats observed in the greater study 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.
- Focal nest site surveys for confirmed raptor nests. All such sites should be mapped accurately and checked on each visit to the study area to confirm continued occupancy, and to record any evidence of breeding, and where possible, the outcomes of such activity, that may take place over the survey period.
- 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)	Regime 1 One site visit of 1-5 days	Regime 1 One site visit of 1-5 days	Regime 2 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches
	Medium (30-150 ha / 10-50 MW)	Regime 1 One site visit of 1-5 days	Regime 2 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches	Regime 2 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches
	Large (>150 ha / >50 MW)	Regime 2 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches	Regime 2 2-3 seasonal visits of 3-5 days over 6 months Pre- & post-con monitoring mortality searches	Regime 3 4-5 seasonal visits of 4-8 days over 12 months Pre- & post-con monitoring mortality searches
CSP	All	Regime 3 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:

- All natural and intact thornveld, as well as drainage lines, wetlands, and dams must be avoided, including the buffer recommended by the aquatic and/or wetland specialist.
- The more disturbed areas such as cultivated and fallow fields, and disturbed thornveld appear to be the most suitable areas for placement of the proposed infrastructure.
- The primary and secondary grid connection corridors are optimal as they follow existing powerline routes instead of disturbing new areas. As the proposed grid connection will be via linking to the existing infrastructure, no additional impacts are expected.

8. REFERENCES

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9. APPENDICES

APPENDIX A: SPECIES LIST

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
1	<i>Ortygornis sephaena</i>	Crested Francolin	LC	LC
2	<i>Pternistis natalensis</i>	Natal Spurfowl	LC; En	LC
3	<i>Pternistis swainsonii</i>	Swainson's Spurfowl	LC; En	LC
4	<i>Numida meleagris</i>	Helmeted Guineafowl	LC	LC
5	<i>Dendrocygna viduata</i>	White-faced Duck	LC	LC
6	<i>Alopochen aegyptiaca</i>	Egyptian Goose	LC	LC
7	<i>Anas erythrorhyncha</i>	Red-billed Teal	LC	LC
8	<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	LC	LC
9	<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	LC; En	LC
10	<i>Tockus rufirostris</i>	Red-billed Hornbill	LC	LC
11	<i>Tockus leucomelas</i>	Southern Yellow-billed Hornbill	LC; En	LC
12	<i>Lophoceros nasutus</i>	African Grey Hornbill	LC	LC
13	<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe	LC	LC
14	<i>Rhinopomastus cyanomelas</i>	Common Scimitarbill	LC	LC
15	<i>Coracias garrulus</i>	European Roller	NT	LC
16	<i>Coracias caudatus</i>	Lilac-breasted Roller	LC	LC
17	<i>Coracias naevius</i>	Purple Roller	LC	LC
18	<i>Halcyon senegalensis</i>	Woodland Kingfisher	LC	LC
19	<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	LC	LC
20	<i>Merops pusillus</i>	Little Bee-eater	LC	LC
21	<i>Merops apiaster</i>	European Bee-eater	LC	LC
22	<i>Urocolius indicus</i>	Red-faced Mousebird	LC	LC
23	<i>Clamator jacobinus</i>	Jacobin Cuckoo	LC	LC
24	<i>Clamator levillantii</i>	Levillant's Cuckoo	LC	LC
25	<i>Cuculus clamosus</i>	Black Cuckoo	LC	LC
26	<i>Chrysococcyx caprius</i>	Diederik Cuckoo	LC	LC
27	<i>Centropus burchellii</i>	Burchell's Coucal	LC	LC
28	<i>Cypsiurus parvus</i>	African Palm-Swift	LC	LC
29	<i>Apus barbatus</i>	African Black Swift	LC	LC
30	<i>Apus affinis</i>	Little Swift	LC	LC
31	<i>Apus caffer</i>	White-rumped Swift	LC	LC
32	<i>Crinifer concolor</i>	Grey Go-away-bird	LC	LC
33	<i>Tyto alba</i>	Barn Owl	LC	LC
34	<i>Glaucidium perlatum</i>	Pearl-spotted Owlet	LC	LC
35	<i>Caprimulgus rufigena</i>	Rufous-cheeked Nightjar	LC	LC
36	<i>Caprimulgus pectoralis</i>	Fiery-necked Nightjar	LC	LC
37	<i>Columba guinea</i>	Speckled Pigeon	LC	LC
38	<i>Spilopelia senegalensis</i>	Laughing Dove	LC	LC
39	<i>Streptopelia capicola</i>	Cape Turtle-Dove	LC	LC

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
40	<i>Streptopelia semitorquata</i>	Red-eyed Dove	LC	LC
41	<i>Oena capensis</i>	Namaqua Dove	LC	LC
42	<i>Lophotis ruficrista</i>	Red-crested Korhaan	LC; En	LC
43	<i>Gallinula chloropus</i>	Common Moorhen	LC	LC
44	<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	NT	LC
45	<i>Tringa nebularia</i>	Common Greenshank	LC	LC
46	<i>Tringa glareola</i>	Wood Sandpiper	LC	LC
47	<i>Calidris minuta</i>	Little Stint	LC	LC
48	<i>Rostratula benghalensis</i>	Greater Painted-snipe	NT	LC
49	<i>Actophilornis africanus</i>	African Jacana	LC	LC
50	<i>Burhinus capensis</i>	Spotted Thick-knee	LC	LC
51	<i>Charadrius tricollaris</i>	Three-banded Plover	LC	LC
52	<i>Vanellus armatus</i>	Blacksmith Lapwing	LC	LC
53	<i>Vanellus senegallus</i>	African Wattled Lapwing	LC	LC
54	<i>Vanellus coronatus</i>	Crowned Lapwing	LC	LC
55	<i>Elanus caeruleus</i>	Black-shouldered Kite	LC	LC
56	<i>Milvus aegyptius</i>	Yellow-billed Kite	LC	LC
57	<i>Gyps africanus</i>	White-backed Vulture	CR	CR
58	<i>Gyps coprotheres</i>	Cape Vulture	EN	VU
59	<i>Circaetus pectoralis</i>	Black-chested Snake-Eagle	LC	LC
60	<i>Circaetus cinereus</i>	Brown Snake-Eagle	LC	LC
61	<i>Micronisus gabar</i>	Gabar Goshawk	LC	LC
62	<i>Buteo buteo</i>	Steppe Buzzard	LC	LC
63	<i>Aquila nipalensis</i>	Steppe Eagle	LC	EN
64	<i>Hieraetus wahlbergi</i>	Wahlberg's Eagle	LC	LC
65	<i>Falco naumanni</i>	Lesser Kestrel	LC	LC
66	<i>Falco amurensis</i>	Amur Falcon	LC	LC
67	<i>Falco biarmicus</i>	Lanner Falcon	VU	LC
68	<i>Tachybaptus ruficollis</i>	Little Grebe	LC	LC
69	<i>Ardea melanocephala</i>	Black-headed Heron	LC	LC
70	<i>Bubulcus ibis</i>	Cattle Egret	LC	LC
71	<i>Butorides striata</i>	Green-backed Heron	LC	LC
72	<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	LC	LC
73	<i>Ixobrychus sturmii</i>	Dwarf Bittern	LC	LC
74	<i>Plegadis falcinellus</i>	Glossy Ibis	LC	LC
75	<i>Bostrychia hagedash</i>	Hadeda Ibis	LC	LC
76	<i>Threskiornis aethiopicus</i>	African Sacred Ibis	LC	LC
77	<i>Lanius collurio</i>	Red-backed Shrike	LC	LC
78	<i>Lanius minor</i>	Lesser Grey Shrike	LC	LC
79	<i>Urolestes melanoleucus</i>	Magpie Shrike	LC	LC
80	<i>Eurocephalus anguitimens</i>	Southern White-crowned Shrike	LC; En	LC
81	<i>Corvus albus</i>	Pied Crow	LC	LC

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
82	<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	LC	LC
83	<i>Terpsiphone viridis</i>	African Paradise-Flycatcher	LC	LC
84	<i>Nilaus afer</i>	Brubru	LC	LC
85	<i>Dryoscopus cubla</i>	Black-backed Puffback	LC	LC
86	<i>Tchagra australis</i>	Brown-crowned Tchagra	LC	LC
87	<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike	LC; En	LC
88	<i>Batis molitor</i>	Chin-spot Batis	LC	LC
89	<i>Turdus litsitsirupa</i>	Groundscraper Thrush	LC	LC
90	<i>Melaenornis mariquensis</i>	Marico Flycatcher	LC; En	LC
91	<i>Melaenornis pammelaina</i>	Southern Black Flycatcher	LC	LC
92	<i>Muscicapa striata</i>	Spotted Flycatcher	LC	LC
93	<i>Myioparus plumbeus</i>	Grey Tit-Flycatcher	LC	LC
94	<i>Cercotrichas leucophrys</i>	White-browed Scrub-Robin	LC	LC
95	<i>Cercotrichas paena</i>	Kalahari Scrub-Robin	LC; En	LC
96	<i>Lamprotornis nitens</i>	Cape Glossy Starling	LC	LC
97	<i>Lamprotornis australis</i>	Burchell's Starling	LC; En	LC
98	<i>Creatophora cinerea</i>	Wattled Starling	LC	LC
99	<i>Acridotheres tristis</i>	Common Myna	LC; Intro	LC
100	<i>Buphagus erythrorhynchus</i>	Red-billed Oxpecker	LC	LC
101	<i>Anthoscopus minutus</i>	Cape Penduline-Tit	LC; En	LC
102	<i>Melaniparus niger</i>	Southern Black Tit	LC	LC
103	<i>Melaniparus cinerascens</i>	Ashy Tit	LC; En	LC
104	<i>Hirundo rustica</i>	Barn Swallow	LC	LC
105	<i>Cecropis abyssinica</i>	Lesser Striped Swallow	LC	LC
106	<i>Cecropis semirufa</i>	Red-breasted Swallow	LC	LC
107	<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	LC	LC
108	<i>Cisticola chiniana</i>	Rattling Cisticola	LC	LC
109	<i>Cisticola fulvicapilla</i>	Neddicky	LC	LC
110	<i>Cisticola juncidis</i>	Zitting Cisticola	LC	LC
111	<i>Cisticola aridulus</i>	Desert Cisticola	LC	LC
112	<i>Prinia subflava</i>	Tawny-flanked Prinia	LC	LC
113	<i>Prinia flavicans</i>	Black-chested Prinia	LC; En	LC
114	<i>Camaroptera brevicaudata</i>	Grey-backed Camaroptera	LC	LC
115	<i>Eremomela usticollis</i>	Burnt-necked Eremomela	LC	LC
116	<i>Sylvietta rufescens</i>	Long-billed Crombec	LC	LC
117	<i>Phylloscopus trochilus</i>	Willow Warbler	LC	LC
118	<i>Turdoides bicolor</i>	Southern Pied Babbler	LC; En	LC
119	<i>Turdoides jardineii</i>	Arrow-marked Babbler	LC	LC
120	<i>Curruca subcoerulea</i>	Chestnut-vented Tit-Babbler	LC; En	LC
121	<i>Mirafraga africana</i>	Rufous-naped Lark	LC	LC
122	<i>Calendulauda sabota</i>	Sabota Lark	LC; En	LC
123	<i>Eremopterix leucotis</i>	Chestnut-backed Sparrowlark	LC	LC

#	Scientific Name	Common Name	Conservation Status	
			National	Global
			RSA	IUCN
124	<i>Cinnyris talatala</i>	White-bellied Sunbird	LC	LC
125	<i>Passer melanurus</i>	Cape Sparrow	LC; En	LC
126	<i>Passer diffusus</i>	Southern Grey-headed Sparrow	LC	LC
127	<i>Gymnoris superciliaris</i>	Yellow-throated Petronia	LC	LC
128	<i>Anthus cinnamomeus</i>	African Pipit	LC	LC
129	<i>Bubalornis niger</i>	Red-billed Buffalo-Weaver	LC	LC
130	<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	LC; En	LC
131	<i>Ploceus intermedius</i>	Lesser Masked-Weaver	LC	LC
132	<i>Ploceus velatus</i>	Southern Masked-Weaver	LC	LC
133	<i>Quelea quelea</i>	Red-billed Quelea	LC	LC
134	<i>Euplectes albonotatus</i>	White-winged Widowbird	LC	LC
135	<i>Pytilia melba</i>	Green-winged Pytilia	LC	LC
136	<i>Lagonosticta senegala</i>	Red-billed Firefinch	LC	LC
137	<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch	LC	LC
138	<i>Uraeginthus angolensis</i>	Blue Waxbill	LC	LC
139	<i>Estrilda astrild</i>	Common Waxbill	LC	LC
140	<i>Brunhilda erythronotos</i>	Black-faced Waxbill	LC	LC
141	<i>Ortygospiza atricollis</i>	African Quailfinch	LC	LC
142	<i>Amadina fasciata</i>	Cut-throat Finch	LC	LC
143	<i>Vidua regia</i>	Shaft-tailed Whydah	LC; En	LC
144	<i>Vidua macroura</i>	Pin-tailed Whydah	LC	LC
145	<i>Vidua paradisaea</i>	Long-tailed Paradise-Whydah	LC	LC
146	<i>Crithagra atrogularis</i>	Black-throated Canary	LC	LC
147	<i>Emberiza tahapisi</i>	Cinnamon-breasted Bunting	LC	LC
148	<i>Emberiza flaviventris</i>	Golden-breasted Bunting	LC	LC

CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; En = Endemic

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.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
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

Nyala 2 Solar Energy Facility

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

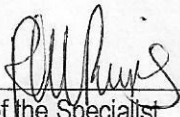
1. SPECIALIST INFORMATION

Specialist Company Name:	Cossypha Ecological			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4 (EME)	Percentage Procurement recognition	N/A
Specialist name:	Robyn Phillips			
Specialist Qualifications:	MSc (Zoology) UNP			
Professional affiliation/registration:	SACNASP Reg no 400401/12			
Physical address:	16 MacDonald Road Woodside Westville			
Postal address:	16 MacDonald Road Woodside Westville			
Postal code:	3629	Cell:	084 695 1648	
Telephone:	031 267 2748	Fax:		
E-mail:	robyn@cossypha.co.za			

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.

Robyn Phillips

Signature of the Specialist

Cossypha Ecological

Name of Company

31 May 2023

Date

[Signature]

Signature of the Commissioner of Oaths

2023-05-31

Date

