AVIFAUNA ASSESSMENT OF THE REMAINING EXTENT OF THE FARM ZULANI 167, DOUGLAS, NORTHER CAPE

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CK 2007/043724/23
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To whom it may concern,

REVIEW OF SPECIALIST AVIFAUNAL ASSESSMENT:

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I, Lukas Jurie Niemand, member and principal consultant of Pachnoda Consulting and registered professional scientist in the fields of Zoological and Ecological sciences, evaluated the avifaunal (bird) component of the abovementioned specialist assessment compiled by Mr CW Vermeulen of Hystrix Environmental Specialists. The report was evaluated in accordance with the **scope of work** (as defined in the report) and the guidelines proposed by the relevant provincial department.

In general, criticism lodged against avifaunal/ecological studies include: poor use of relevant scientific literature, lack of, or poor field surveys and associated data collection, poor use of regional information datasets, general poor knowledge of subject, failure to describe limitations or constraints on survey methodology, insufficient or inadequate data, vague generalisations with no indication of the relative importance of a particular component.

With regards to the above criticism, none of it is relevant to the avifaunal assessment of the aforementioned report and it fulfils the basic requirements as defined by the scope of work:

1. A detailed account was provided on the occurrence of bird species of conservation concern. The specialist also provided distributional information on active nesting sites for a critically endangered vulture species while also corroborated with BirdLife South Africa on recommended buffer zones. In addition, the specialist also provided spatial context on potential breeding habitat which extends beyond the study site boundaries (an important consideration for future land use planning);

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2. The specialist provides an indication on the potential and observed species richness on the study site, whereby he also consulted national datasets as well as contributing towards the SABAP2 citizen science project.

However, I do recommend that the specialist conduct a follow-up site with the objective to:

1. Improve the shortlist of observed bird species in the area. The number of hours spent on site was considered to be of short duration for a surface area exceeding 1000 ha in extent. It would also be advantageous to include a sampling protocol (e.g. the use of point counts) to gain information on dominant taxa and the relative densities of the passerine association on the site;
2. To quantify the White-backed Vulture (*Gyps africanus*) breeding population on the study site as well as on neighbouring farms (farms that border the study site). The aim is to provide an indication of the number of active nests on the site (and on neighbouring farms) as well as their distribution on the site (and on neighbouring farms), and to assess the proportion of the South African population that utilize the area for breeding and roosting purposes. The survey should coincide with the onset of the breeding season (c. May-July) and should follow the protocol as explained by Malan and Howells (2009) and Monadjem and van Zyl (2009).

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It is concluded that the report comply with the general requirements for avifaunal assessments, although the recommendations as outlined above should be included.

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1. Introduction

Hystrix Environmental Specialists was appointed to conduct an Avifaunal Assessment for the proposed Agricultural development on the remaining extent of the Farm Zulani 167 (hereafter referred to as the study area) in the Douglas area, Northern Cape.

This report is based on the avifaunal species present on the study area as well as species that could potentially occur. The report primarily focuses on species with conservation concerns **(NT** = Near Threatened, **VU** = Vulnerable, **EN** = Endangered, **CR** = Critically Endangered) and other species with conservation importance occurring on or near the study area to ensure that, should any such species exist, the appropriate actions are taken to guarantee the well-being of these species.

2. Scope of the study

- To provide a comprehensive (where possible) shortlist of bird species occurring on the study area.
- To identify discrete avifaunal habitats on the study area.
- To compare the species composition occurring on the study area with the regional composition that has been recorded in that area in recent history.
- To identify ecologically sensitive areas in terms of species occurrence and/or habitat.
- To provide inventories of the bird species occurring on the study area as well as species possibly occurring in the area as a result of habitat preferences, nomadism and historical records.
- To provide a list of species with conservation importance (*sensu* IUCN, 2017 and Taylor et al. 2015).
- To provide recommendations in the form of mitigation of negative impacts, should the development be approved.

3. Study Area

The study area is situated between the R357 to the North and the Vaal river to the South, approximately 34km East of Douglas, Northern Cape (**Figure 1**). The size of the study area is approximately 2767 hectares and is located within the 2824CC quarter degree square (QDS) and within the 2855_2405 pentad (A pentad is a 5 minute x 5 minute coordinate grid super-imposed over the continent for spatial reference, one QDS comprises of 9 pentads) (SABAP2). The study area transects two regional vegetation types according to Mucina and Rutherford (2012): Kimberley Thornveld and Upper Gariep Alluvial Vegetation.

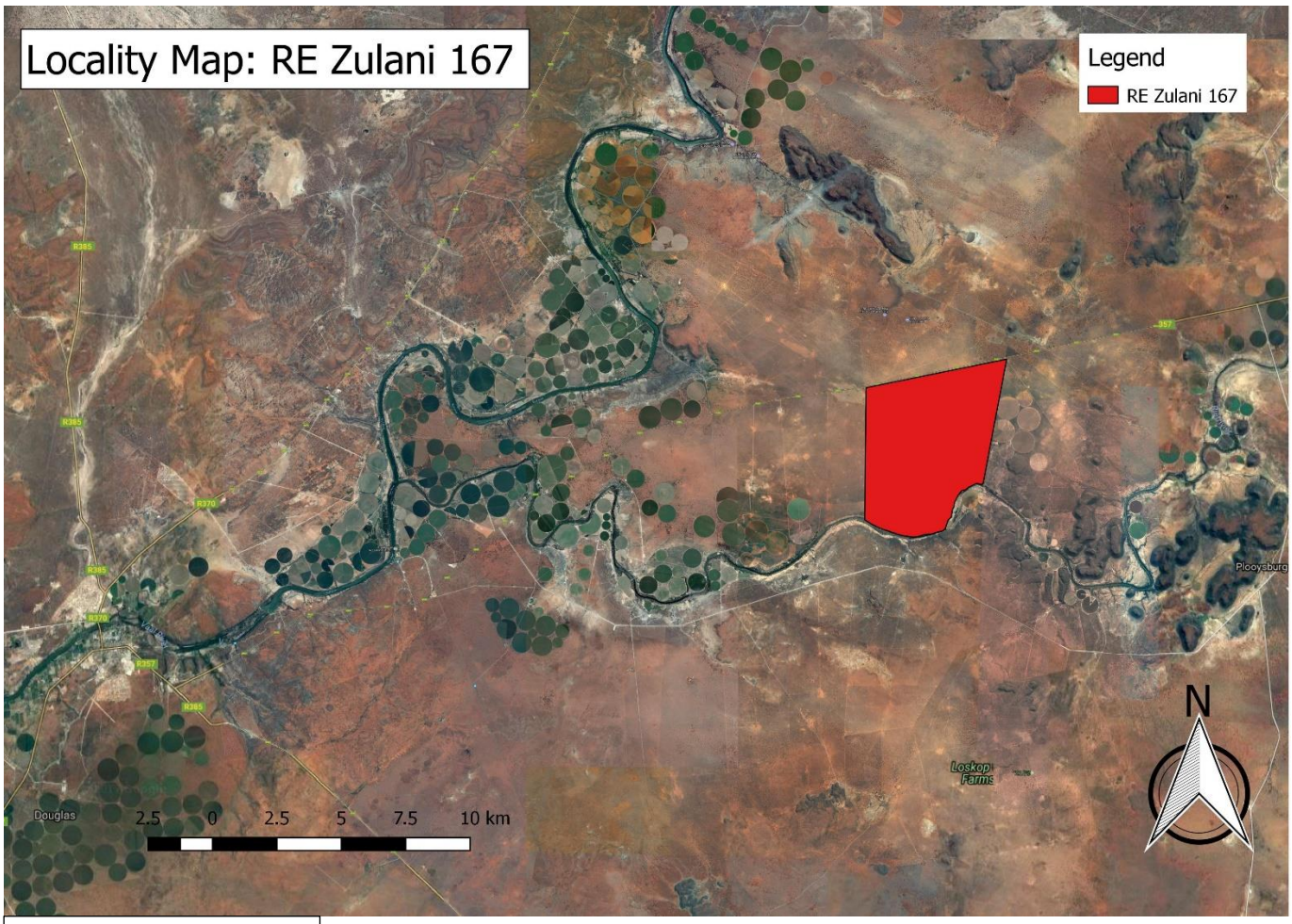


Figure 1: Locality Map

A locality map showing all the surrounding roads and open space as well as the study area indicated in red.

4. Methods

4.1 Limitations and assumptions

The majority of the data used to conclude the distribution of Red Data species were sourced by making use of the SABAP 1 and 2 data bases. Any limitations in the above-mentioned studies will in effect have implications on the findings and conclusion of this assessment. Furthermore, this avifaunal assessment was conducted during September; hence the survey was done outside the main breeding period of the most of the local bird species. Moreover, most of the Palearctic and intra-Africa migratory bird species have not yet arrived from their boreal and equatorial summer breeding habitat. With respect to this assessment the implications of not being able to record migratory bird species will be minimal, seeing that threatened or near threatened Palearctic species face threats on their boreal breeding habitat.

Limited time to conduct the survey could potentially result in not recording all species within the study area. The study site was visited on the 27th of September 2017. In total, nine and a half hours were spent on site while conducting this avifaunal assessment. As a result of the size of the study area, 9 hours was deemed sufficient time to record all the prevalent bird species on and around the study area. However, more time is needed to conclusively map active White-backed Vulture nests as well as confirming the occurrence of species not confirmed during the field survey. Due to the abovementioned the focus of the survey was to (1) provide an indication of the occurrence of species of conservation concern and their habitats and (2) to provide an indication on the general species richness". Also, no quantifiable information was collected and therefore the dominance, relative densities, local compositions and functional groups were not analysed. As such, the results provide a "snapshot" of the bird richness and occurrence probability of birds with conservation concerns in the area and was based on a single instantaneous sampling.

4.2 Field Survey

A nine-and-a-half-hour field survey was conducted on the study area on the 27th September 2017. Before conducting the field survey, a desktop assessment was conducted to document the prevalent avifaunal species occurring on or near the study area. A list of expected species was compiled and used as a reference during the field surveys to ensure that bird species that should theoretically occur were not overlooked. All distinct avifaunal habitats were identified on site, after which each habitat was assessed to record the associated avifaunal species present in that specific habitat. Species were identified by actual sightings, calls as well as signs of presence in the form of eggshells, nests, droppings and feathers (Chris & Tilde Stuart., 2000). Where necessary, species were verified using Sasol Birds of Southern Africa (Sinclair *et al*., 2011).

Figure 2: GPS waypoints for each bird species

The geographical position of the initial observation of each bird species within the study area, thereby illustrating the coverage of the study area during the survey. These observed species are color coded and listed in Table 1 (Recorded on site – 5)

4.3 The occurrence of potential species

By using Southern Africa Bird Atlas Project 1 and 2 (SABAP2) a comprehensive species list could be compiled for the 2824CC quarter degree square (QDS) and within the 2855_2405 pentad. SABAP2 is the follow-up project to the Southern African Bird Atlas Project (for which the acronym was SABAP, and which is now referred to as SABAP1). This first bird atlas project took place from 1987-1991. The second bird atlas project started on 1 July 2007 and plans to run indefinitely. The project aims to map the distribution and relative abundance of birds in southern Africa. The field work for this project is done by

more than one thousand nine hundred volunteers, known as citizen scientists. The unit of data collection is the pentad, five minutes of latitude by five minutes of longitude, squares with sides of roughly 9 km.

The initial list compiled for the species occurring in the QDS can however not be used as an accurate list in terms of the species actually occurring within the study area since it covers a larger area as well as a wider variety of habitats. In order to compile an accurate species list for the study area, all the species previously recorded in and around the 2824CC QDS were considered and added or eliminated on account of the habitat present on the study area as well as the habitat preferences of each of the species previously recorded within the larger QDS.

4.4 Threatened and Near Threatened bird species

By consulting the SABAP2 data basis, all the threatened (referring to IUCN categories Critically endangered, endangered and vulnerable) and/or near threatened bird species previously recorded within and surrounding the 2824CC QDS were added to the initial reference list of species that could potentially occur on or near the study area. All the threatened species occurring in or around the study area were reviewed (Roberts VII, Hockey *et al.* 2005; Taylor *et al.,* 2015*)* before conducting the field survey. During the field survey special attention was paid to identify any signs such as; actual sightings, suitable habitat, nest sites, suitable hunting/ foraging habitat or roosting spots pointing to the presence of these species.

A list was compiled to indicate the presence and/ or occurrence probability of bird species with conservation concerns based on the above-mentioned indicators (**Table 2**).

4.5 Specific Requirements in terms of Red Data Avifaunal species

4.5.1. The Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is an international convention (to which South Africa is a signatory) and represents a commitment to sustainable development. The Convention has three main objectives: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources.

4.5.2. The Convention on the Conservation of Migratory Species of Wild Animals

The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) is an intergovernmental treaty and is the most appropriate instrument to deal with the conservation of terrestrial, aquatic and avian migratory species. The convention includes policy and guidelines with regards to the impact associated with man-made developments. CMS requires that parties (South Africa is a signatory) take measures to avoid migratory species from becoming endangered (Art II, par. 1 and 2) and to make every effort to prevent the adverse effects of activities and obstacles that seriously impede or prevent the migration of migratory species.

4.5.3. The Agreement on the Convention of African-Eurasian Migratory Water Birds

The Agreement on the Conservation of African-Eurasian Migratory Water birds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory water birds and their habitat across Africa, Europe, the Middle East Central Asia, Greenland and the Canadian Archipelago. The AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual cycle and is a legally binding agreement by all contracting parties (South Africa included) to guarantee the conservation of migratory water birds within their national boundaries through species and habitat protection and the management of human activities.

4.5.4. The National Environmental Management: Biodiversity Act

The National Environmental Management: Biodiversity Act (No. 10 of 2004, NEMBA) regulations on Threatened and Protected Species (TOPS) provides for the consolidation of biodiversity legislation through establishing national norms and standards for the management of biodiversity across all sectors and by different management authorities. The national Act and several sets of provincial conservation legislation provide for among other things, the management and conservation of South Africa's biodiversity; protection of species and ecosystems that necessitate national protection and the sustainable use of indigenous biological resources.

Threatened and near threatened bird species of the region (*sensu* Taylor et al., 2015 and IUCN, 2017):

- Kori Bustard (*Ardeotis kori*) **NT**
- Ludwig's Bustard (*Neotis ludwigii*) **EN**
- Martial Eagle (*Polemaetus bellicosus*) **EN**
- Tawny Eagle (*Aquila rapax*) **EN**

- Lanner Falcon (*Falco biarmicus*) **VU**
- Secretarybird (*Sagittarius serpentarius*) **VU**
- Abdim's Stork (*Ciconia abdimii*) **NT**
- White-backed Vulture (*Gyps africanus*) **CR**
- Curlew Sandpiper (Calidris feruginnea) **NT** (according to IUCN, 2017)

5. Results

5.1 Avifaunal Habitat Assessment:

During the habitat assessment three distinct bird habitats were identified within the study area. These habitats include: *Vachellia erioloba* dominated savanna, *Senegalia mellifera* dominated Alluvial Vegetation and Agricultural land. (**Figure 3**). All the habitats identified on the study area are individually discussed.

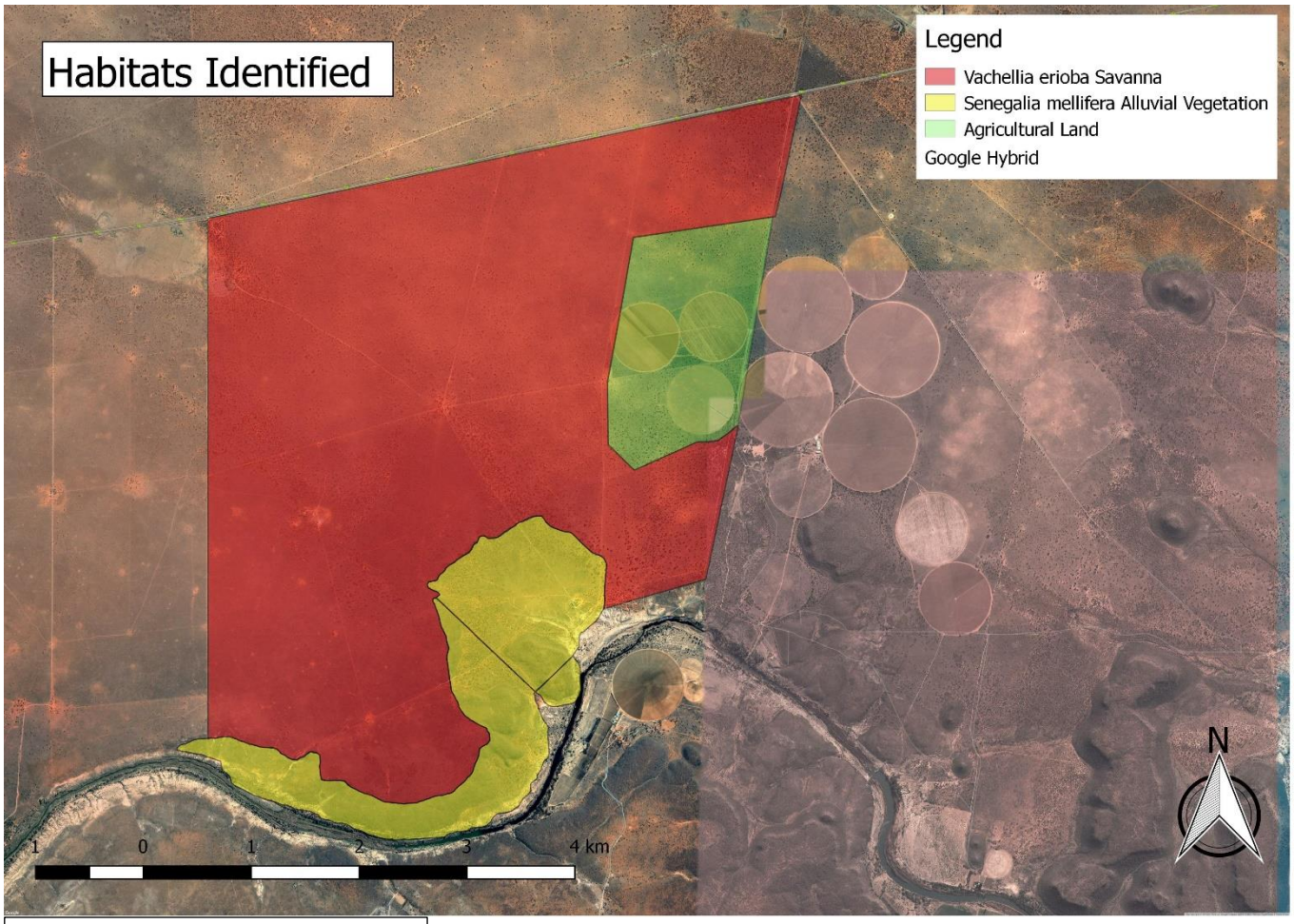


Figure 3: Habitats Identified

5.1.1 *Vachellia erioloba* Savanna:

The *Vachellia erioloba* dominated Savanna study unit contains a large number of mature trees including by *Vachellia haematoxylon*, *Senegalia mellifera* and *Ziziphus mucronata* interspersed with various grass species dominated by the genera *Eragrostis*, silky awn grasses *Stipagrostis* and stick grasses *Aristida* (Figure 4). This study unit supports an overall high species composition with an apparent high number of bird individuals. Some of the bird species observed within this study unit includes; Crimson-breasted Shrike (*Laniarius atrococcineus*), White-fronted Bee-eater (*Merops bullockoides*), Pygmy Falcon (*Polihierax semitorquatus*), Red-crested Korhaan (*Lophotis ruficrista*) and Black-shouldered Kite (*Elanus caeruleus*). The largest part of this study unit remains in a natural state with very good connectivity to the west and north, and a moderate connectivity to the east. This study unit provides the optimal habitat for a number of the threatened and near threatened bird species expected to occur within the larger study area of which Martial Eagle (*Polemaetus bellicosus*) **EN** and White-backed Vulture White-backed Vulture (*Gyps*

africanus) **CR** were recorded during the field survey. **Six active White-backed Vulture nests were recorded within the study unit during the field survey**. Even though only six active white-backed Vulture nests were recorded during the field survey, it is reasonable to deduct that this study unit contains a much larger number of nests. This statement is based on the large size of the study unit, which makes it increasingly difficult to observe and record nest sites, along with the abundance of Vultures recorded within the study unit during the field survey. Vulture nests can easily be overlooked due to the fact that canopies of *V. erioloba* nest trees are often significantly convex and vultures do not always nest at the apex of the tree. This in conjunction with the dens leaf cover of the trees makes it difficult to state with confidence that all active nests on the study area was in fact recorded during the survey. A total of approximately 46 individual vultures were recorded. Apart from providing optimal breeding habitat for a number of threatened and near threatened species, this study unit also provides optimal foraging and hunting habitat for certain threatened and near threatened species such as Secretarybird (*Sagittarius serpentarius*) **VU** and Kori Bustard (*Ardeotis kori*) **NT**. On account of the aforementioned and the near natural state of the study unit together with the overall high avifauna species composition, this study unit was deemed **highly sensitive** from an avifaunal perspective.

Figure 4: *Vachellia erioloba* dominated Savanna

5.1.2 *Senegalia mellifera* dominated Alluvial Vegetation

The *Senegalia mellifera* dominated Alluvial Vegetation study unit consists of undulating shrubland with outcrops interspersed with a number of seasonal drainage lines. The majority of the study unit is situated on the southernmost section of the study area. *Senegalia mellifera* is the most dominant shrub in the study unit, but *Rhigozum trichotomum* is also common with *Stipagrostis sp.* the most dominant grass. Other more sparsely scattered shrubs include *Phaeoptilum spinosum, Ziziphus mucronata, Zygophyllum rigidum, Crotalaria cf. spartioides* and *Aptosimum marlothii.* The habitat provides the optimal foraging habitat for Kori Bustard, known to be present in the area, as well as providing the preferred habitat for other threatened and near threatened avifauna species such as Ludwig's Bustard. As a result of the unique environment a number of habitat specific species such as Anteating Chat (*Myrmecocichla formicivora*), Fawn-coloured Lark (*Calendulauda africaniodes*), Karoo Shrub-robin (*Erythropygia coryphaeus*) and Black-faced Waxbill (*Estrilda erythronotos*) occurs. Connectivity of the habitat unit with surrounding homogenous habitats is relatively good throughout the study area. On account of the aforementioned function of connectivity, the optimal habitat for threatened bird species, natural state of the habitat and unique species composition, the largest part of this habitat was deemed to be **moderately sensitive** from an avifaunal perspective. **Please Note;** The study unit does not include the riparian zone of the Vaal river since the proposed agricultural development will not form part of this riparian zone.

Figure 5: *Senegalia mellifera* dominated Alluvial Vegetation

5.1.3 Agricultural Land

A small part in the north-east of the study area consists of this habitat type. A large number of bird species have adapted to this transformed habitat. This habitat is largely transformed due to agricultural activities and contains cultivated land. Species associated and adapted to this environment includes; Korhaan, Francolins, Spurfowl, Guineafowl, Ostrich, Cattle Egrets, Ibis, Storks, Pigeons, Chats and Starlings. Although this habitat might occasionally be utilized for foraging purposes by threatened and near threatened species such as Secretarybird, Kori Bustard and Ludwig's Bustard, no suitable breeding habitat for any threatened or near threatened avifaunal species were observed, and as such the area cannot be deemed sensitive solely on account of the sporadic and occasional presence of these IUCN Red listed bird species. As a result of the lack of suitable breeding habitat for threatened and near threatened avifauna as well as the numerous disturbances associated with agricultural activities this habitat type was deemed to have a reasonably **low avifaunal sensitivity**.

Table 1: Bird species observed within the study area during the field survey, as well as bird species potentially occurring on the study area as a result of habitat preferences and historical records.

The biodiversity index indicates the probability of a species breeding (BP) within the study area as well as the occurrence probability within the study area according to the habitat preferences (OP) of that specific species. Very Low – 1, Low – 2, Medium – 3, High – 4, Recorded on site – 5, Not likely to occur/breed – 0, Threatened or near threatened Species

	Species name	**Afrikaans**	***Taxonomic name***	**OP**	**BP**
1.	Avocet, Pied	Bontelsie	*Recurvirostra avosetta*	*2*	*1*
2.	Barbet, Acacia Pied	Bonthoutkapper	*Tricholaema leucomelas*	*5*	*4*
3.	Batis, Pririt	Piritbosbontrokkie	*Batis pririt*	*5*	*4*
4.	Bee-eater, European	Europese Byvreter	*Merops apiaster*	*5*	*3*
5.	Bee-eater, Swallow-tailed	Swaelstertbyvreter	*Merops hirundineus*	*5*	*4*
6.	Bee-eater, White-fronted	Rooikeelbyvreter	*Merops bullockoides*	*5*	*4*
7.	Bishop, Southern Red	Rooivink	*Euplectes orix*	*5*	*4*

8.	Bokmakierie, Bokmakierie	Bokmakierie	*Telophorus zeylonus*	*5*	*4*
9.	Brubru, Brubru	Bontroklaksman	*Nilaus afer*	*5*	*4*
10.	Bulbul, African Red-eyed	Rooioogtiptol	*Pycnonotus nigricans*	*5*	*4*
11.	Bunting, Golden-breasted	Rooirugstreepkoppie	*Emberiza flaviventris*	*4*	*4*
12.	Bustard, Kori	Gompou	*Ardeotis kori*	*4*	*4*
13.	Bustard, Ludwig's	Ludwigse Pou	*Neotis ludwigii*	*3*	*3*
14.	Buttonquail, Kurrichane	Bosveldkwarteltjie	*Turnix sylvaticus*	*4*	*4*
15.	Buzzard, Steppe	Bruinjakkalsvoel	*Buteo vulpinus*	*4*	*0*
16.	Canary, Black-throated	Bergkanarie	*Crithagra atrogularis*	*5*	*4*
17.	Canary, Yellow	Geelkanarie	*Crithagra flaviventris*	*5*	*4*
18.	Chat, Anteating	Swartpiek	*Myrmecocichla formicivora*	*5*	*5*
19.	Chat, Familiar	Gewone Spekvreter	*Cercomela familiaris*	*5*	*4*
20.	Cisticola, Desert	Woestynklopkloppie	*Cisticola aridulus*	*5*	*4*
21.	Cisticola, Zitting	Landeryklopkloppie	*Cisticola juncidis*	*5*	*4*
22.	Cliff-swallow, South African	Familieswael	*Hirundo spilodera*	*4*	*4*
23.	Coot, Red-knobbed	Bleshoender	*Fulica cristata*	*3*	*3*
24.	Cormorant, Reed	Rietduiker	*Phalacrocorax africanus*	*4*	*2*
25.	Cormorant, White-breasted	Witborsduiker	*Phalacrocorax carbo*	*4*	*2*
26.	Courser, Double-banded	Dubbelbanddrawwertjie	*Rhinoptilus africanus*	*5*	*4*
27.	Courser, Temminck's	Trekdrawwertjie	*Cursorius temminckii*	*4*	*4*
28.	Crombec, Long-billed	Bosveldstompstert	*Sylvietta rufescens*	*4*	*4*

29.	Crow, Pied	Witborskraai	*Corvus albus*	5	5
30.	Cuckoo, Diderick	Diederikkie	*Chrysococcyx caprius*	4	4
31.	Cuckoo, Jacobin	Bontnuwejaarsvoel	*Clamator jacobinus*	4	4
32.	Darter, African	Slanghalsvoel	*Anhinga rufa*	4	3
33.	Dove, Laughing	Rooiborsduifie	*Streptopelia senegalensis*	5	5
34.	Dove, Namaqua	Namakwaduifie	*Oena capensis*	5	4
35.	Dove, Red-eyed	Grootringduif	*Streptopelia semitorquata*	5	4
36.	Drongo, Fork-tailed	Mikstertbyvanger	*Dicrurus adsimilis*	5	4
37.	Duck, African Black	Swarteend	*Anas sparsa*	4	3
38.	Duck, White-faced	Nonnetjie-eend	*Dendrocygna viduata*	4	3
39.	Duck, Yellow-billed	Geelbekeend	*Anas undulata*	4	4
40.	Eagle, Martial	Breekoparend	*Polemaetus bellicosus*	5	4
41.	Eagle, Tawny	Roofarend	*Aquila rapax*	2	0
42.	Eagle-owl, Spotted	Gevlekte Ooruil	*Bubo africanus*	4	4
43.	Egret, Cattle	Veereier	*Bubulcus ibis*	4	2
44.	Egret, Little	Kleinwitreier	*Egretta garzetta*	4	2
45.	Eremomela, Yellow-bellied	Geelpensbossanger	*Eremomela icteropygialis*	4	4
46.	Falcon, Lanner	Edelvalk	*Falco biarmicus*	4	2
47.	Falcon, Pygmy	Dwergvalk	*Polihierax semitorquatus*	5	4
48.	Finch, Red-headed	Rooikopvink	*Amadina erythrocephala*	5	4

49.	Finch, Scaly-feathered	Baardmannetjie	*Sporopipes squamifrons*	*5*	*5*
50.	Fiscal, Common (Southern)	Fiskaallaksman	*Lanius collaris*	*5*	*4*
51.	Fish-eagle, African	Visarend	*Haliaeetus vocifer*	*4*	*4*
52.	Flycatcher, Chat	Grootvlieevanger	*Bradornis infuscatus*	*5*	*4*
53.	Flycatcher, Fairy	Feevlieievanger	*Stenostira scita*	*4*	*1*
54.	Flycatcher, Fiscal	Fiskaalvlieivanger	*Sigelus silens*	*5*	*4*
55.	Flycatcher, Marico	Maricovlieevanger	*Bradornis mariquensis*	*5*	*4*
56.	Goose, Egyptian	Kolgans	*Alopochen aegyptiacus*	*4*	*4*
57.	Goose, Spur-winged	Wildemakou	*Plectropterus gambensis*	*4*	*4*
58.	Goshawk, Gabar	Kleinsingvalk	*Melierax gabar*	*5*	*4*
59.	Goshawk, Southern Pale Chanting	Bleeksingvalk	*Melierax canorus*	*5*	*4*
60.	Grebe, Black-necked	Swartnekdobbertjie	*Podiceps nigricollis*	*2*	*1*
61.	Grebe, Little	Kleindobbertjie	*Tachybaptus ruficollis*	*4*	*4*
62.	Greenshank, Common	Groenpootruiter	*Tringa nebularia*	*4*	*0*
63.	Guineafowl, Helmeted	Gewone Tarentaal	*Numida meleagris*	*5*	*4*
64.	Hamerkop, Hamerkop	Hamerkop	*Scopus umbretta*	*4*	*4*
65.	Heron, Black-headed	Swartkopreier	*Ardea melanocephala*	*4*	*4*
66.	Heron, Grey	Bloureier	*Ardea cinerea*	*4*	*4*
67.	Honeyguide, Lesser	Kleinheuningwyser	*Indicator minor*	*3*	*3*
68.	Hoopoe, African	Hoephoep	*Upupa africana*	*4*	*4*
69.	Hornbill, African Grey	Grysneushoringvoel	*Tockus nasutus*	*4*	*4*

70.	Hornbill, Southern Yellow-billed	Geelbekneushoringvoel	*Tockus leucomelas*	5	4
71.	Ibis, African Sacred	Skoorsteenveer	*Threskiornis aethiopicus*	4	2
72.	Ibis, Glossy	Glansibis	*Plegadis falcinellus*	3	2
73.	Ibis, Hadeda	Hadeda	*Bostrychia hagedash*	5	4
74.	Kestrel, Greater	Grootrooivalk	*Falco rupicoloides*	4	4
75.	Kestrel, Rock	Kransvalk	*Falco rupicolus*	4	4
76.	Kingfisher, Giant	Reusevisvanger	*Megaceryle maximus*	4	4
77.	Kingfisher, Malachite	Kuifkopvisvanger	*Alcedo cristata*	4	4
78.	Kingfisher, Pied	Bontvisvanger	*Ceryle rudis*	4	4
79.	Kite, Black-shouldered	Blouvalk	*Elanus caeruleus*	4	4
80.	Korhaan, Northern Black	Witvlerkkorhaan	*Afrotis afraoides*	5	4
81.	Korhaan, Red-crested	Boskorhaan	*Lophotis ruficrista*	5	4
82.	Lapwing, Blacksmith	Bontkiewiet	*Vanellus armatus*	4	4
83.	Lapwing, Crowned	Kroonkiewiet	*Vanellus coronatus*	5	4
84.	Lark, Eastern Clapper	Hoeveldklappertjie	*Mirafra fasciolata*	4	4
85.	Lark, Fawn-coloured	Vaalbruinlewerik	*Calendulauda africanoides*	5	4
86.	Lark, Rufous-naped	Rooineklewerik	*Mirafra africana*	5	4
87.	Lark, Sabota	Sabotalewerik	*Calendulauda sabota*	5	4
88.	Martin, Brown-throated	Afrikaanse Oewerswael	*Riparia paludicola*	5	4
89.	Martin, Rock	Kransswael	*Hirundo fuligula*	5	4
90.	Masked-weaver, Southern	Swartkeelgeelvink	*Ploceus velatus*	5	5
91.	Moorhen, Common	Grootwaterhoender	*Gallinula chloropus*	4	4

92.	Mousebird, Red-faced	Rooiwangmuisvoel	*Urocolius indicus*	4	4
93.	Mousebird, White-backed	Witkruismuisvoel	*Colius colius*	5	4
94.	Neddicky, Neddicky	Neddikkie	*Cisticola fulvicapilla*	4	4
95.	Nightjar, Rufous-cheeked	Rooiwangnaguil	*Caprimulgus rufigena*	4	4
96.	Ostrich, Common	Volstruis	*Struthio camelus*	5	4
97.	Penduline-tit, Cape	Kaapse Kapokvoel	*Anthoscopus minutus*	4	4
98.	Pigeon, Speckled	Kransduif	*Columba guinea*	5	5
99.	Pipit, African	Gewone Koester	*Anthus cinnamomeus*	5	4
100.	Plover, Kittlitz's	Geelborsstrandkiewiet	*Charadrius pecuarius*	3	3
101.	Plover, Three-banded	Driebandstrandkiewiet	*Charadrius tricollaris*	4	4
102.	Pochard, Southern	Bruineend	*Netta erythrophthalma*	3	3
103.	Prinia, Black-chested	Swartbandlangstertjie	*Prinia flavicans*	5	4
104.	Quailfinch, African	Gewone Kwartelvinkie	*Ortygospiza atricollis*	5	4
105.	Quelea, Red-billed	Rooibekkwelea	*Quelea quelea*	5	4
106.	Reed-warbler, African	Kleinrietsanger	*Acrocephalus baeticatus*	5	4
107.	Robin-chat, Cape	Gewone Janfrederik	*Cossypha caffra*	4	4
108.	Rock-thrush, Short-toed	Korttoonkliplyster	*Monticola brevipes*	4	4
109.	Ruff, Ruff	Kemphaan	*Philomachus pugnax*	3	0
110.	Sandgrouse, Namaqua	Kelkiewyn	*Pterocles namaqua*	4	4
111.	Sandpiper, Common	Gewone Ruiter	*Actitis hypoleucos*	4	0
112.	Sandpiper, Curlew	Krombekstrandloper	*Calidris ferruginea*	2	0
113.	Sandpiper, Marsh	Moerasruiter	*Tringa stagnatilis*	2	0

114.	Sandpiper, Wood	Bosruiter	*Tringa glareola*	*3*	*0*
115.	Scimitarbill, Common	Swartbekkakelaar	*Rhinopomastus cyanomelas*	*5*	*4*
116.	Scrub-robin, Kalahari	Kalahariwipstert	*Cercotrichas paena*	*5*	*4*
117.	Scrub-robin, Karoo	Slangverklikker	*Cercotrichas coryphoeus*	*4*	*4*
118.	Shelduck, South African	Kopereend	*Tadorna cana*	*4*	*4*
119.	Shoveler, Cape	Kaapse Slopeend	*Anas smithii*	*4*	*4*
120.	Shrike, Crimson-breasted	Rooiborslaksman	*Laniarius atrococcineus*	*5*	*4*
121.	Shrike, Lesser Grey	Gryslaksman	*Lanius minor*	*3*	*0*
122.	Shrike, Red-backed	Rooiruglaksman	*Lanius collurio*	*4*	*0*
123.	Sparrow, Cape	Gewone Mossie	*Passer melanurus*	*5*	*5*
124.	Sparrow, Great	Grootmossie	*Passer motitensis*	*3*	*3*
125.	Sparrow, House	Huismossie	*Passer domesticus*	*3*	*3*
126.	Sparrow, Southern Grey-headed	Gryskopmossie	*Passer diffusus*	*5*	*4*
127.	Sparrow-weaver, White-browed	Koringvoel	*Plocepasser mahali*	*5*	*4*
128.	Sparrowlark, Grey-backed	Grysruglewerik	*Eremopterix verticalis*	*4*	*4*
129.	Spoonbill, African	Lepelaar	*Platalea alba*	*4*	*2*
130.	Spurfowl, Cape	Kaapse Fisant	*Pternistis capensis*	*5*	*4*
131.	Starling, Cape Glossy	Kleinglansspreeu	*Lamprotornis nitens*	*5*	*4*
132.	Starling, Pied	Witgatspreeu	*Spreo bicolor*	*4*	*4*
133.	Starling, Wattled	Lelspreeu	*Creatophora cinerea*	*4*	*2*

134.	Secretarybird, Secretarybird	Sekretarisvoel	*Sagittarius serpentarius*	*3*	*3*
135.	Stilt, Black-winged	Rooipootelsie	*Himantopus himantopus*	*3*	*2*
136.	Stint, Little	Kleinstrandloper	*Calidris minuta*	*3*	*0*
137.	Stork, Abdim's	Kleinswartooievaar	*Ciconia abdimii*	*2*	*0*
138.	Swallow, Barn	Europese Swael	*Hirundo rustica*	*4*	*0*
139.	Swallow, Greater Striped	Grootstreepswael	*Hirundo cucullata*	*4*	*4*
140.	Swallow, Pearl-breasted	PiAÂ¿AÂ½relborsswael	*Hirundo dimidiata*	*5*	*4*
141.	Swallow, Red-breasted	Rooiborsswael	*Hirundo semirufa*	*5*	*4*
142.	Swamp-warbler, Lesser	Kaapse Rietsanger	*Acrocephalus gracilirostris*	*4*	*4*
143.	Swift, Horus	Horuswindswael	*Apus horus*	*2*	*2*
144.	Swift, Little	Kleinwindswael	*Apus affinis*	*2*	*2*
145.	Tchagra, Brown-crowned	Rooivlerktjagra	*Tchagra australis*	*4*	*4*
146.	Teal, Cape	Teeleend	*Anas capensis*	*4*	*4*
147.	Teal, Red-billed	Rooibekeend	*Anas erythrorhyncha*	*4*	*4*
148.	Tern, White-winged	Witvlerksterretjie	*Chlidonias leucopterus*	*2*	*0*
149.	Thick-knee, Spotted	Gewone Dikkop	*Burhinus capensis*	*5*	*4*
150.	Thrush, Karoo	Geelbeklyster	*Turdus smithi*	*4*	*4*
151.	Tit, Ashy	Akasiagrysmees	*Parus cinerascens*	*5*	*4*
152.	Tit-babbler, Chestnut-vented	Bosveldtjeriktik	*Parisoma subcaeruleum*	*5*	*4*
153.	Turtle-dove, Cape	Gewone Tortelduif	*Streptopelia capicola*	*5*	*4*
154.	Vulture, White-backed	Witrugaasvoel	*Gyps africanus*	*5*	*5*
155.	Wagtail, Cape	Gewone Kwikkie	*Motacilla capensis*	*4*	*4*

156.	Warbler, Rufous-eared	Rooioorlangstertjie	*Malcorus pectoralis*	*4*	*4*
157.	Waxbill, Black-faced	Swartwangsysie	*Estrilda erythronotos*	*5*	*4*
158.	Waxbill, Violet-eared	Koningblousysie	*Granatina granatina*	*5*	*4*
159.	Weaver, Sociable	Versamelvoiel	*Philetairus socius*	*5*	*5*
160.	Wheatear, Mountain	Bergwagter	*Oenanthe monticola*	*4*	*4*
161.	White-eye, Cape	Kaapse Glasogie	*Zosterops virens*	*3*	*3*
162.	White-eye, Orange River	Gariepglasogie	*Zosterops pallidus*	*4*	*4*
163.	Whydah, Pin-tailed	Koningrooibekkie	*Vidua macroura*	*5*	*4*
164.	Woodpecker, Golden-tailed	Goudstertspeg	*Campethera abingoni*	*4*	*4*
Totals			**0**	**0**	**14**
			1	0	3
			2	9	12
			3	15	13
			4	70	113
			5	70	9
Total threatened and near threatened Species expected to occur within and around the study area.				***9***	

Of the 164 bird species listed in **Table 1**, 140 species (85.89%) are highly likely to occur in or around the study area of which 122 species are likely to breed on or near the study area. Fifteen (15) of the 164 listed bird species have a medium occurrence probability and nine a low to very low occurrence probability. In addition, 70 species were observed during the site visit, which contributes to approximately 43 % of the expected number of species.

Nine threatened and/or near threatened bird species have been recorded within and around the larger 2824CC QDS and are listed in **Table 2**. On account of the habitat availability on the study area as well as specific habitat preferences, at least six of these species have a high probability of occurrence on the study area.

Red Data Bird Species

Red Data bird species previously recorded within and around the 2824CC QDS according to Harrison *et al*. (1997), Tarboton *et al*. (1987) and SABAP2 (**Table2**).

Table 2: Red Data bird species thought to be present in the 2824CC QDS.

	Species name	Last Recorded (Year)	Red Data: (Regional; Global)	Taxonomic name	SABAP2 Rep Rate (%)	HP	Br
1.	Bustard, Kori	2011	**NT, NT**	*Ardeotis kori*	50	4	4
2.	Bustard, Ludwig's	Not recorded	**EN, EN**	*Neotis ludwigii*	0	3	3
3.	Eagle, Martial	2017	**EN, VU**	*Polemaetus bellicosus*	50	5	4
4.	Eagle, Tawny	Prior to 2007	**EN, LC**	*Aquila rapax*	0 (8.33 during SABAP1)	2	0
5.	Falcon, Lanner	2011	**VU, LC**	*Falco biarmicus*	50	4	2
6.	Sandpiper, curlew	Prior to 2007	**LC, NT**	*Calidris ferruginea*	0 (8.33 during SABAP1)	2	0
7.	Secretarybird,	Not recorded	**VU, VU**	*Sagittarius serpentarius*	Single incidental observation	3	3
8.	Stork, Abdim's	2010	**NT, NT**	*Ciconia abdimii*	0	2	0
9.	Vulture, White-backed	2017	**CR, CR**	*Gyps africanus*	100	5	5

Red data species Categories for the Birds of Southern Africa (Birdlife South Africa 2015)

LC = Least Concern, **NT** = Near Threatened, **VU** = Vulnerable, **EN** = Endangered, **CR** = Critically Endangered.

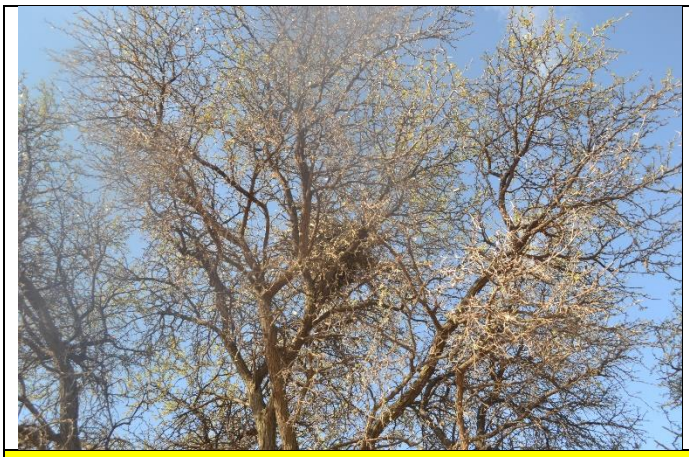
A total of nine threatened and/or near threatened bird species have been recorded within and around the 2824CC QDS (**Table 2**). Four of these have not yet been recorded within the 2855_2405 pentad since the commencement of the South African Bird Atlas Project 2 in 2007. With the exception of Abdim's Stork and Tawny Eagle, the remaining species are likely to occur since the study area provides suitable foraging and/or breeding habitat for these species. Two of the abovementioned species, namely Martial Eagle and White-backed Vulture, were confirmed during the field survey in September 2017. In addition, 46 individual White-backed Vultures and six active nests were recorded within the study area. It is reasonable to except that there are more nests within the study area,

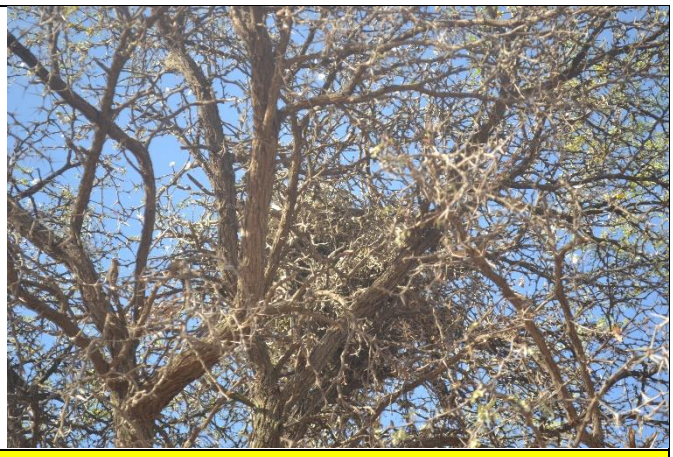
6. White-backed Vulture nest sites - preliminary results.

The *Vachellia erioloba* dominated Savanna habitat unit provides suitable breeding habitat for the internationally critically endangered White-backed Vulture (*Gyps africanus*). Six active nest sites (figure 6) were confirmed within the study area during the field survey. As a result of this observation a detailed habitat assessment was conducted with the aim to map suitable breeding and foraging habitat for this species on and adjacent to the study area to determine the number of White-backed Vulture pairs that could potentially be utilising the study area for breeding purposes. Initially, optimal breeding habitat for White-backed Vultures was identified and mapped accordingly. The study area was then thoroughly surveyed to identify active nests sites; however, vulture nests can easily be overlooked due to the fact that canopies of *V. erioloba* nest trees are often significantly convex and vultures do not always nest at the apex of the tree. This in conjunction with the dens leaf cover of the trees makes it difficult to state with confidence that all active nests on the study area was in fact recorded during the survey. A 1.5km buffer area was then applied to each nests site (*pers. comm*., Me. B Wilson, Head of Zoology Department - McGregor Museum Kimberley - South Africa). Due to the fact that five of the six nests identified within the study area were within 100-200m of each other, this cluster of nests can be considered as a small colony and was given a 2km buffer. Wilbur and Jackson (1983) state that there is considerable variability in the sensitivity of vulture species to disturbance. Southern African vultures are generally considered to be more sensitive to disturbance from people than some species in West Africa and Asia (Mundy, et al, 1992). This particularly applies to the breeding sites of these birds. Boshoff, Anderson & Borello (1997) recommend that disturbance in the vicinity of nesting sites of southern African Vultures should be prevented completely.

Photo Record of Active Vulture nests within the study area

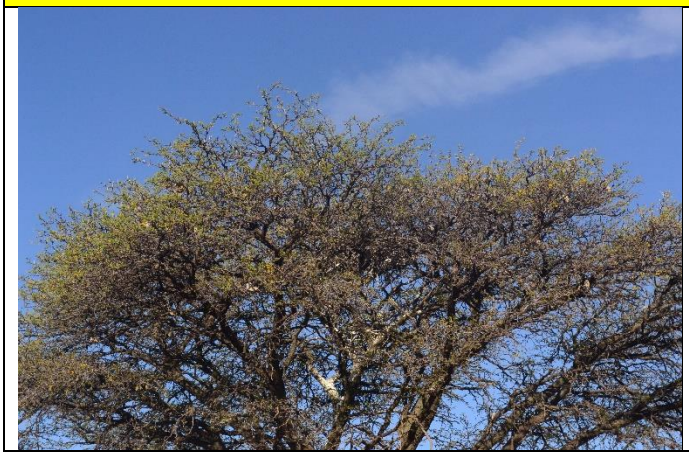
Nest No 1: -28.980605, 24.097945





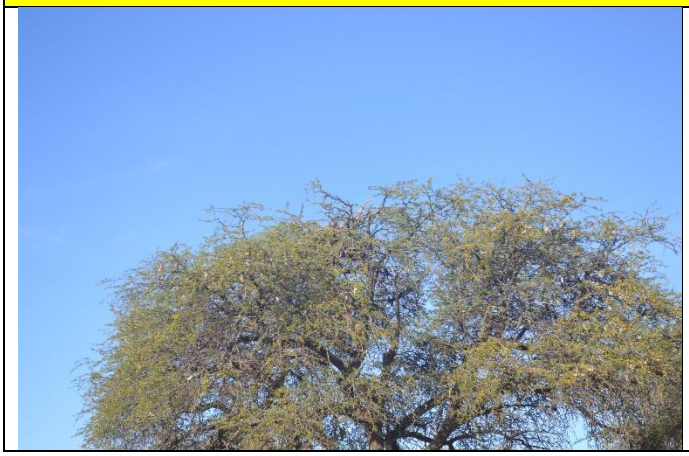
Nest No 2: -28.979609, 24.094973

Nest No 3: -28.978044, 24.095667



Nest No 4: -28.978404, 24.098886

Nest No 5: -28.977449, 24.099292



Nest No 6: -28.970806°, 24.101500°

Figure 6: Confirmed Active White-backed Vulture (*Gyps africanus*) Nests

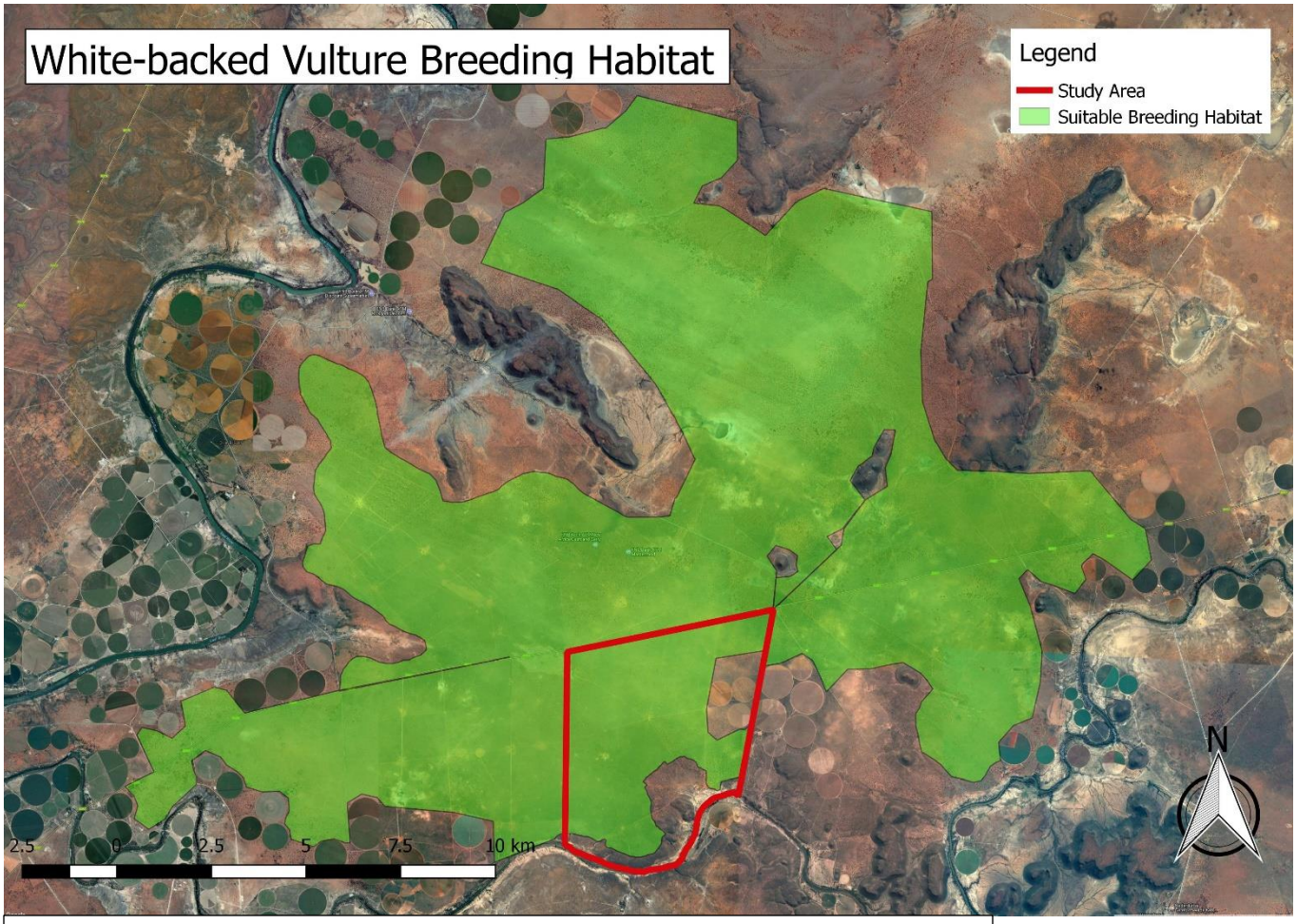


Figure 7: Suitable White-backed Vulture (*Gyps africanus*) habitat

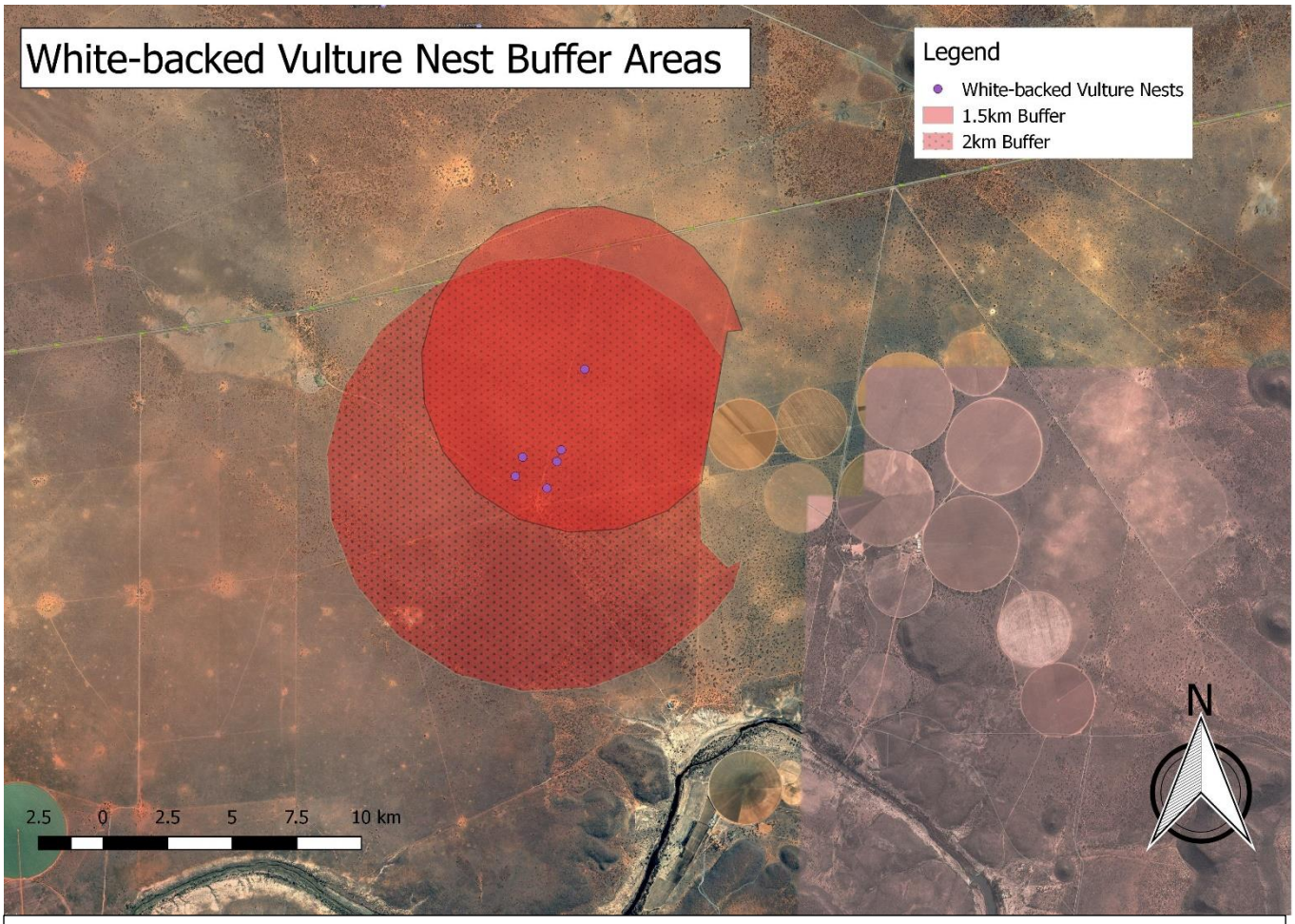


Figure 8: Buffer areas applied to White-backed Vulture (*Gyps africanus*) nest sites

Table 3. The surface areas of suitable White-backed Vulture (*Gyps africanus*) habitat are as follow:

African White-backed Vulture (*Gyps africanus*) habitat survey	
Identified Area	**Surface Area (hectares)**
Suitable breeding habitat (including habitat surrounding the study area)	20 958 ha
Suitable breeding habitat (within the study area)	2 057ha

According to Campbell et al (2002) - nest densities range from 0.32/km^2 to 0.61/km^2 across colonies, with an average density of 0.46/km^2. The nest density of the confirmed nests on the study area is approximately 0.29/km^2. On account of the aforementioned it is highly probable that the study area actually holds more active nests than the number of confirmed nests. Therefore, the entire *Vachellia erioloba* dominated Savanna habitat unit can be seen as being **highly sensitive** from an avifaunal perspective.

7. Findings

The discrete habitats identified within the study area support a variety of bird species, with approximately 155 with a high to medium occurrence probability, of which six threatened and/or near threatened avifaunal species are likely to recur and/or be resident. The following findings were made for each of the associated habitat units within the larger study area.

- **Agricultural:** As a result of the lack of suitable breeding habitat for threatened/near threatened avifauna, as well as the numerous disturbances associated with agricultural activities, this habitat unit was deemed to have a low avifaunal sensitivity.
- ***Senegalia mellifera* dominated Alluvial Vegetation:** No suitable breeding habitat for threatened/near threatened bird species were observed on site, although the habitat might be suitable in terms of foraging and hunting for certain threatened and near threatened species such as Lanner Falcons, Kori Bustard and Ludwig's Bustard. On account of the near natural state of this habitat unit together with the overall high avifaunal species composition, this study unit was deemed moderately sensitive from an avifaunal perspective.
- ***Vachellia erioloba* dominated Savanna:** On account of this habitat unit's connectivity function, the optimal habitat for threatened and near threatened bird species, the natural state of the habitat and unique species composition, it was deemed to be highly sensitive from a avifaunal perspective. Furthermore, six active White-backed Vulture nests were recorded within the habitat unit, with a high probability that more nests could be present. This augments the sensitivity of this habitat unit.

8. Recommendations

- It is highly recommended that a follow-up survey be conducted, spanning more than 24 hours of sampling, to quantify the White-backed Vulture (*Gyps africanus*) breeding population on the study site as well as on neighboring farms (farms that border the study site). The aim is to provide an indication of the number of active nests on the site (and on neighboring farms) as well as their distribution on the site (and on neighboring farms) and to assess the proportion the South African population that utilize the area for breeding and roosting purposes. The survey should coincide with the onset of the breeding season (c. May-July) and should follow the protocol as explained by Malan and Howells (2009) and Monadjem and van Zyl (2009).
- Given the Critically Endangered status of this species the actual number of nests is important. It should be mandatory to count all the Vulture nests during the breeding season

according to accepted protocol. A follow-up site visit should mandatory not only to map out the nest, but also to determine the nesting success prior to the development (including a management plan in consultation with NC department).

- Should any agricultural development occur within the study area, such developments should be restricted the areas deemed to have a low to medium avifaunal sensitivity.
- No development should take place on areas of high avifaunal sensitivity (refer to figure 9).
- No Camel Thorn trees (*Vachellia erioloba*) should be removed or harmed in any way, since they provide nesting platforms for White-back Vultures.
- No development should be permitted within a 1.5km radius of any single White-backed Vulture nest nor should any development occur within a 2km radius of the small nesting White-backed Vulture colony as seen in figure 8. The aforementioned buffer zones should be respected.

9. Conclusion

The study area contains a total of three distinct habitats of which the Agricultural habitat unit was deemed to have a low avifaunal sensitivity. The *Vachellia erioloba* dominated Savanna habitat unit was deemed to be highly sensitive on account of various factors as discussed, but mainly due to a number of active White-backed Vulture nest within this habitat unit. Development within the habitat unit deemed to have a high avifaunal sensitivity should be restricted.

At least nine threatened and/or near threatened bird species are thought to sporadically visit and/or reside within the study area, of which six species are judged to have a medium to high probability of breading and/or being resident within the study area. These species are highly specialized and restricted to their associated habitats as stipulated in this report. Therefore, care should be taken to preserve these unique habitats by restricting disturbances and minimizing transformation in these areas.

Special attention should be assigned to ensure that connectivity of homogeneous habitats stays intact as connectivity of the various habitat units within surrounding homogenous habitats is mandatory to ensure sustainable demographic patterns of avifaunal species relying on certain habitats for survival.

The recommendations under heading 8 should adhered to and included in relevant EIA applications and documentation.

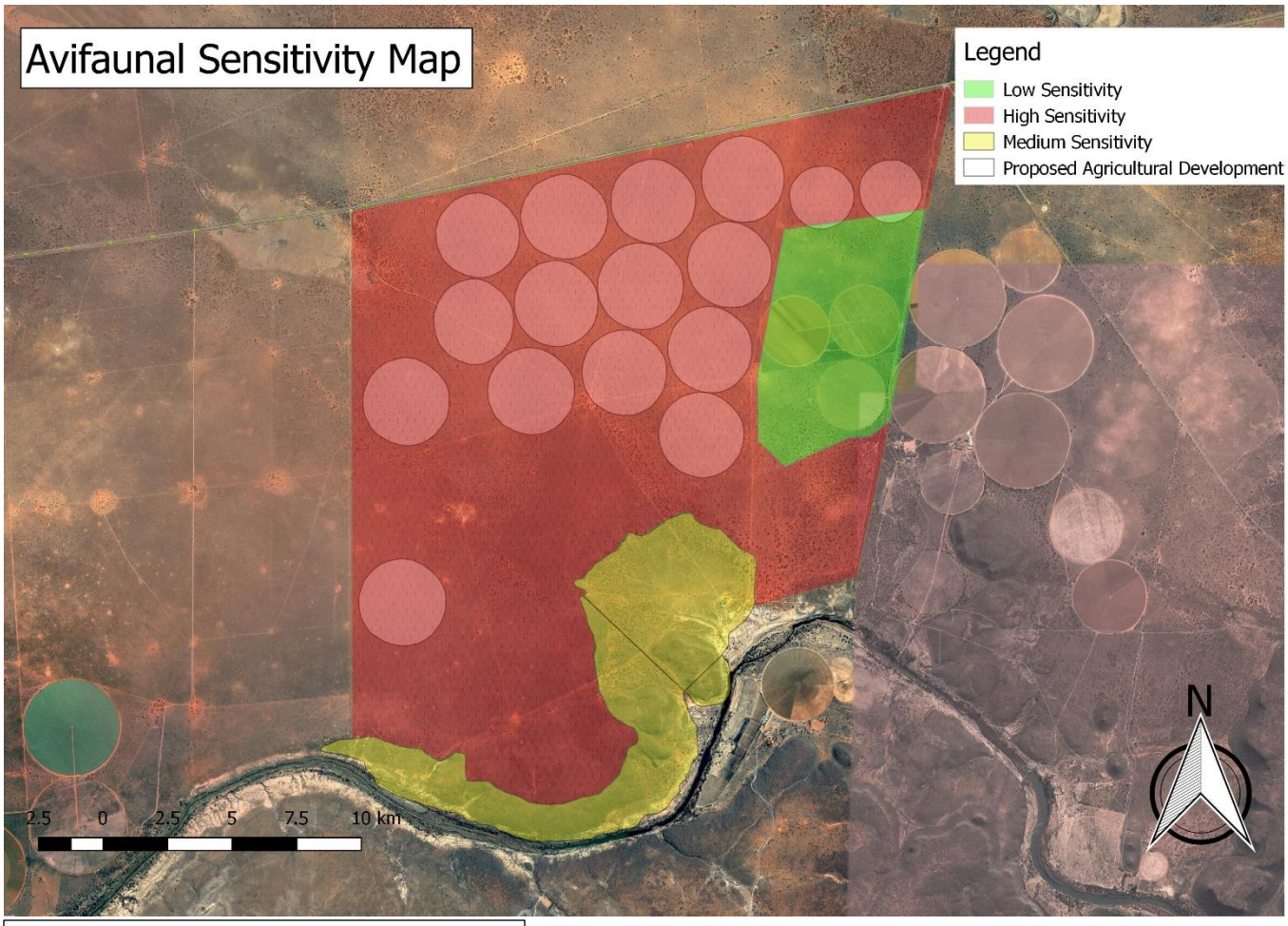


Figure 9: Avifaunal Sensitivity Map

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