

# **BIRD IMPACT ASSESSMENT STUDY**

**Eskom Transmission**

**AVIFAUNAL IMPACT ASSESSMENT:**

**RUSTENBURG STRENGTHENING PROJECT**



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**Chris van Rooyen**

Chris has seventeen years' experience in the management of wildlife interactions with electricity infrastructure. He was head of the Eskom-Endangered Wildlife Trust (EWT) Strategic Partnership from 1996 to 2007, which has received international acclaim as a model of co-operative management between industry and natural resource conservation. He is an acknowledged global expert in this field

and has worked in South Africa, Namibia, Botswana, Lesotho, New Zealand, Texas, New Mexico and Florida. Chris also has extensive project management experience and has received several management awards from Eskom for his work in the Eskom-EWT Strategic Partnership. He is the author of 15 academic papers (some with co-authors), co-author of two book chapters and several research reports. He has been involved as ornithological consultant in more than 100 power line and 25 wind generation projects. Chris is also co-author of the Best Practice for Avian Monitoring and Impact Mitigation at Wind Development Sites in Southern Africa, which is currently (2013) accepted as the industry standard. Chris also works outside the electricity industry and had done a wide range of bird impact assessment studies associated with various residential and industrial developments.

**Albert Froneman (Pr.Sci.Nat)**

Albert has an M. Sc. in Conservation Biology from the University of Cape Town, and started his career in the natural sciences as a Geographic Information Systems (GIS) specialist at Council for Scientific and Industrial Research (CSIR). He is a registered Professional Natural Scientist in the field of zoological science with the South African Council of Natural Scientific Professionals (SACNASP). In 1998, he joined the Endangered Wildlife Trust where he headed up the Airports Company South Africa – EWT Strategic Partnership, a position he held until he resigned in 2008 to work as a private ornithological consultant. Albert’s specialist field is the management of wildlife, especially bird related hazards at airports. His expertise is recognized internationally; in 2005 he was elected as Vice Chairman of the International Bird Strike Committee. Since 2010, Albert has worked closely with Chris van Rooyen in developing a protocol for pre-construction monitoring at wind energy facilities, and they are currently jointly coordinating pre-construction monitoring programmes at several wind farm facilities. Albert also works outside the electricity industry and had done a wide range of bird impact assessment studies associated with various residential and industrial developments.

**DECLARATION OF INDEPENDENCE**

I, Chris van Rooyen as duly authorised representative of Chris van Rooyen Consulting, and working under the supervision of and in association with Albert Froneman (SACNASP Zoological Science Registration number 400177/09) as stipulated by the Natural Scientific Professions Act 27 of 2003, hereby confirm my independence (as well as that of Chris van Rooyen Consulting) as a specialist and declare that neither I nor Chris van Rooyen Consulting have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which DIGES was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for services performed in connection with this project.



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Full Name: Chris van Rooyen  
Title / Position: Director

## EXECUTIVE SUMMARY

Marang 400/88kV substation is one of the four Main Transmission Substations (MTS), which are currently supplying Rustenburg's platinum mining, smelting operations and commercial operations. The substation is supplied via the 3 x 400kV power lines, i.e., Matimba-Marang, Bighorn-Marang and Midas-Marang. It comprises of 4 x 315 MVA, 400/88kV transformers and has a capacity of 945 MVA. The recorded peak load was 776MVA in years 2010/11 and 694MVA in years 2011/12. As a result, the Marang 400/88kV will exceed the 400/88kV firm capacity limit by 2015/16. To address these transformation capacity constraints and to align with the 20 year load forecast, Eskom proposes to strengthen the network. Eskom had initially applied for and assessed the construction of a substation and 400kV power line where three substation and corresponding corridors were assessed. Eskom has since identified another feasible alternative of extending the existing Marang substation to make provision for new 3x 500MVA 400/132kV transformers. This report therefore assesses four alternatives, i.e., three alternatives for the construction of a substation and 400kV loop in and out power line and one alternative for the extension of the existing Marang substation.

### FINDINGS

The construction of the proposed extension to the Marang substation or the construction of a new substation and power line (all alternatives) will pose a limited threat to the birds occurring in the vicinity of the new infrastructure, largely due to the extensive impacts already evident at the site. The impact of displacement due to habitat transformation will have a **low** impact, and should only affect a few non-Red Data species at a local level. The cumulative impact of the development may however in the long term be more significant due to the ongoing development of the region, which is continually reducing the available bird habitat.

The power line poses a **low** collision risk, mostly to non-Red Data species but **no** electrocution risk. The impact of displacement due to habitat transformation will have a **low** impact, and should only affect a few non-Red Data species at a local level. The habitat at all the proposed alternative substation sites and power line corridors is essentially similar, consisting of open, moderate to heavily disturbed woodland. All the site and corridor alternatives are essentially similar in terms of potential risk to avifauna. From an avifaunal impact perspective, the extension of the substation is preferred as a small area is required for the proposed works resulting in a low impact on habitat transformation.

## **RECOMMENDATIONS**

The following mitigation measures are proposed:

- The vegetation clearing should be restricted to what is absolutely necessary, in order to minimize the impact on the natural woodland habitat.
- Strict adherence to Eskom standards and specifications is required during the construction phase.
- The construction of new roads should only be considered if existing road cannot be utilized.
- Access must be restricted to the footprint of the development, and access to the surrounding area must be strictly controlled.

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## **1. INTRODUCTION & BACKGROUND**

Marang 400/88kV substation is one of the four Main Transmission Substations (MTS), which are currently supplying Rustenburg's platinum mining, smelting operations and commercial operations. The substation is supplied via the 3 x 400kV power lines, i.e., Matimba-Marang, Bighorn-Marang and Midas-Marang. It comprises of 4 x 315 MVA, 400/88kV transformers and has a capacity of 945 MVA. The recorded peak load was 776MVA in years 2010/11 and 694MVA in years 2011/12. As a result, the Marang 400/88kV will exceed the 400/88kV firm capacity limit by 2015/16. To address these transformation capacity constraints and to align with the 20 year load forecast, Eskom initially proposed to construct a new substation and 400kV power lines where three substation and corridor alternatives were assessed. Eskom has since identified an additional alternative of extending the existing Marang substation to make a provision for new 3x 500MVA 400/132kV transformers. This reports therefore takes into account the assessment of four alternatives.

The existing 400/88kV Marang Main Transmission substation is situated on Farm Klipgat 281 JQ and Portion 2 of the Farm Elandsheuvel 282 JQ.

Concern was expressed by Eskom that the proposed development will impact on birdlife and an impact study was therefore requested to investigate the extent of the risk. The terms of reference for the study are as follows:

- Describe the affected environment.
- Indicate how birdlife will be affected.
- Discuss gaps in baseline data.
- List and describe the expected impacts.
- Assess and evaluate the potential of impacts.
- Recommend relevant mitigation measures.

Maps of the study area are presented below in Figures 1 and 2 below.

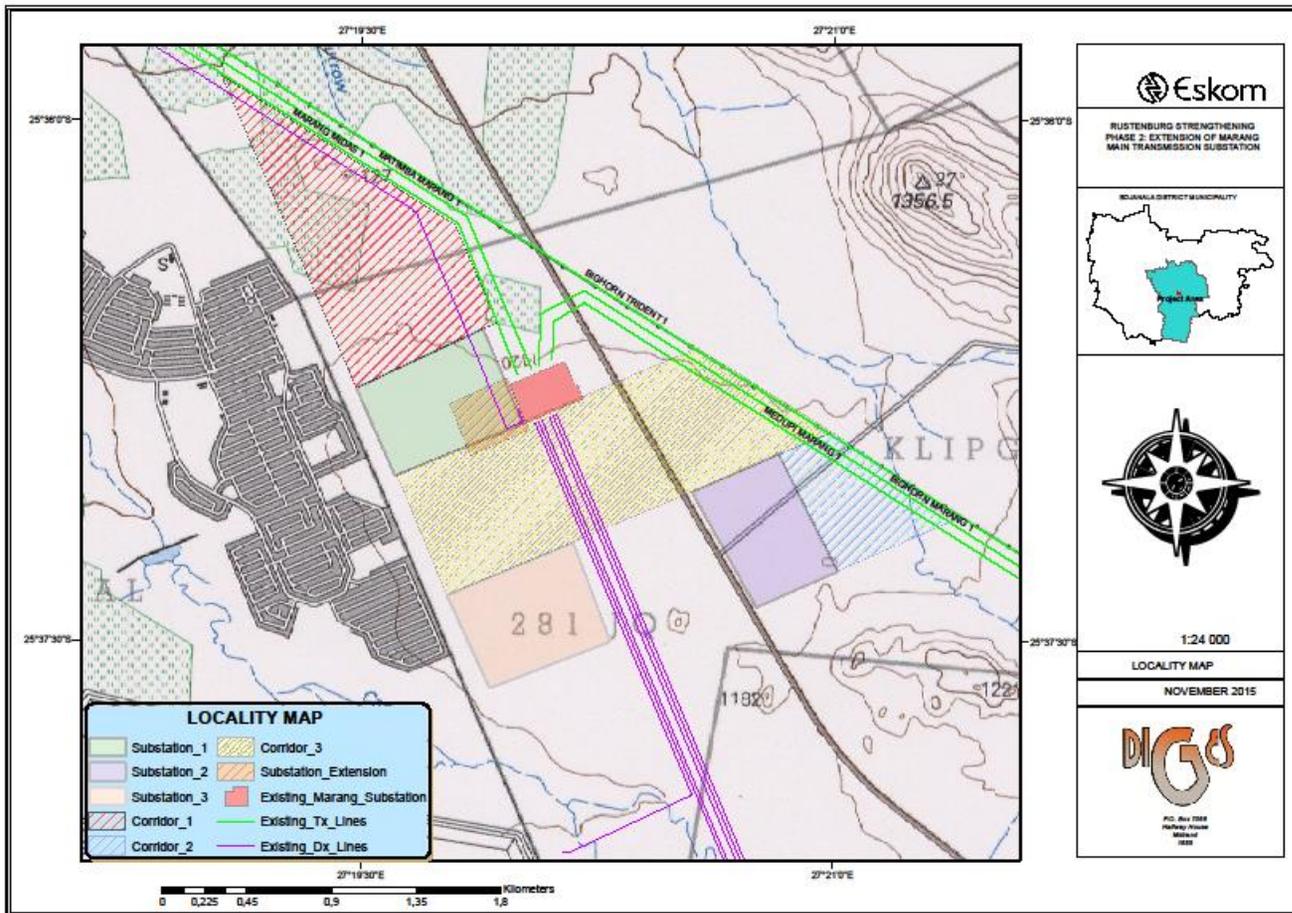


Figure 1: Map of the proposed extension of the Marang substation, indicating existing infrastructure and landscape features.



## 2. SOURCES OF INFORMATION

The following information sources were consulted in order to compile this report:

- Bird distribution data of the Southern African Bird Atlas Project 2 (SABAP2)(<http://sabap2.adu.org.za>) was obtained for the pentads where the project is located, namely 2535\_2715 and 2535\_2720. A pentad covers 5 minutes of latitude by 5 minutes of longitude. Each pentad is approximately 8 × 7.6 km.
- The conservation status of all species considered likely to occur in the area was determined as per the most recent iteration of the southern African Red Data list for birds (Barnes 2000), and the most recent and comprehensive summary of southern African bird biology (Hockey *et al.* 2005).
- The author has travelled and worked extensively on power line projects in the North-West Province since 1996. Personal observations of avifauna and bird/habitat associations have therefore also been used to supplement the data that is available from SABAP2, including observations made during the field trip in October 2013.
- The power line bird mortality incident database of the Eskom - Endangered Wildlife Trust Strategic Partnership (1996 to 2008) was consulted to determine which of the species occurring in the study area are typically impacted upon by power lines and the extent to which they are impacted on (Van Rooyen 2007; Jenkins *et al.* 2010).
- A classification of the vegetation types in the QDGC where the proposed development is situated, namely 2527CA, was obtained from the Southern African Bird Atlas Project 1 (SABAP1, Harrison *et al.* (1997) and the Vegetation Map of South Africa (Mucina & Rutherford 2006).
- Information on the location of vulture restaurants was obtained from Kerri Wolter, independent vulture researcher and director of the Vulture Conservation Programme (Vulpro), an NGO dedicated to vulture conservation (Wolter 2012).
- Information on the micro habitat level was obtained through visiting the site in October 2013 and obtaining a first-hand perspective.

### 2.2 Assumptions & Limitations

The following assumptions and limitations are applicable in this study:

- In this instance the 2535\_2715 and 2535\_2720 pentads were reasonably well covered by SABAP2, with data recorded on 9 and 8 data cards respectively to date. This means that the species diversity and densities recorded by SABAP2 provides a fairly accurate picture of the avifauna potentially occurring in the study area (see Appendix 1 Species List). Where necessary, the list of Red Data species that could be encountered was supplemented with observations and general knowledge of the area.
- Conclusions in this report are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will hold true under all circumstances. However, power line and substation impacts can be predicted with a fair amount of certainty (see References Section 6).
- It is important to note that, although the predicted impacts are mostly concerned with Red Data species, the non-Red Data species should also benefit from the proposed mitigation measures as they share the same habitat and face the same potential impacts as the Red Data species.

## 2 DESCRIPTION OF AFFECTED ENVIRONMENT

### 2.1 Relevant bird populations

A total of 186 species were recorded in 2535\_2715 by SABAP2, with 4 classified as Red Data species (Barnes 2000). In 2535\_2720, a total of 144 species were recorded, none of which are currently classified as Red Data species. Reporting rates are an indication of the relative density of a species on the ground in that it reflects the number of times that a species was recorded relative to the total amount of cards that were completed for the pentad.

Table 1 provides a guideline of the species that could **potentially** be encountered anywhere within a pentad where **suitable** habitat is available, and should therefore not be used as a measure of actual densities along the proposed power line alignments. The likelihood of it occurring at the substation site is covered in the last column.

**TABLE 1: Red Data species potentially occurring in 2535\_2715 and 2535\_2720. NT = Near threatened, VU = Vulnerable**

Species	Conservation Status (Barnes 2000)	Potential habitat in the 2530_2710 pentad (Harrison <i>et al.</i> 1997, Barnes 2000, Hockey <i>et al.</i> 2005, personal observations)	SABAP2 Reporting rate 2535_2715 (%)	SABAP2 Reporting rate 2530_2720 (%)	Likelihood of occurrence at the substation site
YELLOW-BILLED STORK <i>Mycteria ibis</i>	NT	Rivers, dams. No suitable habitat at the site, likely to occur at the Bospoort Dam, approximately 4km north of the site.	11	-	Negligible
RED-BILLED OXPECKER <i>Buphagus erythrorhynchus</i>	NT	Woodland, in association with cattle.	-	-	Negligible
SECRETARYBIRD <i>Sagittarius serpentarius</i>	NT	Open woodland and old lands. Could occur anywhere, but high level of urbanization will act as deterrent.	-	-	Low
GREATER FLAMINGO <i>Phoenicopterus ruber</i>	NT	Open shallow, eutrophic wetlands. Probably occurs regularly at Bospoort Dam. No suitable habitat at site itself.	11	-	Negligible
LESSER FLAMINGO <i>Phoenicopterus minor</i>	NT	Open shallow, eutrophic wetlands. Probably occurs regularly at Bospoort Dam. No suitable habitat at site itself.	22	-	Negligible
LANNER FALCON <i>Falco biarmicus</i>	NT	Generally prefers open habitat, but exploits a wide range of habitats. Could be encountered anywhere in the study area, even in industrial areas.	11	-	Medium
YELLOW-THROATED SANDGROUSE <i>Pterocles gutturalis</i>	NT	Grassland, arable lands on black turf soil. Could be encountered anywhere in open woodland and old lands.	-	-	Low

CAPE VULTURE <i>Gyps coprotheres</i>	VU	Large cliffs for breeding and roosting, open woodland and grassland. Roosts on transmission lines. Closest breeding colonies are in the Magaliesberg app. 23km south-east at Roberts Farm. Closest vulture restaurant is about 42km away at Mankwe. May fly over the site, but unlikely to feed regularly in the area due to proximity of urban development.	-	-	Negligible
GREATER PAINTED SNIPE <i>Rostratula benghalensis</i>	NT	Dams, pans and marshy river flood plains. Probably occurs sporadically at Bospoort Dam. No suitable habitat at site itself.	-	-	Negligible
CASPIAN TERN <i>Sterna caspia</i>	NT	Large water bodies, both natural and man-made, with preference for saline pans and large impoundments. No suitable habitat at the site, likely to occur at the Bospoort Dam	-	-	Negligible
HALF-COLLARED KINGFISHER <i>Alcedo semitorquata</i>	NT	Fast-flowing streams with clear water and well-wooded banks. Could occur along the Hex River.	-	-	Negligible
AFRICAN MARSH HARRIER <i>Circus ranivorus</i>	VU	Large permanent wetlands with dense reed beds. Sometimes forages over smaller wetlands and adjacent grassland. Probably occurs sporadically at Bospoort Dam.	-	-	Negligible
LESSER KESTREL <i>Falco naumanni</i>	VU	Grasslands, old lands, cultivated lands. May occur sporadically.	-	-	Negligible
PINK-BACKED PELICAN <i>Pelecanus rufescens</i>	V	Wide range of wetlands, lakes dams and slow flowing rivers. Sometimes visit pans in the North-West Province. Occurs sporadically at Bospoort Dam.	-	-	Negligible

## 2.2 Vegetation types and bird habitats

The natural vegetation in the study area is Marikana Thornveld, which is open *Acacia karroo* woodland, with shrubs more dense along drainage lines, on termitaria, rocky outcrops or in other habitats protected from fire (Mucina & Rutherford 2006). In the study area, the woodland consists mostly of short trees and shrubs, with and extensive but heavily grazed grass understorey. It is generally accepted that vegetation structure, rather than the actual plant species, influences bird species distribution and abundance (Harrison *et al.* 1997). Therefore, the vegetation description below does not focus on lists of plant species, but rather on factors which are relevant to bird distribution. The classification used in this report makes extensive use of the work of Harrison *et al.* (1997). The criteria used by the atlas authors to amalgamate botanically defined vegetation units, or to keep them separate were (1) the existence of clear differences in vegetation structure, likely to be relevant to birds, and (2) the results of published community studies on bird/vegetation associations.

The 2527CB quarter degree grid cell, where the study area is situated, is comprised entirely of woodland (See TABLE 2 below).

**TABLE 2: Vegetation types in 2527CB (Harrison *et al.* 1997)**

<b>Biome</b>	<b>Vegetation type</b>	<b>2527AC</b>
Savanna	Arid Woodland	46%
Savanna	Moist Woodland	54%

**Woodland (or savanna)** is the dominant natural vegetation type in the study area and it is defined as having a grassy under-storey and a distinct woody upper-storey of trees and tall shrubs (Harrison *et al.* 1997). Soil types are varied but are generally nutrient poor. The savanna biome contains a large variety of bird species (it is the most species-rich community in southern Africa) but very few bird species are restricted to this biome. It is also relatively well conserved compared to the grassland biome. The savanna biome is particularly rich in large raptors, and forms the stronghold of Red Data species such as White-backed Vulture *Gyps africanus*, Cape Vulture, Martial Eagle *Polemaetus bellicosus*, Tawny Eagle *Aquila rapax*, Bateleur *Terathopius ecaudatus*, and Lappet-faced Vulture *Torgos tracheliotis*. Apart from Red Data species, it also serves as the stronghold of several non-Red Data raptor species, such as the Brown Snake Eagle *Circaetus cinereus*, Black-chested Snake Eagle *Circaetus pectoralis*, and a multitude of medium-sized raptors for example the migratory Steppe Buzzard *Buteo vulpinus*, African Harrier Hawk (Gymnogene) *Polyboroides typus*, Wahlberg's Eagle *Aquila wahlbergi* and African Hawk Eagle *Aquila spilogaster*. Apart from raptors, woodland in its undisturbed state is suitable for a wide range of other power line sensitive birds, including the Kori Bustard *Neotis kori*.

The study area is situated within a 50km radius of two Important Bird Areas (IBA) namely SA025 (Magaliesberg and Witwatersberg), and SA023 (Pilanesberg) (Barnes 1998). The Magaliesberg forms the core of the Magaliesberg and Witwatersberg IBA. The area north of Rustenburg towards Pilanesberg, particularly those areas that belonged to the former Bophutatswana homeland, has extensive populations of livestock, particularly donkeys, and carcasses of the latter are scavenged by Cape Vultures (personal observation). Pilanesberg IBA is important in that it represents a large, well-managed protected area. It has extensive populations of waterbirds, centred on the Mankwe River and dam. It is also an important draw card for raptors, and has an active vulture restaurant that attracts Cape Vultures, Lappet-faced Vultures and White-backed Vultures (Wolter 2012). Kori Bustard are also recorded in the open woodland in the centre of the park (Barnes 1998). It is not envisaged that the proposed development will have a direct impact on any of the two IBAs.

The habitat at the proposed sites consists of open, moderate to heavily disturbed woodland. The vegetation shows clear signs of sustained high stocking rates which in turn has led to a depletion of the grass layer. The woody component is more intact and consists of small trees and shrubs (see Figure 3 below).



Figure 3: The habitat at Site 1 of the proposed Marang B substation.



Figure 4: The habitat at Site 2 of the proposed Marang B substation.



Figure 5: The habitat at Site 3 of the proposed Marang B substation.

### **3. ASSESSMENT OF IMPACTS**

Because of their size and prominence, electrical infrastructures constitute an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are (a) electrocution of birds and other animals and (b) birds colliding with power lines (Ledger & Annegarn 1981; Ledger 1983; Ledger 1984; Hobbs & Ledger 1986a; Hobbs & Ledger 1986b; Ledger *et al.* 1992; Kruger & Van Rooyen 1998; Van Rooyen 1998; Kruger 1999; Van Rooyen 1999; Van Rooyen 2000, Anderson 2001; Van Rooyen 2007; Jenkins *et al.* 2010). Other problems include electrical faults caused by bird excreta when roosting or breeding on electricity infrastructure (Van Rooyen *et al.* 2002), and displacement through disturbance and habitat destruction during construction and maintenance activities.

#### **3.1 Displacement due to loss of breeding, foraging and roosting habitat through habitat transformation.**

During the construction phase and maintenance of power lines and substations, habitat destruction and alteration inevitably takes place. This happens with the construction of access roads, and the clearing of servitudes. These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the site, through the modification of habitat.

Historically, i.e. before the establishment of the current settlements and industrial activity the area surrounding the Marang substation site must have comprised entirely of undisturbed woodland. As a result it would most likely have supported a number of power line sensitive Red Data species, particularly raptor species such as Martial Eagle, Tawny Eagle, Bateleur, Lappet-faced Vulture and also non-raptors such as Kori Bustard. However this area is rapidly transforming to accommodate

a change in land use (i.e. industrial and human settlement) which reduced the number and variety of species originally inhabiting the area, on account of the loss of habitat and decline in food availability.

The habitat at the proposed Marang substation site, namely heavily disturbed woodland, do not contain unique features that will make it critically important for the Red Data species listed in Table 1. This habitat is common in the area and due to the high level of impacts already evident at the site; the Red Data species listed in Table 1 are unlikely to be attracted to the area. The species (if any) that will be affected by the loss of habitat are the smaller, non-threatened mostly passerines that are currently potentially resident in the patch of heavily disturbed woodland that will be taken up by the substation extension. It is not envisaged that any Red Data species will be permanently displaced by the habitat transformation that will take place at the area comprising the proposed substation and corridor sites. The construction of the proposed extension to the Marang substation and substation and corridor 1, 2 and 3 should therefore have a **LOW** displacement impact from an avifaunal perspective. It must be noted though that the impact of development in general, particularly mining, urbanisation and the associated infrastructure in the area between Rustenburg and Pilanesberg is leading to an increase in disturbance levels and fragmentation of habitat. This in turn is impacting on several species of birds, including Secretarybirds and other large raptors, and this is likely to increase in future.

### **3.3 Collisions with the proposed power line.**

Due to the high level of existing impacts in the study area and the short length of the proposed line it is not expected that the proposed power line will pose a significant collision risk to Red Data species. Very few if any Red Data species is expected to occur in the study area. The collision risk is therefore regarded as **LOW**.

### **3.4 Electrocutions on the proposed 400kV power line.**

**NO** electrocution risk is foreseen on the power line. Transmission lines do not pose an electrocution risk because the clearances between live components or live and earthed components are too big to be bridged by even the largest birds.

## **4 CONCLUSIONS**

The construction of the proposed extension to the Marang substation or the construction of a new substation and power line (all alternatives) will pose a limited threat to the birds occurring in the vicinity of the new infrastructure, largely due to the extensive impacts already evident at the site. The impact of displacement due to habitat transformation will have a **low** impact, and should only affect a few non-Red Data species at a local level. The cumulative impact of the development may however in the long term be more significant due to the ongoing development of the region, which is continually reducing the available bird habitat.

The power line poses a **low** collision risk, mostly to non-Red Data species but **no** electrocution risk. The impact of displacement due to habitat transformation will have a **low** impact, and should only affect a few non-Red Data species at a local level. The habitat at all the proposed alternative substation sites and power line corridors is essentially similar, consisting of open, moderate to heavily disturbed woodland. All the site and corridor alternatives are essentially similar in terms of potential risk to avifauna. From an avifaunal impact perspective, the extension of the substation is preferred as a small area is required for the proposed works resulting in a low impact on habitat transformation.

## 5 RECOMMENDATIONS

The following mitigation measures are proposed:

- The vegetation clearing should be restricted to what is absolutely necessary, in order to minimize the impact on the natural woodland habitat.
- Strict adherence to Eskom standards and specifications is required during the construction phase.
- The construction of new roads should only be considered if existing road cannot be utilised.
- Access must be restricted to the footprint of the development, and access to the surrounding area must be strictly controlled.

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**APPENDIX 1: AVIFAUNA RECORDED BY SABAP2**

2535_2715			
Species	Sc. Name	Red Data status	Reporting rate
Apalis, Bar-throated	<i>Apalis thoracica</i>		22%
Avocet, Pied	<i>Recurvirostra avosetta</i>		22%
Babbler, Arrow-marked	<i>Turdoides jardineii</i>		11%
Barbet, Acacia Pied	<i>Tricholaema leucomelas</i>		33%
Barbet, Black-collared	<i>Lybius torquatus</i>		44%
Barbet, Crested	<i>Trachyphonus vaillantii</i>		44%
Batis, Chinspot	<i>Batis molitor</i>		44%
Bee-eater, European	<i>Merops apiaster</i>		33%
Bee-eater, White-fronted	<i>Merops bullockoides</i>		67%
Bishop, Southern Red	<i>Euplectes orix</i>		78%
Bishop, Yellow-crowned	<i>Euplectes afer</i>		44%
Bokmakierie, Bokmakierie	<i>Telophorus zeylonus</i>		11%
Boubou, Southern	<i>Laniarius ferrugineus</i>		67%
Bulbul, Dark-capped	<i>Pycnonotus tricolor</i>		100%
Bunting, Cinnamon-breasted	<i>Emberiza tahapisi</i>		44%
Bunting, Golden-breasted	<i>Emberiza flaviventris</i>		33%
Camaroptera, Grey-backed	<i>Camaroptera brevicaudata</i>		22%
Canary, Black-throated	<i>Crithagra atrogularis</i>		44%
Canary, Yellow-fronted	<i>Crithagra mozambicus</i>		44%
Chat, Familiar	<i>Cercomela familiaris</i>		22%
Cisticola, Desert	<i>Cisticola aridulus</i>		11%
Cisticola, Levaillant's	<i>Cisticola tinniens</i>		44%
Cisticola, Rattling	<i>Cisticola chiniana</i>		100%
Cisticola, Zitting	<i>Cisticola juncidis</i>		44%
Coot, Red-knobbed	<i>Fulica cristata</i>		33%
Cormorant, Reed	<i>Phalacrocorax africanus</i>		78%
Cormorant, White-breasted	<i>Phalacrocorax carbo</i>		44%
Coucal, Burchell's	<i>Centropus burchellii</i>		56%
Crake, Black	<i>Amaurornis flavirostris</i>		33%
Crombec, Long-billed	<i>Sylvietta rufescens</i>		44%
Crow, Pied	<i>Corvus albus</i>		33%
Cuckoo, Diderick	<i>Chrysococcyx caprius</i>		67%
Cuckoo, Jacobin	<i>Clamator jacobinus</i>		11%
Cuckoo, Levaillant's	<i>Clamator levaillantii</i>		11%
Cuckoo, Red-chested	<i>Cuculus solitarius</i>		22%
Darter, African	<i>Anhinga rufa</i>		44%
Dove, Laughing	<i>Streptopelia senegalensis</i>		100%
Dove, Namaqua	<i>Oena capensis</i>		11%

Dove, Red-eyed	<i>Streptopelia semitorquata</i>		33%
Dove, Rock	<i>Columba livia</i>		56%
Drongo, Fork-tailed	<i>Dicrurus adsimilis</i>		44%
Duck, African Black	<i>Anas sparsa</i>		33%
Duck, Fulvous	<i>Dendrocygna bicolor</i>		11%
Duck, White-faced	<i>Dendrocygna viduata</i>		89%
Duck, Yellow-billed	<i>Anas undulata</i>		33%
Eagle-Owl, Spotted	<i>Bubo africanus</i>		11%
Egret, Cattle	<i>Bubulcus ibis</i>		56%
Egret, Great	<i>Egretta alba</i>		22%
Egret, Little	<i>Egretta garzetta</i>		56%
Falcon, Amur	<i>Falco amurensis</i>		11%
Falcon, Lanner	<i>Falco biarmicus</i>	Vulnerable	11%
Finch, Cuckoo	<i>Anomalospiza imberbis</i>		11%
Finch, Cut-throat	<i>Amadina fasciata</i>		22%
Finch, Red-headed	<i>Amadina erythrocephala</i>		11%
Finch, Scaly-feathered	<i>Sporopipes squamifrons</i>		44%
Firefinch, Red-billed	<i>Lagonosticta senegala</i>		11%
Fiscal, Common	<i>Lanius collaris</i>		78%
Fish-Eagle, African	<i>Haliaeetus vocifer</i>		33%
Flamingo, Greater	<i>Phoenicopterus ruber</i>	Near-threatened	11%
Flamingo, Lesser	<i>Phoenicopterus minor</i>	Near-threatened	22%
Flycatcher, Fiscal	<i>Sigelus silens</i>		44%
Flycatcher, Marico	<i>Bradornis mariquensis</i>		11%
Flycatcher, Spotted	<i>Muscicapa striata</i>		67%
Francolin, Crested	<i>Dendroperdix sephaena</i>		22%
Go-away-bird, Grey	<i>Corythaixoides concolor</i>		44%
Goose, Egyptian	<i>Alopochen aegyptiacus</i>		33%
Goshawk, Gabar	<i>Melierax gabar</i>		
Grebe, Little	<i>Tachybaptus ruficollis</i>		44%
Greenshank, Common	<i>Tringa nebularia</i>		22%
Guineafowl, Helmeted	<i>Numida meleagris</i>		33%
Gull, Grey-headed	<i>Larus cirrocephalus</i>		33%
Hamerkop, Hamerkop	<i>Scopus umbretta</i>		56%
Heron, Black	<i>Egretta ardesiaca</i>		11%
Heron, Black-headed	<i>Ardea melanocephala</i>		33%
Heron, Green-backed	<i>Butorides striata</i>		33%
Heron, Grey	<i>Ardea cinerea</i>		67%
Heron, Squacco	<i>Ardeola ralloides</i>		22%
Hornbill, African Grey	<i>Tockus nasutus</i>		22%
Ibis, African Sacred	<i>Threskiornis aethiopicus</i>		67%
Ibis, Glossy	<i>Plegadis falcinellus</i>		56%

Ibis, Hadeda	<i>Bostrychia hagedash</i>	67%
Jacana, African	<i>Actophilornis africanus</i>	22%
Kingfisher, Brown-hooded	<i>Halcyon albiventris</i>	67%
Kingfisher, Giant	<i>Megaceryle maximus</i>	22%
Kingfisher, Pied	<i>Ceryle rudis</i>	67%
Kingfisher, Woodland	<i>Halcyon senegalensis</i>	22%
Kite, Black-shouldered	<i>Elanus caeruleus</i>	33%
Kite, Yellow-billed	<i>Milvus aegyptius</i>	11%
Korhaan, Northern Black	<i>Afrotis afraoides</i>	11%
Lapwing, African Wattled	<i>Vanellus senegallus</i>	33%
Lapwing, Blacksmith	<i>Vanellus armatus</i>	56%
Lapwing, Crowned	<i>Vanellus coronatus</i>	78%
Lark, Rufous-naped	<i>Mirafra africana</i>	44%
Lark, Sabota	<i>Calendulauda sabota</i>	44%
Longclaw, Cape	<i>Macronyx capensis</i>	11%
Mannikin, Bronze	<i>Spermestes cucullatus</i>	56%
Martin, Brown-throated	<i>Riparia paludicola</i>	44%
Masked-Weaver, Lesser	<i>Ploceus intermedius</i>	11%
Masked-Weaver, Southern	<i>Ploceus velatus</i>	100%
Moorhen, Common	<i>Gallinula chloropus</i>	44%
Mousebird, Red-faced	<i>Urocolius indicus</i>	100%
Mousebird, Speckled	<i>Colius striatus</i>	89%
Mousebird, White-backed	<i>Colius colius</i>	11%
Myna, Common	<i>Acridotheres tristis</i>	100%
Neddicky, Neddicky	<i>Cisticola fulvicapilla</i>	56%
Oriole, Black-headed	<i>Oriolus larvatus</i>	11%
Palm-Swift, African	<i>Cypsiurus parvus</i>	67%
Paradise-Flycatcher, African	<i>Terpsiphone viridis</i>	56%
Paradise-Whydah, Long-tailed	<i>Vidua paradisaea</i>	11%
Pigeon, Speckled	<i>Columba guinea</i>	44%
Pipit, African	<i>Anthus cinnamomeus</i>	33%
Plover, Kittlitz's	<i>Charadrius pecuarius</i>	11%
Plover, Three-banded	<i>Charadrius tricollaris</i>	44%
Pochard, Southern	<i>Netta erythrophthalma</i>	33%
Prinia, Black-chested	<i>Prinia flavicans</i>	67%
Prinia, Tawny-flanked	<i>Prinia subflava</i>	67%
Puffback, Black-backed	<i>Dryoscopus cubla</i>	11%
Pytilia, Green-winged	<i>Pytilia melba</i>	11%
Quail, Common	<i>Coturnix coturnix</i>	11%
Quailfinch, African	<i>Ortygospiza atricollis</i>	11%
Quelea, Red-billed	<i>Quelea quelea</i>	44%
Reed-Warbler, African	<i>Acrocephalus baeticatus</i>	44%

Reed-Warbler, Great	<i>Acrocephalus arundinaceus</i>		22%
Robin-Chat, Cape	<i>Cossypha caffra</i>		44%
Robin-Chat, White-throated	<i>Cossypha humeralis</i>		33%
Ruff, Ruff	<i>Philomachus pugnax</i>		22%
Rush-Warbler, Little	<i>Bradypterus baboecala</i>		56%
Sandpiper, Common	<i>Actitis hypoleucos</i>		44%
Sandpiper, Curlew	<i>Calidris ferruginea</i>		11%
Sandpiper, Marsh	<i>Tringa stagnatilis</i>		11%
Sandpiper, Wood	<i>Tringa glareola</i>		33%
Scrub-Robin, Kalahari	<i>Cercotrichas paena</i>		44%
Scrub-Robin, White-browed	<i>Cercotrichas leucophrys</i>		67%
Seedeater, Streaky-headed	<i>Crithagra gularis</i>		22%
Shoveler, Cape	<i>Anas smithii</i>		11%
Shrike, Crimson-breasted	<i>Laniarius atrococcineus</i>		33%
Shrike, Lesser Grey	<i>Lanius minor</i>		22%
Shrike, Red-backed	<i>Lanius collurio</i>		33%
Snake-Eagle, Black-chested	<i>Circaetus pectoralis</i>		11%
Snipe, African	<i>Gallinago nigripennis</i>		22%
Sparrow, Cape	<i>Passer melanurus</i>		67%
Sparrow, House	<i>Passer domesticus</i>		67%
Sparrow, Southern Grey-headed	<i>Passer diffusus</i>		56%
Sparrow-Weaver, White-browed	<i>Plocepasser mahali</i>		44%
Spoonbill, African	<i>Platalea alba</i>		33%
Spurfowl, Natal	<i>Pternistis natalensis</i>		11%
Spurfowl, Swainson's	<i>Pternistis swainsonii</i>		44%
Starling, Cape Glossy	<i>Lamprotornis nitens</i>		11%
Starling, Red-winged	<i>Onychognathus morio</i>		11%
Stilt, Black-winged	<i>Himantopus himantopus</i>		44%
Stint, Little	<i>Calidris minuta</i>		11%
Stork, Yellow-billed	<i>Mycteria ibis</i>	Endangered	11%
Sunbird, White-bellied	<i>Cinnyris talatala</i>		44%
Swallow, Barn	<i>Hirundo rustica</i>		67%
Swallow, Greater Striped	<i>Hirundo cucullata</i>		56%
Swallow, Lesser Striped	<i>Hirundo abyssinica</i>		67%
Swallow, Red-breasted	<i>Hirundo semirufa</i>		22%
Swallow, White-throated	<i>Hirundo albigularis</i>		67%
Swamphen, African Purple	<i>Porphyrio madagascariensis</i>		11%
Swamp-Warbler, Lesser	<i>Acrocephalus gracilirostris</i>		78%
Swift, Little	<i>Apus affinis</i>		44%
Swift, White-rumped	<i>Apus caffer</i>		22%
Tchagra, Brown-crowned	<i>Tchagra australis</i>		33%
Teal, Cape	<i>Anas capensis</i>		22%

Teal, Red-billed	<i>Anas erythrorhyncha</i>		33%
Thick-knee, Spotted	<i>Burhinus capensis</i>		33%
Thrush, Groundscraper	<i>Psophocichla litsipsirupa</i>		11%
Thrush, Karoo	<i>Turdus smithi</i>		22%
Thrush, Kurrichane	<i>Turdus libonyanus</i>		44%
Tit-Babbler, Chestnut-vented	<i>Parisoma subcaeruleum</i>		67%
Turtle-Dove, Cape	<i>Streptopelia capicola</i>		67%
Wagtail, Cape	<i>Motacilla capensis</i>		44%
Warbler, Marsh	<i>Acrocephalus palustris</i>		11%
Warbler, Willow	<i>Phylloscopus trochilus</i>		22%
Waxbill, Black-faced	<i>Estrilda erythronotos</i>		11%
Waxbill, Blue	<i>Uraeginthus angolensis</i>		89%
Waxbill, Common	<i>Estrilda astrild</i>		44%
Waxbill, Orange-breasted	<i>Amandava subflava</i>		11%
Waxbill, Violet-eared	<i>Granatina granatina</i>		22%
Weaver, Thick-billed	<i>Amblyospiza albifrons</i>		33%
Weaver, Village	<i>Ploceus cucullatus</i>		22%
White-eye, Cape	<i>Zosterops virens</i>		44%
Whydah, Pin-tailed	<i>Vidua macroura</i>		33%
Widowbird, Red-collared	<i>Euplectes ardens</i>		11%
Widowbird, White-winged	<i>Euplectes albonotatus</i>		78%
Wood-Hoopoe, Green	<i>Phoeniculus purpureus</i>		11%

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Species	Sc. Name	Red Data status	Reporting rate
Apalis, Bar-throated	<i>Apalis thoracica</i>		13%
Avocet, Pied	<i>Recurvirostra avosetta</i>		13%
Barbet, Acacia Pied	<i>Tricholaema leucomelas</i>		25%
Barbet, Black-collared	<i>Lybius torquatus</i>		63%
Barbet, Crested	<i>Trachyphonus vaillantii</i>		13%
Batis, Chinspot	<i>Batis molitor</i>		50%
Bee-eater, European	<i>Merops apiaster</i>		50%
Bee-eater, White-fronted	<i>Merops bullockoides</i>		50%
Bishop, Southern Red	<i>Euplectes orix</i>		50%
Bishop, Yellow-crowned	<i>Euplectes afer</i>		25%
Boubou, Southern	<i>Laniarius ferrugineus</i>		25%
Bulbul, Dark-capped	<i>Pycnonotus tricolor</i>		75%
Bunting, Cinnamon-breasted	<i>Emberiza tahapisi</i>		25%
Bunting, Golden-breasted	<i>Emberiza flaviventris</i>		50%
Canary, Black-throated	<i>Crithagra atrogularis</i>		50%
Canary, Yellow	<i>Crithagra flaviventris</i>		25%
Canary, Yellow-fronted	<i>Crithagra mozambicus</i>		25%

Chat, Familiar	<i>Cercomela familiaris</i>	25%
Cisticola, Desert	<i>Cisticola aridulus</i>	13%
Cisticola, Lazy	<i>Cisticola aberrans</i>	25%
Cisticola, Levaillant's	<i>Cisticola tinniens</i>	13%
Cisticola, Rattling	<i>Cisticola chiniana</i>	50%
Cisticola, Wing-snapping	<i>Cisticola ayresii</i>	13%
Cisticola, Zitting	<i>Cisticola juncidis</i>	25%
Cliff-Chat, Mocking	<i>Thamnolaea cinnamomeiventris</i>	13%
Coot, Red-knobbed	<i>Fulica cristata</i>	13%
Cormorant, Reed	<i>Phalacrocorax africanus</i>	38%
Cormorant, White-breasted	<i>Phalacrocorax carbo</i>	38%
Crombec, Long-billed	<i>Sylvietta rufescens</i>	63%
Crow, Pied	<i>Corvus albus</i>	75%
Cuckoo, Diderick	<i>Chrysococcyx caprius</i>	38%
Cuckoo, Red-chested	<i>Cuculus solitarius</i>	38%
Dove, Laughing	<i>Streptopelia senegalensis</i>	100%
Dove, Namaqua	<i>Oena capensis</i>	25%
Dove, Red-eyed	<i>Streptopelia semitorquata</i>	25%
Dove, Rock	<i>Columba livia</i>	88%
Drongo, Fork-tailed	<i>Dicrurus adsimilis</i>	25%
Duck, White-faced	<i>Dendrocygna viduata</i>	25%
Duck, Yellow-billed	<i>Anas undulata</i>	13%
Egret, Cattle	<i>Bubulcus ibis</i>	50%
Egret, Great	<i>Egretta alba</i>	13%
Egret, Little	<i>Egretta garzetta</i>	25%
Eremomela, Yellow-bellied	<i>Eremomela icteropygialis</i>	13%
Finch, Scaly-feathered	<i>Sporopipes squamifrons</i>	88%
Firefinch, Jameson's	<i>Lagonosticta rhodopareia</i>	25%
Fiscal, Common	<i>Lanius collaris</i>	75%
Flycatcher, Fiscal	<i>Sigelus silens</i>	50%
Flycatcher, Marico	<i>Bradornis mariquensis</i>	13%
Flycatcher, Spotted	<i>Muscicapa striata</i>	13%
Francolin, Crested	<i>Dendroperdix sephaena</i>	13%
Go-away-bird, Grey	<i>Corythaixoides concolor</i>	38%
Goose, Spur-winged	<i>Plectropterus gambensis</i>	13%
Grassbird, Cape	<i>Sphenoeacus afer</i>	13%
Grebe, Little	<i>Tachybaptus ruficollis</i>	13%
Guineafowl, Helmeted	<i>Numida meleagris</i>	25%
Hamerkop, Hamerkop	<i>Scopus umbretta</i>	38%
Heron, Black-headed	<i>Ardea melanocephala</i>	13%
Heron, Grey	<i>Ardea cinerea</i>	13%
Hornbill, African Grey	<i>Tockus nasutus</i>	50%

Ibis, African Sacred	<i>Threskiornis aethiopicus</i>	13%
Ibis, Glossy	<i>Plegadis falcinellus</i>	13%
Ibis, Hadedda	<i>Bostrychia hagedash</i>	13%
Indigobird, Purple	<i>Vidua purpurascens</i>	13%
Kingfisher, Brown-hooded	<i>Halcyon albiventris</i>	13%
Kite, Black-shouldered	<i>Elanus caeruleus</i>	25%
Kite, Yellow-billed	<i>Milvus aegyptius</i>	13%
Korhaan, Northern Black	<i>Afrotis afraoides</i>	13%
Lapwing, Blacksmith	<i>Vanellus armatus</i>	13%
Lapwing, Crowned	<i>Vanellus coronatus</i>	25%
Lark, Rufous-naped	<i>Mirafraga africana</i>	25%
Lark, Sabota	<i>Calendulauda sabota</i>	38%
Longclaw, Cape	<i>Macronyx capensis</i>	13%
Mannikin, Bronze	<i>Spermestes cucullatus</i>	25%
Martin, Rock	<i>Hirundo fuligula</i>	25%
Masked-Weaver, Southern	<i>Ploceus velatus</i>	88%
Mousebird, Red-faced	<i>Urocolius indicus</i>	75%
Mousebird, Speckled	<i>Colius striatus</i>	38%
Mousebird, White-backed	<i>Colius colius</i>	25%
Myna, Common	<i>Acridotheres tristis</i>	75%
Neddicky, Neddicky	<i>Cisticola fulvicapilla</i>	63%
Palm-Swift, African	<i>Cypsiurus parvus</i>	38%
Paradise-Flycatcher, African	<i>Terpsiphone viridis</i>	13%
Paradise-Whydah, Long-tailed	<i>Vidua paradisaea</i>	13%
Pigeon, Speckled	<i>Columba guinea</i>	25%
Pipit, African	<i>Anthus cinnamomeus</i>	38%
Pipit, Buffy	<i>Anthus vaalensis</i>	13%
Pipit, Long-billed	<i>Anthus similis</i>	13%
Pipit, Plain-backed	<i>Anthus leucophrys</i>	13%
Plover, Three-banded	<i>Charadrius tricollaris</i>	25%
Prinia, Black-chested	<i>Prinia flavicans</i>	50%
Prinia, Tawny-flanked	<i>Prinia subflava</i>	13%
Pytilia, Green-winged	<i>Pytilia melba</i>	25%
Quelea, Red-billed	<i>Quelea quelea</i>	50%
Reed-Warbler, African	<i>Acrocephalus baeticatus</i>	13%
Robin-Chat, White-throated	<i>Cossypha humeralis</i>	25%
Ruff, Ruff	<i>Philomachus pugnax</i>	13%
Rush-Warbler, Little	<i>Bradypterus baboecala</i>	13%
Sandpiper, Common	<i>Actitis hypoleucos</i>	13%
Sandpiper, Marsh	<i>Tringa stagnatilis</i>	13%
Scrub-Robin, Kalahari	<i>Cercotrichas paena</i>	25%
Scrub-Robin, White-browed	<i>Cercotrichas leucophrys</i>	38%

Shrike, Crimson-breasted	<i>Laniarius atrococcineus</i>	13%
Shrike, Magpie	<i>Corvinella melanoleuca</i>	13%
Shrike, Red-backed	<i>Lanius collurio</i>	38%
Sparrow, Cape	<i>Passer melanurus</i>	88%
Sparrow, House	<i>Passer domesticus</i>	63%
Sparrow, Southern Grey-headed	<i>Passer diffusus</i>	63%
Sparrow-Weaver, White-browed	<i>Plocepasser mahali</i>	38%
Spurfowl, Natal	<i>Pternistis natalensis</i>	13%
Spurfowl, Swainson's	<i>Pternistis swainsonii</i>	38%
Starling, Cape Glossy	<i>Lamprotornis nitens</i>	50%
Starling, Red-winged	<i>Onychognathus morio</i>	13%
Starling, Wattled	<i>Creatophora cinerea</i>	13%
Stilt, Black-winged	<i>Himantopus himantopus</i>	13%
Stonechat, African	<i>Saxicola torquatus</i>	25%
Sunbird, Amethyst	<i>Chalcomitra amethystina</i>	13%
Sunbird, White-bellied	<i>Cinnyris talatala</i>	25%
Swallow, Barn	<i>Hirundo rustica</i>	50%
Swallow, Greater Striped	<i>Hirundo cucullata</i>	25%
Swallow, Lesser Striped	<i>Hirundo abyssinica</i>	25%
Swallow, Red-breasted	<i>Hirundo semirufa</i>	25%
Swamp-Warbler, Lesser	<i>Acrocephalus gracilirostris</i>	13%
Swift, Alpine	<i>Tachymarptis melba</i>	13%
Swift, Little	<i>Apus affinis</i>	63%
Swift, White-rumped	<i>Apus caffer</i>	38%
Tchagra, Black-crowned	<i>Tchagra senegalus</i>	13%
Tchagra, Brown-crowned	<i>Tchagra australis</i>	50%
Teal, Red-billed	<i>Anas erythrorhyncha</i>	13%
Thrush, Groundscraper	<i>Psophocichla litsipsirupa</i>	13%
Thrush, Karoo	<i>Turdus smithi</i>	13%
Tit-Babbler, Chestnut-vented	<i>Parisoma subcaeruleum</i>	63%
Tit-Flycatcher, Grey	<i>Myioparus plumbeus</i>	13%
Turtle-Dove, Cape	<i>Streptopelia capicola</i>	38%
Wagtail, Cape	<i>Motacilla capensis</i>	25%
Waxbill, Black-faced	<i>Estrilda erythronotos</i>	13%
Waxbill, Blue	<i>Uraeginthus angolensis</i>	63%
Waxbill, Violet-eared	<i>Granatina granatina</i>	25%
Weaver, Cape	<i>Ploceus capensis</i>	25%
Weaver, Village	<i>Ploceus cucullatus</i>	13%
Whydah, Pin-tailed	<i>Vidua macroura</i>	50%
Whydah, Shaft-tailed	<i>Vidua regia</i>	13%
Widowbird, White-winged	<i>Euplectes albonotatus</i>	38%
Wood-Dove, Emerald-spotted	<i>Turtur chalcospilos</i>	13%

Woodpecker, Golden-tailed	<i>Campethera abingoni</i>		13%
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