AVIFAUNA ASSESSMENT OF THE REMAINING EXTENT OF THE FARM BANKS DRIFT 164 AND PORTION 1 OF THE FARM CHRISTIAN'S DRIFT 166, DOUGLAS, NORTHERN CAPE

HYSTRIX

Cell: 084 814 7904
E-mail: mvr@hystrix.co.za
Address: 12 Tokara, Blinkblaarweg,
Woodland Hills Wildlife Estate
Bloemfontein
9301

Hystrix Environmental Specialists.

Report author: Mr C.W. Vermeulen (BSc. Biological and Environmental Science)
Report Reviewed by: Lukas Niemand (MSc Zoology: Pr. Sci. Nat.)

88 Rubida Street
Murrayfield X1
Pretoria

P.O. Box 72847
Lynwood Ridge
Pretoria
0040

Tel: 012 365 2546
Cell: 083 978 0817
Fax: 012 365 3217
E-mail: lukas@pachnoda.co.za

CK 2007/043724/23
VAT No. 4690249976

09 November 2017

To whom it may concern,

REVIEW OF SPECIALIST AVIFAUNAL ASSESSMENT:

AVIFAUNA ASSESSMENT OF THE REMAINING EXTENT OF THE FARM BANKS DRIFT 164 AND PORTION 1 OF THE FARM CHRISTIAN'S DRIFT 166, DOUGLAS, NORTHERN CAPE

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 (if any).

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 (*c*. threatened and near threatened species; *sensu* Taylor et al. 2015) based on a site visit and the consultation of national datasets (SABAP1 and SABAP2). The specialist also provided information on the presence/absence of nesting sites for a critically endangered vulture species and corroborated with BirdLife South Africa and relevant specialists at the McGregor

88 Rubida Street
Murrayfield X1
Pretoria

P.O. Box 72847
Lynwood Ridge
Pretoria
0040

Tel: 012 365 2546
Cell: 083 978 0817
Fax: 012 365 3217
E-mail: lukas@pachnoda.co.za

CK 2007/043724/23
VAT No. 4690249976

Museum in Kimberley on appropriate buffer zones (if nests were observed). In addition, the specialist provided spatial context regarding potential vulture breeding habitat which extended beyond the study site boundaries (an important consideration for future land use planning);

2. The specialist provided an indication on the expected and observed species richness on the study site based on personal observations and the consultation of national datasets (e.g. SABAP1 and SABAP2). He also contributed towards the SABAP2 citizen science project.

However, it is recommended that the specialist conducts a follow-up site visit 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 when surface areas exceed 1000 ha in extent. It would also be advantageous to include a sampling protocol (e.g. the use of point counts) to obtain information on dominant taxa and the relative densities of the passerine community on the site;
2. To quantify the White-backed Vulture (*Gyps africanus*) breeding/roosting 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 nests on the site (and on neighbouring farms) as well as their distribution on the site (and on neighbouring farms). This information will be valuable in estimating the proportion of the South African vulture population that utilizes 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).

88 Rubida Street
Murrayfield X1
Pretoria

P.O. Box 72847
Lynwood Ridge
Pretoria
0040

Tel: 012 365 2546
Cell: 083 978 0817
Fax: 012 365 3217
E-mail: lukas@pachnoda.co.za

CK 2007/043724/23
VAT No. 4690249976

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

Lukas Niemand
MSc Zoology - UP; Pr. Sci. Nat. Reg. no. 400095/06)
Pachnoda Consulting

Table of Contents

Figures

Tables

1. Introduction

Hystrix Environmental Specialists was appointed to conduct an Avifaunal Assessment for the proposed Agricultural development on the remaining extent of the farm Banks Drift 164 and portion 1 of the farm Christian's drift 166 (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 their well-being.

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 37km East of Douglas, Northern Cape (figure 1). The size of the study area is approximately 1883 hectares and is largely located within the 2824CC quarter degree square

(QDS) and within the 2855_2405, 2900_2410, 2855_2410, 2900_2405 pentads (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 tree regional vegetation types according to Mucina and Rutherford (2012): Kimberley Thornveld, Vaalbos Rocky Shrubland and Upper Gariep Alluvial Vegetation.

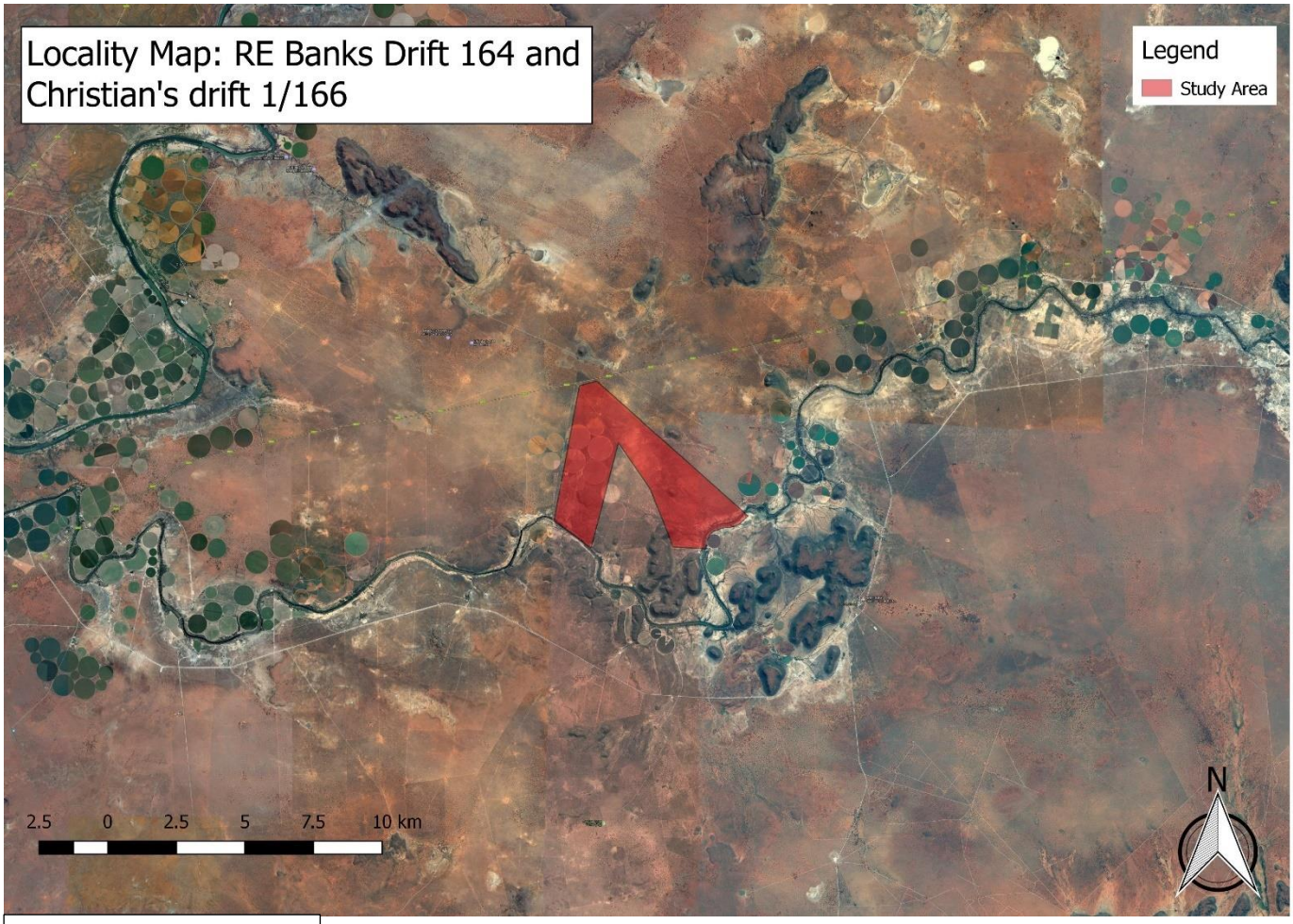


Figure 1: Locality Map

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 28th of September 2017. In total, eight hours were spent on site while conducting this avifaunal assessment. As a result of the size of the study area, eight hours was deemed sufficient time to record the prevalent bird species on and around the study area. However, more time is needed to conclusively state that the study area does not contain any 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 concern in the area and was based on a single instantaneous sampling bout.

4.2 Field Survey

An eight-hour field survey was conducted on the study area on the 28th 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 co-ordinates for each bird species recorded

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 list of expected species list could be compiled for the study area by retrieving information from the 2824CC quarter degree square (QDS) and the 2855_2405, 2900_2410, 2855_2410, 2900_2405 pentads. 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 nine km in extent.

The initial inventory 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/expected list of species that could potentially occur on or near the study area. All the threatened and near 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 shortlist was compiled to indicate the presence and/or occurrence probability of bird species with conservation concern in accordance with 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 ferruginea*) **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.

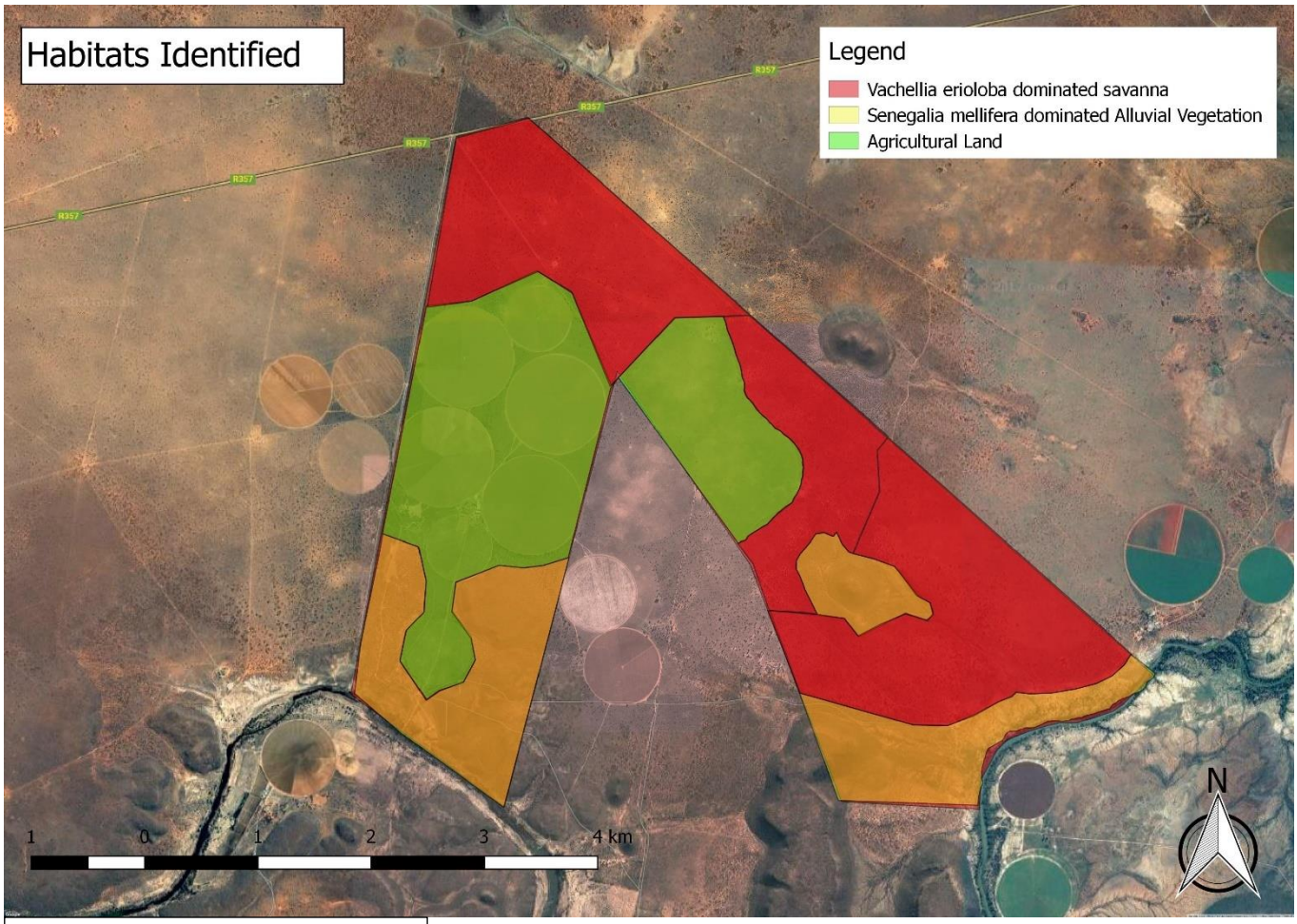


Figure 3: Habitats Identified

5.1.1 *Vachellia erioloba* Savanna:

The *Vachellia erioloba* dominated Savanna study unit is approximately 500 hectares in size and contains a large number of mature trees including *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 east and north, and moderate connectivity to the west. This study unit provides the optimal habitat

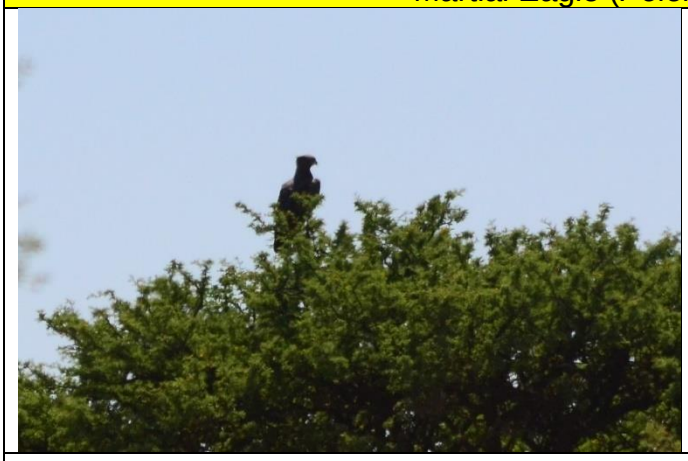
for a number of the threatened and near threatened bird species expected to occur within the larger study area of which Martial Eagle (*Polemaetus bellicosus*) **EN** and White-backed Vulture (*Gyps africanus*) **CR** were recorded during the field survey.

Due to the confirmed occurrence of the aforementioned threatened birds, the habitat unit was thoroughly surveyed to determine whether either of these species were actively nesting within the study unit. Of the eight hours spent surveying the larger study area, six hours were spent surveying this study unit to determine whether it provided nesting sites for Martial Eagle and/or White-backed Vulture. No nest sites for either of the aforementioned species were observed during the survey even though the habitat provides optimal breeding habitat for both species. It contains large mature *Vachellia erioloba* trees which provide suitable nesting platforms for both species. However, Vulture nests can easily be overlooked due to the fact that canopies of *V. erioloba* trees are often significantly convex and vultures do not always nest at the apex of the tree. This in conjunction with the dense leaf cover of the trees makes it difficult to state with confidence that there are no nests present within the study unit. A total of eight individual vultures were recorded within this study unit. With none observed perching. They were all observed flying over the study unit.

The Martial Eagles primarily utilize the study area for foraging purposes and it overlaps with the home range of at least one breeding pair. This was confirmed since no nests were observed as well as the fact that one of the individuals was observed successfully hunting within the study unit. A successful hunt was observed during the field survey when a mature Martial Eagle caught a Guineafowl. It started eating the Guineafowl directly after it caught the bird within one of the gravel roads, after which it flew to the nearest large tree where it pearched and finished consuming it's pray (figure 5).

Although no active White-backed Vulture or Martial Eagle nests were observed within the study unit it does provide optimal breeding habitat for the aforementioned species as well as other threatened and near threatened species such as (*Sagittarius serpentarius*) **VU**. It 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 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

Photo Record of confirmed threatened birds within the study area
Martial Eagle (*Polemaetus bellicosus*)
 

Remains of a Guineafowl after a successful hunt

Vulture White-backed Vulture (*Gyps africanus*)

Figure 5: Martial Eagle and Vulture White-backed Vulture sightings within the study unit

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, although *Rhigozum trichotomum* is also common with *Stipagrostis sp.* the most dominant graminoid. Other sparsely scattered shrubs include *Phaeoptilum spinosum, Ziziphus mucronata, Zygophyllum rigidum, Crotalaria cf. spartioides* and *Aptosimum marlothii.* The habitat provides 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 presence of drainage lines, well-defined graminoid layer, sandy soils and occurrence of microphyllous woodland, a number of arid thorn- and shrubland species such as White-throated Canary (*Crithagra albogularis*), 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 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 6: *Senegalia mellifera* dominated Alluvial Vegetation

5.1.3 Agricultural Land

A section in the middle 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. 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: Expected and observed bird species 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.	Barbet, Acacia Pied	Bonthoutkapper	*Tricholaema leucomelas*	5	4
2.	Barbet, Crested	Kuifkophoutkapper	*Trachyphonus vaillantii*	2	2
3.	Batis, Pririt	Piritbosbontrokkie	*Batis pririt*	5	4
4.	Bee-eater, European	Europese Byvreter	*Merops apiaster*	5	2
5.	Bee-eater, Swallow-tailed	Swaelstertbyvreter	*Merops hirundineus*	5	4
6.	Bishop, Southern Red	Rooivink	*Euplectes orix*	5	4
7.	Bokmakierie, Bokmakierie	Bokmakierie	*Telophorus zeylonus*	5	4

8.	Brubru, Brubru	Bontroklaksman	*Nilaus afer*	5	4
9.	Bulbul, African Red-eyed	Rooioogtiptol	*Pycnonotus nigricans*	5	4
10.	Bunting, Cape	Rooivlerkstreepkoppie	*Emberiza capensis*	4	4
11.	Bunting, Cinnamon-breasted	Klipstreepkoppie	*Emberiza tahapisi*	3	3
12.	Bunting, Golden-breasted	Rooirugstreepkoppie	*Emberiza flaviventris*	4	4
13.	Bunting, Lark-like	Vaalstreepkoppie	*Emberiza impetuani*	4	4
14.	Bustard, Kori	Gompou	*Ardeotis kori*	4	3
15.	Bustard, Ludwig's	Ludwigse Pou	*Neotis ludwigii*	4	3
16.	Buzzard, Jackal	Rooiborsjakkalsvoel	*Buteo rufofuscus*	3	2
17.	Buzzard, Steppe	Bruinjakkalsvoel	*Buteo vulpinus*	4	0
18.	Canary, Black-throated	Bergkanarie	*Crithagra atrogularis*	5	4
19.	Canary, Cape	Kaapse Kanarie	*Serinus canicollis*	2	2
20.	Canary, White-throated	Witkeelkanarie	*Crithagra albogularis*	5	4
21.	Canary, Yellow	Geelkanarie	*Crithagra flaviventris*	5	4
22.	Chat, Anteating	Swartpiek	*Myrmecocichla formicivora*	5	5
23.	Chat, Familiar	Gewone Spekvreter	*Cercomela familiaris*	5	4
24.	Cisticola, Desert	Woestynklopkloppie	*Cisticola aridulus*	5	4
25.	Cisticola, Grey-backed	Grysrugtinktinkie	*Cisticola subruficapilla*	4	4
26.	Cisticola, Zitting	Landeryklopkloppie	*Cisticola juncidis*	5	4
27.	Courser, Double-banded	Dubbelbanddrawwertjie	*Rhinoptilus africanus*	4	4
28.	Crombec, Long-billed	Bosveldstompstert	*Sylvietta rufescens*	5	4
29.	Crow, Pied	Witborskraai	*Corvus albus*	5	5
30.	Cuckoo, Diderick	Diederikkie	*Chrysococcyx caprius*	5	4

31.	Cuckoo, Jacobin	Bontnuwejaarsvoel	*Clamator jacobinus*	4	4
32.	Dove, Laughing	Rooiborsduifie	*Streptopelia senegalensis*	5	5
33.	Dove, Namaqua	Namakwaduifie	*Oena capensis*	5	4
34.	Dove, Red-eyed	Grootringduif	*Streptopelia semitorquata*	5	4
35.	Drongo, Fork-tailed	Mikstertbyvanger	*Dicrurus adsimilis*	5	4
36.	Duck, White-faced	Nonnetjie-eend	*Dendrocygna viduata*	3	3
37.	Eagle, Booted	Dwergarend	*Aquila pennatus*	4	2
38.	Eagle, Martial	Breekoparend	*Polemaetus bellicosus*	5	3
39.	Eagle, Tawny	Roofarend	*Aquila rapax*	2	2
40.	Eagle-owl, Spotted	Gevlekte Ooruil	*Bubo africanus*	4	4
41.	Eagle-owl, Verreaux's	Reuse-ooruil	*Bubo lacteus*	1	1
42.	Egret, Cattle	Veereier	*Bubulcus ibis*	5	2
43.	Eremomela, Yellow-bellied	Geelpensbossanger	*Eremomela icteropygialis*	4	4
44.	Falcon, Lanner	Edelvalk	*Falco biarmicus*	4	2
45.	Falcon, Pygmy	Dwergvalk	*Polihierax semitorquatus*	5	5
46.	Finch, Red-headed	Rooikopvink	*Amadina erythrocephala*	3	3
47.	Finch, Scaly-feathered	Baardmannetjie	*Sporopipes squamifrons*	5	5
48.	Fiscal, Common (Southern)	Fiskaallaksman	*Lanius collaris*	5	4
49.	Fish-eagle, African	Visarend	*Haliaeetus vocifer*	4	4
50.	Flycatcher, Chat	Grootvlieevanger	*Bradornis infuscatus*	5	4
51.	Flycatcher, Fairy	Feevlieievanger	*Stenostira scita*	4	1
52.	Flycatcher, Fiscal	Fiskaalvlieivanger	*Sigelus silens*	4	4
53.	Flycatcher, Marico	Maricovlieevanger	*Bradornis mariquensis*	5	4
54.	Flycatcher, Spotted	Europese Vlieievanger	*Muscicapa striata*	4	0

55.	Goose, Egyptian	Kolgans	*Alopochen aegyptiacus*	4	4
56.	Goshawk, Gabar	Kleinsingvalk	*Melierax gabar*	5	4
57.	Goshawk, Southern Pale Chanting	Bleeksingvalk	*Melierax canorus*	5	4
58.	Guineafowl, Helmeted	Gewone Tarentaal	*Numida meleagris*	5	4
59.	Heron, Grey	Bloureier	*Ardea cinerea*	4	2
60.	Honeyguide, Greater	Grootheuningwyser	*Indicator indicator*	4	4
61.	Honeyguide, Lesser	Kleinheuningwyser	*Indicator minor*	4	4
62.	Hoopoe, African	Hoephoep	*Upupa africana*	4	4
63.	Hornbill, African Grey	Grysneushoringvoel	*Tockus nasutus*	4	4
64.	Hornbill, Southern Yellow-billed	Geelbekneushoringvoel	*Tockus leucomelas*	5	4
65.	Ibis, Hadeda	Hadeda	*Bostrychia hagedash*	5	4
66.	Kestrel, Greater	Grootrooivalk	*Falco rupicoloides*	4	4
67.	Kestrel, Lesser	Kleinrooivalk	*Falco naumanni*	4	0
68.	Kestrel, Rock	Kransvalk	*Falco rupicolus*	4	4
69.	Kingfisher, Brown-hooded	Bruinkopvisvanger	*Halcyon albiventris*	4	4
70.	Kingfisher, Pied	Bontvisvanger	*Ceryle rudis*	4	4
71.	Kite, Black-shouldered	Blouvalk	*Elanus caeruleus*	4	4
72.	Korhaan, Northern Black	Witvlerkkorhaan	*Afrotis afraoides*	5	4
73.	Korhaan, Red-crested	Boskorhaan	*Lophotis ruficrista*	5	4
74.	Lapwing, Blacksmith	Bontkiewiet	*Vanellus armatus*	5	4
75.	Lapwing, Crowned	Kroonkiewiet	*Vanellus coronatus*	4	4
76.	Lark, Eastern Clapper	Hoeveldklappertjie	*Mirafra fasciolata*	5	4
77.	Lark, Fawn-coloured	Vaalbruinlewerik	*Calendulauda africanoides*	5	4

78.	Lark, Rufous-naped	Rooineklewerik	*Mirafra africana*	5	4
79.	Lark, Sabota	Sabotalewerik	*Calendulauda sabota*	5	4
80.	Longclaw, Cape	Oranjekeelkalkoentjie	*Macronyx capensis*	4	4
81.	Martin, Brown-throated	Afrikaanse Oewerswael	*Riparia paludicola*	5	4
82.	Martin, Rock	Kransswael	*Hirundo fuligula*	5	4
83.	Masked-weaver, Southern	Swartkeelgeelvink	*Ploceus velatus*	5	5
84.	Mousebird, Red-faced	Rooiwangmuisvoel	*Urocolius indicus*	5	4
85.	Mousebird, White-backed	Witkruismuisvoel	*Colius colius*	5	4
86.	Neddicky, Neddicky	Neddikkie	*Cisticola fulvicapilla*	5	4
87.	Nightjar, Rufous-cheeked	Rooiwangnaguil	*Caprimulgus rufigena*	5	4
88.	Ostrich, Common	Volstruis	*Struthio camelus*	5	4
89.	Owl, Barn	Nonnetjie-uil	*Tyto alba*	4	4
90.	Owlet, Pearl-spotted	Witkoluil	*Glaucidium perlatum*	4	4
91.	Palm-swift, African	Palmwindswael	*Cypsiurus parvus*	5	1
92.	Penduline-tit, Cape	Kaapse Kapokvoel	*Anthoscopus minutus*	4	4
93.	Pigeon, Speckled	Kransduif	*Columba guinea*	5	4
94.	Pipit, African	Gewone Koester	*Anthus cinnamomeus*	5	4
95.	Pipit, Buffy	Vaalkoester	*Anthus vaalensis*	4	4
96.	Pipit, Long-billed	Nicholsonse Koester	*Anthus similis*	4	4
97.	Pipit, Plain-backed	Donkerkoester	*Anthus leucophrys*	3	3
98.	Plover, Three-banded	Driebandstrandkiewiet	*Charadrius tricollaris*	4	4
99.	Prinia, Black-chested	Swartbandlangstertjie	*Prinia flavicans*	5	4
100.	Pytilia, Green-winged	Gewone Melba	*Pytilia melba*	4	4
101.	Quelea, Red-billed	Rooibekkwelea	*Quelea quelea*	5	4

102.	Robin-chat, Cape	Gewone Janfrederik	*Cossypha caffra*	5	4
103.	Rock-thrush, Short-toed	Korttoonkliplyster	*Monticola brevipes*	5	4
104.	Sandgrouse, Namaqua	Kelkiewyn	*Pterocles namaqua*	4	4
105.	Sandpiper, Curlew	Krombekstrandloper	*Calidris ferruginea*	*2*	*0*
106.	Scimitarbill, Common	Swartbekkakelaar	*Rhinopomastus cyanomelas*	5	4
107.	Scrub-robin, Kalahari	Kalahariwipstert	*Cercotrichas paena*	5	4
108.	Scrub-robin, Karoo	Slangverklikker	*Cercotrichas coryphoeus*	4	4
109.	Secretarybird	Sekretarisvoel	*Sagittarius serpentarius*	4	3
110.	Shelduck, South African	Kopereend	*Tadorna cana*	4	4
111.	Shrike, Crimson-breasted	Rooiborslaksman	*Laniarius atrococcineus*	5	4
112.	Shrike, Lesser Grey	Gryslaksman	*Lanius minor*	3	0
113.	Shrike, Red-backed	Rooiruglaksman	*Lanius collurio*	4	0
114.	Snake-eagle, Black-chested	Swartborsslangarend	*Circaetus pectoralis*	3	3
115.	Sparrow, Cape	Gewone Mossie	*Passer melanurus*	5	4
116.	Sparrow, Southern Grey-headed	Gryskopmossie	*Passer diffusus*	5	4
117.	Sparrow-weaver, White-browed	Koringvoel	*Plocepasser mahali*	5	5
118.	Spoonbill, African	Lepelaar	*Platalea alba*	4	2
119.	Spurfowl, Cape	Kaapse Fisant	*Pternistis capensis*	4	4
120.	Spurfowl, Swainson's	Bosveldfisant	*Pternistis swainsonii*	5	4
121.	Starling, Cape Glossy	Kleinglansspreeu	*Lamprotornis nitens*	5	4
122.	Starling, Pied	Witgatspreeu	*Spreo bicolor*	2	2
123.	Starling, Wattled	Lelspreeu	*Creatophora cinerea*	4	3

124.	Stilt, Black-winged	Rooipootelsie	*Himantopus himantopus*	3	2
125.	Stork, Abdim's	Kleinswartooievaar	*Ciconia abdimii*	2	0
126.	Sunbird, Dusky	Namakwasuikerbekkie	*Cinnyris fuscus*	4	4
127.	Sunbird, White-bellied	Witpenssuikerbekkie	*Cinnyris talatala*	2	2
128.	Swallow, Barn	Europese Swael	*Hirundo rustica*	5	0
129.	Swallow, Greater Striped	Grootstreepswael	*Hirundo cucullata*	5	4
130.	Swallow, Pearl-breasted	PiAÂ¿AÂ½relborsswael	*Hirundo dimidiata*	5	4
131.	Swallow, Red-breasted	Rooiborsswael	*Hirundo semirufa*	5	4
132.	Swallow, White-throated	Witkeelswael	*Hirundo albigularis*	4	4
133.	Swift, Alpine	Witpenswindswael	*Tachymarptis melba*	3	1
134.	Swift, Little	Kleinwindswael	*Apus affinis*	3	1
135.	Swift, White-rumped	Witkruiswindswael	*Apus caffer*	4	4
136.	Tchagra, Brown-crowned	Rooivlerktjagra	*Tchagra australis*	5	4
137.	Thick-knee, Spotted	Gewone Dikkop	*Burhinus capensis*	5	4
138.	Thrush, Karoo	Geelbeklyster	*Turdus smithi*	5	4
139.	Tit, Ashy	Akasiagrysmees	*Parus cinerascens*	4	4
140.	Tit-babbler, Chestnut-vented	Bosveldtjeriktik	*Parisoma subcaeruleum*	5	4
141.	Tit-babbler, Layard's	Grystjeriktik	*Parisoma layardi*	1	1
142.	Turtle-dove, Cape	Gewone Tortelduif	*Streptopelia capicola*	5	4
143.	Vulture, White-backed	Witrugaasvoel	*Gyps africanus*	5	3
144.	Wagtail, Cape	Gewone Kwikkie	*Motacilla capensis*	5	4
145.	Warbler, Rufous-eared	Rooioorlangstertjie	*Malcorus pectoralis*	5	4
146.	Warbler, Willow	Hofsanger	*Phylloscopus trochilus*	5	0

147.	Waxbill, Black-faced	Swartwangsysie	*Estrilda erythronotos*	5	4
148.	Waxbill, Blue	Gewone Blousysie	*Uraeginthus angolensis*	1	1
149.	Waxbill, Common	Rooibeksysie	*Estrilda astrild*	4	4
150.	Waxbill, Violet-eared	Koningblousysie	*Granatina granatina*	5	4
151.	Weaver, Sociable	Versamelvoiel	*Philetairus socius*	5	5
152.	Wheatear, Mountain	Bergwagter	*Oenanthe monticola*	5	4
153.	White-eye, Cape	Kaapse Glasogie	*Zosterops virens*	3	3
154.	White-eye, Orange River	Gariepglasogie	*Zosterops pallidus*	5	4
155.	Whydah, Shaft-tailed	Pylstertrooibekkie	*Vidua regia*	5	4
156.	Wood-hoopoe, Green	Rooibekkakelaar	*Phoeniculus purpureus*	5	4
157.	Woodpecker, Bearded	Baardspeg	*Dendropicos namaquus*	2	2
158.	Woodpecker, Cardinal	Kardinaalspeg	*Dendropicos fuscescens*	4	4
159.	Woodpecker, Golden-tailed	Goudstertspeg	*Campethera abingoni*	2	2

Totals	***0***	**0**	**9**
	1	3	7
	2	9	15
	3	11	12
	4	52	108
	5	84	8
Total threatened Species expected to occur within and around the study area.		***9***	

Of the 159 bird species listed in **Table 1**, 136 species (85.53%) are highly likely to occur in or around the study area of which 116 species are likely to breed on or near the study area. Eleven (11) of the 159 listed bird species have a medium occurrence probability and 22 a low to very low occurrence probability. In addition, 84 species were observed during the site visit, which contributes to approximately 52.83% of the expected number of species.

Nine threatened and/or near threatened bird species have been recorded in the 2824CC QDS which also coincide with the study area 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 in 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**). Two of these have not yet been recorded within the 2855_2405, 2900_2410, 2855_2410, 2900_2405 pentads since the commencement of the South African Bird Atlas Project 2 in 2007. With the exception of Curlew Sandpiper, 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, eight individual White-backed Vultures and two Martial Eagles were recorded within the study area. Breeding of the vultures and Martial Eagles were not recorded observed on site. Notwithstanding, a section of the study area does provide optimal breeding habitat for the

Endangered Martial Eagle, the Near Threatened Secretarybird and the Critically Endangered White-backed vulture (figure 7).

6. White-backed Vulture breeding habitat - preliminary results.

The *Vachellia erioloba* dominated Savanna habitat unit provides suitable breeding habitat for the internationally critically endangered White-backed Vulture (*Gyps africanus*). No active nest sites were confirmed within the study area during the field survey. However, as a result of the optimal breeding habitat observed within the study area, a habitat assessment was conducted with the aim to map suitable breeding and foraging habitat for this species within the study area. Initially, optimal breeding habitat for White-backed Vultures was identified and mapped accordingly. The identified breeding habitat (c. 450 ha) was subsequently surveyed to identify the presence of nests sites. No nests were recorded during the survey; however, it should be noted that vulture nests can easily be overlooked due to the fact that canopies of *V. erioloba* trees are often significantly convex and vultures do not always nest at the apex of the tree. This, in conjunction with the dense leaf cover of the trees, makes it difficult to state with confidence that there are no nests within the study area.

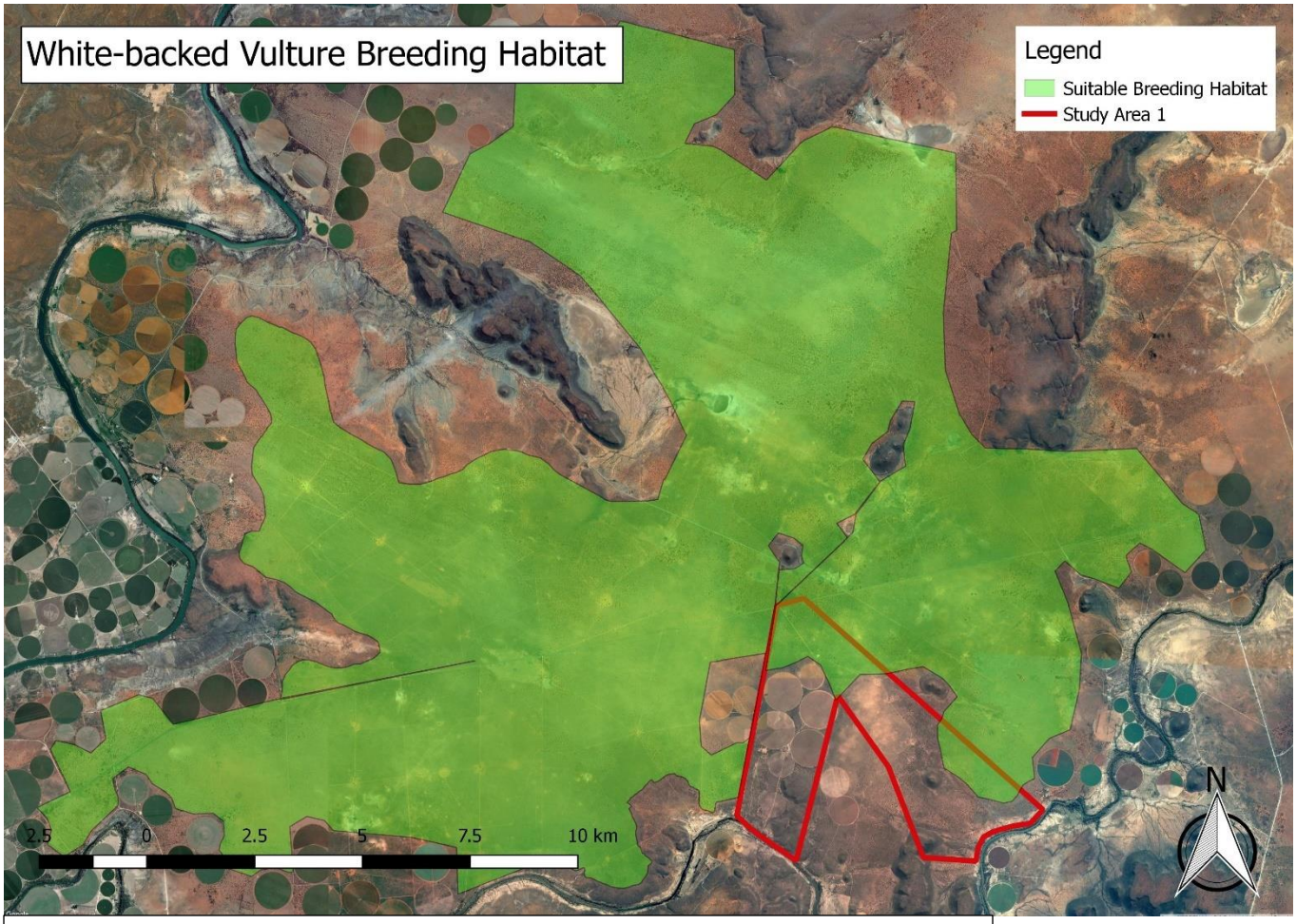


Figure 7: Suitable White-backed Vulture (*Gyps africanus*) habitat

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)	450 ha

A very small portion of the study area can be considered as optimal White-backed Vulture breeding habitat. However, active vulture nests are present on both of the adjacent farms to the west and the east of the study area. As such there is still a probability of vultures nesting within this area regardless of its small size. Apart from direct persecution (e.g. poisoning) and interaction with electrical infrastructure, the loss of suitable habitat due to a range of human activities, including the clearing of land for agriculture, is one of the main reasons for the decline in vulture

numbers worldwide (Bunning, 1985). On account of the aforementioned, 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 have a high probability of occurrence and/or to 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 (e.g. frequent tilling of soil), 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 may provide suitable foraging habitat for certain threatened and near threatened species such as Lanner Falcons, Kori Bustard and Ludwig's Bustard. On account of the natural state of this habitat unit, together with the overall high avifaunal species composition, it 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 distinct species composition, it was deemed to be highly sensitive from an avifaunal perspective

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 surrounding the study area, including neighboring farms (farms that border the study site). The aim is to provide an indication of the number of nests on surrounding farms, their distribution as well as an assessment of the proportion of the South African population that utilizes 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 that the loss of suitable habitat due to a range of human activities, including the clearing of land for agriculture, is one of the main reasons for the decline in vulture numbers worldwide (Bunning, 1985). The main aim of vulture conservation should not only be to protect individuals or known nesting aggregations, but rather to protect the preferred breeding and foraging habitat of the species in such a way to ensure a sustainable future for the species and prevent isolation of breeding aggregations.
- Given the Critically Endangered status of this species the actual number of nests on adjacent properties is important. It should be mandatory to count all the Vulture nests in the area surrounding the study area 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.

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 the optimal breeding habitat it provides for the White-backed Vulture. As such the habitat unit was deemed highly sensitive from an avifaunal perspective, hence any development within this area should be restricted.

At least nine threatened and/or near threatened bird species have been recorded in the study region, 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 habitats by limiting disturbances and minimizing transformation in these areas.

Given that the loss of suitable White-backed vulture habitat as a result of clearing of land for agricultural purposes is one of the reasons for the decline in vulture numbers worldwide (Bunning, 1985), vulture conservation should not only focus to protect individuals or known nesting aggregations, but rather to protect the larger preferred breeding and foraging habitat of the species of the size of the section of available suitable habitat. This will ensure a sustainable future for the species and prevent isolation of breeding colonies.

Special attention should be assigned to ensure that connectivity of homogeneous habitats remains intact. Connectivity of the habitat units with similar structure and floristic composition is mandatory to ensure sustainable demographic patterns of avifaunal species relying on important habitats for survival (as indicated above).

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

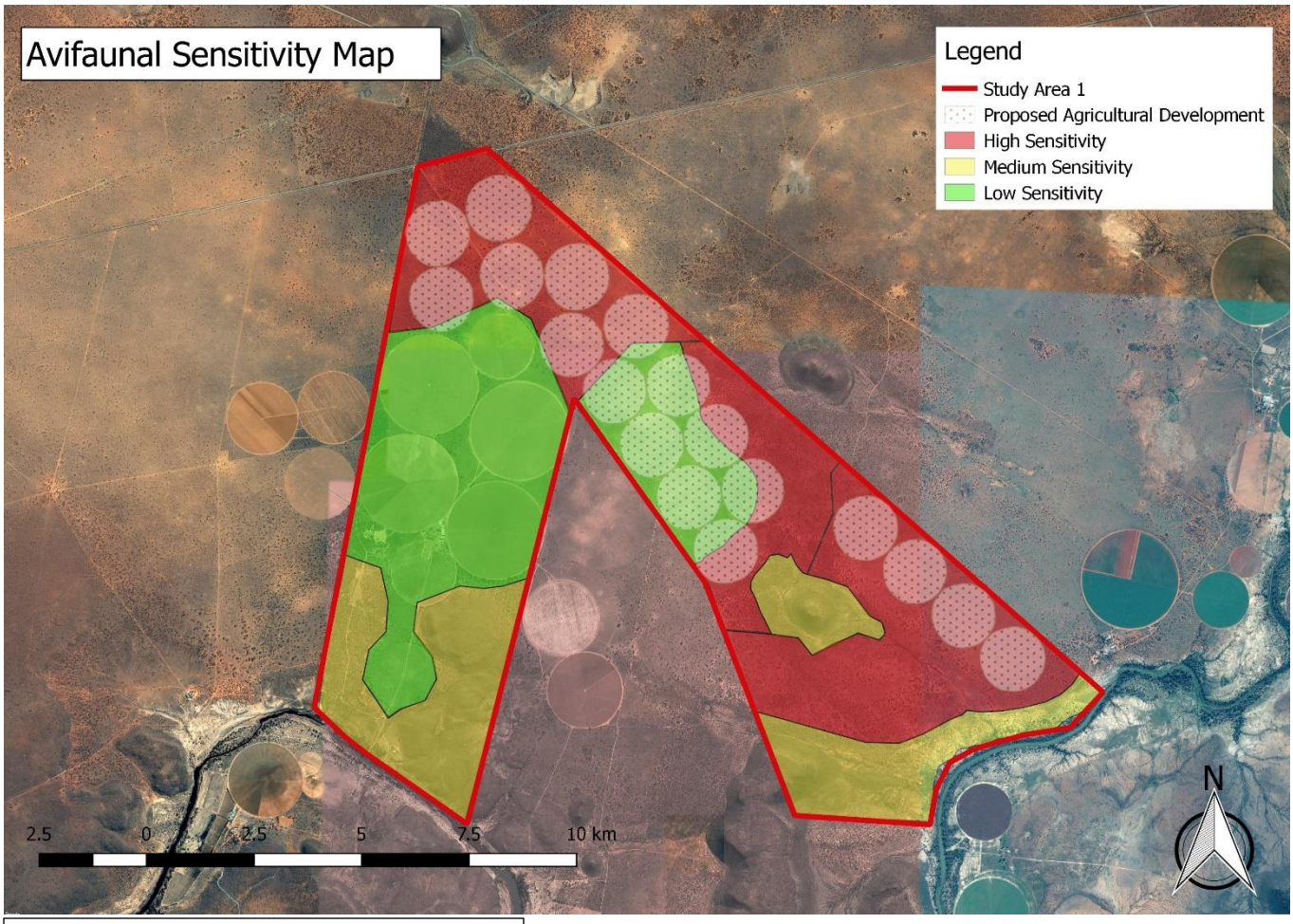


Figure 8: Avifaunal Sensitivity Map

10. Literature Sources

Barnes, K.N., (ed.) 2000. *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swasiland.* BirdLife South Africa, Johannesburg.

BirdLife South Africa. 2016. BirdLife South Africa official Checklist of Birds in South Africa 2016. http://www.birdlife.org.za/publications/checklists

Bunning, L.J. (ed.). 1985. Proceedings of the Birds and ManSymposium.Witwatersrand Bird Club, Johannesburg.

Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J. Parker, V. & Brown, C.J. (eds.). 1997. *The Atlas of Southern African Birds.* Vol. 1 &2. BirdLife South Africa, Johannesburg.

Hockey, P.A.R., Dean, W.R.J. & Ryan, P.G. 2005. *Roberts Birds of Southern Africa VIIth Edition,* The Trustees of the John Voelcker Bird Book Fund, Cape Town

Malan, G. & Howells, B. 2009. *Tree nest surveys: Raptors that nest in trees*. In: Malan, G. (ed). 2009. Raptor survey and monitoring - a field guide for African birds of prey. Briza Academic Books.

Monadjem, A. & van Zyl, A. 2009. *Surveying gregarious raptors that use trees - breeding White-backed Vultures and roosting kestrels*. In: Malan, G. (ed). 2009. Raptor survey and monitoring - a field guide for African birds of prey. Briza Academic Books.

Mucina, L. & Rutherford, M.C. (eds.) 2006. The vegetation of South Arica, Lesotho and Swasiland. Strelitzia 19. South Africa National Biodiversity Institute, Pretoria.

Murn, C., Anderson, M.D. & Anthony, A. (2002). Aerial survey of African white-backed vulture colonies around Kimberley, Northern Cape and Free State provinces, South Africa. South African Journal of Wildlife Research, 32, 145–152.

Sinclair I., & Hockey P & Tarboton, W. 2011*. Sasol Birds of Southern Africa.* Struik, Cape Town.

Southern African Bird Atlas Project 2. South Africa, Lesotho, Botswana, Namibia, Mozambique, Swaziland, Zimbabwe, Zambia. 2016. Animal Demography Unit. University of Cape Town. www.sabap2.adu.org.za. accessed on 28 March 2016.

Tarboton, W., Kemp, M.I., & Kemp, A.C. 1987. *Birds of the Transvaal.* Transvaal Museum, Pretoria.

Taylor, M.R., Peacock, F. & Wanless, R.M. 2015. The 2015 Eskom Red Data Book of BIRDS of South Africa, Lesotho and Swaziland. BirdLife South Africa. Gauteng.