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Environmental Consultants

Impact Assessments - Environmental Management Programs - Compliance Monitoring - Process Review

THE AUTHORISED PAARDE VALLEY PV2 PHOTO-VOLTAIC SOLAR ENERGY FACILITY, NEAR DE AAR, NORTHERN CAPE PROVINCE: AVIFAUNAL PRE-CONSTRUCTION MONITORING

PROGRESS REPORT 1

FEBRUARY 2023

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1 Introduction

Paarde Valley PV2 (Pty) Ltd is the holder of an Environmental Authorisation (EA) for the 150 MW Paarde Valley PV2 Solar Energy Facility. An avifaunal impact assessment was conducted for the authorised development by D Harebottle in February 2012, based on a two-day site visit. This study included the mitigation measure that avifaunal pre-construction monitoring be conducted prior to construction using a methodology based on avifaunal pre-construction monitoring guidelines for wind energy facilities, since a guideline for solar energy facilities was not yet available at the time. An avifaunal site inspection was conducted in March 2022 by Chris van Rooyen Consulting as part of an amendment application for the authorised development.

Paarde Valley PV2 (Pty) Ltd plan to start construction of the authorised Paarde Valley PV 2 Solar Energy Facility and the proposed switching station, OHPL and associated infrastructure (if authorised) in 2023.

Mulilo has appointed Holland and Associates Environmental Consultants (H&A) to conduct avifaunal pre-construction monitoring in line with the current BirdLife SA Birds & Solar Energy Best Practice Guidelines¹ ('the Best Practice Guidelines') for the authorised PV site.

1.1 The BirdLife SA Birds & Solar Energy Best Practice Guidelines

According to the Birds & Solar Energy guidelines an avifaunal impact assessment of solar power facilities should consist of the following stages:

- *Stage 1: Preliminary Assessment to give an overview of the biological context, likely impacts and potential red flags to development, identify alternatives and determine the appropriate assessment regime.*
- *Stage 2: Data Collection on which to base the impact assessment report, and to provide a baseline against which post-construction monitoring can be compared.*
- *Stage 3: Impact Assessment.*
- *Stage 4: Post-construction monitoring, if required.*

The amount of data to be collected (the avian assessment regime) is prescribed by the guidelines as follows in Table 1:

Table 1: Avian Assessment Regimes for Solar Energy Projects (Jenkins *et al.* 2017)

Type of technology	Size	Avifaunal Sensitivity		
		Low	Medium	High
All except CSP power tower	Small (<30 ha)	Regime 1 ²	Regime 1	Regime 2 ³
	Medium (30-150 ha)	Regime 1	Regime 2	Regime 2
	Large (>150 ha)	Regime 2	Regime 2	Regime 3 ⁴
CSP power tower	All	Regime 3		

¹ Jenkins AR, Ralston-Paton S & Smit Robinson HA. 2017. Birds & Solar Energy Best Practice Guidelines. Guidelines for assessing and monitoring the impacts of solar power generating facilities on birds in southern Africa. Birdlife South Africa, Pretoria. 34pp.

² Regime 1: One site visit (peak season): minimum 1 – 5 days

³ Regime 2: Pre- and post-construction: minimum 2-3 days over 6 months (including peak season); carcass searches

⁴ Regime 3: Pre- and post-construction: minimum 4-5 days x 4-8 days over 12 months, carcass searches

The Best Practice Guidelines further state:

- (2) *For multi-phased projects, the aggregate footprint of all the phases should be used. At 3 ha per MW, Small = < 10 MW, Medium = 10-50 MW, Large = > 50MW.*
- (3) *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.*

For example, an area would be considered to be of high avifaunal sensitivity if one or more of the following is found (or suspected to occur) within the broader impact zone: 1) avifaunal habitat (e.g. a wetlands, nesting or roost sites) of regional or national significance, 2) a population of a priority species that is of regional or national significance, and/or 3) a bird movement corridor that is of regional or national significance, and 4) a protected area and/ or Important Bird and Biodiversity Area.

An area would be considered to be of medium avifaunal sensitivity if it does not qualify as high avifaunal sensitivity, but one or more of the following is found (or suspected to occur) within the broader impact zone 1) avifaunal habitat (e.g. a wetland, nesting or roost sites) of local significance, 2) a locally significant population of a priority species, 3) a locally significant bird movement corridor.

An area would be considered to be of low avifaunal sensitivity if it is does not meet any of the above criteria. that Regime 1 may be applied to some large sites, but only in instances where there is abundant existing data to support the assessment of low sensitivity.

- (4) *Regime 1 may be applied to some large sites, but only in instances where there is abundant existing data to support the assessment of low sensitivity.*

2 Methodology

2.1 Desktop Study

The following information was used to conduct the required desktop study for the site sensitivity verification:

- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI 2018)
- Northern Cape Critical Biodiversity Areas & Ecological Support Areas (DENC 2016)
- National Freshwater Ecosystem Priority Areas (NFEPAs);
- Terrestrial Ecosystem Threat Status and Protection Level (SANBI 2018);
- National Protected Area Expansion Strategy for South Africa (NPAES);
- Coordinated Waterbird Counts (CWAC)
- The DFFE National Web-based Screening Tool;
- South African Bird Atlas Project 2 (SABAP2) (Brooks & Ryan 2023)
- Important Bird and Biodiversity Areas (Birdlife SA 2015);
- The 2015 Eskom Red Data Book of Birds (Taylor et al. 2015)
- The IUCN Red List of Threatened Species (www.iucnredlist.org)

- South Africa Protected Areas Database (DEA 2022);
- South African Conservation Areas (DEA 2022);
- Habitat Suitability Models (Birdlife SA 2021)
- Publicly available satellite imagery, elevation; and topographical data
- Avifaunal Impact Assessment Report (Harebottle 2012)

The desktop study concluded that the area is likely to be of low avian sensitivity in terms of the Best Practice Guidelines, and that due to the size of the project sampling Regime 2 is to be followed.

Priority Species were defined as species with a Red Data listing of regionally or globally Near-threatened or higher, endemic and near-endemic species, and range-restricted species.

2.2 Summer Pre-construction Monitoring Survey

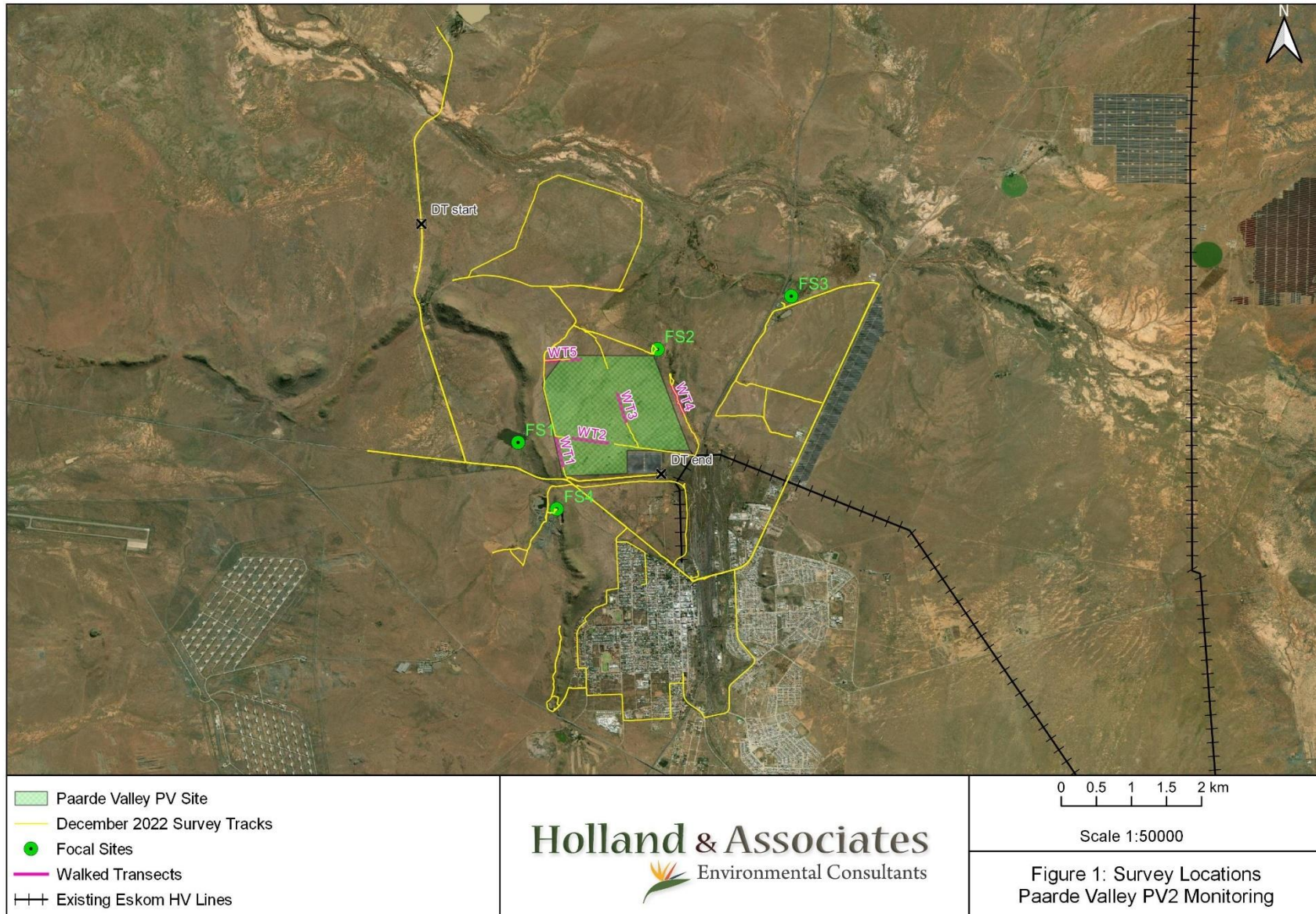
A first seasonal (summer) pre-construction monitoring survey was conducted in line with Best Practice Guidelines by a team of experienced avifaunal observers over 3 days from 11 to 13 December 2022.

2.2.1 Walked Transects

Six walked transects with a length of approximately 500 - 550 m were established and sampled three times each (Figure 1, Table 2). All birds seen on the transect were recorded, including number, behaviour, age and sex if possible, and environmental variables (wind, cloud cover, visibility, temperature, rain).

Table 2: Walked Transect Survey Details

Ref	Start Coordinates	End Coordinates	Length	Dates & Times Conducted
WT1	-30.628607°; 23.993398°	-30.624179°; 23.992357°	523 m	11/12/2022 13:29 12/12/2022 07:16 13/12/2022 06:37
WT2	-30.62427°; 23.994795°	-30.624949°; 24.000079°	519 m	11/12/2022 13:43 12/12/2022 07:04 13/12/2022 06:27
WT3	-30.621908°; 24.002947°	-30.617648°; 24.001439°	519 m	11/12/2022 14:12 12/12/2022 06:47 13/12/2022 06:06
WT4	-30.61636°; 24.009505°	-30.620516°; 24.011272°	520 m	11/12/2022 14:58 12/12/2022 06:24 13/12/2022 05:37
WT5	-30.612726°; 23.990658°	-30.612509°; 23.995888°	523 m	11/12/2022 15:37 12/12/2022 05:57 13/12/2022 18:07
WT6	-30.609598°; 23.99821°	-30.613858°; 24.000009°	512 m	11/12/2022 16:05 12/12/2022 05:36 12/12/2022 17:21



2.2.2 *Focal Sites*

Four focal sites were established (Figure 1), and surveyed three times each, with all birds present, and environmental variables recorded (Table 3). Focal sites were a dam, a watercourse (Plate 1), sewerage works (Plate 2) and a Verreaux’s Eagle nest on a cliff (Plate 3).

Table 3: Focal Site Survey Details

Ref	Coordinate	Type	Dates Visited
FS1	-30.624864°; 23.986659°	Dam	12/12/2022 09:14 13/12/2022 07:21
FS2	-30.66062°; 23.991988°	Watercourse	12/12/2022 10:28 12/12/2022 17:52
FS3	-30.604226°; 24.026146°	Sewerage Works	12/12/2022 11:30 13/12/2022 08:22
FS4	-30.634768°; 23.992406°	Verreaux's Eagle nest	12/12/2022 12:30



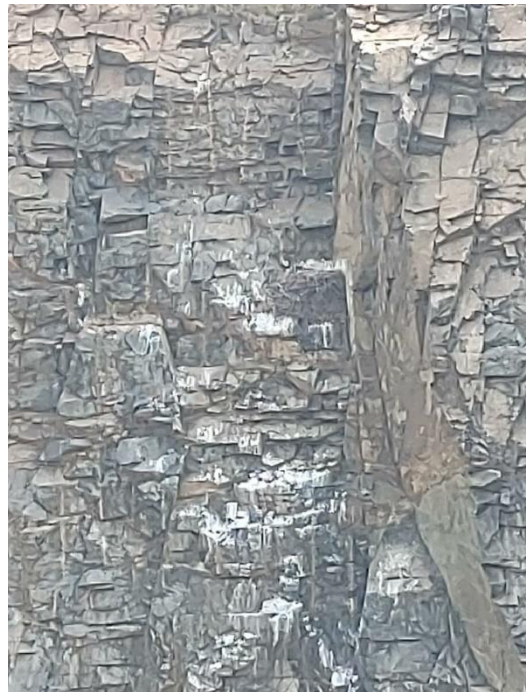
Plate 1: Focal Site 2 (Watercourse)



Plate 2: Focal Site 3 (Sewage works)



Plate 3: Verreaux's Eagle nest on cliff with recent splatter



2.2.3 Driven Transects

One driven transect was conducted twice during the summer survey (Table 3). All Species of Conservation Concern, as well as other large terrestrial species and raptors were recorded while driving slowly on Birdlasser software with GPS coordinates, details on the observed individual, behaviour, and weather conditions.

Table 4: Driven Transect Survey Details:

Ref	Start Coordinate	End Coordinate	Date & Time Surveyed
DT1	-30.592348; 23.972283	-30.629542; 24.007952	12/12/2022 12:38 13/12/2022 06:47

2.2.4 Incidental records

All raptors and Species of Conservation Concern were recorded incidentally throughout the survey, with their GPS coordinates and details recorded.

2.2.5 Avifauna

A checklist of all bird species encountered during the survey was kept using Birdlasser software. A list of potentially occurring species was compiled using data from the pentads (5x5 degree squares) covering the project area from SABAP2 and desktop information.

3 Results

3.1 Walked Transect Results

A total of 60 avian species were recorded during walked transect surveys on the PV Site during the summer survey, with a total of 1097 birds recorded. WT 4 (Figure 1) had the highest abundance of birds with an Index of Kilometric Abundance (IKA) of 208.3 birds per km. The lowest IKA was found on WT2 with 94.2 birds per km. These are relatively high numbers for the arid karoo, and can be attributed partly to summer migrants such as Amur Falcon and Lesser Kestrel being present, in larger numbers, as well as recent rainfalls attracting Ludwig's Bustard and a variety of numerous passerines. De Aar is known to be an important summer roost for Lesser Kestrel and Amur Falcon, at one point estimated to host up to 10% of the global population of Lesser Kestrels.

Table 5: Walked Transect Results Summer Survey

Ref	Individuals recorded (most abundant species in brackets)			Total distance, total birds	Index of Kilometric Abundance	Number of Species recorded	SCC (bold) & notable species recorded
	Survey 1	Survey 2	Survey 3				
WT1	16	28	126 (55 Lesser Kestrel, 25 Amur Falcon)	1.57 km 170 birds	105.7 birds / km	23	Lesser Kestrel, Amur Falcon
WT2	24	62 (22 Wattled Starling)	61 (12 Quailfinch)	1.56 km 147 birds	94.2 birds / km	19	Northern Black Korhaan
WT3	9	42 (12 Southern Red Bishop)	49 (14 Southern Red Bishop)	1.56 km 100 birds	64.1 birds / km	17	Double-banded Courser, Northern Black Korhaan
WT4	152 (50 Greater Striped Swallow, 45 Southern Red Bishop, 15 Barn Swallow)	112 (25 Southern Red Bishop, 12 Cape Sparrow)	65 (Spike-heeled Lark)	1.56 km 329 birds	208.3 birds / km	32	Jackal Buzzard
WT5	54	72 (15 Cape Sparrow)	33 (14 Ludwig's Bustard)	1.57 km 159 birds	101.3 birds / km	19	Ludwig's Bustard (EN)
WT6	16 (10 Spike-heeled Lark)	121 (17 Ludwig's Bustard)	55 (26 Cape Sparrow)	1.54 km 192 birds	124.7 birds / km	21	Ludwig's Bustard (EN)

3.2 Focal Site Results

A total of twelve species, all of which are water-associated species, were recorded at the dam at Focal Site 1 (FS1), including a group of 105 Greater Flamingo, which is a Species of Conservation Concern (SCC) listed globally as Least Concern, but regionally as Near-threatened (Table 6). The Greater Flamingos were present on both days that the dam was visited.

Table 6: Survey Results Focal Site 1 Summer Survey

Focal Site 1 (Dam)				Max number recorded
Common name	Scientific Name	Red List Status & Endemism		
Black-necked Grebe	<i>Podiceps nigricollis</i>			7
Blacksmith Lapwing	<i>Vanellus armatus</i>			25
Black-winged Stilt	<i>Himantopus himantopus</i>			27
Egyptian Goose	<i>Alopochen aegyptiaca</i>			50
Greater Flamingo	<i>Phoenicopterus roseus</i>	Near-threatened		105
Kittlitz's Plover	<i>Charadrius pecuarius</i>			12
Little Grebe	<i>Tachybaptus ruficollis</i>			12

Focal Site 1 (Dam)				Max number recorded
Common name	Scientific Name	Red List Status & Endemism		
Red-billed Teal	<i>Anas erythrorhyncha</i>			8
Three-banded Plover	<i>Charadrius tricollaris</i>			5
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>			5
Yellow-billed Duck	<i>Anas undulata</i>			12
Total				268

At Focal Site 2 (a watercourse in flood, Plate 1) a total of fourteen species were recorded during the summer survey, including the SCC Lanner Falcon (Vulnerable) and the near-endemic SCC African Rock Pipit (Near-threatened). A group of 10 foraging Lesser Kestrel were also recorded. The most numerous species were Little Swift, greater Striped Swallow and White-throated Swallow, and two species of waterfowl (red-billed Teal and Yellow-billed Duck) were also recorded (Table 7).

Table 7: Survey Results Focal Site 2 Summer Survey

Focal Site 2 (Watercourse)				Max number recorded
Common name	Scientific Name	Red List Status & Endemism		
African Rock Pipit	<i>Anthus crenatus</i>	Near-threatened, near-endemic		2
Desert Cisticola	<i>Cisticola aridulus</i>			1
Greater Striped Swallow	<i>Cecropis cucullata</i>			10
Grey-backed Cisticola	<i>Cisticola subruficapilla</i>			2
Lanner Falcon	<i>Falco biarmicus</i>	Vulnerable		1
Lesser Kestrel	<i>Falco naumanni</i>			10
Little Swift	<i>Apus affinis</i>			21
Pied Crow	<i>Corvus albus</i>			5
Red-billed Teal	<i>Anas erythrorhyncha</i>			4
Rock Martin	<i>Ptyonoprogne fuligula</i>			5
Rufous-eared Warbler	<i>Malcorus pectoralis</i>			3
White-backed Mousebird	<i>Colius colius</i>			5
White-throated Swallow	<i>Hirundo albigularis</i>			12
Yellow-billed Duck	<i>Anas undulata</i>			5
Total				86

At Focal Site 3 (Plate 2) thirteen species were recorded, including 35 Greater Flamingo and 5 Lesser Flamingo, both SCC red list as near-threatened. The other species recorded were all relatively common occurring waterfowl and water-associated species (

Table 8)

Table 8: Survey Results Focal Site 3 Summer Survey

Focal Site 3 (Sewerage works)				Max number recorded
Common name	Scientific Name	Red List Status & Endemism		
African Sacred Ibis	<i>Threskiornis aethiopicus</i>			20
Blacksmith Lapwing	<i>Vanellus armatus</i>			45
Black-winged Stilt	<i>Himantopus himantopus</i>			30
Egyptian Goose	<i>Alopochen aegyptiaca</i>			40
Glossy Ibis	<i>Plegadis falcinellus</i>			80
Greater Flamingo	<i>Phoenicopterus roseus</i>	Near-threatened		35
Grey Heron	<i>Ardea cinerea</i>			3
Hadada Ibis	<i>Bostrychia hagedash</i>			12
Kittlitz's Plover	<i>Charadrius pecuarius</i>			20
Lesser Flamingo	<i>Phoeniconaias minor</i>	Near-threatened		5
South African Shelduck	<i>Tadorna cana</i>			8
Three-banded Plover	<i>Charadrius tricollaris</i>			12
Yellow-billed Duck	<i>Anas undulata</i>			16
Total				321

Focal Site 4 (Plate 3) is a well-established Verreaux's Eagle (Vulnerable) nest on a cliff in an old quarry approximately 1 km west of the closest De Aar residential area, 500 m south of the R48 regional road AND Paarde Valley PV 2 Site boundary. The De Aar Nature Reserve is located approximately 250 m east of the nest. No birds were present at the nest at the time of the survey, however as Verreaux's Eagle breed in winter, and there were signs of recent activity, the nest is considered to be active and should be monitored going forward. Verreaux's Eagle is an SCC listed as Vulnerable, and it appears that the eagles utilising this particular nest have become habituated to the disturbance that is already present in the immediate vicinity of the nest.

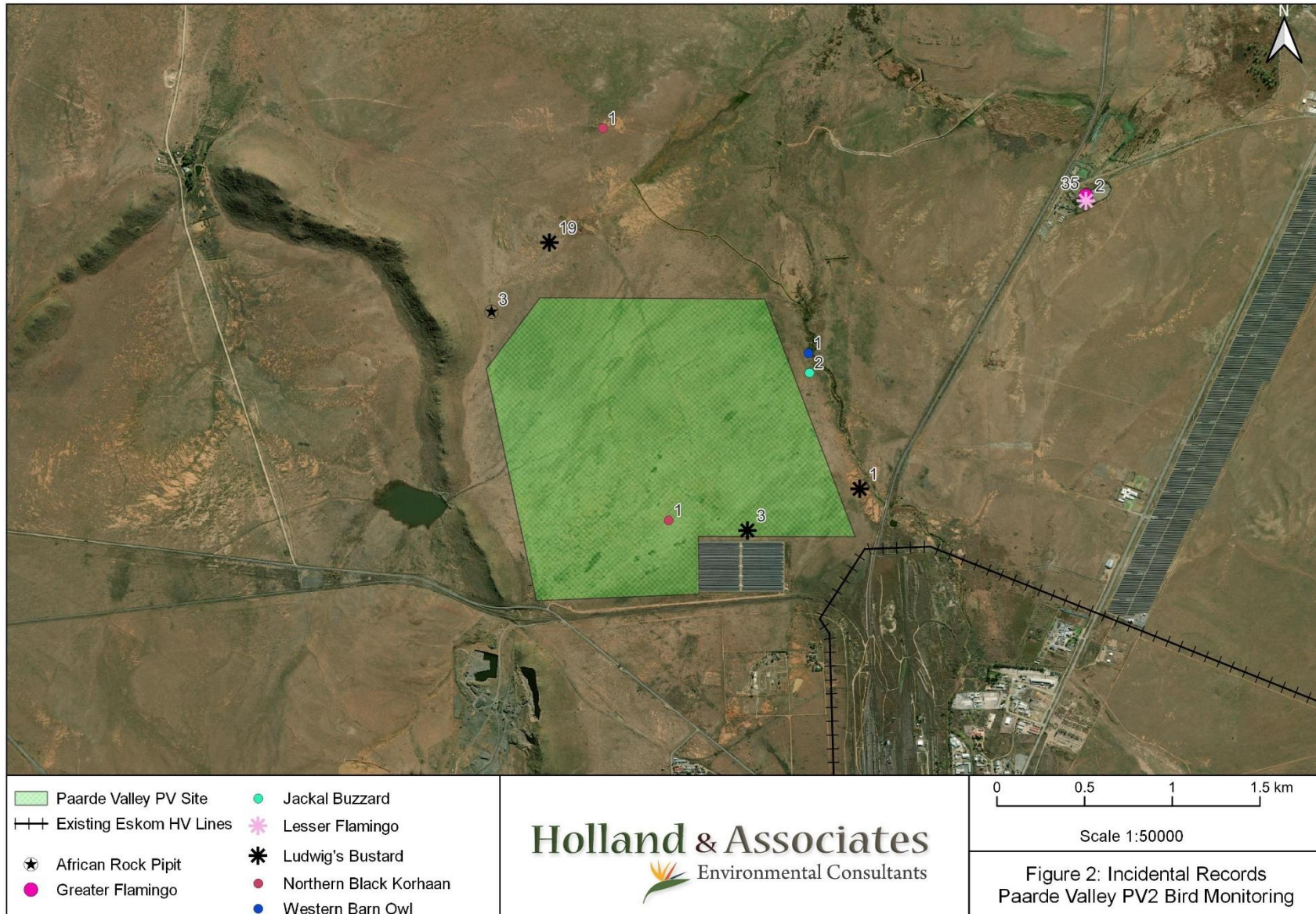
3.3 Driven Transect Results

Three species were recorded during the two driven transects, and these were the same group of Greater Flamingo recorded at Focal Site 1 (110 counted), one Northern Black Korhaan, and a pair of the SCC Blue Crane (Near-threatened).

3.4 Incidental Records

Ten incidental records of seven species were made during the three - day survey outside of the above presented protocols (Figure 2). Of these, four species are SCC: Ludwig's Bustard (Endangered), Greater Flamingo (Near-threatened), Lesser Flamingo (Near-threatened) and African Rock Pipit (Near-threatened). Only two records were made within the Paarde Valley PV2 Site area. These were of one Northern Black Korhaan and three Ludwig's Bustards. The locations

of incidental records is presented in Figure 2, with the number of individuals recorded displayed next to the respective marker.



3.5 Avifauna of the study area

154 species of birds have been recorded by SABAP2 in the pentads covering the project site (3035_2355 and 3035_2400). Refer to Appendix A for a full list. Of the recorded species, ten are Species of Conservation Concern, globally or regionally listed as Near-threatened, Vulnerable or Endangered. Thirteen species are near-endemic species.

Common name	Scientific name	Red data (Regional, global)	Endemism	SABAP2 Reporting rate	Summer survey
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN, EN		15.3846	x
Tawny Eagle	<i>Aquila rapax</i>	EN, VU		7.6923	
Blue Korhaan	<i>Eupodotis caerulescens</i>	LC, NT	SLS	15.3846	
Curlew Sandpiper	<i>Calidris ferruginea</i>	LC, NT		7.6923	
Greater Flamingo	<i>Phoenicopterus roseus</i>	NT, LC		23.0769	x
Blue Crane	<i>Grus paradisea</i>	NT, VU		23.0769	x
Black Stork	<i>Ciconia nigra</i>	VU, LC		15.3846	
Lanner Falcon	<i>Falco biarmicus</i>	VU, LC		7.6923	x
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU, LC		7.6923	
Secretarybird	<i>Sagittarius serpentarius</i>	VU, VU		7.6923	
Cape White-eye	<i>Zosterops virens</i>		NE	30.7692	
Cinnamon-breasted Warbler	<i>Euryptila subcinnamomea</i>		NE	0	
Fairy Flycatcher	<i>Stenostira scita</i>		NE	7.6923	
Fiscal Flycatcher	<i>Melaenornis silens</i>		NE	15.3846	
Grey-winged Francolin	<i>Scleroptila afra</i>		SLS	0	
Jackal Buzzard	<i>Buteo rufofuscus</i>		NE	15.3846	x
Karoo Lark	<i>Calendulauda albescens</i>		NE	15.3846	x
Karoo Prinia	<i>Prinia maculosa</i>		NE	15.3846	x
Karoo Thrush	<i>Turdus smithi</i>		NE	61.5385	
Large-billed Lark	<i>Galerida magnirostris</i>		NE	23.0769	
Pied Starling	<i>Lamprotornis bicolor</i>		SLS	53.8462	
Sickle-winged Chat	<i>Emarginata sinuata</i>		NE	0	
South African Cliff Swallow	<i>Petrochelidon spilodera</i>		BNE	46.1538	

4 Discussion & Recommendations

The Paarde Valley PV2 Solar Energy Facility was authorised in 2012, and is scheduled to be constructed in 2023. As per the original recommendation of the specialist and the authorised EMPr for the project, pre-construction monitoring is required prior to the commencement of construction.

A seasonal summer pre-construction survey was conducted in December 2023 to align the project with current Best Practice Guidelines and comply with the authorised EMPr for the project. A second seasonal survey will be required to be in line with current Best Practice Guidelines and is recommended to take place in the winter months.

The results to date indicate that the PV Site layout avoids areas of high sensitivity such as the rivers and wetlands utilised by SCC, and most SCC were recorded outside of the authorised footprint. The main concern for the project based on data available to date is the occurrence of the Endangered Ludwig's Bustard on site, with larger groups recorded in the greater area.

The following mitigation measures should be included in an updated Environmental Management Programme for the project.

- Vegetation clearing within the development footprint, including underneath the PV panels must be in line with the recommendations of the vegetation specialist and kept to the practically and safe possible minimum.
- The footprint of disturbance must be kept to a minimum during construction and demarcated.
- Before the planned commencement of construction activities an avifaunal specialist must conduct a walkthrough of the development footprint within 4 weeks of commencement of construction. Any management measures to protect sensitive sites recommended by the avifaunal specialist following the walkthrough must be implemented.
- An avian species specialist must train the ECO in the identification of the SCCs (identified as potentially present in the area in this report), and the presence, location and behaviour thereof during any site visits must be recorded.
- Should any SCC be found breeding within the development footprint at any point during construction, all works within 1 km of the breeding site must be halted, and the avian species specialist must be contacted for further instruction.
- Should any SCC be found breeding within the site boundary at any point during operation of the facility, the area must be cordoned off and the avian species specialist must be contacted for further instruction.
- Any fatalities of SCC must be reported by the environmental manager to the consulting specialist, Birdlife SA, and the Competent Authority.
- Minimise outdoor lighting needed to operate the facility to the maximum extent practicable.
- Minimise perching opportunities within the facility by installing anti-perching devices, netting or other deterrents where required.
- Minimise the length of all overhead powerlines.
- All electrical infrastructure to be of bird-friendly insulated design in line with the latest Eskom Technical Standards.
- Install bird flight diverters along the entire length of all overhead powerlines.
- Bury low and medium voltage powerlines wherever practically possible.

- All fencing must be in line with Birdlife South Africa's Guideline for Fences & Birds⁵
- All water reservoirs and open water must be covered with netting or mesh to avoid birds drowning.
- No chemicals detrimental to the health of animal species are to be used for the cleaning of the PV panels.
- A Post-construction Monitoring Plan (to be compiled following pre-construction monitoring) must be implemented in line with current Best Practice Guidelines.
- The Verreaux's Eagle nest, and any other nests of SCC identified within 1 km of the development footprint must be monitored for breeding activity and success at the beginning and the end of the breeding season. The ECO for the project can be trained by an avifaunal specialist to conduct these surveys. Breeding records must be submitted annually to Birdlife SA in order to contribute positively towards the conservation and knowledge base of this red-listed species.

5 References

Birdlife SA. 2015. Important Bird and Biodiversity Areas.

Jenkins AR, Ralston-Paton S & Smit-Robinson HA. 2017. Guidelines for assessing and monitoring the impact of solar power generating facilities on bird in southern Africa. Birdlife South Africa, Pretoria.

South African National Biodiversity Institute (SANBI) 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the terrestrial Fauna and Flora Species protocol for environmental impact assessments in South Africa.* South African National Biodiversity Institute, Pretoria. Version 3.1.2022

⁵ <https://www.birdlife.org.za/what-we-do/landscape-conservation/what-we-do/birds-and-fences/>

Appendix A: List of Potential and Recorded Species

Full Name	Scientific Name	Red List	Endemism	SABAP2 Reporting Rate	Summer Survey
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>			61.5385	
African Black Duck	<i>Anas sparsa</i>			7.6923	
African Black Swift	<i>Apus barbatus</i>			0	x
African Harrier-Hawk	<i>Polyboroides typus</i>			7.6923	
African Hoopoe	<i>Upupa africana</i>			38.4615	
African Pipit	<i>Anthus cinnamomeus</i>			53.8462	x
African Quail-finch	<i>Ortygospiza atricollis</i>			7.6923	x
African Red-eyed Bulbul	<i>Pycnonotus nigricans</i>			61.5385	
African Rock Pipit	<i>Anthus crenatus</i>	NT, LC	SLS	0	x
African Sacred Ibis	<i>Threskiornis aethiopicus</i>			61.5385	x
African Snipe	<i>Gallinago nigripennis</i>			7.6923	
African Stonechat	<i>Saxicola torquatus</i>			38.4615	x
Alpine Swift	<i>Tachymarptis melba</i>			0	
Amur Falcon	<i>Falco amurensis</i>			15.3846	x
Ant-eating Chat	<i>Myrmecocichla formicivora</i>			84.6154	x
Barn Swallow	<i>Hirundo rustica</i>			53.8462	x
Black Crane	<i>Zapornia flavirostra</i>			7.6923	
Black Stork	<i>Ciconia nigra</i>	VU, LC		15.3846	
Black-chested Prinia	<i>Prinia flavicans</i>			15.3846	x
Black-headed Heron	<i>Ardea melanocephala</i>			23.0769	
Blacksmith Lapwing	<i>Vanellus armatus</i>			61.5385	x
Black-throated Canary	<i>Criethagra atrogularis</i>			38.4615	
Black-winged Kite	<i>Elanus caeruleus</i>			15.3846	x
Black-winged Stilt	<i>Himantopus himantopus</i>			53.8462	
Blue Crane	<i>Grus paradisea</i>	NT, VU		23.0769	x
Blue Korhaan	<i>Eupodotis caerulescens</i>	LC, NT	SLS	15.3846	
Bokmakierie	<i>Telophorus zeylonus</i>			69.2308	x
Booted Eagle	<i>Hieraaetus pennatus</i>			23.0769	
Brown-throated Martin	<i>Riparia paludicola</i>			15.3846	
Cape Bunting	<i>Emberiza capensis</i>			15.3846	x
Cape Glossy (Cape) Starling	<i>Lamprotornis nitens</i>			7.6923	
Cape Robin-chat	<i>Cossypha caffra</i>			46.1538	
Cape Shoveler	<i>Spatula smithii</i>			7.6923	
Cape Sparrow	<i>Passer melanurus</i>			100	x
Cape Teal	<i>Anas capensis</i>			23.0769	

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Cape Turtle (Ring-necked) Dove	<i>Streptopelia capicola</i>			76.9231	
Cape Wagtail	<i>Motacilla capensis</i>			61.5385	x
Cape Weaver	<i>Ploceus capensis</i>		NE	0	x
Cape White-eye	<i>Zosterops virens</i>		NE	30.7692	
Capped Wheatear	<i>Oenanthe pileata</i>			38.4615	x
Chat Flycatcher	<i>Melaenornis infuscatus</i>			30.7692	x
Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>			0	x
Cinnamon-breasted Warbler	<i>Euryptila subcinnamomea</i>		NE	0	
Cloud Cisticola	<i>Cisticola textrix</i>		NE	0	x
Common (Steppe) Buzzard	<i>Buteo buteo</i>			7.6923	
Common Greenshank	<i>Tringa nebularia</i>			23.0769	
Common Moorhen	<i>Gallinula chloropus</i>			38.4615	
Common Ostrich	<i>Struthio camelus</i>			15.3846	
Common Quail	<i>Coturnix coturnix</i>			0	x
Common Ringed Plover	<i>Charadrius hiaticula</i>			0	
Common Sandpiper	<i>Actitis hypoleucos</i>			0	
Common Starling	<i>Sturnus vulgaris</i>			38.4615	
Common Swift	<i>Apus apus</i>			15.3846	
Common Waxbill	<i>Estrilda astrild</i>			23.0769	
Crowned Lapwing	<i>Vanellus coronatus</i>			15.3846	x
Curlew Sandpiper	<i>Calidris ferruginea</i>	LC, NT		7.6923	
Desert Cisticola	<i>Cisticola aridulus</i>			38.4615	x
Diederik Cuckoo	<i>Chrysococcyx caprius</i>			23.0769	
Double-banded Courser	<i>Rhinoptilus africanus</i>	LC,		0	x
Dusky Sunbird	<i>Cinnyris fuscus</i>			7.6923	
Eastern Clapper Lark	<i>Mirafraga fasciolata</i>	, LC		53.8462	x
Egyptian Goose	<i>Alopochen aegyptiaca</i>			69.2308	x
European Bee-eater	<i>Merops apiaster</i>			61.5385	x
Fairy Flycatcher	<i>Stenostira scita</i>		NE	7.6923	
Familiar Chat	<i>Oenanthe familiaris</i>			69.2308	
Fiscal Flycatcher	<i>Melaenornis silens</i>		NE	15.3846	
Gabar Goshawk	<i>Micronisus gabar</i>			7.6923	
Glossy Ibis	<i>Plegadis falcinellus</i>			46.1538	
Greater Flamingo	<i>Phoenicopterus roseus</i>	NT, LC		23.0769	x

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Greater Striped Swallow	<i>Cecropis cucullata</i>			23.0769	x
Grey Heron	<i>Ardea cinerea</i>			30.7692	x
Grey-backed Cisticola	<i>Cisticola subruficapilla</i>			30.7692	
Grey-backed Sparrow-lark	<i>Eremopterix verticalis</i>			7.6923	
Grey-headed Gull	<i>Chroicocephalus cirrocephalus</i>			7.6923	
Grey-winged Francolin	<i>Scleroptila afra</i>		SLS	0	
Hadeda (Hadada) Ibis	<i>Bostrychia hagedash</i>			76.9231	x
Hamerkop	<i>Scopus umbretta</i>			7.6923	
Helmeted Guineafowl	<i>Numida meleagris</i>			61.5385	
House Sparrow	<i>Passer domesticus</i>			53.8462	
Jackal Buzzard	<i>Buteo rufofuscus</i>		NE	15.3846	x
Karoo Lark	<i>Calendulauda albescens</i>		NE	15.3846	x
Karoo Prinia	<i>Prinia maculosa</i>		NE	15.3846	x
Karoo Scrub Robin	<i>Cercotrichas coryphoeus</i>			69.2308	x
Karoo Thrush	<i>Turdus smithi</i>		NE	61.5385	
Kittlitz's Plover	<i>Charadrius pecuarius</i>			7.6923	x
Kori Bustard	<i>Ardeotis kori</i>	NT, NT		x	x
Lanner Falcon	<i>Falco biarmicus</i>	VU, LC		7.6923	
Large-billed Lark	<i>Galerida magnirostris</i>		NE	23.0769	x
Lark-like Bunting	<i>Emberiza impetuanii</i>			15.3846	x
Laughing Dove	<i>Spilopelia senegalensis</i>			76.9231	
Lesser Flamingo	<i>Phoeniconaias minor</i>	NT, NT		x	x
Lesser Kestrel	<i>Falco naumanni</i>			53.8462	x
Lesser Swamp Warbler	<i>Acrocephalus gracilirostris</i>			23.0769	
Levaillant's Cisticola	<i>Cisticola tinniens</i>			15.3846	x
Little Egret	<i>Egretta garzetta</i>			7.6923	
Little Grebe	<i>Tachybaptus ruficollis</i>			7.6923	
Little Stint	<i>Calidris minuta</i>			15.3846	
Little Swift	<i>Apus affinis</i>			69.2308	
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN, EN		15.3846	x
Malachite Kingfisher	<i>Corythornis cristatus</i>			7.6923	
Mountain Wheatear	<i>Myrmecocichla monticola</i>			7.6923	
Namaqua Dove	<i>Oena capensis</i>			23.0769	
Namaqua Sandgrouse	<i>Pterocles namaqua</i>			7.6923	
Neddicky	<i>Cisticola fulvicapilla</i>			15.3846	
Nicholson's Pipit	<i>Anthus nicholsoni</i>			7.6923	

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Nicholson's Pipit	<i>Anthus nicholsoni</i>			7.6923	
Northern Black Korhaan	<i>Afrotis afrooides</i>			84.6154	x
Orange River White-eye	<i>Zosterops pallidus</i>			23.0769	
Pale Chanting Goshawk	<i>Melierax canorus</i>			53.8462	
Pale-winged Starling	<i>Onychognathus naboroup</i>			30.7692	
Pied Avocet	<i>Recurvirostra avosetta</i>			30.7692	
Pied Crow	<i>Corvus albus</i>			92.3077	x
Pied Starling	<i>Lamprotornis bicolor</i>		SLS	53.8462	x
Pin-tailed Whydah	<i>Vidua macroura</i>			15.3846	
Red-billed Quelea	<i>Quelea quelea</i>			38.4615	
Red-billed Teal	<i>Anas erythrorhyncha</i>			15.3846	
Red-eyed Dove	<i>Streptopelia semitorquata</i>			46.1538	
Red-faced Mousebird	<i>Urocolius indicus</i>			30.7692	
Red-headed Finch	<i>Amadina erythrocephala</i>			15.3846	
Red-knobbed coot	<i>Fulica cristata</i>			15.3846	
Rock Dove	<i>Columba livia</i>			15.3846	
Rock Kestrel	<i>Falco rupicolus</i>			23.0769	x
Rock Martin	<i>Ptyonoprogne fuligula</i>			38.4615	x
Ruff	<i>Calidris pugnax</i>			23.0769	
Rufous-eared Warbler	<i>Malcorus pectoralis</i>			69.2308	x
Sabota Lark	<i>Calendulauda sabota</i>			38.4615	x
Secretarybird	<i>Sagittarius serpentarius</i>	VU, VU		7.6923	
Short-toed Rock Thrush	<i>Monticola brevipes</i>			0	
Sickle-winged Chat	<i>Emarginata sinuata</i>		NE	0	x
South African Cliff Swallow	<i>Petrochelidon spilodera</i>		BNE	46.1538	
South African Shelduck	<i>Tadorna cana</i>			38.4615	x
Southern (Common) Fiscal	<i>Lanius collaris</i>			84.6154	
Southern Masked Weaver	<i>Ploceus velatus</i>			92.3077	x
Southern Red Bishop	<i>Euplectes orix</i>			61.5385	x
Speckled Pigeon	<i>Columba guinea</i>			46.1538	x
Spike-heeled Lark	<i>Chersomanes albofasciata</i>			53.8462	x
Spotted Eagle-Owl	<i>Bubo africanus</i>			7.6923	
Spotted flycatcher	<i>Muscicapa striata</i>			15.3846	

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Spotted Thick-knee	<i>Burhinus capensis</i>			15.3846	
Spur-winged Goose	<i>Plectropterus gambensis</i>			30.7692	x
Tawny Eagle	<i>Aquila rapax</i>	EN, VU		7.6923	
Three-banded Plover	<i>Charadrius tricollaris</i>			53.8462	x
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU, LC		7.6923	
Wattled Starling	<i>Creatophora cinerea</i>			7.6923	x
Western Barn Owl	<i>Tyto alba</i>			x	x
Western Cattle Egret	<i>Bubulcus ibis</i>			7.6923	
White Stork	<i>Ciconia ciconia</i>			7.6923	
White-backed Mousebird	<i>Colius colius</i>			69.2308	
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>			7.6923	
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>			15.3846	
White-faced Whistling Duck	<i>Dendrocygna viduata</i>			7.6923	
White-necked Raven	<i>Corvus albicollis</i>			15.3846	
White-necked Raven	<i>Corvus albicollis</i>			15.3846	
White-rumped Swift	<i>Apus caffer</i>			38.4615	
White-throated Canary	<i>Crithagra albogularis</i>			30.7692	
White-throated Swallow	<i>Hirundo albigularis</i>			15.3846	
Wood Sandpiper	<i>Tringa glareola</i>			7.6923	
Yellow-bellied Eremomela	<i>Eremomela icteropygialis</i>			23.0769	x
Yellow-billed Duck	<i>Anas undulata</i>			23.0769	x
Zitting Cisticola	<i>Cisticola juncidis</i>			38.4615	