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PLUTO-MAHIKENG 400KV POWER LINE DEVIATIONS

AVIFAUNAL IMPACT ASSESSMENT REPORT

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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 22 years. She has 20 years' worth of experience in the field of bird interactions with electrical infrastructure and during this time has completed impact assessments for over 260 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, powerlines, 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 Powerline 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 *Vhubvo Archaeo-Heritage Consultants CC* 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 authorised development, but aim to present facts and our best scientific and professional opinion regarding 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 report is based on a desktop investigation using the available information and data related to the site to be affected and a three-day, single season site visit of the power line deviations on 17 March, 26 March and 2 April 2026. 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 report 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 this report.
- The specialist investigator reserves the right to modify this report, recommendations and conclusions at any stage should additional information become available.
- Information, recommendations, and conclusions in this report cannot be applied to any other area without proper investigation.
- This report, 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 report, in any physical or digital form, serves to confirm acknowledgment of these terms and liabilities.



30 June 2026

EXECUTIVE SUMMARY

The Watershed Strengthening Phase 3 project is a strategic transmission development identified in Eskom's Transmission Development Plans, aimed at strengthening the national 400kV network by improving capacity and voltage regulation at the Watershed Substation. The project, implemented by the National Transmission Company South Africa (NTCSA), includes the development of the Mafikeng Main Transmission Substation (MTS) and the associated Mahikeng–Pluto 400kV transmission power line to support improved network reliability and regional power distribution.

An avifaunal impact assessment was originally completed in 2018 in support of the Environmental Impact Assessment (EIA) process, which resulted in Environmental Authorisation being granted in February 2019. Due to delays associated with funding constraints, land negotiations and servitude acquisition, the authorisation lapsed and was subsequently reinstated in February 2024 following approval of an amendment application. During servitude acquisition, approximately 14 km (Deviation 1) and 40m (Deviation 2) of the authorised transmission line was negotiated outside the assessed 2km corridor respectively, necessitating a Basic Assessment (BA) process for the proposed route deviations. This report therefore reassesses the avifaunal sensitivities and potential bird-related risks associated with the revised alignment (along the two deviations), taking into consideration current environmental conditions and applicable best-practice mitigation guidelines.

A screening report for the *Pluto-Mahikeng 400kV Power Line* route deviations, was compiled on 5 February 2026 by *Vhubvo*. The National Environmental Screening Tool (Animal Species Theme) classifies portions of the authorised route alignment as HIGH sensitivity, primarily due to the confirmed occurrence of Martial Eagle *Polemaetus bellicosus* and White-bellied Korhaan *Eupodotis senegalensis*. The remainder of the development footprint is classified as MEDIUM sensitivity as the development area is considered to contain habitat for White-bellied Korhaan, as defined in the *Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species* (Government Gazette No 43855, 30 October 2020) based on historical records.

A site sensitivity verification and dedicated field survey for the authorised *Pluto-Mahikeng 400kV Power Line* route deviations was undertaken by an experienced avifaunal specialist, incorporating a desktop analysis and verified through field observations during site sensitivity verification surveys conducted on 17 March, 26 March and 2 April 2026. The level of assessment is considered appropriate to inform the study, taking into account prevailing land use practices, relatively stable avifaunal habitats, and the availability of relevant secondary datasets. Collectively, these factors reduce ecological uncertainty and support the adequacy of the survey effort.

Assessment of the Mahikeng–Pluto 400kV Power Line route deviations identified five primary avifaunal microhabitats, namely rivers, bushveld, grassland, cultivated land and existing high-voltage power lines, all of which are consistent with habitats identified during the 2018 assessment. Deviation 1 traverses the Mooi River,

which functions as an important movement and foraging corridor for water-associated bird species and supports diverse riparian habitat characterised by dense woody vegetation. The river and associated floodplain areas may support several Species of Conservation Concern, including waterbirds, raptors and wetland-associated species.

Deviation 1 is located entirely within the Carletonville Dolomite Grassland vegetation unit, an important grassland habitat supporting a high diversity of bird species, including several Red List and endemic species. Of particular significance is the presence of suitable habitat for the endemic Melodious Lark, as well as terrestrial SCC such as White-bellied Korhaan and Secretarybird. Grassland and floodplain habitats may also support species including Lesser Kestrel, African Marsh Harrier and Marsh Owl, while the availability of prey species may attract larger raptors such as Martial Eagle.

Deviation 2 is situated within the Stella Bushveld vegetation type, characterised by open savanna comprising mixed grassland interspersed with scattered Acacia (*Vachellia and Senegalia*) trees and shrubs. This habitat provides suitable foraging, nesting, and roosting opportunities for a diverse assemblage of bushveld and grassland-associated bird species. Scattered trees serve as important perching and vantage sites for raptors and other aerial predators, while the well-developed grass layer supports granivorous, insectivorous, and terrestrial species through the availability of seeds, invertebrates, and small vertebrate prey. The mosaic of open grassland and woody vegetation is characteristic of the Kalahari Bushveld and supports a representative avifaunal community, including larks, chats, shrikes, finches, waxbills, korhaans, and a range of raptor species.

Cultivated lands within Deviation 1 are limited in extent and largely associated with the Mooi River. Although transformed, these areas may provide opportunistic foraging habitat for several bird species, including Lesser Kestrel and a range of common raptors, herons, ibises and other open-country foragers. Existing high-voltage transmission infrastructure within the area also represents an important avifaunal habitat feature, particularly as established roosting substrate for vultures and other large birds.

Two hundred and thirty-eight bird species have been recorded within the relevant *Pluto-Mahikeng 400kV Power Line* route deviation pentads during the SABAP2 atlassing period to date. Of the 238 recorded species, 65 species are identified as power line-sensitive, largely comprising large terrestrial birds, raptors, and wetland-associated species, all of which are known to be vulnerable to collisions with overhead power line cables and earthwires. Eleven are classified as SCC, with a further ten listed as Near Threatened.

The site visit yielded a total of 63 bird species, including a two SCC, namely Cape Vulture and White-backed Vulture and two Near Threatened species i.e. Black-winged Kite *Elanus caeruleus* and Yellow-billed Duck *Anas undulata*. The avifaunal community was dominated by common passerines and larger terrestrial species typically associated with the broader assessment area. Notable observations included Amur Falcon *Falco*

amurensis, a Palearctic migrant occurring in southern Africa during the non-breeding season. These records reflect the seasonal and opportunistic use of the landscape by both resident and migratory raptors.

Key avifaunal risks associated with the development include habitat transformation, disturbance, direct mortality during construction, and collision with overhead conductors. These impacts are most relevant to SCC and other power line-sensitive species, particularly in open habitats where flight paths intersect infrastructure.

From a cumulative impact perspective, the *Mahikeng–Pluto 400kV Power Line* route deviations have an approximate length of 14km and 40m respectively and form part of the authorised *Mahikeng–Pluto 400kV Power Line* and an already well-established transmission network within the region (30km radius), which includes existing high-voltage, medium-voltage, and distribution infrastructure extending across a wide area. The landscape remains sensitive to cumulative avifaunal impacts, particularly for collision-prone SCC such as large terrestrial species, vultures, raptors and water-dependent species which move across wide ranges and are vulnerable to multiple infrastructure interactions. While the addition of a single power line does not in itself result in unacceptable cumulative impact, it contributes incrementally to an already present risk profile associated with overhead transmission infrastructure in open landscapes. On this basis, the cumulative impact of the authorised *Pluto-Mahikeng 400kV Power Line* route deviation is considered to be MEDIUM in isolation, largely due to alignment within an already influenced corridor, but the broader regional cumulative exposure to high-voltage power lines and similar infrastructure remains HIGH, reflecting the additive nature of risk across the wider landscape rather than the project alone.

In conclusion, the avifaunal habitat within which the proposed route deviations are situated is considered to range from HIGH to MEDIUM sensitivity, reflecting the presence of diverse habitat types and the confirmed and potential occurrence of SCC, including several collision-prone and disturbance-sensitive taxa. The construction of the authorised *Pluto-Mahikeng 400kV Power Line* within the proposed route deviations is expected to result in localised impacts of HIGH to MEDIUM significance on avifauna occurring in the vicinity of the infrastructure. These impacts are primarily associated with an increased risk of collision in open landscapes in addition to displacement impacts associated with disturbance and, to a lesser extent, habitat transformation during construction. These impacts can be effectively reduced through the implementation of appropriate mitigation measures, including targeted collision mitigation and construction-phase management controls. It is anticipated that the *Pluto-Mahikeng 400kV Power Line* can be constructed and operated, within the proposed route deviations, with acceptable levels of residual impact on the resident and mobile avifauna, provided that recommended mitigation measures are implemented.

The following recommendations are provided for potentially significant impacts. These have been included in the site-specific Construction Environmental Management Programme (CEMPr) and Operational Environmental Management Programme (OEMPr) for the authorised *Pluto-Mahikeng 400kV Power Line*, dated

15 May 2026, in addition to those existing recommendations contained within the *Generic EMPr for the Development and Expansion of Substation Infrastructure for the Transmission and Distribution of Electricity*:

Site Specific Construction (CEMPr) Recommendations

- It is recommended that Bird Flights Diverters (BFDs) be installed on the earth wires between the towers 491 and 521 (Deviation 1) and towers 110-111 (Deviation 2) as detailed in the *Pluto-Mahikeng 400kV Power Line Mitigation Matrix*, dated 15 May 2026.
- Bird Flight Diverters (BFDs) must be installed ten metres apart, on the earth wires in an alternating black and white/yellow pattern. BFDs must be installed on the entire length of the earth wire span to ensure maximum collision protection for the movement of vultures when roosting on the towers. BFDs must be installed on the earth wires as soon as possible after stringing.
- The installation of bird guards, in accordance with the *Eskom Transmission Bird Perch Guidelines Unique Identifier 41-332*, above the insulator strings of Towers 491 to 521 and Towers 110-111 is highly recommended.
- Should a raptor nest be identified within or in close proximity to the alignment prior to or during construction, all construction activities in the immediate vicinity must be temporarily halted. The Environmental Control Officer (ECO) must appoint a suitably qualified avifaunal specialist to assess the nest and provide site-specific management recommendations, including appropriate buffer distances and activity restrictions. Implementation of these measures may necessitate a delay or rescheduling of construction activities to avoid disturbance, particularly where the nest is active.
- Avoid removal of sensitive vegetation types. The recommendations of the botanical CEMPr must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
- Construction activity should be restricted to the immediate footprint of the *Mahikeng-Puto 400kV Power Line* infrastructure. This is especially relevant to vegetation clearing undertaken to facilitate access during construction, which should be carefully managed to prevent inadvertent disturbance or loss of nesting habitat.
- All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
- All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.

Site Specific Operational (OEMPr) Recommendations

- *NTCSA* Line and Servitude Managers are requested to report all bird collisions encountered during routine line patrols of the *Pluto-Mahikeng 400kV Power Line* to the *Eskom-Endangered Wildlife Trust*

Strategic Partnership, who will provide additional site-specific mitigation recommendations, if required.

- All Bird Flight Diverters must be maintained for the duration of the operational lifespan of the *Pluto-Mahikeng 400kV Power Line*.
- Should raptor nests be identified during the operational phase, *NTCSA* Line and Servitude Managers must report these to the Environmental Manager, who will in turn notify the *Eskom-Endangered Wildlife Trust Strategic Partnership* for site-specific guidance. Recommendations provided must be implemented, including the delineation of appropriate buffer distances and the postponement/rescheduling of maintenance activities, where required, to prevent disturbance-related nest abandonment or breeding failure.
- While it is not illegal to remove an unoccupied nest that is posing a quality of supply risk, the removal of nests that contain eggs, chicks or adult birds will require a permit to do so. *Eskom* are requested to notify the *Eskom-Endangered Wildlife Trust Strategic Partnership* in these instances to arrange for the translocation or removal of the nest.
- All bird guards should be maintained for the duration of the operational lifespan of the *Pluto-Mahikeng 400kV Power Line*.
- *NTCSA* Line and Servitude Managers are requested to report all bird related faulting on the *Pluto-Mahikeng 400kV Power Line* infrastructure to the *Eskom-Endangered Wildlife Trust Strategic Partnership,* who will provide site-specific mitigation recommendations if required.
- Mitigation requirements detailed in the site specific botanical OEMPr report must be strictly implemented to ensure minimal habitat impact.
- Existing roads must be used as far as possible for access during the operational lifespan of the project.
- All operational activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.

Importantly, this assessment confirms alignment with the findings of the original 2018 avifaunal assessment. There have been no material changes in habitat condition, species composition, or ecological sensitivity that would alter the original impact conclusions. On this basis, the findings of the 2018 assessment remain valid, and the authorised development is considered environmentally acceptable from an avifaunal perspective, subject to implementation of the recommended mitigation measures.

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1. INTRODUCTION

The Watershed Strengthening Phase 3 project is a strategically important transmission initiative identified in Eskom's Transmission Development Plans (2016-2025 and 2019-2028), aimed at addressing existing network constraints within South Africa's power system. Specifically, the project seeks to alleviate capacity limitations and improve voltage regulation at the Watershed Substation, thereby enhancing overall network performance and reliability. Implemented by the National Transmission Company South Africa (NTCSA), the development includes the establishment of the Mafikeng Main Transmission Substation (MTS) and the associated Pluto-Mahikeng 400kV transmission power line, forming part of a broader, long-term strategy to reinforce the national 400kV network and support increased capacity for both power evacuation and regional distribution.

An avifaunal impact assessment for the project was originally undertaken in 2018 by *Pachnoda Consulting CC*, the findings of which informed the Environmental Impact Assessment Report (EIR) and supported the granting of Environmental Authorisation (EA) on 4 February 2019. However, owing to funding constraints that delayed the commencement of construction, as well as protracted land negotiations and servitude acquisition processes, the authorisation lapsed. Following approval of an amendment application, the Environmental Authorisation was reinstated on 21 February 2024 and extended for a further five-year period.

During servitude acquisition, approximately 14km (Deviation 1) and 40m (Deviation 2) of the authorised transmission line was negotiated outside the 2km corridor assessed within the 2018 Environmental Impact Assessment Report (EIAR) and as such a Basic Assessment (BA) process must be undertaken to obtain an EA for these route deviations. This report therefore reassesses the potential avifaunal risks associated with the authorised infrastructure (along the new route alignment), taking into account current environmental conditions and best practice guidelines, to inform the BA application and ensure continued compliance with applicable environmental legislation.

2. PROJECT LOCATION

The authorised power line alignment extends from the existing Pluto MTS, located approximately 25km west of Randfontein to the new Mahikeng MTS, located approximately 20km north-west of Mahikeng. The power line deviations are located between towers 491 and 521 (Deviation 1) in addition to towers 110 and 111 (Deviation 2), within the JB Marks and Mahikeng Local Municipalities, North West Province (FIGURE 1 and 2).

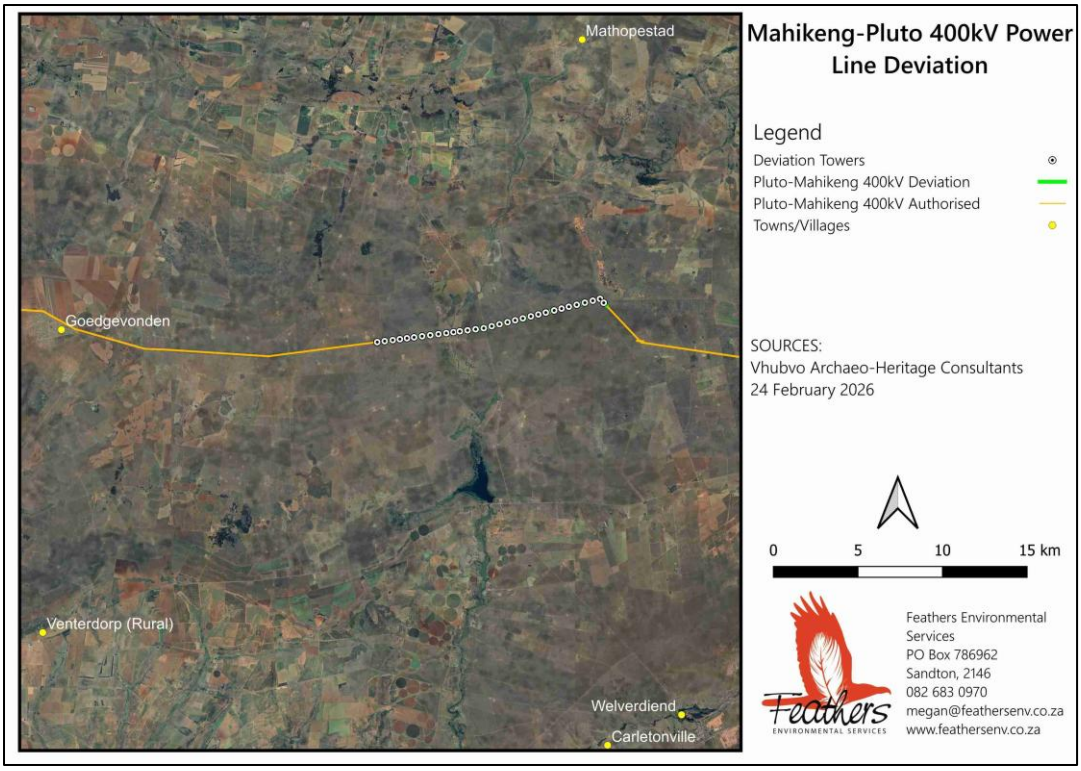


FIGURE 1: Regional map detailing the location of Deviation 1 of the authorised *Mahikeng–Pluto 400kV Power Line* located in the North West Province.

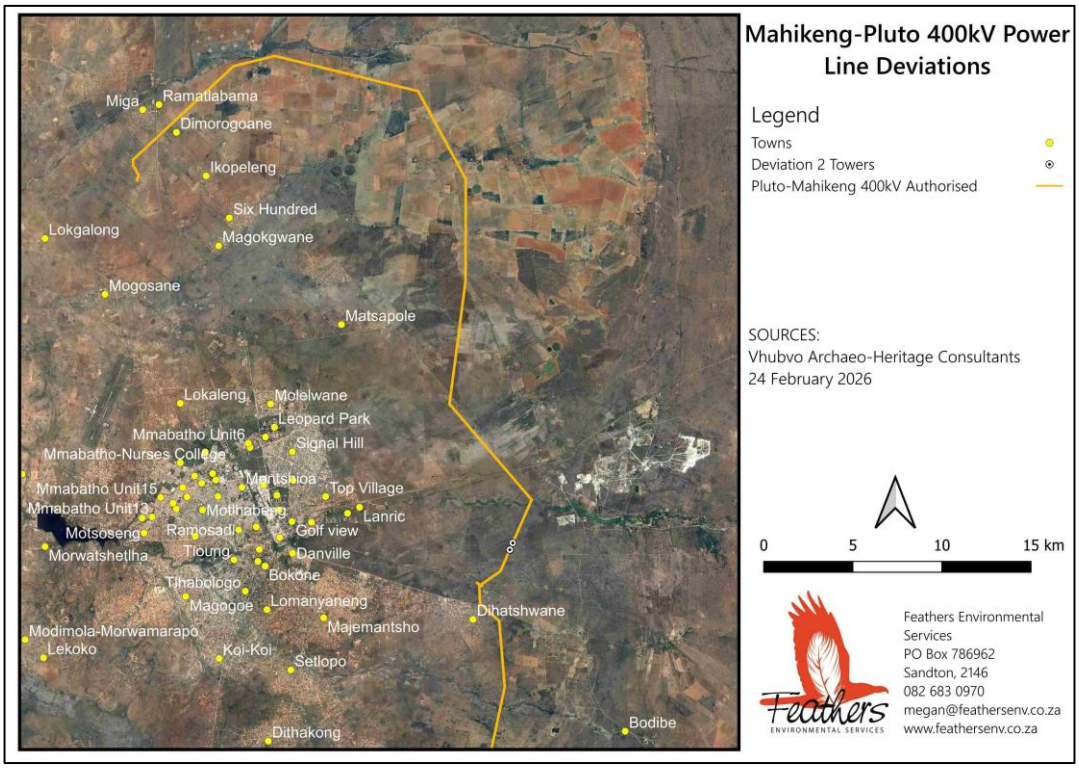


FIGURE 2: Regional map detailing the location of Deviation 2 of the authorised *Mahikeng–Pluto 400kV Power Line* located in the North West Province.

3. PROJECT DESCRIPTION

The works to be undertaken include the construction and operation of the *Pluto-Mahikeng 400kV Power Line*, along the proposed deviations, approximately 14km (Deviation 1) and 40m (Deviation 2) in length.

4. THIS REPORT

4.1 Scope of Work

NTCSA has appointed *Vhubvo Archaeo-Heritage Consultants CC* (hereinafter referred to as *Vhubvo*) as independent environmental assessment practitioners to manage the BA process for the proposed power line deviations. *Feathers Environmental Services CC (*hereafter referred to as *Feathers)* was appointed by *Vhubvo* to reassess and confirm the impacts associated with the construction and operation of the *Pluto-Mahikeng 400kV Power Line*, along the proposed deviations, from an avifaunal perspective and compile a specialist avifaunal impact assessment report, that will inform the BA report.

4.3 Terms of Reference

Feathers has undertaken this avifaunal impact assessment in accordance with the terms of reference provided by *NTCSA*, as well as the minimum reporting requirements outlined in the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (Government Gazette No 43855, 30 October 2020):

- Review the baseline avifaunal environment as assessed in the initial avifaunal impact assessment, final EIR and EA, and evaluate its current status, including any changes that have occurred since authorisation;
- Undertake a comprehensive review of previous avifaunal studies, supported by a site sensitivity verification incorporating both desktop analysis (e.g. satellite imagery and relevant datasets) and a field survey, to confirm the current status of the receiving environment;
- Confirm whether the original impact ratings and proposed mitigation measures remain valid, identify any additional or revised mitigation measures required, and assess whether any new guidelines or assessment requirements are applicable to the authorised development;
- Assess changes in the surrounding environment, including land-use changes and new developments, and evaluate their implications for the project;
- Analyse relevant avifaunal datasets (including Important Bird Areas and other applicable sources) and describe the avifaunal communities likely to occur within the assessment area, with specific reference to Species of Conservation Concern (SCC);

- Identify and assess avifaunal microhabitats along the *Pluto-Mahikeng 400kV Power Line* deviations in terms of their suitability for breeding, roosting, and foraging by both SCC and other priority species;
- Describe the avifaunal communities most likely to be impacted, based on field data and regional occurrence records;
- Identify and assess potential direct, indirect, and cumulative impacts associated with the construction and operation of the *Pluto-Mahikeng 400kV Power Line* along the proposed deviations, and evaluate their significance using a defined rating methodology;
- Identify, assess, and where possible quantify cumulative impacts, clearly outlining the methodology used and demonstrating how information from similar developments has been incorporated; the cumulative impact assessment must also inform the need and desirability of the proposed deviations and include a reasoned statement on whether the power line development along the proposed deviations should proceed;
- Review the proposed power line deviations and provide recommendations for any required adjustments;
- Recommend practical and implementable mitigation measures for inclusion in the Environmental Management Programme (EMPr), and, where necessary, propose a monitoring programme for sensitive species, habitats, or receptors; and
- Identify any gaps in baseline data and indicate associated confidence levels, noting that the assessment is based on the best available information.

4.3 Structure of this report

In terms of the NEMA 2014 EIA Regulations contained in GN R982 of 04 December 2014 (as amended) all specialist studies must comply with Appendix 6 of the NEMA 2014 EIA Regulations GN R982 of 04 December 2014 (TABLE 1) and in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (Government Gazette No 43855, 30 October 2020) (TABLE 2).

TABLE 1: Information to be included in specialist reports

Legal Requirement		Relevant Section in Specialist study
(1)	A specialist report prepared in terms of these Regulations must contain-	
(a)	details of-	
	(i) the specialist who prepared the report; and	Professional Experience and Appendix 4
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Professional Experience and Appendix 4

Legal Requirement		Relevant Section in Specialist study
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Declaration of Independence
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 4
(cA)	an indication of the quality and age of base data used for the specialist report;	Section 5
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 7
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 5
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 5
(f)	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 7
(g)	an identification of any areas to be avoided, including buffers;	N/A
(h)	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 14
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 7-9
(k)	any mitigation measures for inclusion in the EMPr;	Section 11 & 12
(l)	any conditions for inclusion in the environmental authorisation;	Section 11 & 12
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 12
(n)	a reasoned opinion	Section 13
	whether the proposed activity, activities or portions thereof should be authorised;	Section 13
	regarding the acceptability of the proposed activity or activities; and	Section 13
	if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 11 Section 12 Section 13

Legal Requirement		Relevant Section in Specialist study
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	Not Applicable
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Not Applicable
(q)	any other information requested by the competent authority.	Not Applicable
(2)	Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Section 4, Table 2, Section 5 and Section 7

TABLE 2: Minimum report requirements listed in the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020)

HIGH SENSITIVITY RATING FOR TERRESTRIAL ANIMAL SPECIES	
SITE SENSITIVITY VERIFICATION	
The site sensitivity verification must be undertaken by an environmental assessment practitioner or specialist.	Professional Experience and Appendix 4
The site sensitivity verification must be undertaken through the use of: (a) a desk top analysis, using satellite imagery; (b) a preliminary on-site inspection; and (c) any other available and relevant information.	Section 5 & 7
The outcome of the site sensitivity verification must be recorded in the form of a report that: (a) confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; (b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and (c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations	Section 7 and Appendix 2
SPECIALIST ASSESSMENT & MINIMUM REPORT CONTENT REQUIREMENTS	
Contact details and relevant experience as well as the SACNASP Registration number of the specialist preparing the assessment including a curriculum vitae;	Professional Experience and Appendix 4
A signed statement of independence by the specialist;	Declaration of Independence

A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 5 & 14
A description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	Section 5
A description of the mean density of observations/number of sample sites per unit area and the site inspection observations;	Section 7
A description of the assumptions made and any uncertainties or gaps in knowledge or data;	Section 14
details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;	Section 7
the online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the PAOI;	N/A
The location of areas not suitable for development and to be avoided during construction where relevant;	N/A
a discussion on the cumulative impacts;	Section 10
Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 11
A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	Section 13
A motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above that were identified as having "low" or "medium" terrestrial animal species sensitivity and were not considered. appropriate.	N/A

5. APPROACH AND METHODOLOGY

5.1 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 *Pluto-Mahikeng 400kV Power Line* along the proposed route deviations 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 collisions with the power line conductors/earthwires based on specific morphological and/or behavioural characteristics. Priority species include both 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 and Vulnerable, as well as lower conservation concern species and other impact susceptible species;

- The proposed *Pluto-Mahikeng 400kV Power Line* route deviations are located within three South African Bird Atlas Project 2 (SABAP2) pentad grid cells (FIGURE 3). Eighty-one full protocol lists have been completed, which provide an adequate snapshot of avifaunal occurrence within the assessment area;
- Various avifaunal data sets (detailed in section 5.2) were analysed 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 *Pluto-Mahikeng 400kV Power Line* infrastructure along the proposed route deviations;
- Suitable avifaunal habitats and potential sensitive areas (APPENDIX 2) along the proposed *Pluto-Mahikeng 400kV Power Line* route deviations were identified using various Geographic Information System (GIS) datasets and Google Earth imagery, and subsequently verified through field observations undertaken on 17 March, 26 March and 2 April 2026, supported by records from the initial surveys conducted between September 2017 and March 2018;
- Primary avifaunal diversity and occurrence data were collected during the field surveys conducted on 17 March, 26 March and 2 April 2026 (FIGURE 4), and supplemented with data from surveys undertaken in between September 2017 and March 2018. 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 along the proposed *Pluto-Mahikeng 400kV Power Line* route deviations, and the immediate surrounds;
- The potential impacts, associated with the construction and operation of the *Pluto-Mahikeng 400kV Power Line* infrastructure, along the proposed route deviations, on the avifaunal community and their significance were predicted and assessed according to quantitative criteria (APPENDIX 3);
- Practical recommendations for the management and mitigation of impacts, related to the construction and operation of the power line along the proposed route deviations are provided in Section 11 for inclusion in the draft EMPr.

5.2 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;

* Screening Report for an Environmental Authorisation as required by the 2014 EIA Regulations - Proposed Site Environmental Sensitivity: The Pluto-Watershed Deviations, compiled by *Vhubvo* on 5 February 2026;
* Avifauna and Fauna Report for the proposed Mahikeng Main Transmission Substation & proposed 400kV Pluto-Mahikeng Powerline compiled by Pachnoda Consulting CC in April 2018;
* Bird distribution data of the South African Bird Atlas 2 (SABAP 2) (Animal Demography Unit, SABAP2 Coverage: MAH-PLU DEV) accessed 17 May 2026 and SABAP2 Coverage: PLU MAH DEV2 29 June 2026;
* The Important Bird & Biodiversity Areas (IBAs) report (Marnewick et al. 2015);
* Key Biodiversity Areas Key Biodiversity Areas in South Africa - SANBI (accessed 17 May and 29 June 2026);
* Co-ordinated Waterbird Count Database (CWAC) (Animal Demography Unit CWAC | Coordinated Waterbird Counts | ADU (accessed 17 May 2026 and 29 June 2026);
* Coordinated Avifaunal Roadcount project database (CAR) (Animal Demography Unit Coordinated Avifaunal Roadcounts accessed 17 May 2026 and 29 June 2026);
* iNaturalist database Observations · iNaturalist (accessed 17 May 2026 and 29 June 2026);
* Endangered Wildlife Trust: Threatened Species No Go Mapping Tool Threatened Species No-Go Map (accessed 17 May 2026 and 29 June 2026);
* Endangered Wildlife Trust: African Crane Sightings Data Set Occurrence search (accessed 17 May 2026 and 29 June 2026);
* Endangered Wildlife Trust: African Crane Breeding Sites Data Set EWT_CraneBreedingMap_2020.pdf (accessed 17 May 2026 and 29 June 2026);
* The global and regional conservation status and endemism information of all bird species (Lee et al. 2025) and the latest (2025-2) IUCN Red List of Threatened Species IUCN Red List of Threatened Species;
* Vulture roost and colony data, received from Vulpro 6 May 2026;
* Vulture restaurant location data, received from Vulpro 6 May 2026;
* The power line - bird mortality incident database of the Eskom/Endangered Wildlife Trust Strategic Partnership (1996 to 2021) was consulted to determine which of the species occurring within the route deviations 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 ©2026 imagery was used to examine the micro-habitats within the power line route deviations;
* KMZ. shapefiles detailing the location of the *Pluto-Mahikeng 400kV Power Line* route deviations, provided by *Vhubvo* on 24 February 2026; and
* Three-day in-field site sensitivity verification survey of the *Pluto-Mahikeng 400kV Power Line* route deviations conducted on 17 March, 26 March and 2 April 2026 (late summer surveys), to form a first-hand impression of avifaunal species presence and micro-habitat occurring within route deviations (FIGURE 4). This data is supplemented with occurrence data collected during previous in-field surveys conducted September 2017 and March 2018. This information, together with the SABAP2 data was used to compile a comprehensive list of species that could occur within the route deviations.

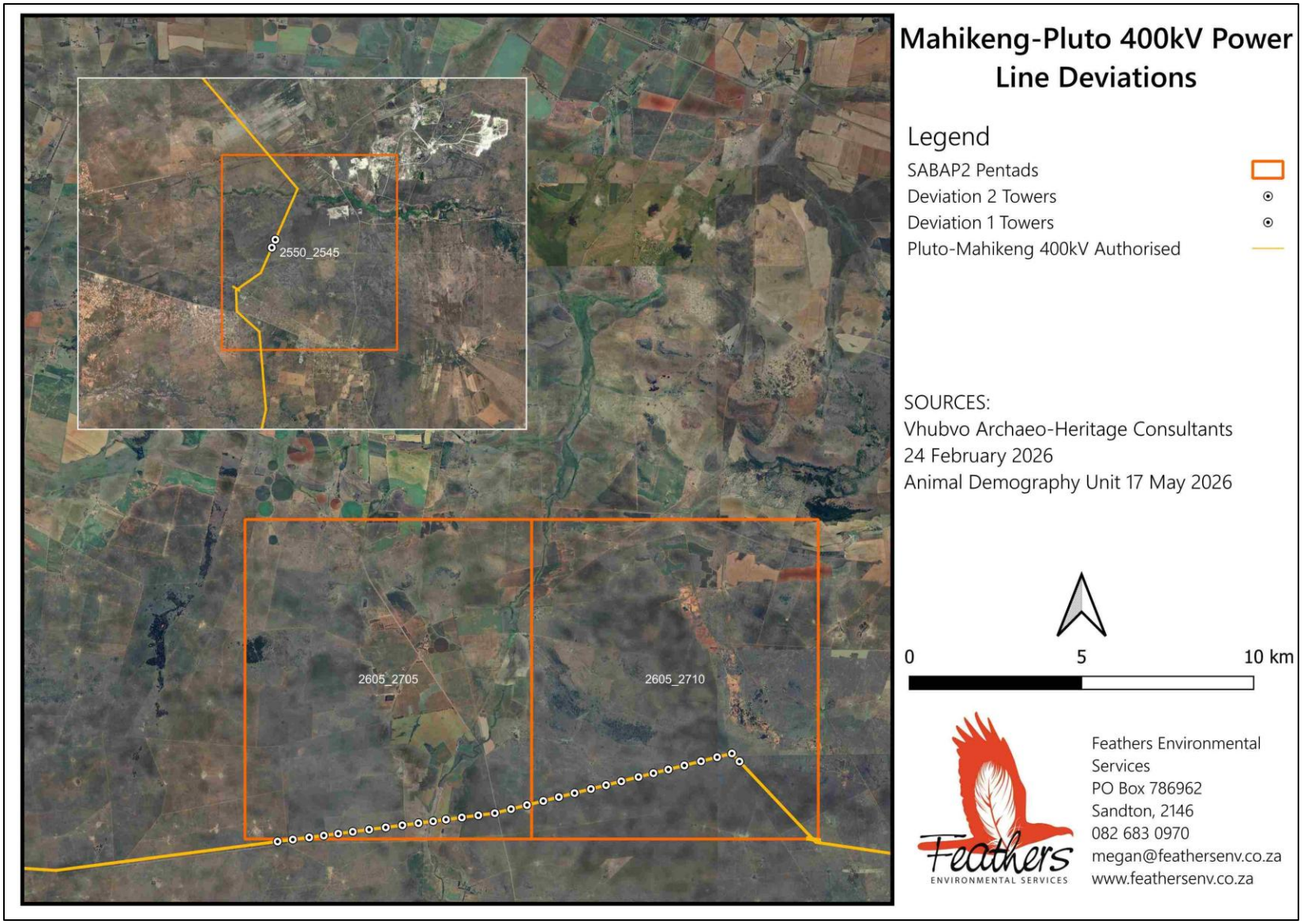


FIGURE 3: Location of the three South African Bird Atlas Project 2 (SABAP2) pentad grid cells that were considered for Deviation 1 and 2 of the *Pluto-Mahikeng 400kV Power Line*

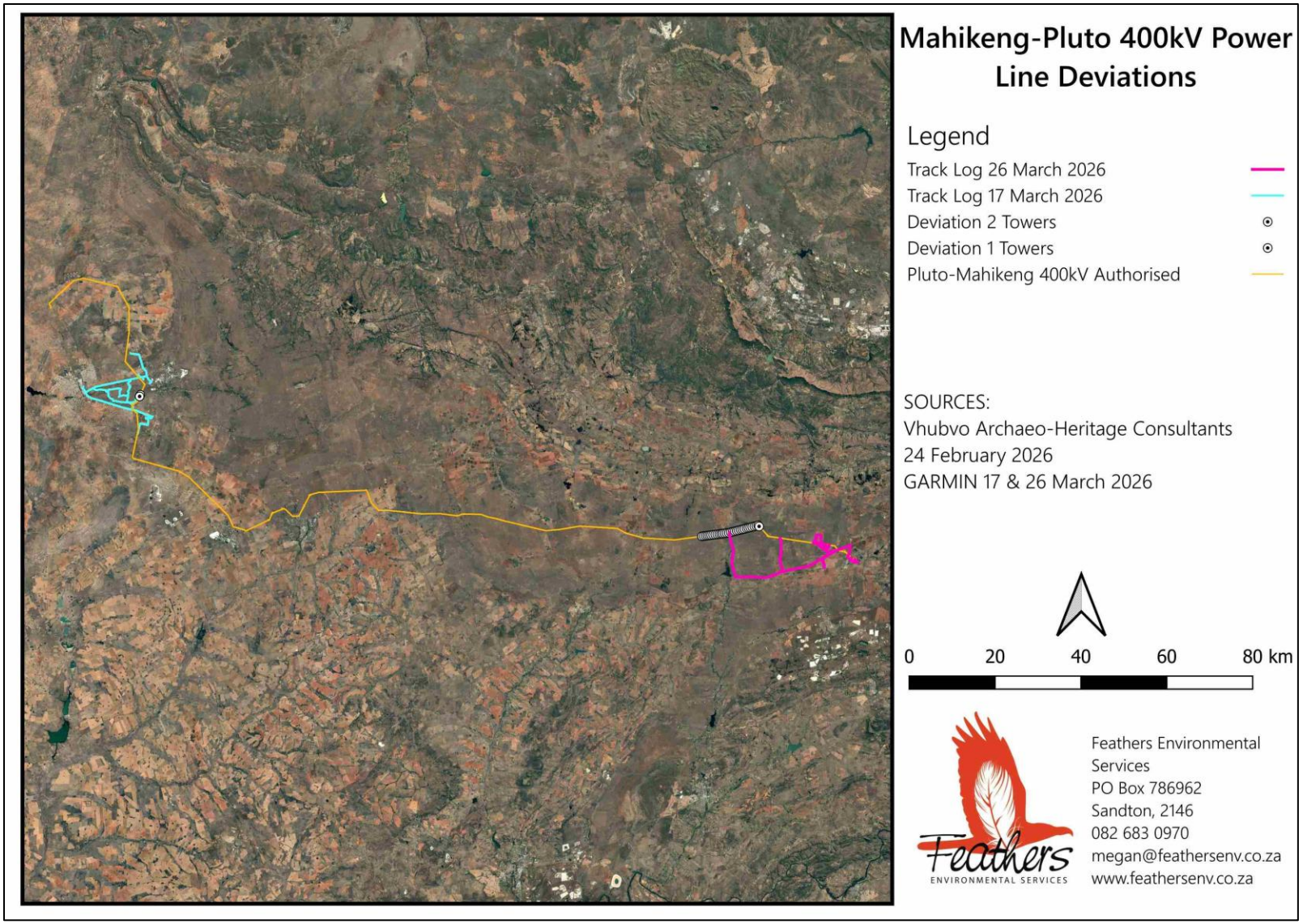


FIGURE 4: Regional map detailing the routes surveyed during the site survey of the *Pluto-Mahikeng 400kV Power Line route Deviation 1 and 2*, conducted on 17 March, 26 March (vehicle/walked surveys) and 2 April 2026 (drone survey)

6. APPLICABLE LEGISLATION, POLICIES AND GUIDELINES

The following pieces of legislation, policies and guidelines are applicable to this assessment:

6.1 Agreements and Conventions

South Africa is party to various agreements and conventions (TABLE 3) which are relevant to the conservation of avifauna (BirdLife International, 2022).

TABLE 3: 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)	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. 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. 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.	Regional
Convention on Biological Diversity (CBD), Nairobi, 1992	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. 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 *not* occur lies with the proponent of the activity posing the threat. 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.	Global

Convention on the Conservation of Migratory Species of Wild Animals, (CMS), Bonn, 1979	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 obstacles that seriously impede or prevent the migration of migratory species (Art III, par. 4b and 4c). 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 several obligations that are relevant to migratory waterbirds and infrastructure development.	Global
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

6.2 National & Provincial Legislation

The following pieces of national and provincial legislation (TABLE 4) are applicable to this assessment:

TABLE 4: 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 several 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	National

	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.	
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 indigenous biological resources.	National
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 therefor; 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 *Species Environmental Assessment Guideline* 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

The Standard for the Development and Expansion of Power Lines and Substations within Identified Geographical Areas	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 *Standard for the Development and Expansion of Power lines and Substations within Identified Geographical Areas* 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: * 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 falls outside of any strategic transmission corridor.	National
The North West Biodiversity Management Act No.4 of 2016	Provincial biodiversity legislation providing for the protection, management and sustainable use of indigenous fauna and habitats within the North West Province. In relation to avifauna, the Act regulates restricted activities involving listed bird species, including hunting, capture, possession, trade, transport, disturbance or destruction of nests, breeding sites and habitat. The Act further provides for the protection of threatened ecosystems, riparian habitat and aquatic systems that support bird populations, and regulates invasive and extra-limital species that may threaten indigenous avifauna. Schedule 3 lists all indigenous bird species as "ordinary species", except for a small number of exempt species such as the Pied Crow (*Corvus albus*), Cape Sparrow (*Passer melanurus*) and Red-billed Quelea (*Quelea quelea*). Permits are required for various activities involving protected avifauna and their habitats.	Provincial
North West Biodiversity Management Amendment Bill of 2017	The Amendment Bill proposed revisions and refinements to the 2016 Act, including amendments to schedules of protected and ordinary species. In terms of avifauna, the Bill expanded and clarified the listing of several bird groups and species under the "ordinary species" schedules, including bulbuls, mousebirds, weavers, doves, pigeons and Red-knobbed Coot. The Bill reinforced provincial controls over restricted activities affecting bird species and maintained the broader objectives of conserving biodiversity, protecting habitats and regulating activities that may negatively affect indigenous avifauna.	Provincial

7. DESCRIPTION OF THE BASELINE CONDITIONS

7.1 Site Sensitivity Verification

A screening report for the *Pluto-Mahikeng 400kV Power Line* route deviations, was compiled on 5 February 2026 by *Vhubvo*. The National Environmental Screening Tool (Animal Species Theme) classifies portions of the authorised route alignment as HIGH sensitivity, primarily due to the confirmed occurrence of Martial Eagle *Polemaetus bellicosus* and White-bellied Korhaan *Eupodotis senegalensis*. The remainder of the development footprint is classified as MEDIUM sensitivity as the development area is considered to contain habitat for White-bellied Korhaan, as defined in the *Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species* (Government Gazette No 43855, 30 October 2020) based on historical records (FIGURE 5).

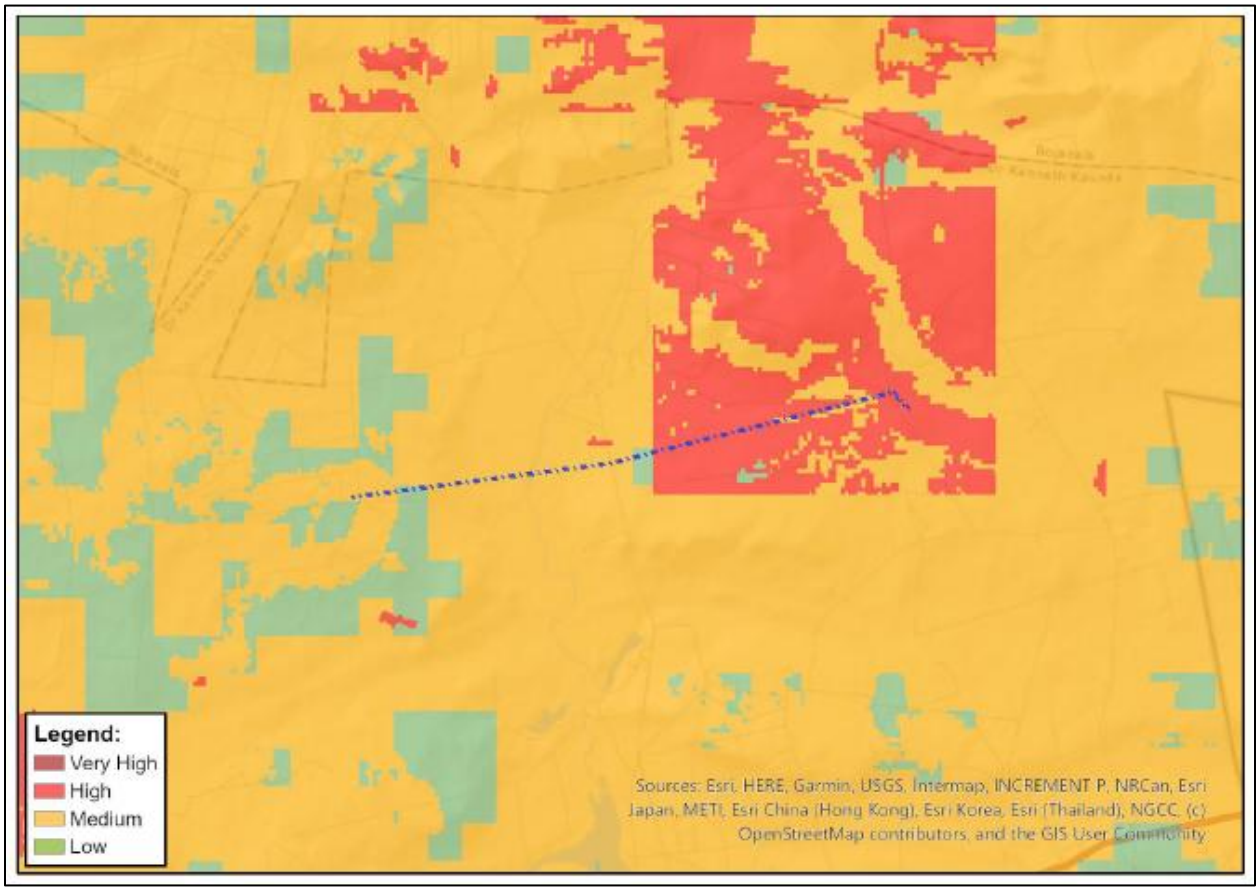


FIGURE 5: DFFE site sensitivity map detailing the HIGH and MEDIUM Animal Species Theme Sensitivity defined for Deviation 1 of the authorised *Pluto-Mahikeng 400kV Power Line*

7.2 Relevant Bird Populations

A site sensitivity verification and dedicated field survey for the authorised *Pluto-Mahikeng 400kV Power Line* route deviations was undertaken by an experienced avifaunal specialist, incorporating a desktop analysis and verified through field observations during site sensitivity verification surveys conducted on 17 March, 26 March and 2 April 2026. The level of assessment is considered appropriate to inform the study, taking into account prevailing land use practices, relatively stable avifaunal habitats, and the availability of relevant secondary datasets. Collectively, these factors reduce ecological uncertainty and support the adequacy of the survey effort.

7.2.1 Protected Areas

Protected areas are formally designated and managed for biodiversity conservation, and as such provide important habitat capable of supporting a diverse and potentially abundant avifaunal assemblage. Deviation 1 occurs along the northern boundary of both the Fred Coetzee Private Nature Reserve and Somerville Private Nature Reserve (FIGURE 6) and Deviation 2 occurs to the east of the Mahikeng Game Reserve (FIGURE 7). While detailed avifaunal data are not available for the Fred Coetzee and Somerville Private Nature Reserves, it is worth noting that as of 2023, little to no modification has occurred within the reserves and it is reasonable to infer that these areas support avifaunal SCC. The Mafikeng Game Reserve supports a diverse avifaunal community, with more than 300 bird species recorded across its approximately 4,600ha of open Kalahari grassland, mixed bushveld, acacia thorn scrub, wetlands, and associated waterbodies. The reserve provides habitat for a broad range of grassland, bushveld, and wetland-associated species, including numerous larks, pipits, chats, cisticolas, shrikes, waxbills, finches, and barbets. Characteristic grassland species include Northern Black Korhaan *Afrotis afraoides*, Common Ostrich *Struthio camelus*, Sabota Lark *Calendulauda sabota*, Rufous-naped Lark *Mirafra africana*, Spike-heeled Lark *Chersomanes albofasciata*, African Pipit *Anthus cinnamomeus*, Cape Longclaw *Macronyx capensis*, and Ant-eating Chat *Myrmecocichla formicivora*, while bushveld habitats support species such as Crimson-breasted Shrike *Laniarius atrococcineus*, Kalahari Scrub-robin *Cercotrichas paena*, Marico Flycatcher *Melaenornis mariquensis*, African Red-eyed Bulbul *Pycnonotus nigricans,* African Hoopoe *Upupa africana*, Acacia Pied Barbet *Tricholaema leucomelas*, and Green-winged Pytilia *Pytilia melba*. Wetlands, dams, and the Molopo River attract a diversity of waterbirds and waterfowl, including African Fish Eagle *Haliaeetus vocifer* and African Finfoot *Podica senegalensis*. The reserve also supports a notable assemblage of raptors, including Pale Chanting Goshawk *Melierax canorus*, Secretarybird *Sagittarius serpentarius*, White-backed Vulture *Gyps africanus*, Greater Kestrel *Falco rupicoloides*, and various owl species, while several intra-African and Palearctic migratory species occur seasonally, including European Bee-eater *Merops apiaster*, Lesser Grey Shrike *Lanius minor*, Red-backed Shrike *Lanius collurio*, Barn Swallow *Hirundo rustica*, Diederik Cuckoo *Chrysococcyx caprius*, and Spotted Flycatcher *Muscicapa striata*. Collectively, the diversity of habitats within the reserve supports a rich and representative avifaunal assemblage characteristic of the Kalahari–Bushveld ecotone, including several species of conservation interest.

It is noted that the occurrence of protected areas along the authorised power line corridor was assessed as part of the 2018 avifaunal impact assessment report. Accordingly, the current assessment of the deviations does not alter or undermine the findings of the original study. The species associated with these protected areas were already represented within the broader regional datasets (including atlas data and other secondary sources) that informed the original assessment. The additional contextual information provided herein therefore serves to support and strengthen the findings of the 2018 assessment, rather than materially changing the interpretation of avifaunal sensitivity or impact significance.

The presence of an electrocuted White-backed Vulture on the existing 88kV power line within the Mafikeng Game Reserve provides direct evidence that the current electricity network poses an electrocution risk to large soaring birds. This observation highlights the susceptibility of vultures to power line-related mortality in the area and indicates that any additional electrical infrastructure should be carefully assessed and appropriately mitigated to minimise cumulative impacts on these species.

7.2.2 Key Biodiversity Areas

A Key Biodiversity Area (KBA) is a site identified as critically important for the conservation of biodiversity, based on the presence of threatened, endemic, or ecologically significant species and ecosystems. While not necessarily legally protected, KBAs are used to guide land-use planning and environmental decision-making to ensure that key biodiversity features are maintained.

The Magaliesburg and Cradle of Humankind KBAs are situated approximately 25km north and 40km north-east of Deviation 1 respectively and within 180kms of Deviation 2 (FIGURE 6 and 7). Magaliesberg is a large protected terrestrial site. Mainly savanna dominated, with tree and shrub layers. The site includes small areas of deciduous, open to dense short thorny woodland, dominated by *Acacia* species with herbaceous layer of mainly grasses. This site qualifies as a Key Biodiversity Area of international significance that meets the thresholds for four criteria described in the Global Standard for the Identification of KBAs. The KBA trigger species at this site include birds (i.e. Cape Vulture *Gyps coprotheres*), mammals, plants, and reptiles. Similarly, the Cradle of Humankind KBA is a large terrestrial site. Most of the landscape is slightly undulating plains dissected by prominent rocky chert ridges, dominated by a complex mosaic of species-rich grasslands. A smaller component is moderately undulating plains and low hills supporting tall, usually *Hyparrhenia hirta*-dominated grassland, with some woody species on rocky outcrops or rock sheets. The rocky habitats show a high diversity of woody species, which occur in the form of scattered shrub groups or solitary small trees. Three threatened plant species and one reptile species meet the KBA criteria for this site.

KBAs were not explicitly assessed as part of the 2018 avifaunal impact assessment. However, the occurrence of Cape Vulture was considered. The consideration of KBAs, within the broader area, does not materially alter the original findings.

7.2.3 Important Bird Areas

An IBA is a site identified as being of international significance for the conservation of bird species and their habitats. IBAs are designated using globally standardised criteria developed by BirdLife International and implemented locally by BirdLife South Africa. These areas are selected based on factors such as the presence of threatened species, large congregations of birds, range-restricted species, or species representative of specific biomes. While IBAs are not necessarily legally protected, they are recognised as priority areas for conservation and are widely used to inform environmental planning, impact assessments, and biodiversity management.

The proposed *Pluto-Mahikeng 400kV Power Line* route deviations do not traverse IBAS; however, the Magaliesburg (SA025) IBA occurs 20km north of the proposed Deviation 1 and approximately 144kms east of proposed Deviation 2 (FIGURE 6 and 7). The most important trigger species in this IBA is the globally threatened Cape Vulture*, which breeds at* Nooitgedacht and at Skeerpoort. Many other raptor species occur within the Magaliesberg IBA, including White-backed Vulture, Lappet-faced Vulture *Torgos tracheliotus* and Lanner Falcon *Falco biarmicus,* although most records are of individual birds. Verreauxs' Eagle *Aquila verreauxii* breeds in the Magaliesberg with African Grass Owl *Tyto capensis* and Secretarybird regularly observed. Long-crested Eagle *Lophaetus occipitalis* is a more recent coloniser of the range. White-bellied Korhaan is found in grassland at the top of the Magaliesberg, as well on the Witwatersberg. A single pair of Black Stork *Ciconia nigra* also breeds at Skeerpoort, and there is a possibility that more birds may occur in the broader area. The densely wooded valleys along overgrown, slow-flowing streams hold Half-collared Kingfisher *Alcedo semitorquata*, with African Finfoot being recorded regularly along the Hennops and Magalies rivers within the IBA.

The 2018 avifaunal impact assessment identified and considered IBAs as part of the broader regional context, particularly the Botsalano Game Park (SA024) based on its proximity to the authorised power line. The current review confirms that IBA ecological function and species assemblages remain largely consistent within the development and broader areas. As such, the findings of the 2018 assessment are still considered valid, as no material changes have occurred that would significantly alter the original impact evaluation. While the proposed power line deviations are not expected to directly impact these IBAs, their presence increases the regional avifaunal sensitivity. Wide-ranging and mobile SCC, particularly large-bodied and flocking species such as vultures, flamingos, cranes, and bustards, may utilise the broader landscape between these sites, thereby increasing the potential risk of collision with power line infrastructure. Consequently, the development necessitates appropriate mitigation measures to minimise impacts on these species, although it does not preclude development from an avifaunal perspective.

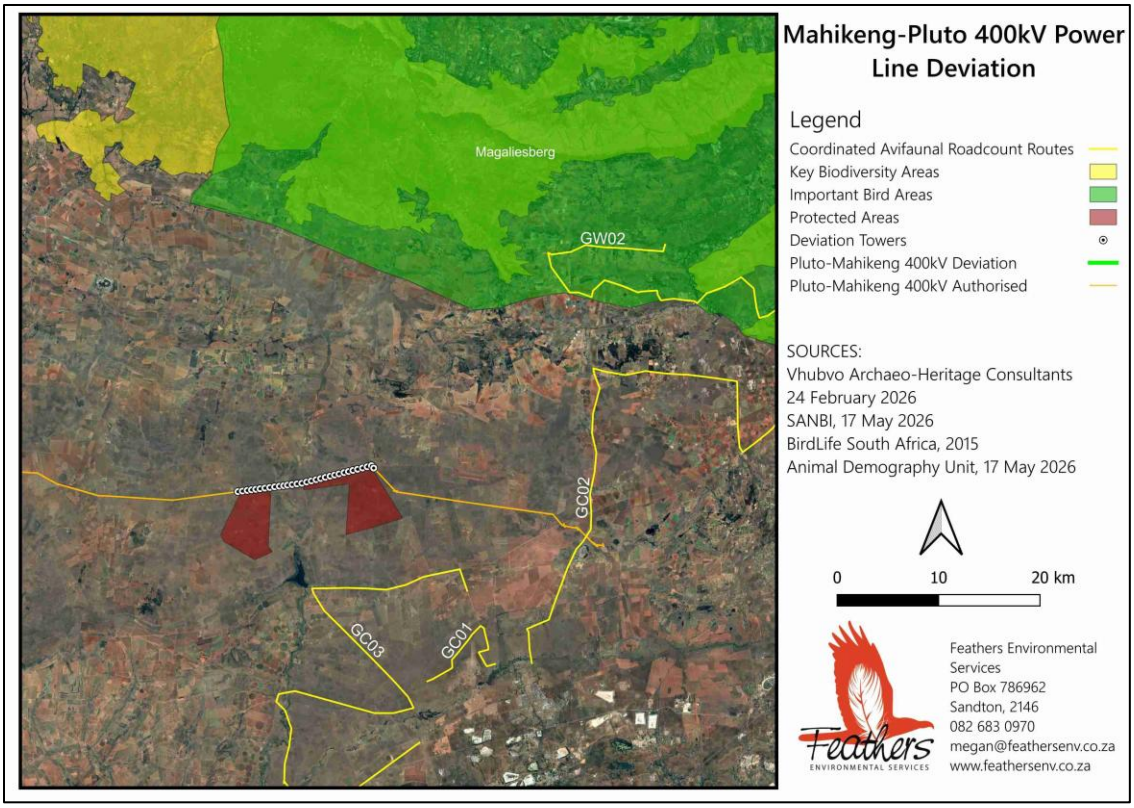


FIGURE 6: Protected Areas, KBAs, IBAs & CAR Routes in relation to Deviation 1 of the *Pluto-Mahikeng 400kV Power Line*

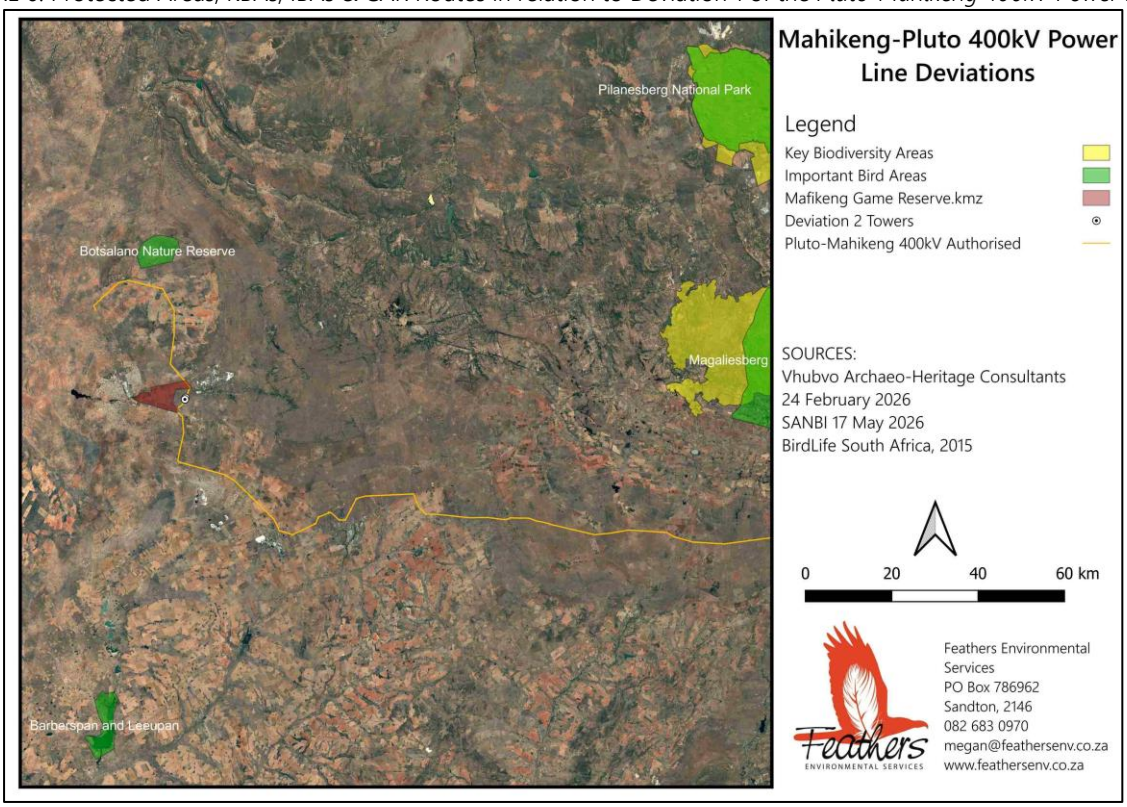


FIGURE 7: Protected Area, KBAs, IBAs in relation to Deviation 2 of the *Pluto-Mahikeng 400kV Power Line*

7.2.4 South African Bird Atlas Project 2 Data

A combined total of 238 bird species were recorded within the relevant Deviation 1 and Deviation 2 pentads during the SABAP2 atlassing period to date (APPENDIX 1). Of the 238 recorded species, 65 species are identified as power line-sensitive, largely comprising large terrestrial birds, raptors, and wetland-associated species, all of which are known to be vulnerable to collisions with overhead power line cables and earthwires. Eleven are classified as SCC (Lee et al., 2025), with a further ten listed as Near Threatened. Each power line sensitive species' potential for occurring in a specific habitat class is indicated in TABLE 5, in addition to the type of impact that could potentially affect each species, specific to the location of this project.

The 2018 avifaunal assessment recorded an average of 221 species across the entire project area and 31 regional and/or global Red List species within the relevant quarter degree squares. However, comparisons between SABAP2 pentad data and earlier quarter degree square-based datasets should be made with caution due to differences in spatial scale, survey effort, and atlas methodologies between SABAP1 and SABAP2 datasets. The absence of 12 Red List species previously recorded in the 2018 assessment from current SABAP2 pentad records does not necessarily indicate true absence from the area, but may reflect variability in detectability, seasonal coverage, or incomplete sampling. Overall, the combined datasets confirm that a meaningful proportion of the regional avifauna, including multiple SCC and collision-prone species, continues to occur within or traverse the proposed deviations. This supports the continued applicability of the 2018 assessment findings, particularly with respect to avifaunal sensitivity and collision risk associated with overhead transmission infrastructure in open natural landscapes.

7.2.5 Coordinated Waterbird Count Sites

A Coordinated Waterbird Count (CWAC) site is any body of water, other than the oceans, which supports a significant number (typically ~500 individual waterbirds, irrespective of species composition) of birds utilising the site for feeding, breeding, and/or roosting (Harrison et al., 2004). This definition includes natural systems such as pans, vleis, marshes, lakes and rivers, as well as artificial impoundments (e.g. sewage works). There are no CWAC sites located within the confines of the *Pluto-Mahikeng 400kV Power Line* deviations; however, four CWAC sites occur within approximately 25km of the proposed Deviation 1 (FIGURE 6). The significance of these sites reinforces the importance of the surrounding landscape for supporting high concentrations of waterbirds, including SCC.

CWAC sites were not explicitly considered as a spatial layer in the 2018 avifaunal assessment. However, the waterbird and associated SCC recorded at these sites were already encompassed within the broader species-level datasets and regional occurrence information used to inform the original assessment.

7.2.6 Coordinated Road Count Routes

Cranes, bustards, storks and other large birds that spend most of their time on the ground, need wide, open spaces and are certainly not restricted to protected areas. Agricultural habitats are used extensively for feeding, roosting and breeding, often because no natural, pristine habitats are available, and sometimes because the agricultural habitats are especially attractive to birds. The Coordinated Avifaunal Roadcounts (CAR) project monitors the populations of 36 species of large terrestrial birds in agricultural habitats, in addition to gamebirds, raptors and corvids along 350 fixed routes covering over 19 000km. Although CAR counts do not give an absolute count of all the individuals in a population, they do provide a measure of relative abundance in a particular area. CAR routes GC01, GC02 and GC03 occur within 20km of Deviation 1 of the *Pluto-Mahikeng 400kV Power Line* (FIGURE 6).

Notable SCC observations along the GC02 route include Secretarybird and Black Harrier *Circus maurus* as well as White Stork *Ciconia ciconia* protected internationally under the Bonn Convention on Migratory Species. SCC observations along the GC01 and GC03 routes included Secretarybird, African Marsh Harrier *Circus ranivorus,* White-bellied Korhaan and Yellow-billed Stork *Mycteria ibis*, in addition to internationally protected White Stork. The more common Helmeted Guineafowl *Numida meleagris*, Spur-winged Goose *Plectropterus gambensis*, Black-headed Heron *Ardea melanocephala* and Northern Black Korhaan *Afrotis afraoides* were all recorded regularly and in large numbers along each of the routes, all of which are considered collision-susceptible species due to their size, flight behaviour, and use of open landscapes.

While the 2018 avifaunal assessment did not include a dedicated evaluation of the aforementioned CAR routes, it is confirmed that data derived from this dataset was incorporated into the broader species occurrence and sensitivity analysis undertaken for the project. The continued presence of these SCC along the proposed deviations reinforces the relevance of the original findings, particularly with regard to collision risk within open grassland and agricultural landscapes traversed by the authorised infrastructure.

7.2.7 iNaturalist Biodiversity Data

iNaturalist data refers to biodiversity occurrence records generated through the iNaturalist platform, a global, crowdsourced system where users upload georeferenced observations (often with photographs or audio) of organisms. These records are typically identified through a combination of community verification and expert input, and are used to document species presence and distribution at local to global scales.

White-backed Vulture is the only SCC recorded within the available iNaturalist dataset for the proposed deviation routes, with records concentrated along Deviation 2. The absence of SCC records within this dataset does not necessarily confirm the absence of such species from the area, but it does indicate a lack of documented observations for the proposed alignment based on currently available citizen science records.

7.2.8 Vulture Colonies, Nest Locations & Roosts

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). Six of South Africa's vultures are threatened, so their conservation through a variety of mechanisms is an absolute must.

Vulture occurrence within the North West Province is centred primarily around extensive savanna, agricultural and game farming landscapes that provide suitable foraging habitat, with particularly important breeding and roosting areas associated with the Magaliesberg mountain range and within the western and central bushveld and thornveld regions. Situated to the north and east of proposed deviations, the Magaliesberg represents one of the most important vulture breeding landscapes in South Africa, with the quartzite cliffs supporting historically significant Cape Vulture breeding colonies at Skeerpoort and Nooitgedacht that have been monitored for several decades. The Magaliesberg population remains regionally important, with birds known to forage widely across the North West Province, often travelling hundreds of kilometres from nesting sites in search of food.

The province also supports breeding populations of White-backed Vulture, particularly within the Mareetsane regions (>40km west of Deviation 2). Historical and contemporary breeding localities include Mahikeng (formerly Mafikeng), Zeerust, Vryburg, Stella, Madikwe and other areas of the province. Recent surveys undertaken by conservation organisations recorded more than 160 active White-backed Vulture nests at selected sites within the province, further confirming the regional importance of the area for vulture conservation and supporting the likelihood of vulture movement through the broader landscape.

Established vulture roosts were recorded on the existing transmission powerline infrastructure adjacent to the proposed Deviation 1 alignment (FIGURE 8), while a smaller number were observed on the existing 88kV powerline near Deviation 2 (FIGURE 9). Collectively, these records demonstrate the importance of the broader corridor for vulture movement, roosting, and associated behavioural activities. The regular utilisation of existing towers by vultures indicates that the area already forms part of an active and established power line environment to which birds have become habituated over time. From an avifaunal impact perspective, this highlights the sensitivity of further power line development within the area, particularly in relation to collision risk, disturbance of established roosting behaviour, and the cumulative effects associated with multiple linear infrastructure corridors. Importantly, these roosting observations and their associated risks were identified and assessed as part of the initial 2018 avifaunal survey and impact assessment process. As such, the current assessment does not introduce new impact pathways or materially alter the findings of the original study, but rather confirms the continued ecological importance of the area for vultures and reinforces the need for appropriate mitigation and monitoring measures associated with any additional infrastructure development.

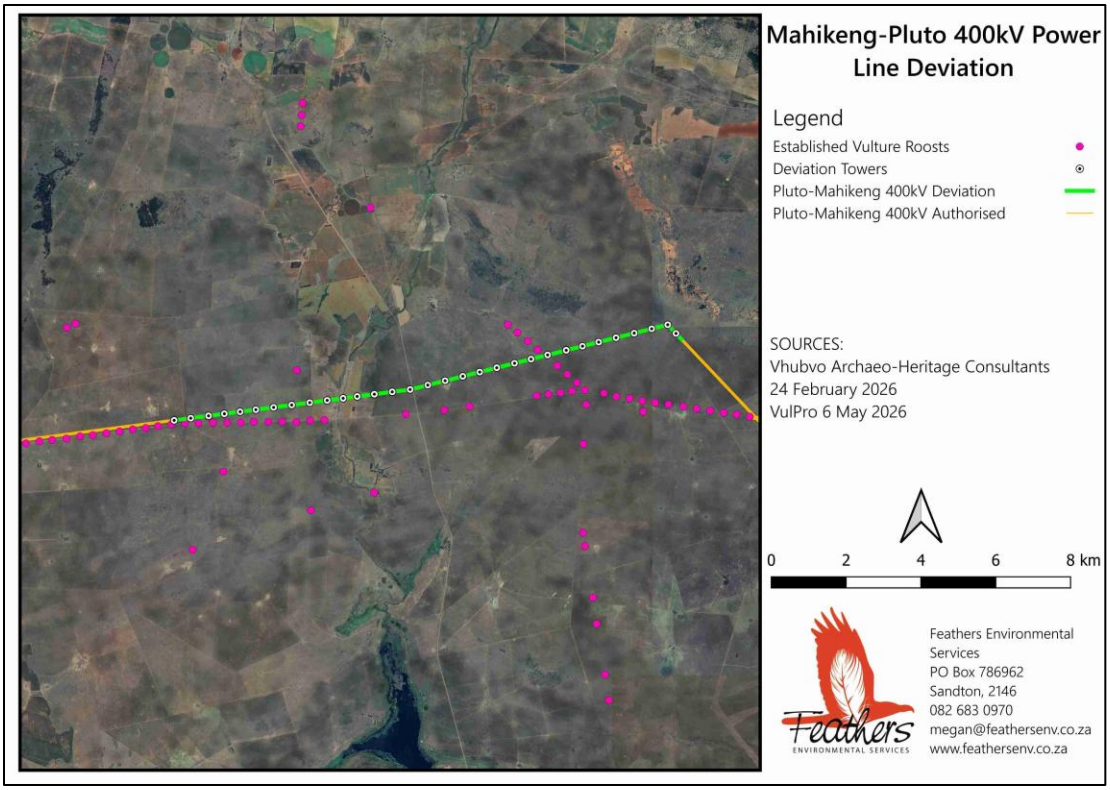


FIGURE 8: Established vulture roosts in relation to Deviation 1 of the authorised *Pluto-Mahikeng 400kV Power Line*

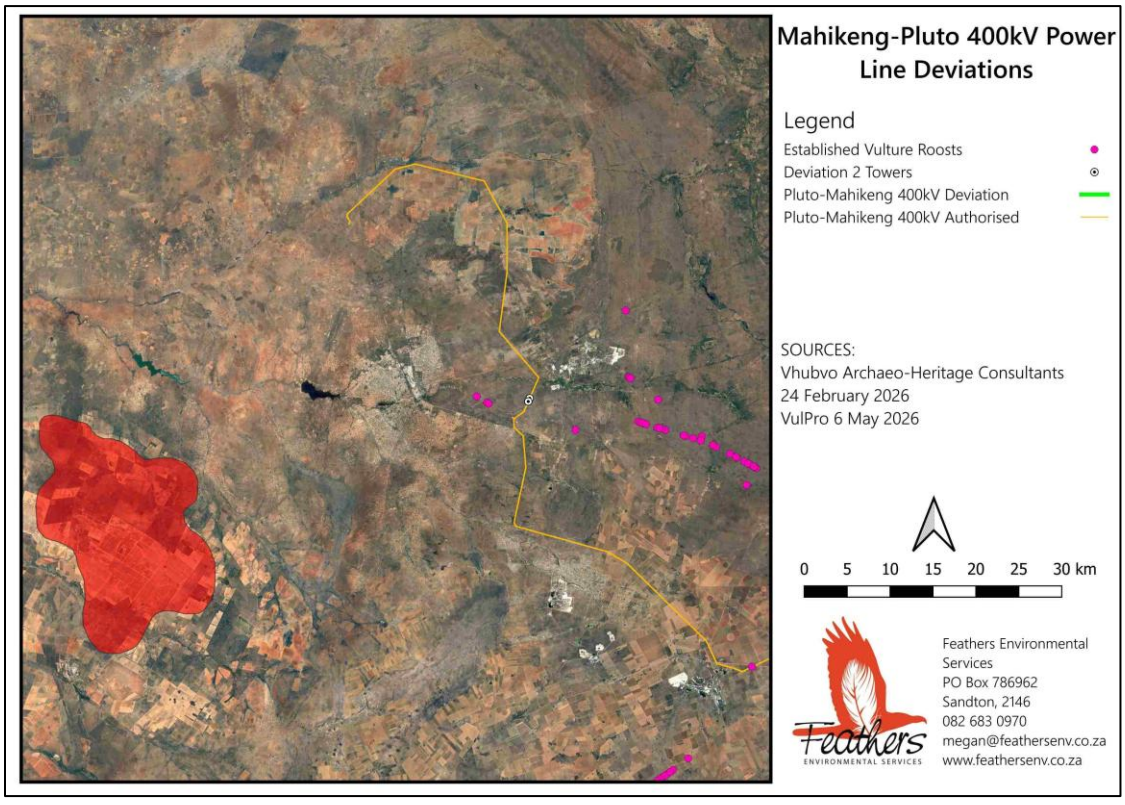


FIGURE 9: Established vulture nests & roosts in relation to Deviation 2 of the *Pluto-Mahikeng 400kV Power Line*

7.2.9 Survey Observations (Primary Data)

A site-specific walk down of the authorised *Pluto-Mahikeng 400kV Power Line* including the proposed deviations was conducted over a nine-day period from 16-26 March 2026. To describe the avifaunal community present, a concerted effort was made to sample the avifauna in all the primary habitats that were available along the authorised route alignment and proposed deviations. All species encountered (observed and heard) during the walk down were noted and are indicated (highlighted in grey) in APPENDIX 1.

The site visit yielded a total of 63 bird species, including a two SCC, namely Cape Vulture and White-backed Vulture and two Near Threatened species i.e. Black-winged Kite *Elanus caeruleus* and Yellow-billed Duck *Anas undulata*. The avifaunal community was dominated by common passerines and larger terrestrial species typically associated with the broader assessment area. Notable observations included Amur Falcon *Falco amurensis*, a Palearctic migrant occurring in southern Africa during the non-breeding season. These records reflect the seasonal and opportunistic use of the landscape by both resident and migratory raptors.

TABLE 5: Annotated list of regional priority species that have been recorded in the relevant *Pluto-Mahikeng 400kV Power Line* deviations SABAP2 pentads

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Priority Species	Recorded during Surveys	River	Bushveld	Grassland	Cultivation	TX Power Lines	Power Line Collision	Displacement: Habitat Transformation	Displacement: Disturbance
African Black Duck	Anas sparsa	0.0	0.7	-	LC	x		x					x		x
African Darter	Anhinga rufa	0.0	0.7	-	NT	x		x					x		x
African Fish Eagle	Haliaeetus vocifer	2.6	0.0	-	LC	x		x							x
African Harrier-Hawk	Polyboroides typus	0.0	0.7	-	-	x			x	x				x	x
African Marsh Harrier	Circus ranivorus	1.3	0.0	-	VU	x				x				x	x
African Sacred Ibis	Threskiornis aethiopicus	10.4	3.7	-	-	x	x	x			x		x	x	x
African Spoonbill	Platalea alba	3.9	0.7	-	-	x		x					x		x
Amur Falcon	Falco amurensis	13.0	5.2	-	-	x	x		x	x				x	
Black Heron	Egretta ardesiaca	7.8	1.5	-	LC	x		x					x		x
Black Kite	Milvus migrans	1.3	0.0	-	-	x			x	x				x	
Black Sparrowhawk	Accipiter melanoleucus	1.3	0.7	-	-	x		riparian	x	x	x			x	x
Black-chested Snake Eagle	Circaetus pectoralis	3.9	0.7	-	-	x			x	x				x	x
Black-headed Heron	Ardea melanocephala	27.3	8.1	-	LC	x	x		x	x	x		x	x	x
Black-winged Kite	Elanus caeruleus	33.8	7.4	-	NT	x	x		x	x	x	x		x	x
Blue-billed Teal	Spatula hottentota	1.3	0.7	-	LC	x		x					x		x
Brown Snake Eagle	Circaetus cinereus	1.3	2.2	-	-	x			x	x				x	x
Cape Crow	Corvus capensis	16.9	5.9	-	-	x			x	x	x	x		x	x
Cape Vulture	Gyps coprotheres	22.1	8.9	EN	VU	x	x		x	x		x	x		x
Common Buzzard	Buteo buteo	11.7	3.7	-	-	x			x	x				x	
Common Moorhen	Gallinula chloropus	2.6	0.0	-	-	x		x							x
Egyptian Goose	Alopochen aegyptiaca	16.9	4.4	-	LC	x		x					x	x	x
Gabar Goshawk	Micronisus gabar	2.6	0.7	-	-	x		riparian	x	x				x	x
Glossy Ibis	Plegadis falcinellus	5.2	2.2	-	-	x				x	x		x	x	x
Goliath Heron	Ardea goliath	1.3	0.0	-	-	x		x					x		x
Great Crested Grebe	Podiceps cristatus	1.3	0.0	-	VU	x		x					x		x
Great Egret	Ardea alba	6.5	1.5	-	NT	x		x					x		x
Greater Kestrel	Falco rupicoloides	15.6	1.5	-	-	x	x		x	x	x	x		x	x
Grey Heron	Ardea cinerea	7.8	3.0	-	LC	x		x					x		x
Hadada Ibis	Bostrychia hagedash	53.2	14.8	-	-	x	x	x	x	x	x	x	x	x	x
Hamerkop	Scopus umbretta	3.9	1.5	-	NT	x		x					x		x
Helmeted Guineafowl	Numida meleagris	49.4	9.6	-	-	x	x		x	x	x	x		x	x
Knob-billed Duck	Sarkidiornis melanotos	2.6	0.0	-	NT	x		x					x		x
Lappet-faced Vulture	Torgos tracheliotos	2.6	0.7	EN	CR	x			x	x		x	x	x	x
Lesser Kestrel	Falco naumanni	3.9	0.0	-	VU	x			x	x	x	x		x	

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Priority Species	Recorded during Surveys	River	Bushveld	Grassland	Cultivation	TX Power Lines	Power Line Collision	Displacement: Habitat Transformation	Displacement: Disturbance
Little Egret	Egretta garzetta	7.8	3.7	-	-	x		x					x		x
Little Grebe	Tachybaptus ruficollis	3.9	0.0	-	LC	x		x					x		x
Marsh Owl	Asio capensis	1.3	0.0	-	NT	x				x	x		x	x	x
Martial Eagle	Polemaetus bellicosus	1.3	0.0	EN	EN	x			x	x		x		x	x
Northern Black Korhaan	Afrotis afraoides	70.1	15.6	-	-	x	x		x	x	x		x	x	x
Ovambo Sparrowhawk	Accipiter ovampensis	2.6	0.0	-	-	x			x	x				x	x
Pale Chanting Goshawk	Melierax canorus	5.2	5.2	-	-	x			x	x		x		x	x
Pied Crow	Corvus albus	67.5	8.9	-	-	x	x		x	x	x	x		x	x
Purple Heron	Ardea purpurea	6.5	2.2	-	LC	x		x					x		x
Red-billed Teal	Anas erythrorhyncha	10.4	3.7	-	NT	x		x					x		x
Red-crested Korhaan	Lophotis ruficrista	1.3	0.0	-	-	x			x	x			x	x	x
Red-knobbed Coot	Fulica cristata	5.2	0.0	-	LC	x	x	x					x		x
Reed Cormorant	Microcarbo africanus	11.7	3.7	-	-	x	x	x					x		x
Rock Kestrel	Falco rupicolus	0.0	0.7	-	-	x				x				x	x
Saddle-billed Stork	Ephippiorhynchus senegalensis	1.3	0.0	-	EN	x		x					x		x
Secretarybird	Sagittarius serpentarius	2.6	0.0	EN	VU	x			x	x			x	x	x
Shikra	Accipiter badius	1.3	0.0	-	-	x			x	x				x	x
South African Shelduck	Tadorna cana	14.3	2.2	-	LC	x		x					x		x
Southern Pochard	Netta erythrophthalma	1.3	0.0	-	NT	x		x					x		x
Spotted Eagle-Owl	Bubo africanus	1.3	0.0	-	-	x			x	x	x		x	x	x
Spur-winged Goose	Plectropterus gambensis	14.3	2.2	-	LC	x		x			x	x	x	x	x
Squacco Heron	Ardeola ralloides	3.9	1.5	-	-	x		x					x		x
Western Barn Owl	Tyto alba	1.3	0.0	-	-	x			x	x	x		x	x	x
Western Cattle Egret	Bubulcus ibis	44.2	29.6	-	LC	x	x		x	x	x		x	x	x
White-backed Vulture	Gyps africanus	3.9	1.5	CR	CR	x	x		x	x		x	x	x	x
White-bellied Korhaan	Eupodotis senegalensis	3.9	0.0	-	VU	x				x			x	x	x
White-breasted Cormorant	Phalacrocorax lucidus	0.0	0.7	-	-	x		x					x		x
White-faced Whistling Duck	Dendrocygna viduata	5.2	0.7	-	LC	x		x					x		x
Yellow-billed Duck	Anas undulata	14.3	2.2	-	NT	x	x	x					x		x
Yellow-billed Egret	Ardea brachyrhyncha	3.9	1.5	-	NT	x		x					x		x
Yellow-billed Stork	Mycteria ibis	1.3	0.0	-	VU	x		x					x		x

7.3 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 *Mahikeng–Pluto 400kV Power Line* route deviations revealed five broadly described avifaunal micro habitats i.e. rivers, bushveld, grassland, agriculture and high voltage power lines. APPENDIX 2 provides a photographic record of the bird habitats. These habitat types are consistent with those identified in the initial 2018 avifaunal assessment.

7.3.1. Rivers

Rivers function as important linear corridors of microhabitat for avifauna, providing drinking water, foraging opportunities, bathing sites and cover for skulking and riparian-associated species. Within the context of this assessment, the proposed Deviation 1 traverses the Mooi River thereby introducing a potential interaction point between infrastructure and river associated avifauna. Riparian habitat associated with the Mooi River provides an important movement and foraging corridor for a range of avifaunal species within the region, particularly water-associated birds. The well-developed woody riparian vegetation contributes to increased habitat heterogeneity and niche availability, thereby supporting elevated local avifaunal diversity, including a variety of bushveld-associated species. Vegetation along the river is characterised by a prominent woody component dominated by dense stands of *Vachellia karroo* and *Asparagus laricinus*. In terms of SCC, the river may support the Saddle-billed Stork *Ephippiorhynchus senegalensis* and Yellow-billed Stork recorded in the area, but is more likely to support Hamerkop *Scopus umbretta*, Great Egret *Ardea alba,* Yellow-billed Egret *Ardea brachyrhyncha*, Red-billed Teal *Anas erythrorhyncha* and Yellow-billed Duck *Anas undulata* in addition to a diversity of the more common water-dependent power-line priority species.

7.3.2. Bushveld

Deviation 2 is situated within the Stella Bushveld vegetation type, characterised by open savanna comprising mixed grassland interspersed with scattered Acacia (*Vachellia and Senegalia*) trees and shrubs. This habitat provides suitable foraging, nesting, and roosting opportunities for a diverse assemblage of bushveld and grassland-associated bird species. Scattered trees serve as important perching and vantage sites for raptors and other aerial predators, while the well-developed grass layer supports granivorous, insectivorous, and terrestrial species through the availability of seeds, invertebrates, and small vertebrate prey. The mosaic of open grassland and woody vegetation is characteristic of the Kalahari Bushveld and supports a representative avifaunal community, including larks, chats, shrikes, finches, waxbills, korhaans, and a range of raptor species. Although portions of the habitat have been modified by existing infrastructure and historical land use, the

Stella Bushveld within the study area retains ecological functionality and contributes to habitat connectivity and foraging resources for both resident and seasonally occurring bird species.

7.3.3. Grassland

Deviation 1 is located entirely within the Carletonville Dolomite Grassland vegetation unit, characterised by species-rich, undulating grassland systems occurring on dolomitic substrates. The Grassland Biome is recognised as one of the most important avifaunal regions in South Africa, supporting approximately 350 of the country's 841 bird species, including 29 Red List species, ten endemics and numerous specialist species that are highly dependent on intact grassland habitat.

Of particular significance within the study area is the presence of suitable habitat for the endemic Melodious Lark *Mirafra cheniana*, a species strongly associated with open, lightly disturbed grassland systems. The habitat further supports several terrestrial Species of Conservation Concern (SCC), including White-bellied Korhaan and Secretarybird, both of which are sensitive to habitat transformation and increasing infrastructure development within remaining grassland landscapes. Grassland floodplain areas associated with the Mooi River may also provide suitable habitat for species such as Lesser Kestrel *Falco naumanni*, African Marsh Harrier and Marsh Owl *Asio capensis*. In addition, these grassland areas provide favourable foraging habitat for game bird species including francolins, spurfowl and Helmeted Guineafowl *Numida meleagris*, which may in turn attract larger predatory raptors such as Martial Eagle due to the availability and accessibility of prey resources.

7.3.4. Cultivated Lands

Cultivated or arable land can represent an important foraging resource for a range of bird species across landscapes, primarily because soil disturbance during land preparation exposes insects, seeds, bulbs and other food items that become readily accessible to avifauna. In addition, cultivated crops and pasture species may themselves be directly utilized by birds, or may attract invertebrates that are subsequently exploited as a food source. Although cultivation results in a complete transformation of the original vegetation structure, certain bird species do benefit from this land-use change, particularly those adapted to open or disturbed environments. Relevant to Deviation 1, the cultivated lands are not extensive and are largely confined to the Mooi River area. From a conservation perspective, Lesser Kestrel is the primary SCC likely to utilise cultivated areas within the assessment area. In addition, these habitats may attract other lower conservation concern species including Black-winged Kite and Marsh Owl as well as a range of opportunistic foragers such as Black-headed Heron *Ardea melanocephala*, Common Buzzard *Buteo buteo*, Hadeda Ibis *Bostrychia hagedash*, Helmeted Guineafowl, and Western Cattle Egret *Bubulcus ibis*, all of which are known to exploit freshly ploughed fields and fallow lands for feeding opportunities.

7.3.5. High Voltage Power Lines

High voltage lines are treated as a distinct bird habitat because they serve as an important roosting substrate for some species, particularly vultures, in the assessment area.

TABLE 5 details the micro habitats that the power line sensitive bird species (recorded by SABAP2) will typically frequent within the development area. 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 5 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.

7.4 Sensitivity Determination

Based on the range of habitats present within the assessment area, including rivers, bushveld and grasslands as well as the proximity of regionally important avifaunal areas i.e. vulture roosts, the DFFE screening sensitivity of HIGH and MEDIUM is considered appropriate and defensible. Areas of HIGH sensitivity are supported by the confirmed and likely presence of SCC, particularly large-bodied and power line-vulnerable species such as Cape Vulture and White-backed Vulture as well as the likely presence of Lappet-faced Vulture, Secretarybird, White-bellied Korhaan and various water-dependent species, in combination with habitat features that facilitate their use of the landscape (e.g. Mooi River, open grassland and vulture roost sites).

In contrast, areas classified as MEDIUM sensitivity are primarily informed by the availability of suitable habitat for SCC based on historical records, rather than confirmed recent occurrences. The assessment area retains ecological characteristics that may support SCC intermittently or opportunistically, even if such species were not recorded during recent surveys. Collectively, this reflects a landscape that supports both confirmed and potential SCC presence, thereby justifying the assigned HIGH and MEDIUM sensitivity ratings within the development area.

8. 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. With so many variables involved, the impacts of each development must be assessed individually. Each of these potential effects can interact, either increasing the overall impact on birds or, in some cases, reducing a particular impact

(for example where habitat loss and disturbance cause a reduction in birds using an area which may then reduce the risk of collision). The principal areas of concern for SCC and non-SCC power line sensitive species are:

8.1 Construction Phase

8.1.1. Displacement: habitat loss or transformation

Habitat transformation is an unavoidable consequence of power line construction, primarily associated with the establishment of tower footprints and access tracks. The significance of this impact depends on factors such as the location and scale of infrastructure, the extent and uniqueness of affected habitat, and the sensitivity and conservation status of species utilising the area. Relevant to the proposed *Pluto-Mahikeng 400kV Power Line* deviations, disturbance will be largely confined to tower positions and narrow access routes, resulting in a relatively small overall footprint. While some localised loss of foraging, roosting, or breeding habitat may occur, leading to temporary or permanent displacement, these impacts are expected to be limited in extent.

8.1.2. Displacement as a result of disturbance

Excavation and construction activities associated with the proposed *Pluto-Mahikeng 400kV Power Line* route deviations will introduce elevated levels of disturbance, primarily due to the presence of machinery, increased human activity, and associated noise over the construction period. For most bird species, this is expected to result in temporary disruption to normal behaviours such as foraging and roosting. In more sensitive cases, particularly where disturbance coincides with critical breeding periods, there is potential for reduced breeding success, including temporary breeding failure or, in extreme instances, nest abandonment.

Construction activities associated with the authorised power line along the proposed deviations are likely to result in the temporary disturbance and displacement of priority species, particularly vultures known to utilise the existing 88kV and transmission power line infrastructure within the area for roosting purposes. Given that Deviation 1 will be located adjacent to two existing transmission power lines and one distribution power line, construction-related noise, increased human presence, vegetation clearing and vehicle movement may reduce the suitability of currently utilised roosting structures during the construction period. This may result in vultures redistributing to adjacent towers and concentrating in higher numbers on remaining available roost sites. Such congregation behaviour could consequently increase the risk of collision with overhead conductors, particularly during take-off and landing movements under low light or poor weather conditions, while also elevating the potential for electrocution on the adjacent distribution line, which typically presents a higher electrocution risk due to reduced conductor clearances and pole-top configurations. While these impacts are expected to be largely temporary and localised to the construction phase, the sensitivity of vultures to disturbance and their

reliance on existing roosting infrastructure necessitate the implementation of appropriate mitigation measures to minimise displacement and associated secondary mortality risks.

8.1.3. 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.

8.2 Operational Phase

8.2.1. Mortality due to collisions with the 400kV 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, various species of waterbirds and roosting vultures. These species are mostly heavy-bodied birds with limited maneuverability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines (van Rooyen 2004, Anderson 2001). Unfortunately, many of the collision sensitive species are considered threatened in southern Africa. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because several 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 10 below – Eskom, 2021). This only gives a measure of the general susceptibility of the species to power line collisions, and not an absolute measurement for any specific line.

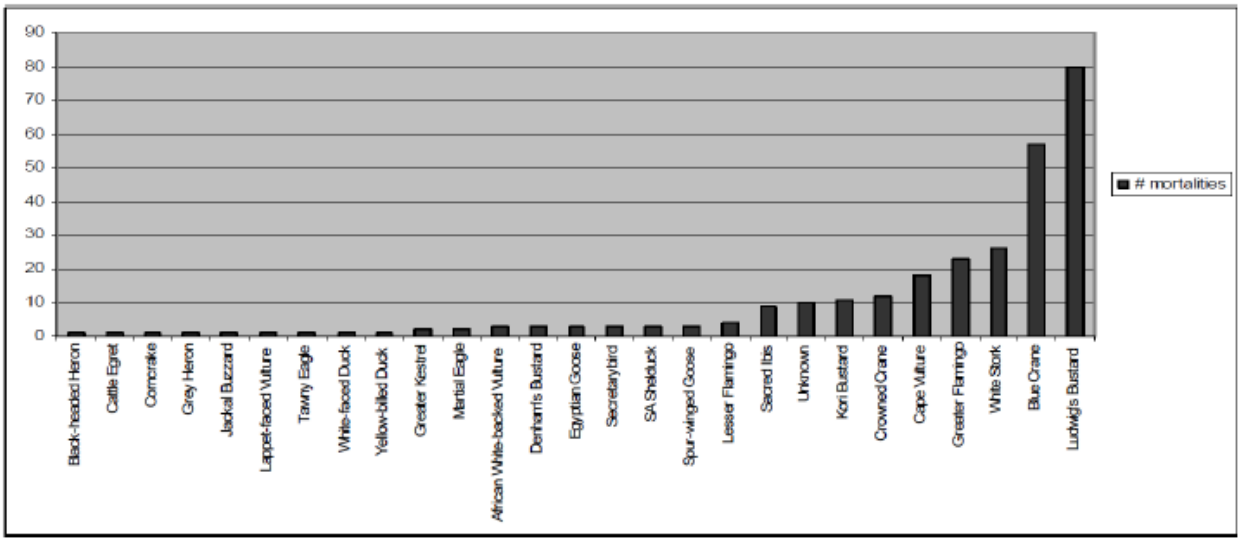


FIGURE 10: Number of reported collisions per species on transmission power lines documented in the Eskom/EWT Strategic Partnership central incident register 1996 - 2021 (Eskom, 2021)

Relevant to this power line development within the route deviations, collisions are likely to be linked to specific habitat types and/or specific sets of circumstances. The Mooi River, grassland habitat and vulture roosts present themselves as collision scenarios within the authorised development area. The species most likely to be at risk of collision with the authorised power line within the proposed route deviations include White-backed Vulture, Cape Vulture, Lappet-faced Vulture, Secretarybird and White-bellied Korhaan. A significant portion of the Deviation 1 is located adjacent to the Hera-Watershed 275kV and Pluto-Watershed 275kV power lines. While the parallel routing of the authorised power line with existing infrastructure is advantageous from a cumulative impact perspective and may partially mitigate collision risk through increased overall visibility (APLIC 2012; Sundar & Choudhury 2005), it does not eliminate risk. Careful consideration must be given to the differences in structural design and height of the conductors.

8.2.2. Impact on the quality of the electrical supply

Although not a primary focus of this assessment, it is important to acknowledge that avifauna may also impact the authorised power line infrastructure along the proposed deviations. Power line structures can provide additional roosting and nesting opportunities for certain species, particularly in landscapes where natural substrates are limited. While this may be beneficial for some birds, it can also increase the likelihood of bird-related faults. Bird streamers and general fouling can occur when birds perch and defecate on towers, sometimes directly above live conductors, which may result in electrical faults. An increased frequency of such faults can affect the reliability of power supply to end users. Should this become an issue post-construction, site-specific mitigation measures can be implemented on a reactive basis.

In addition, bird nesting behaviour can pose a risk to infrastructure. Nest material may encroach into the air gap between live components, increasing the likelihood of flashovers. Species such as crows are known to incorporate conductive materials, including wire, into their nests, which can exacerbate this risk. In some cases, flashovers may ignite nest material, potentially leading to equipment damage or veld fires, with associated repair costs and possible liability for damages. In areas where vultures are prevalent, the installation of bird guards on in-line and strain self-supporting structures can assist in reducing these risks.

9. IMPACT SIGNIFICANCE

A quantitative methodology was used to describe, evaluate, and rate the significance of the impacts associated with the construction and operation of the *Pluto-Mahikeng 400kV Power Line* along the proposed route deviations. This assessment is presented in tabular format below (TABLES 6 - 8) for both pre- and post-mitigation according to set criteria described in APPENDIX 3.

TABLE 6: Assessment of the displacement impact associated with habitat loss and/or transformation caused by the construction of the authorised 400kV power line within the proposed deviation routes

Activity:	Construction of the 400kV power line				
Impact:	Displacement of SCC and non-SCC priority species as a result of habitat loss & transformation				
Significance rating:	Probability	Duration	Scale	Magnitude	Significance
Pre-Mitigation	2	3	1	6	20 LOW
Post-Mitigation	2	3	1	2	12 NEGLIGIBLE
Is the Impact Reversible?	2 – Partly Reversible				
Residual impacts:	Species are likely return once the construction activity is completed and the vegetation reestablishes itself.				

TABLE 7: Assessment of the disturbance impact caused by the construction of the authorised 400kV power line within the proposed deviation routes

Activity:	Construction of the 400kV power line				
Impact:	Displacement of SCC and non-SCC priority species as a result of disturbance				
Significance rating:	Probability	Duration	Scale	Magnitude	Significance
Pre-Mitigation	4	1	2	8	44 MODERATE
Post-Mitigation	4	1	2	6	32 LOW
Is the Impact Reversible?	2 – Partly Reversible				
Residual impacts:	Most species observed in the assessment area are likely to return once the construction activity is completed				

TABLE 8: Assessment of mortality due to collision with the 400kV power line conductors/earthwires within the proposed deviation routes

Activity:	Operation of the 400kV power line				
Impact:	Mortality of SCC and non-SCC priority species due to collision with the 400kV power line conductors/earthwires				
Significance rating:	Probability	Duration	Scale	Magnitude	Significance
Pre-Mitigation	5	4	3	8	75 HIGH
Post-Mitigation	2	4	3	6	26 LOW
Is the Impact Reversible?	2 – Partly Reversible				
Residual impacts:	It is envisaged that mitigation, if required, will reduce but may not eliminate collision mortality.				

Overall, the significance of avifaunal impacts associated with the authorised *Mahikeng–Pluto 400kV Power Line* route deviations remain consistent with the findings and impact interpretation presented in the 2018 assessment. While the 2018 study did not assign quantitative significance ratings to impacts, the significance and anticipated severity of impacts were clearly articulated within the narrative assessment. The conclusions reached in that assessment remain applicable, largely because there have been no material changes to the fundamental habitat composition, ecological functioning or avifaunal assemblage within the assessment area since the original study was undertaken.

Furthermore, there is no evidence that new high-sensitivity species have established within the development area in a manner that would materially alter the original impact interpretation. Updated datasets considered as part of the current assessment continue to confirm the persistence, or continued potential presence, of the same key collision-prone and disturbance-sensitive species identified in 2018. Importantly, the spatial configuration of the authorised infrastructure remains largely unchanged, with similar exposure to open habitats and existing linear disturbance features. On this basis, the impact conclusions and significance interpretation provided in the 2018 avifaunal impact assessment are still considered valid, and no material revision to the significance of impacts is warranted.

10. CUMULATIVE IMPACT

Cumulative impact refers to the combined effect of past, present, and reasonably foreseeable future activities, considered together with the impacts of the authorised development. In the context of avifaunal interactions with power line infrastructure, cumulative impacts are particularly relevant, as collision risk is known to increase where multiple linear structures occur within the same landscape, effectively increasing the probability of bird–infrastructure interactions over time. The purpose of this assessment is therefore to determine whether the addition of the authorised *Pluto-Mahikeng 400kV Power Line* route deviations materially increases existing avifaunal risk within the broader landscape. The *Mahikeng–Pluto 400kV Power Line* route deviations are approximately 14km (Deviation 1) and 40m (Deviation 2) in length and form part of the authorised *Mahikeng–Pluto 400kV Power Line* and an already well-established transmission network within the region (30km radius), which includes existing high-voltage, medium-voltage, and distribution infrastructure extending across a wide area (FIGURE 11 and 12). The landscape remains sensitive to cumulative avifaunal impacts, particularly for collision-prone SCC such as large terrestrial species, vultures, raptors and water-dependent species which move across wide ranges and are vulnerable to multiple infrastructure interactions. While the addition of a single power line does not in itself result in unacceptable cumulative impact, it contributes incrementally to an already present risk profile associated with overhead transmission infrastructure in open landscapes.

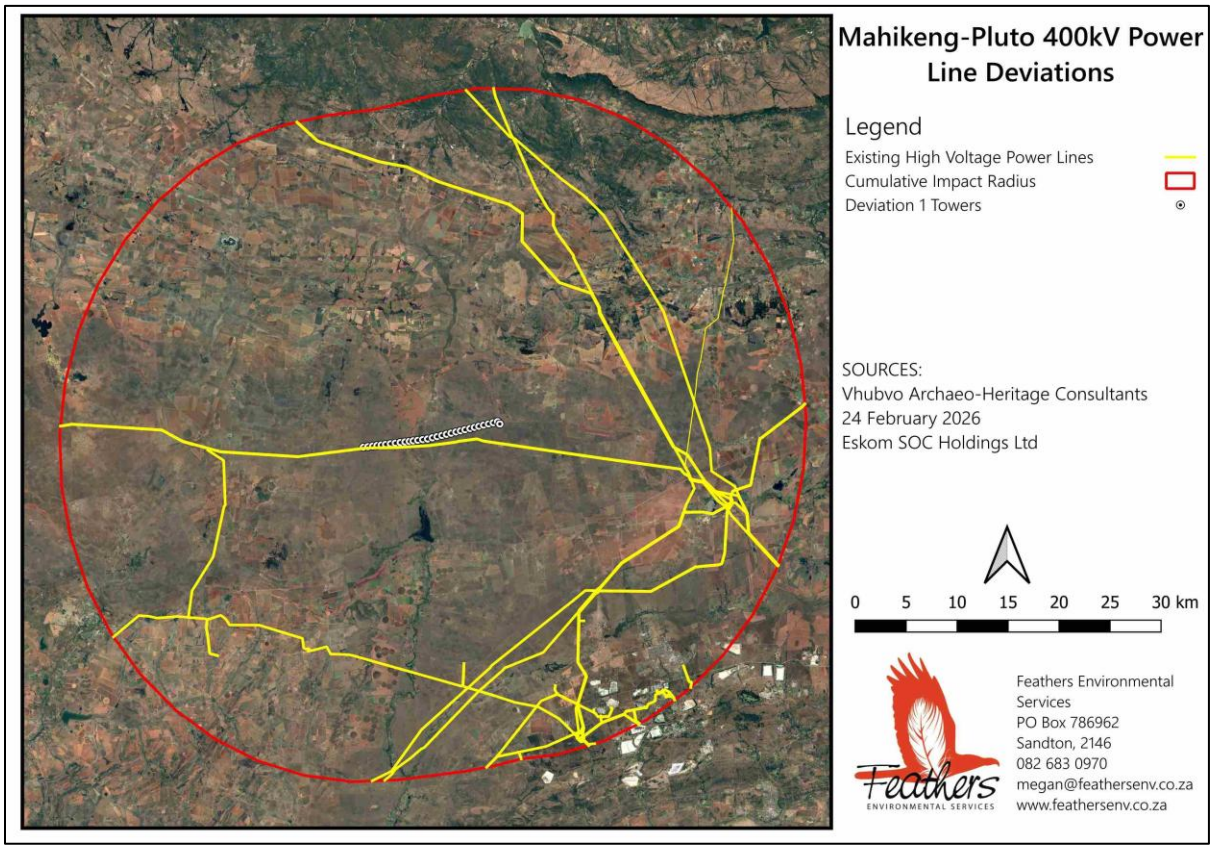


FIGURE 11: Existing power lines within 30km of Deviation 1 of the authorised *Pluto-Mahikeng 400kV Power Line*.

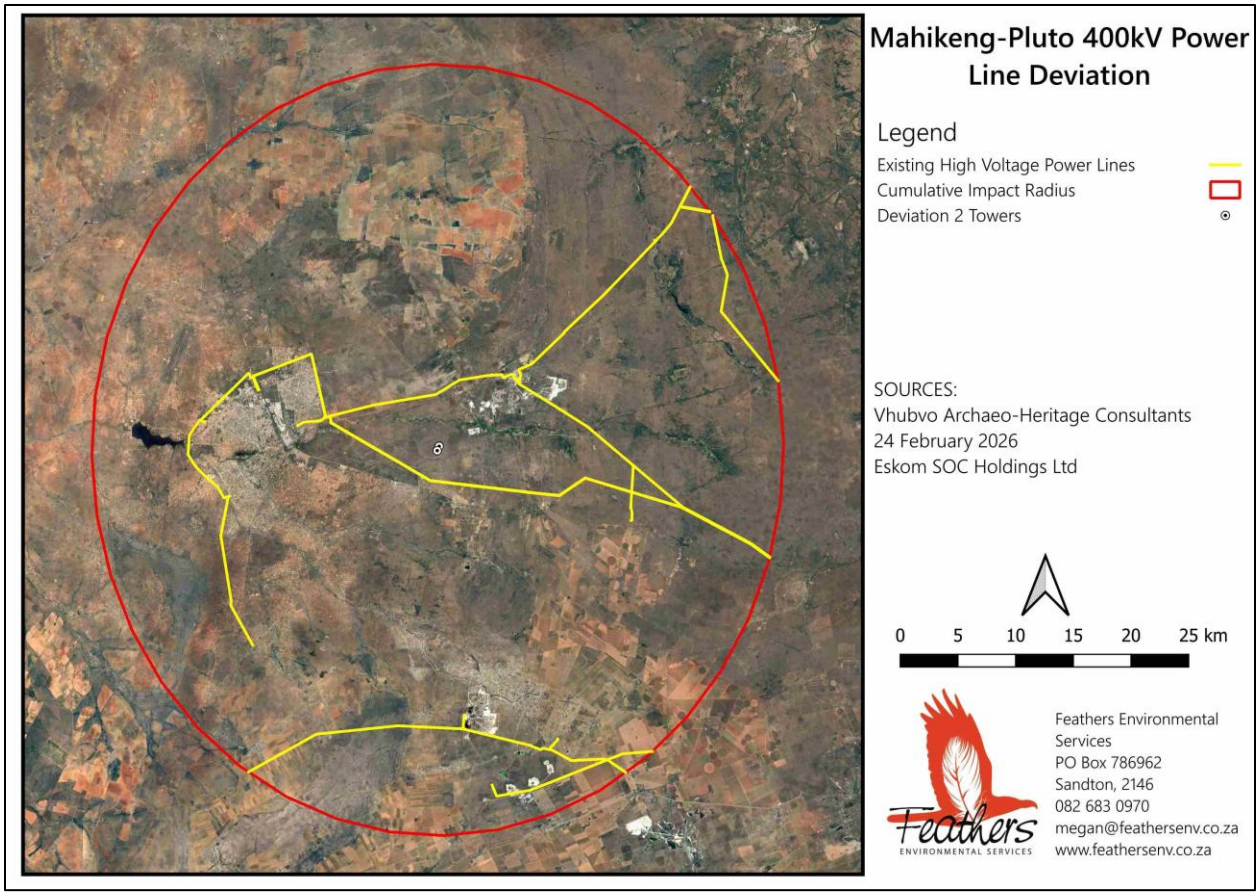


FIGURE 12: Existing power lines within 30km of Deviation 2 of the authorised *Pluto-Mahikeng 400kV Power Line*.

On this basis, the cumulative impact of the authorised *Pluto-Mahikeng 400kV Power Line* route deviations is considered to be MEDIUM in isolation, largely due to alignment within an already influenced corridor, but the broader regional cumulative exposure to high-voltage power lines and similar infrastructure remains HIGH, reflecting the additive nature of risk across the wider landscape rather than the project alone.

11. PROPOSED IMPACT MITIGATION ACTIONS

Based on the anticipated impacts described above, the following recommendations are provided regarding practical mitigation measures for potentially significant impacts that have been included in the site-specific Construction Environmental Management Programme (CEMPr) and Operational Environmental Management Programme (OEMPr) for the authorised *Pluto-Mahikeng 400kV Power Line* dated 15 May 2026, in addition to those existing recommendations contained within the *Generic EMPr for the Development and Expansion of Substation Infrastructure for the Transmission and Distribution of Electricity*.

Site Specific Construction (CEMPr) Recommendations

- It is recommended that Bird Flights Diverters (BFDs) be installed on the earth wires between the towers 491 and 521 (Deviation 1) and towers 110-111 (Deviation 2) as detailed in the *Pluto-Mahikeng 400kV Power Line Mitigation Matrix*, dated 15 May 2026.
- Bird Flight Diverters (BFDs) must be installed ten metres apart, on the earth wires in an alternating black and white/yellow pattern. BFDs must be installed on the entire length of the earth wire span to ensure maximum collision protection for the movement of vultures when roosting on the towers. BFDs must be installed on the earth wires as soon as possible after stringing.
- The installation of bird guards, in accordance with the *Eskom Transmission Bird Perch Guidelines Unique Identifier 41-332*, above the insulator strings of Towers 491 to 521 and Towers 110-111 is highly recommended.
- Should a raptor nest be identified within or in close proximity to the deviation alignments prior to or during construction, all construction activities in the immediate vicinity (500m) must be temporarily halted. The Environmental Control Officer (ECO) must appoint a suitably qualified avifaunal specialist to assess the nest and provide site-specific management recommendations, including appropriate buffer distances and activity restrictions. Implementation of these measures may necessitate a delay or rescheduling of construction activities to avoid disturbance, particularly where the nest is active.
- Avoid removal of sensitive vegetation types. The recommendations of the botanical CEMPr must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
- Construction activity should be restricted to the immediate footprint of the *Mahikeng-Puto 400kV Power Line* infrastructure within the proposed deviation routes. This is especially relevant to vegetation clearing undertaken to facilitate access during construction, which should be carefully managed to prevent inadvertent disturbance or loss of nesting habitat.
- All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
- All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.

Site Specific Operational (OEMPr) Recommendations

- *NTCSA* Line and Servitude Managers are requested to report all bird collisions encountered during routine line patrols of the *Pluto-Mahikeng 400kV Power Line* to the *Eskom-Endangered Wildlife Trust Strategic Partnership,* who will provide additional site-specific mitigation recommendations, if required.

- All Bird Flight Diverters must be maintained for the duration of the operational lifespan of the *Pluto-Mahikeng 400kV Power Line*.
- Should raptor nests be identified during the operational phase, *NTCSA* Line and Servitude Managers must report these to the Environmental Manager, who will in turn notify the *Eskom-Endangered Wildlife Trust Strategic Partnership* for site-specific guidance. Recommendations provided must be implemented, including the delineation of appropriate buffer distances and the postponement/rescheduling of maintenance activities, where required, to prevent disturbance-related nest abandonment or breeding failure.
- While it is not illegal to remove an unoccupied nest that is posing a quality of supply risk, the removal of nests that contain eggs, chicks or adult birds will require a permit to do so. *Eskom* are requested to notify the *Eskom-Endangered Wildlife Trust Strategic Partnership* in these instances to arrange for the translocation or removal of the nest.
- All bird guards should be maintained for the duration of the operational lifespan of the *Pluto-Mahikeng 400kV Power Line*.
- *NTCSA* Line and Servitude Managers are requested to report all bird related faulting on the *Pluto-Mahikeng 400kV Power Line* infrastructure to the *Eskom-Endangered Wildlife Trust Strategic Partnership*, who will provide site-specific mitigation recommendations if required.
- Mitigation requirements detailed in the site specific botanical OEMPr report must be strictly implemented to ensure minimal habitat impact.
- Existing roads must be used as far as possible for access during the operational lifespan of the project.
- All operational activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.

12. PROPOSED MONITORING ACTIONS

NTCSA power line servitude staff to include avifaunal monitoring during routine inspections of the *Pluto-Mahikeng 400kV Power Line* and record the number of mortalities, nesting activity and faecal matter fouling and determine the effectiveness of the mitigation actions taken.

13. ENVIRONMENTAL IMPACT STATEMENT

13.1 Conditions to be included in the Environmental Authorisation

In conclusion, the avifaunal habitat within which the proposed route deviations are situated is considered to range from HIGH to MEDIUM sensitivity, reflecting the presence of diverse habitat types and the confirmed and potential occurrence of SCC, including several collision-prone and disturbance-sensitive taxa. The

construction of the authorised *Pluto-Mahikeng 400kV Power Line* within the proposed route deviations is expected to result in localised impacts of HIGH to MEDIUM significance on avifauna occurring in the vicinity of the infrastructure. These impacts are primarily associated with an increased risk of collision in open landscapes in addition to displacement impacts associated with disturbance and, to a lesser extent, habitat transformation during construction. These impacts can be effectively reduced through the implementation of appropriate mitigation measures, including targeted collision mitigation and construction-phase management controls. It is anticipated that the *Pluto-Mahikeng 400kV Power Line* can be constructed and operated, within the proposed route deviations, with acceptable levels of residual impact on the resident and mobile avifauna, provided that recommended mitigation measures are implemented.

13.2 Specialist Opinion

In accordance with the baseline conditions and impact assessment presented in this report, and in alignment with the findings of the original 2018 avifaunal assessment, there are no identified unmitigable impacts associated with the authorised development within the proposed route deviations. Importantly, this assessment confirms that the current findings remain consistent with, and supportive of, the conclusions reached in 2018, with no material changes in habitat integrity, species composition, or sensitivity that would warrant a revision of the original impact significance ratings. On this basis, the authorised development is considered environmentally acceptable from an avifaunal perspective, subject to the effective implementation of the recommended mitigation and management measures.

14. 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 a three-day field survey of the proposed route deviations. No long-term, seasonal monitoring was conducted by the avifaunal specialist. This assessment relies upon previous survey secondary data sources with regards to bird occurrence and abundance such as the SABAP2, KBA and IBA projects. 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 visit 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 along the route deviations. Based on these findings, the

specialist was able to identify and assess the anticipated impacts and provide recommendations for mitigation;

- The focus of this assessment is primarily on the potential impacts on regional SCC and non-SCC power line sensitive species i.e., species that are vulnerable to the displacement and collision impacts associated with the construction and operation of the *Pluto-Mahikeng 400kV Power Line* along the proposed route deviations; 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 cannot be reduced to formulas that will hold true under all circumstances. It must also be noted that, it is often not possible to 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 *Pluto-Mahikeng 400kV Power Line* along the route deviations, will be unavoidable, they are likely to be temporary and of moderate to low significance following mitigation.

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 PLUTO-MAHIKENG 400KV POWER LINE DEVIATIONS

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Endemicity
Acacia Pied Barbet	Tricholaema leucomelas	40.3	22.2	-	-	
African Black Duck	Anas sparsa	0.0	0.7	-	LC	
African Darter	Anhinga rufa	0.0	0.7	-	NT	
African Fish Eagle	Haliaeetus vocifer	2.6	0.0	-	LC	
African Harrier-Hawk	Polyboroides typus	0.0	0.7	-	-	
African Hoopoe	Upupa africana	2.6	2.2	-	-	
African Marsh Harrier	Circus ranivorus	1.3	0.0	-	VU	
African Palm Swift	Cypsiurus parvus	7.8	0.7	-	-	
African Paradise Flycatcher	Terpsiphone viridis	2.6	0.7	-	-	
African Pipit	Anthus cinnamomeus	63.6	13.3	-	-	
African Red-eyed Bulbul	Pycnonotus nigricans	9.1	0.0	-	-	
African Sacred Ibis	Threskiornis aethiopicus	10.4	3.7	-	-	
African Snipe	Gallinago nigripennis	6.5	2.2	-	-	
African Spoonbill	Platalea alba	3.9	0.7	-	-	
African Stonechat	Saxicola torquatus	79.2	19.3	-	-	
African Wattled Lapwing	Vanellus senegallus	14.3	0.7	-	-	
Amethyst Sunbird	Chalcomitra amethystina	6.5	1.5	-	-	
Amur Falcon	Falco amurensis	13.0	5.2	-	-	
Ant-eating Chat	Myrmecocichla formicivora	83.1	27.4	-	-	
Arrow-marked Babbler	Turdoides jardineii	1.3	0.0	-	-	
Ashy Tit	Melaniparus cinerascens	5.2	1.5	-	-	
Banded Martin	Riparia cincta	29.9	8.1	-	-	
Barn Swallow	Hirundo rustica	31.2	14.8	-	-	
Black Heron	Egretta ardesiaca	7.8	1.5	-	LC	
Black Kite	Milvus migrans	1.3	0.0	-	-	
Black Sparrowhawk	Accipiter melanoleucus	1.3	0.7	-	-	
Black-backed Puffback	Dryoscopus cubla	0.0	0.7	-	-	
Black-chested Prinia	Prinia flavicans	70.1	20.0	-	-	
Black-chested Snake Eagle	Circaetus pectoralis	3.9	0.7	-	-	
Black-collared Barbet	Lybius torquatus	1.3	1.5	-	-	
Black-crowned Tchagra	Tchagra senegalus	3.9	2.2	-	-	
Black-headed Heron	Ardea melanocephala	27.3	8.1	-	LC	
Blacksmith Lapwing	Vanellus armatus	77.9	23.7	-	-	
Black-throated Canary	Crithagra atrogularis	72.7	23.7	-	-	
Black-winged Kite	Elanus caeruleus	33.8	7.4	-	NT	
Blue Waxbill	Uraeginthus angolensis	0.0	1.5	-	-	
Blue-billed Teal	Spatula hottentota	1.3	0.7	-	LC	
Bokmakierie	Telophorus zeylonus	57.1	16.3	-	-	
Brown Snake Eagle	Circaetus cinereus	1.3	2.2	-	-	
Brown-crowned Tchagra	Tchagra australis	3.9	0.7	-	-	
Brown-throated Martin	Riparia paludicola	1.3	0.0	-	-	
Buffy Pipit	Anthus vaalensis	18.2	6.7	-	-	
Cape Crow	Corvus capensis	16.9	5.9	-	-	
Cape Longclaw	Macronyx capensis	64.9	19.3	-	-	
Cape Robin-Chat	Cossypha caffra	6.5	2.2	-	-	
Cape Sparrow	Passer melanurus	57.1	7.4	-	-	
Cape Starling	Lamprotornis nitens	49.4	20.0	-	-	

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Endemicity
Cape Turtle Dove	Streptopelia capicola	79.2	14.1	-	-	
Cape Vulture	Gyps coprotheres	22.1	8.9	EN	VU	
Cape Wagtail	Motacilla capensis	29.9	5.9	-	-	
Cape Weaver	Ploceus capensis	5.2	0.7	-	-	Near Endemic
Cape White-eye	Zosterops virens	3.9	3.7	-	-	Near Endemic
Capped Wheatear	Oenanthe pileata	46.8	8.9	-	-	
Cardinal Woodpecker	Dendropicos fuscescens	1.3	0.0	-	-	
Chestnut-backed Sparrow-Lark	Eremopterix leucotis	9.1	0.0	-	-	
Chestnut-vented Warbler	Curruca subcoerulea	46.8	17.0	-	-	
Chinspot Batis	Batis molitor	0.0	1.5	-	-	
Cinnamon-breasted Bunting	Emberiza tahapisi	5.2	3.7	-	-	
Cloud Cisticola	Cisticola textrix	39.0	5.9	-	-	Near Endemic
Common Buzzard	Buteo buteo	11.7	3.7	-	-	
Common Greenshank	Tringa nebularia	2.6	0.7	-	-	
Common House Martin	Delichon urbicum	0.0	1.5	-	-	
Common Moorhen	Gallinula chloropus	2.6	0.0	-	-	
Common Myna	Acridotheres tristis	29.9	3.0	-	-	
Common Ostrich	Struthio camelus	5.2	1.5	-	-	
Common Scimitarbill	Rhinopomastus cyanomelas	1.3	1.5	-	-	
Common Swift	Apus apus	0.0	2.2	-	-	
Common Waxbill	Estrilda astrild	20.8	1.5	-	-	
Common Whitethroat	Curruca communis	0.0	0.7	-	-	
Coqui Francolin	Peliperdix coqui	9.1	2.2	-	-	
Crested Barbet	Trachyphonus vaillantii	27.3	4.4	-	-	
Crested Francolin	Dendroperdix sephaena	2.6	0.0	-	-	
Crimson-breasted Shrike	Laniarius atrococcineus	18.2	3.0	-	-	
Crowned Lapwing	Vanellus coronatus	80.5	12.6	-	-	
Dark-capped Bulbul	Pycnonotus tricolor	50.6	20.7	-	-	
Desert Cisticola	Cisticola aridulus	19.5	8.9	-	-	
Diederik Cuckoo	Chrysococcyx caprius	15.6	3.7	-	-	
Eastern Clapper Lark	Mirafra fasciolata	42.9	5.2	-	-	
Egyptian Goose	Alopochen aegyptiaca	16.9	4.4	-	LC	
European Bee-eater	Merops apiaster	10.4	3.7	-	-	
Fairy Flycatcher	Stenostira scita	2.6	0.0	-	-	Near Endemic
Familiar Chat	Oenanthe familiaris	9.1	5.9	-	-	
Fawn-colored Lark	Calendulauda africanoides	1.3	0.0	-	-	
Fiscal Flycatcher	Melaenornis silens	42.9	13.3	-	-	Near Endemic
Fork-tailed Drongo	Dicrurus adsimilis	7.8	1.5	-	-	
Gabar Goshawk	Micronisus gabar	2.6	0.7	-	-	
Garden Warbler	Sylvia borin	3.9	3.7	-	-	
Glossy Ibis	Plegadis falcinellus	5.2	2.2	-	-	
Golden-breasted Bunting	Emberiza flaviventris	1.3	0.0	-	-	
Goliath Heron	Ardea goliath	1.3	0.0	-	-	
Great Egret	Ardea alba	6.5	1.5	-	NT	
Greater Honeyguide	Indicator indicator	1.3	0.0	-	-	
Greater Kestrel	Falco rupicoloides	15.6	1.5	-	-	
Greater Striped Swallow	Cecropis cucullata	23.4	4.4	-	-	
Green Wood Hoopoe	Phoeniculus purpureus	1.3	0.0	-	-	

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Endemicity
Green-winged Pytilia	Pytilia melba	6.5	1.5	-	-	
Grey Go-away-bird	Crinifer concolor	1.3	0.7	-	-	
Grey Heron	Ardea cinerea	7.8	3.0	-	LC	
Grey-backed Sparrow-Lark	Eremopterix verticalis	1.3	0.7	-	-	
Groundscraper Thrush	Turdus litsitsirupa	3.9	2.2	-	-	
Hadada Ibis	Bostrychia hagedash	53.2	14.8	-	-	
Hamerkop	Scopus umbretta	3.9	1.5	-	NT	
Helmeted Guineafowl	Numida meleagris	49.4	9.6	-	-	
House Sparrow	Passer domesticus	28.6	7.4	-	-	
Icterine Warbler	Hippolais icterina	1.3	0.0	-	-	
Jacobin Cuckoo	Clamator jacobinus	1.3	0.7	-	-	
Kalahari Scrub Robin	Cercotrichas paena	50.6	21.5	-	-	
Karoo Thrush	Turdus smithi	2.6	0.0	-	-	Near Endemic
Knob-billed Duck	Sarkidiornis melanotos	2.6	0.0	-	NT	
Lappet-faced Vulture	Torgos tracheliotos	2.6	0.7	EN	CR	
Laughing Dove	Spilopelia senegalensis	88.3	31.9	-	-	
Lesser Grey Shrike	Lanius minor	3.9	4.4	-	-	
Lesser Kestrel	Falco naumanni	3.9	0.0	-	VU	
Levaillant's Cisticola	Cisticola tinniens	29.9	3.0	-	-	
Lilac-breasted Roller	Coracias caudatus	2.6	0.0	-	-	
Little Bee-eater	Merops pusillus	20.8	9.6	-	-	
Little Egret	Egretta garzetta	7.8	3.7	-	-	
Little Grebe	Tachybaptus ruficollis	3.9	0.0	-	LC	
Little Swift	Apus affinis	13.0	0.7	-	-	
Long-billed Crombec	Sylvietta rufescens	2.6	0.0	-	-	
Long-tailed Paradise Whydah	Vidua paradisaea	0.0	1.5	-	-	
Long-tailed Widowbird	Euplectes progne	75.3	16.3	-	-	
Malachite Kingfisher	Corythornis cristatus	2.6	0.0	-	-	
Marico Flycatcher	Melaenornis mariquensis	2.6	0.0	-	-	
Marsh Owl	Asio capensis	1.3	0.0	-	NT	
Marsh Warbler	Acrocephalus palustris	2.6	0.0	-	-	
Martial Eagle	Polemaetus bellicosus	1.3	0.0	EN	EN	
Melodious Lark	Mirafra cheniana	2.6	0.0	-	-	Near Endemic
Mountain Wheatear	Myrmecocichla monticola	2.6	0.0	-	-	
Namaqua Dove	Oena capensis	70.1	29.6	-	-	
Namaqua Sandgrouse	Pterocles namaqua	22.1	1.5	-	-	
Neddicky	Cisticola fulvicapilla	45.5	19.3	-	-	
Nicholson's Pipit	Anthus nicholsoni	1.3	1.5	-	-	
Northern Black Korhaan	Afrotis afraoides	70.1	15.6	-	-	
Orange River Francolin	Scleroptila gutturalis	50.6	4.4	-	-	
Orange-breasted Waxbill	Amandava subflava	1.3	0.0	-	-	
Ovambo Sparrowhawk	Accipiter ovampensis	2.6	0.0	-	-	
Pale Chanting Goshawk	Melierax canorus	5.2	5.2	-	-	
Pied Crow	Corvus albus	67.5	8.9	-	-	
Pied Kingfisher	Ceryle rudis	3.9	0.0	-	-	
Pied Starling	Lamprotornis bicolor	51.9	15.6	-	-	Endemic
Pink-billed Lark	Spizocorys conirostris	1.3	0.0	-	-	
Pin-tailed Whydah	Vidua macroura	16.9	5.9	-	-	

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Endemicity
Plain-backed Pipit	Anthus leucophrys	20.8	4.4	-	-	
Purple Heron	Ardea purpurea	6.5	2.2	-	LC	
Quailfinch	Ortygospiza atricollis	61.0	11.1	-	-	
Rattling Cisticola	Cisticola chiniana	1.3	0.7	-	-	
Red-backed Shrike	Lanius collurio	18.2	14.1	-	-	
Red-billed Firefinch	Lagonosticta senegala	1.3	0.0	-	-	
Red-billed Quelea	Quelea quelea	68.8	18.5	-	-	
Red-billed Teal	Anas erythrorhyncha	10.4	3.7	-	NT	
Red-breasted Swallow	Cecropis semirufa	9.1	2.2	-	-	
Red-capped Lark	Calandrella cinerea	29.9	4.4	-	-	
Red-collared Widowbird	Euplectes ardens	6.5	0.0	-	-	
Red-eyed Dove	Streptopelia semitorquata	46.8	3.7	-	-	
Red-faced Mousebird	Urocolius indicus	45.5	17.0	-	-	
Red-headed Finch	Amadina erythrocephala	1.3	1.5	-	-	
Red-knobbed Coot	Fulica cristata	5.2	0.0	-	LC	
Red-throated Wryneck	Jynx ruficollis	1.3	0.0	-	-	
Red-winged Francolin	Scleroptila levaillantii	0.0	0.7	-	-	
Reed Cormorant	Microcarbo africanus	11.7	3.7	-	-	
Rock Dove	Columba livia	6.5	3.7	-	-	
Rock Kestrel	Falco rupicolus	0.0	0.7	-	-	
Rock Martin	Ptyonoprogne fuligula	1.3	0.0	-	-	
Ruff	Calidris pugnax	1.3	0.7	-	-	
Rufous-cheeked Nightjar	Caprimulgus rufigena	1.3	0.0	-	-	
Rufous-eared Warbler	Malcorus pectoralis	6.5	4.4	-	-	
Rufous-naped Lark	Mirafra africana	48.1	23.0	-	-	
Sabota Lark	Calendulauda sabota	6.5	6.7	-	-	
Saddle-billed Stork	Ephippiorhynchus senegalensis	1.3	0.0	-	EN	
Sand Martin	Riparia riparia	2.6	0.0	-	-	
Scaly-feathered Weaver	Sporopipes squamifrons	33.8	17.8	-	-	
Secretarybird	Sagittarius serpentarius	2.6	0.0	EN	VU	
Shikra	Accipiter badius	1.3	0.0	-	-	
South African Cliff Swallow	Petrochelidon spilodera	27.3	3.7	-	-	Endemic: Breeding
South African Shelduck	Tadorna cana	14.3	2.2	-	LC	
Southern Boubou	Laniarius ferrugineus	2.6	0.0	-	-	
Southern Fiscal	Lanius collaris	87.0	20.7	-	-	
Southern Grey-headed Sparrow	Passer diffusus	66.2	17.0	-	-	
Southern Masked Weaver	Ploceus velatus	79.2	23.0	-	-	
Southern Pochard	Netta erythrophthalma	1.3	0.0	-	NT	
Southern Red Bishop	Euplectes orix	61.0	9.6	-	-	
Speckled Mousebird	Colius striatus	14.3	5.2	-	-	
Speckled Pigeon	Columba guinea	55.8	13.3	-	-	
Spike-heeled Lark	Chersomanes albofasciata	28.6	2.2	-	-	
Spotted Eagle-Owl	Bubo africanus	1.3	0.0	-	-	
Spotted Flycatcher	Muscicapa striata	0.0	1.5	-	-	
Spotted Thick-knee	Burhinus capensis	1.3	2.2	-	-	
Spur-winged Goose	Plectropterus gambensis	14.3	2.2	-	LC	
Squacco Heron	Ardeola ralloides	3.9	1.5	-	-	
Streaky-headed Seedeater	Crithagra gularis	3.9	8.1	-	-	

Species name	Scientific name	Full Protocol Report Rate	Ad Hoc Protocol Report Rate	Global Red List	Regional Red List	Endemicity
Swainson's Spurfowl	Pternistis swainsonii	44.2	8.1	-	-	
Swallow-tailed Bee-eater	Merops hirundineus	13.0	8.1	-	-	
Tawny-flanked Prinia	Prinia subflava	9.1	3.7	-	-	
Temminck's Courser	Cursorius temminckii	1.3	0.0	-	-	
Three-banded Plover	Charadrius tricollaris	3.9	0.7	-	-	
Violet-eared Waxbill	Granatina granatina	2.6	2.2	-	-	
Wailing Cisticola	Cisticola lais	10.4	5.2	-	-	
Wattled Starling	Creatophora cinerea	22.1	5.9	-	-	
Western Barn Owl	Tyto alba	1.3	0.0	-	-	
Western Cattle Egret	Bubulcus ibis	44.2	29.6	-	LC	
Whiskered Tern	Chlidonias hybrida	3.9	2.2	-	-	
White-backed Mousebird	Colius colius	48.1	16.3	-	-	
White-backed Vulture	Gyps africanus	3.9	1.5	CR	CR	
White-bellied Korhaan	Eupodotis senegalensis	3.9	0.0	-	VU	
White-bellied Sunbird	Cinnyris talatala	22.1	11.9	-	-	
White-breasted Cormorant	Phalacrocorax lucidus	0.0	0.7	-	-	
White-browed Scrub Robin	Cercotrichas leucophrys	0.0	2.2	-	-	
White-browed Sparrow-Weaver	Plocepasser mahali	81.8	25.9	-	-	
White-faced Whistling Duck	Dendrocygna viduata	5.2	0.7	-	LC	
White-rumped Swift	Apus caffer	26.0	5.2	-	-	
White-throated Robin-Chat	Cossypha humeralis	3.9	2.2	-	-	
White-throated Swallow	Hirundo albigularis	11.7	0.7	-	-	
White-winged Widowbird	Euplectes albonotatus	19.5	4.4	-	-	
Willow Warbler	Phylloscopus trochilus	3.9	0.7	-	-	
Wing-snapping Cisticola	Cisticola ayresii	3.9	0.7	-	-	
Wood Sandpiper	Tringa glareola	6.5	0.7	-	-	
Yellow Canary	Crithagra flaviventris	45.5	11.9	-	-	
Yellow-billed Duck	Anas undulata	14.3	2.2	-	NT	
Yellow-billed Egret	Ardea brachyrhyncha	3.9	1.5	-	NT	
Yellow-billed Stork	Mycteria ibis	1.3	0.0	-	VU	
Yellow-crowned Bishop	Euplectes afer	16.9	5.2	-	-	
Yellow-fronted Canary	Crithagra mozambica	6.5	3.0	-	-	
Zitting Cisticola	Cisticola juncidis	41.6	11.1	-	-	

APPENDIX 2: AVIFAUNAL HABITAT OBSERVED WITHIN THE PLUTO-MAHIKENG 400KV POWER LINE DEVIATIONS



FIGURE 1: The Mooi River (Deviation 1)



FIGURE 2: Bushveld vegetation (Deviation 2)



FIGURE 3: Typical grassland habitat (Deviation 1)

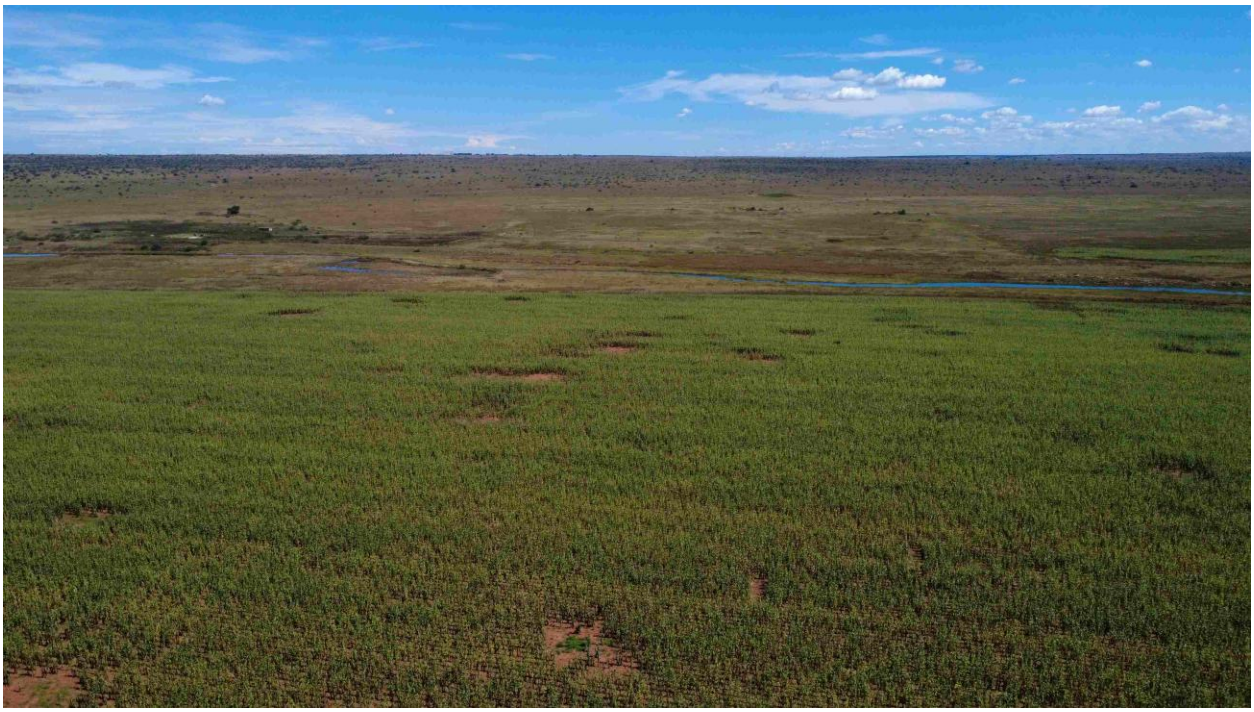


FIGURE 4: Cultivated lands adjacent to the Mooi River (Deviation 1)



FIGURE 5: Existing high voltage power lines (note vultures roosting on both the Self-Support and Cross Rope Suspension towers)

APPENDIX 3: METHOD OF ASSESSING THE SIGNIFICANCE OF POTENTIAL ENVIRONMENTAL IMPACTS

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability: This describes the likelihood of the impact actually occurring

Improbable: The possibility of the impact occurring is very low, due to the circumstances, design or experience.

Probable: There is a probability that the impact will occur to the extent that provision must be made therefore.

Highly Probable: It is most likely that the impact will occur at some stage of the development.

Definite: The impact will take place regardless of any prevention plans and there can only be relied on mitigatory measures or contingency plans to contain the effect.

Duration: The lifetime of the impact

Short Term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span that is as long as the activity

Medium Term: The impact will last up to the end of the phases, where after it will be negated.

Long Term: The impact will last for the entire operational phase of the project, but will be mitigated by direct human action or by natural processes thereafter.

Permanent: The impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: The physical and spatial size of the impact

Local: The impacted area extends only as far as the activity, e.g. the footprint.

Site: The impact could affect the whole, or a measurable portion of the above-mentioned properties.

Regional: The impact could affect the area including the neighbouring district areas.

Magnitude / Severity: Does the impact destroy the environment, or alter its function?

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

TABLE 2:WEIGHTS ASSIGNED TO EACH ATTRIBUTE

Aspect	Description	Weight
Probability	Improbable	**1**
	Probable	**2**
	Highly Probable	**4**
	Definite	**5**
Duration	Short term	**1**
	Medium term	**3**
	Long term	**4**
	Permanent	**5**
Scale	Local	**1**
	Site	**2**
	Regional	**3**
Magnitude / Severity	Low	**2**
	Medium	**6**
	High	**8**
Reversibility	Fully reversible (environment can return to baseline within short timeframe)	**1**
	Partially reversible (recovery possible but requires intervention and time)	**2**
	Low reversibility (substantial recovery unlikely without major intervention)	**3**
	Irreversible (permanent loss of resources or function)	**4**
Significance	**SUM (Duration, Scale, Magnitude) x Probability**	
	Negligible Impact	**≤ 20**
	Low Impact	**> 20 ≤ 40**
	Moderate Impact	**> 40 ≤ 60**
	High Impact	**> 60**

APPENDIX 4: 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.;
- 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 line 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.

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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.