



BIODIVERSITY AND AVIFAUNA IMPACT ASSESSMENT FOR THE GEMSBOK TO KWAMHLANGA POWERLINE

Kwamhlanga, Mpumalanga

September 2020

CLIENT



Prepared by:

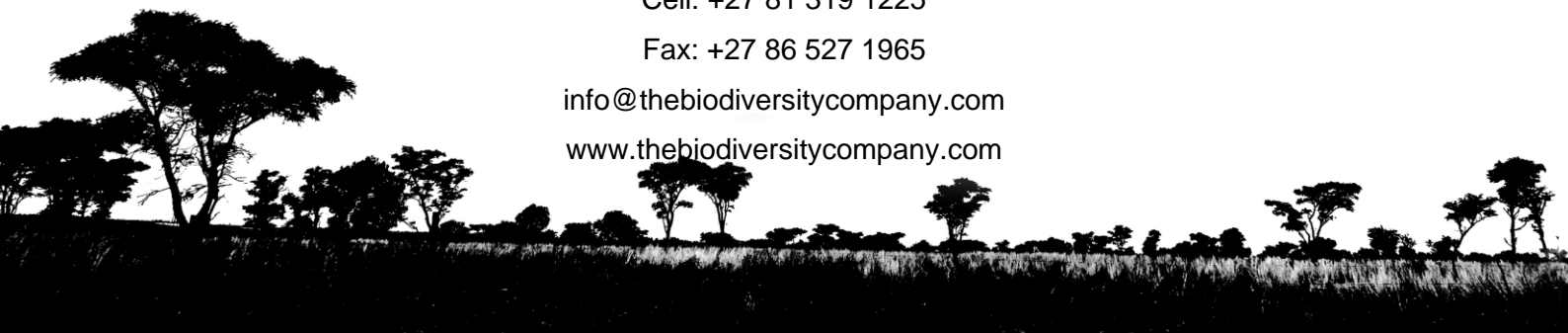
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Report Name	BIODIVERSITY AND AVIFAUNA IMPACT ASSESSMENT FOR THE GEMSBOK to KWAMHLANGA POWERLINE
Submitted to	
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Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2014 (as amended). We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principles of science.</p>

DECLARATION

I, Martinus Erasmus, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Martinus Erasmus

Terrestrial Ecologist

The Biodiversity Company

September 2020

DECLARATION

I, Lindi Steyn, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Lindi Steyn

Terrestrial Ecologist

The Biodiversity Company

September 2020

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1 Introduction

The Biodiversity Company (TBC) was appointed to conduct a biodiversity and supporting avifauna baseline and impact assessment for the proposed Kwamhlanga to Gemsbok Powerline. The Kwamhlanga substation is new, and the existing Gemsbok substation was assessed and addressed in a separate basic assessment application process. The detailed project and activity description as per WSP (2020) are:

- Construct 18.4 km single circuit, 132kV, Kingbird line between the two substations;
- Gemsbok spare bay, establish new 132kV feeder bay;
- Plant 7618 – 3 Poles structure inline with the new feeder bay. Swing the Kwaggafontein feeder into the new bay;
- Dismantle the Kwaggafontein strain lattice terminal tower to create way/route for the Kwamhlanga closing span;
- Plant new 7808 terminating structure on the Ekangala and dismantle the existing Ekangala strain lattice terminal tower;
- Close Span for Kwamhlanga 132kV line at Gemsbok substation; and
- Clearance of a 30 m footprint.

An early wet season survey was conducted from the 14th to 15th of September 2020. The survey focussed on a 100 m corridor around the footprint.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020: “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 the National Environmental Management Act, 1998, when applying for Environmental Authorisation”. The National Web based Environmental Screening Tool has characterised the aquatic and terrestrial biodiversity for the project area as “high sensitivity”, however majority of the footprint falls across a “medium sensitivity” and a “low sensitivity” area.

This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making with regards to the proposed project.

2 Project Area

The project area starts in Kwamhlanga and ends in an area 3.6 km east of Enkeldoornoog-C, Mpumalanga. The area surrounding the project area predominantly consists of mainly housing development and well as cattle farms (Figure 2-1).

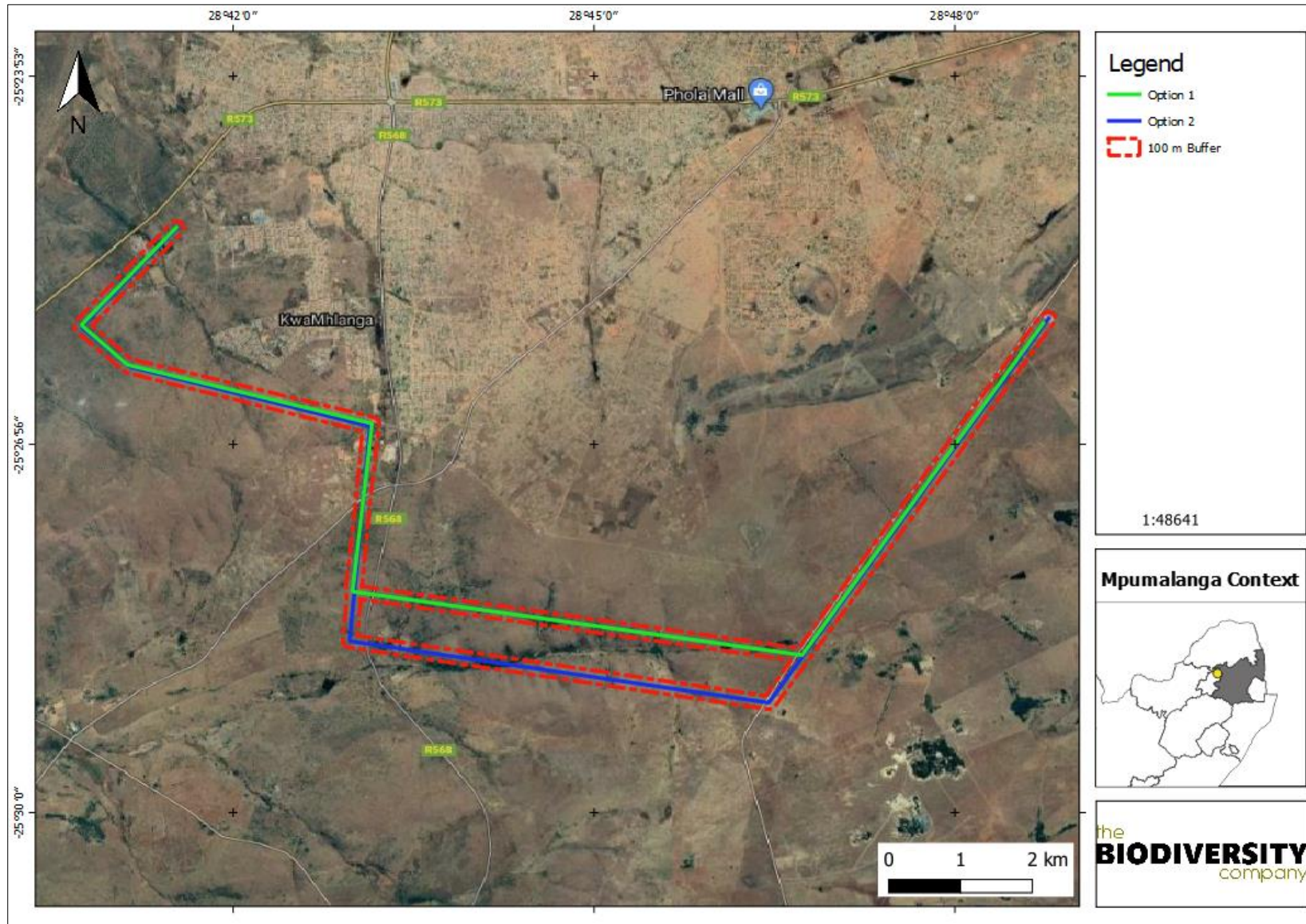


Figure 2-1 The general location of the proposed project area

3 Terms of Reference

The Terms of Reference (ToR) included the following:

- Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as site specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity and avifauna) that occur in the project area, and the manner in which these sensitive receptors may be affected by the activity;
- Identify 'significant' ecological, botanical and faunal features within the proposed project area;
- Identification of conservation significant habitats around the project area which might be impacted by the proposed project;
- Determine the possible presence of species of conservation concern (SCC);
- Site visit to verify desktop information;
- Suggest possible impacts, mitigation and rehabilitation measures to prevent or reduce the possible impacts; and
- Identification of risk factors associated with the developments.

4 Key Legislative Requirements

The legislation, policies and guidelines listed below are applicable to the current project in terms of biodiversity and ecological support systems (Table 4-1). The list below, although extensive, may not be exhaustive and other legislation, policies and guidelines may apply in addition to those listed below.

Table 4-1	A list of key legislative requirements relevant to biodiversity and conservation within the project area
INTERNATIONAL	Convention on Biological Diversity (CBD, 1993)
	The United Nations Framework Convention on Climate Change (UNFCCC, 1994)
	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)
NATIONAL	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management Biodiversity Act (Act No. 10 of 2004)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989)
	National Environmental Management Air Quality Act (No. 39 of 2004)
	National Protected Areas Expansion Strategy (NPAES)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	National Water Act, 1998 (Act 36 of 1998)
	National Freshwater Ecosystem Priority Areas (NFEPA's)
	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	
Sustainable Utilisation of Agricultural Resources (Draft Legislation).	
White Paper on Biodiversity	
PROVINCIAL	Mpumalanga Parks Board Act 6 of 1995
	Mpumalanga Conservation Act, 1998 (Act 10 of 1998)
	Mpumalanga Tourism and Parks Agency Act, No 5 of 2005
	Mpumalanga Conservation Plan (C-plan 2)
	Mpumalanga Biodiversity Sector Plan

5 Limitations

The following limitations should be noted for the project:

- Some of the areas had limited access;
- Portions of the project area were burned at time of the survey;

- As per the scope of work, the fieldwork component of the assessment comprised of one assessment only, which was conducted during the early wet season, and therefore no temporal trends have been assessed;
- The basic assessment reports for the Gemsbok substation were not made available at time of completion of this report; and
- Despite these limitations, a comprehensive desktop assessment was conducted, in conjunction with the detailed results from the surveys, and as such there is a high confidence in the information provided.

6 Methodologies

6.1 Terrestrial Assessment

6.1.1 Geographic Information Systems (GIS) Mapping

Existing data layers were incorporated into GIS software to establish how the proposed project might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018);
- Mpumalanga Biodiversity Sector Plan (MTPA, 2014); and
- National Biodiversity Assessment: Threat Status and Protection Level (2018).

Field surveys were conducted to confirm (or refute) the presence of species identified in the desktop assessment. The specialist disciplines completed for this project included:

- Botanical;
- Fauna (mammals and avifauna); and
- Herpetology (reptiles and amphibians).

Brief descriptions of the standardised methodologies applied in each of the specialist disciplines are provided below. More detailed descriptions of survey methodologies are available upon request.

6.1.2 Botanical Assessment

The botanical assessment encompassed an assessment of all the vegetation units and habitat types within the project area. The focus was on an ecological assessment of habitat types as well as identification of any Red Data species within the known distribution of the project area. The methodology included the following survey techniques:

- Sensitivity analysis based on available remaining natural structural habitat; and
- Identification of expected floral Red Data species (desktop analysis).

6.1.3 Literature Study

A literature review was conducted as part of the desktop assessment to identify the potential habitats present within the project area. The South African National Biodiversity Institute (SANBI) provides an electronic database system, namely the Botanical Database of Southern Africa (BODATSA), to access distribution records on southern African plants. This is a new database which replaces the old Plants of Southern Africa (POSA) database. The POSA database provided distribution data of flora at the quarter degree square (QDS) resolution.

The Red List of South African Plants website (SANBI, 2017) was utilized to provide the most current account of the national status of flora. Relevant field guides and texts consulted for identification purposes in the field during the surveys included the following:

- A Field Guide to Wild Flowers (Pooley, 1998);
- Guide to Grasses of Southern Africa (Van Oudtshoorn, 1999);
- Orchids of South Africa (Johnson & Bytebier, 2015);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Medicinal Plants of South Africa (Van Wyk *et al.*, 2013);

Additional information regarding ecosystems, vegetation types, and species of conservation concern (SCC) included the following sources:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2012);
- Grassland Ecosystem Guidelines: landscape interpretation for planners and managers (SANBI, 2013); and
- Red List of South African Plants (Raimondo *et al.*, 2009; SANBI, 2016).

6.1.4 Faunal Assessment (Mammals)

The faunal desktop assessment included the following:

- Compilation of expected species lists;
- Compilation of identified species lists;
- Identification of any Red Data or species of conservation concern (SCC) present or potentially occurring in the area; and
- Emphasis was placed on the probability of occurrence of species of provincial, national and international conservation importance.

The field survey component of the project utilised a variety of sampling techniques including, but not limited to, the following:

- Visual observations;
- Identification of tracks and signs; and
- Utilization of local knowledge.

Habitat types sampled included pristine, disturbed and semi-disturbed zones, drainage lines and wetlands.

Mammal distribution data were obtained from the following information sources:

- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Bats of Southern and Central Africa (Monadjem *et al.*, 2010);
- The 2016 Red List of Mammals of South Africa, Lesotho and Swaziland (www.ewt.org.za) (EWT, 2016);
- Animal Demography Unit (ADU) - MammalMap Category (MammalMap, 2017) (mammalmap.adu.org.za); and
- A Field Guide to the Tracks and Signs of Southern, Central and East African Wildlife (Stuart & Stuart, 2013).

6.1.5 Herpetology (Reptiles & Amphibians)

A herpetofauna desktop assessment of the possible species in the area was done and attention was paid to the SCCs, sources used included the IUCN (2017) and ADU (2019).

Herpetofauna distributional data was obtained from the following information sources:

- South African Reptile Conservation Assessment (SARCA) (sarca.adu.org);
- A Guide to the Reptiles of Southern Africa (Alexander & Marais, 2007);
- Field guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- Atlas and Red list of Reptiles of South Africa, Lesotho and Swaziland (Bates *et al.*, 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez & Carruthers, 2009);
- Animal Demography Unit (ADU) - FrogMAP (frogmap.adu.org.za);
- Atlas and Red Data Book of Frogs of South Africa, Lesotho and Swaziland (Mintner *et al.*, 2004); and
- Ensuring a future for South Africa's frogs (Measey, 2011).

A herpetofauna field assessment were conducted in each habitat or vegetation type within the project area, as identified from the desktop assessment, with a focus on those areas which will be most impacted by the proposed development (i.e. the infrastructure development and waste dumping areas).

The herpetological field survey comprised the following techniques:

- Hand searching is used for reptile species that shelter in or under particular habitats. Visual searches, typically undertaken for species with activities that occur on surfaces or for species that are difficult to detect by hand-searches or trap sampling.

6.1.6 Early Wet Season Fieldwork

The early wet season fieldwork was conducted, and sample sites were placed within specific areas (i.e. target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork.

The focus of the fieldwork was therefore to maximise coverage and navigate to each target site in the field in order to perform a vegetation and ecological habitat assessment at each sample site. Emphasis was placed on sensitive habitats, especially those overlapping with proposed development areas.

Notes were made regarding current impacts (e.g. erosion, alien plants, rubble, etc.), and subjective recording of dominant vegetation species was noted. In addition, opportunistic observations were made while navigating through the project area. Effort was made to cover all the different habitat types within the limits of time and access. The geographic location of sample sites and site coverage are shown under the Results section.

6.2 Avifauna Assessment

6.2.1 Desktop Assessment

The avifaunal desktop assessment included the following:

- Compilation of expected species lists;
- Compilation of identified species lists;
- Identification of any Red Data or species of conservation concern (SCC) present or potentially occurring in the area; and
- Emphasis was placed on the probability of occurrence of species of provincial, national and international conservation importance.

The field survey component of the project utilised a variety of sampling techniques including, but not limited to, the following:

- Visual observations;
- Identification of tracks and signs; and
- Utilization of local knowledge.

Habitat types sampled included pristine, disturbed and semi-disturbed zones, drainage lines and wetlands.

While the Avifauna distribution and other pertinent data was obtained from:

- Southern African Bird Atlas Project 2 (SABAP2, 2019);
- Birdlife South Africa (2015);
- Birdlife. (2017). Important Bird Areas Factsheets;

- Checklist of the Birds of the World (Del Hoyo *et al.*, 1996);
- Co-ordinated Wetland Counts (<http://cwac.birdmap.africa/>);
- Co-ordinated Avifaunal Road counts (<http://car.birdmap.africa/>);
- Birds in Reserves Project (<http://birp.adu.org.za/>);
- Book of birds of South Africa, Lesotho and Swaziland (Taylor *et al.*, 2015); and
- Roberts – Birds of Southern Africa (Hockey *et al.*, 2005).

6.2.2 Field Assessment

Sampling consisted of standardized point counts as well as random diurnal incidental surveys and vantage point surveys. Standardized point counts (following Buckland *et al.* 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. Each point count was run over a 5 min period. The horizontal detection limit was set at 50 m. At each point the observer would document the date, start time and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and flight direction and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, river scanning and road cruising. To ensure raptors are accounted for, a vantage point survey was conducted at two locations.

6.2.3 Data analysis

Point count data was arranged into a matrix with point count samples in rows and species in columns. The table formed the basis of the various subsequent statistical analyses. This data was first used to distinguish similarities / differences in the species composition between the four identified avifaunal habitats, the matrix was converted into a Bray-Curtis dissimilarity matrix and used to generate a two-axis Principal component analysis (PCA) ordination. The data was subject to fourth root transformation to downscale the contribution of very abundant species while upscaling the influence of less abundant species. However, the effect was negligible and ultimately the raw data proved more informative. Thirdly, raw count data was converted to relative abundance values and used to establish dominant species and calculate the diversity of each habitat. Shannons Diversity Index (H) was the metric used to estimate diversity. Lastly, present and potentially occurring species were assigned to 13 major trophic guilds loosely based on the classification system developed by González-Salazar *et al.* (2014). Species were first classified by their dominant diet (carnivore, herbivore, granivore, frugivore, nectarivore, omnivore, then by the medium upon / within which they most frequently forage (ground, water, foliage, air) and lastly by their activity period (nocturnal or diurnal). All statistical analyses were performed using **Statistical Package for the Social Sciences (SPSS)**.

6.2.4 Buffer Requirements

Buffers were determined between the proposed activity and the impact receptor (e.g. breeding site, roost or other key habitat). The aim of the buffer is to provide an area that must be avoided.

7 Project Area

7.1 Desktop Spatial Assessment

The following features represent a summary of various spatial datasets analysed in regard to the project area with an emphasis on those aspects which are deemed to have a possible impact on the receiving environment. This assessment is based on spatial data that are provided by various sources such as the provincial environmental authority and SANBI. The desktop analysis and their relevance to this project are listed in Table 7-1.

Table 7-1 Desktop spatial features examined

Desktop Information Considered	Relevant/Not relevant	Section
Conservation Plan	The project area option 1 will overlap with: <ul style="list-style-type: none"> • Critical Biodiversity Area (CBA) optimal; • Other Natural Area (ONA); and • Moderately modified old lands; • Heavily Modified Areas (HMA's). Option 2 overlap with: <ul style="list-style-type: none"> • Other Natural Area (ONA); and • Moderately modified old lands; • Heavily Modified Areas (HMA's). 	7.2
Rocky Ridges	Irrelevant: Mpumalanga does not have legislation regarding rocky ridges.	-
Ecosystem Threat Status	Falls within a <i>LC</i> ecosystem	7.3.1
Ecosystem Protection Level	Falls in a <i>poorly protected</i> and <i>moderately protected</i> ecosystem	7.3.2
Protected Areas	Irrelevant: Closest SAPAD or SACAD is 6km away from the project area: Leeufontein Nature Reserve	-
Mpumalanga Protected Areas Expansion Strategy (MPAES)	The option 1 project area overlaps with a MPAES area, while option 2 is 340 m away from another MPAES	7.4
NBA Rivers and Wetlands	The project area overlaps with an <i>LC</i> wetland	7.5
Mining and Biodiversity Guidelines	Irrelevant: No mining component	-
Important Bird and Biodiversity Areas	Irrelevant: Project area is situated more than 35 km away from the Loskop Dam Nature Reserve IBA.	-
Mpumalanga Highveld Grasslands	Irrelevant: The project area does not overlap with any MPHG wetlands	-
Strategic Water Source Areas (SWSA)	Irrelevant: the closest SWSA is 40 km from the project area	-
NPAES	Irrelevant: the closest NPAES (NW/Gauteng NPAES) is 7.4 km from the project area	-

7.2 Mpumalanga Biodiversity Sector Plan

The key output of this systematic biodiversity plan is a map of biodiversity priority areas (MTPA, 2014). The MBSP CBA map delineates Critical Biodiversity Areas, Ecological Support Areas, Other Natural Areas, Protected Areas, and areas that have been irreversibly modified from their natural state (MTPA, 2014). The MBSP uses the following terms to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area (CBA);
- Ecological Support Area (ESA);
- Other Natural Area (ONA);
- Protected Area (PA); and
- Moderately or Heavily Modified Areas (MMA's or HMA's).

CBAs are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species (MTPA, 2014). Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species (MTPA, 2014).

The Mpumalanga Biodiversity Sector Plan (MBSP) specifies two different CBA areas, **Irreplaceable CBA's and Optimal CBA's**. Irreplaceable CBA's include: (1) areas required to meet targets and with irreplaceability biodiversity values of more than 80%; (2) critical linkages or pinch-points in the landscape that must remain natural; or (3) critically Endangered ecosystems (MTPA, 2014).

ESAs are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic (SANBI-BGIS, 2017).

ONAs consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (SANBI-BGIS, 2017).

Moderately or Heavily Modified Areas (sometimes called 'transformed' areas) are areas that have been heavily modified by human activity so that they are by-and-large no longer natural, and do not contribute to biodiversity targets (MTPA, 2014). Some of these areas may still provide limited biodiversity and ecological infrastructural functions but, their biodiversity value has been significantly, and in many cases irreversibly, compromised.

Figure 7-1 shows the project area superimposed on the MBSP Terrestrial CBA map. Based on this, the project area option 1 will overlap with:

- Critical Biodiversity Area (CBA) optimal;
- Other Natural Area (ONA);
- Moderately modified old lands; and
- Heavily Modified Areas (HMA's).

Option 2 overlap with:

- Other Natural Area (ONA);
- Moderately modified old lands; and
- Heavily Modified Areas (HMA's).

Figure 7-2 shows the project area superimposed on the MBSP Freshwater CBA map. Based on this, the project area option 1 and option 2 will overlap with:

- Heavily modified; and
- Other natural areas.

The CBA area in which the project area fall is in a degraded state and does not correlate to the ascribed status.

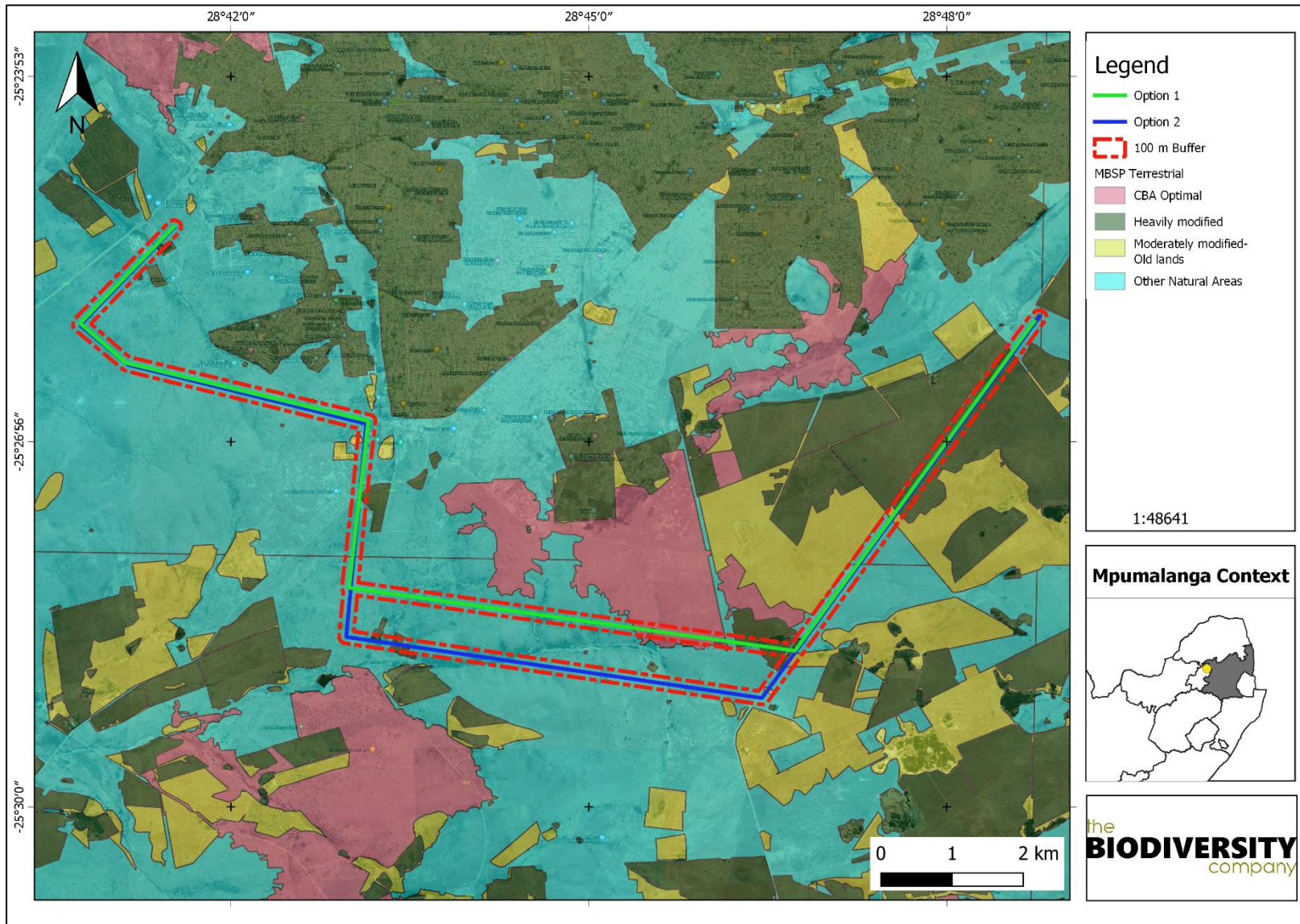


Figure 7-1 Project area in relation to the Terrestrial Mpumalanga Biodiversity Sector Plan

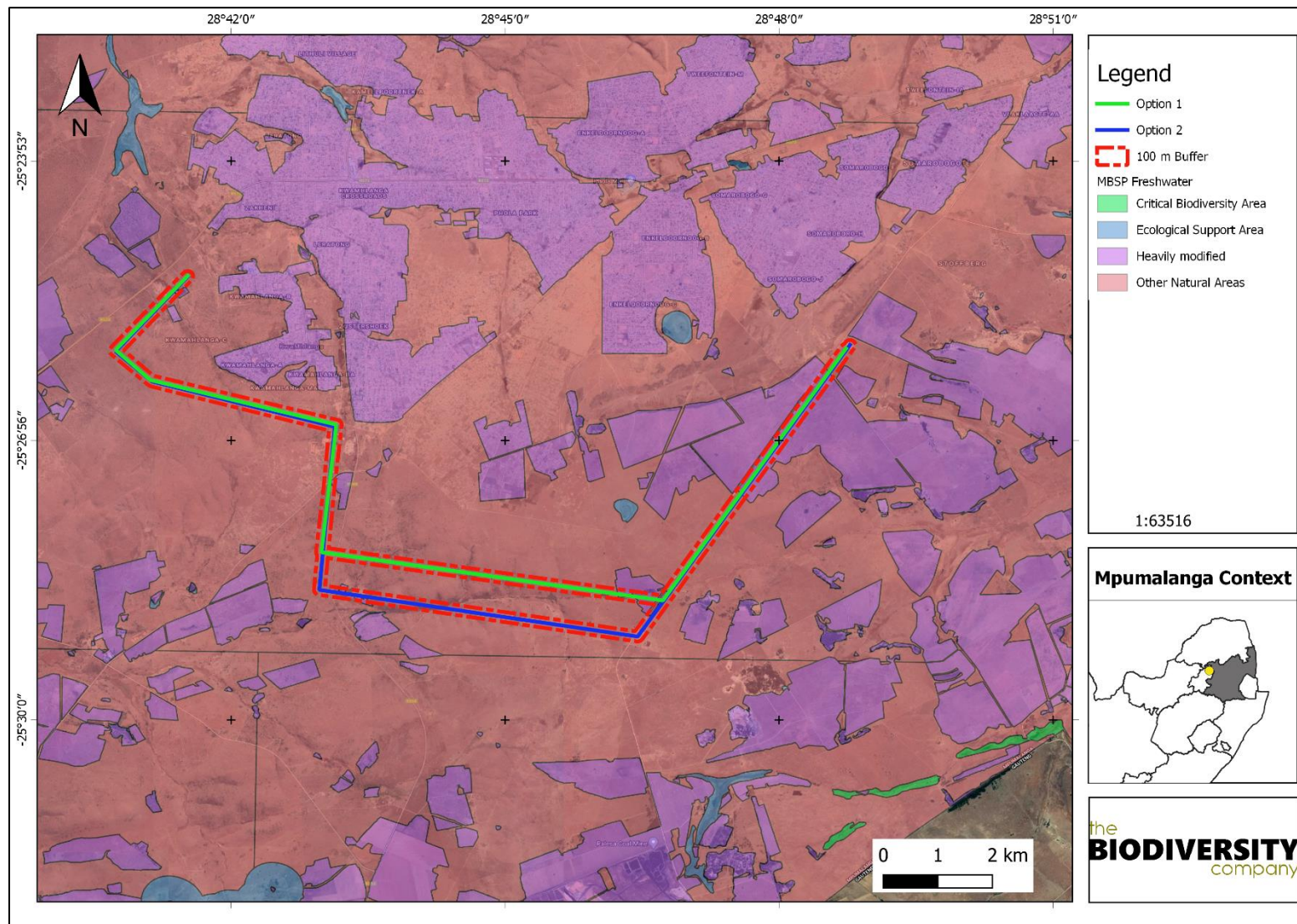


Figure 7-2 Project area in relation to the Freshwater Mpumalanga Biodiversity Sector Plan

7.3 National Biodiversity Assessment

The National Biodiversity Assessment (NBA) was completed as a collaboration between the SANBI, the DEA and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period (Skowno *et al.*, 2019).

The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors (Skowno *et al.*, 2019).

The two headline indicators assessed in the NBA are Ecosystem Threat Status and Ecosystem Protection Level.

7.3.1 Ecosystem Threat Status

Ecosystem Threat Status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Skowno *et al.*, 2019).

Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Skowno *et al.*, 2019).

The proposed project area was superimposed on the terrestrial ecosystem threat status (Figure 7-3). As seen in this figure the project area falls across one ecosystem, which is listed LC.

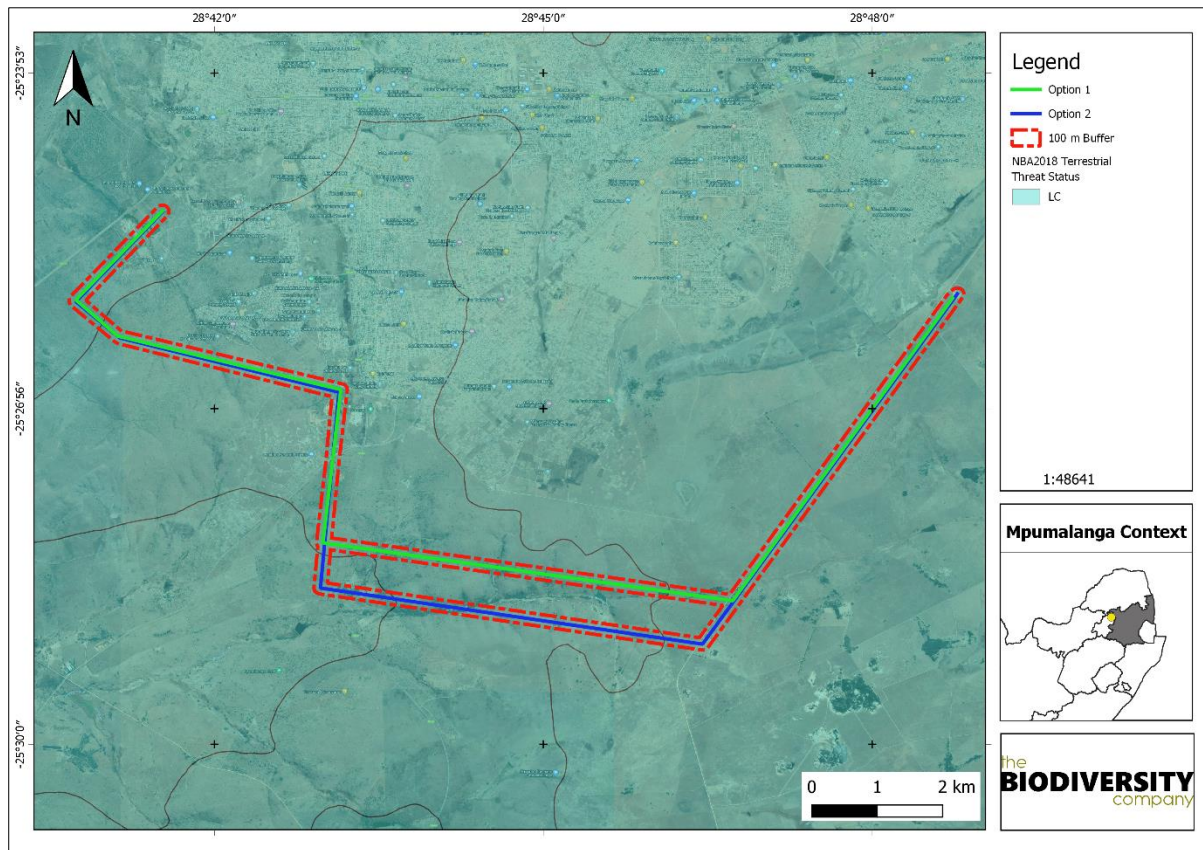


Figure 7-3 The project area showing the ecosystem threat status of the associated terrestrial ecosystems (Skowno *et al*, 2019)

7.3.2 Ecosystem Protection Level

Ecosystem Protection Level details whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as either not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.*, 2019).

The project area was superimposed on the ecosystem protection level map to assess the protection status of terrestrial ecosystems associated with the development (Figure 7-4). Based on this the terrestrial ecosystems associated with the proposed project area are rated as *poorly protected* and *moderately protected*. This means that these ecosystem types (and associated habitats) are not well protected anywhere in the country (such as in nationally protected areas).

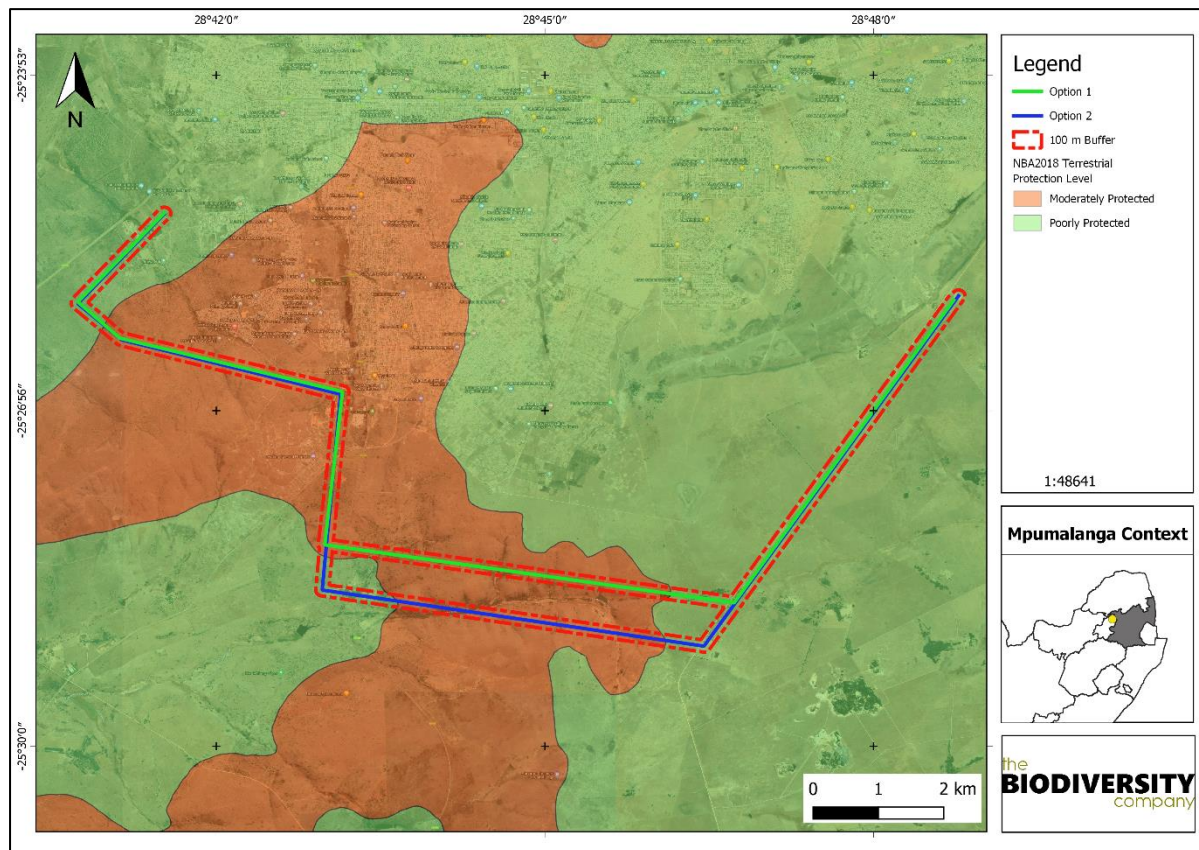


Figure 7-4 The project area showing the level of protection of terrestrial ecosystems (Skowno et al, 2019)

7.4 Mpumalanga Protected Areas Expansion Strategies

The Mpumalanga Protected Area Expansion Strategy (MPAES, 2013), commissioned by the MTPA, serves to function as a provincial framework for an integrated, co-ordinated and uniform approach in the expansion and consolidation of the Provincial PAS, in line with the requirements of the NPAES.

The priority areas for PA Expansion within Mpumalanga were spatially established based on the premise that the primary goal of these areas is to protect biodiversity targets. Several biodiversity data sources were used for the assessment, namely the: Threatened Ecosystems, MBCP Terrestrial Assessment, MBCP Aquatic Assessment, MBCP Irreplaceability, C-plan Irreplaceability, and the National Spatial Biodiversity Assessment Priority areas. A combination of all these were used, together with the spatial priorities established within the NPAES, to establish the spatial priority areas that will guide the MPAES over the next 20 years as reflected below (Figure 7-5). Option 1 crosses a MPAES area, while option 2 is approximately 340 m from a separate MPAES area.

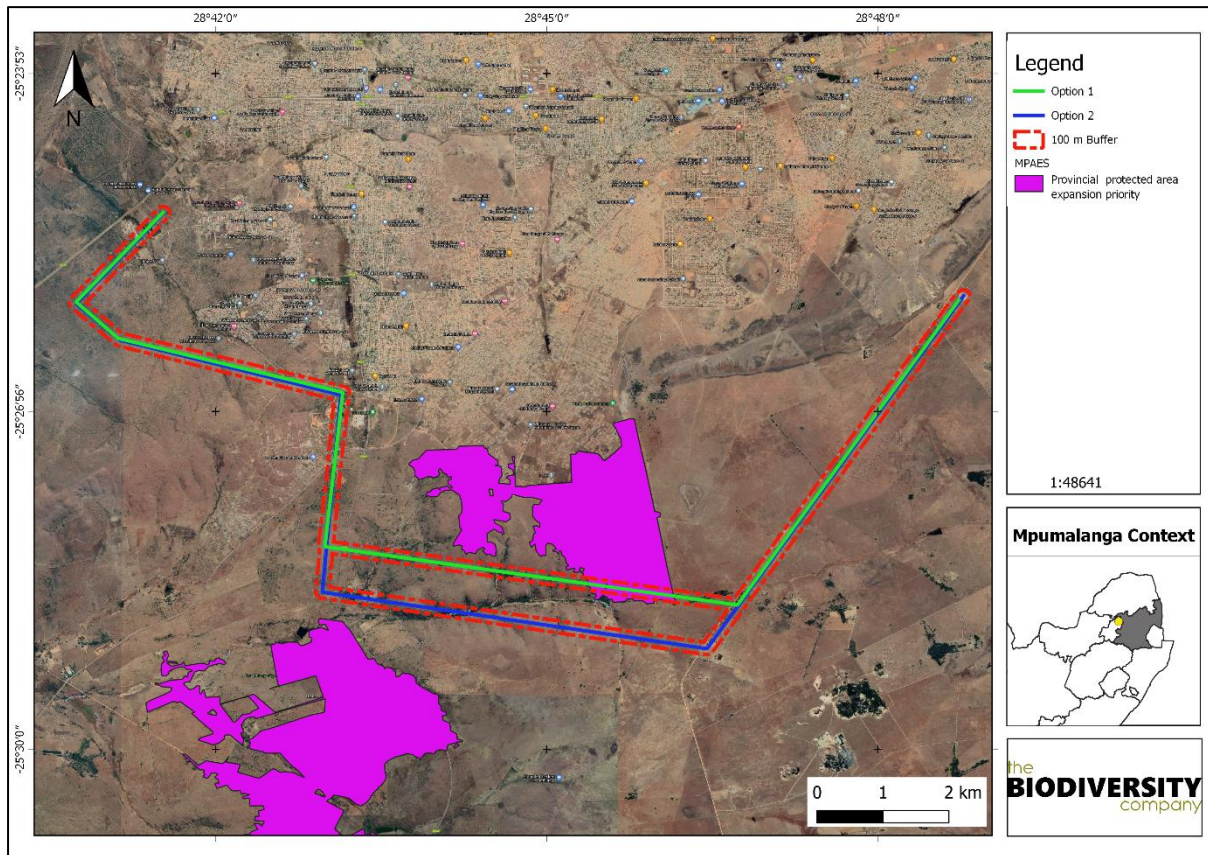


Figure 7-5 The project area in relation to the Mpumalanga Protected Areas Expansion Strategy areas

7.5 National Biodiversity Assessment Wetlands

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018.

Ecosystem threat status (ETS) of river ecosystem types is based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LC, with CR, EN and VU ecosystem types collectively referred to as ‘threatened’ (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019).

Figure 7-6 shows that the wetland that runs across the project area is LC.

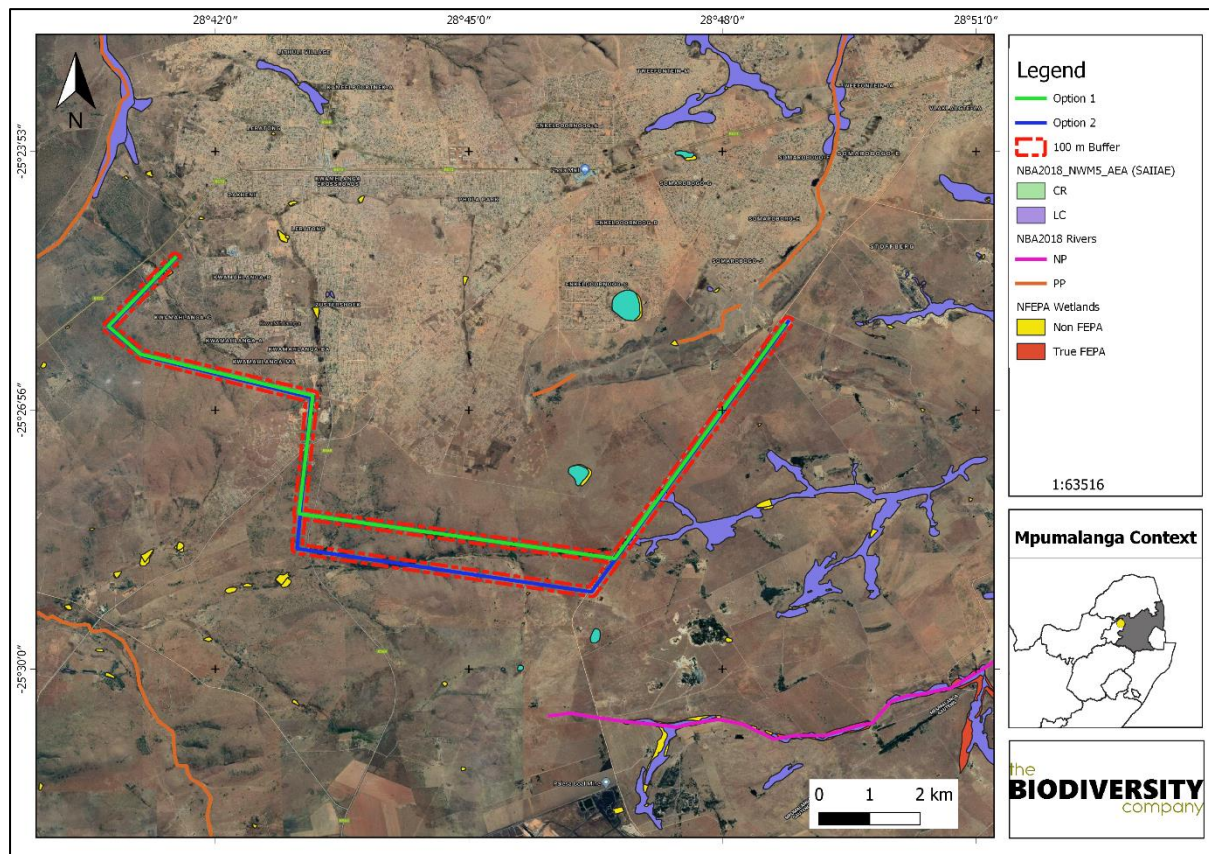


Figure 7-6 The project area in relation to the wetlands and rivers (NBA, 2018).

8 Results & Discussion

8.1 Desktop Assessment

8.1.1 Vegetation Assessment

The site is situated in the Savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

- a) Seasonal precipitation; and
- b) (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006).

The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layers, over-topped by a discontinuous, but distinct woody plant layer. At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are

dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Acacia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

8.1.1.1 Vegetation Types

The Grassland biome comprises of many different vegetation types. The proposed project area falls within Central Sandy Bushveld and Loskop Mountain Bushveld (Figure 8-1) vegetation type (SANBI, 2019).

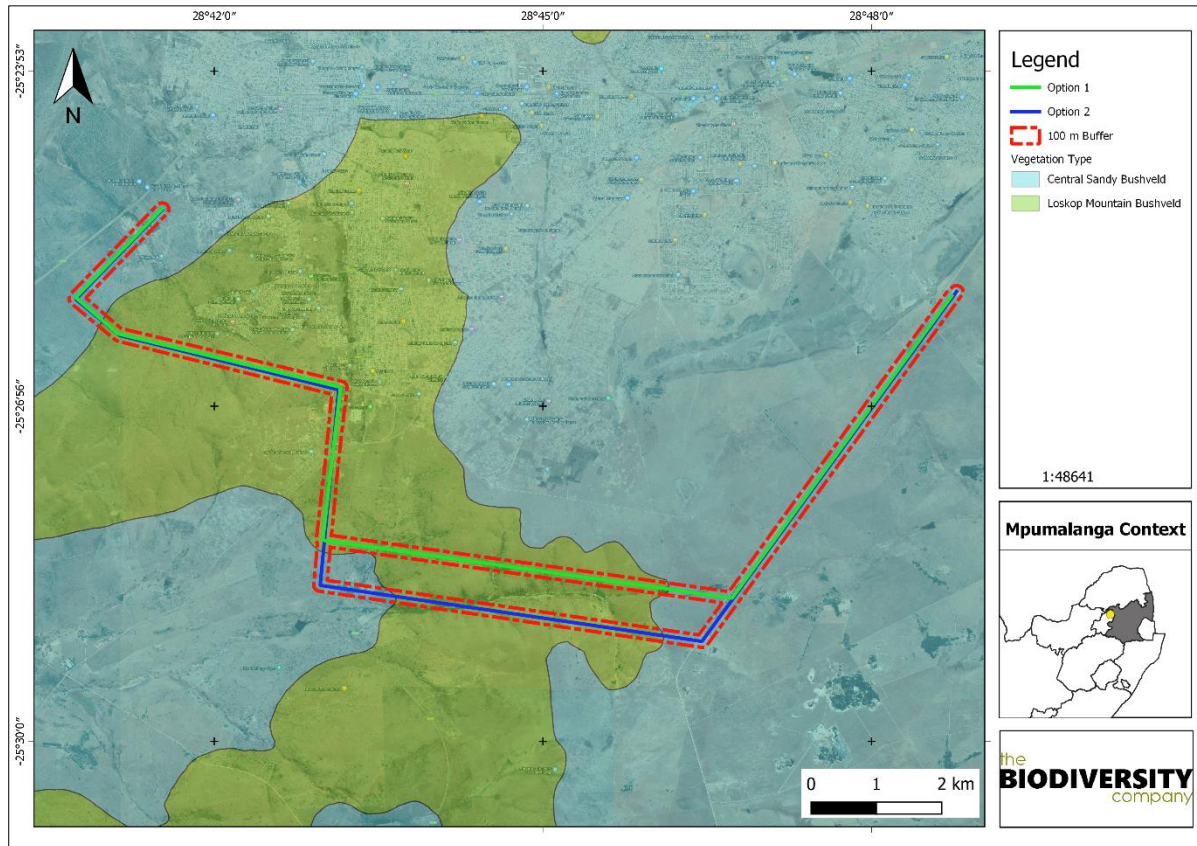


Figure 8-1 The project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2018)

8.1.1.2 Central Sandy Bushveld

Central Sandy Bushveld is undulating terrain at altitudes of 850-1450m. These areas are sometimes found between mountains, sandy plains and catenas that support tall, deciduous *Terminalia sericea* and *Burkea africana*.

Important Plant Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are important in the Central Sandy Bushveld.

Tall Trees: *Senegalia burkei*, *Vachellia robusta*, *Sclerocarya birrea* subsp. *caffra*.

Small Trees: *Burkea africana*, *Combretum apiculatum*, *C. zeyheri*, *Terminalia sericea*, *Ochna pulchra*, *Peltophorum africanum*, *Searsia leptodictya*.

Tall Shrubs: *Combretum hereroense*, *Grewia bicolor*, *G. monticola*, *Strychnos pungens*.

Low Shrubs: *Agathisanthemum bojeri*, *Indigofera filipes*, *Felicia fascicularis*, *Gnidia sericocephala*.

Geoxylic Suffrutex: *Dichapetalum cymosum*.

Woody Climber: *Asparagus buchananii*.

Graminoids: *Brachiaria nigropedata*, *Eragrostis pallens*, *E. rigidior*, *Hyperthelia dissoluta*, *Panicum maximum*, *Perotis patens*, *Antheophora pubescens*, *Aristida scabrivalvis* subsp. *scabrivalvis*, *Brachiaria serrata*, *Elionurus muticus*, *Eragrostis nindensis*, *Loudetia simplex*, *Schmidtia pappophoroides*, *Themeda triandra*, *Trachypogon spicatus*.

Herbs: *Dicerocaryum senecioides*, *Barleria macrostegia*, *Blepharis integrifolia*, *Crabbea angustifolia*, *Evolvulus alsinoides*, *Geigeria burkei*, *Hermannia lancifolia*, *Indigofera daleoides*, *Justicia anagaloides*, *Kyphocarpa angustifolia*, *Lophiocarpus tenuissimus*, *Waltheria indica*, *Xerophyta humilis*.

Geophytic Herb: *Hypoxis hemerocallidea*.

Succulent Herb: *Aloe greatheadii* var. *davyana*.

Biogeographically Important Taxa (Central Bushveld endemics)

Graminoid: *Mosdenia leptostachys*.

Herb: *Oxygonum dregeanum* subsp. *canescens* var. *dissectum*.

Conservation Status of the Vegetation Type

The conservation status of this vegetation community was listed by Mucina and Rutherford (2006) as VU. The national conservation target of 19% of which less than 3% is statutorily conserved across many nature reserves.

8.1.1.3 Loskop Mountain Bushveld

This vegetation type consists of low mountains and ridges in open tree savanna. Dominant trees include *Burkea Africana*, *Senegalia caffra*, *Combretum apiculatum*, and *Diplorhynchus condylocarpon*. The herbaceous layer is dominated by grasses.

Important Taxa

Tall Tree: *Senegalia burkei*.

Small Trees: *Senegalia caffra*, *Burkea africana*, *Combretum apiculatum*, *C. zeyheri*, *Croton gratissimus*, *Faurea saligna*, *Heteropyxis natalensis*, *Ochna pulchra*, *Protea caffra*, *Pseudolachnostylis maprouneifolia*, *Terminalia sericea*, *Brachylaena rotundata*, *Combretum molle*, *Englerophytum magalismontanum*, *Ozoroa sphaerocarpa*, *Pappea capensis*, *Sersia leptodictya*, *Strychnos cocculoides*, *Vangueria parvifolia*.

Tall Shrubs: *Diplorhynchus condylocarpon*, *Elephantorrhiza burkei*, *Combretum moggii*, *Grewia flava*, *Mundulea sericea*, *Pavetta zeyheri*, *Psydrax livida*, *Vitex rehmannii*.

Low Shrub: *Sersia zeyheri*.

Succulent Shrub: *Aloe castanea*.

Graminoids: *Aristida transvaalensis*, *Loudetia simplex*, *Trachypogon spicatus*, *Digitaria eriantha* subsp. *eriantha*, *Enneapogon pretoriensis*, *Heteropogon contortus*, *Setaria sphacelata*, *Themeda triandra*, *Tristachya biseriata*.

Herb: *Xerophyta retinervis*.

Endemic Taxa Geophytic Herb: *Gladiolus pole-evansii*.

Succulent Herb: *Haworthia koelmaniorum*.

Conservation status

This vegetation type is classified as LC, with its national conservation target being 24%. About 15% has been statutorily conserve in the Loskop Dam and Mabusa Nature Reserve.

8.1.1.4 Plant Species of Conservation Concern

Based on the Plants of Southern Africa (BODATSA-POSA, 2019) database, 327 plant species are expected to occur in the project area. Figure 8-2 shows the extent of the grid that was used to compile the expected species list based on the Plants of Southern Africa (BODATSA-POSA, 2016) database. The list of expected plant species is provided in Appendix A. Of the 327-plant species, two species are listed as being SCCs.

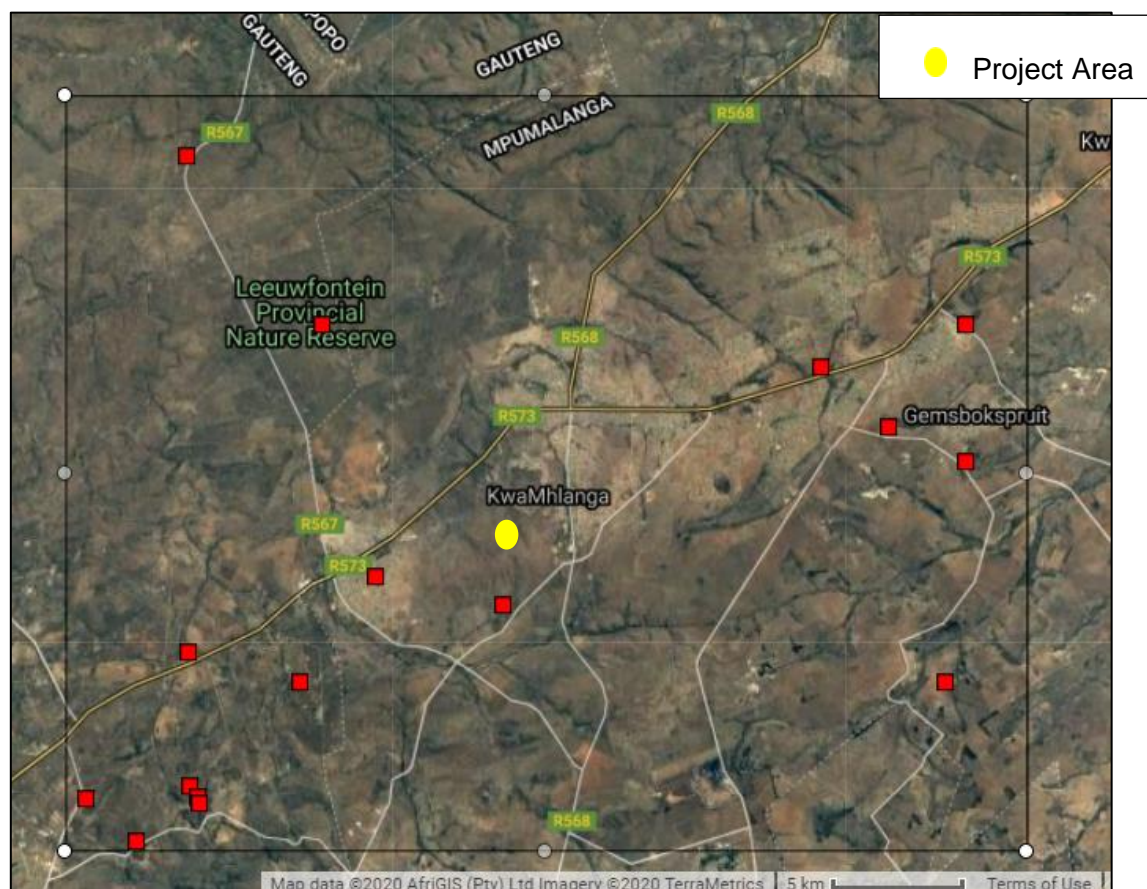


Figure 8-2 Map showing the grid drawn to compile an expected species list (BODATSA-POSA, 2019)

Table 8-1 Flora SCCs expected in the project area

Family	Taxon	Author	IUCN	Ecology
Fabaceae	<i>Argyrolobium megarrhizum</i>	Bolus	NT	Indigenous; Endemic
Anacardiaceae	<i>Searsia gracillima</i> var. <i>gracillima</i>	(Engl.) Moffett	NT	Indigenous; Endemic

8.1.2 Faunal Assessment

8.1.2.1 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 319 bird species are expected to occur in the vicinity of the project area (pentads 2520_2835; 2520_2840; 2520_2845; 2525_2835; 2525_2840; 2525_2845; 2530_2840; 2530_2845; 2530_2850). The full list of potential bird species is provided in Appendix B.

Of the expected bird species, twelve (12) species are listed as SCC either on a regional scale or international scale (Table 8-2). The SCC include the following:

- Three (3) species that are listed as EN on a regional basis;
- Five (5) species that are listed as VU on a regional basis; and
- Four (4) species that are listed as NT on a regional basis.

Five species were given a low likelihood of occurrence based on a lack of suitable habitat and the level of disturbances.

Table 8-2 List of bird species of regional or global conservation importance that are expected to occur in pentads mentioned above (SABAP2, 2018, ESKOM, 2015; IUCN, 2017)

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC	Moderate
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU	Low
<i>Aquila rapax</i>	Eagle, Tawny	EN	LC	Low
<i>Circus macrourus</i>	Harrier, Pallid	NT	NT	Moderate
<i>Coracias garrulus</i>	Roller, European	NT	LC	Moderate
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied	VU	LC	High (Observed)
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	High
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN	Low
<i>Neotis denhami</i>	Bustard, Denham's	VU	NT	High
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	VU	Low
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU	High
<i>Tyto capensis</i>	Grass-owl, African	VU	LC	Low

Alcedo semitorquata (Half-collared Kingfisher) is listed as NT on a regional scale and occurs across a large range. This species generally prefers narrow rivers, streams, and estuaries with dense vegetation onshore, but it may also move into coastal lagoons and lakes. It mainly feeds

on fish (IUCN, 2017). The possibility of occurrence is moderate due to the streams that occur in the project area, they are disturbed which does decrease the likelihood of occurrence.

Circus macrourus (Pallid Harrier) is listed as NT on a regional and global scale, and overwinters in semi-desert, scrub, savanna and wetlands. The species is migratory, with most birds wintering in sub-Saharan Africa or south-east Asia (IUCN, 2017). The species is most likely only to use the area as a migratory route or a temporary overwintering location from August to March, the likelihood of occurrence is moderate.

Coracias garrulous (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller has a preference for bushy plains and dry savannah areas (IUCN, 2017). There is a moderate chance of this species occurring in the project area as they prefer to forage in open/disturbed grassland areas.

Eupodotis senegalensis (White-bellied Korhaan) is Near-endemic to South Africa, occurring from the Limpopo Province and adjacent provinces, south through Swaziland to KwaZulu-Natal and the Eastern Cape. It generally prefers tall, dense sour or mixed grassland, either open or lightly wooded, occasionally moving into cultivated or burnt land (Hockey *et al*, 2005), which is present in the project area. The species was observed in the study.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals but have also been observed to be solitary. Their diet is mainly composed of small birds such as pigeons and francolins. The likelihood of incidental records of this species in the project area is rated as high due to the natural veld condition and the presence of many bird species on which Lanner Falcons may predate.

Neotis denhami (Denhams Bustard) is listed as VU on a regional scale and NT on a global scale. It occurs in flat, arid, mostly open country such as grassland, karoo, bushveld, thornveld, scrubland and savanna but also including modified habitats such as wheat fields and firebreaks. Collisions with power lines may be a significant threat in parts of the range, particularly South Africa (IUCN, 2007). The habitat at the project site does provide suitable habitat for this species and therefore its likelihood of occurrence is rated as high.

Sagittarius serpentarius (Secretarybird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2017). The likelihood of occurrence is rated as high due to the extensive grasslands and wetland/stream areas present in the project area.

8.1.2.2 Mammals

The IUCN Red List Spatial Data (IUCN, 2017) lists 93 mammal species that could be expected to occur within the vicinity of the project area (Appendix C). Of these species, 9 are medium to large conservation dependant species, such as *Ceratotherium simum* (Southern White Rhinoceros) and *Equus quagga* (Plains Zebra) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected species list (Appendix C).

Of the remaining 92 small to medium sized mammal species, fifteen (15) are listed as being of conservation concern on a regional or global basis (Table 8-3). The list of potential species includes:

- Three (3) that are listed as EN on a regional basis;
- Four (4) that are listed as VU on a regional basis; and
- Eight (8) that are listed as NT on a regional scale.

Eleven species were given a low likelihood of occurrence based on the lack of suitable habitat and the high level of disturbance specifically in the form of poaching.

Table 8-3 List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2016)

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	Moderate
<i>Atelerix frontalis</i>	South Africa Hedgehog	NT	LC	Moderate
<i>Cloeotis percivali</i>	Short-eared Trident Bat	EN	LC	Low
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	NT	LC	Low
<i>Dasymys incomtus</i>	African Marsh rat	NT	LC	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Low
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT	Moderate
<i>Leptailurus serval</i>	Serval	NT	LC	High
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Low
<i>Ourebia ourebi</i>	Oribi	EN	LC	Low
<i>Panthera pardus</i>	Leopard	VU	VU	Low
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	Low
<i>Pelea capreolus</i>	Grey Rhebok	NT	NT	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC	Low
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC	Low

Aonyx capensis (Cape Clawless Otter) is the most widely distributed otter species in Africa (IUCN, 2017). This species is predominantly aquatic, and it is seldom found far from water. Based on some streams in the project area although somewhat disturbed, the likelihood of occurrence of this species occurring in the project area is considered to be moderate.

Atelerix frontalis (South African Hedgehog) has a tolerance of a degree of habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), *A. frontalis* populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Although the species is cryptic and therefore not often seen, there is areas of suitable habitat in the project area and therefore the likelihood of occurrence is rated as moderate.

Hydrictis maculicollis (Spotted-necked Otter) inhabits freshwater habitats where water is unsilted, unpolluted, and rich in small to medium sized fishes (IUCN, 2017). Suitable habitat may be available in the streams in the project area, therefore the likelihood of occurrence is moderate.

Leptailurus serval (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa, they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Large areas of natural grassland occur in the project area and as such the likelihood of occurrence is rated as high.

8.1.2.3 Herpetofauna (Reptiles & Amphibians)

8.1.2.3.1 Reptiles

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMap database provided by the Animal Demography Unit (ADU, 2017) 82 reptile species are expected to occur in the project area (Appendix D). Three (3) reptile SCC are expected to be present in the project area (Table 9-4), two of which have a low likelihood of occurrence based on a lack of suitable habitat.

Table 8-4 Expected reptile SCC that may occur in the project area

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	NT	NT	Low
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	VU	Low
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	NT	Moderate

Homoroselaps dorsalis (Striped Harlequin Snake) is partially fossorial and known to inhabit old termitaria in grassland habitat (IUCN, 2017). Most of its range is at moderately high altitudes, reaching 1,800 m in Mpumalanga and Swaziland, but it is also found at elevations as low as about 100 m in KwaZulu-Natal. The likelihood of occurrence was rated as moderate based on suitable habitat being available although somewhat disturbed.

8.1.2.3.2 Amphibians

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the ADU (ADU, 2017). Thirty (30) amphibian species are expected to occur in the project area (Appendix E).

No amphibian SCC are expected to occur in the project area according to the above-mentioned sources.

8.2 Field Survey

8.2.1 Terrestrial Assessment

The field survey for the project area was conducted from the 14th to 15th of September 2020. During the survey the floral and faunal communities within the project development footprint were assessed. The project area was ground-truthed on foot, which included spot checks in pre-selected areas to validate desktop data. Photographs were recorded during the site visit and some are provided in this section of the report. All site photographs are available on request.

8.2.1.1 Flora Assessment

The vegetation assessment was conducted throughout the extent of the project area. A total of 95 tree, shrub and herbaceous plant species were recorded in the project area during the field assessment (Table 8-5). Plants listed as Category 1 alien or invasive species under the National Environmental Management: Biodiversity Act (NEMBA) appear in green text. Plants listed in Category 2 or as 'not indigenous' or 'naturalised' according to NEMBA, appear in blue text. Three species were found that are protected under schedule 11 of the Mpumalanga Nature Conservation Act no 10 of 1998. The Common sugar bush (*Protea caffra*) were restricted to the grasslands, while the Poison bulbs (*Boophone disticha*) were found in the bushveld habitat. The Tamboti (*Spirostachys africana*) were found mainly in the riparian habitat.

Table 8-5 Trees, shrubs and weeds recorded at the project area

Scientific Name	Common Names	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
<i>Acacia mearnsii</i>	Black Wattle			NEMBA Category 2
<i>Agave americana</i>	Century plant			Naturalized exotic weed
<i>Aloe davyana</i>	Gras aalwyn	LC	Not Endemic	
<i>Alternanthera pungens</i>	Paper thorns			Naturalized exotic weed
<i>Amaranthus hybridus</i>	Smooth Pigweed			Naturalized exotic weed
<i>Arctotis venusta</i>	Free State Daisy	LC	Not Endemic	
<i>Argemone ochroleuca</i>	Mexican poppy			NEMBA Category 1b.
<i>Aristida junciformis</i>	Wire Grass	LC	Not Endemic	
<i>Asclepias meliodora</i>		LC	Not Endemic	
<i>Asparagus suaveolens</i>	Bushveld Asparagus	LC	Not Endemic	
<i>Bidens pilosa</i>	Blackjack			Naturalized exotic weed
<i>Boophone disticha</i>	Poison bulb	LC-Schedule 11 Mpumalanga	Not Endemic	
<i>Buddleja salviifolia</i>	Sagewood	LC	Not Endemic	
<i>Bulbine capitata</i>	Narrow-leaved Bulbine	LC	Not Endemic	
<i>Burkea africana</i>	Wild Seringa	LC	Not Endemic	

Scientific Name	Common Names	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
<i>Celtis africana</i>	Witstinkhout	LC	Not Endemic	
<i>Cereus jamacara</i>	Queen of the night			NEMBA Category 1b
<i>Cirsium vulgare</i>	Spear Thistle			NEMBA Category 1b
<i>Combretum zeyheri</i>	Raasblaar	LC	Not Endemic	
<i>Conyza bonariensis</i>	Hairy Fleabane			Naturalized exotic weed
<i>Cussonia paniculata</i>	Highveld cabagetree	LC	Endemic	
<i>Cymbopogon caesius</i>	Broad Leaved Turpentine Grass	LC	Not Endemic	
<i>Cynodon dactylon</i>	Common Couch Grass			
<i>Datura ferox</i>	Thorn apple			NEMBA Category 1b
<i>Dichrostachys cinerea</i>	Sekelbos	LC	Not Endemic	
<i>Dicoma anomala</i>	Aambeibos	LC	Not Endemic	
<i>Dombeya rotundifolia</i>	Drolpeer	LC	Not Endemic	
<i>Ehretia rigida</i>	Puzzlebush	LC	Endemic	
<i>Eleusine coracana</i>	Finger millet			Naturalized exotic
<i>Elionurus muticus</i>	Wire Lemongrass	LC	Not Endemic	
<i>Englerophytum magalimontanum</i>	Stamvrug	LC	Not Endemic	
<i>Eragrostis curvula</i>	African Love Grass	LC	Not Endemic	
<i>Eragrostis racemosa</i>	Narrow Heart Love Grass	LC	Not Endemic	
<i>Erythrina lysistemon</i>	Coral Tree	LC	Not Endemic	
<i>Eucalyptus camaldulensis</i>	Red River Gum			NEMBA Category 1b
<i>Euclea crispa</i>	Blue Guarri	LC	Not Endemic	
<i>Euphorbia clavarioides</i>	Lion's Spoor	LC	Endemic	
<i>Faurea saligna</i>	Transvaal Beechwood	LC	Not Endemic	
<i>Felicia muricata</i>	Taai-Astertjie	LC	Not Endemic	
<i>Ficus salicifolia</i>	Wonderboom	LC	Not Endemic	
<i>Gazania krebsiana</i>	Common Gazania	LC	Not Endemic	
<i>Gomphrena celosioides</i>	Bachelor's Button			Naturalized exotic
<i>Gymnosporia buxifolia</i>	Common Spike-thorn	LC	Not Endemic	
<i>Helichrysum caespititium</i>	Speelwonderboom	LC	Not Endemic	
<i>Helichrysum nudifolium</i>	Hottentot's Tea	LC	Not Endemic	
<i>Heteropogon contortus</i>	Speargrass	LC	Not Endemic	
<i>Hyparrhenia filipendula</i>	Fine Thatching Grass	LC	Not Endemic	
<i>Hyparrhenia hirta</i>	Thatching Grass	LC	Not Endemic	
<i>Hypoxis hemerocallidea</i>	African star grass	LC	Not Endemic	

Scientific Name	Common Names	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
<i>Hypoxis obtusa</i>	Moli-boea	LC	Not Endemic	
<i>Hypoxis rigidula</i>	Silver-leaved Star-flower	LC	Not Endemic	
<i>Jamesbrittenia aurantiaca</i>	Cape Saffron	LC	Not Endemic	
<i>Lantana camara</i>	Lantana			NEMBA Category 1b
<i>Lasiosiphon kraussianus</i>	Lasiosiphon kraussianus	LC	Not Endemic	
<i>Ledebouria revoluta</i>	Ubuhlungu	LC	Not Endemic	
<i>Leonotis leonurus</i>	Wild Dagga	LC	Not Endemic	
<i>Ligustrum japonicum</i>	Wax-leaf privet			NEMBA Category 1b
<i>Lopholaena coriifolia</i>	Leather-leaved Fluff-bush	LC	Not Endemic	
<i>Melia azedarach</i>	"Syringa", Persian Lilac			NEMBA Category 1b.
<i>Melinis repens</i>	Red Natal grass	LC	Not Endemic	
<i>Morus alba</i>	Mulberry			NEMBA Category 2
<i>Mundulea sericea</i>	Cork bush	LC	Not Endemic	
<i>Ocimum obovatum</i>	Cat's Whiskers	LC	Not Endemic	
<i>Opuntia ficus indica</i>	Prickly-Pear			NEMBA Category 1b
<i>Panicum schinzii</i>	Blousaadgras	LC	Not Endemic	
<i>Parinari capensis</i>	Dwarf Mobola-plum	LC	Not Endemic	
<i>Pellaea calomelanos</i>	Hard Fern	LC	Not Endemic	
<i>Phragmites australis</i>	Common Reed	LC	Not Endemic	
<i>Populus alba</i>	Poplar			NEMBA Category 2
<i>Protea caffra</i>	Common Sugarbush	LC-Schedule 11 Mpumalanga	Not Endemic	
<i>Ricinus communis</i>	Castor Oil			NEMBA Category 1b
<i>Searsia lancea</i>	Karee	LC	Not Endemic	
<i>Searsia leptodictya</i>	Mountain karee	LC	Not Endemic	
<i>Searsia pyroides</i>	Common Wild Currant	LC	Not Endemic	
<i>Senegalia caffra</i>	Common Hook-thorn	LC	Not Endemic	
<i>Senegalia sieberiana</i>	Monkey thorn	LC	Not Endemic	
<i>Solanum campylacanthum</i>	Bitter Apple	LC	Not Endemic	
<i>Solanum mauritianum</i>	Bugweed			NEMBA Category 1b
<i>Solanum sisymbriifolium*</i>	Sticky nightshade			NEMBA Category 1b
<i>Spirostachys africana</i>	Tamboti	LC-Schedule 11 Mpumalanga	Not Endemic	
<i>Stoebe plumosa</i>	Bankruptbush	LC	Not Endemic	
<i>Strychnos madagascariensis</i>	Black monkey orange	LC	Not Endemic	
<i>Syzygium cordatum</i>	Wayerberry	LC	Not Endemic	

Scientific Name	Common Names	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
<i>Tagetes minuta</i>	Khaki weed			Naturalized exotic
<i>Tarchonanthus camphoratus</i>	Camphor bush	LC	Not Endemic	
<i>Terminalia sericea</i>	Vaalbos	LC	Not Endemic	
<i>Themeda triandra</i>	Red Grass	LC	Not Endemic	
<i>Tipuana tipu</i>	Tipuana			Naturalized exotic
<i>Tricholaena monachne</i>	Blue Seed Tricholaena	LC	Not Endemic	
<i>Typha capensis</i>	Bulrush, Common Cattail	LC	Not Endemic	
<i>Vachellia karroo</i>	Sweethorn	LC	Not Endemic	
<i>Verbena bonariensis</i>	Purple Top			
<i>Xanthium strumarium</i>	Rough cocklebur			NEMBA Category 1b.
<i>Xerophyto retinervis</i>	Bobbejaanstert	LC	Not Endemic	
<i>Ziziphus mucronata</i>	Buffalo thorn	LC	Not Endemic	

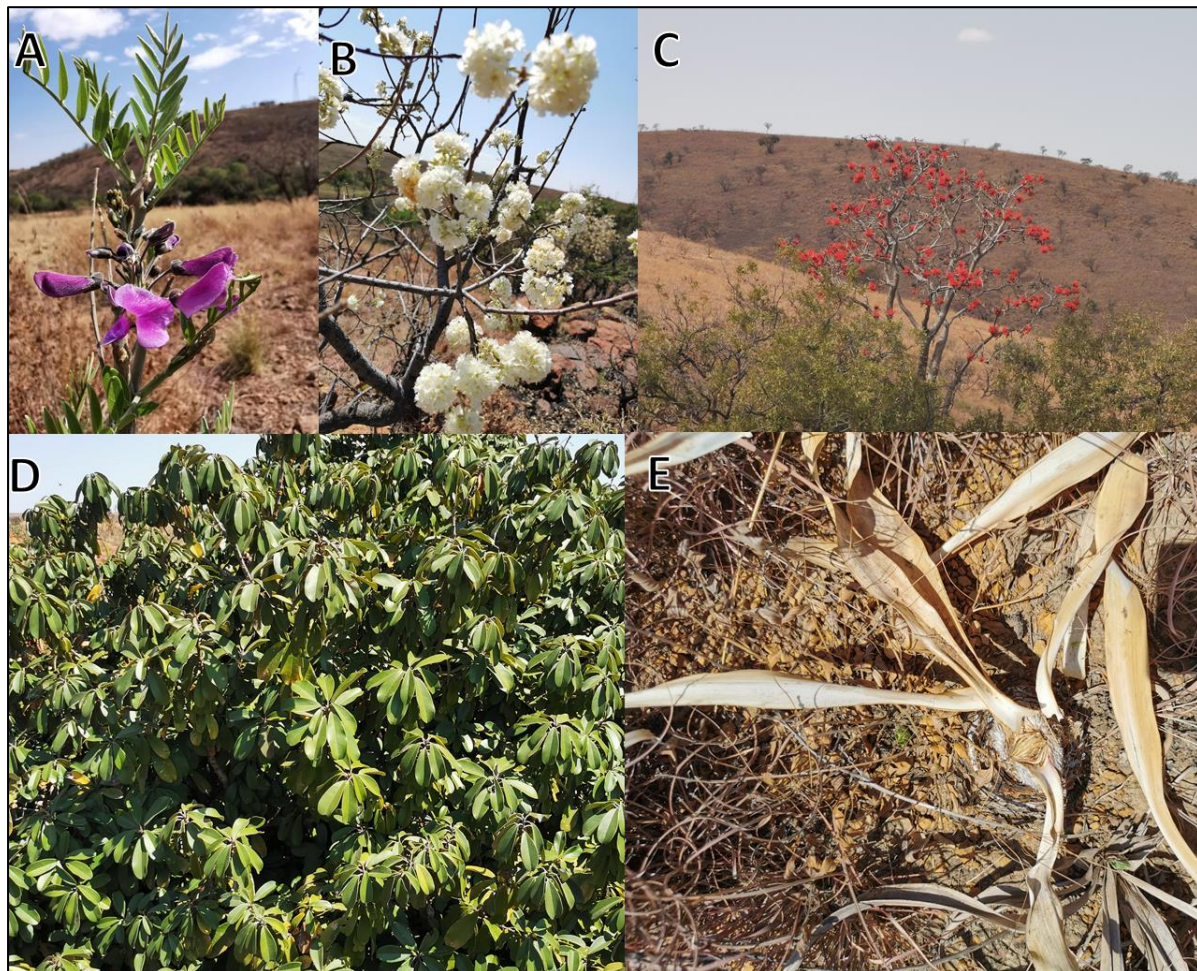


Figure 8-3 Some of the plant species recorded in the project area: A) Cork Bush (*Mundulea sericea*), B) Drolpeer (*Dombeya rotundifolia*), C) Coral tree (*Erythrina lysistemon*), D) Stamvrug (*Englerophytum magalismontanum*), E) Poison bulb (*Boophone disticha*)

8.2.1.1.1 Alien and Invasive Plants

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of these systems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The NEMBA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014, and was amended in September 2020 in the Government Gazette No. 43726. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse.

Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing
- Take steps to manage the listed invasive species in compliance with:

- Section 75 of the Act;
- The relevant invasive species management programme developed in terms of regulation 4; and
- Any directive issued in terms of section 73(3) of the Act.

Thirteen (13) Category 1b invasive plant species were recorded within the project area and it is recommended that an alien invasive plant management programme be implemented in compliance of section 75 of the Act as stated above. The NEMBA listed species identified within the project area are marked in green (Table 9-5).

8.2.1.2 Fauna

8.2.1.2.1 Mammals

Overall, mammal diversity in the project area was considered to be good, with 8 mammal species being recorded during the September 2020 survey based on direct observations and/or the presence of visual tracks & signs (Table 8-6 and Figure 8-4). The habitat observed has a high likelihood of supporting SCC, especially Serval.

Table 8-6 Mammal species recorded in the project area during the September 2020 survey .

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Canis mesomelas</i>	Black-backed Jackal	LC	LC
<i>Chlorocebus pygerythrus</i>	Vervet Monkey	LC	LC
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC
<i>Felis silvestris</i>	African Wildcat	LC	LC
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
<i>Raphicerus campestris</i>	Steenbok	LC	LC
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC



Figure 8-4 Signs and tracks of the mammal species recorded within the project area; A) Scrub Hare (*Lepus saxatilis*), B) Black-backed Jackal (*Canis mesomelas*), C) Cape Porcupine (*Hystrix africae australis*) and D) Yellow mongoose (*Cynictis penicillata*)

8.2.1.2.2 Herpetofauna (Reptiles & Amphibians)

Five reptile species were recorded in the project area, while only one amphibian species was recorded (Table 8-7 and Figure 8-5). Some tadpoles were also observed. It is expected after some rains that the number of amphibian species present will increase. Large portions of the project area were burned, and this could have contributed to the lower number of reptiles recorded in the project area compared to the high number of species that were expected.

Table 8-7 Herpetofauna observed in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Reptiles			
<i>Agama atra</i>	Southern Rock Agama	LC	LC

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Leptotyphlops incognitus</i>	Incognito Thread Snake	LC	Unlisted
<i>Pachydactylus affinis</i>	Transvaal Gecko	LC	LC
<i>Trachylepis striata</i>	Striped Skink	LC	Unlisted
<i>Trachylepis variegata</i>	Variegated Skink	LC	Unlisted
Amphibians			
<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC	LC

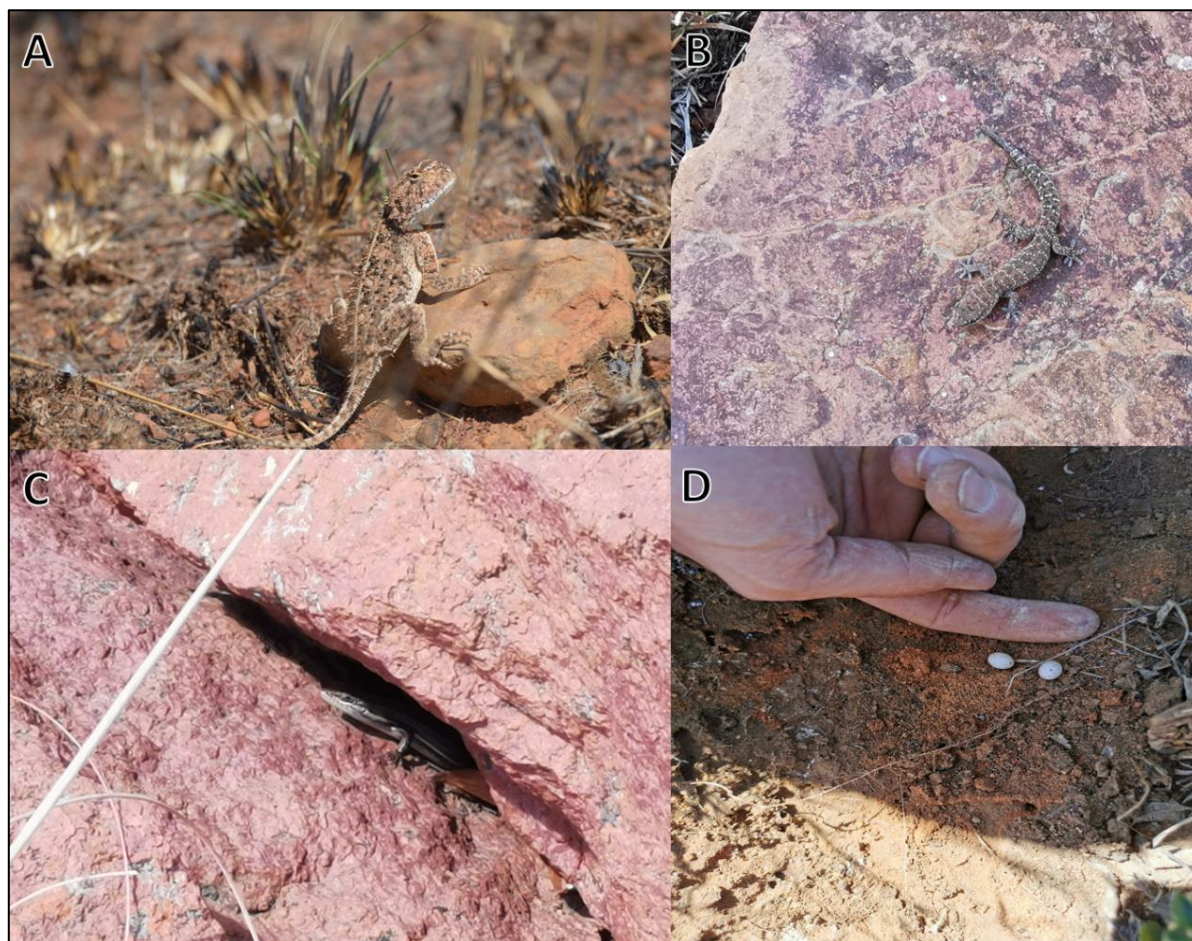


Figure 8-5 Some of the reptile species recorded in the project area: A) Southern Rock Agama (*Agama atra*), B) Transvaal Gecko (*Pachydactylus affinis*), C) Variegated Skink (*Trachylepis variegata*) and D) Gecko sp. eggs.

8.2.2 Avifauna Assessment

8.2.2.1 Field results

Fifty eight species were recorded across four habitats (Table 8-8 and Figure 8-5). One of the species, the White-bellied Korhaan (*Eupodotis senegalensis*), is classified as VU in South Africa. The Korhaan were not noticed in the 100 m buffer area of the project area, but based on their presence it is of utmost importance that the area be examined prior to any development and that a walked-through be undertaken prior to construction (Figure 8-7). No nests were observed for the Korhaan, but this could just be as a result of the time of the survey.

These birds are known to occur in grassland habitats which does form part of the project area, should these species or their nests be noticed prior/during construction an appropriate specialist must be contacted to advise on the appropriate steps to follow.

Table 8-8 Avifauna observed in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Acrocephalus baeticatus</i>	Reed-warbler, African	Unlisted	Unlisted
<i>Alcedo cristata</i>	Kingfisher, Malachite	Unlisted	Unlisted
<i>Anthus caffer</i>	Pipit, Bushveld	Unlisted	LC
<i>Batis molitor</i>	Batis, Chinspot	Unlisted	LC
<i>Bostrychia hagedash</i>	Ibis, Hadededa	Unlisted	LC
<i>Bradornis pallidus</i>	Flycatcher, Pale	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Buteo rufofuscus</i>	Buzzard, Jackal	Unlisted	LC
<i>Cercomela familiaris</i>	Chat, Familiar	Unlisted	LC
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst	Unlisted	LC
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Unlisted	LC
<i>Cinnyris talatala</i>	Sunbird, White-bellied	Unlisted	LC
<i>Cisticola juncidis</i>	Cisticola, Zitting	Unlisted	LC
<i>Cisticola tinniens</i>	Cisticola, Levaillant's	Unlisted	LC
<i>Corvinella melanoleuca</i>	Shrike, Magpie	Unlisted	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Corythaixoides concolor</i>	Go-away-bird, Grey	Unlisted	LC
<i>Cossypha caffra</i>	Robin-chat, Cape	Unlisted	LC
<i>Crithagra atrogularis</i>	Canary, Black-throated	Unlisted	LC
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed	Unlisted	LC
<i>Emberiza flaviventris</i>	Bunting, Golden-breasted	Unlisted	LC
<i>Eremomela icteropygialis</i>	Eremomela, Yellow-bellied	Unlisted	LC
<i>Euplectes capensis</i>	Bishop, Yellow	Unlisted	LC
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied	VU	LC
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	LC
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded	Unlisted	LC
<i>Hirundo albigularis</i>	Swallow, White-throated	Unlisted	LC
<i>Indicator minor</i>	Honeyguide, Lesser	Unlisted	LC
<i>Lamprotornis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Laniarius ferrugineus</i>	Boubou, Southern	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC
<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC
<i>Motacilla capensis</i>	Wagtail, Cape	Unlisted	LC
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC
<i>Oenanthe monticola</i>	Wheatear, Mountain	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC
<i>Passer melanurus</i>	Sparrow, Cape	Unlisted	LC
<i>Phalacrocorax lucidus</i>	Cormorant, White-breasted	Unlisted	LC
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC
<i>Prinia flavicans</i>	Prinia, Black-chested	Unlisted	LC
<i>Prinia subflava</i>	Prinia, Tawny-flanked	Unlisted	LC
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped	Unlisted	Unlisted
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC
<i>Spreo bicolor</i>	Starling, Pied	Unlisted	LC
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Streptopelia semitorquata</i>	Dove, Red-eyed	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Thamnodia cinnamomeiventris</i>	Cliff-chat, Mocking	Unlisted	LC
<i>Tockus leucomelas</i>	Hornbill, Southern Yellow-billed	Unlisted	LC
<i>Tockus nasutus</i>	Hornbill, African Grey	Unlisted	LC
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC
<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC
<i>Zosterops virens</i>	White-eye, Cape	Unlisted	LC

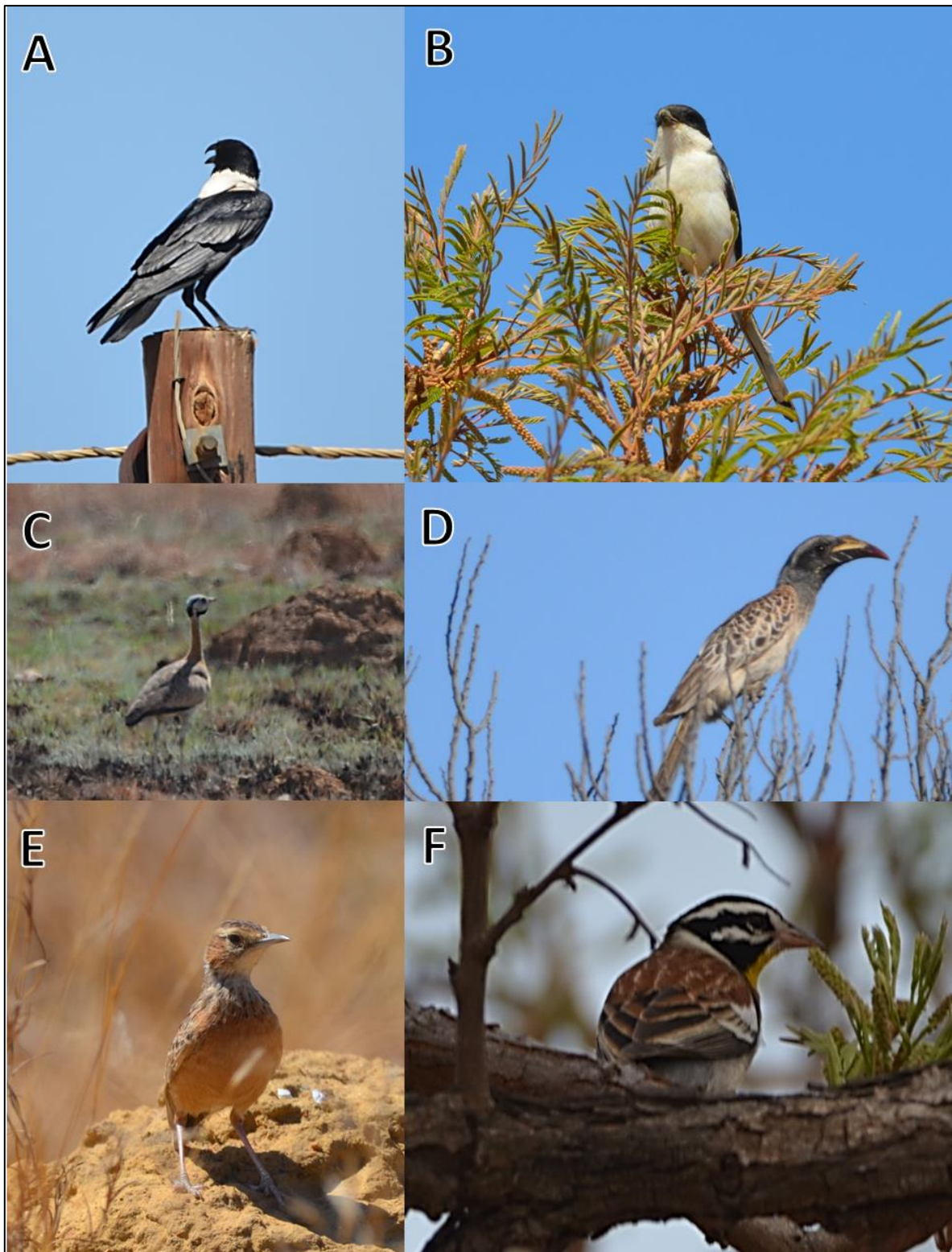


Figure 8-6 Some of the avifaunal species recorded in the project area: A) Pied crow (*Corvus albus*), B) Common Fiscal (*Lanius collaris*), C) White-bellied Korhaan (*Eupodotis senegalensis*), D) African Grey Hornbill (*Tockus nasutus*), E) Spiked Heel Lark (*Chersomanes albofasciata*) and F) Golden Breasted Bunting (*Emberiza flaviventris*).

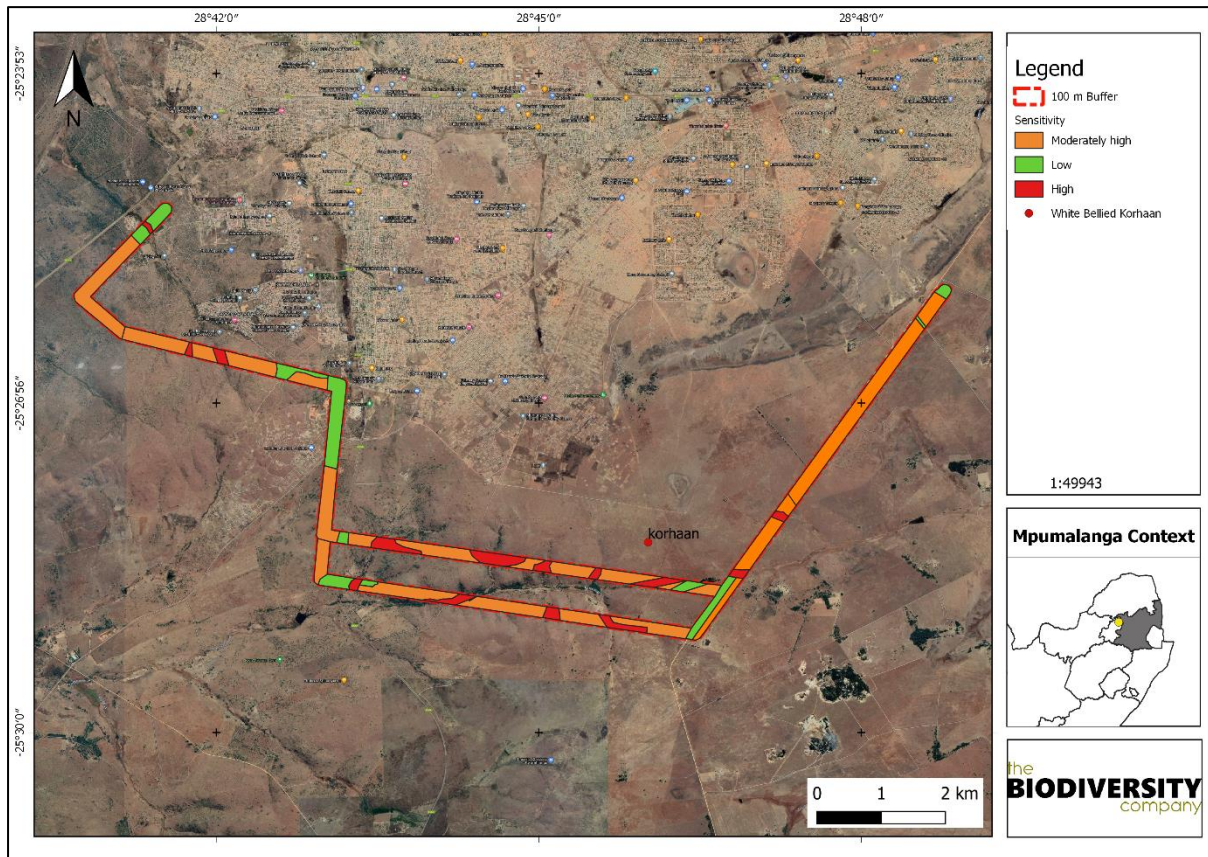


Figure 8-7 Location of the white bellied korhaan observed in relation to the project footprint

8.2.2.1.1 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014); they divided avifauna into 13 major groups based on their diet, habitat, and main area of activity. The analysis of the major avifaunal guilds reveals that the species composition is dominated by insectivores (IGD), omnivores (OMD) and granivores (GGD) (Figure 8-8). Nocturnal birds are low as they would just have been observed by chance. No nocturnal studies were performed as there was a safety risk. Based on the amount of water resources in the project area the number of water birds recorded were lower than expected, it is possible that due to the early wet season survey that these numbers were low and could increase with more rainfall.

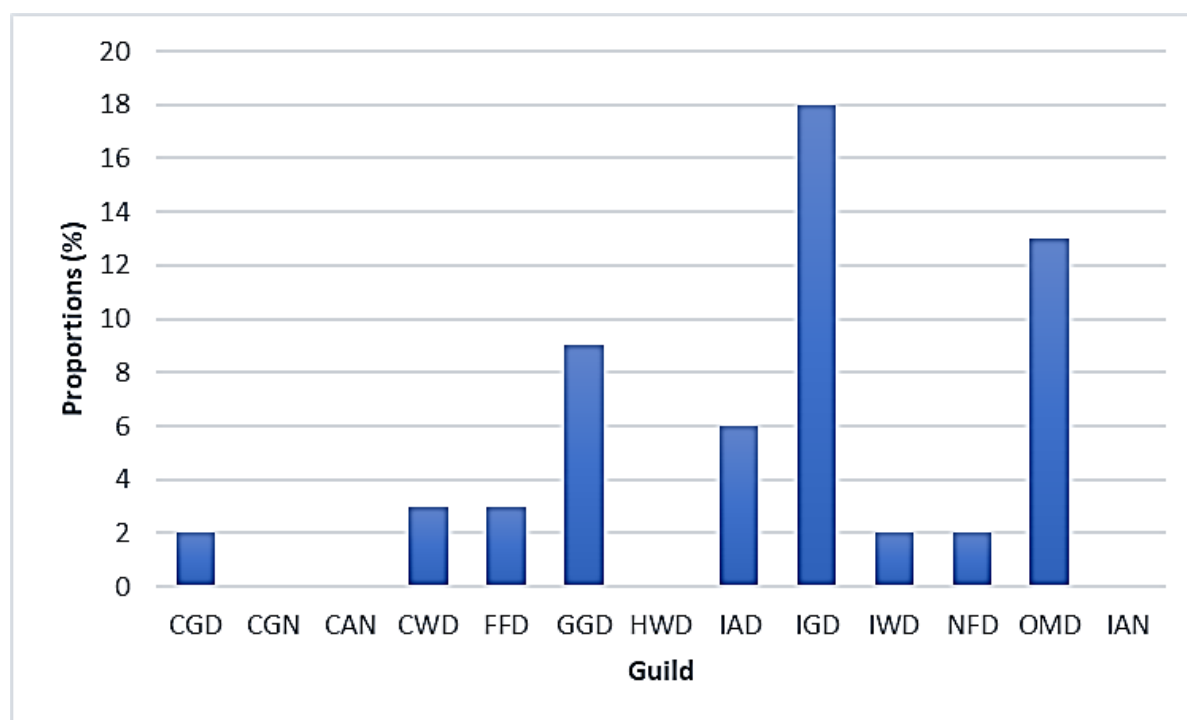


Figure 8-8 Avifaunal trophic guilds. CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal, CAN, carnivore air nocturnal, CWD, carnivore water diurnal; FFD, frugivore foliage diurnal; GCD, granivore ground diurnal; HWD, herbivore water diurnal; IAD, insectivore air diurnal; IGD, insectivore ground diurnal; IWD, insectivore water diurnal; NFD, nectivore foliage diurnal; OMD, omnivore multiple diurnal; IAN, Insectivore air nocturnal.

8.2.2.1.2 Dominant species

Table 8-9 provides a list of the dominant species for the project area together with the frequency with which each species appeared in the point count samples. The data shows the Southern Masked weaver, Pied Crow, House Sparrow, Hadedda Ibis, Mocking Cliff-chat and Common Myna were the most abundant species. The frequency with which a species was recorded provides an overview of the spread of the species in the project area. Fourteen (14) species were recorded in more than one habitat. Species with the highest frequency includes: Pied Crow, House Sparrow, Hadedda Ibis, Common Myna and Cape Turtle Dove. From the type of species with the highest abundance and frequency one can extrapolate that the habitat was more suitable for generalist species that can adapt to disturbances.

Table 8-9 Dominant avifaunal species within the project area as defined as those species whose relative abundances cumulatively account for more than 76% of the overall abundance shown alongside the frequency with which a species was detected among point counts.

Species	Common Name	Relative Abundance	Frequency (%)
<i>Ploceus velatus</i>	Masked-weaver, Southern	0.113	13.043
<i>Corvus albus</i>	Crow, Pied	0.108	43.478
<i>Passer domesticus</i>	Sparrow, House	0.085	17.391
<i>Bostrychia hagedash</i>	Ibis, Hadedda	0.042	17.391
<i>Thamnolaea cinnamomeiventris</i>	Cliff-chat, Mocking	0.038	8.696
<i>Acridotheres tristis</i>	Myna, Common	0.038	17.391
<i>Streptopelia capicola</i>	Turtle-dove, Cape	0.028	17.391

<i>Bubulcus ibis</i>	Egret, Cattle	0.024	4.348
<i>Lanius collaris</i>	Fiscal, Common (Southern)	0.024	17.391
<i>Prinia subflava</i>	Prinia, Tawny-flanked	0.024	13.043
<i>Tockus nasutus</i>	Hornbill, African Grey	0.019	8.696
<i>Passer melanurus</i>	Sparrow, Cape	0.019	8.696
<i>Lamprotornis nitens</i>	Starling, Cape Glossy	0.019	8.696
<i>Saxicola torquatus</i>	Stonechat, African	0.019	8.696
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst	0.019	8.696
<i>Uraeginthus angolensis</i>	Waxbill, Blue	0.019	13.043
<i>Oenanthe monticola</i>	Wheatear, Mountain	0.019	8.696
<i>Cisticola juncidis</i>	Cisticola, Zitting	0.014	13.043
<i>Streptopelia senegalensis</i>	Dove, Laughing	0.014	8.696
<i>Numida meleagris</i>	Guineafowl, Helmeted	0.014	4.348
<i>Vanellus coronatus</i>	Lapwing, Crowned	0.014	8.696
<i>Prinia flavicans</i>	Prinia, Black-chested	0.014	8.696
<i>Motacilla capensis</i>	Wagtail, Cape	0.014	13.043
<i>Zosterops virens</i>	White-eye, Cape	0.014	8.696
<i>Lybius torquatus</i>	Barbet, Black-collared	0.009	4.348

8.2.3 Habitat Assessment

Four different habitat types were identified: Grasslands, Bushveld, Riparian and Disturbed areas (Figure 8-9 and Figure 8-10).

Modified Grassland

The modified grassland habitat was disturbed in places and the overall diversity of grasses, forbs and herbaceous species were low. This habitat unit was overgrazed in portions by cattle and was also burned. The dominant grass species found were thatching grass (*Hyparrhenia hirta*) and Red grass (*Themeda triandra*). The grasslands do still provide habitat for a number of species including Yellow Mongoose (*Cynictis penicillata*) and Steenbok (*Raphicerus campestris*). Avifaunal species that were found in this habitat include Spiked-heeled Lark (*Chersomanes albofasciata*), Cape longclaw (*Macronyx capensis*) and Mountain Wheatear (*Oenanthe monticola*).

The main ecological characteristics of these grasslands are still intact and include (SANBI, 2013):

- Climate – warm, wet summers and cool, dry winters that result in a long growing season creating high primary productivity, frost plays an important role in reducing the grazing which enables suitability for burning, which promotes diversity and rejuvenation;
- Fire – the most important ecosystem process to maintain biodiversity and productivity in this ecosystem. These Grasslands have a high natural incidence and frequency of fire;

- Grazing – these grasslands are not well adapted to manage constant high intensity grazing pressure;
- Soils – well drained and are in general deeper than in the escarpment areas; and
- Life-history strategies – the plant species that dominate this habitat are long lived perennial species, which reproduces sporadically through seeds and vegetatively. Fire and frost adapted species which store energy in their root systems are typical. Thus, any impact where areas are cleared, leads to colonisation by annual weeds as the seed bank in the topsoil is species-poor or comprised of indigenous annual species.

The spatial guidelines for land use for these grasslands that are relevant to this project area include (SANBI,2013);

- Natural and near-natural areas should be linked by means of corridors.
- Establish and respect buffers around sensitive habitats and SCC;
- Avoid any further fragmentation of primary grassland;
- Maintain connectivity between natural areas across the landscape; and
- Manage wetland systems, rivers, ridges and valleys for biodiversity.

Riparian

The riparian habitat includes drainage lines, wetlands, streams and rivers. Some of the systems had mostly indigenous vegetation that surrounded them while others were overgrown by Black Wattle trees. The habitat unit supports a high diversity of species and functions as a water source and refuge area. Species such as White stinkwood (*Celtis africana*), Tamboti (*Spirostachys africana*) and Wonderboom fig (*Ficus salicifolia*) were found in this habitat. Avifaunal species present in this habitat unit includes African Reed Warbler (*Acrocephalus baeticatus*), Cape Wagtail (*Motacilla capensis*) and Malachite Kingfisher (*Alcedo cristata*). The area was assigned a high sensitivity based on its function in the ecosystem.

Bushveld

This habitat unit consist of grasslands with trees scattered in between on hills and valleys. The portions of this habitat unit that were the furthest away from housing developments were in the best condition. The trees closer to the houses have been felled for firewood or bark has been removed for medicinal purposes. Species such as Highveld cabbage tree (*Cussonia paniculata*), Cork bush (*Mundulea sericea*), Drolpeer (*Dombeya rotundifolia*) and Black Money Orange (*Strychnos madagascariensis*) were prevalent in this habitat. Species of conservation concern such as *Boophone disticha* were observed in this habitat. Avifaunal species that were found in this habitat include Chin-spot Batis (*Batis molitor*), Fork-tailed Drongo (*Dicrurus adsimilis*) and Common Fiscal (*Lanius collaris*). Based on the mostly intact nature of this habitat unit it was assigned a moderate-high sensitivity.

Disturbed areas

A portion of the project area has been altered from its natural state through the dumping of litter and building rubble, the building of roads and houses and severe overgrazing and erosion. Invasive plant species were found to be the highest in these disturbed habitats. These

areas do still support some generalist fauna species and certain portions have recovered to a semi natural state. Avifaunal species found in this habitat includes the Common Myna (*Acridotheres tristis*) and the House Sparrow (*Passer domesticus*). This habitat was assigned a low sensitivity.

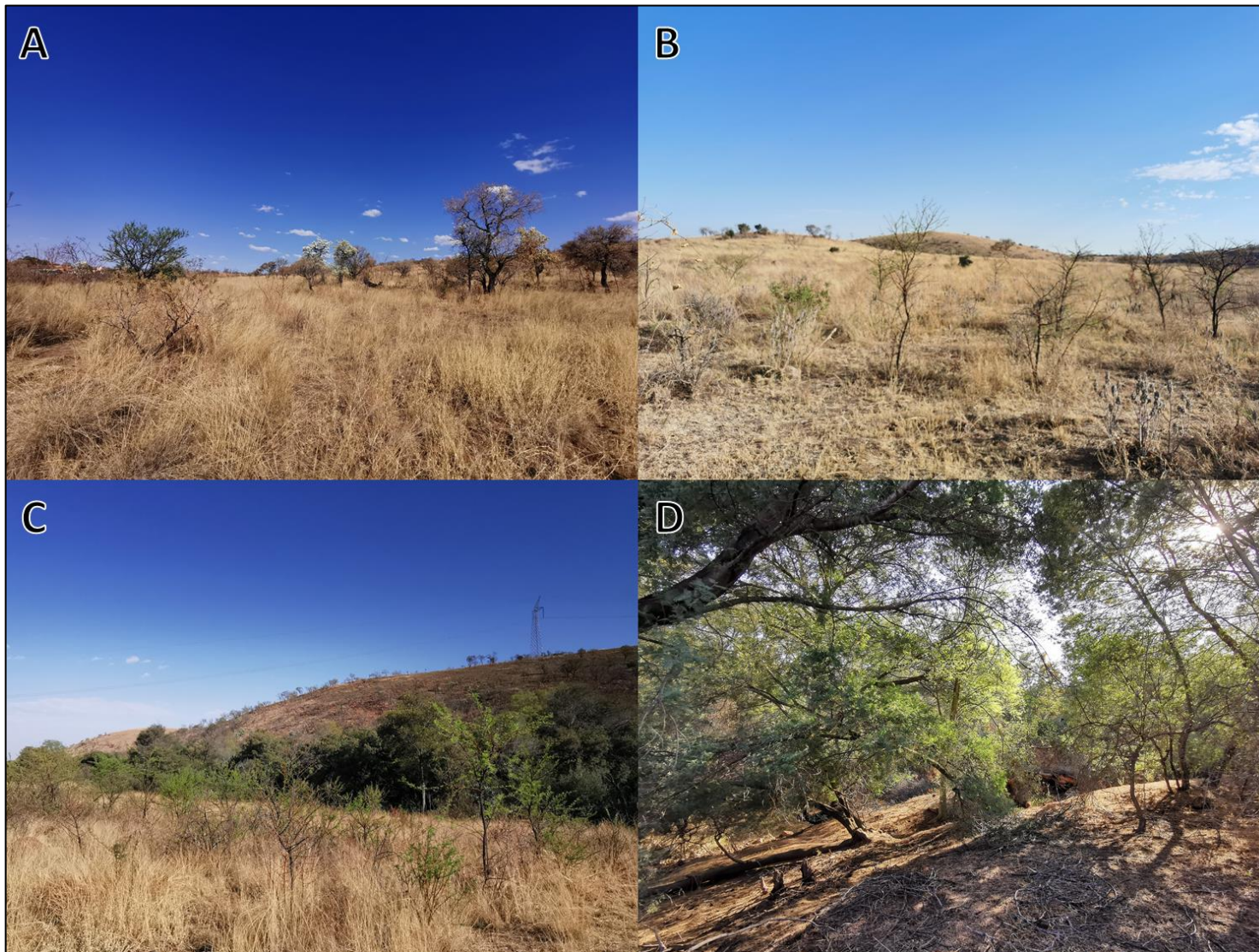


Figure 8-9 Pictures of the condition of the habitats: A & B) Bushveld with some ridges, C & D) Riparian habitat from far and underneath

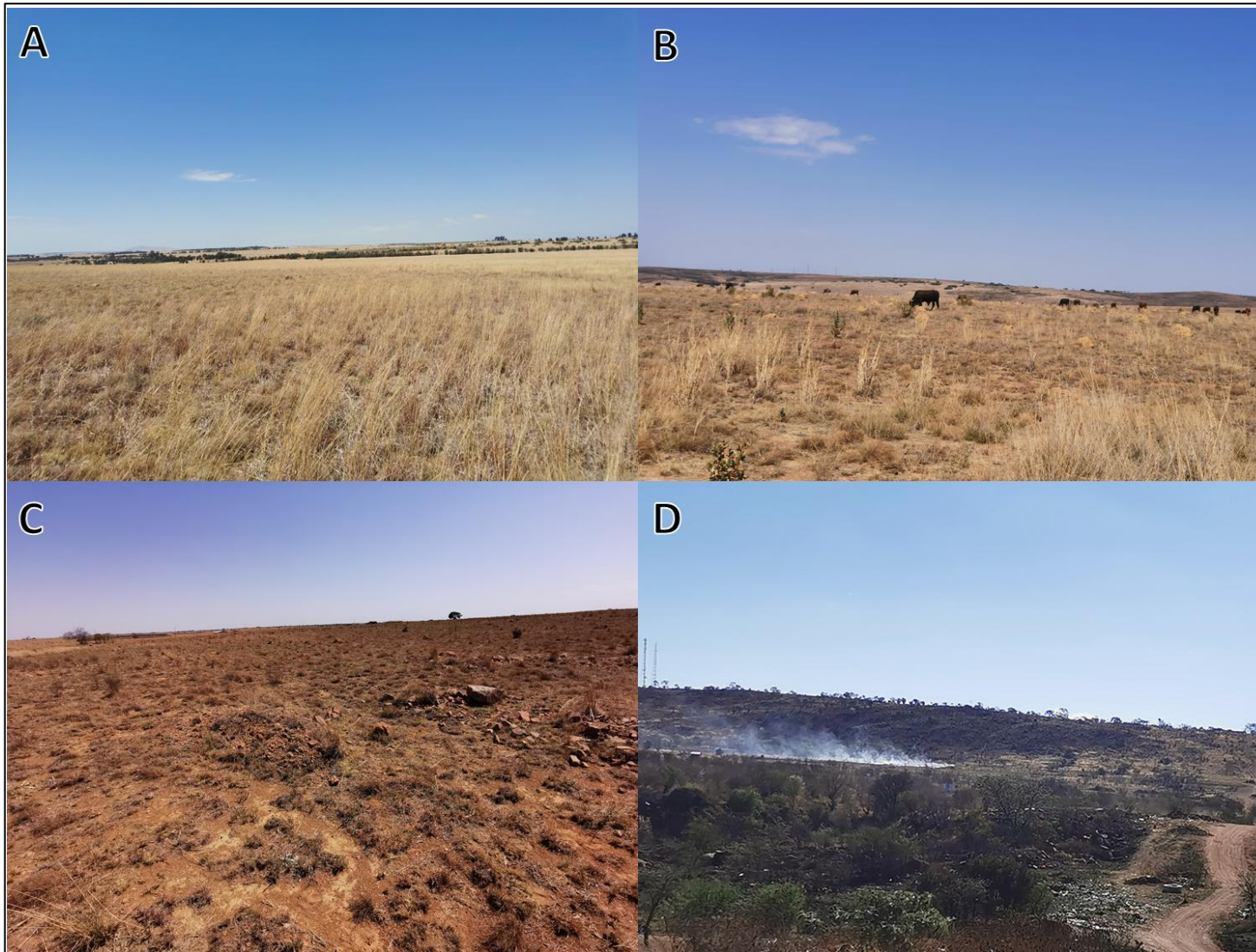


Figure 8-10 Pictures of the condition of the habitats: A & B) Grasslands, C & D) Disturbed areas

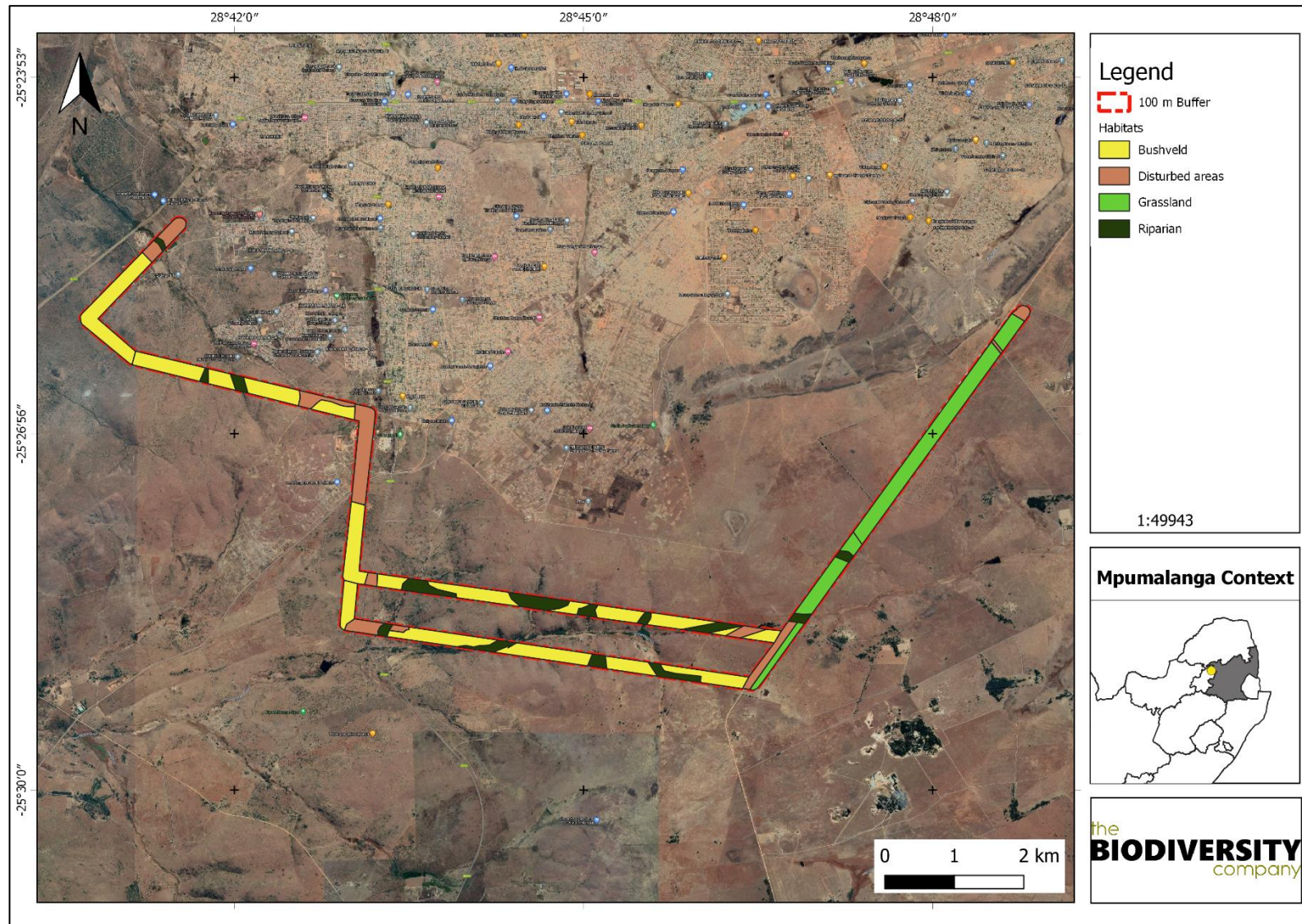


Figure 8-11 The habitats identified in the project area

8.2.3.1 Avifaunal Habitat Association

The Principal Component Analysis (PCA) ordination shown in Figure 8-12 provides a visual representation of the correlation of the species among the four habitats types. From the ordination plot it can be observed that the bird assemblage is largely distinct, with the closest association being between the species found in the grasslands and the disturbed areas. The riparian habitat also has species that are unique to this habitat as is represented by the second axis of the graph below (cumulative variation of 88.33).

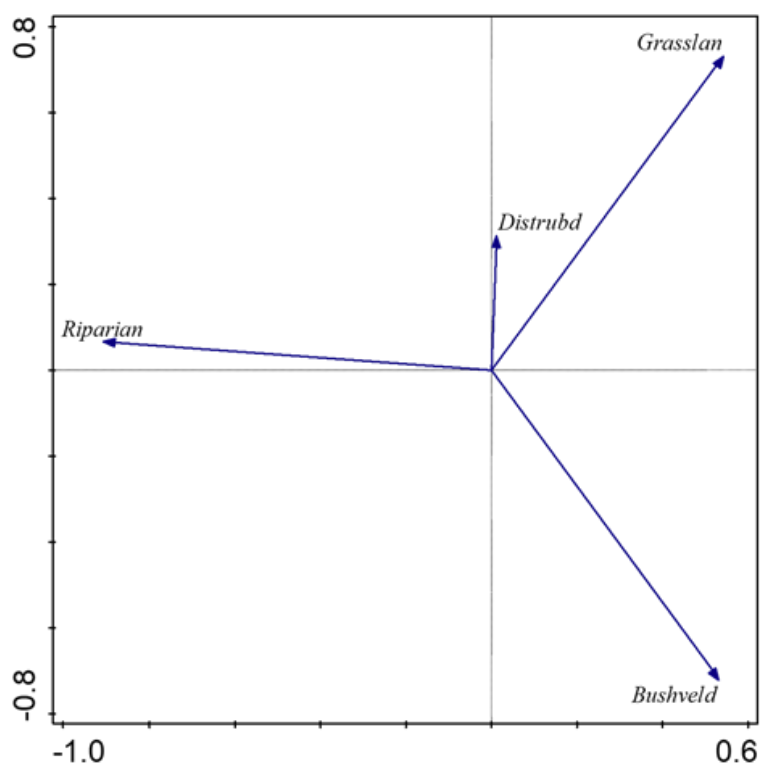


Figure 8-12 A Principal component analysis ordination of the relative abundances of bird species between the four different areas.

8.2.4 Habitat Sensitivity

The biodiversity theme sensitivity as indicated in the screening report was derived to be Low with small patches of Very High (Figure 8-13). The animal species theme sensitivity were Medium with some areas being classified as High (Figure 8-14). Species that were highlighted were predominantly avifaunal species which comprised of Denham's bustard (*Neotis denhami*), Secretary bird (*Sagittarius serpentarius*) and African Grass Owl (*Tyto capensis*), as well as mammal species, namely Spotted-necked otter (*Hydrictis maculicollis*). The Denham's bustard and Secretary bird were given a high likelihood of occurrence in the project area based on the available habitat. The African Grass Owl were given a low likelihood of occurrence as no suitable habitat were present for this species in the project area. The Spotted-necked otter has a moderate likelihood of occurrence. None of these species were observed but mitigation measures have been prescribed nonetheless.

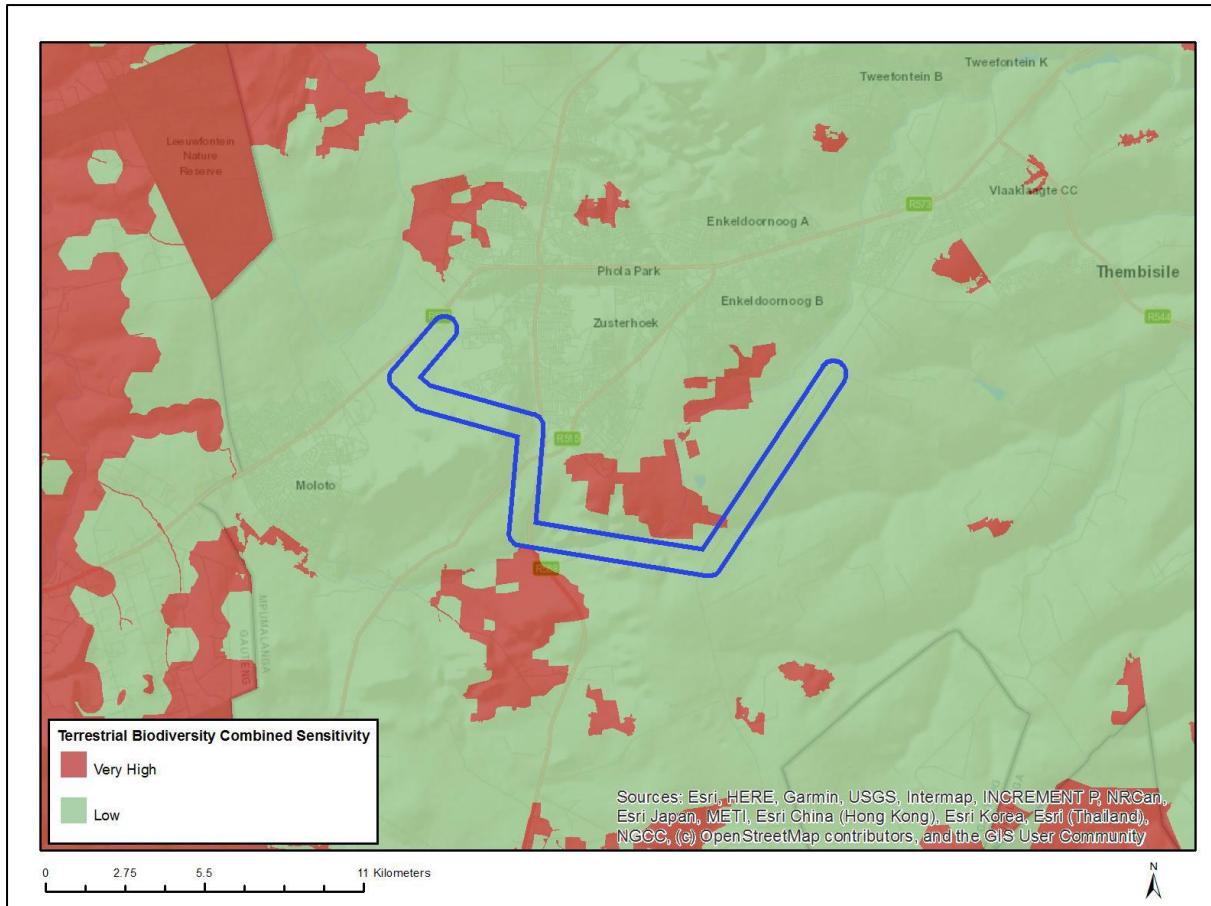


Figure 8-13 Biodiversity Theme Sensitivity, TBC Screening Report

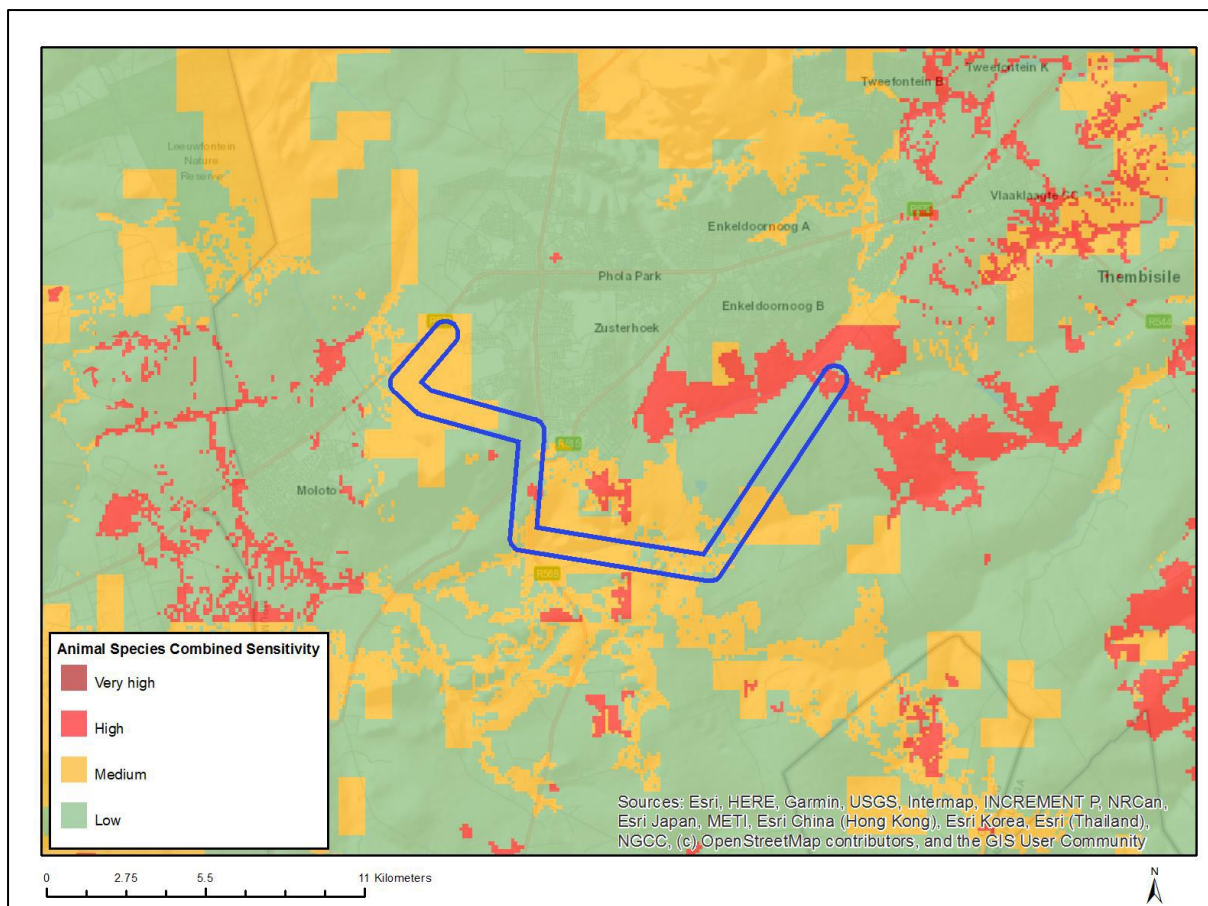


Figure 8-14 Animal Theme Sensitivity, TBC Screening Report

The completion of the terrestrial biodiversity assessment confirmed the areas classified as Low sensitivity, the area to the north of the project area has been altered and does not uphold its Very High status anymore and cannot be regarded as CBA optimal anymore.

As per the terms of reference for the project, GIS sensitivity maps are required in order to identify sensitive features in terms of the relevant specialist discipline/s within the project area. The sensitivity scores identified during the field survey for each terrestrial habitat are mapped in Figure 8-15.

In terms of terrestrial habitats, areas that were classified as having a low sensitivity are those areas which were deemed by the specialists to have been impacted upon and/or were modified from their original condition due to factors such as clearing of vegetation and dumping of litter and rubble. The habitats rated as possessing a moderate-high sensitivity are habitats that:

- support various faunal and floral species;
- are mostly in a natural condition or has the capacity to recover; and
- have a moderate-high diversity.

The habitat rated as possessing a High sensitivity is riparian habitat that is home to species restricted to water resources. Moreover, if this habitat is lost the species in the surrounding habitats would also decrease as they are dependent on the refuge, foraging and water typically associated with this habitat type.

It is important to note that this map does not replace any local, provincial or government legislation relating to these areas or the land use capabilities or sensitivities of these environments but is done in relation to the legislation.

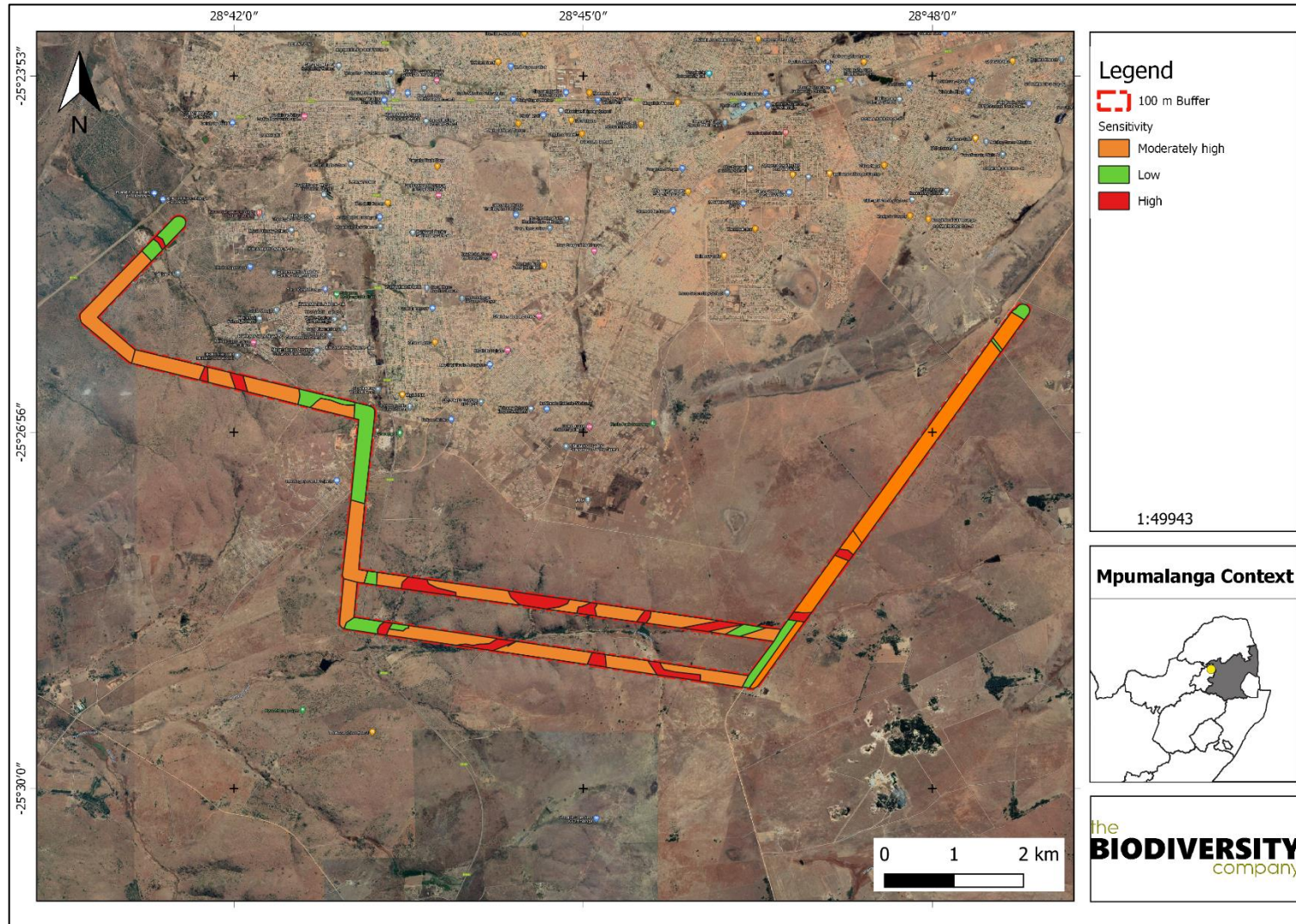


Figure 8-15 Biodiversity sensitivity of the project area

8.2.4.1 Buffer Requirements

The White-bellied Korhaan (*Eupodotis senegalensis*) were observed outside of the 100 m buffer area of the project footprint. No nest was observed for the Korhaan and it could possibly be that they use the area for foraging alone. No no-go buffer was assigned for that reason. It is however pertinent that before construction begins that the area be walked through and assessed for nests and the presence of these birds. Should they occur a qualified specialist must be contacted for advice on how to proceed. The flora SCCs found can be relocated should they be in the footprint of the line and therefore also do not require a buffer.

9 Impact Assessment

Development-related activities can have significant impacts on biodiversity and ecosystem services, often causing irreversible and large-scale habitat loss across large areas or areas important for the provision of important ecosystem services.

Key impacts commonly associated with development activities are discussed below. The listed activities are merely indicative, and the proposed rehabilitation may either have additional or fewer activities depending on the circumstances. It should be noted that these categories, with associated impact descriptions is not exhaustive, and more impacts may be identified at a later stage as more information becomes available.

The significance (quantification) of potential environmental impacts has been assessed in terms of the Guideline Documentation on EIA Regulation; Department of Environmental Affairs and Tourism, 2014 (Impact Assessment Methodology, Appendix 6).

9.1 Impact Assessment Methodology

Potential impacts were evaluated against the data captured during the desktop and field assessment to identify relevance to the project area. The methodology used in determining the significance of potential environmental impacts relating to project was supplied by WSP.

9.2 Methodology

The EIA will utilise a methodological framework developed by WSP to meet the combined requirements of international best practice and the relevant EIA Regulations. The determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact;
- Significance of the Impact;
- Consequence of the Impact;
- Extent of the impact;
- Duration of the Impact;
- Probability if the impact;
- Degree to which the impact:
 - can be reversed;

- may cause irreplaceable loss of resources; and
- can be avoided, managed or mitigated.

Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:

- **Magnitude:** to what extent environmental resources are going to be affected;
- **Sensitivity of the resource or receptor** (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
- **Severity of the impact,** measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance will be assessed with and without mitigation measures in place. Impacts are assessed in terms of the following criteria:

- a) The nature; a description of what causes the effect, what will be affected and how it will be affected.

Table 9-1 Nature or Type of Impact

Nature or Type of Impact	Definition
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g. new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g. noise changes due to changes in road or rail traffic resulting from the operation of Project).
Secondary	Secondary or induced impacts caused by a change in the Project environment (e.g. employment opportunities created by the supply chain requirements).
Cumulative	Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

- b) The physical extent.

Table 9-2 Physical Extent Rating of Impact

Score	Description
1	the impact will be limited to the site;
2	the impact will be limited to the local area;
3	the impact will be limited to the region;
4	the impact will be national; or
5	the impact will be international;

- c) The duration, wherein it is indicated whether the lifetime of the impact will be:

Table 9-3 Duration Rating of Impact

Score	Description
1	of a very short duration (0 to 1 years)
2	of a short duration (2 to 5 years)
3	medium term (5–15 years)
4	long term (> 15 years)
5	permanent

- d) **Reversibility:** An impact is either reversible or irreversible. The level of reversibility is the ability of an environmental receptor to rehabilitate or restore itself after the activity has caused environmental change (i.e. how long before impacts on receptors cease to be evident).

Table 9-4 Reversibility of an Impact

Score	Description
1	The impact is immediately reversible.
3	The impact is reversible within 2 years after the cause or stress is removed; or
5	The activity will lead to an impact that is in all practical terms permanent.

- e) The magnitude of impact on ecological processes, quantified on a scale from 0-10, where a score is assigned.

Table 9-5 Magnitude Rating of Impact

Score	Description
0	small and will have no effect on the environment.
1	minor and will not result in an impact on processes.
2	low and will cause a slight impact on processes.
3	moderate and will result in processes continuing but in a modified way.
4	high (processes are altered to the extent that they temporarily cease).
5	very high and results in complete destruction of patterns and permanent cessation of processes.

- f) The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:

Table 9-6 Probability Rating of Impact

Score	Description
1	very improbable (probably will not happen).
2	improbable (some possibility, but low likelihood).
3	probable (distinct possibility).
4	highly probable (most likely).
5	definite (impact will occur regardless of any prevention measures).

- The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The status, which is described as either positive, negative or neutral;

- The degree to which the impact can be reversed;
- The degree to which the impact may cause irreplaceable loss of resources; and
- The degree to which the impact can be mitigated.

The significance is determined by combining the above criteria in the following formula:

$$\text{Significance} = (\text{Extent} + \text{Duration} + \text{Reversibility} + \text{Magnitude}) \times \text{Probability}$$

$$[S = (E + D + R + M) \times P]$$

Where the symbols are as follows:

Symbol	Criteria	Description	
S	Significance Weighting	Refer to Table 9-7	Significance Weightings of an Impact
E	Extent	Refer to Table 9-2	Physical Extent Rating of Impact
D	Duration	Refer to Table 9-3	Duration Rating of Impact
R	Reversibility	Refer to Table 9-4	Reversibility of an Impact
M	Magnitude	Refer to Table 9-5	Magnitude Rating of Impact
P	Probability	Refer to Table 9-6	Probability Rating of Impact

The significance score can therefore range from 3 (minimum) to 100 (Maximum). The significance weightings are defined as Low, Medium and High, as such the scoring system has been allocated accordingly to define the significance weighting, as identified in Table 10-7.

Table 9-7 Significance Weightings of an Impact

Overall Score	Significance Rating (Negative)	Significance Rating (Positive)	Description
< 30 points	Low	Low	where this impact would not have a direct influence on the decision to develop in the area
31 - 60 points	Medium	Medium	where the impact could influence the decision to develop in the area unless it is effectively mitigated
> 60 points	High	High	where the impact must have an influence on the decision process to develop in the area

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in the ESIA.

9.2.1 Current Impacts

During the field survey, the current impacts that are having a negative impact on the area were identified, and are listed below and some are shown in Figure 9-1:

- Fencing;
- Anthropogenic activities in close proximity;

- Secondary roads and cleared areas;
- Invasive plant species;
- Powerlines within the vicinity of the project area;
- Sand mining;
- Livestock;
- Uncontrolled burning;
- Poaching of animals and plants;
- Chopping of wood for firewood; and
- Litter and rubble dumping.

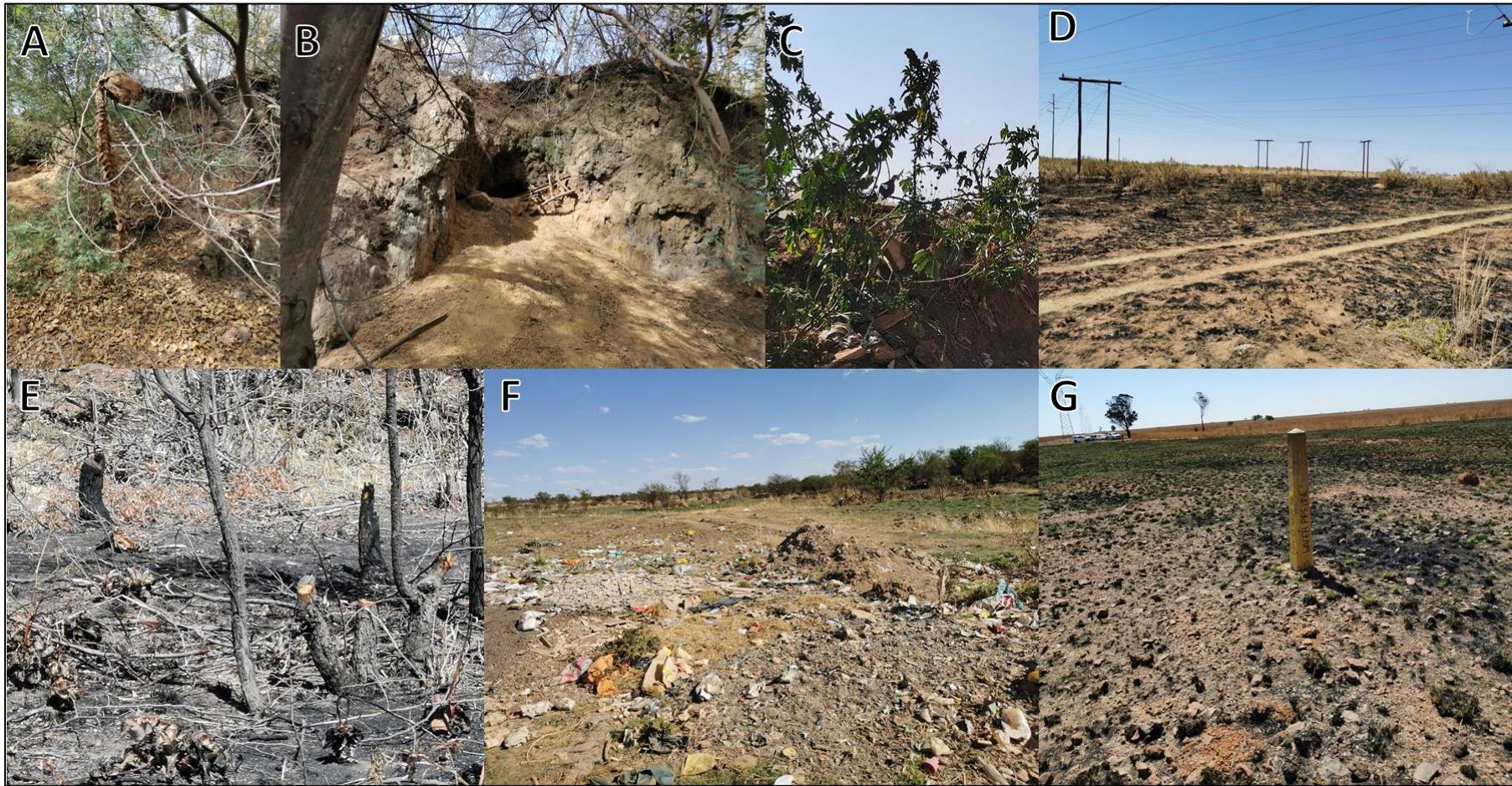


Figure 9-1 Impacts observed during the fieldwork A & B) Animal trapping and poaching, C) Invasive plants, D) Existing powerline network, E) Chopping of trees for fire wood, F) Litter and dumping of rubble, G) Uncontrolled burning

9.3 Terrestrial Impacts

9.3.1 Anticipated Impacts

The development is associated with the construction of a powerline which could alter the natural areas still present. The activities may lead to the loss and destruction of certain habitats, direct mortalities and displacement of fauna and flora. Due to the nature of the development a closure and rehabilitation phase was not assessed as the development is considered to be permanent, servicing the local area. There was very little difference in the habitats and sensitivities of the two alternatives and both areas were in a similar state, as such their impacts were assessed simultaneously. The development will not considerably affect processes that were observed (e.g. pollination, hydrology, seed dispersal from frugivores etc) but limiting fires to protect the infrastructure will be an impact to grassland functioning and long-term diversity. Therefore, controlled burning at the required ecological rate should be undertaken to prevent over-burning as well as protect infrastructure from unforeseen fires.

It is assumed that temporary access roads will need to be made to be able to install the powerlines as not all areas were accessible by road during the field visit. No proposed layouts were provided prior to the assessments and as such general impacts were assessed for new temporary roads.

The potential impacts associated with the each of the project phases are discussed below and the expected impact pre-mitigation and post-mitigation can be seen in Table 9-8, Table 9-9 and Table 9-10.

9.3.1.1 Pre-construction Phase

The pre-construction phase activities are considered a low risk as they typically involve desktop assessments and initial site inspections. The site comprises areas that has already been altered. This phase of the assessment would include, amongst others, site visits of various contractors, environmental and social impact assessment and compiling of management plans. Only one minor impact was assessed regarding the planning phase:

- Temporary disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles.

Table 9-8 Terrestrial ecological assessment of impact significance for the planning phase.

Impact #	Receptor	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						M+	E+	R+	Dx	P=	S	Rating	M+	E+	R+	Dx	P=	S	Rating
1	Flora and Fauna	Temporary disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles	Pre-Construction	Negative	Easy	3	3	3	2	3	33	N2	2	2	1	1	2	14	N1
Significance						N2 - Medium							N1 - Low						

9.3.1.2 Construction Phase

The following potential impacts were considered on terrestrial biodiversity. This phase refers to the period when construction of the proposed powerline is built/installed. This phase usually has the largest direct impact on biodiversity:

- Destruction, further loss and fragmentation of the vegetation community (including a VU vegetation type);
- Loss of flora SCCs;
- Displacement, direct mortalities and disturbance of faunal community (including potential threatened species) due to habitat loss and disturbances (such as site clearance, dust, vibrations, fire, poaching and noise);
- Mortalities of fauna species due to temporary roads and open holes (for the poles); and
- Spread and/or establishment of alien and/or invasive species, especially in areas that are cleared and not rehabilitated.

Table 9-9 Terrestrial ecological assessment of impact significance for the construction phase.

Impact number	Receptor	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+)	E+	R+	D)x	P=	S	Rating	(M+)	E+	R+	D)x	P=	S	Rating
Impact 2:	Flora	Destruction, further loss and fragmentation of the vegetation community (including a VU vegetation type)	Construction Phase	Negative	Moderate	4	3	3	4	4	56	N2	2	1	1	2	3	18	N1
Significance						N2 - Medium							N1 - Low						
Impact 3:	Flora	Loss of flora SCCs	Construction Phase	Negative	Moderate	3	2	3	4	4	48	N2	2	2	1	2	3	21	N1
Significance						N2 - Medium							N1 - Low						
Impact 4:	Fauna	Displacement, direct mortalities and disturbance of faunal community (including potential threatened species) due to habitat loss and disturbances (such as site clearance, dust, vibrations, poaching and noise)	Construction Phase	Negative	Moderate	3	3	3	4	4	52	N2	2	2	1	2	2	14	N1
Significance						N2 - Medium							N1 - Low						
Impact 5:	Fauna	Mortalities of fauna species due to temporary access roads and open holes (for the poles)	Construction Phase	Negative	Moderate	4	3	3	4	4	56	N2	2	1	1	2	2	12	N1
Significance						N2 - Medium							N1 - Low						
Impact 6:	Flora and Fauna	Spread and/or establishment of alien and/or invasive species, especially in areas that are cleared and not rehabilitated.	Construction Phase	Negative	Moderate	4	3	3	4	4	56	N2	2	1	1	2	2	12	N1
Significance						N2 - Medium							N1 - Low						

9.3.1.3 Operational Phase

The following potential impacts were considered on biodiversity (fauna and flora) during the operational phase. This phase refers to when construction has been completed and the proposed infrastructure has been built and is functional and rehabilitation is in progress.

- Continued displacement, disturbance (such as fire) and fragmentation due to ongoing habitat degradation (activity such as mowing and clearing of vegetation under the line);
- Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the line); and
- Continued alien vegetation encroachment.

Table 9-10 Terrestrial ecological assessment of impact significance for the operational phase.

Impact number	Receptor	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+)	E+	R+	D)x	P=	S	Rating	(M+)	E+	R+	D)x	P=	S	Rating
Impact 7:	Flora	Continued displacement, disturbance and fragmentation due to ongoing habitat degradation (activity such as mowing and clearing of vegetation under the line)	Operational Phase	Negative	Moderate	2	2	3	4	4	44	N2	1	1	3	2	2	14	N1
Significance						N2 - Medium							N1 - Low						
Impact 8:	Fauna	Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the line)	Operational Phase	Negative	Moderate	3	3	3	4	3	39	N2	2	1	3	2	2	16	N1
Significance						N2 - Medium							N1 - Low						
Impact 9:	Flora and Fauna	Continued alien vegetation encroachment	Operational Phase	Negative	Moderate	4	3	3	4	4	56	N2	2	2	3	3	2	20	N1
Significance						N2 - Medium							N1 - Low						

9.4 Avifaunal Impacts

9.4.1 Anticipated Impacts

The development of a powerline will have a greater impact on the avifauna in the area. A new set of lines would pose more challenges for the birds in the form of bird strikes and electrocutions. The potential impacts associated with the each of the project phases are discussed below and the expected impact pre-mitigation and post-mitigation can be seen in Table 9-11 and Table 9-12.

9.4.1.1 Construction Phase

The following potential impacts were considered on avifauna. This phase usually has the largest direct impact on biodiversity:

- Sensory disturbance, during construction sensory disturbances (e.g. noise, dust, vibrations) are anticipated to displace a large proportion of the local avifauna. However, this impact is anticipated to be temporary in nature;
- Destruction of nests and nesting material;
- Destruction of habitat; and
- Disturbance or mortality of SCCs.

Table 9-11 Avifaunal assessment of impact significance for the construction phase.

Impact number	Receptor	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+)	E+	R+	D)x	P=	S	Rating	(M+)	E+	R+	D)x	P=	S	Rating
Impact 10:	Avifauna	Sensory disturbance, during construction sensory disturbances (e.g. noise, dust, vibrations) are anticipated to displace a large proportion of the local avifauna. However, this impact is anticipated to be temporary in nature;	Construction Phase	Negative	Moderate	4	3	3	3	4	52	N2	2	2	3	2	2	18	N1
Significance						N2 - Medium							N1 - Low						
Impact 11:	Avifauna	Destruction of nests and nesting material	Construction Phase	Negative	Moderate	4	3	3	4	4	56	N2	2	2	3	2	2	18	N1
Significance						N2 - Medium							N1 - Low						
Impact 12:	Avifauna	Destruction of habitat.	Construction Phase	Negative	Moderate	4	3	3	4	4	56	N2	2	2	3	3	2	20	N1
Significance						N2 - Medium							N1 - Low						
Impact 13:	Avifauna	Disturbance or mortality of SCC	Construction Phase	Negative	Moderate	5	4	5	4	4	72	N3	3	3	3	3	2	24	N1
Significance						N3 - High							N1 - Low						

9.4.1.2 Operational Phase

The following potential impacts were considered on avifauna during the operational phase. Species such as the Pied Crow, Jackal buzzard and Rock Kestrel all perch on the powerline poles and are at risk for electrocution. The White Bellied Korhaan has a great risk for collisions with the powerlines and bird flappers at 10 m intervals are pertinent to the reduction of their risk. The impacts considered during this phase is:

- Electrocution; and
- Collisions with the power lines.

Table 9-12 Avifaunal assessment of impact significance for the operational phase.

Impact number	Receptor	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 13:	Avifauna	Electrocution	Operational Phase	Negative	Moderate	5	4	3	4	4	64	N3	3	2	3	3	2	22	N1
Significance						N3 - High							N1 - Low						
Impact 14:	Avifauna	Collisions with the powerlines	Operational Phase	Negative	Moderate	5	4	3	4	4	64	N2	2	2	3	3	2	20	N1
Significance						N2 - Medium							N1 - Low						

9.4.2 Specialist Terrestrial Management Plan

The aim of the management outcomes is to present the mitigations in such a way that these can be incorporated into the Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring guidelines. Table 9-13 presents the recommended mitigation measures and the respective timeframes, targets and performance indicators for the terrestrial assessment.

Table 9-13 Mitigation measures including requirements for timeframes, roles and responsibilities for the terrestrial assessment

Management outcome: Vegetation and Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property by making use of spatial data.	Planning	Project manager, Environmental Officer	Number of contractors within the area	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint (30m), should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
When vegetation is cleared, hand cutting techniques should be used as far possible in order to avoid the use of heavy machinery. This is also relevant for maintenance on the line.	Construction Phase/Operational Phase	Environmental Officer	Clearing method	When Required
Vegetation may not be cleared in the riparian areas of the project area. Powerline should span the riparian habitat.	Construction/Operational Phase	Environmental Officer	Riparian vegetation	Ongoing
All construction/operational and access must make use of the existing roads as far as possible;	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
Temporary access roads may only be accessed by light vehicles and not heavy machinery.	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
Protected plant species must be relocated to nearby areas, outside of the project footprint.	Construction Phase	Environmental Officer	Relocation of protected plant species	Ongoing
The project area must be walked through prior to construction and protected species must be marked. SCC must be avoided, alternatively a permit may be required for the removal of selected species.	Construction Phase	Environmental Officer	Relocation of protected plant species	During Phase
All laydown, chemical toilets etc. should be restricted to disturbed areas. No materials may be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent structures should be permitted at construction sites. Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage	Construction Phase	Environmental Officer & Design Engineer	Laydown areas and material storage & placement.	During Phase

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of vehicles or equipment will be allowed outside of the designated project areas.				
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after start of operational phase
A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing
Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair	Life of operation	Environmental Officer & Contractor	Leaks and spills	Ongoing
It should be made an offence for any staff to /take bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
A fire management plan needs to be complied and implemented to restrict the impact fire might have on the habitats. Controlled burning at the required ecological rate should be undertaken to prevent over-burning as well as protect infrastructure from unforeseen fires.	Life of operation	Environmental Officer & Contractor	Fire Management	During Phases

Management outcome: Fauna

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that are found	Construction Phase	Environmental Officer, Contractor	Presence of any faunal species	During Phase

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during the activities. The area must be walked though prior to construction to ensure no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.				
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals	Construction Phase	Environmental Officer	Noise levels	During Phase
No trapping, killing, or poisoning of any wildlife is to be allowed	Construction Phase	Environmental Officer	Evidence of trapping etc	During Phase
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna	Construction Phase	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	During Phase
Progressive construction must be done, no holes may be left uncovered overnight as fauna species will fall into them.	Construction Phase	Environmental Officer & Contractor	Sealing of holes	After each site, progressively.
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing
Schedule any activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day in the case.	Ongoing

Management outcome: Avifauna

Impact Management Actions	Implementation			
	Phase	Responsible Party	Aspect	Phase
Jumper wires must pass under the cross arm rather than over it	Construction/Operational Phase	Design Engineer/ECO	Presence of electrocuted birds	Life of operation
Suspended chain insulators rather than upright pin insulators must be used	Construction/Operational Phase	Design Engineer/ECO	Presence of electrocuted birds	Life of operation
Ensure that the phase cables are spaced far enough apart to reduce the risk of large birds touching both simultaneously (1.4 m for large raptors) (Prinsen <i>et al.</i> , 2012). If such separation (isolation) cannot be provided, exposed parts must be covered (insulated) to reduce electrocution risk.	Construction/Life of operation	Design Engineer/ECO	Presence of electrocuted birds	Life of operation

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Use of non-conducting materials for support structures, such as wooden poles or fibre-reinforced composite crossarms	Construction/Life of operation	Design Engineer/ECO	Presence of electrocuted birds	Life of operation
Perch structures must be installed. South African standards state 270cm above the cross arm (Prinsen <i>et al.</i> , 2012).	Construction/Life of operation	Design Engineer/ECO	Presence of electrocuted birds	Life of operation
Bird flappers must be installed on the lines at 10m intervals. The must specifically be placed over the area that crosses the riparian and grassland habitats.	Construction/Life of operation	Design Engineer/ECO	Presence of birds strikes	Life of operation
The area must be walked through prior to construction and before maintenance to ensure that no nests or birds are found in the construction area or in the temporary access areas. Appropriate specialist must be contacted to advise on how to proceed should nests be found or if species do not move off on their own.	Construction Phase	Environmental Officer	Presence of nests or birds	Life of operation

Management outcome: Alien Vegetation

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Compilation of and implementation of an alien vegetation management plan.	Life of operation	Project manager, Environmental Officer & Contractor	Assess presence and encroachment of alien vegetation	Quarterly monitoring
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas	Construction Phase	Project manager, Environmental Officer & Contractor	Footprint Area	During Phase
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	Construction Phase	Environmental Officer & Health and Safety Officer	Presence of waste	During Phase

Management outcome: Dust

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Monitoring
Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and dumps especially. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated.	Construction Phase	Contractor	Dustfall	During Phase

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Management outcome: Waste management				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Waste management must be a priority and all waste must be collected and stored effectively.	Construction Phase	Environmental Officer & Contractor	Waste Removal	Weekly during phase
Litter, spills, fuels, chemicals and human waste in and around the project area.	Construction Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily during phase
A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Construction Phase	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily during phase
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility	Construction Phase	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste.	Ongoing during phase
Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site	Construction Phase	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste.	Ongoing during phase
Refuse bins will be emptied and secured Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Construction Phase	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing during phase
Management outcome: Environmental awareness training				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Monitoring
All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMP.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing

10 Recommendations

The following recommendations are suggested, and are to be implemented if not already being undertaken for the area:

- Bird collisions have been recorded with the guy or stay wires of towers, the construction of self-supporting towers, which do not require stay wires, is recommended; and
- A rehabilitation plan needs to be implemented for the decommissioning of temporary access routes, laydown areas and working areas associated with each structure/pole.

11 Conclusion

The survey, which was completed, resulted in good site coverage, assessing the major habitats and ecosystems, obtaining a general species (fauna and flora) overview and observing the major current impacts.

It is clear from the regional ecological overview, as well as the baseline data collected to date that much of the project area has been altered, both historically and at present due to the surrounding land use and the existing powerlines. Four main habitats were identified in the project area; Disturbed areas, Grasslands, Bushveld and Riparian habitat. These habitats were given a sensitivity of low, moderately high (Grasslands, Bushveld) and high, respectively. Three plant species were found that are protected under Schedule 11 of the Mpumalanga Nature Conservation Act no 10 of 1998. The Common sugar bush (*Protea caffra*) were restricted to the grasslands, while Poison bulbs (*Boophone disticha*) were found in the bushveld habitat. The Tamboti (*Spirostachys africana*) were found mainly in the riparian habitat. Only one faunal species of conservation concern was identified the White-bellied Korhaan (*Eupodotis senegalensis*) which is classified as VU in South Africa. This species also has a high risk for collisions with the powerlines and therefore specific mitigations such as the installation of bird flappers in the riparian and grassland habitat were prescribed.

The habitats and sensitivities of the two alternatives were in a similar state, as such we do not object to the preferred Option 1 route. The greatest impact on the overall habitat is expected to be an increase in alien plant infestations as a result of the construction disturbances, through the implementation of an alien management plan this impact can successfully be mitigated. The greatest impact on the avifauna is envisioned to be electrocution and collisions these can be mitigated with changes in the design and the installation of bird flappers. All the impacts can be successfully mitigated, it is therefore imperative that the mitigations and recommendations be considered by the issuing authority.

11.1 Impact Statement

An impact statement is required as per the NEMA EIA regulations (as amended) with regards to the proposed development.

Considering the findings of the respective studies, no fatal flaws were identified for the proposed project. Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all negative aspects pertaining to the terrestrial ecology and avifauna is expected to be low. It is thus the opinion of the specialists that the

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project can proceed, and that all the prescribed mitigation measures and recommendations are considered by the issuing authority.

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APPENDIX A: *Floral species expected to occur in the project area*

Family	Taxon	Author	IUCN	Ecology
Fabaceae	<i>Acacia decurrens</i>	Willd.	NE	Not indigenous; Naturalised; Invasive
Euphorbiaceae	<i>Acalypha angustata</i>	Sond.	LC	Indigenous
Euphorbiaceae	<i>Acalypha caperonioides</i> var. <i>caperonioides</i>	Baill.	DD	Indigenous
Asteraceae	<i>Acanthospermum glabratum</i>	(DC.) Wild		Not indigenous; Naturalised
Lamiaceae	<i>Acrotome hispida</i>	Benth.	LC	Indigenous
Passifloraceae	<i>Adenia glauca</i>	Schinz	LC	Indigenous
Rubiaceae	<i>Afrocanthium gilfillanii</i>	(N.E.Br.) Lantz	LC	Indigenous
Turneraceae	<i>Afroqueta capensis</i>	(Harv.) Thulin & Razafim.	LC	Indigenous
Rubiaceae	<i>Agathisanthemum bojeri</i> subsp. <i>bojeri</i>	Klotzsch	LC	Indigenous
Loranthaceae	<i>Agelanthus natalitius</i> subsp. <i>zeyheri</i>	(Meisn.) Polhill & Wiens	LC	Indigenous
Orobanchaceae	<i>Alectra vogelii</i>	Benth.	LC	Indigenous
Poaceae	<i>Alloteropsis semialata</i> subsp. <i>semialata</i>	(R.Br.) Hitchc.	LC	Indigenous
Asphodelaceae	<i>Aloe davyana</i>	Schonland		Indigenous; Endemic
Poaceae	<i>Antheophora pubescens</i>	Nees	LC	Indigenous
Rubiaceae	<i>Anthospermum rigidum</i> subsp. <i>rigidum</i>	Eckl. & Zeyh.	LC	Indigenous
Aponogetonaceae	<i>Aponogeton stuhlmannii</i>	Engl.	LC	Indigenous
Archidiaceae	<i>Archidium ohioense</i>	Schimp. ex Mull.Hal.		Indigenous
Fabaceae	<i>Argyrolobium megarrhizum</i>	Bolus	NT	Indigenous; Endemic
Poaceae	<i>Aristida aequiglumis</i>	Hack.	LC	Indigenous
Poaceae	<i>Aristida congesta</i> subsp. <i>congesta</i>	Roem. & Schult.	LC	Indigenous
Poaceae	<i>Aristida diffusa</i> subsp. <i>burkei</i>	Trin.	LC	Indigenous
Asparagaceae	<i>Asparagus flavicaulis</i> subsp. <i>flavicaulis</i>	(Oberm.) Fellingham & N.L.Mey.	LC	Indigenous
Asparagaceae	<i>Asparagus suaveolens</i>	Burch.	LC	Indigenous
Iridaceae	<i>Babiana bainesii</i>	Baker	LC	Indigenous
Asteraceae	<i>Berkheya seminivea</i>	Harv. & Sond.	LC	Indigenous; Endemic
Bruniaceae	<i>Berzelia lanuginosa</i>	(L.) Brongn.	LC	Indigenous; Endemic
Poaceae	<i>Bewsia biflora</i>	(Hack. ex Schinz) Gooss.	LC	Indigenous
Poaceae	<i>Bothriochloa insculpta</i>	(Hochst. ex A.Rich.) A.Camus	LC	Indigenous
Poaceae	<i>Brachiaria brizantha</i>	(A.Rich.) Stapf	LC	Indigenous
Poaceae	<i>Brachiaria serrata</i>	(Thunb.) Stapf	LC	Indigenous
Apocynaceae	<i>Brachystelma pygmaeum</i> subsp. <i>flavidum</i>	(Schltr.) N.E.Br.	LC	Indigenous; Endemic
Apocynaceae	<i>Brachystelma rubellum</i>	(E.Mey.) Peckover	LC	Indigenous
Rubiaceae	<i>Breonadia</i> sp.			
Bryaceae	<i>Bryum argenteum</i>	Hedw.		Indigenous
Orobanchaceae	<i>Buchnera</i> sp.			
Asphodelaceae	<i>Bulbine favosa</i>	(Thunb.) Schult. & Schult.f.	LC	Indigenous

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Fabaceae	<i>Chamaecrista comosa</i> var. <i>capricornia</i>	E.Mey.	LC	Indigenous
Fabaceae	<i>Chamaecrista mimosoides</i>	(L.) Greene	LC	Indigenous
Fabaceae	<i>Chamaecrista stricta</i>	E.Mey.	LC	Indigenous
Pteridaceae	<i>Cheilanthes hirta</i> var. <i>brevipilosa</i>	Sw.	LC	Indigenous
Oleaceae	<i>Chionanthus foveolatus</i> subsp. <i>foveolatus</i>	(E.Mey.) Stearn	LC	Indigenous
Gentianaceae	<i>Chironia palustris</i> subsp. <i>transvaalensis</i>	Burch.	LC	Indigenous
Gentianaceae	<i>Chironia purpurascens</i> subsp. <i>humilis</i>	(E.Mey.) Benth. & Hook.f.	LC	Indigenous
Poaceae	<i>Chloris pycnothrix</i>	Trin.	LC	Indigenous
Agavaceae	<i>Chlorophytum fasciculatum</i>	(Baker) Kativu	LC	Indigenous
Agavaceae	<i>Chlorophytum recurvifolium</i>	(Baker) C.Archer & Kativu	LC	Indigenous
Agavaceae	<i>Chlorophytum transvaalense</i>	(Baker) Kativu	LC	Indigenous
Cleomaceae	<i>Cleome monophylla</i>	L.	LC	Indigenous
Combretaceae	<i>Combretum microphyllum</i>	Klotzsch	LC	Indigenous
Commelinaceae	<i>Commelina africana</i> var. <i>lancispatha</i>	L.	LC	Indigenous
Commelinaceae	<i>Commelina benghalensis</i>	L.	LC	Indigenous
Commelinaceae	<i>Commelina livingstonii</i>	C.B.Clarke	LC	Indigenous
Commelinaceae	<i>Commelina subulata</i>	Roth	LC	Indigenous
Convolvulaceae	<i>Convolvulus thunbergii</i>	Roem. & Schult.	LC	Indigenous
Asteraceae	<i>Conyza ulmifolia</i>	(Burm.f.) Kuntze		Indigenous
Boraginaceae	<i>Cordia caffra</i>	Sond.	LC	Indigenous
Rubiaceae	<i>Cordylostigma virgata</i>	(Willd.) Groeninckx & Dessein		Indigenous
Crassulaceae	<i>Crassula capitella</i> subsp. <i>nodulosa</i>	Thunb.	LC	Indigenous
Asteraceae	<i>Crepis hypochaeridea</i>	(DC.) Thell.		Not indigenous; Naturalised; Invasive
Amaryllidaceae	<i>Crinum lugardiae</i>	N.E.Br.	LC	Indigenous
Acanthaceae	<i>Crossandra greenstockii</i>	S.Moore	LC	Indigenous
Fabaceae	<i>Crotalaria globifera</i>	E.Mey.	LC	Indigenous
Fabaceae	<i>Crotalaria magaliesbergensis</i>	A.S.Flores & Sch.Rodr.	LC	Indigenous; Endemic
Apocynaceae	<i>Cryptolepis oblongifolia</i>	(Meisn.) Schltr.	LC	Indigenous
Cucurbitaceae	<i>Cucumis hirsutus</i>	Sond.	LC	Indigenous
Araliaceae	<i>Cussonia paniculata</i> subsp. <i>sinuata</i>	Eckl. & Zeyh.	LC	Indigenous
Commelinaceae	<i>Cyanotis speciosa</i>	(L.f.) Hassk.	LC	Indigenous
Apiaceae	<i>Cyclospermum leptophyllum</i>	(Pers.) Sprague ex Britton & P.Wilson		Not indigenous; Naturalised
Orobanchaceae	<i>Cycnium tubulosum</i> subsp. <i>tubulosum</i>	(L.f.) Engl.	LC	Indigenous
Cyperaceae	<i>Cyperus obtusiflorus</i> var. <i>flavissimus</i>	Vahl	LC	Indigenous
Cyperaceae	<i>Cyperus squarrosus</i>	L.	LC	Indigenous
Thymelaeaceae	<i>Dais cotinifolia</i>	L.	LC	Indigenous
Asteraceae	<i>Denekia capensis</i>	Thunb.	LC	Indigenous

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Poaceae	<i>Diandrochloa namaquensis</i>	(Nees) De Winter	LC	Indigenous
Caryophyllaceae	<i>Dianthus mooiensis</i>	F.N.Williams	LC	Indigenous
Pedaliaceae	<i>Dicerocaryum senecioides</i>	(Klotzsch) Abels	LC	Indigenous
Asteraceae	<i>Dicoma anomala subsp. anomala</i>	Sond.	LC	Indigenous
Asteraceae	<i>Dicoma anomala subsp. gerrardii</i>	Sond.	LC	Indigenous
Poaceae	<i>Digitaria debilis</i>	(Desf.) Willd.	LC	Indigenous
Poaceae	<i>Digitaria eriantha</i>	Steud.	LC	Indigenous
Poaceae	<i>Digitaria longiflora</i>	(Retz.) Pers.	LC	Indigenous
Poaceae	<i>Digitaria sp.</i>			
Poaceae	<i>Digitaria ternata</i>	(A.Rich.) Stapf	LC	Indigenous
Poaceae	<i>Diheteropogon amplexens var. amplexens</i>	(Nees) Clayton	LC	Indigenous
Asteraceae	<i>Dimorphotheca caulescens</i>	Harv.	LC	Indigenous
Asteraceae	<i>Dimorphotheca spectabilis</i>	Schltr.	LC	Indigenous; Endemic
Apocynaceae	<i>Diplorhynchus condylocarpon</i>	(Mull.Arg.) Pichon	LC	Indigenous
Fabaceae	<i>Dolichos angustifolius</i>	Eckl. & Zeyh.	LC	Indigenous
Hyacinthaceae	<i>Drimia depressa</i>	(Baker) Jessop	LC	Indigenous
Amaranthaceae	<i>Dysphania carinata</i>	(R.Br.) Mosyakin & Clemants		Not indigenous; Naturalised; Invasive
Poaceae	<i>Echinochloa holubii</i>	(Stapf) Stapf	LC	Indigenous
Asteraceae	<i>Eclipta prostrata</i>	(L.) L.		Not indigenous; Naturalised
Fabaceae	<i>Elephantorrhiza elephantina</i>	(Burch.) Skeels	LC	Indigenous
Poaceae	<i>Eleusine coracana subsp. africana</i>	(L.) Gaertn.	LC	Indigenous
Poaceae	<i>Elionurus muticus</i>	(Spreng.) Kunth	LC	Indigenous
Asteraceae	<i>Emilia transvaalensis</i>	(Bolus) C.Jeffrey	LC	Indigenous
Poaceae	<i>Enneapogon pretoriensis</i>	Stent	LC	Indigenous
Equisetaceae	<i>Equisetum ramosissimum subsp. ramosissimum</i>	Desf.	LC	Indigenous
Poaceae	<i>Eragrostis aspera</i>	(Jacq.) Nees	LC	Indigenous
Poaceae	<i>Eragrostis capensis</i>	(Thunb.) Trin.	LC	Indigenous
Poaceae	<i>Eragrostis chloromelas</i>	Steud.	LC	Indigenous
Poaceae	<i>Eragrostis cilianensis</i>	(All.) Vignolo ex Janch.	LC	Indigenous
Poaceae	<i>Eragrostis curvula</i>	(Schrad.) Nees	LC	Indigenous
Poaceae	<i>Eragrostis heteromera</i>	Stapf	LC	Indigenous
Poaceae	<i>Eragrostis hierniana</i>	Rendle	LC	Indigenous
Poaceae	<i>Eragrostis inamoena</i>	K.Schum.	LC	Indigenous
Poaceae	<i>Eragrostis mexicana subsp. virescens</i>	(Hornem.) Link	NE	Not indigenous; Naturalised
Poaceae	<i>Eragrostis patentipilosa</i>	Hack.	LC	Indigenous
Poaceae	<i>Eragrostis racemosa</i>	(Thunb.) Steud.	LC	Indigenous
Poaceae	<i>Eragrostis remotiflora</i>	De Winter	LC	Indigenous; Endemic
Poaceae	<i>Eragrostis sp.</i>			
Poaceae	<i>Eragrostis superba</i>	Peyr.	LC	Indigenous
Poaceae	<i>Eragrostis tef</i>	(Zuccagni) Trotter	NE	Not indigenous; Naturalised
Poaceae	<i>Eragrostis viscosa</i>	(Retz.) Trin.	LC	Indigenous
Fabaceae	<i>Eriosema burkei var. burkei</i>	Benth. ex Harv.	LC	Indigenous

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Fabaceae	<i>Eriosema cordatum</i>	E.Mey.	LC	Indigenous
Fabaceae	<i>Eriosema pauciflorum</i> var. <i>pauciflorum</i>	Klotzsch	LC	Indigenous
Fabaceae	<i>Eriosema psoraleoides</i>	(Lam.) G.Don	LC	Indigenous
Euphorbiaceae	<i>Euphorbia heterophylla</i>	L.	NE	Not indigenous; Naturalised
Euphorbiaceae	<i>Euphorbia striata</i>	Thunb.	LC	Indigenous
Gentianaceae	<i>Exochaenium grande</i>	(E.Mey.) Griseb.	LC	Indigenous
Exorhizaceae	<i>Exorhiza holstii</i>	Steph.		Indigenous
Fabroniaceae	<i>Fabronia pilifera</i>	Hornsch.		Indigenous
Rubiaceae	<i>Fadogia homblei</i>	De Wild.	LC	Indigenous
Asteraceae	<i>Felicia muricata</i> subsp. <i>muricata</i>	(Thunb.) Nees	LC	Indigenous
Moraceae	<i>Ficus ingens</i> var. <i>ingens</i>	(Miq.) Miq.		Indigenous
Salicaceae	<i>Flacourtia indica</i>	(Burm.f.) Merr.	LC	Indigenous
Commelinaceae	<i>Floscopa glomerata</i>	(Willd. ex Schult. & J.H.Schult.) Hassk.	LC	Indigenous
Rubiaceae	<i>Gardenia volkensii</i> subsp. <i>volkensii</i>	K.Schum.	NE	Indigenous
Asteraceae	<i>Gazania krebsiana</i> subsp. <i>serrulata</i>	Less.	LC	Indigenous
Asteraceae	<i>Gerbera ambigua</i>	(Cass.) Sch.Bip.	LC	Indigenous
Iridaceae	<i>Gladiolus dalenii</i> subsp. <i>dalenii</i>	Van Geel	LC	Indigenous
Iridaceae	<i>Gladiolus elliotii</i>	Baker	LC	Indigenous
Iridaceae	<i>Gladiolus permeabilis</i> subsp. <i>edulis</i>	D.Delaroche	LC	Indigenous
Iridaceae	<i>Gladiolus rehmannii</i>	Baker	LC	Indigenous
Asteraceae	<i>Gnaphalium filagopsis</i>	Hilliard & B.L.Burt	LC	Indigenous
Thymelaeaceae	<i>Gnidia</i> sp.			
Apocynaceae	<i>Gomphocarpus glaucophyllus</i>	Schltr.	LC	Indigenous
Amaranthaceae	<i>Gomphrena celosioides</i>	Mart.		Not indigenous; Naturalised
Orbanchaceae	<i>Graderia subintegra</i>	Mast.	LC	Indigenous
Malvaceae	<i>Grewia monticola</i>	Sond.	LC	Indigenous
Malvaceae	<i>Grewia subspathulata</i>	N.E.Br.	LC	Indigenous
Amaranthaceae	<i>Guilleminea densa</i>	(Humb. & Bonpl. ex Schult.) Moq.		Not indigenous; Naturalised; Invasive
Celastraceae	<i>Gymnosporia tenuispina</i>	(Sond.) Szyszyl.	LC	Indigenous
Orchidaceae	<i>Habenaria epipactidea</i>	Rchb.f.	LC	Indigenous
Amaryllidaceae	<i>Haemanthus montanus</i>	Baker	LC	Indigenous
Asteraceae	<i>Helichrysum acutatum</i>	DC.	LC	Indigenous
Asteraceae	<i>Helichrysum caespititium</i>	(DC.) Harv.	LC	Indigenous
Asteraceae	<i>Helichrysum chionosphaerum</i>	DC.	LC	Indigenous
Asteraceae	<i>Helichrysum nudifolium</i> var. <i>nudifolium</i>	(L.) Less.	LC	Indigenous
Asteraceae	<i>Helichrysum rugulosum</i>	Less.	LC	Indigenous
Asteraceae	<i>Helichrysum setosum</i>	Harv.	LC	Indigenous
Poaceae	<i>Heteropogon contortus</i>	(L.) Roem. & Schult.	LC	Indigenous
Heteropyxidaceae	<i>Heteropyxis natalensis</i>	Harv.	LC	Indigenous

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Malvaceae	<i>Hibiscus nigricaulis</i>	Baker f.	LC	Indigenous
Malvaceae	<i>Hibiscus pusillus</i>	Thunb.	LC	Indigenous
Asteraceae	<i>Hilliardiella elaeagnoides</i>	(DC.) Swelank. & J.C.Manning		Indigenous
Asteraceae	<i>Hilliardiella hirsuta</i>	(DC.) H.Rob.	LC	Indigenous
Pittosporaceae	<i>Hymenosporum flavum</i>	(Hook.) R.Br. ex F.Muell.		Not indigenous; Naturalised
Hypericaceae	<i>Hypericum aethiopicum subsp. sonderi</i>	Thunb.	LC	Indigenous
Hypericaceae	<i>Hypericum lalandii</i>	Choisy	LC	Indigenous
Hypoxidaceae	<i>Hypoxis argentea var. argentea</i>	Harv. ex Baker	LC	Indigenous
Hypoxidaceae	<i>Hypoxis filiformis</i>	Baker	LC	Indigenous
Hypoxidaceae	<i>Hypoxis iridifolia</i>	Baker	LC	Indigenous
Hypoxidaceae	<i>Hypoxis rigidula var. rigidula</i>	Baker	LC	Indigenous
Fabaceae	<i>Indigostrum burkeanum</i>	(Benth. ex Harv.) Schrire	LC	Indigenous
Fabaceae	<i>Indigofera egens</i>	N.E.Br.	LC	Indigenous; Endemic
Fabaceae	<i>Indigofera filipes</i>	Benth. ex Harv.	LC	Indigenous
Fabaceae	<i>Indigofera hedyantha</i>	Eckl. & Zeyh.	LC	Indigenous
Fabaceae	<i>Indigofera hilaris var. hilaris</i>	Eckl. & Zeyh.	LC	Indigenous
Fabaceae	<i>Indigofera oxalidea</i>	Welw. ex Baker	LC	Indigenous
Fabaceae	<i>Indigofera oxytropis</i>	Benth. ex Harv.	LC	Indigenous
Fabaceae	<i>Indigofera sordida</i>	Benth. ex Harv.	LC	Indigenous
Fabaceae	<i>Indigofera zeyheri</i>	Spreng. ex Eckl. & Zeyh.	LC	Indigenous
Convolvulaceae	<i>Ipomoea transvaalensis</i>	A.Meeuse	LC	Indigenous
Poaceae	<i>Ischaemum fasciculatum</i>	Brongn.	LC	Indigenous
Scrophulariaceae	<i>Jamesbrittenia sp.</i>			
Euphorbiaceae	<i>Jatropha lagarinthoides</i>	Sond.	LC	Indigenous; Endemic
Juncaceae	<i>Juncus lomatophyllus</i>	Spreng.	LC	Indigenous
Acanthaceae	<i>Justicia betonica</i>	L.	LC	Indigenous
Rubiaceae	<i>Kohautia amatymbica</i>	Eckl. & Zeyh.	LC	Indigenous
Rubiaceae	<i>Kohautia caespitosa subsp. brachyloba</i>	Schnizl.	LC	Indigenous
Cyperaceae	<i>Kyllinga alba</i>	Nees	LC	Indigenous
Cyperaceae	<i>Kyllinga melanosperma var. melanosperma</i>	Nees		Indigenous
Fabaceae	<i>Lablab purpureus subsp. uncinatus</i>	(L.) Sweet	LC	Indigenous
Thymelaeaceae	<i>Lasiosiphon capitatus</i>	(L.f.) Burt Davy	LC	Indigenous
Thymelaeaceae	<i>Lasiosiphon sericocephalus</i>	(Meisn.) J.C.Manning & Boatwr.	LC	Indigenous
Hyacinthaceae	<i>Ledebouria cooperi</i>	(Hook.f.) Jessop	LC	Indigenous
Poaceae	<i>Leersia hexandra</i>	Sw.	LC	Indigenous
Fabaceae	<i>Leobordea divaricata</i>	Eckl. & Zeyh.	LC	Indigenous
Fabaceae	<i>Leobordea hirsuta</i>	(Schinz) B.-E.van Wyk & Boatwr.	LC	Indigenous; Endemic
Verbenaceae	<i>Lippia scaberrima</i>	Sond.	LC	Indigenous
Fabaceae	<i>Listia bainesii</i>	(Baker) B.-E.van Wyk & Boatwr.	LC	Indigenous

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Fabaceae	<i>Listia heterophylla</i>	E.Mey.	LC	Indigenous
Lobeliaceae	<i>Lobelia erinus</i>	L.	LC	Indigenous
Fabaceae	<i>Lotononis laxa</i>	Eckl. & Zeyh.	LC	Indigenous
Fabaceae	<i>Lotus discolor subsp. discolor</i>	E.Mey.	LC	Indigenous
Poaceae	<i>Loudetia flavida</i>	(Stapf) C.E.Hubb.	LC	Indigenous
Poaceae	<i>Loudetia simplex</i>	(Nees) C.E.Hubb.	LC	Indigenous
Asteraceae	<i>Macledium zeyheri subsp. zeyheri</i>	(Sond.) S.Ortiz	LC	Indigenous
Scrophulariaceae	<i>Manulea parviflora var. parviflora</i>	Benth.	LC	Indigenous
Fabaceae	<i>Medicago sativa</i>	L.	NE	Not indigenous; Cultivated; Naturalised; Invasive
Malvaceae	<i>Melhania prostrata</i>	DC.	LC	Indigenous
Fabaceae	<i>Mellilotus albus</i>	Medik.	NE	Not indigenous; Naturalised; Invasive
Poaceae	<i>Melinis nerviglumis</i>	(Franch.) Zizka	LC	Indigenous
Lobeliaceae	<i>Monopsis decipiens</i>	(Sond.) Thulin	LC	Indigenous
Geraniaceae	<i>Monsonia angustifolia</i>	E.Mey. ex A.Rich.	LC	Indigenous
Geraniaceae	<i>Monsonia burkeana</i>	Planch. ex Harv.	LC	Indigenous
Amaryllidaceae	<i>Nerine gaberonsensis</i>	Bremek. & Oberm.	LC	Indigenous
Asteraceae	<i>Nidorella anomala</i>	Steetz	LC	Indigenous
Asteraceae	<i>Nidorella hottentotica</i>	DC.	LC	Indigenous
Lamiaceae	<i>Ocimum obovatum subsp. obovatum</i>	E.Mey. ex Benth.	NE	Indigenous
Onagraceae	<i>Oenothera jamesii</i>	Torr. & A.Gray		Not indigenous; Naturalised; Invasive
Onagraceae	<i>Oenothera rosea</i>	L'Her. ex Aiton		Not indigenous; Naturalised; Invasive
Asteraceae	<i>Oocephala staehelinoides</i>	(Harv.) H.Rob. & Skvarla		Indigenous; Endemic
Fabaceae	<i>Ophrestia oblongifolia var. oblongifolia</i>	(E.Mey.) H.M.L.Forbes	LC	Indigenous
Poaceae	<i>Oropetium capense</i>	Stapf	LC	Indigenous
Orchidaceae	<i>Orthochilus welwitschii</i>	Rchb.f.	LC	Indigenous
Polygonaceae	<i>Oxygonum dregeanum subsp. canescens</i>	Meisn.	NE	Indigenous; Endemic
Polygonaceae	<i>Oxygonum dregeanum subsp. canescens</i>	Meisn.	NE	Indigenous
Apocynaceae	<i>Pachycarpus schinzianus</i>	(Schltr.) N.E.Br.	LC	Indigenous
Poaceae	<i>Panicum maximum</i>	Jacq.	LC	Indigenous
Poaceae	<i>Panicum natalense</i>	Hochst.	LC	Indigenous
Poaceae	<i>Panicum schinzii</i>	Hack.	LC	Indigenous
Chrysobalanaceae	<i>Parinari capensis subsp. capensis</i>	Harv.	LC	Indigenous
Rubiaceae	<i>Pavetta gardeniifolia var. subtomentosa</i>	A.Rich.	LC	Indigenous
Fabaceae	<i>Pearsonia sessilifolia subsp. sessilifolia</i>	(Harv.) Dummer	LC	Indigenous
Geraniaceae	<i>Pelargonium dolomiticum</i>	R.Knuth	LC	Indigenous
Rubiaceae	<i>Pentanisia angustifolia</i>	(Hochst.) Hochst.	LC	Indigenous
Rubiaceae	<i>Pentanisia prunelloides subsp. latifolia</i>	(Klotzsch ex Eckl. & Zeyh.) Walp.	LC	Indigenous
Apocynaceae	<i>Pentarrhinum inspidum</i>	E.Mey.	LC	Indigenous
Poaceae	<i>Phragmites australis</i>	(Cav.) Steud.	LC	Indigenous

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Phyllanthaceae	<i>Phyllanthus incurvus</i>	Thunb.	LC	Indigenous
Lamiaceae	<i>Platostoma rotundifolium</i>	(Briq.) A.J.Paton	LC	Indigenous
Caryophyllaceae	<i>Pollichia campestris</i>	Aiton	LC	Indigenous
Caryophyllaceae	<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>	(L.) Lam.		Not indigenous; Naturalised
Asteraceae	<i>Polydora angustifolia</i>	(Steetz) H.Rob.	LC	Indigenous
Polygalaceae	<i>Polygala africana</i>	Chodat	LC	Indigenous
Polygalaceae	<i>Polygala hottentotta</i>	C.Presl	LC	Indigenous
Polygalaceae	<i>Polygala transvaalensis</i>	Chodat		Indigenous
Polygalaceae	<i>Polygala transvaalensis</i> subsp. <i>transvaalensis</i>	Chodat	LC	Indigenous
Asteraceae	<i>Pseudognaphalium luteoalbum</i>	(L.) Hilliard & B.L.Burtt	LC	Cryptogenic
Asteraceae	<i>Pseudopegolettia tenella</i>	(DC.) H.Rob., Skvarla & V.A.Funk		Indigenous
Rubiaceae	<i>Psydrax livida</i>	(Hiern) Bridson	LC	Indigenous
Fabaceae	<i>Pterocarpus rotundifolius</i> subsp. <i>rotundifolius</i>	(Sond.) Druce	LC	Indigenous
Pedaliaceae	<i>Pterodiscus speciosus</i>	Hook.	LC	Indigenous
Cyperaceae	<i>Pycnus mundii</i>	Nees	LC	Indigenous
Rubiaceae	<i>Pygmaeothamnus zeyheri</i> var. <i>zeyheri</i>	(Sond.) Robyns	LC	Indigenous
Ranunculaceae	<i>Ranunculus multifidus</i>	Forssk.	LC	Indigenous
Rhamnaceae	<i>Rhamnus prinoides</i>	L'Her.	LC	Indigenous
Fabaceae	<i>Rhynchosia confusa</i>	Burtt Davy	NE	Indigenous
Fabaceae	<i>Rhynchosia monophylla</i>	Schltr.	LC	Indigenous
Fabaceae	<i>Rhynchosia nervosa</i> var. <i>nervosa</i>	Benth. ex Harv.	LC	Indigenous
Fabaceae	<i>Rhynchosia nitens</i>	Benth. ex Harv.	LC	Indigenous
Fabaceae	<i>Rhynchosia reptabunda</i>	N.E.Br.	LC	Indigenous
Fabaceae	<i>Rhynchosia totta</i> var. <i>rigidula</i>	(Thunb.) DC.		Indigenous
Ricciaceae	<i>Riccia atropurpurea</i>	Sim		Indigenous
Ricciaceae	<i>Riccia okahandjana</i>	S.W.Arnell		Indigenous
Ricciaceae	<i>Riccia volkii</i>	S.W.Arnell		Indigenous
Rubiaceae	<i>Richardia brasiliensis</i>	Gomes	NE	Not indigenous; Naturalised
Rubiaceae	<i>Richardia scabra</i>	L.	NE	Not indigenous; Naturalised
Lamiaceae	<i>Rothea louwalbertsii</i>	(P.P.J.Herman) P.P.J.Herman & Retief	LC	Indigenous
Rubiaceae	<i>Rubia petiolaris</i>	DC.	LC	Indigenous
Acanthaceae	<i>Ruellia cordata</i>	Thunb.	LC	Indigenous
Polygonaceae	<i>Rumex rhodesius</i>	Rech.f.	LC	Indigenous
Celastraceae	<i>Salacia rehmannii</i>	Schinz	LC	Indigenous; Endemic
Orchidaceae	<i>Satyrium hallackii</i> subsp. <i>ocellatum</i>	Bolus	LC	Indigenous
Dipsacaceae	<i>Scabiosa columbaria</i>	L.	LC	Indigenous
Asteraceae	<i>Schistostephium crataegifolium</i>	(DC.) Fenzl ex Harv.	LC	Indigenous
Poaceae	<i>Schizachyrium jeffreysii</i>	(Hack.) Stapf	LC	Indigenous
Hyacinthaceae	<i>Schizocarpus nervosus</i>	(Burch.) Van der Merwe	LC	Indigenous

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Cyperaceae	<i>Schoenoplectus muriculatus</i>	(Kuk.) Browning	LC	Indigenous
Anacardiaceae	<i>Searsia gracillima</i> var. <i>gracillima</i>	(Engl.) Moffett	NT	Indigenous; Endemic
Selaginellaceae	<i>Selaginella dregei</i>	(C.Presl) Hieron.	LC	Indigenous
Asteraceae	<i>Senecio coronatus</i>	(Thunb.) Harv.	LC	Indigenous
Asteraceae	<i>Senecio glanduloso-pilosus</i>	Volken & Muschl.	LC	Indigenous; Endemic
Asteraceae	<i>Senecio pentactinus</i>	Klatt	LC	Indigenous
Asteraceae	<i>Senecio venosus</i>	Harv.	LC	Indigenous
Fabaceae	<i>Senegalia burkei</i>	(Benth.) Kyal. & Boatwr.	LC	Indigenous
Fabaceae	<i>Senegalia caffra</i>	(Thunb.) P.J.H.Hurter & Mabb.	LC	Indigenous
Fabaceae	<i>Senegalia mellifera</i> subsp. <i>detinens</i>	(Vahl) Seigler & Ebinger	LC	Indigenous
Fabaceae	<i>Senna didymobotrya</i>	(Fresen.) H.S.Irwin & Barneby	NE	Not indigenous; Cultivated; Naturalised; Invasive
Pedaliaceae	<i>Sesamum alatum</i>	Thonn.	LC	Indigenous
Fabaceae	<i>Sesbania sesban</i> subsp. <i>sesban</i>	(L.) Merr.	NE	Indigenous
Poaceae	<i>Setaria lindenbergiana</i>	(Nees) Stapf	LC	Indigenous
Poaceae	<i>Setaria sphacelata</i> var. <i>torta</i>	(Schumach.) Stapf & C.E.Hubb. ex M.B.Moss	LC	Indigenous
Solanaceae	<i>Solanum nigrum</i>	L.		Not indigenous; Naturalised
Malpighiaceae	<i>Sphedamnocarpus pruriens</i> subsp. <i>galphimifolius</i>	(A.Juss.) Szyszyl.	LC	Indigenous
Poaceae	<i>Sporobolus festivus</i>	Hochst. ex A.Rich.	LC	Indigenous
Poaceae	<i>Sporobolus panicoides</i>	A.Rich.	LC	Indigenous
Poaceae	<i>Sporobolus pyramidalis</i>	P.Beauv.	LC	Indigenous
Poaceae	<i>Sporobolus stapfianus</i>	Gand.	LC	Indigenous
Apocynaceae	<i>Stapelia grandiflora</i> var. <i>grandiflora</i>	Masson	LC	Indigenous
Orobanchaceae	<i>Striga bilabiata</i> subsp. <i>bilabiata</i>	(Thunb.) Kuntze	LC	Indigenous
Orobanchaceae	<i>Striga gesnerioides</i>	(Willd.) Vatke	LC	Indigenous
Fabaceae	<i>Stylosanthes fruticosa</i>	(Retz.) Alston	LC	Indigenous
Lamiaceae	<i>Syncolostemon pretoriae</i>	(Gurke) D.F.Otieno	LC	Indigenous
Talinaceae	<i>Talinum caffrum</i>	(Thunb.) Eckl. & Zeyh.	LC	Indigenous
Fabaceae	<i>Tephrosia acaciifolia</i>	Baker	LC	Indigenous
Fabaceae	<i>Tephrosia burchellii</i>	Burt Davy	LC	Indigenous
Fabaceae	<i>Tephrosia elongata</i> var. <i>elongata</i>	E.Mey.	LC	Indigenous
Fabaceae	<i>Tephrosia multijuga</i>	R.G.N.Young	LC	Indigenous
Combretaceae	<i>Terminalia sericea</i>	Burch. ex DC.	LC	Indigenous
Lamiaceae	<i>Teucrium trifidum</i>	Retz.	LC	Indigenous
Thelypteridaceae	<i>Thelypteris confluens</i>	(Thunb.) C.V.Morton	LC	Indigenous
Santalaceae	<i>Thesium costatum</i> var. <i>costatum</i>	A.W.Hill	LC	Indigenous
Santalaceae	<i>Thesium gypsophiloides</i>	A.W.Hill	LC	Indigenous; Endemic
Poaceae	<i>Trachypogon spicatus</i>	(L.f.) Kuntze	LC	Indigenous
Poaceae	<i>Tragus berteronianus</i>	Schult.	LC	Indigenous
Malpighiaceae	<i>Triaspis hypericoides</i> subsp. <i>nelsonii</i>	(DC.) Burch.	LC	Indigenous
Boraginaceae	<i>Trichodesma physaloides</i>	(Fenzl) A.DC.	LC	Indigenous

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Poaceae	<i>Trichoneura grandiglumis</i>	(Nees) Ekman	LC	Indigenous
Malvaceae	<i>Triumfetta sonderi</i>	Ficalho & Hiern	LC	Indigenous; Endemic
Poaceae	<i>Urochloa panicoides</i>	P.Beauv.	LC	Indigenous
Fabaceae	<i>Vachellia hebeclada</i> subsp. <i>hebeclada</i>	(DC.) Kyal. & Boatwr.	LC	Indigenous
Fabaceae	<i>Vachellia luederitzii</i> var. <i>luederitzii</i>	(Engl.) Kyal. & Boatwr.	LC	Indigenous
Fabaceae	<i>Vachellia luederitzii</i> var. <i>retinens</i>	(Engl.) Kyal. & Boatwr.	LC	Indigenous
Verbenaceae	<i>Verbena bonariensis</i>	L.		Not indigenous; Naturalised; Invasive
Fabaceae	<i>Vigna vexillata</i> var. <i>vexillata</i>	(L.) A.Rich.	LC	Indigenous
Santalaceae	<i>Viscum verrucosum</i>	Harv.	LC	Indigenous
Campanulaceae	<i>Wahlenbergia undulata</i>	(L.f.) A.DC.	LC	Indigenous
Convolvulaceae	<i>Xenostegia tridentata</i> subsp. <i>angustifolia</i>	(L.) D.F.Austin & Staples	LC	Indigenous
Olacaceae	<i>Ximenia caffra</i> var. <i>caffra</i>	Sond.	LC	Indigenous
Rutaceae	<i>Zanthoxylum capense</i>	(Thunb.) Harv.	LC	Indigenous
Asteraceae	<i>Zinnia peruviana</i>	(L.) L.		Not indigenous; Naturalised; Invasive
Fabaceae	<i>Zornia linearis</i>	E.Mey.	LC	Indigenous
Fabaceae	<i>Zornia milneana</i>	Mohlenbr.	LC	Indigenous

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APPENDIX B: Avifaunal species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Accipiter badius</i>	Shikra	Unlisted	LC
<i>Accipiter melanoleucus</i>	Sparrowhawk, Black	Unlisted	LC
<i>Accipiter minullus</i>	Sparrowhawk, Little	Unlisted	LC
<i>Accipiter ovampensis</i>	Sparrowhawk, Ovambo	Unlisted	LC
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Acrocephalus baeticatus</i>	Reed-warbler, African	Unlisted	Unlisted
<i>Acrocephalus gracilirostris</i>	Swamp-warbler, Lesser	Unlisted	LC
<i>Acrocephalus palustris</i>	Warbler, Marsh	Unlisted	LC
<i>Actitis hypoleucos</i>	Sandpiper, Common	Unlisted	LC
<i>Actophilornis africanus</i>	Jacana, African	Unlisted	LC
<i>Afrotis afraoides</i>	Korhaan, Northern Black	Unlisted	LC
<i>Alcedo cristata</i>	Kingfisher, Malachite	Unlisted	Unlisted
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC
<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Unlisted	LC
<i>Amadina erythrocephala</i>	Finch, Red-headed	Unlisted	LC
<i>Amadina fasciata</i>	Finch, Cut-throat	Unlisted	Unlisted
<i>Amandava subflava</i>	Waxbill, Orange-breasted	Unlisted	Unlisted
<i>Amaurornis flavirostris</i>	Crake, Black	Unlisted	LC
<i>Amblyospiza albifrons</i>	Weaver, Thick-billed	Unlisted	LC
<i>Anaplectes rubriceps</i>	Weaver, Red-headed	Unlisted	LC
<i>Anas erythrorhyncha</i>	Teal, Red-billed	Unlisted	LC
<i>Anas smithii</i>	Shoveler, Cape	Unlisted	LC
<i>Anas sparsa</i>	Duck, African Black	Unlisted	LC
<i>Anas undulata</i>	Duck, Yellow-billed	Unlisted	LC
<i>Anhinga rufa</i>	Darter, African	Unlisted	LC
<i>Anomalospiza imberbis</i>	Finch, Cuckoo	Unlisted	LC
<i>Anthoscopus minutus</i>	Penduline-tit, Cape	Unlisted	LC
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU
<i>Anthus caffer</i>	Pipit, Bushveld	Unlisted	LC
<i>Anthus cinnamomeus</i>	Pipit, African	Unlisted	LC
<i>Anthus leucophrys</i>	Pipit, Plain-backed	Unlisted	LC
<i>Anthus lineiventris</i>	Pipit, Striped	Unlisted	LC
<i>Anthus nicholsoni</i>	Nicholson's pipit	Unlisted	Unlisted
<i>Anthus vaalensis</i>	Pipit, Buffy	Unlisted	LC
<i>Apalis thoracica</i>	Apalis, Bar-throated	Unlisted	LC
<i>Apus affinis</i>	Swift, Little	Unlisted	LC
<i>Apus apus</i>	Swift, Common	Unlisted	LC
<i>Apus barbatus</i>	Swift, African Black	Unlisted	LC
<i>Apus caffer</i>	Swift, White-rumped	Unlisted	LC
<i>Apus horus</i>	Swift, Horus	Unlisted	LC
<i>Aquila rapax</i>	Eagle, Tawny	EN	LC

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<i>Aquila spilogaster</i>	Hawk-eagle, African	Unlisted	LC
<i>Aquila wahlbergi</i>	Eagle, Wahlberg's	Unlisted	LC
<i>Ardea cinerea</i>	Heron, Grey	Unlisted	LC
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC
<i>Ardea purpurea</i>	Heron, Purple	Unlisted	LC
<i>Ardeola ralloides</i>	Heron, Squacco	Unlisted	LC
<i>Asio capensis</i>	Owl, Marsh	Unlisted	LC
<i>Aviceda cuculoides</i>	Hawk, African Cuckoo	Unlisted	LC
<i>Batis molitor</i>	Batis, Chinspot	Unlisted	LC
<i>Bostrychia hagedash</i>	Ibis, Hadeda	Unlisted	LC
<i>Bradornis mariquensis</i>	Flycatcher, Marico	Unlisted	LC
<i>Bradornis pallidus</i>	Flycatcher, Pale	Unlisted	LC
<i>Bradypterus baboecala</i>	Rush-warbler, Little	Unlisted	LC
<i>Bubo africanus</i>	Eagle-owl, Spotted	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Buphagus erythrorhynchus</i>	Oxpecker, Red-billed	Unlisted	Unlisted
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC
<i>Buteo vulpinus</i>	Buzzard, Common	Unlisted	Unlisted
<i>Butorides striata</i>	Heron, Green-backed	Unlisted	LC
<i>Calamonastes fasciolatus</i>	Wren-warbler, Barred	Unlisted	LC
<i>Calandrella cinerea</i>	Lark, Red-capped	Unlisted	LC
<i>Calendulauda africanoides</i>	Lark, Fawn-coloured	Unlisted	LC
<i>Calendulauda sabota</i>	Lark, Sabota	Unlisted	LC
<i>Camaroptera brevicaudata</i>	Camaroptera, Grey-backed	Unlisted	Unlisted
<i>Campephaga flava</i>	Cuckoo-shrike, Black	Unlisted	LC
<i>Campethera abingoni</i>	Woodpecker, Golden-tailed	Unlisted	LC
<i>Campethera bennettii</i>	Woodpecker, Bennett's	Unlisted	LC
<i>Caprimulgus pectoralis</i>	Nightjar, Fiery-necked	Unlisted	LC
<i>Caprimulgus rufigena</i>	Nightjar, Rufous-cheeked	Unlisted	LC
<i>Centropus burchellii</i>	Coucal, Burchell's	Unlisted	Unlisted
<i>Cercomela familiaris</i>	Chat, Familiar	Unlisted	LC
<i>Cercotrichas leucophrys</i>	Scrub-robin, White-browed	Unlisted	LC
<i>Cercotrichas paena</i>	Scrub-robin, Kalahari	Unlisted	LC
<i>Certhilauda semitorquata</i>	Lark, Eastern Long-billed	Unlisted	LC
<i>Ceryle rudis</i>	Kingfisher, Pied	Unlisted	LC
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst	Unlisted	LC
<i>Charadrius tricollaris</i>	Plover, Three-banded	Unlisted	LC
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Unlisted	LC
<i>Chlidonias hybrida</i>	Tern, Whiskered	Unlisted	LC
<i>Chlidonias leucopterus</i>	Tern, White-winged	Unlisted	LC
<i>Chrysococcyx caprius</i>	Cuckoo, Diderick	Unlisted	LC
<i>Chrysococcyx klaas</i>	Cuckoo, Klaas's	Unlisted	LC
<i>Cinnyricinclus leucogaster</i>	Starling, Violet-backed	Unlisted	LC
<i>Cinnyris mariquensis</i>	Sunbird, Marico	Unlisted	LC
<i>Cinnyris talatala</i>	Sunbird, White-bellied	Unlisted	LC

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<i>Circaetus cinereus</i>	Snake-eagle, Brown	Unlisted	LC
<i>Circaetus pectoralis</i>	Snake-eagle, Black-chested	Unlisted	LC
<i>Circus macrourus</i>	Harrier, Pallid	NT	NT
<i>Circus pygargus</i>	Montagu's Harrier	Unlisted	LC
<i>Cisticola aberrans</i>	Cisticola, Lazy	Unlisted	LC
<i>Cisticola aridulus</i>	Cisticola, Desert	Unlisted	LC
<i>Cisticola ayresii</i>	Cisticola, Wing-snapping	Unlisted	LC
<i>Cisticola chiniana</i>	Cisticola, Rattling	Unlisted	LC
<i>Cisticola fulvicapilla</i>	Neddicky, Neddicky	Unlisted	LC
<i>Cisticola juncidis</i>	Cisticola, Zitting	Unlisted	LC
<i>Cisticola lais</i>	Cisticola, Wailing	Unlisted	LC
<i>Cisticola rufilatus</i>	Cisticola, Tinkling	Unlisted	LC
<i>Cisticola textrix</i>	Cisticola, Cloud	Unlisted	LC
<i>Cisticola tinniens</i>	Cisticola, Levillant's	Unlisted	LC
<i>Clamator glandarius</i>	Cuckoo, Great Spotted	Unlisted	LC
<i>Clamator jacobinus</i>	Cuckoo, Jacobin	Unlisted	LC
<i>Clamator levillantii</i>	Cuckoo, Levillant's	Unlisted	LC
<i>Colius striatus</i>	Mousebird, Speckled	Unlisted	LC
<i>Columba guinea</i>	Pigeon, Speckled	Unlisted	LC
<i>Columba livia</i>	Dove, Rock	Unlisted	LC
<i>Coracias caudatus</i>	Roller, Lilac-breasted	Unlisted	LC
<i>Coracias garrulus</i>	Roller, European	NT	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Corvus capensis</i>	Crow, Cape	Unlisted	LC
<i>Corythaixoides concolor</i>	Go-away-bird, Grey	Unlisted	LC
<i>Cossypha caffra</i>	Robin-chat, Cape	Unlisted	LC
<i>Cossypha humeralis</i>	Robin-chat, White-throated	Unlisted	LC
<i>Coturnix coturnix</i>	Quail, Common	Unlisted	LC
<i>Coturnix delegorguei</i>	Quail, Harlequin	Unlisted	LC
<i>Creatophora cinerea</i>	Starling, Wattled	Unlisted	LC
<i>Crithagra atrogularis</i>	Canary, Black-throated	Unlisted	LC
<i>Crithagra flaviventris</i>	Canary, Yellow	Unlisted	LC
<i>Crithagra gularis</i>	Seed-eater, Streaky-headed	Unlisted	LC
<i>Crithagra mozambicus</i>	Canary, Yellow-fronted	Unlisted	LC
<i>Cuculus clamosus</i>	Cuckoo, Black	Unlisted	LC
<i>Cuculus gularis</i>	Cuckoo, African	Unlisted	LC
<i>Cuculus solitarius</i>	Cuckoo, Red-chested	Unlisted	LC
<i>Cursorius temminckii</i>	Courser, Temminck's	Unlisted	LC
<i>Cypsiurus parvus</i>	Palm-swift, African	Unlisted	LC
<i>Delichon urbicum</i>	House-martin, Common	Unlisted	LC
<i>Dendrocygna viduata</i>	Duck, White-faced Whistling	Unlisted	LC
<i>Dendroperdix sephaena</i>	Francolin, Crested	Unlisted	LC
<i>Dendropicos fuscescens</i>	Woodpecker, Cardinal	Unlisted	LC
<i>Dendropicos namaquus</i>	Woodpecker, Bearded	Unlisted	LC
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed	Unlisted	LC

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<i>Dryoscopus cubla</i>	Puffback, Black-backed	Unlisted	LC
<i>Egretta alba</i>	Egret, Great	Unlisted	LC
<i>Egretta garzetta</i>	Egret, Little	Unlisted	LC
<i>Egretta intermedia</i>	Egret, Yellow-billed	Unlisted	LC
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC
<i>Emberiza capensis</i>	Bunting, Cape	Unlisted	LC
<i>Emberiza flaviventris</i>	Bunting, Golden-breasted	Unlisted	LC
<i>Emberiza tahapisi</i>	Bunting, Cinnamon-breasted	Unlisted	LC
<i>Eremomela icteropygialis</i>	Eremomela, Yellow-bellied	Unlisted	LC
<i>Eremomela scotops</i>	Eremomela, Green-capped	Unlisted	LC
<i>Eremomela usticollis</i>	Eremomela, Burnt-necked	Unlisted	LC
<i>Eremopterix leucotis</i>	Sparrowlark, Chestnut-backed	Unlisted	LC
<i>Eremopterix verticalis</i>	Sparrowlark, Grey-backed	Unlisted	LC
<i>Estrilda astrild</i>	Waxbill, Common	Unlisted	LC
<i>Euplectes afer</i>	Bishop, Yellow-crowned	Unlisted	LC
<i>Euplectes albonotatus</i>	Widowbird, White-winged	Unlisted	LC
<i>Euplectes ardens</i>	Widowbird, Red-collared	Unlisted	LC
<i>Euplectes axillaris</i>	Widowbird, Fan-tailed	Unlisted	LC
<i>Euplectes orix</i>	Bishop, Southern Red	Unlisted	LC
<i>Euplectes progne</i>	Widowbird, Long-tailed	Unlisted	LC
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied	VU	LC
<i>Falco amurensis</i>	Falcon, Amur	Unlisted	LC
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC
<i>Falco naumanni</i>	Kestrel, Lesser	Unlisted	LC
<i>Falco rupicoloides</i>	Kestrel, Greater	Unlisted	LC
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	LC
<i>Fulica cristata</i>	Coot, Red-knobbed	Unlisted	LC
<i>Gallinago nigripennis</i>	Snipe, African	Unlisted	LC
<i>Gallinula chloropus</i>	Moorhen, Common	Unlisted	LC
<i>Glaucidium perlatum</i>	Owlet, Pearl-spotted	Unlisted	LC
<i>Granatina granatina</i>	Waxbill, Violet-eared	Unlisted	LC
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded	Unlisted	LC
<i>Halcyon chelicuti</i>	Kingfisher, Striped	Unlisted	LC
<i>Halcyon senegalensis</i>	Kingfisher, Woodland	Unlisted	LC
<i>Haliaeetus vocifer</i>	Fish-eagle, African	Unlisted	LC
<i>Himantopus himantopus</i>	Stilt, Black-winged	Unlisted	LC
<i>Hippolais icterina</i>	Warbler, Icterine	Unlisted	LC
<i>Hirundo abyssinica</i>	Swallow, Lesser Striped	Unlisted	LC
<i>Hirundo albicularis</i>	Swallow, White-throated	Unlisted	LC
<i>Hirundo cucullata</i>	Swallow, Greater Striped	Unlisted	LC
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC
<i>Hirundo fuligula</i>	Martin, Rock	Unlisted	Unlisted
<i>Hirundo rustica</i>	Swallow, Barn	Unlisted	LC
<i>Hirundo semirufa</i>	Swallow, Red-breasted	Unlisted	LC

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<i>Hirundo spilodera</i>	Cliff-swallow, South African	Unlisted	LC
<i>Indicator indicator</i>	Honeyguide, Greater	Unlisted	LC
<i>Indicator minor</i>	Honeyguide, Lesser	Unlisted	LC
<i>Jynx ruficollis</i>	Wryneck, Red-throated	Unlisted	LC
<i>Kaupifalco monogrammicus</i>	Buzzard, Lizard	Unlisted	LC
<i>Lagonosticta rhodopareia</i>	Firefinch, Jameson's	Unlisted	LC
<i>Lamprotornis australis</i>	Starling, Burchell's	Unlisted	LC
<i>Lamprotornis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Laniarius atrococcineus</i>	Shrike, Crimson-breasted	Unlisted	LC
<i>Laniarius ferrugineus</i>	Boubou, Southern	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC
<i>Lanius collurio</i>	Shrike, Red-backed	Unlisted	LC
<i>Lanius minor</i>	Shrike, Lesser Grey	Unlisted	LC
<i>Lophaetus occipitalis</i>	Eagle, Long-crested	Unlisted	LC
<i>Lophotis ruficrista</i>	Korhaan, Red-crested	Unlisted	LC
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC
<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC
<i>Malaconotus blanchoti</i>	Bush-shrike, Grey-headed	Unlisted	LC
<i>Megaceryle maximus</i>	Kingfisher, Giant	Unlisted	Unlisted
<i>Melaenornis pammelaina</i>	Flycatcher, Southern Black	Unlisted	LC
<i>Melierax canorus</i>	Goshawk, Southern Pale Chanting	Unlisted	LC
<i>Melierax gabar</i>	Goshawk, Gabar	Unlisted	LC
<i>Merops apiaster</i>	Bee-eater, European	Unlisted	LC
<i>Merops bullockoides</i>	Bee-eater, White-fronted	Unlisted	LC
<i>Merops hirundineus</i>	Bee-eater, Swallow-tailed	Unlisted	LC
<i>Merops pusillus</i>	Bee-eater, Little	Unlisted	LC
<i>Milvus aegyptius</i>	Kite, Yellow-billed	Unlisted	Unlisted
<i>Mirafra africana</i>	Lark, Rufous-naped	Unlisted	LC
<i>Mirafra cheniana</i>	Lark, Melodious	LC	LC
<i>Mirafra fasciolata</i>	Lark, Eastern Clapper	Unlisted	LC
<i>Mirafra passerina</i>	Lark, Monotonous	Unlisted	LC
<i>Mirafra rufocinnamomea</i>	Lark, Flappet	Unlisted	LC
<i>Monticola brevipes</i>	Rock-thrush, Short-toed	Unlisted	LC
<i>Motacilla capensis</i>	Wagtail, Cape	Unlisted	LC
<i>Muscicapa striata</i>	Flycatcher, Spotted	Unlisted	LC
<i>Myrmecocichla formicivora</i>	Chat, Anteating	Unlisted	LC
<i>Neotis denhami</i>	Bustard, Denham's	VU	NT
<i>Netta erythrophthalma</i>	Pochard, Southern	Unlisted	LC
<i>Nilaus afer</i>	Brubru	Unlisted	LC
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC
<i>Nycticorax nycticorax</i>	Night-Heron, Black-crowned	Unlisted	LC
<i>Oena capensis</i>	Dove, Namaqua	Unlisted	LC
<i>Oenanthe monticola</i>	Wheatear, Mountain	Unlisted	LC
<i>Oenanthe pileata</i>	Wheatear, Capped	Unlisted	LC
<i>Onychognathus morio</i>	Starling, Red-winged	Unlisted	LC

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<i>Oriolus larvatus</i>	Oriole, Black-headed	Unlisted	LC
<i>Oriolus oriolus</i>	Oriole, Eurasian Golden	Unlisted	LC
<i>Ortygospiza atricollis</i>	Quailfinch, African	Unlisted	LC
<i>Parisoma subcaeruleum</i>	Tit-babbler, Chestnut-vented	Unlisted	Unlisted
<i>Parus niger</i>	Tit, Southern Black	Unlisted	Unlisted
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC
<i>Passer melanurus</i>	Sparrow, Cape	Unlisted	LC
<i>Peliperdix coqui</i>	Francolin, Coqui	Unlisted	LC
<i>Pernis apivorus</i>	Honey-buzzard, European	Unlisted	LC
<i>Petronia superciliaris</i>	Petronia, Yellow-throated	Unlisted	LC
<i>Phalacrocorax africanus</i>	Cormorant, Reed	Unlisted	LC
<i>Phalacrocorax carbo</i>	Cormorant, White-breasted	LC	LC
<i>Phoeniculus purpureus</i>	Wood-hoopoe, Green	Unlisted	LC
<i>Phylloscopus trochilus</i>	Warbler, Willow	Unlisted	LC
<i>Pinarocorys nigricans</i>	Lark, Dusky	Unlisted	LC
<i>Platalea alba</i>	Spoonbill, African	Unlisted	LC
<i>Plectropterus gambensis</i>	Goose, Spur-winged	Unlisted	LC
<i>Plegadis falcinellus</i>	Ibis, Glossy	Unlisted	LC
<i>Plocepasser mahali</i>	Sparrow-weaver, White-browed	Unlisted	LC
<i>Ploceus capensis</i>	Weaver, Cape	Unlisted	LC
<i>Ploceus cucullatus</i>	Weaver, Village	Unlisted	LC
<i>Ploceus intermedius</i>	Masked-weaver, Lesser	Unlisted	LC
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC
<i>Podiceps cristatus</i>	Grebe, Great Crested	Unlisted	LC
<i>Pogoniulus chrysoconus</i>	Tinkerbird, Yellow-fronted	Unlisted	LC
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	VU
<i>Polyboroides typus</i>	Harrier-Hawk, African	Unlisted	LC
<i>Porphyrio madagascariensis</i>	Swamphen, African Purple	Unlisted	Unlisted
<i>Prinia flavicans</i>	Prinia, Black-chested	Unlisted	LC
<i>Prinia subflava</i>	Prinia, Tawny-flanked	Unlisted	LC
<i>Prionops plumatus</i>	Helmet-shrike, White-crested	Unlisted	LC
<i>Prodotiscus regulus</i>	Honeybird, Brown-backed	Unlisted	LC
<i>Psophocichla litsipsirupa</i>	Thrush, Groundscraper	Unlisted	Unlisted
<i>Pternistis natalensis</i>	Spurfowl, Natal	Unlisted	LC
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's	Unlisted	LC
<i>Ptilopsis granti</i>	Scops-owl, Southern White-faced	Unlisted	Unlisted
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped	Unlisted	Unlisted
<i>Pytilia melba</i>	Pytilia, Green-winged	Unlisted	LC
<i>Quelea quelea</i>	Quelea, Red-billed	Unlisted	LC
<i>Rallus caerulescens</i>	Rail, African	Unlisted	LC
<i>Riparia cincta</i>	Martin, Banded	Unlisted	LC
<i>Riparia paludicola</i>	Martin, Brown-throated	Unlisted	LC
<i>Riparia riparia</i>	Martin, Sand	Unlisted	LC
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU

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<i>Sarothrura rufa</i>	Flufftail, Red-chested	Unlisted	LC
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC
<i>Scleroptila levaillantii</i>	Francolin, Red-winged	Unlisted	LC
<i>Scleroptila levaillantoides</i>	Francolin, Orange River	Unlisted	LC
<i>Scleroptila shelleyi</i>	Francolin, Shelley's	Unlisted	LC
<i>Scopus umbretta</i>	Hamerkop	Unlisted	LC
<i>Sigelus silens</i>	Flycatcher, Fiscal	Unlisted	LC
<i>Spermestes cucullatus</i>	Mannikin, Bronze	Unlisted	Unlisted
<i>Sphenoeacus afer</i>	Grassbird, Cape	Unlisted	LC
<i>Sporopipes squamifrons</i>	Finch, Scaly-feathered	Unlisted	LC
<i>Spreo bicolor</i>	Starling, Pied	Unlisted	LC
<i>Stenostira scita</i>	Flycatcher, Fairy	Unlisted	LC
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Streptopelia semitorquata</i>	Dove, Red-eyed	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Struthio camelus</i>	Ostrich, Common	Unlisted	LC
<i>Sylvia borin</i>	Warbler, Garden	Unlisted	LC
<i>Sylvietta rufescens</i>	Crombec, Long-billed	Unlisted	LC
<i>Tachybaptus ruficollis</i>	Grebe, Little	Unlisted	LC
<i>Tachymartia melba</i>	Swift, Alpine	Unlisted	LC
<i>Tchagra australis</i>	Tchagra, Brown-crowned	Unlisted	LC
<i>Tchagra senegalus</i>	Tchagra, Black-crowned	Unlisted	LC
<i>Telophorus zeylonus</i>	Bokmakierie, Bokmakierie	Unlisted	LC
<i>Terpsiphone viridis</i>	Paradise-flycatcher, African	Unlisted	LC
<i>Thalassornis leuconotus</i>	Duck, White-backed	Unlisted	LC
<i>Thamnolaea cinnamomeiventris</i>	Cliff-chat, Mocking	Unlisted	LC
<i>Threskiornis aethiopicus</i>	Ibis, African Sacred	Unlisted	LC
<i>Tockus leucomelas</i>	Hornbill, Southern Yellow-billed	Unlisted	LC
<i>Tockus nasutus</i>	Hornbill, African Grey	Unlisted	LC
<i>Tockus rufirostris</i>	Hornbill, Southern Red-billed	Unlisted	Unlisted
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied	Unlisted	LC
<i>Tringa glareola</i>	Sandpiper, Wood	Unlisted	LC
<i>Tringa nebularia</i>	Greenshank, Common	Unlisted	LC
<i>Turdoides jardineii</i>	Babbler, Arrow-marked	Unlisted	LC
<i>Turdus libonyanus</i>	Thrush, Kurrichane	Unlisted	Unlisted
<i>Turdus smithi</i>	Thrush, Karoo	Unlisted	LC
<i>Turnix sylvaticus</i>	Buttonquail, Kurrichane	Unlisted	LC
<i>Tyto alba</i>	Owl, Barn	Unlisted	LC
<i>Tyto capensis</i>	Grass-owl, African	VU	LC
<i>Upupa africana</i>	Hoopoe, African	Unlisted	LC
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC
<i>Urocolius indicus</i>	Mousebird, Red-faced	Unlisted	LC
<i>Urolestes melanoleucus</i>	Shrike, Magpie	Unlisted	LC
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC

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<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC
<i>Vanellus senegallus</i>	Lapwing, African Wattled	Unlisted	LC
<i>Vidua chalybeata</i>	Indigobird, Village	Unlisted	LC
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC
<i>Vidua paradisaea</i>	Paradise-whydah, Long-tailed	Unlisted	LC
<i>Vidua purpurascens</i>	Indigobird, Purple	Unlisted	LC
<i>Vidua regia</i>	Whydah, Shaft-tailed	Unlisted	LC
<i>Zosterops virens</i>	White-eye, Cape	Unlisted	LC

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APPENDIX C: *Mammals species expected to occur in the project area*

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Aethomys ineptus</i>	Tete Veld Rat	LC	LC
<i>Aethomys namaquensis</i>	Namaqua rock rat	LC	LC
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT
<i>Atelerix frontalis</i>	South Africa Hedgehog	NT	LC
<i>Atilax paludinosus</i>	Water Mongoose	LC	LC
<i>Canis mesomelas</i>	Black-backed Jackal	LC	LC
<i>Caracal caracal</i>	Caracal	LC	LC
<i>Chlorocebus pygerythrus</i>	Vervet Monkey	LC	LC
<i>Cloeotis percivali</i>	Short-eared Trident Bat	EN	LC
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	LC	LC
<i>Crocidura hirta</i>	Lesser Red Musk Shrew	LC	LC
<i>Crocidura maquassiensis</i>	Makwassie musk shrew	VU	LC
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	NT	LC
<i>Crocidura silacea</i>	Lesser Grey-brown Musk Shrew	LC	LC
<i>Cryptomys hottentotus</i>	Common Mole-rat	LC	LC
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC
<i>Dasymys incomtus</i>	African Marsh rat	NT	LC
<i>Dendromus melanotis</i>	Grey Climbing Mouse	LC	LC
<i>Dendromus mystacalis</i>	Chestnut Climbing Mouse	LC	LC
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC	NT
<i>Elephantulus brachyrhynchus</i>	Short-snouted Sengi	LC	LC
<i>Elephantulus myurus</i>	Eastern Rock Sengi	LC	LC
<i>Epomophorus wahlbergi</i>	Wahlberg's epauletted fruit bat	LC	LC
<i>Eptesicus hottentotus</i>	Long-tailed Serotine Bat	LC	LC
<i>Felis nigripes</i>	Black-footed Cat	VU	VU
<i>Felis silvestris</i>	African Wildcat	LC	LC
<i>Genetta genetta</i>	Small-spotted Genet	LC	LC
<i>Gerbilliscus brantsii</i>	Highveld Gerbil	LC	LC
<i>Gerbilliscus leucogaster</i>	Bushveld Gerbil	LC	LC
<i>Graphiurus microtis</i>	Large Savanna African Dormouse	LC	LC
<i>Graphiurus platyops</i>	Rock Dormouse	LC	LC
<i>Herpestes sanguineus</i>	Slender Mongoose	LC	LC
<i>Hipposideros caffer</i>	Sundevall's Leaf-nosed Bat	LC	LC
<i>Hydrichtis maculicollis</i>	Spotted-necked Otter	VU	NT
<i>Hystrix africae australis</i>	Cape Porcupine	LC	LC
<i>Ichneumia albicauda</i>	White-tailed Mongoose	LC	LC
<i>Ictonyx striatus</i>	Striped Polecat	LC	LC
<i>Kerivoula lanosa</i>	Lesser Woolly Bat	LC	LC
<i>Lemniscomys rosalia</i>	Single-striped Mouse	LC	LC
<i>Leptailurus serval</i>	Serval	NT	LC
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC

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<i>Lepus victoriae</i>	African Savanna Hare	LC	LC
<i>Mastomys coucha</i>	Multimammate Mouse	LC	LC
<i>Mastomys natalensis</i>	Natal Multimammate Mouse	LC	LC
<i>Mellivora capensis</i>	Honey Badger	LC	LC
<i>Mungos mungo</i>	Banded Mongoose	LC	LC
<i>Mus indutus</i>	Desert Pygmy Mouse	LC	LC
<i>Mus musculus</i>	House Mouse	Unlisted	LC
<i>Myotis tricolor</i>	Temminck's Hairy Bat	LC	LC
<i>Myotis welwitschii</i>	Welwitsch's Hairy Bat	LC	LC
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN
<i>Neoromicia capensis</i>	Cape Serotine Bat	LC	LC
<i>Neoromicia nana</i>	Banana Bat	LC	LC
<i>Neoromicia zuluensis</i>	Aloe Bat	LC	LC
<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC	LC
<i>Oreotragus oreotragus</i>	Klipspringer	LC	LC
<i>Orycteropus afer</i>	Aardvark	LC	LC
<i>Otolemur crassicaudatus</i>	Thick-tailed Bushbaby	LC	LC
<i>Otomys angoniensis</i>	Angoni Vlei Rat	LC	LC
<i>Ourebia ourebi</i>	Oribi	EN	LC
<i>Panthera pardus</i>	Leopard	VU	VU
<i>Papio ursinus</i>	Chacma Baboon	LC	LC
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT
<i>Pedetes capensis</i>	Springhare	LC	LC
<i>Pelea capreolus</i>	Grey Rhebok	NT	NT
<i>Phacochoerus africanus</i>	Common Warthog	LC	LC
<i>Pipistrellus rusticus</i>	Rusty Bat	LC	LC
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC
<i>Procavia capensis</i>	Rock Hyrax	LC	LC
<i>Pronolagus randensis</i>	Jameson's Red Rock Rabbit	LC	LC
<i>Proteles cristata</i>	Aardwolf	LC	LC
<i>Raphicerus campestris</i>	Steenbok	LC	LC
<i>Rattus rattus</i>	House Rat	Exotic (Not listed)	LC
<i>Redunca arundinum</i>	Southern Reedbuck	LC	LC
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC
<i>Rhabdomys pumilio</i>	Xeric Four-striped Mouse	LC	LC
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC	LC
<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat	LC	LC
<i>Rhinolophus simulator</i>	Bushveld Horseshoe Bat	LC	LC
<i>Saccostomus campestris</i>	Pouched Mouse	LC	LC
<i>Sauromys petrophilus</i>	Flat-headed Free-tail Bat	LC	LC
<i>Scotophilus dinganii</i>	Yellow House Bat	LC	LC
<i>Steatomys krebsii</i>	Krebs's Fat Mouse	LC	LC
<i>Steatomys pratensis</i>	Fat Mouse	LC	LC
<i>Suncus lixus</i>	Greater Dwarf Shrew	LC	LC
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC	LC

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<i>Suricata suricatta</i>	Suricate	LC	LC
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	LC	LC
<i>Taphozous mauritianus</i>	Mauritian Tomb Bat	LC	LC
<i>Thallomys paedulus</i>	Tree Rat	LC	LC
<i>Thryonomys swinderianus</i>	Greater Cane Rat	LC	LC
<i>Vulpes chama</i>	Cape Fox	LC	LC

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APPENDIX D: *Reptile species expected to occur within the project area*

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Acanthocercus atricollis</i>	Southern Tree Agama	LC	LC
<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	LC	LC
<i>Afroedura nivaria</i>	Drankensberg Flat Gecko	LC	LC
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	LC	LC
<i>Agama aculeata distantii</i>	Eastern Ground Agama	LC	LC
<i>Agama atra</i>	Southern Rock Agama	LC	LC
<i>Amblyodipsas polylepis</i>	Purple Gloss Snake	Unlisted	Unlisted
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	LC	LC
<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	LC	LC
<i>Bitis arietans arietans</i>	Puff Adder	LC	LC
<i>Boaedon capensis</i>	Brown House Snake	LC	LC
<i>Causus rhombeatus</i>	Rhombic Night Adder	LC	LC
<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC	LC
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	NT	NT
<i>Chondrodactylus turneri</i>	Turner's Gecko	LC	LC
<i>Cordylus jonesii</i>	Jones' Girdled Lizard	LC	LC
<i>Cordylus vittifer</i>	Common Girdled Lizard	LC	LC
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	VU
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	LC	LC
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	LC
<i>Dendroaspis polylepis</i>	Black Mamba	LC	LC
<i>Dispholidus typus</i>	Boomslang	LC	LC
<i>Duberria lutrix</i>	Common Slug-eater	LC	LC
<i>Elapsoidea sundevallii sundevallii</i>	Sundevall's Garter Snake	LC	LC
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	LC	LC
<i>Gracililima nyassae</i>	Black File Snake	LC	LC
<i>Hemachatus haemachatus</i>	Rinkhals	LC	LC
<i>Hemidactylus mabouia</i>	Common Tropical House Gecko	LC	LC
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	NT
<i>Homoroselaps lacteus</i>	Spotted Harlequin Snake	LC	LC
<i>Ichnotropis capensis</i>	Ornate Rough-scaled Lizard	LC	LC
<i>Kinixys lobatsiana</i>	Lobatse hinged-back Tortoise	LC	LC

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<i>Kinixys spekii</i>	Speke's Hinged-Back Tortoise	LC	LC
<i>Lamprophis aurora</i>	Aurora House Snake	LC	LC
<i>Leptotyphlops scutifrons</i>	Peters' Thread Snake	LC	LC
<i>Limaformosa capensis</i>	Common File Snake	LC	LC
<i>Lycodonomorphus inornatus</i>	Olive House Snake	LC	LC
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	LC	LC
<i>Lycophidion capense capense</i>	Cape Wolf Snake	LC	LC
<i>Lygodactylus capensis</i>	Cape dwarf gecko	LC	LC
<i>Lygodactylus nigropunctatus</i>	Cryptic Dwarf Gecko	DD	DD
<i>Lygodactylus ocellatus</i>	Spotted Dwarf Gecko	LC	LC
<i>Meroles squamulosus</i>	Common Rough-scaled Lizard	LC	LC
<i>Mochlus sundevallii</i>	Sundevall's Writhing Skink	LC	LC
<i>Naja annulifera</i>	Snouted Cobra	LC	LC
<i>Naja mossambica</i>	Mozambique Spitting Cobra	LC	LC
<i>Nucras holubi</i>	Holub's Sandveld Lizard	LC	LC
<i>Nucras intertexta</i>	Spotted Sandveld Lizard	LC	LC
<i>Nucras ornata</i>	Ornate Sandveld Lizard	LC	LC
<i>Pachydactylus affinis</i>	Transvaal Gecko	LC	LC
<i>Pachydactylus capensis</i>	Cape Gecko	LC	LC
<i>Panaspis wahlbergi</i>	Wahlberg's Snake-eyed Skink	LC	LC
<i>Pedioplanis lineocellata lineocellata</i>	Spotted Sand Lizard	LC	LC
<i>Pelomedusa galeata</i>	South African Marsh Terrapin	Not evaluated	Not evaluated
<i>Pelusios sinuatus</i>	Serrated Hinged Terrapin	LC	LC
<i>Philothamnus hoplogaster</i>	South Eastern Green Snake	LC	LC
<i>Philothamnus occidentalis</i>	Western Nalal Green Snake	Unlisted	Unlisted
<i>Philothamnus semivariegatus</i>	Spotted Bush Snake	LC	LC
<i>Prosymna ambigua</i>	Angolan Shovel-snout	Unlisted	Unlisted
<i>Prosymna bivittata</i>	Two-Striped Shovel-Snout	LC	LC
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	LC	LC
<i>Psammophis angolensis</i>	Dwarf Sand Snake	LC	LC
<i>Psammophis brevisrostris</i>	Short-snouted Grass Snake	LC	LC
<i>Psammophis orientalis</i>	Eastern Stripe-bellied Sand Snake	Unlisted	Unlisted
<i>Psammophis subtaeniatus</i>	Stripe-bellied Sand Snake	LC	LC
<i>Psammophis trinasalis</i>	Fork-marked Sand Snake	LC	LC
<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	LC	LC

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<i>Psammophylax tritaeniatus</i>	Striped Grass Snake	LC	LC
<i>Pseudaspis cana</i>	Mole Snake	LC	LC
<i>Python natalensis</i>	Southern African Python	LC	LC
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	LC	LC
<i>Smaug vandami</i>	Van Dam's Dragon Lizard	LC	LC
<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	LC
<i>Telescopus semiannulatus semiannulatus</i>	Eastern Tiger Snake	LC	LC
<i>Thelotornis capensis</i>	Southern Twig Snake	LC	LC
<i>Trachylepis capensis</i>	Cape Skink	LC	LC
<i>Trachylepis damarana</i>	Damara skink	Unlisted	Unlisted
<i>Trachylepis margaritifera</i>	Rainbow Skink	LC	LC
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC	LC
<i>Trachylepis varia</i>	Variable Skink	LC	LC
<i>Varanus albigularis albigularis</i>	Southern Rock Monitor	LC	LC
<i>Varanus niloticus</i>	Water Monitor	LC	LC

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APPENDIX E: *Amphibian species expected to occur within the project area*

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Amietia delalandii</i>	Delalande's River Frog	LC	Unlisted
<i>Amietia fuscigula</i>	Common River Frog	LC	LC
<i>Amietia poyntoni</i>	Poynton's River Frog	LC	LC
<i>Breviceps adspersus</i>	Bushveld Rain Frog	LC	LC
<i>Cacosternum boettgeri</i>	Common Caco	LC	LC
<i>Hemisis marmoratus</i>	Mottled Shovel-nosed Frog	LC	LC
<i>Hyperolius marmoratus</i>	Painted Reed Frog	LC	LC
<i>Kassina senegalensis</i>	Bubbling Kassina	LC	LC
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC	LC
<i>Phrynomantis bifasciatus</i>	Banded Rubber Frog	LC	LC
<i>Poyntonophrynus fenoulheti</i>	Northern Pygmy Toad	LC	LC
<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad	LC	LC
<i>Ptychadena anchietae</i>	Plain Grass Frog	LC	LC
<i>Ptychadena mossambica</i>	Mozambique Ridged Frog	LC	LC
<i>Ptychadena porosissima</i>	Striped Grass Frog	LC	LC
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	LC	LC
<i>Pyxicephalus edulis</i>	African Bullfrog	LC	LC
<i>Schismaderma carens</i>	African Red Toad	LC	LC
<i>Sclerophrys capensis</i>	Raucous Toad	LC	LC
<i>Sclerophrys garmani</i>	Olive Toad	LC	LC
<i>Sclerophrys gutturalis</i>	Guttural Toad	LC	LC
<i>Sclerophrys poweri</i>	Power's Toad	LC	LC
<i>Sclerophrys pusilla</i>	Flatbacked Toad	LC	LC
<i>Semnodactylus wealii</i>	Rattling Frog	LC	LC
<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC	LC
<i>Strongylopus grayii</i>	Clicking Stream Frog	LC	LC
<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	LC	LC
<i>Tomopterna natalensis</i>	Natal Sand Frog	LC	LC
<i>Tomopterna tandyi</i>	Tandy's Sand Frog	LC	LC
<i>Xenopus laevis</i>	Common Platanna	LC	LC