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MERENSKY-UCHOBA 132KV POWERLINE
SECOND ROUTE DEVIATION
SPECIALIST CONFIRMING STATEMENT (AVIFAUNA)

DRAFTED BY:
MEGAN DIAMOND
FEATHERS ENVIRONMENTAL SERVICES
P.O. BOX 786962
SANDTON, 2146
MEGAN@FEATHERSENV.CO.ZA

PREPARED FOR:
LANDSCAPE DYNAMICS ENVIRONMENTAL CONSULTANTS
PO BOX 947
GROENKLOOF
PRETORIA, 0027

PROFESSIONAL EXPERIENCE

Ms. Megan Diamond completed a Bachelor of Science degree in Environmental Management from the University of South Africa and has been involved in conservation for 20 years. She has 17 years' worth of experience in the field of bird interactions with electrical infrastructure and during this time has completed impact assessments for over 160 projects. During her tenure at the Endangered Wildlife Trust's Wildlife & Energy Programme and the Programme's primary project (i.e. the Eskom-EWT Strategic Partnership) from 2006 to 2013, Megan was responsible for assisting the energy industry and the national utility in minimising the negative impacts, associated with the construction and operation of electrical infrastructure, on wildlife through the provision of strategic guidance, risk and impact assessments, training and research. Megan (SACNASP Environmental Science Registration number 300022/14) currently owns and manages *Feathers Environmental Services* and is tasked with providing guidance to industry through the development of best practice procedures and avifaunal specialist studies for various developments including renewable energy facilities, power lines, power stations and substation infrastructure in addition to railway infrastructure and residential developments within South Africa and elsewhere within Africa. Megan has attended and presented at several conferences and facilitated workshops, as a subject expert, since 2007. Megan has authored and co-authored several academic papers, research reports and energy industry related guidelines, including the *BirdLife South Africa/ Endangered Wildlife Trust best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa* and the *Avian Wind Farm Sensitivity Map for South Africa* (2015), and played an instrumental role in facilitating the endorsement of these two products by the South African Wind Energy Association (SAWEA), IAIAsa (International Association for Impact Assessment South Africa) and Eskom. She chaired the Birds and Wind Energy Specialist Group in South Africa (2011/2012) and the IUCN/SSC Crane Specialist Group's Crane and Power line Network (2013-2015), a working group comprised of subject matter experts from across the world, working in partnership to share lessons, develop capacity, pool resources, and accelerate collective learning towards finding innovative solutions to mitigate this impact on threatened crane populations. She is currently a member of the IUCN Stork, Ibis and Spoonbill Specialist Group and the Eskom-EWT Strategic Partnership Ludwig's Bustard Working Group.

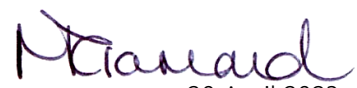
DECLARATION OF INDEPENDENCE

I, Megan Diamond, in my capacity as a specialist consultant, hereby declare that I:

- * Act as an independent specialist to Landscape Dynamics Environmental Consultants for this project.
- * Do not have any personal or financial interest in the project except for financial compensation for specialist investigations completed in a professional capacity as specified by the Amendment to Environmental Impact Assessment Regulations, 2017.
- * Will not be affected by the outcome of the environmental process, of which this report forms part of.
- * Do not have any influence over the decisions made by the governing authorities.
- * Do not object to or endorse the proposed development, but aim to present facts and our best scientific and professional opinion with regard to the impacts of the development.
- » Undertake to disclose to the relevant authorities any information that has or may have the potential to influence its decision or the objectivity of any report, plan, or document required in terms of the Amendment to Environmental Impact Assessment Regulations, 2017.

INDEMNITY

- * This confirming statement is based on a desktop investigation using the available information and data related to the site to be affected and two, one-day, site visits to the project area on 16 September 2022 and 20 January 2023 respectively. No long-term investigation or monitoring has been conducted.
- * The Precautionary Principle has been applied throughout this assessment.
- * The findings, results, observations, conclusions and recommendations given in this confirming statement are based on the author's best scientific and professional knowledge as well as available information at the time of study.
- * Additional information may become known or available during a later stage of the process for which no allowance could have been made at the time of writing this confirming statement.
- * The specialist investigator reserves the right to modify this confirming statement, recommendations and conclusions at any stage should additional information become available.
- * Information, recommendations and conclusions in this confirming statement cannot be applied to any other area without proper investigation.
- * This confirming statement, in its entirety or any portion thereof, may not be altered in any manner or form or for any purpose without the specific and written consent of the specialist investigator as specified above.
- * Acceptance of this confirming statement, in any physical or digital form, serves to confirm acknowledgment of these terms and liabilities.


20 April 2023

CONFIRMING STATEMENT

This avifaunal specialist assessment and resultant report have been compiled in accordance with the legislative requirements as described in Gazette Notice Nr 2313, 27 July 2022: Standard for the Development and Expansion of Power Lines and Substations within identified Geographical Areas, promulgated on 27 July 2022 by the Department of Forestry, Fisheries and the Environment (2022)

A statement on the duration, date and season of the site verification inspection and walk through as well as the relevance of the season to the outcome of the confirming statement

The site verification was conducted over two, one-day periods (16 September 2022 and 20 January 2023 respectively) during the austral spring and summer seasons. These area considered peak season surveys in avifaunal terms, maximising the opportunity to observe seasonal migrants. Incidental points counts were conducted along the length of the proposed route where all species observed and heard were recorded.

A description of the affected environment relating to avifauna within the *preliminary corridor*, based on the most recently available desktop data, site verification inspection and walk through information

A total of 241 bird species have been recorded across the four pentads, within which the proposed power line deviation is located, during the SABAP2 atlassing period to date.

The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur at the along the proposed power line deviation. Of the 241 species, four are regional Red List species (i.e. SCC) (Taylor et al, 2015). Relevant to this development, 44 species are classified as priority power line species (see definition in section 4). Of the power line sensitive species, 12 are likely to occur regularly along the proposed 132kV power line second route deviation.

The site verifications yielded a total species list of 68 species which is considered an accurate reflection of the avian communities likely to be utilising the habitats within the proposed 132kV power line second route deviation, given the significant levels of disturbance and habitat transformation in the area.

Identification of avifaunal sensitive areas to be avoided within the *preliminary corridor*, including buffers;

No VERY HIGH or HIGH sensitivity areas were identified. There are no areas that need to be avoided.

An avifauna sensitivity map overlaid with the proposed development footprint (i.e. pylon placement and power line route, as well as supporting infrastructure);

MEDIUM areas of sensitivity requiring mitigation (bird flight diverters) include open grassland areas and ephemeral drainage lines – Figure 6, Section 8

A description on how the identified environmental sensitivity, relating to avifauna, has been considered in determining the proposed route;

There are no specific avifaunal constraints that impact on the determination of the proposed 132kV power line second route deviation.

The majority of the proposed 132kV power line second route deviation occurs within habitats that are subject to significant transformation and disturbance, resulting in a LOW sensitivity. Areas that are deemed moderately sensitive include small pockets of grassland habitat and the ephemeral drainage lines and may be areas where avian collisions with the power line may occur. It is recommended that bird flight diverters be installed where the power line crosses these areas.

A description on how the identified engineering constraints, relating to avifauna, have been considered in determining the proposed route;

The orientation of the power line within close proximity to the R555 road is likely to preclude the presence of SCC, thereby reducing the likely disturbance and collision impacts. Power line spans are likely to traverse comfortably across the Steelpoort River and ephemeral drainage lines thereby minimising the potential habitat loss impact at these important avian corridors.

A description of the implementation of the mitigation hierarchy in order to determine the proposed route and/or substation location;

Mitigation hierarchy includes the following steps in the order of decreasing desirability: Avoid, Minimise, Rehabilitate, and Offset. In the case of this project, the following applies:

Avoid

There are no identified areas of VERY HIGH or HIGH sensitivity that must be avoided

Minimise

- * The 132kV power line second route deviation must be constructed using a bird friendly structure (i.e. DT 7641/7649).
- * Additional mitigation in the form of insulating sleeves on *jumper*s present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.
- * Bird flight diverters to be installed on earthwires of spans crossing The Steelpoort River, ephemeral drainage lines and old agricultural land (grassland habitat).
- * The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint (especially the removal of natural vegetation) and rehabilitation of disturbed areas is concerned.
- * If collision or electrocution impacts are recorded once the Merensky-Uchoba 132kV power line is

operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.

Rehabilitate

Rehabilitation of avian resources is not applicable to this project

Offset

Offsets are not applicable to this project

How the inputs of I&APs were considered when determining the *final pre-negotiated route* and/or substation location; and

This Specialist Confirming Statement is being distributed together with the Draft Environmental Sensitivity Report (ESR) for public comment. Should any input from the public change the content / outcome of this confirming statement, amendments will be made and submitted with the Final ESR. The Final ESR will be submitted to DFFE for decision making and registration of the project.

A statement confirming that:

- a. impact management actions as contained in the pre-approved Generic EMPr template are sufficient for the avoidance, management and mitigation of impacts and risks; or
- b. where required specific impact management outcomes and actions are required and have been provided as part of the site specific EMPr;

The Eskom Generic EMPr is sufficient for the avoidance, management and mitigation of impacts and risks associated with disturbance, however site specific mitigation measures should also be included in the EMPr. These include:

- * The 132kV power line must be constructed using a bird friendly structure (i.e. DT 7641/7649).
- * Additional mitigation in the form of insulating sleeves on *jumpers* present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.
- * Bird flight diverters to be installed on earthwires of spans crossing the Steelpoort River, ephemeral drainage lines and old agricultural land (grassland habitat).
- * If additional collision or electrocution impacts are recorded once the Merensky-Uchoba 132kV power line is operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.

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1. INTRODUCTION

Eskom Holdings SOC Ltd (hereinafter referred to as *Eskom*) was granted an Environmental Authorisation (EA) by the national Department of Environmental Affairs (DEA) now Department of Forestry, Fisheries and the Environment (DFFE) to construct a new Merensky-Uchoba 132kV steel monopole power line (approximately 18km in length) extending from the existing Merensky Main Transmission Substation (MTS) to the Merensky-Jane Furse-Uchoba 132kV power line T-off. In 2020, an initial avifaunal impact assessment study was completed, by *Chris van Rooyen Consulting*, as part of a Basic Assessment (BA) process for the power line project. The avifaunal impact assessment report determined that the habitat within the project and broader study area was low to moderately sensitive from a potential bird impact perspective. The study concluded that construction of the Merensky-Uchoba 132kV power line would pose a low risk to power line sensitive SCC and that appropriate mitigation would reduce the risk even further to very low.

Subsequent to this assessment and the resultant authorisation, Eskom need to consider an alternative routing and have proposed an 10.6km deviation to the authorised route (within a 100m corridor) which requires specialist assessment, to identify any potential impacts within the amended route alignment and the measures needed to manage and monitor the impacts. Existing access roads will be used. A new 6m wide access road will be developed for construction, maintenance and inspection purposes within the servitude area along the power line, occurring outside of the identified High and Very High Sensitive Areas.

2. PROJECT LOCATION

The proposed second route deviation to the Merensky-Uchoba 132kV power line is located alongside the R555 road, for the most part of its alignment, near Steelpoort in the Sekhukhune District Municipality, Limpopo Province (FIGURE 1). The proposed route alignment adheres to the following General Environmental Principles described in the *Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas*:

- * Avoidance of all known Blue Swallow *Hirundo atrocaerulea* breeding habitat by a 2.5km buffer;
- * Avoidance of Cape Vulture *Gyps coprotheres* and White-backed Vulture *Gyps africanus* breeding colonies by a 5km buffer. In addition, the management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental Control Officer (ECO);
- * Avoidance of vulture restaurants by a 5km buffer; and
- * The power line alignment is not located within 500m of the edge of waterbodies that support Greater Flamingo *Phoeniconaias roseus*, Lesser Flamingo *Phoeniconaias minor*, Black Stork *Ciconia nigra*, Blue

Crane *Anthropoides paradiseus*, Great White Pelican *Pelacanus onocrotalus* and African Marsh Harrier *Circus ranivorus*.

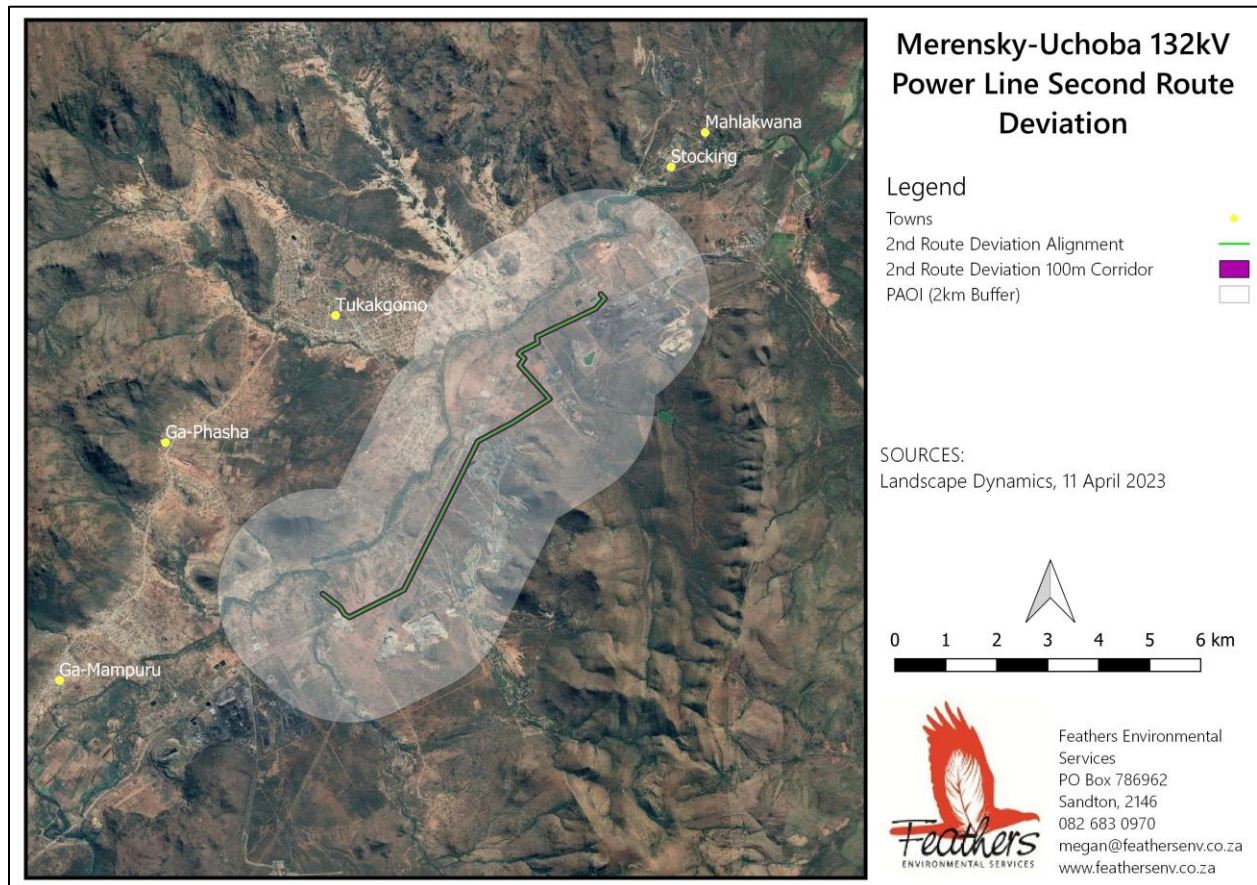


FIGURE 1: Regional map detailing the location of the proposed Merensky-Uchoba 132kV Power Line Second Route Deviation located near Steelpoort in the Sekhukhune District Municipality, Limpopo Province

3. THIS CONFIRMING STATEMENT

3.1 Scope of Work

Feathers Environmental Services CC (hereafter referred to as *Feathers*) was appointed by *Landscape Dynamics Environmental Consultants* (hereafter referred to as *Landscape Dynamics*) to assess the proposed 132kV power line second route deviation, within a 100m corridor, and compile a specialist avifaunal confirming statement, that will inform the Environmental Sensitivity Report required by the *Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas* for the application of an Environmental Authorisation (EA) for the Merensky-Uchoba 132kV power line second route deviation. This confirming statement is based on a desktop review and two field surveys conducted over a one-day period each on 16 September 2022 and 20 January 2023 respectively, which uses a set methodology and various data sets to determine which avian species regularly occur within the proposed

study area, the availability of bird micro habitats (i.e. avifaunal sensitive areas), the possible impacts of the proposed 132kV power line second route deviation, and their significance and the provision of recommendations for the mitigation of the anticipated impacts.

3.2 Terms of Reference

Feathers has drafted this avifaunal confirming statement according to the following terms of reference, in accordance with the *Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas* as detailed below. The standard allows for the exclusion of activities which relate to the construction and operation of electricity transmission and distribution infrastructure, that are proposed within Electricity Grid Infrastructure (EGI) corridors that were assessed as part of a Strategic Environmental Assessment (SEA) in 2016 and 2019 respectively. The provisions of this standard are applicable to this project since the proposed deviation occurs within an EGI corridor with an environmental sensitivity of MEDIUM and/or LOW as determined by the web-based screening tool and confirmed as such by this assessment.

Standard for the Development and Expansion of Power Lines and Substations within Identified Geographical Areas

APPENDIX A – ENVIRONMENTAL SPECIFICATIONS

A.5. Avifauna

9. During the planning phase:

- a. A 2 km buffer either side of the centre line of the proposed route of the power line alignment falling within the preliminary corridor must be drawn for verification of avifaunal sensitivity.
- b. The Avifauna specialist must:
 - i. Use the most recently obtainable and available information (spatial and otherwise) as well as the screening tool, professional knowledge of the EAP and the avifauna specialist to determine, on a desktop level, the habitat sensitivity for avifaunal species along the power line route and/or substation location. BirdLife South Africa, WWF, the Endangered Wildlife Trust and VULPRO, must be contacted for their input.
 - ii. The power line bird mortality incident database of the Endangered Wildlife Trust must be consulted to determine which of the species occurring in the broader study area are typically impacted upon by power lines (EWT unpublished data).
 - iii. Establish habitat and migratory routes and likely flight paths based on the most recently obtainable and available desktop data and site verification.

- iv. The conservation status of all avifaunal species recorded by the most recent iteration of the SABAP in the broader study area must be determined as per the most recent iteration of the list of threatened species and the IUCN Red Data List of Birds.
- v. Based on the information collected on birds typically impacted upon by power lines, identify the presence of threatened species which include, as a minimum, Cranes, Flamingos, Vultures, Kori Bustards, and Pelicans.
- vi. Where high risk areas are identified these areas must be confirmed with EWT by using their risk assessment tool.
- vii. Where the risk assessment tool identifies that mitigation measures can be applied, apply these mitigation measures in consultation with EWT, BirdLife South Africa and the local conservation agency.
- viii. Where no acceptable mitigation measures can be applied, re-routing options or engineering solution, for example routing under the risk area identified or increasing the height of the power line in order to avoid potential collision risk areas, must be applied. Where engineering options are considered these must be discussed with EWT, BirdLife South Africa and the local conservation agency.

4. APPROACH AND METHODOLOGY

4.1 Methodology

The following methods were employed to compile this avifaunal impact assessment report:

- * The focus of this assessment is primarily on the potential impacts of the Merensky-Uchoba 132kV power line second route deviation on priority species. Priority species are defined as those species which could potentially be impacted by displacement through habitat transformation and/or disturbance as well as collision and electrocution based on specific morphological and/or behavioural characteristics. These include both Species of Conservation Concern (SCC) as defined by the *Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa (2020)* i.e. those species listed on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Vulnerable, Near Threatened and Data Deficient, as well as certain other impact susceptible species.
- * By virtue of their mobility, the identification of bird presence and abundance cannot be confined to the 132kV power line alignment, therefore the Project Area of Influence (PAOI) is defined as a 2km

zone around the proposed power line alignment. Avifaunal sensitivity has been defined for this PAOI.

- * The proposed Merensky-Uchoba 132kV power line second route deviation is located across two South African Bird Atlas Project 2 (SABAP2) pentad grid cells (i.e. 2245_3005 and 2245_3010). A larger area (comprised of four pentads – 2440_3005; 2440_3010; 2245_3005 and 2245_3010) is necessary to obtain a dataset that is large enough to ensure that reasonable conclusions about species diversity and densities, in a particular habitat type, can be drawn (FIGURE 2). A total of 38 full protocol lists and 12 ad hoc protocol lists have been completed, which should provide a reasonably accurate snapshot of the avifauna in the study area;

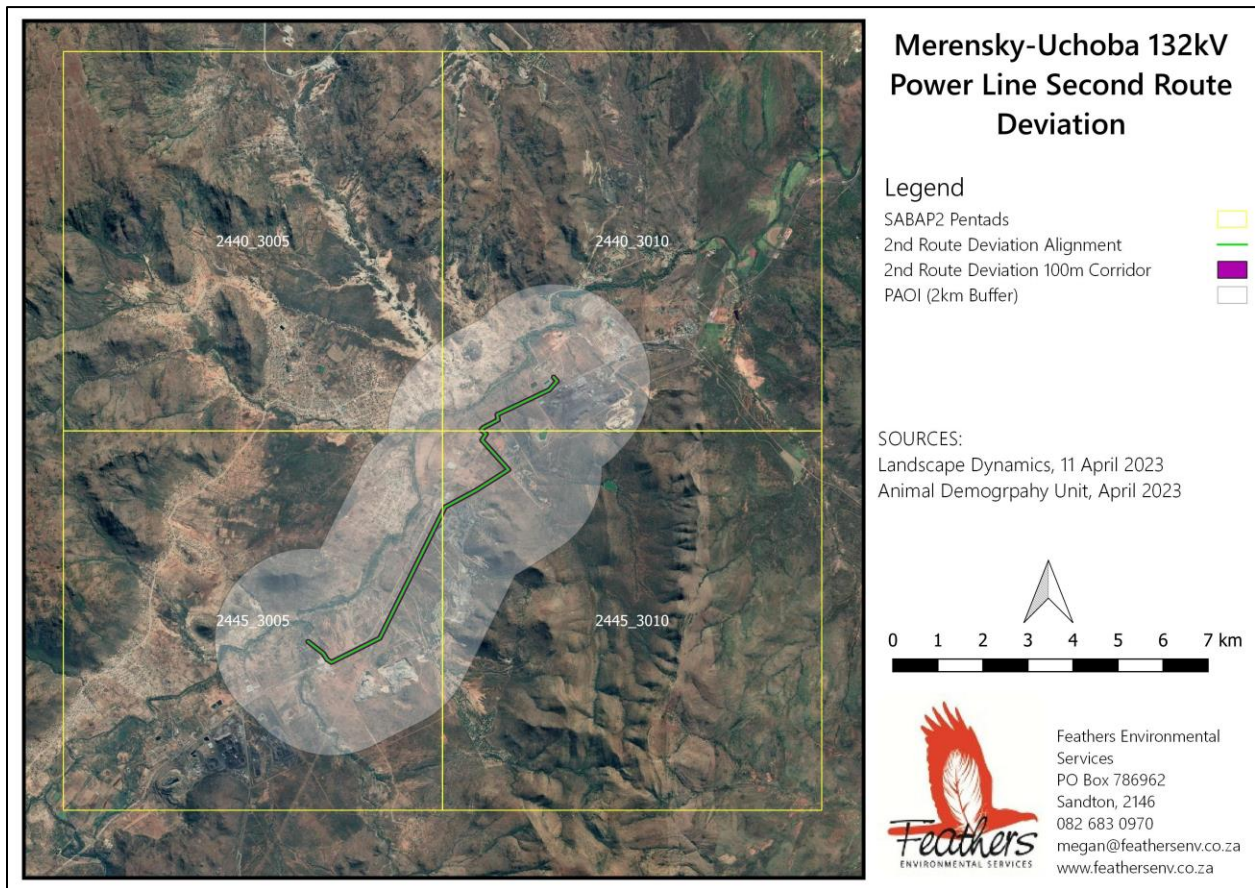


FIGURE 2: Location of the four South African Bird Atlas Project 2 (SABAP2) pentad grid cells that were considered for the Merensky-Uchoba 132kV Power Line Second Route Deviation

- * Collected and examined various avifaunal data sets (detailed in section 4.2) at a desktop level to determine the presence of species, that may be vulnerable to the impacts associated with the construction and operation of the Merensky-Uchoba 132kV power line along the second route deviation;

- * Suitable avifaunal habitats and potential sensitive areas along the proposed Merensky-Uchoba 132kV power line second route deviation, where impacts are likely to occur, were identified using various Geographic Information System (GIS) layers and Google Earth imagery and confirmed based on personal observations made during the site verification surveys;
- * Primary avifaunal diversity and occurrence data collected during spring and summer season surveys to the PAOI, conducted on 16 September 2022 and 20 January 2023. Data was collected by means of incidental counts to ground truth the information gleaned from secondary data sources and to collect primary bird occurrence data within the 100m corridor, within which the Merensky-Uchoba 132kV power line second route deviation is located in addition to its immediate surrounds;
- * The potential impacts, associated with the construction and operation of the Merensky-Uchoba 132kV (steel monopole) power line along the proposed second route deviation on the avifaunal community are discussed; and
- * Practical recommendations for the management and mitigation of impacts, related to the construction and operation of the Merensky-Uchoba 132kV power line within the proposed second route deviation are provided in Section 8 for inclusion in the draft EMPr.

4.2 Data sources used

The following data sources and reports were used in varying levels of detail for this study:

- * Procedures for the Assessment and Minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA when applying for Environmental Authorisation (Gazetted October 2020);
- * Guidelines for the Implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for EIAs in South Africa produced by the South African National Biodiversity Institute on behalf of the Department of Environment, Forestry and Fisheries (2020) were consulted to determine the applicable protocol to be used;
- * The Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas;
- * Screening Report for an Environmental Authorisation as required by the 2014 EIA Regulations - Proposed Site Environmental Sensitivity: Merensky-Uchoba 132kV Powerline 2nd Route Deviation, compiled by *Landscape Dynamics* on 14 March 2023;
- * Bird distribution data of the South African Bird Atlas 2 (SABAP 2) (Animal Demography Unit, 19 January 2023, 22 March 2023 and 20 April 2023)
- * The Important Bird & Biodiversity Areas (IBAs) report (Marnewick et al. 2015). There are no IBAs located within the confines of the deviation and broader PAOI and therefore IBA data was not used as a criterion to assess the sensitivity and anticipated impacts within the PAOI;
- * Protected Areas - these areas are protected by law and managed for biodiversity conservation, providing much needed habitat that can potentially support a diversity and abundance of avifaunal species. The

proposed 132kV power line deviation PAOI does not form part of a protected area, therefore this is not used as a criterion to assess the sensitivity and anticipated impacts within the PAOI;

- * Co-ordinated Waterbird Count Database (CWAC – Taylor et al. 1999). There are no CWAC sites located within the confines of the deviation and broader PAOI and therefore CWAC data was not used as a criterion to assess the sensitivity and anticipated impacts within the PAOI;
- * Coordinated Avifaunal Roadcount project database (CAR – Young et al, 2003) - was consulted to obtain relevant data on large terrestrial bird report rates in the area. There are no CAR routes located within the confines of the deviation and broader PAOI and therefore CAR data was not used as a criterion to assess the sensitivity and anticipated impacts within the PAOI;
- * The global and regional conservation status and endemism information of all bird species (Taylor et al. 2015) and the latest (2022-2) IUCN Red List of Threatened Species (<http://www.iucnredlist.org>);
- * Vulture colony and restaurant location data , received from Vulpro May, 2021;
- * The power line - bird mortality incident database of the Eskom/Endangered Wildlife Trust Strategic Partnership (1996 to 2013) was consulted to determine which of the species occurring in the PAOI are typically impacted upon by power lines, and the extent of the impact;
- * The latest vegetation classification described in the Vegetation Map of South Africa (South African National Biodiversity Institute, 2012 and Mucina & Rutherford, 2006);
- * High-resolution Google Earth ©2023 imagery was used to examine the micro-habitats within the PAOI;
- * KMZ. shapefiles detailing the location of the Merensky-Uchoba 132kV power line second route deviation, provided by *Landscape Dynamics* on 11 April 2023; and
- * Two site surveys of the Merensky-Uchoba 132kV power line PAOI conducted on 16 September 2022 and 20 January 2023 (spring and summer surveys) respectively to form a first-hand impression of avifaunal species presence and micro-habitat occurring within the larger PAOI (FIGURE 3).

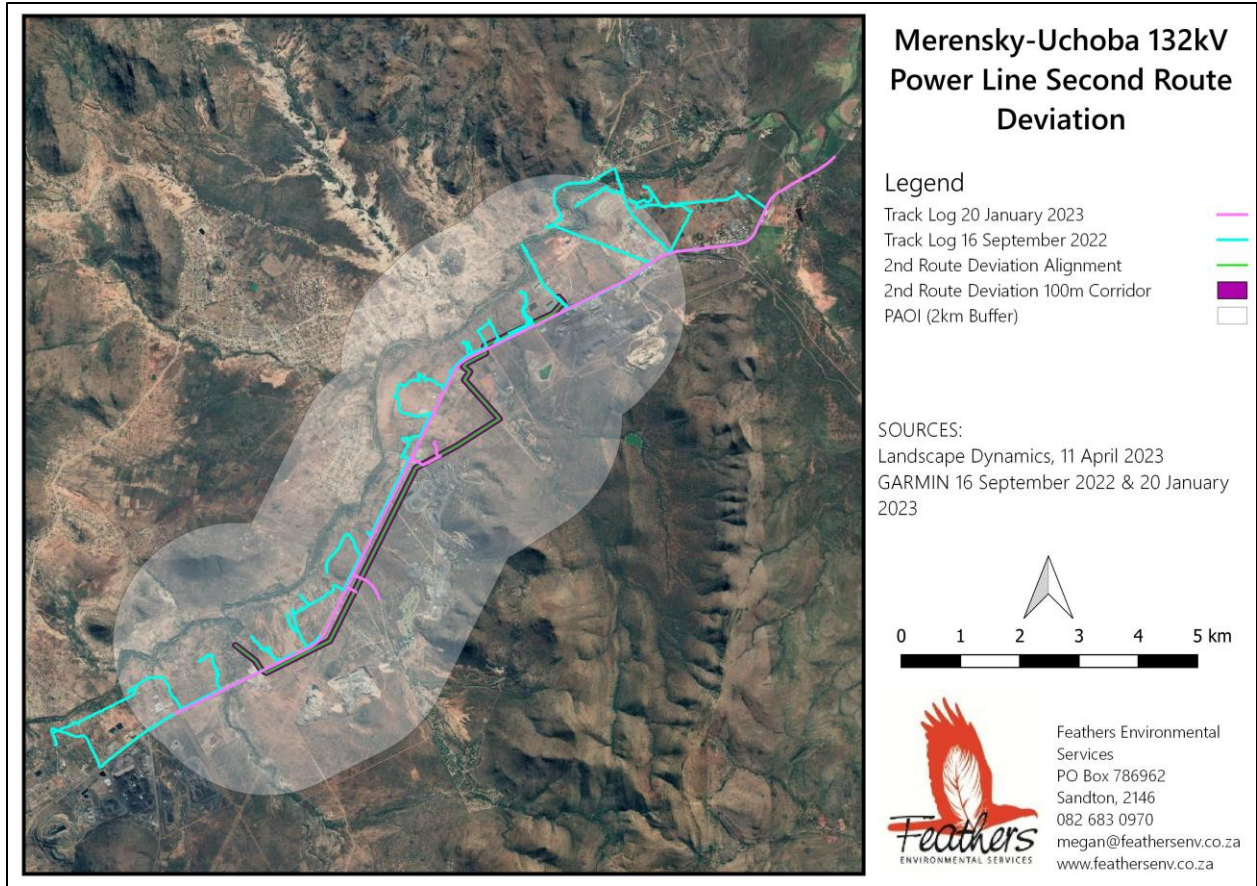


FIGURE 3: Regional map detailing the areas surveyed during the site surveys of the PAOI, conducted on 16 September 2022 and 20 January 2023

5. APPLICABLE LEGISLATION, POLICIES AND GUIDELINES

The following pieces of legislation are applicable to this assessment:

5.1 Agreements and Conventions

South Africa is party to various agreements and conventions (TABLE 1) which are relevant to the conservation of avifauna (BirdLife International, 2022) .

TABLE 1: Agreements and conventions which South Africa is party to and which is relevant to the conservation of avifauna.

| Convention Name | Description | Geographic scope |
|--|---|------------------|
| African-Eurasian Waterbird Agreement (AEWA) | <p>The Agreement on the Conservation of African-Eurasian Migratory Water birds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats across Africa, Europe, the Middle East, Central Asia, Greenland and the Canadian Archipelago.</p> <p>The AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual cycle, including many species of divers, grebes, pelicans, cormorants, herons, storks, rails, ibises, spoonbills, flamingos, ducks, swans, geese, cranes, waders, gulls, terns, tropic birds, auks, frigate birds and even the South African penguin.</p> <p>The core activities carried out under AEWA are described in its Action Plan, which is legally binding for all countries that have joined the Agreement. The AEWA Action Plan details the various measures to be undertaken by Contracting Parties to guarantee the conservation of migratory waterbirds within their national boundaries. These include species and habitat protection, and the management of human activities, as well as legal and emergency measures.</p> | Regional |
| Convention on Biological Diversity (CBD), Nairobi, 1992 | <p>The CBD 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.</p> <p>The convention makes provision (in a general policy guideline) for keeping and restoring biodiversity. In addition to this the CBD is an ardent supporter of thorough assessment procedures (Strategic Environmental Assessments (SEAs) and Environmental Impact Assessments (EIAs)) and requires that Parties apply these processes when planning activities that will have a biodiversity impact. An important principle encompassed by the CBD is the precautionary principle which essentially states that where serious threats to the environment exist, lack of full scientific certainty should not be used as a reason for delaying management of these risks. The burden of proof that the impact will <i>not</i> occur lies with the proponent of the activity posing the threat.</p> <p>In addition, the Aichi Biodiversity Targets (CBD 2011) address several priority issues i.e. the loss of biodiversity and its causes; reducing direct pressure on biodiversity; safeguarding ecosystems, species and genetic diversity and participatory planning to enhance implementation of biodiversity conservation. Each of these is relevant to a project of this nature and bird conservation through all project phases from planning to the implementation of mitigation measures for all developments.</p> | Global |
| Convention on the Conservation of Migratory Species of Wild Animals, (CMS), Bonn, 1979 | <p>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 impacts associated with man-made infrastructure. CMS requires that Parties 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</p> | Global |

| | | |
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| | <p>obstacles that seriously impede or prevent the migration of migratory species (Art III, par. 4b and 4c).</p> <p>At CMS/CoP7 (2002) Res. 7.2 on Impact Assessment and Migratory Species was accepted, requesting Parties to apply appropriate SEA and EIA procedures for all proposed developments. An agreement developed in the framework of CMS, in force since November 1999, brings the 119 Range States of the Africa Eurasian Waterbird Agreement (AEWA) region together in a common policy to protect migratory waterbirds that use the flyway from the Arctic to southern Africa. The agreement contains a number of obligations that are relevant to migratory waterbirds and infrastructure development.</p> | |
| Convention on the International Trade in Endangered Species of Wild Flora and Fauna, (CITES), Washington DC, 1973 | CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. | Global |
| Ramsar Convention on Wetlands of International Importance, Ramsar, 1971 | The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. | Global |
| Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia | The Signatories will aim to take coordinated measures to achieve and maintain the favourable conservation status of birds of prey throughout their range and to reverse their decline when and where appropriate. | Regional |

5.2 National & Provincial Legislation

The following pieces of national and provincial legislation (TABLE 2) are applicable to this assessment:

TABLE 2: National and provincial legislation which is relevant to the conservation of avifauna.

| Legislation | Description | Geographic scope |
|--|--|------------------|
| The National Environmental Management Act 107 of 1998 (NEMA) | The National Environmental Management Act 107 of 1998 (NEMA) creates the legislative framework for environmental protection in South Africa and is aimed at giving effect to the environmental right in the Constitution. It sets out a number of guiding principles that apply to the actions of all organs of state that may significantly affect the environment. Sustainable development (socially, environmentally and economically) is one of the key principles, and internationally accepted principles of environmental management, such as the precautionary principle and the polluter pays principle, are also incorporated. NEMA also provides that a wide variety of listed developmental activities, which may significantly affect the environment, may be performed only after an environmental impact assessment has been done and authorization has been obtained from the relevant authority. Many of these listed activities can potentially have negative impacts on bird populations in a variety of ways. The clearance of natural vegetation, for instance, can lead to a loss of habitat and may depress prey populations, while erecting structures needed for generating and distributing energy, communication, and so forth can cause mortalities by collision or electrocution. | National |
| The National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) and the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations) | 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 provides 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 | National |

| | | |
|--|--|----------|
| | indigenous biological resources. | |
| The National Environmental Management: Protected Areas Act 57 of 2003 | The National Environmental Management: Protected Areas Act (No. 57 of 2003), as amended in 2014, provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. The Act also provides for the establishment of a national register of all national, provincial and local protected areas that are managed in accordance with national norms and standards; and to endure intergovernmental co-operation and public consultation in matters concerning protected areas. Protected areas are declared in order to regulate the area as a buffer zone for protection of a special nature reserve, world heritage site or nature reserve; to enable owners of land to take collective action to conserve biodiversity on their land and to seek legal recognition thereof; to protect the area if the area is sensitive to development due to its- (i) biological diversity; (ii) natural characteristics; (iii) scientific, cultural, historical, archaeological or geological value; (iv) scenic and landscape value; or (v) provision of environmental goods and services; to protect a specific ecosystem outside of a special nature reserve, world heritage site or nature reserve; to ensure that the use of natural resources in the area is sustainable. This Act explicitly states that no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority. | National |
| The National Environmental Management Act 107 of 1998 (NEMA) Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal and or Avifaunal Species | This protocol provides the criteria for the specialist assessment and minimum report content requirements for impacts on terrestrial animal and/or avifaunal species for activities requiring environmental authorisation. This protocol replaces the requirements of Appendix 6 of the Environmental Impact Assessment Regulations. The assessment and reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool) for terrestrial animal species. The relevant terrestrial animal species data in the screening tool has been provided by the South African National Biodiversity Institute (SANBI). | National |
| Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa. | The <i>Species Environmental Assessment Guideline</i> provides background and context to the assessment and minimum reporting criteria contained within the Terrestrial Animal and Plant Species Protocols; as well as to provide guidance on sampling and data collection methodologies for the different taxonomic groups that are represented in the respective protocols. This guideline is intended for specialist studies undertaken for activities that have triggered a listed and specified activity in terms of the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as identified by the EIA Regulations, 2014 (as amended) and Listing Notices 1-3. | National |

| | | |
|---|--|-------------------|
| <p>The Standard for the Development and Expansion of Power Lines and Substations within Identified Geographical Areas</p> | <p>Section 24(2)(c) - (e) of NEMA provides the ability of the Minister, or MEC in concurrence with the Minister to identify activities and geographical areas within which activities may be excluded from the requirement to obtain environmental authorisation. The <i>Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas</i> allows for the exclusion of activities which relate to the development and expansion of electricity transmission and distribution infrastructure as identified in Listing Notices 1 and 2 of the Environmental Impact Assessment (EIA) Regulations. This Standard has been developed based on two Strategic Environmental Assessment (SEA) processes undertaken for the development of Electricity Grid Infrastructure (EGI) in South Africa. This Standard has been prepared to allow a proponent to achieve planning, routing, siting and remediation objectives that will ensure the acceptability of the impacts of the development of EGI on the environment, independently from the need for an assessment by the competent authority. This Standard and exclusions do not apply in the following instances:</p> <ul style="list-style-type: none"> * Where any part of the infrastructure occurs in an area for which the environmental sensitivity for a relevant environmental theme is identified as being very high or high by the screening tool and confirmed to be such by the EAP or the relevant specialist for the identified environmental theme; * Where the site verification for a specific theme identifies that the low or medium sensitivity rating of the screening tool is in fact high or very high; or * Where the greater part of the proposed infrastructure fall outside of any strategic transmission corridor. | <p>National</p> |
| <p>The Limpopo Environmental Management Act, 2003 (Act 7 of 2003) (LEMA)</p> | <p>The Limpopo Province is rich in natural biodiversity, with most of the flora and fauna species protected in private nature reserves and provincial parks within the province. This piece of legislation was promulgated to regulate the utilisation of wildlife as well as the protection and conservation of the environment as a whole. It makes provision for a wide variety of matters regarding the environment including: protected areas; hunting of wild and exotic animals; the establishment of Wildlife Councils; the protection and aquatic systems; the protection of indigenous plants; the application of CITES; and restrictions on development and environmental impact reports. The objectives of this Act are to 1) manage and protect the environment in the Province; 2) secure ecologically sustainable development and responsible use of natural resources in the Province; 3) contribute to the progressive realisation of the fundamental rights contained in section 24 of the Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996), and 4) give effect to international agreements effecting environmental management which are binding on the Province.</p> | <p>Provincial</p> |
| <p>Limpopo Conservation Plan, Version 2 (LCPv2)</p> | <p>Bioregional plans are one of a range of decision support tools provided for in the Biodiversity Act 1 that can be used to enable biodiversity conservation in priority areas. The purpose of a bioregional plan is to inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity (Desmet et al, 2013). The Limpopo Conservation Plan version 2 (LCPv2) supports integrated development planning and sustainable development by identifying an efficient set of Critical Biodiversity Areas (CBA) that are required to meet national and provincial biodiversity objectives and need to be maintained in the appropriate condition for their category. The LCPv2 contains a map of CBAs together with accompanying land-use guideline tables, aimed at informing strategic decision making and facilitating biodiversity conservation in priority areas outside the protected area network (Desmet et al, 2013).</p> | <p>Provincial</p> |

6. DESCRIPTION OF THE BASELINE CONDITIONS

6.1 Site Sensitivity Verification

A screening report for the Merensky-Uchoba 132kV power line second route deviation was generated on 14 March 2023. A small portion of the proposed 132kV power line deviation is delineated as having a HIGH Animal Species sensitivity, based on the possible occurrence of Lanner Falcon *Falco biarmicus*. The remaining sections of the proposed deviation have been assigned a MEDIUM Animal Species sensitivity, based on the possible occurrence Secretarybird *Sagittarius serpentarius* and Tawny Eagle *Aquila rapax*. A site sensitivity verification was conducted through the use of a desktop analysis and two field surveys, the results of which determine the sensitivity to be MEDIUM within the proposed development footprint. Lanner Falcon has been recorded in the PAOI during the 15-year SABAP2 survey period, but in relatively low abundances (n=12) and Secretarybird and Tawny Eagle have not been recorded. While the aforementioned species may occasionally forage along the proposed second route deviation and within the broader POAI, it is highly unlikely that area earmarked for the 132kV power line second route deviation will support the breeding requirements of these species, owing to the significant levels of anthropogenic disturbance.

TABLE 3: Specialist Avifaunal Sensitivity disputing or confirming the assigned Screening Tool Sensitivity

| Sensitivity Theme | Screening Tool Site Sensitivity | Specialist Site Sensitivity | Reasons why the Screening Tool Sensitivity is disputed or confirmed |
|-------------------|--|-----------------------------|--|
| Animal Species | HIGH Lanner Falcon <i>Falco biarmicus</i> | MEDIUM | Lanner Falcon has been recorded in the PAOI in relatively low abundances according to SABAP2 data. The species may occasionally forage along the proposed second route deviation and within the broader POAI, but is highly unlikely that area earmarked for the 132kV power line second route deviation will support the breeding requirements of this species, owing to the significant levels of anthropogenic disturbance. |
| Animal Species | MEDIUM Secretarybird <i>Sagittarius serpentarius</i> Tawny Eagle <i>Aquila rapax</i> | MEDIUM | Secretarybird and Tawny Eagle have not been recorded in the PAOI according to SABAP2 data. These species may occasionally forage along the proposed second route deviation and within the broader POAI, but is highly unlikely that area earmarked for the 132kV power line second route deviation will support the breeding requirements of these species, owing to the significant levels of anthropogenic disturbance. |

6.2 Relevant Bird Populations

6.2.1 South African Bird Atlas Project 2 Data (SABAP2)

A total of 241 bird species have been recorded across the four pentads, within which the proposed power line second route deviation is located, during the SABAP2 atlassing period to date (APPENDIX 1). The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur at the along the proposed power line second route deviation. Of the 241 species, four are

regional Red List species (i.e. SCC) (Taylor et al, 2015). Relevant to this development, 44 species are classified as priority species (see definition in section 4). Of the power line sensitive species, 12 are likely to occur regularly along the proposed 132kV power line second route deviation alignment. APPENDIX 1 provides a comprehensive list of all the species. It is important to note that the SCC have been recorded in very low numbers with between one and 12 individual birds of each species being recorded over the 15-year survey period. This is an accurate reflection of the diversity and abundance of SCC that are likely to be found within the area surrounding the proposed Merensky-Uchoba 132kV power line second route deviation given the habitat present and the existing disturbance along the proposed alignment and the broader PAOI. No SCC were observed during the field surveys. Although this report focuses on SCC, since the impacts associated with the construction and operation of the Merensky-Uchoba 132kV power line within the proposed second route deviation are likely to be more biologically significant for these species, the impact on non-SCC power line sensitive species is also assessed. Furthermore, SCC can often be used as surrogate species for the others in terms of impacts and the necessary mitigation. Each priority species' potential for occurring in a specific habitat class is indicated in TABLE 4, in addition to the type of impact that could potentially affect each species, specific to the location of this project.

TABLE 4: Annotated list of regional SCC that have been recorded in the relevant SABAP2 pentads (with a medium to high likelihood of occurrence) surrounding the proposed Merensky-Uchoba 132kV power line second route deviation PAOI

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Power Line Priority | Recorded during surveys | Likelihood of regular occurrence in PAOI | Woodland | Rivers & Drainage Lines | Mountains | Open (Cleared Areas) | Industrial Areas | Existing Power Lines | Power Line - Electrocutation | Power Line - Collision | Displacement: Habitat Transformation | Displacement: Disturbance |
|----------------------------|-------------------------------|---------------|-----------------|-------------------|---------------------|---------------------|-------------------------|--|----------|-------------------------|-----------|----------------------|------------------|----------------------|------------------------------|------------------------|--------------------------------------|---------------------------|
| African Black Duck | <i>Anas sparsa</i> | 10.5 | 0.0 | - | - | x | | M | | x | | | | | | x | | |
| African Darter | <i>Anhinga rufa</i> | 10.5 | 0.0 | - | - | x | | M | | x | | | | | | x | | |
| African Fish Eagle | <i>Haliaeetus vocifer</i> | 23.7 | 8.3 | - | - | x | | M | | x | | | | | | | | |
| Black-chested Snake Eagle | <i>Circaetus pectoralis</i> | 18.4 | 0.0 | - | - | x | | M | x | | | x | | x | | | x | |
| Black-headed Heron | <i>Ardea melanocephala</i> | 13.2 | 8.3 | - | - | x | | M | | | | x | | | | x | | x |
| Black-winged Kite | <i>Elanus caeruleus</i> | 15.8 | 0.0 | - | - | x | x | H | x | | | x | | | | | x | x |
| Brown Snake Eagle | <i>Circaetus cinereus</i> | 5.3 | 0.0 | - | - | x | | M | x | | | x | | x | | | x | x |
| Cape Vulture | <i>Gyps coprotheres</i> | 2.6 | 0.0 | EN | EN | x | | M | | | x | | | x | x | x | | |
| Common Buzzard | <i>Buteo buteo</i> | 7.9 | 0.0 | - | - | x | | H | x | | | | | | | | x | |
| Egyptian Goose | <i>Alopochen aegyptiaca</i> | 50.0 | 8.3 | - | - | x | | H | | x | | | | | | | x | x |
| Hadada Ibis | <i>Bostrychia hagedash</i> | 52.6 | 8.3 | - | - | x | x | H | x | | | | x | x | | x | x | x |
| Hamerkop | <i>Scopus umbretta</i> | 26.3 | 0.0 | - | - | x | | H | | x | | | | | | x | | |
| Helmeted Guineafowl | <i>Numida meleagris</i> | 47.4 | 0.0 | - | - | x | x | H | x | | | x | | x | | x | x | x |
| Lanner Falcon | <i>Falco biarmicus</i> | 31.6 | 16.7 | - | VU | x | | H | x | | x | | x | x | | | | x |
| Little Grebe | <i>Tachybaptus ruficollis</i> | 7.9 | 0.0 | - | - | x | | M | | x | | | | | | x | | |
| Little Sparrowhawk | <i>Accipiter minullus</i> | 18.4 | 0.0 | - | - | x | | M | x | | | | | | | | x | x |
| Long-crested Eagle | <i>Lophaetus occipitalis</i> | 2.6 | 0.0 | - | - | x | | H | x | | | | | | | | x | x |
| Pied Crow | <i>Corvus albus</i> | 81.6 | 50.0 | - | - | x | x | H | x | | | x | x | x | | | x | x |
| Reed Cormorant | <i>Microcarbo africanus</i> | 13.2 | 0.0 | - | - | x | | M | | x | | | | | | x | | |
| Rock Kestrel | <i>Falco rupicolus</i> | 13.2 | 8.3 | - | - | x | | M | | | | | | | | | | |
| Spotted Eagle-Owl | <i>Bubo africanus</i> | 2.6 | 0.0 | - | - | x | | H | x | | | | | | | x | x | x |
| Wahlberg's Eagle | <i>Hieraaetus wahlbergi</i> | 15.8 | 0.0 | - | - | x | | M | x | | | | | | | | x | x |
| Western Cattle Egret | <i>Bubulcus ibis</i> | 47.4 | 16.7 | - | - | x | x | H | x | | | | | | | x | x | x |
| White-breasted Cormorant | <i>Phalacrocorax lucidus</i> | 21.1 | 8.3 | - | - | x | | M | | x | | | | | | x | | |
| White-faced Whistling Duck | <i>Dendrocygna viduata</i> | 5.3 | 0.0 | - | - | x | | M | | x | | | | | | x | | |
| Yellow-billed Kite | <i>Milvus aegyptius</i> | 15.8 | 0.0 | - | - | x | x | H | x | | | x | | | | | x | x |

6.2.2. *Vulture Colonies, Nest Locations, Movement & Restaurant Data*

Despite being a remarkable part of South Africa's rich and celebrated diversity, vultures are one of a handful of species that are largely ignored and have been saddled with the rather poor reputation of being creatures of the afterlife (Wolter et al, 2013). Their contribution to the environment is enormous - they reduce the spread of diseases such as anthrax and keep rabies in check by minimising contact of the virus with mammalian predators (Sharp, 2001; Mudur, 2001; Hugh-Jones and de Vos, 2002) as well as reduce blow-fly populations. Six of South Africa's vultures are threatened, so their conservation through a variety of mechanisms is an absolute must. The PAOI has undergone fairly significant land use changes in recent years, with the establishment of dense human settlement resulting in a loss of habitat, and a reduction in ungulate populations, key threats to this family of birds.

Vultures are a far-ranging species and forage extensively across the broader PAOI, as carcasses become available (Wolter et al 2010). Cape Vulture are capable of traversing large distances - individuals captured in the Eastern Cape, covered an area of approximately 366 km² (Pfeiffer et al. 2015) while those captured in the North West Province and Namibia foraged over much larger areas, approximately 90 845 km² and 21 320 km² respectively (Bamford et al. 2007, Phipps et al. 2013b). As a communal cliff-nesting raptor, Cape Vultures form large breeding colonies on suitable rock formations (Benson 2015) and also congregate at overnight roosts (cliffs, on power line poles/towers, or in trees) to sleep (Mundy et al. 1992, Dermody et al. 2011, Pfeiffer et al. 2015). As adult breeding Cape Vulture usually forage within a certain area around a central colony (Boshoff & Minnie 2011), the risk of impact is likely to be greatest closest to these sites. Cape Vulture can be expected to regularly use the air-space within 50km around their roosts and breeding locations, based on fixed kernel density estimates (Venter et al, 2018). Research suggests that Cape Vulture movement patterns and core foraging ranges are closely associated with the spatial distribution of power lines (Phipps *et al.* 2013). The vultures' ability to traverse vast distances and the high proportion of time they spend foraging outside protected areas and particularly in the vicinity of power lines makes them especially vulnerable to negative interactions (both collision and electrocution) with the expanding power line network across the region. Continued, unmitigated mortality of adult breeding birds on the power line infrastructure will undoubtedly affect breeding success at breeding locations. The closest Cape Vulture colony is located over 60km north east of the PAOI.

To promote the survival of these high-flying scavengers, the practice of supplemental feeding of vultures in so called vulture restaurants, was initiated and today there are 236 documented vulture restaurants scattered throughout South Africa (Wolter et al, 2013). In this system of supplementary feeding, carcasses donated by stock farmers and hunters in the surrounding area are routinely placed out at selected sites, assisting in the continued survival of vultures. The closest vulture restaurant to the proposed second route deviation is located 30km away.

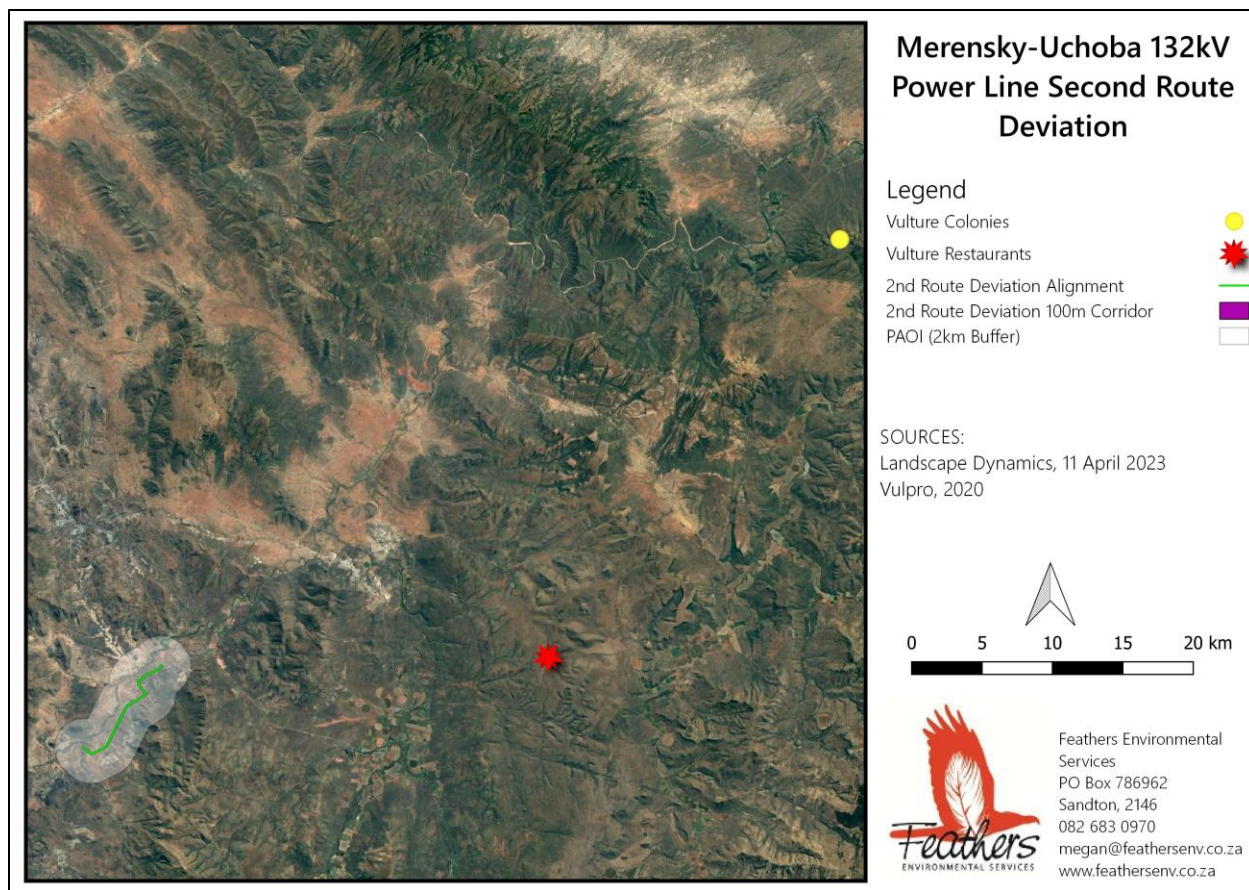


FIGURE 4: Cape Vulture Colonies and active Vulture Restaurants in relation to the Merensky-Uchoba 132kV Power Line Second Route Deviation

6.2.3. Primary Data Collection



Two site surveys were conducted within the PAOI on 16 September 2022 and 20 January 2023 respectively. In order to describe the avifaunal community present, a concerted effort was made to sample the avifauna in all of the primary habitats that were available within the PAOI associated with the deviation. All species encountered (observed and heard) during the site surveys were noted and are indicated (highlighted in grey) in APPENDIX 1.

The site visits produced a combined list of 68 species. The majority of observations were of passerine species that are common to this area. Each of these species has the potential to be displaced by the construction of 132kV power line within the proposed second route deviation as a result of habitat transformation and/or disturbance. However, these species have persisted despite existing disturbance (i.e. industrial, small and large scale business and urban and peri-urban activities) within the PAOI. This resilience, coupled with the fact that more suitable habitat is available within the broader area, means that the displacement impact will not be of regional or national significance.

6.3 Avifaunal Habitats

Vegetation is one of the primary factors determining bird species distribution and abundance in an area. It is widely accepted within ornithological circles that vegetation structure is more important in determining which bird species will occur there. Whilst much of the distribution and abundance of bird species can be attributed to the broad vegetation types present in an area, it is the smaller micro habitats that are determined by factors other than vegetation, such as topography, land use, food availability, and various anthropogenic factors all of which will either attract or deter birds. Micro habitats are critically important in mapping the site in terms of avifaunal sensitivity and ultimately informing mitigation requirements. Assessment of the Merensky-Uchoba 132kV power line deviation PAOI revealed the following broadly described avifaunal micro habitats (TABLE 5):

TABLE 5: Avifaunal microhabitats identified within the Merensky-Uchoba 132kV power line deviation PAOI

| Micro Habitat | Description | Example within the PAOI |
|---------------|--|--|
| Woodland | <p>The study area is situated in the woodland (savanna) biome (Mucina & Rutherford 2006, Harrison <i>et al</i> 1997). The natural vegetation type in the study area is classified as Sekhukhune Plains Bushveld. This vegetation type is characterised by short, open to closed thornveld with an abundance of Aloe species and other succulents. Relevant to the PAOI, the woodland varies from almost pristine in places, particularly on rocky outcrops, to heavily disturbed, due to significant industrial development, urban and peri-urban activities and pastoral pressure.</p> |  |
| Rivers | <p>The Steelpoort River is a feature of the broader PAOI. Thirteen species of waterbird are mostly restricted to riverine habitat in southern Africa. The map distribution of these species correlates with the river courses in southern Africa. Rivers are extremely important sources of water for most bird species and will be regularly utilised not only as a source of drinking water and food, but also for bathing.</p> <p>Although the proposed deviation does not contain any major rivers, it does contain several ephemeral drainage lines that act as corridors of microhabitat for waterbirds, with riparian vegetation providing cover for skulking species, as well as the thick riverine woodland with large shady riparian trees (in some areas), potentially offering important breeding substrate for a variety of birds, including raptors.</p> |  |




| | | |
|--|---|---|
| Mountains | Mountains were observed within the broader PAOI, to the west and east of the proposed deviation and are potentially suitable roosting and/or breeding habitat for Verreaux's Eagle and Lanner Falcon. |  |
| Open Grassland | Open grassland vegetation (possibly old agricultural lands) occur within parts of the proposed. These are not extensive and are unlikely to attract large terrestrial species in terms of breeding, but could still be potential areas within which gamebirds and the smaller raptors will forage. |  |
| Built-Up Areas (Industrial, Urban & Peri-Urban) | The PAOI is densely populated, with high impact industry, small and large-scale businesses, residential areas and volumes of pedestrian and vehicle traffic. These environments do not attract power line sensitive SCC, with the possible exception of Lanner Falcons which hunt feral pigeons and (possibly) free-ranging poultry in peri-urban spaces. The disturbance impact associated with these environments spills over into the adjacent habitat types through the constant movement of pedestrians, cattle and dogs into those areas. This has implications for the avifauna, particularly the larger species, in that it can permanently displace species from the area. |  |

TABLE 4 details the micro habitats that each of the power line sensitive bird species (recorded by SABAP2) will typically frequent in the PAOI. It must be stressed that birds can and will, by virtue of their mobility, utilise almost any areas in a landscape from time to time. However, the analysis in TABLE 4 represents each species' most preferred habitats. These locations are where most of the birds of that species will spend most of their time which in turn provides an indication of where impacts on those species will be most significant.

7. IDENTIFICATION OF IMPACTS

Poorly sited or designed facilities and infrastructure can negatively impact not only vulnerable species and habitats, but also entire ecological processes. The effects of any development on birds are highly variable and depend on a wide range of factors including the specification of the development, the topography of the surrounding land, the habitats affected and the number and diversity of species present. The principal areas of concern for SCC and non-SCC power line priority species are detailed below.

7.1 Construction Phase

7.1.1. *Displacement as a result of habitat loss or transformation*

Relevant to this assessment, the risk of displacement of SCC species due to habitat transformation is likely to be fairly limited given the low reporting rate for SCC species in the study area. The biggest potential impact would be the removal of large trees that could potentially serve as nesting substrate for large SCC raptors such as Tawny Eagle and many other non-SCC power line priority avifauna. In the case of the 132kV power line, the direct habitat transformation will be limited to the tower footprints and the narrow access road/track under the power line. If the removal of large trees can be avoided the displacement impact as a result of habitat transformation will not be of regional or national significance.

7.1.2. *Displacement as a result of disturbance*

Excavation and construction activities are a source of significant disturbance. For most bird species, construction activities are likely to be a cause of temporary disturbance impacting on foraging, and roosting behaviours but in more extreme cases, construction may impact on the breeding success of certain species particularly if the disturbance happens during a critical part of the breeding cycle, resulting in temporary breeding failure or permanent nest abandonment. The development area is already subjected to a significant degree of disturbance in the form of industrial, small and large scale business and urban and peri-urban activities. Construction activities within the second route deviation are likely to result in the temporary displacement as many of these species have persisted despite existing disturbance within the PAOI. This resilience, coupled with the fact that similar habitat is available throughout the broader area, means that the displacement impact will not be of regional or national significance.

7.1.3. *Direct mortality as a result of construction activities*

Bird mortality as a result of construction activities is improbable because birds are incredibly mobile and able to move out of harm's way. If mortality does occur, it is likely to be confined to a localised area and restricted to immobile species e.g. nestlings. No terrestrial bird species (ground) nest locations were observed during the site surveys.

7.2 Operational Phase

7.2.1. *Mortality due to collisions with the 132kV power line conductors/earthwires*

Collisions are the biggest single threat posed by power lines to birds in southern Africa (van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because a number of variables play a role in determining the risk, for example weather, rainfall, wind, age, flocking behaviour, power line height, light conditions, topography, population density and so forth. However, from incidental record keeping by the Endangered Wildlife Trust: Wildlife & Energy Programme it is possible to give a measure of what species are likely to be impacted upon (see FIGURE 5 below - Jenkins et al. 2010).

Relevant to the proposed 132kV power line deviation, the risk of collisions is likely to be few and far between, as there are no specific areas where one would expect a concentration of birds in woodland habitat. Vultures would be most at risk of collision if they descend to a carcass near the line. The biggest potential collision risk in the study area is associated with ephemeral drainage lines, where it is expected that waterbirds could commute up and down the when they are flowing or when they contain large pools of standing water.

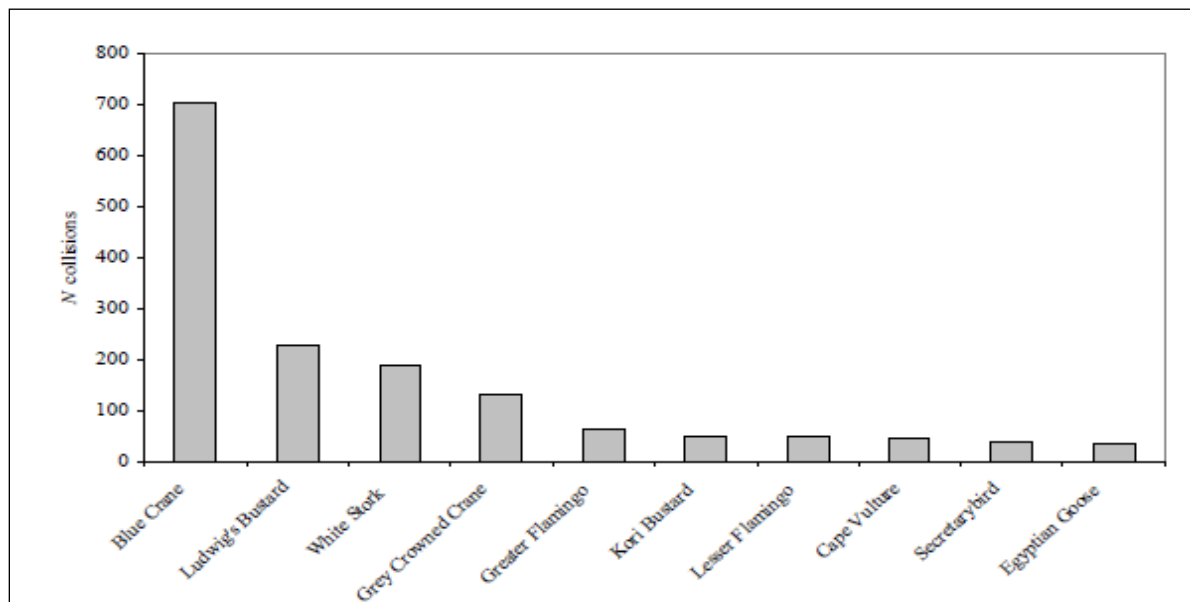


FIGURE 5 :The top ten collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom/EWT Strategic Partnership central incident register 1996 - 2007 (Jenkins et al. 2010)

7.2.2. Mortality due to electrocutions on the 132kV power line infrastructure

Electrocution risk is strongly influenced by the power line voltage and design of the tower/pole structure and mainly affects larger, perching species that are capable of spanning the spaces between energized components (van Rooyen 2004). This is particularly likely when more than one bird attempts to sit on the same pole, a behaviour that is typical of gregarious vulture species when perching or roosting. The only envisaged high risk scenario would be when a carcass becomes available within a few hundred metres of the line, attracting vultures which may cluster on a few poles. The best possible mitigation is the construction of the power line using an Eskom approved bird friendly pole/tower design (DT 7641/7649) accordance with the Distribution Technical Bulletin relating to bird friendly structures (APPENDIX 2). Additional mitigation in the form of insulating sleeves on *jumpers* present on strain poles and terminal poles is also recommended, alternatively all jumpers must be suspended below the crossarms.

7.3 Decommissioning & Closure Phases

7.3.1 Displacement as a result of disturbance

The PAOI is already subjected to a degree of disturbance associated with industrial, small and large scale business and urban and peri-urban activities. While the decommissioning of the Merensky-Uchoba 132kV power within the second route deviation will undoubtedly displace some species, the bird species likely to occupy this area, and the fact that similar habitat is available within the broader PAOI, displacement as a result of disturbance is unlikely to be permanent and of national significance.

8. ENVIRONMENTAL IMPACT STATEMENT

8.1 Conditions to be included in the Environmental Authorisation

In conclusion, the habitat within which the PAOI is located is considered to have a MEDIUM to LOW sensitivity. In recent years, anthropogenic impacts, mostly in the form of industrial, small and large scale business and urban and peri-urban activities that have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the Merensky-Uchoba 132kV power line along the proposed deviation will result in impacts of LOW significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through the application of mitigation measures. It is anticipated that the Merensky-Uchoba 132kV power line can be constructed within the second route deviation with acceptable levels of impact on the resident avifauna, subject to the following recommendations:

- * The 132kV power line must be constructed using a bird friendly structure (i.e. DT 7641/7649) (APPENDIX 2).
- * Additional mitigation in the form of insulating sleeves on *jumpers* present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.
- * Bird flight diverters to be installed on earthwires of spans crossing the Steelpoort River, ephemeral drainage lines and old agricultural land (grassland habitat) (FIGURE 6).
- * The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint (especially the removal of natural vegetation) and rehabilitation of disturbed areas is concerned.
- * Construction activities (i.e. all staff, vehicle and machinery) should be restricted to the immediate footprint of the infrastructure.
- * Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species.
- * Maximum use should be made of existing roads and the construction of new roads must be kept to a minimum.
- * If collision or electrocution impacts are recorded once the Merensky-Uchoba 132kV power line is operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic

Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.

- * In addition to this, the normal suite of environmental good practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible.

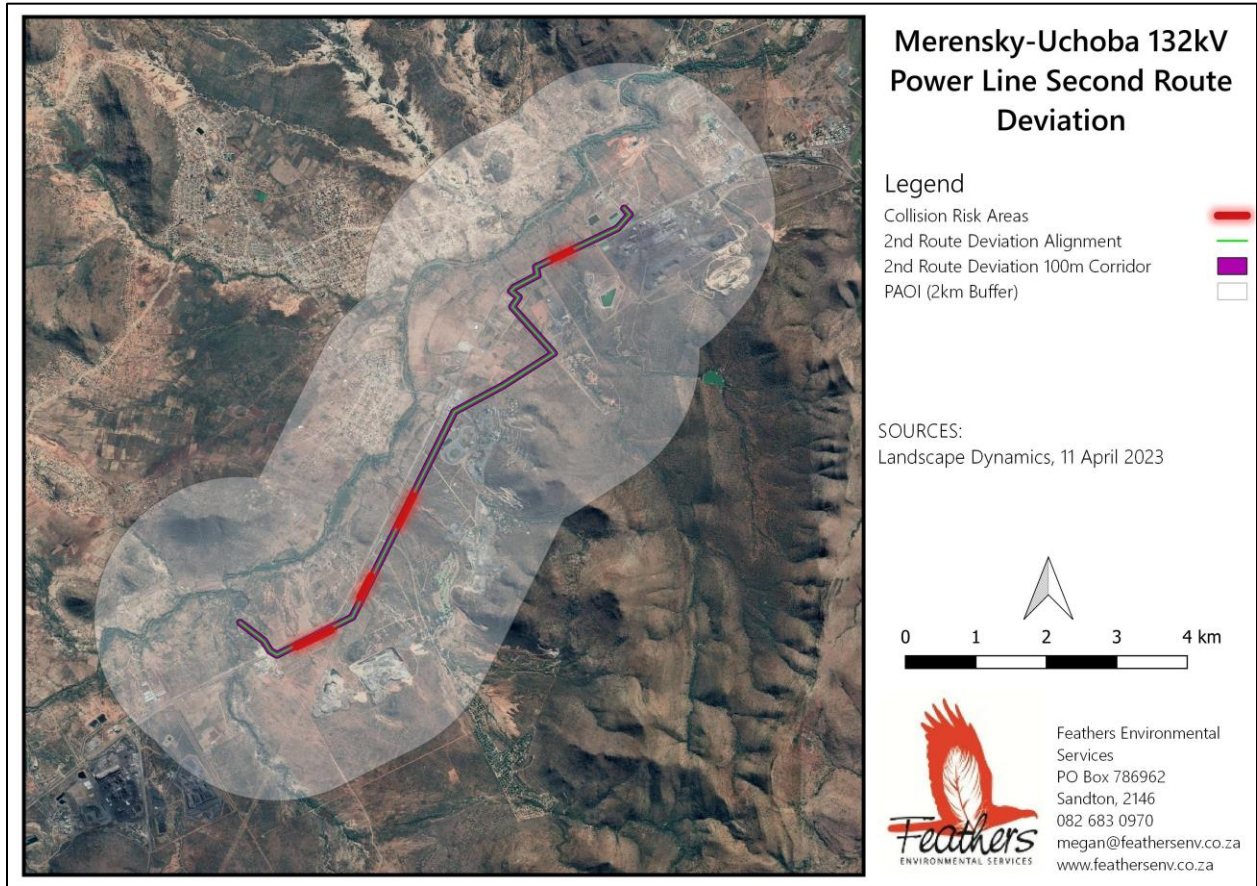


FIGURE 6 : Collision risk areas – ephemeral drainage lines and open grassland habitat. These areas will require collision mitigation in the form of bird flight diverters

8.2 Specialist Opinion

In accordance with the baseline conditions as presented in Section 7 and the outcomes of the impact assessment detailed in Section 8, the construction and operation of the proposed Merensky-Uchoba 132kV steel monopole power line second route deviation and its associated 6m road servitude (for construction and maintenance) are not deemed to present unmitigable negative environmental issues or impacts. It is this specialist's opinion that the construction of the 132kV power line and road servitude within the 100m second route deviation corridor will result in acceptable levels of impact on the resident avifauna subject to the aforementioned mitigation and management measures.

9. ASSUMPTIONS, UNCERTAINTIES & GAPS IN KNOWLEDGE

The avifaunal specialist assumed that the sources of information used for this assessment are reliable. However, it must be noted that there are limiting factors and these may potentially detract from the accuracy of the predicted results.

- * The report is the result of a short-term study and is based on two, one-day, field surveys of the PAOI. No long-term, seasonal monitoring was conducted by the avifaunal specialist. This assessment relies upon secondary data sources with regards to bird occurrence and abundance such as the SABAP2 project. These comprehensive datasets provide a valuable baseline against which any changes in species presence, abundance, and distribution can be monitored. However, primary information on bird habitat and avifaunal species occurrence collected during the site visits and together with professional judgement, based on extensive field experience since 2006, was used directly in determining which species of conservation importance are likely to occur within suitable avifaunal habitat types within the PAOI. Based on these findings, the specialist was able to identify and assess the anticipated impacts and provide recommendations for mitigation; and
- * Predictions in this study are based on experience of these and similar species in different parts of South Africa, through the authors' experience working in the avifaunal specialist field since 2006. However, bird behaviour can't be reduced to formulas that will hold true under all circumstances. It must also be noted that, it is often not possible to entirely eliminate the risk of the disturbance and displacement impacts associated with the construction and operational activities. Our best possible efforts can probably not ensure zero impact on birds. Assessments such as this attempt to minimise the risk as far as possible, and although the displacement impacts, associated with the construction and operation of the 132kV power line second route deviation, will be unavoidable, they are likely to be temporary and of moderate to low significance.

The above limitations need to be stated as part of this assessment so that the reader fully understands the complexities. However, they do not detract from the confidence that this author has in the findings of this impact assessment report and subsequent recommendations for this project.

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APPENDIX 1: SOUTH AFRICAN BIRD ATLAS PROJECT DATA (SABAP2) FOR THE MERENSKY-UCHOBA 132KV POWER LINE SECOND ROUTE DEVIATION PAOI

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Endemic (SA) | Endemic (SA) - detail |
|-----------------------------|-------------------------|---------------|-----------------|-------------------|---------------------|--------------|-----------------------|
| Acacia Pied Barbet | Tricholaema leucomelas | 65.8 | 16.7 | - | - | | |
| African Barred Owlet | Glaucidium capense | 2.6 | 0.0 | - | - | | |
| African Black Duck | Anas sparsa | 10.5 | 0.0 | - | - | | |
| African Black Swift | Apus barbatus | 7.9 | 0.0 | - | - | | |
| African Darter | Anhinga rufa | 10.5 | 0.0 | - | - | | |
| African Firefinch | Lagonosticta rubricata | 10.5 | 0.0 | - | - | | |
| African Fish Eagle | Haliaeetus vocifer | 23.7 | 8.3 | - | - | | |
| African Goshawk | Accipiter tachiro | 7.9 | 0.0 | - | - | | |
| African Grey Hornbill | Lophoceros nasutus | 18.4 | 0.0 | - | - | | |
| African Hoopoe | Upupa africana | 28.9 | 0.0 | - | - | | |
| African Palm Swift | Cypsiurus parvus | 50.0 | 0.0 | - | - | | |
| African Paradise Flycatcher | Terpsiphone viridis | 10.5 | 0.0 | - | - | | |
| African Pied Wagtail | Motacilla aguimp | 18.4 | 0.0 | - | - | | |
| African Pipit | Anthus cinnamomeus | 13.2 | 0.0 | - | - | | |
| African Stonechat | Saxicola torquatus | 2.6 | 0.0 | - | - | | |
| African Wattled Lapwing | Vanellus senegallus | 7.9 | 0.0 | - | - | | |
| Alpine Swift | Tachymarptis melba | 10.5 | 0.0 | - | - | | |
| Amethyst Sunbird | Chalcomitra amethystina | 44.7 | 16.7 | - | - | | |
| Amur Falcon | Falco amurensis | 2.6 | 0.0 | - | - | | |
| Arrow-marked Babbler | Turdoides jardineii | 28.9 | 0.0 | - | - | | |
| Ashy Flycatcher | Muscicapa caerulescens | 7.9 | 0.0 | - | - | | |
| Barn Swallow | Hirundo rustica | 34.2 | 8.3 | - | - | | |
| Bar-throated Apalis | Apalis thoracica | 7.9 | 0.0 | - | - | | |
| Bearded Woodpecker | Chloropicus namaquus | 5.3 | 0.0 | - | - | | |
| Black Crane | Zapornia flavirostra | 5.3 | 0.0 | - | - | | |
| Black Cuckoo | Cuculus clamosus | 5.3 | 0.0 | - | - | | |
| Black Cuckooshrike | Campephaga flava | 2.6 | 0.0 | - | - | | |
| Black-backed Puffback | Dryoscopus cubla | 55.3 | 8.3 | - | - | | |
| Black-chested Prinia | Prinia flavicans | 55.3 | 8.3 | - | - | | |
| Black-chested Snake Eagle | Circaetus pectoralis | 18.4 | 0.0 | - | - | | |
| Black-collared Barbet | Lybius torquatus | 50.0 | 0.0 | - | - | | |
| Black-crowned Night Heron | Nycticorax nycticorax | 2.6 | 0.0 | - | - | | |
| Black-crowned Tchagra | Tchagra senegalus | 10.5 | 0.0 | - | - | | |
| Black-faced Waxbill | Brunhilda erythronotos | 39.5 | 0.0 | - | - | | |
| Black-headed Heron | Ardea melanocephala | 13.2 | 8.3 | - | - | | |
| Black-headed Oriole | Oriolus larvatus | 31.6 | 8.3 | - | - | | |
| Blacksmith Lapwing | Vanellus armatus | 31.6 | 8.3 | - | - | | |
| Black-throated Canary | Crithagra atrogularis | 13.2 | 0.0 | - | - | | |
| Black-winged Kite | Elanus caeruleus | 15.8 | 0.0 | - | - | | |
| Blue Waxbill | Uraeginthus angolensis | 81.6 | 50.0 | - | - | | |
| Brimstone Canary | Crithagra sulphurata | 10.5 | 0.0 | - | - | | |
| Bronze Mannikin | Spermestes cucullata | 21.1 | 8.3 | - | - | | |
| Brown Snake Eagle | Circaetus cinereus | 5.3 | 0.0 | - | - | | |
| Brown-backed Honeybird | Prodotiscus regulus | 2.6 | 0.0 | - | - | | |
| Brown-crowned Tchagra | Tchagra australis | 57.9 | 25.0 | - | - | | |

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Endemic (SA) | Endemic (SA) - detail |
|------------------------------|--------------------------|---------------|-----------------|-------------------|---------------------|--------------|-----------------------|
| Brown-hooded Kingfisher | Halcyon albiventris | 55.3 | 8.3 | - | - | | |
| Brown-throated Martin | Riparia paludicola | 13.2 | 0.0 | - | - | | |
| Brubru | Nilaus afer | 26.3 | 0.0 | - | - | | |
| Burchell's Coucal | Centropus burchellii | 2.6 | 0.0 | - | - | | |
| Burnt-necked Eremomela | Eremomela usticollis | 26.3 | 0.0 | - | - | | |
| Cape Crow | Corvus capensis | 0.0 | 8.3 | - | - | | |
| Cape Penduline Tit | Anthoscopus minutus | 2.6 | 0.0 | - | - | | |
| Cape Robin-Chat | Cossypha caffra | 15.8 | 0.0 | - | - | | |
| Cape Sparrow | Passer melanurus | 34.2 | 16.7 | - | - | | |
| Cape Starling | Lamprotornis nitens | 71.1 | 25.0 | - | - | | |
| Cape Teal | Anas capensis | 2.6 | 0.0 | - | - | | |
| Cape Turtle Dove | Streptopelia capicola | 60.5 | 8.3 | - | - | | |
| Cape Vulture | Gyps coprotheres | 2.6 | 0.0 | EN | EN | | |
| Cape Wagtail | Motacilla capensis | 31.6 | 8.3 | - | - | | |
| Cape Weaver | Ploceus capensis | 2.6 | 0.0 | - | - | x | Near endemic |
| Cape White-eye | Zosterops virens | 36.8 | 8.3 | - | - | x | Near endemic |
| Cardinal Woodpecker | Dendropicops fuscescens | 44.7 | 0.0 | - | - | | |
| Chestnut-backed Sparrow-Lark | Eremopterix leucotis | 7.9 | 0.0 | - | - | | |
| Chestnut-vented Warbler | Curruca subcoerulea | 44.7 | 0.0 | - | - | | |
| Chinspot Batis | Batis molitor | 68.4 | 0.0 | - | - | | |
| Cinnamon-breasted Bunting | Emberiza tahapisi | 18.4 | 0.0 | - | - | | |
| Collared Sunbird | Hedypipna collaris | 2.6 | 0.0 | - | - | | |
| Common Buttonquail | Turnix sylvaticus | 5.3 | 0.0 | - | - | | |
| Common Buzzard | Buteo buteo | 7.9 | 0.0 | - | - | | |
| Common House Martin | Delichon urbicum | 5.3 | 0.0 | - | - | | |
| Common Myna | Acridotheres tristis | 68.4 | 25.0 | - | - | | |
| Common Sandpiper | Actitis hypoleucos | 2.6 | 0.0 | - | - | | |
| Common Scimitarbill | Rhinopomastus cyanomelas | 13.2 | 0.0 | - | - | | |
| Common Waxbill | Estrilda astrild | 26.3 | 0.0 | - | - | | |
| Common Whitethroat | Curruca communis | 2.6 | 0.0 | - | - | | |
| Crested Barbet | Trachyphonus vaillantii | 36.8 | 0.0 | - | - | | |
| Crested Francolin | Dendroperdix sephaena | 44.7 | 8.3 | - | - | | |
| Crimson-breasted Shrike | Laniarius atrococcineus | 34.2 | 16.7 | - | - | | |
| Crowned Lapwing | Vanellus coronatus | 15.8 | 0.0 | - | - | | |
| Cut-throat Finch | Amadina fasciata | 10.5 | 0.0 | - | - | | |
| Dark-capped Bulbul | Pycnonotus tricolor | 89.5 | 25.0 | - | - | | |
| Desert Cisticola | Cisticola aridulus | 7.9 | 0.0 | - | - | | |
| Diederik Cuckoo | Chrysococcyx caprius | 21.1 | 0.0 | - | - | | |
| Double-banded Sandgrouse | Pterocles bicinctus | 7.9 | 0.0 | - | - | | |
| Dusky Lark | Pinarocorys nigricans | 2.6 | 0.0 | - | - | | |
| Egyptian Goose | Alopochen aegyptiaca | 50.0 | 8.3 | - | - | | |
| Emerald-spotted Wood Dove | Turtur chalcospilos | 57.9 | 0.0 | - | - | | |
| European Bee-eater | Merops apiaster | 23.7 | 0.0 | - | - | | |
| Familiar Chat | Oenanthe familiaris | 21.1 | 8.3 | - | - | | |
| Fiery-necked Nightjar | Caprimulgus pectoralis | 13.2 | 0.0 | - | - | | |
| Fiscal Flycatcher | Melaenornis silens | 7.9 | 0.0 | - | - | x | Near endemic |
| Fork-tailed Drongo | Dicrurus adsimilis | 73.7 | 0.0 | - | - | | |

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Endemic (SA) | Endemic (SA) - detail |
|-----------------------------|-----------------------------|---------------|-----------------|-------------------|---------------------|--------------|-----------------------|
| Giant Kingfisher | Megaceryle maxima | 10.5 | 8.3 | - | - | | |
| Glossy Ibis | Plegadis falcinellus | 2.6 | 0.0 | - | - | | |
| Golden-breasted Bunting | Emberiza flaviventris | 52.6 | 0.0 | - | - | | |
| Golden-tailed Woodpecker | Campethera abingoni | 23.7 | 0.0 | - | - | | |
| Great Sparrow | Passer motitensis | 2.6 | 0.0 | - | - | | |
| Greater Honeyguide | Indicator indicator | 21.1 | 0.0 | - | - | | |
| Greater Striped Swallow | Cecropis cucullata | 42.1 | 8.3 | - | - | | |
| Green Wood Hoopoe | Phoeniculus purpureus | 7.9 | 0.0 | - | - | | |
| Green-backed Camaroptera | Camaroptera brachyura | 26.3 | 0.0 | - | - | | |
| Green-winged Pytilia | Pytilia melba | 34.2 | 8.3 | - | - | | |
| Grey Go-away-bird | Crinifer concolor | 68.4 | 8.3 | - | - | | |
| Grey Heron | Ardea cinerea | 5.3 | 0.0 | - | - | | |
| Grey Tit-Flycatcher | Myioparus plumbeus | 10.5 | 0.0 | - | - | | |
| Grey-backed Camaroptera | Camaroptera brevicaudata | 7.9 | 8.3 | - | - | | |
| Grey-headed Bushshrike | Malaconotus blanchoti | 21.1 | 0.0 | - | - | | |
| Groundscraper Thrush | Turdus litsitsirupa | 18.4 | 8.3 | - | - | | |
| Hadada Ibis | Bostrychia hagedash | 52.6 | 8.3 | - | - | | |
| Hamerkop | Scopus umbretta | 26.3 | 0.0 | - | - | | |
| Helmeted Guineafowl | Numida meleagris | 47.4 | 0.0 | - | - | | |
| Horus Swift | Apus horus | 2.6 | 0.0 | - | - | | |
| House Sparrow | Passer domesticus | 42.1 | 25.0 | - | - | | |
| Jacobin Cuckoo | Clamator jacobinus | 13.2 | 0.0 | - | - | | |
| Jameson's Firefinch | Lagonosticta rhodopareia | 44.7 | 25.0 | - | - | | |
| Kalahari Scrub Robin | Cercotrichas paena | 21.1 | 0.0 | - | - | | |
| Klaas's Cuckoo | Chrysococcyx klaas | 15.8 | 0.0 | - | - | | |
| Kurrichane Thrush | Turdus libonyana | 21.1 | 0.0 | - | - | | |
| Lanner Falcon | Falco biarmicus | 31.6 | 16.7 | - | VU | | |
| Lark-like Bunting | Emberiza impetuani | 2.6 | 0.0 | - | - | | |
| Laughing Dove | Spilopelia senegalensis | 89.5 | 50.0 | - | - | | |
| Lazy Cisticola | Cisticola aberrans | 10.5 | 0.0 | - | - | | |
| Lesser Grey Shrike | Lanius minor | 2.6 | 0.0 | - | - | | |
| Lesser Honeyguide | Indicator minor | 2.6 | 0.0 | - | - | | |
| Lesser Masked-weaver | Ploceus intermedius | 18.4 | 0.0 | - | - | | |
| Lesser Striped Swallow | Cecropis abyssinica | 60.5 | 0.0 | - | - | | |
| Lesser Swamp Warbler | Acrocephalus gracilirostris | 2.6 | 0.0 | - | - | | |
| Levaillant's Cuckoo | Clamator levaillantii | 2.6 | 0.0 | - | - | | |
| Little Bee-eater | Merops pusillus | 31.6 | 0.0 | - | - | | |
| Little Grebe | Tachybaptus ruficollis | 7.9 | 0.0 | - | - | | |
| Little Sparrowhawk | Accipiter minullus | 18.4 | 0.0 | - | - | | |
| Little Swift | Apus affinis | 47.4 | 16.7 | - | - | | |
| Long-billed Crombec | Sylvietta rufescens | 71.1 | 8.3 | - | - | | |
| Long-crested Eagle | Lophaetus occipitalis | 2.6 | 0.0 | - | - | | |
| Long-tailed Paradise Whydah | Vidua paradisaea | 15.8 | 0.0 | - | - | | |
| Malachite Kingfisher | Corythornis cristatus | 2.6 | 0.0 | - | - | | |
| Marico Flycatcher | Melaenornis mariquensis | 44.7 | 0.0 | - | - | | |
| Marico Sunbird | Cinnyris mariquensis | 15.8 | 8.3 | - | - | | |
| Marsh Warbler | Acrocephalus palustris | 2.6 | 0.0 | - | - | | |

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Endemic (SA) | Endemic (SA) - detail |
|----------------------------|------------------------------|---------------|-----------------|-------------------|---------------------|--------------|-----------------------|
| Mountain Wagtail | Motacilla clara | 5.3 | 0.0 | - | - | | |
| Namaqua Dove | Oena capensis | 21.1 | 8.3 | - | - | | |
| Natal Spurfowl | Pternistis natalensis | 31.6 | 0.0 | - | - | | |
| Neddicky | Cisticola fulvicapilla | 52.6 | 8.3 | - | - | | |
| Orange-breasted Bushshrike | Chlorophoneus sulfureopectus | 50.0 | 8.3 | - | - | | |
| Orange-breasted Waxbill | Amandava subflava | 10.5 | 0.0 | - | - | | |
| Pale Flycatcher | Melaenornis pallidus | 2.6 | 0.0 | - | - | | |
| Pearl-breasted Swallow | Hirundo dimidiata | 10.5 | 0.0 | - | - | | |
| Pearl-spotted Owlet | Glaucidium perlatum | 2.6 | 0.0 | - | - | | |
| Peregrine Falcon | Falco peregrinus | 2.6 | 0.0 | - | - | | |
| Pied Crow | Corvus albus | 81.6 | 50.0 | - | - | | |
| Pied Kingfisher | Ceryle rudis | 5.3 | 0.0 | - | - | | |
| Pin-tailed Whydah | Vidua macroura | 21.1 | 8.3 | - | - | | |
| Purple Indigobird | Vidua purpurascens | 5.3 | 0.0 | - | - | | |
| Purple-crested Turaco | Gallirex porphyreolophus | 7.9 | 0.0 | - | - | | |
| Quailfinch | Ortygospiza atricollis | 10.5 | 0.0 | - | - | | |
| Rattling Cisticola | Cisticola chiniana | 60.5 | 16.7 | - | - | | |
| Red-backed Shrike | Lanius collurio | 13.2 | 0.0 | - | - | | |
| Red-billed Firefinch | Lagonosticta senegala | 13.2 | 0.0 | - | - | | |
| Red-billed Oxpecker | Buphagus erythrorhynchus | 36.8 | 8.3 | - | - | | |
| Red-billed Quelea | Quelea quelea | 36.8 | 0.0 | - | - | | |
| Red-billed Teal | Anas erythrorhyncha | 0.0 | 8.3 | - | - | | |
| Red-breasted Swallow | Cecropis semirufa | 7.9 | 0.0 | - | - | | |
| Red-capped Robin-Chat | Cossypha natalensis | 7.9 | 0.0 | - | - | | |
| Red-chested Cuckoo | Cuculus solitarius | 18.4 | 0.0 | - | - | | |
| Red-collared Widowbird | Euplectes ardens | 2.6 | 0.0 | - | - | | |
| Red-eyed Dove | Streptopelia semitorquata | 52.6 | 8.3 | - | - | | |
| Red-faced Cisticola | Cisticola erythroptus | 21.1 | 0.0 | - | - | | |
| Red-faced Mousebird | Urocolius indicus | 63.2 | 16.7 | - | - | | |
| Red-headed Finch | Amadina erythrocephala | 18.4 | 0.0 | - | - | | |
| Red-headed Weaver | Anaplectes rubriceps | 2.6 | 0.0 | - | - | | |
| Red-knobbed Coot | Fulica cristata | 2.6 | 0.0 | - | - | | |
| Red-winged Starling | Onychognathus morio | 50.0 | 16.7 | - | - | | |
| Reed Cormorant | Microcarbo africanus | 13.2 | 0.0 | - | - | | |
| Retz's Helmetshrike | Prionops retzii | 7.9 | 0.0 | - | - | | |
| Rock Dove | Columba livia | 10.5 | 0.0 | - | - | | |
| Rock Kestrel | Falco rupicolus | 13.2 | 8.3 | - | - | | |
| Rock Martin | Ptyonoprogne fuligula | 5.3 | 8.3 | - | - | | |
| Rufous-cheeked Nightjar | Caprimulgus rufigena | 2.6 | 0.0 | - | - | | |
| Rufous-naped Lark | Mirafraga africana | 5.3 | 0.0 | - | - | | |
| Sabota Lark | Calendulauda sabota | 39.5 | 0.0 | - | - | | |
| Scaly-feathered Weaver | Sporopipes squamifrons | 47.4 | 25.0 | - | - | | |
| Scarlet-chested Sunbird | Chalcomitra senegalensis | 5.3 | 0.0 | - | - | | |
| Shaft-tailed Whydah | Vidua regia | 5.3 | 0.0 | - | - | | |
| Sombre Greenbul | Andropadus importunus | 10.5 | 0.0 | - | - | | |
| Southern Black Flycatcher | Melaenornis pammelaina | 10.5 | 0.0 | - | - | | |
| Southern Black Tit | Melaniparus niger | 31.6 | 0.0 | - | - | | |

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Endemic (SA) | Endemic (SA) - detail |
|---------------------------------|----------------------------|---------------|-----------------|-------------------|---------------------|--------------|-----------------------|
| Southern Boubou | Laniarius ferrugineus | 65.8 | 16.7 | - | - | | |
| Southern Fiscal | Lanius collaris | 39.5 | 16.7 | - | - | | |
| Southern Grey-headed Sparrow | Passer diffusus | 63.2 | 16.7 | - | - | | |
| Southern Masked Weaver | Ploceus velatus | 86.8 | 16.7 | - | - | | |
| Southern Red Bishop | Euplectes orix | 21.1 | 8.3 | - | - | | |
| Southern Red-billed Hornbill | Tockus rufirostris | 2.6 | 0.0 | - | - | | |
| Southern Yellow-billed Hornbill | Tockus leucomelas | 57.9 | 8.3 | - | - | | |
| Speckled Mousebird | Colius striatus | 68.4 | 25.0 | - | - | | |
| Speckled Pigeon | Columba guinea | 31.6 | 8.3 | - | - | | |
| Spectacled Weaver | Ploceus ocularis | 21.1 | 0.0 | - | - | | |
| Spotted Eagle-Owl | Bubo africanus | 2.6 | 0.0 | - | - | | |
| Spotted Flycatcher | Muscicapa striata | 5.3 | 0.0 | - | - | | |
| Spotted Thick-knee | Burhinus capensis | 18.4 | 0.0 | - | - | | |
| Spur-winged Goose | Plectropterus gambensis | 2.6 | 0.0 | - | - | | |
| Streaky-headed Seedeater | Crithagra gularis | 13.2 | 8.3 | - | - | | |
| Striated Heron | Butorides striata | 7.9 | 0.0 | - | - | | |
| Striped Pipit | Anthus lineiventris | 5.3 | 0.0 | - | - | | |
| Swainson's Spurfowl | Pternistis swainsonii | 21.1 | 0.0 | - | - | | |
| Tawny-flanked Prinia | Prinia subflava | 68.4 | 25.0 | - | - | | |
| Terrestrial Brownbul | Phyllastrephus terrestris | 2.6 | 0.0 | - | - | | |
| Thick-billed Weaver | Amblyospiza albifrons | 5.3 | 0.0 | - | - | | |
| Three-banded Plover | Charadrius tricollaris | 13.2 | 0.0 | - | - | | |
| Verreaux's Eagle | Aquila verreauxii | 2.6 | 0.0 | - | VU | | |
| Village Indigobird | Vidua chalybeata | 5.3 | 8.3 | - | - | | |
| Village Weaver | Ploceus cucullatus | 36.8 | 8.3 | - | - | | |
| Violet-backed Starling | Cinnyricinclus leucogaster | 10.5 | 0.0 | - | - | | |
| Violet-eared Waxbill | Granatina granatina | 18.4 | 8.3 | - | - | | |
| Wahlberg's Eagle | Hieraetus wahlbergi | 15.8 | 0.0 | - | - | | |
| Western Barn Owl | Tyto alba | 2.6 | 0.0 | - | - | | |
| Western Cattle Egret | Bubulcus ibis | 47.4 | 16.7 | - | - | | |
| White Stork | Ciconia ciconia | 2.6 | 0.0 | - | - | | |
| White-backed Vulture | Gyps africanus | 2.6 | 0.0 | CR | CR | | |
| White-bellied Sunbird | Cinnyris talatala | 84.2 | 41.7 | - | - | | |
| White-breasted Cormorant | Phalacrocorax lucidus | 21.1 | 8.3 | - | - | | |
| White-browed Scrub Robin | Cercotrichas leucophrys | 84.2 | 25.0 | - | - | | |
| White-browed Sparrow-Weaver | Plocepasser mahali | 92.1 | 41.7 | - | - | | |
| White-crested Helmetshrike | Prionops plumatus | 7.9 | 0.0 | - | - | | |
| White-faced Whistling Duck | Dendrocygna viduata | 5.3 | 0.0 | - | - | | |
| White-fronted Bee-eater | Merops bullockoides | 28.9 | 8.3 | - | - | | |
| White-necked Raven | Corvus albicollis | 7.9 | 0.0 | - | - | | |
| White-rumped Swift | Apus caffer | 28.9 | 0.0 | - | - | | |
| White-throated Robin-Chat | Cossypha humeralis | 34.2 | 16.7 | - | - | | |
| White-throated Swallow | Hirundo albigularis | 13.2 | 0.0 | - | - | | |
| White-winged Widowbird | Euplectes albonotatus | 26.3 | 8.3 | - | - | | |
| Willow Warbler | Phylloscopus trochilus | 7.9 | 0.0 | - | - | | |
| Wire-tailed Swallow | Hirundo smithii | 15.8 | 8.3 | - | - | | |
| Yellow-bellied Eremomela | Eremomela icteropygialis | 2.6 | 0.0 | - | - | | |

| Species name | Scientific name | Full protocol | Ad hoc protocol | Red List (Global) | Red List (Regional) | Endemic (SA) | Endemic (SA) - detail |
|------------------------------|----------------------------------|---------------|-----------------|-------------------|---------------------|--------------|-----------------------|
| Yellow-bellied Greenbul | <i>Chlorocichla flaviventris</i> | 5.3 | 0.0 | - | - | | |
| Yellow-billed Duck | <i>Anas undulata</i> | 2.6 | 0.0 | - | - | | |
| Yellow-billed Kite | <i>Milvus aegyptius</i> | 15.8 | 0.0 | - | - | | |
| Yellow-breasted Apalis | <i>Apalis flava</i> | 47.4 | 8.3 | - | - | | |
| Yellow-fronted Canary | <i>Crithagra mozambica</i> | 73.7 | 25.0 | - | - | | |
| Yellow-fronted Tinkerbird | <i>Pogoniulus chrysoconus</i> | 15.8 | 8.3 | - | - | | |
| Yellow-throated Bush Sparrow | <i>Gymnoris supercilialis</i> | 5.3 | 0.0 | - | - | | |
| Zitting Cisticola | <i>Cisticola juncidis</i> | 10.5 | 0.0 | - | - | | |

APPENDIX 3: CURRICULUM VITAE

MEGAN DIAMOND

PERSONAL DETAILS

Date of Birth | 7 December 1978
Driver's License | Code A and B
Home Language | English
Other Languages | Afrikaans

EDUCATION

BSc Environmental Management | *University of South Africa (UNISA)* 2002 – 2009

ACCREDITATION

South African Council for Natural Scientific Professions | *Environmental Science*
Registration Number: 300022/14

EXPERIENCE

Owner & Avifaunal Specialist | *Feathers Environmental Services*
July 2013 – Present

- * Perform specialist avifaunal assessment studies to minimise the impact of industrial infrastructure on birds and their habitats;
- * Provide strategic guidance to industry through the development of best practice procedures and guidelines;
- * Review and comment on methodologies, specialist studies and EIA reports for Renewable Energy projects;
- * Provide input into renewable energy and power line developments elsewhere in Africa and across the globe;
- * Manage the collection and collation of relevant and complete desktop and/or field datasets;
- * Manage pre- and post-construction avifaunal monitoring data collected at wind and solar energy facilities;
- * Site assessments, either as part of the project team or independently;
- * Preparation of reports according to project deadlines, including the use of Geographic Information Systems (GIS) to portray data;
- * Attendance of specialist integration meetings; and
- * Liaison with stakeholders where necessary.

Wildlife & Energy Programme Manager | *Endangered Wildlife Trust*
October 2006 – June 2013

Programme management

- * Annually review the programme's conservation and research strategic objectives and update in accordance with the EWT's and programme's vision and mission including work plans for staff etc.;

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- * Ensure timeous, professional delivery on all aspects of Wildlife & Energy Programme activities;
- * Formulate, prioritise and approve relevant research and conservation projects;
- * Ensure acceptable quality of all research projects and their outputs;
- * Participate in international network liaison as and when required;
- * Produce regular popular articles & media releases on the Wildlife & Energy Programme projects and outputs & contribute to the EWT publications;
- * Establish & maintain a network with relevant national & international stakeholders;
- * Deliver presentations at relevant meetings, functions, workshops & conferences on behalf of the programme;
- * Assist with compilation of newsletters, updating of webpage, compilation of press articles, any advocacy issues;
- * Identify & establish partnerships to achieve Wildlife & Energy Programme conservation goals.

Eskom –EWT Strategic Partnership

- * Ensure that this partnership is managed effectively and sustainably against its goals. Manage staff in this division;
- * Develop and maintain relationships with Eskom;
- * Negotiate the terms of reference for the annual service level agreements between EWT and Eskom, to ensure the sustainability of the relationship;
- * Compile annual report to Eskom Corporate Environment and Sustainability;
- * Produce monthly reports to Eskom’s regional grids on the status of incident follow-up;
- * Attend applicable forums to interact with Eskom stakeholders;
- * Participate in international network liaison as and when required;
- * Maintain a network with all relevant local and regional level stakeholders (meetings, forums, workshops, etc.);
- * Identify research needs relating to the management of wildlife interaction with power lines;
- * Conduct research projects on wildlife and power line interaction and present the results at national and international conferences and workshops;
- * Development and implementation of training for Eskom field services staff (at various levels) in the management of wildlife interactions; and
- * Conduct special investigations on power lines relating to wildlife induced faulting.

Environmental Impact Assessment Division

- * Ensure that this division operates effectively and efficiently at all times and manage staff in this division; and
- * Conduct specialist avifaunal studies for new power lines developments including: tendering/quoting for the projects, conducting field work, preparing reports, presenting results & negotiating the acceptance of recommendations, final “walk through” as part of Environmental Management Plans; general project management, all liaison with clients, Eskom, authorities, Interested and Affected Parties etc.

Management and administration

- * Ensure all programme staff have relevant terms of reference;
- * Ensure that all programme staff are performance appraised against their terms of reference;
- * Compile and manage programme budgets, monthly reports, work plans and strategy;
- * Monitor expenditure and take corrective action if necessary; and
- * Ensure timely delivery on all projects to all stakeholders.

CONFERENCE ATTENDANCE

- * *Society for Conservation Biology 21st Annual Meeting (1-5 July 2007)*
- * *The 6th TAWIRI Scientific Conference (3 – 6 December 2007) Presented a paper titled “Co-operative management of wildlife and power line conflicts: an African solution”*
- * *Pan-African Ornithological Congress (7-12 September 2008)*
- * *International Conference on Overhead Lines, Design, Construction, Inspection & Maintenance, Fort Collins Colorado USA. (29 March – 1 April 2010) Presented a paper titled “Bird’s eye view: how birds see is key to avoiding power line collision”*
- * *Windaba 2011 – Implementing South African Wind Energy (27-29 September 2011)*
- * *Pan African Vulture Summit (16-20 April 2012) Presented a paper titled “Electrification in Africa – Are our vultures being strung along”*
- * *4th Wind Power Africa Conference & Renewable Energy Exhibition (28-30 May 2012) Presented a paper titled “Wind Energy in Africa – what does this really mean for our continent’s birds”*
- * *13th Pan-African Ornithological Congress (14-21 October 2012) Presented a paper titled “Stringing South Africa’s Terrestrial Birds Along - Monitoring of Bird Interactions with Power Line and Experimental Testing of Bird Collision Mitigation at the Karoo Long Term Monitoring Site”*
- * *AEWA Single Species Action-Planning Workshop for the Conservation of the Grey Crowned Crane (10-13 September 2013) Presented and participated in the workshop as a subject expert (energy and bird interactions)*

AUTHORED & CO-AUTHORED PAPERS

Jenkins, A.R., Smallie, J. & Diamond, M. 2009. Balls, flashers, flappers and coils: South African perspectives on a global search for ways to prevent avian collisions with overhead lines. In: Harebottle, D.M., Craig, A.J.F.K., Anderson, M.D., Rakatomonana, H. & Muchai, M. (eds). *Proceedings of the 12th Pan-African Ornithological Congress, 2008*. Cape Town, Animal Demography Unit.

Smallie, J., Diamond, M. & Jenkins, A. 2009. Lighting up the African continent – what does it mean for our birds? pp. 38–43. In: Harebottle, D.M., Craig, A.J.F.K., Anderson, M.D., Rakotomanana, H. & Muchai. (eds). *Proceedings of the 12th Pan-African Ornithological Congress, 2008*. Cape Town, Animal Demography Unit.

Jenkins, A. R., Smallie, J.J and Diamond, M. 2010 Avian collisions with power lines: a global review of causes and mitigation with a South African perspective. Bird Conservation International, page1 of16.

Retief, E.F., Diamond, M., Anderson, M.D., Smit, H.A., Jenkins, A.R., Brooks, M. 2011. Avian Wind Farm Sensitivity Map for South Africa.

Jenkins, A.R., Van Rooyen, C.S., Smallie, J.J., Harrison, J.A., Diamond, M. And Smit, H.A. 2012. BirdLife South Africa / Endangered Wildlife Trust best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa.

Jenkins, A.R., De Goede, K.H., Sebele, L. and Diamond, M. 2013. Brokering a settlement between eagles and industry: sustainable management of large raptors nesting on power infrastructure. *Bird Conservation International* (2013) 23:232 – 246.

Diamond, M., Harris, J., Mirande, C. and Austin, J. 2014. People of a feather flock together: A global initiative to address crane and power line interactions. 13th North American Crane Workshop Summary. Lafayette, Louisiana.

Page-Nicholson, S., Tate, G., Hoogstad, C., Murison, M., Diamond, M., Blofield, A., Pretorius, M., Michael, M.D. 2018. Mitigating the Impact of Large Mammals on Wooden Electrical Distribution Poles in the Kruger National Park, South Africa. *African Journal of Wildlife Research*.

Diamond, M. and Hoogstad, C. (in press) Collisions and habitat loss associated with utility lines and wind turbines. IUCN SSC Crane Specialist Group – Crane Conservation Strategy.