



TERRESTRIAL BIODIVERSITY ASSESSMENT – PART II EA AMENDMENT FOR THE MOTUOANE HENNENMAN EXPLORATION PROJECT

Virginia, Free State Province

January 2024

CLIENT



Prepared by:

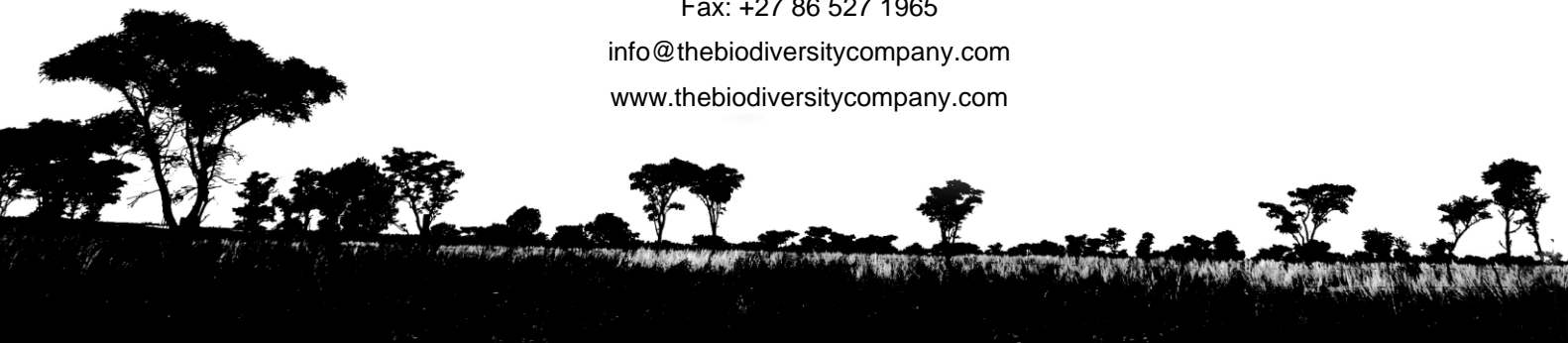
The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com






Report Name	TERRESTRIAL BIODIVERSITY ASSESSMENT – PART II EA AMENDMENT FOR THE MOTUOANE HENNENMAN EXPLORATION PROJECT
Reference	Seismic
Submitted to	
Report Writer	<p>Martinus Erasmus </p> <p>Martinus Erasmus (B. Tech. Nature Conservation) is a registered Pr. Sci. Nat. (118630) and is a specialist terrestrial ecologist and botanist who has 8 years of experience in conducting Basic Assessments (BA), Environmental Impact Assessments (EIA) and is a specialist terrestrial ecologist and botanist who conducts floral and faunal surveys, which include mammals, birds, amphibians and reptiles.</p>
Report Reviewer	<p>Andrew Husted </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 16 years' experience in the environmental consulting field</p>
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, 2017. 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 principals of science.</p>

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a terrestrial biodiversity (fauna and flora) baseline assessment for the proposed additional exploration activities for the Motuoane Hennenman Exploration Project. The proposed project is located near Virginia within the Lejweleputswa District Municipality, Free State Province (Figure 1-1).

The summary is that Motuoane Energy (Pty) Ltd compiled and submitted an application for an exploration right for hydrocarbons, in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 – MPRDA, as amended) to the Petroleum Agency South Africa (PASA) in 2016. The approved exploration area is located over an area of approximately 149 377 hectares (ha), covering various farms near the town of Hennenman, within the Free State Province, extending north from approximately Theunissen, north east towards Kroonstad, and east of Virginia and Hennenman. In accordance with the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) an application for Environmental Authorisation (EA) through a Scoping and EIA was submitted to PASA in 2017 in support of the application for the exploration right. The EA was issued in July 2017 (ref: 12/3/315). However, the EA was only 3 drilling wells, and it did not include the seismic aspects. As the applicant proposes to undertake an addition of ten (10) new exploration boreholes (13 drilling wells in total including the initial 3 which were approved) and ~30km of new seismic transects, an EA Amendment process has been initiated.

To determine the baseline ecological state of the specific area and to present a detailed description of the receiving environment, both a desktop assessment as well as a field survey were conducted during 18-19 October 2023 as well as 11-12 January 2024. Furthermore, the desktop assessment and field survey both involved the detection, identification and description of any locally relevant sensitive receptors and habitats. The manner in which these sensitive features may be affected by the proposed development was also investigated.

The extent of the project components, within the provided property outline is referred to as the Project Area of Influence (PAOI) and pertains to the Project area.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (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" (Reporting Criteria). The National Web based Environmental Screening Tool has characterised the terrestrial sensitivity as "Very High" across the project 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, as to the ecological viability of the proposed project.

1.2 Project Area of Influence

A 25 m buffer area was created from the seismic lines provided, and a 1 km buffer surrounding the drilling wells, resulting in the Project Area of Influence (PAOI) which represents the total area assessed. The area surrounding the project area consists mainly of grazed grassland with interspersed agricultural activities and secondary roads.

A map of the project area in relation to the local region is presented in Figure 1-1, and a map of the project area with the proposed site layout is presented in Figure 1-2.

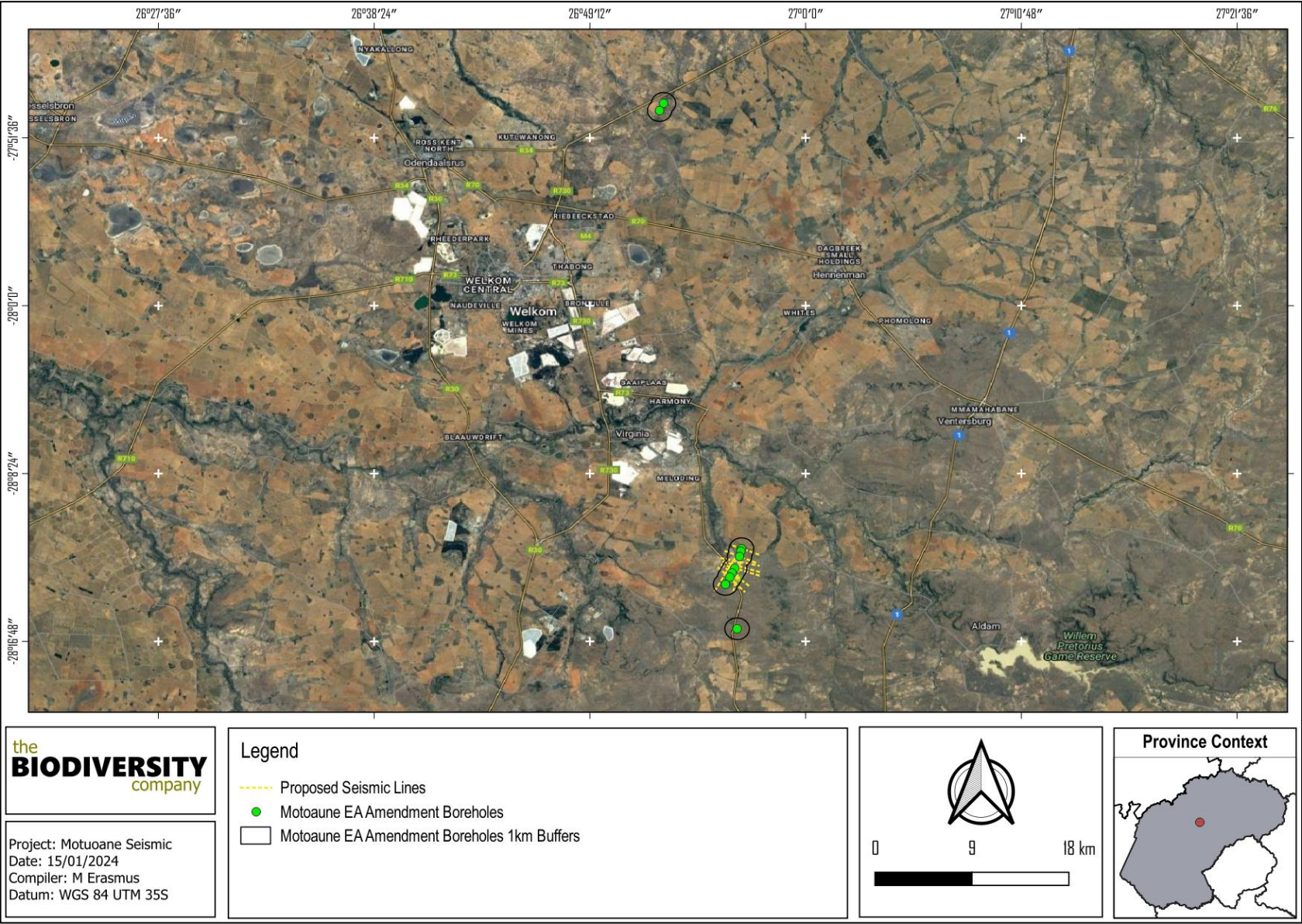


Figure 1-1 Map showing the proposed location of the PAOI in relation to the nearby towns.



Figure 1-2 Map illustrating the proposed PAOI. Left is the northern cluster, whereas right shows the southern cluster.

1.3 Terms of Reference

The Terms of Reference (ToR) included the following:

- 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 wetlands) 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 areas;
- Identification of conservation significant habitats around the project area which might be impacted;
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application;
- Provide a map to identify sensitive receptors in the project area, based on available maps and database information;
- Conduct risk assessments relevant to the proposed activity; and
- Impact assessment, mitigation and rehabilitation measures to prevent or reduce the possible impacts.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The assessment area was based on the spatial data provided by the client and any alterations to the route and/or missing Geographic Information System (GIS) information pertaining to the assessment area would have affected the area surveyed;
- Certain assessment areas was only surveyed during a single site visit and therefore, this assessment does not consider temporal trends, however sufficient to derive meaningful baseline;
- A portion of the PAOI was not delineated as it wasn't deemed necessary due to the resources not overlapping with the area;
- A portion of the PAOI had been burnt limiting plant identification and habitat condition determination.
- The Global Positioning System (GPS) used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by 5 m;
- Single season surveys were conducted for the respective studies, this would constitute wet season surveys; and
- Whilst every effort is made to cover as much of the project area as possible, representative sampling is completed and by its nature, it is possible that some plant and animal species that are present across the project area were not recorded during the field investigations.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 *A list of key legislative requirements relevant to biodiversity and conservation in the Free State Province*

Region	Legislation / Guideline	Comment
National	NEMA	Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	Assessment Protocol (March 2020)	The minimum criteria for reporting.
	Assessment Protocol (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	NEMWA;	The regulation of waste management to protect the environment.
	NWA	The regulation of water uses.
	GN 1003 of GG 43726 of 18 Sept 2020	The regulation and management of alien invasive species.
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilization of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants.
Provincial	Boputhatswana Nature Conservation Act 3 of 1973	To provide for the management and conservation of the province's biophysical environment and protected areas.
	Free State Nature Conservation Ordinance 8 of 1969	To inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management.

2 Methods

2.1 Desktop Baseline

The desktop assessment was principally undertaken using a GIS to access the latest available spatial datasets to develop digital cartographs and species lists. These datasets and their date of publishing are provided below.

2.1.1 Ecologically Important Landscape Features

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

- National Biodiversity Assessment 2018 (Skowno et al, 2019) (NBA)- The purpose of the NBA is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
 - Ecosystem Threat Status (ETS) – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the Red List of Ecosystems (RLE) 2022) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram et al., 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered,

51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022.

- Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas (PA). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
 - *South Africa Protected Areas Database (SAPAD) (Department of Environmental Affairs (DEA), 2020)* – The (SAPAD) Database contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003 (NEMPAA).
 - The Department of Forestry, Fisheries and the Environment (DFFE) maintains a spatial database on PAs and Conservation Areas. Protected Areas and Conservation Areas (PACA) Database scheme that used for classifying protected areas (South Africa Protected Areas Database-SAPAD) and conservation areas (South Africa Conservation Areas Database-(SACAD)) into types and sub-types in South Africa.
 - National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- Free State Biodiversity Plan (DESTEA, 2015) – A key objective of the Free State Provincial Spatial Development Plan is to integrate and standardize planning at all spheres of government in the province with specific reference to amongst others facilitating land-use classification of the entire land surface of the province. To this extent a set of dedicated Spatial Planning Categories (SPCs) were developed which provide a spatial framework to guide decision-making regarding land-use at all levels of planning. The SPCs represent a classification system that indicates the most suitable, or a range of, land use options for a certain piece of land. Associated with each SPC category is land use guidelines which when implemented ensures a balance between development and conservation. Mainstreaming of the biodiversity plan into spatial planning process will be achieved by aligning the biodiversity plan categories with those of the SPCs so that planning according to SPC will then automatically also adopt the biodiversity plan categories and their associated land use guidelines;
- Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; and
- Mining and Biodiversity Guidelines:
 - The Mining and Biodiversity Guidelines (2013) was developed by the Department of Mineral Resources, the Chamber of Mines, the SANBI and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability. The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining, which will eventually translate into best

practice within the mining sector. It provides a tool to facilitate the sustainable development of South Africa's mineral resources, in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. It provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where: mining-related impacts are legally prohibited; biodiversity priority areas may present high risks for mining projects; and biodiversity may limit the potential for mining.

- In identifying biodiversity priority areas, which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:
 - A) Legally protected areas, where mining is prohibited;
 - B) Areas of highest biodiversity importance, which are at the highest risk for mining;
 - C) Areas of high biodiversity importance, which are at a high risk for mining; and
 - D) Areas of moderate biodiversity importance, which are at a moderate risk for mining.

Table 2-1 presents the four different categories and the implications for mining within each of these categories.

Table 2-1 Summary of the Mining and Biodiversity Guidelines

Category	Biodiversity priority areas	Risk for mining	Implications for mining
A. Legally protected	<ul style="list-style-type: none"> Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) 	Mining prohibited	<p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p>
B. Highest biodiversity importance	<ul style="list-style-type: none"> CE and EN CBAs (or equivalent areas) from provincial spatial biodiversity plans River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1 km buffer around these FEPAs Ramsar Sites 	Highest risk for mining	<p>Environmental screening, environmental impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and EAs.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on</p>

Category	Biodiversity priority areas	Risk for mining	Implications for mining
			allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations.
C. High biodiversity importance	<ul style="list-style-type: none"> Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) Other identified priorities from provincial spatial biodiversity plans High water yield areas Coastal Protection Zone Estuarine functional zone 	High risk for mining	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and maintaining important ecosystem services for particular communities or the country as a whole.</p> <p>An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>
D. Moderate biodiversity importance	<ul style="list-style-type: none"> Ecological support areas Vulnerable ecosystems Focus areas for protected area expansion (land-based and offshore protection) 	Moderate risk for mining	<p>These areas are of moderate biodiversity value.</p> <p>EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>

- Freshwater Ecology:

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer et al, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Impact Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types, as well as pressures on these systems.
- Strategic Water Source Areas (SWSAs) (Le Maitre et al, 2021) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.
- National Freshwater Ecosystem Priority Area (NFEPa) (Nel et al., 2011) – The NFEPa database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

2.1.2 Desktop Flora Baseline

The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) and SANBI (2019) was used to identify the vegetation type that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Plants of Southern Africa (POSA) database was accessed to compile a list of expected flora species within the project area (Appendix A). The Red List of South African Plants (Raimondo *et al.*, 2009; SANBI, 2020) was utilized to provide the most current national conservation status of flora species.

2.1.3 Desktop Faunal Assessment

The faunal desktop assessment comprised of the following, compiling an expected:

- Amphibian list, generated from the AmphibianMap database (Fitzpatrick Institute of African Ornithology, 2023a) (IAO), using the 2826 quarter degree square;
- Reptile list, generated from the ReptileMap database (Fitzpatrick Institute of African Ornithology, 2023b), using the 2826 quarter degree square;
- Mammal list from the MammalMap database (FitzPatrick IAO, 2023c), using the 2826 quarter degree square; and
- Avifauna list from the Southern African Bird Atlas Project 2 (SABAP2).

The conservational status (Figure 2-1) of the floral and faunal species was assessed against the latest IUCN red listed species database to identify SCC (IUCN, 2023).

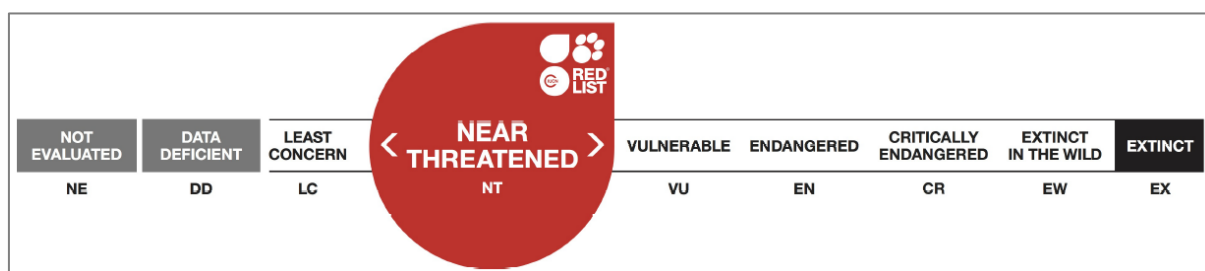


Figure 2-1 IUCN red list categories illustrating the conservational status of the floral and faunal species (IUCN, 2023).

2.2 Biodiversity Field Assessment

A single field survey within the cluster was undertaken in 18-19 October 2023, which is an early wet-season survey, as well as 11-12 January 2024 which is a wet-season survey to determine the presence of Species of Conservation Concern (SCC). Effort was made to cover all the different habitat types, within the limits of time and access.

2.2.1 Flora Survey

2.2.1.1 Botanical Baseline

The botanical assessment encompasses 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 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 that were consulted for identification purposes in the field during the surveys included the following:

- Field Guide to the Wild Flowers of the Highveld (Van Wyk & Malan, 1997);
- 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);
- Mesembs of the World (Smith *et al.*, 1998);
- Medicinal Plants of South Africa (Van Wyk *et al.*, 2013);
- Freshwater Life: A field guide to the plants and animals of southern Africa (Griffiths & Day, 2016); and
- Identification guide to southern African grasses. An identification manual with keys, descriptions and distributions (Fish *et al.*, 2015).

Additional information regarding ecosystems, vegetation types, and Species of Conservation Concern (SCC) will include the following sources:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2012); and
- Red List of South African Plants (Raimondo *et al.*, 2009; SANBI, 2016).

The field work methodology included the following survey techniques:

- Timed meanders;
- Sensitivity analysis based on structural and species diversity; and
- Identification of floral red-data species.

2.2.1.2 Floristic Analysis

The fieldwork and sample sites were placed within targeted areas (i.e. target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork will therefore be to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site. Emphasis will be placed on sensitive habitats, especially those overlapping with the proposed project area.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps. The floristic diversity and search for flora SCC will be conducted through timed meanders within representative habitat units delineated during the scoping fieldwork. Emphasis will be placed mostly on sensitive habitats overlapping with the proposed project area.

The timed random meander method is a highly efficient method for conducting floristic analysis, specifically in detecting flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search was performed based on the original technique described by Goff *et al.* (1982). Suitable habitat for SCC will be identified according to Raimondo *et al.* (2009) and targeted as part of the timed meanders.

At each sample site notes were made regarding current impacts (e.g. roads, erosion etc.), subjective recording of dominant vegetation species and any sensitive features (e.g. wetlands, outcrops etc.). In addition, opportunistic observations were made while navigating through the project area.

2.2.2 Fauna Survey

The faunal assessment within this report pertains to herpetofauna (amphibians and reptiles) and mammals. A separate avifauna impact assessment was conducted for this project. The faunal field survey comprised of the following techniques:

- Visual and auditory searches - This typically comprised of meandering and using binoculars to view species from a distance without them being disturbed; and listening to species calls;
- Active hand-searches - are used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.);
- Camera trapping; and
- Utilization of local knowledge.

Relevant field guides and texts consulted for identification purposes included the following:

- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates *et al*, 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Smithers' Mammals of Southern Africa (Apps, 2000);
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

2.3 Terrestrial Site Ecological Importance

The different habitat types within the project area were delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site) and Receptor Resilience (RR) (its resilience to impacts) as follows.

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 2-2 and Table 2-3, respectively.

Table 2-2 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species.

	> 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 2-3 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 2-4.

Table 2-4 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very low
Functional Integrity (FI)	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 2-5.

Table 2-5 Summary of Resource Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.

Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 2-6.

Table 2-6 *Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)*

Site Ecological Importance		Biodiversity Importance (BI)				
		Very high	High	Medium	Low	Very low
Receptor Resilience (RR)	Very Low	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very High	Medium	Low	Very low	Very low	Very low

Interpretation of the SEI in the context of the proposed project is provided in Table 2-7.

Table 2-7 *Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities*

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

3 Results & Discussion

3.1 Desktop Baseline

3.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features are summarised in Table 3-1.

Table 3-1 *Summary of relevance of the proposed project to ecologically important landscape features.*

Desktop Information Considered	Relevant/Irrelevant	Section
Ecosystem Threat Status	Relevant – Overlaps with LC and EN ecosystems.	3.1.1.1
Ecosystem Protection Level	Relevant – Overlaps with PP and NP areas.	3.1.1.2
Critical Biodiversity Area	Relevant –Overlaps with CBA1 & 2, ESA1, ONA and degraded areas.	3.1.1.3
South African Inventory of Inland Aquatic Ecosystems	Relevant – CR River occurs in close proximity to the PAOI and LC wetland occurs in the vicinity	3.1.1.4
National Freshwater Ecosystem Priority Areas	Relevant – Non-FEPA wetlands occur in close proximity to the PAOI, with the Merriespruit River in close proximity to the western side of the PAOI	3.1.1.5
National Protected Areas Expansion Strategy	Relevant – The project area overlaps with a NPAES Priority Focus Area.	3.1.1.6
Mine guide	Relevant – Sections of the PAOI overlaps with areas of moderate and highest BU	3.1.1.7
Strategic Water Source Areas	Irrelevant – Not located within a SWSA, closest SWSA is more than 100 km away.	-
Protected Areas	Irrelevant – The project area occurs 3 km from the nearest area, The Bushybend Private Nature Reserve.	-
IBA	Irrelevant – Not located within an IBA.	-

3.1.1.1 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset, the proposed project area mainly overlaps with a LC ecosystem, with limited portions of EN ecosystem areas (Figure 3-1).

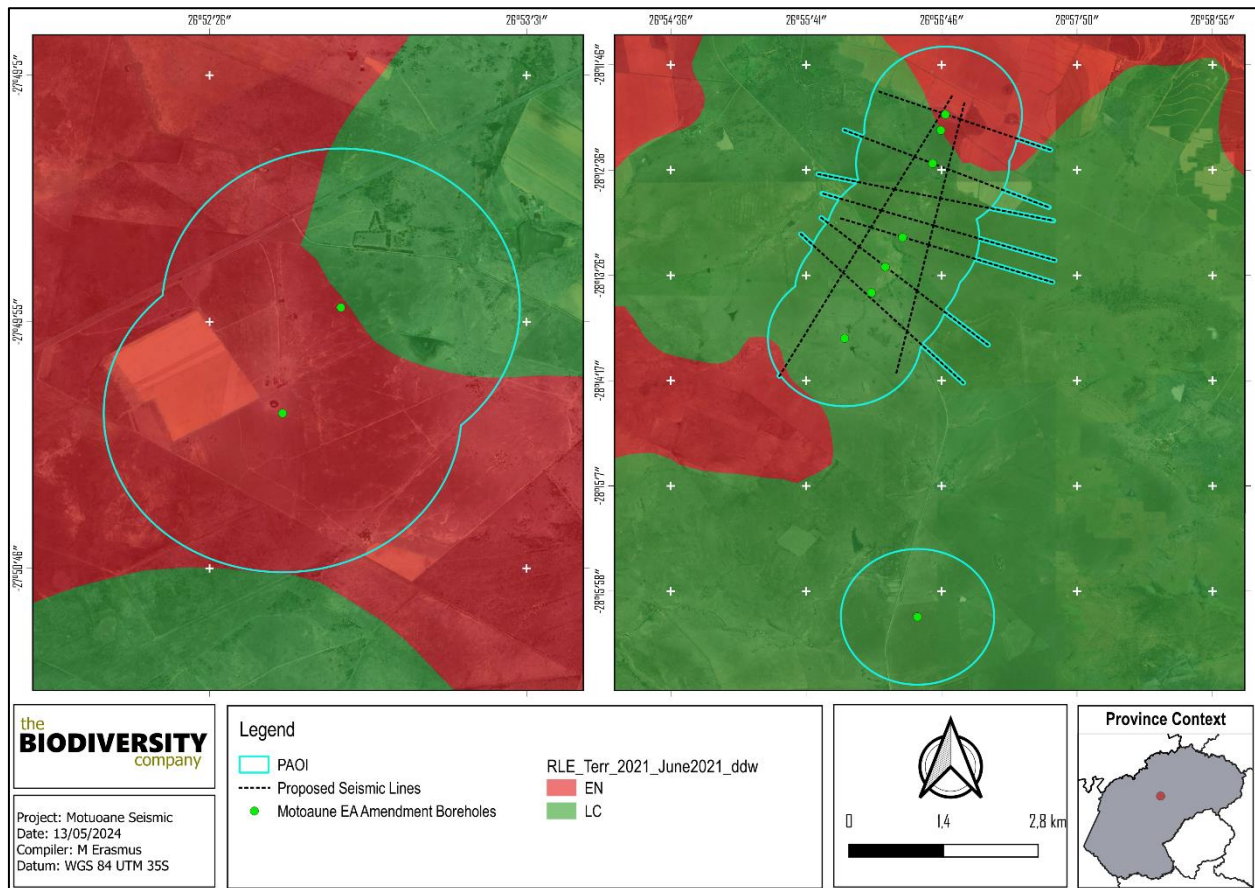


Figure 3-1 Map illustrating the ecosystem threat status associated with the project area.

3.1.1.2 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project mainly overlaps with a Poorly Protected ecosystem (Figure 3-2).

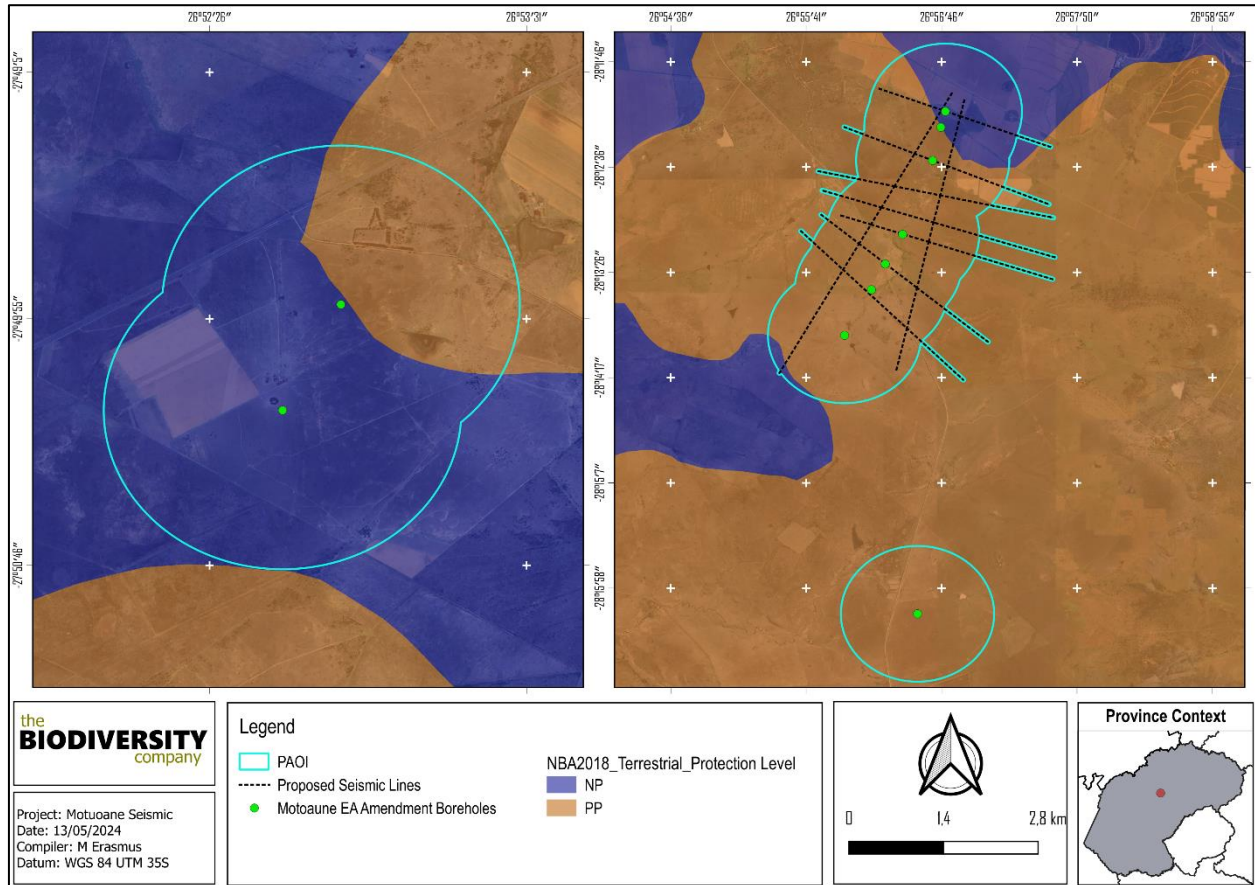


Figure 3-2 Map illustrating the ecosystem protection level associated with the project area.

3.1.1.3 Critical Biodiversity Areas and Ecological Support Areas

The key output of a systematic biodiversity plan is a map of biodiversity priority areas. The CBA map delineates CBAs, Ecological Support Areas ESAs, ONAs, PAs, and areas that have been irreversibly modified from their natural state.

Figure 3-3 shows the project area superimposed on the Terrestrial CBA map. The project area overlaps with CBA1 & 2, an ESA1, ONA and degraded areas. The majority of the area is Other Natural Areas.

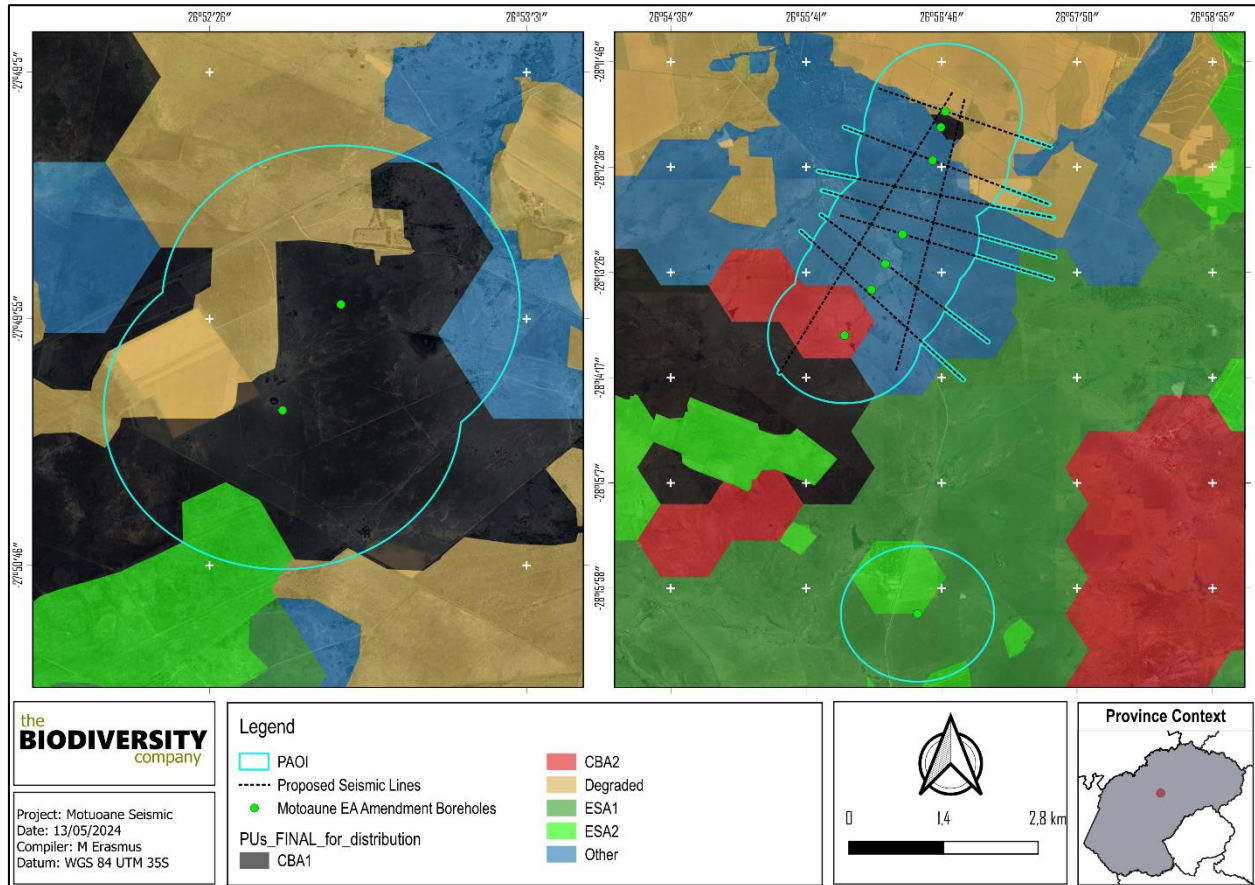


Figure 3-3 Map illustrating the locations of CBAs in the project area.

3.1.1.4 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are 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 LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.*, 2019). A CR River occurs in close proximity to the PAOI and LC wetland is in the vicinity (Figure 3-4).

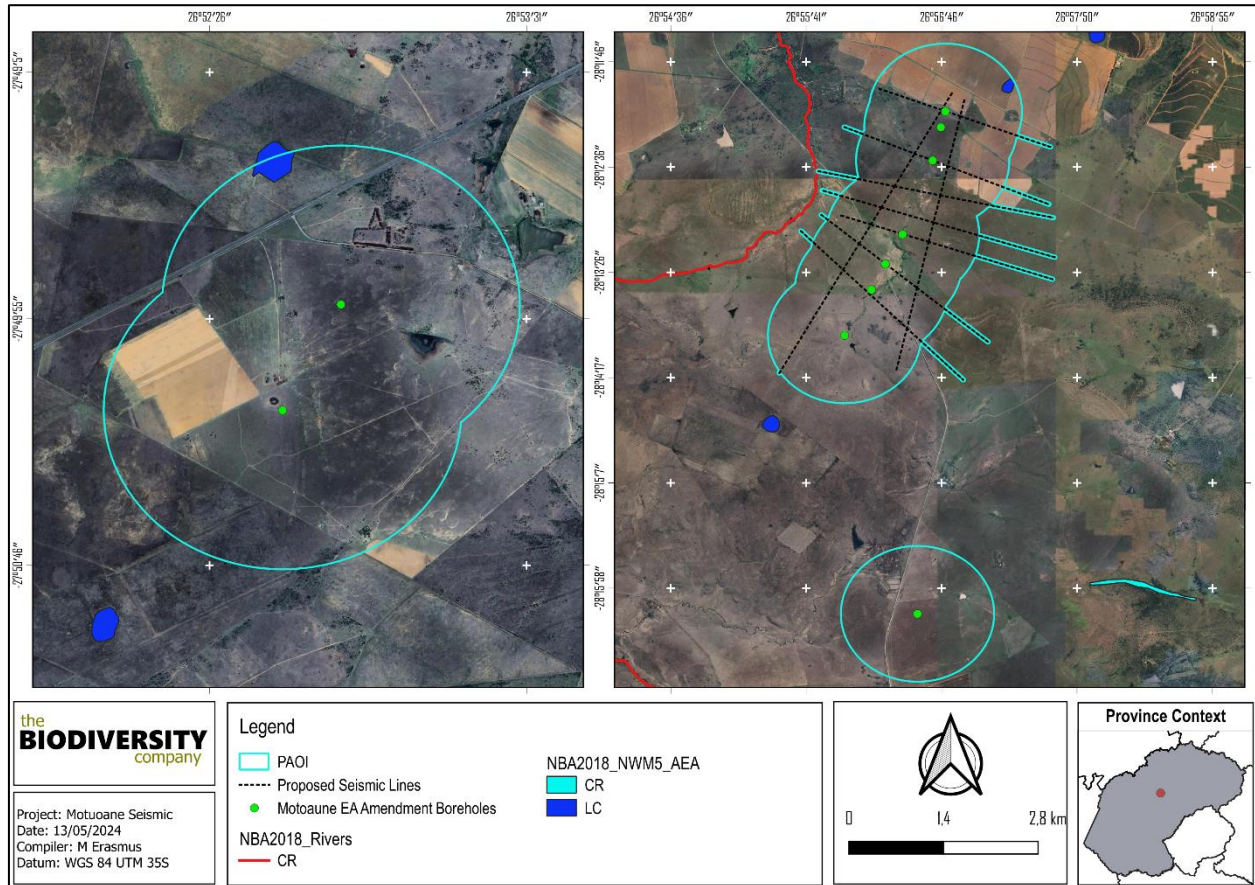


Figure 3-4 Map illustrating the ecosystem threat status of river and wetland ecosystems in the project area.

3.1.1.5 National Freshwater Ecosystem Priority Area Status

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs). The FEPAs are intended to be conservation support tools and are envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel *et al.*, 2011).

Figure 3-5 shows the location of the project area in relation to any wetland and river FEPAs. Non-FEPA wetlands occur in close proximity to the PAOI, with the Merriespruit River in close proximity to the western side of the PAOI.

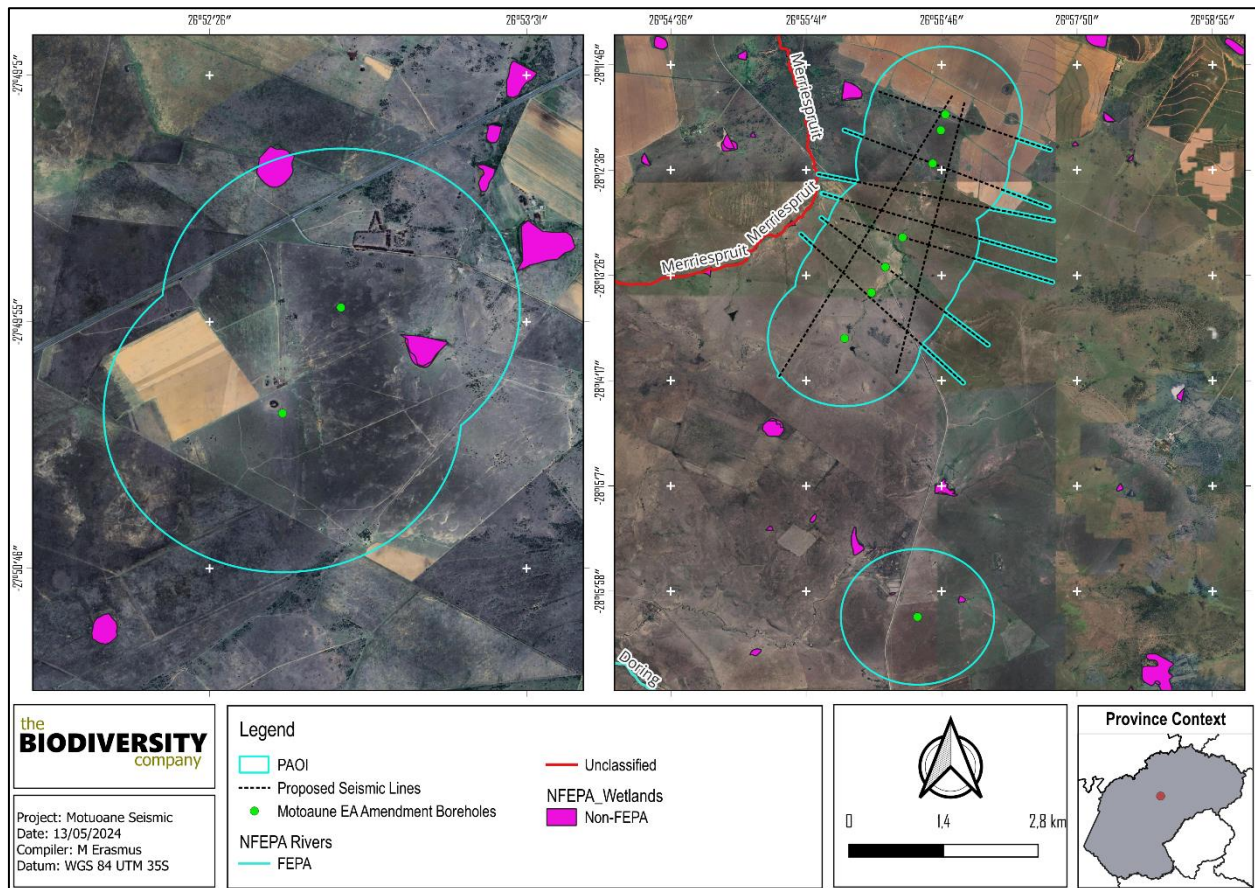


Figure 3-5 The project area in relation to the National Freshwater Ecosystem Priority Area database

3.1.1.6 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2017 (NPAES) were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for finescale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2017). The project area does overlap with Priority Focus Areas (Figure 3-6).

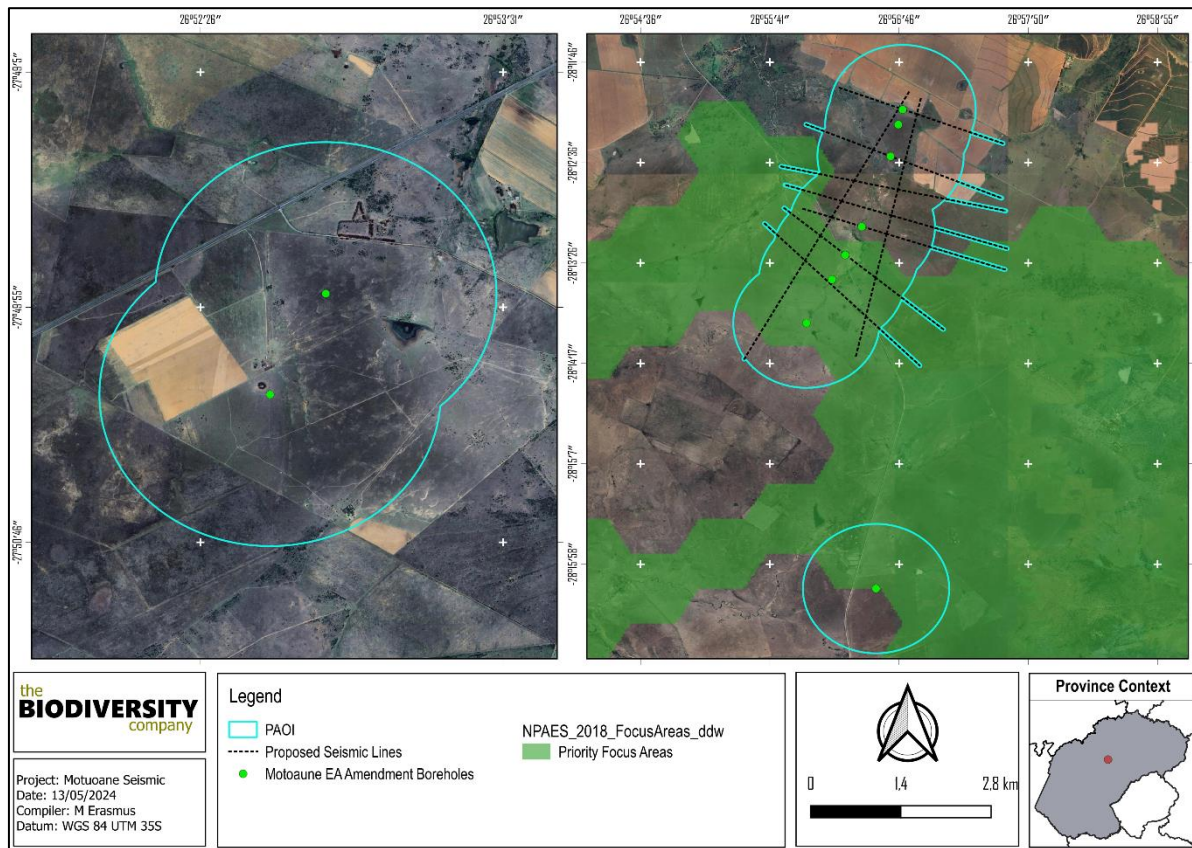


Figure 3-6 The project area in relation to the National Protected Area Expansion Strategy

3.1.1.7 Mining and Biodiversity Guidelines

According to the Mining and Biodiversity Guidelines spatial dataset (2013), sections of the PAOI overlaps with areas of moderate and highest BU (Figure 3-7).

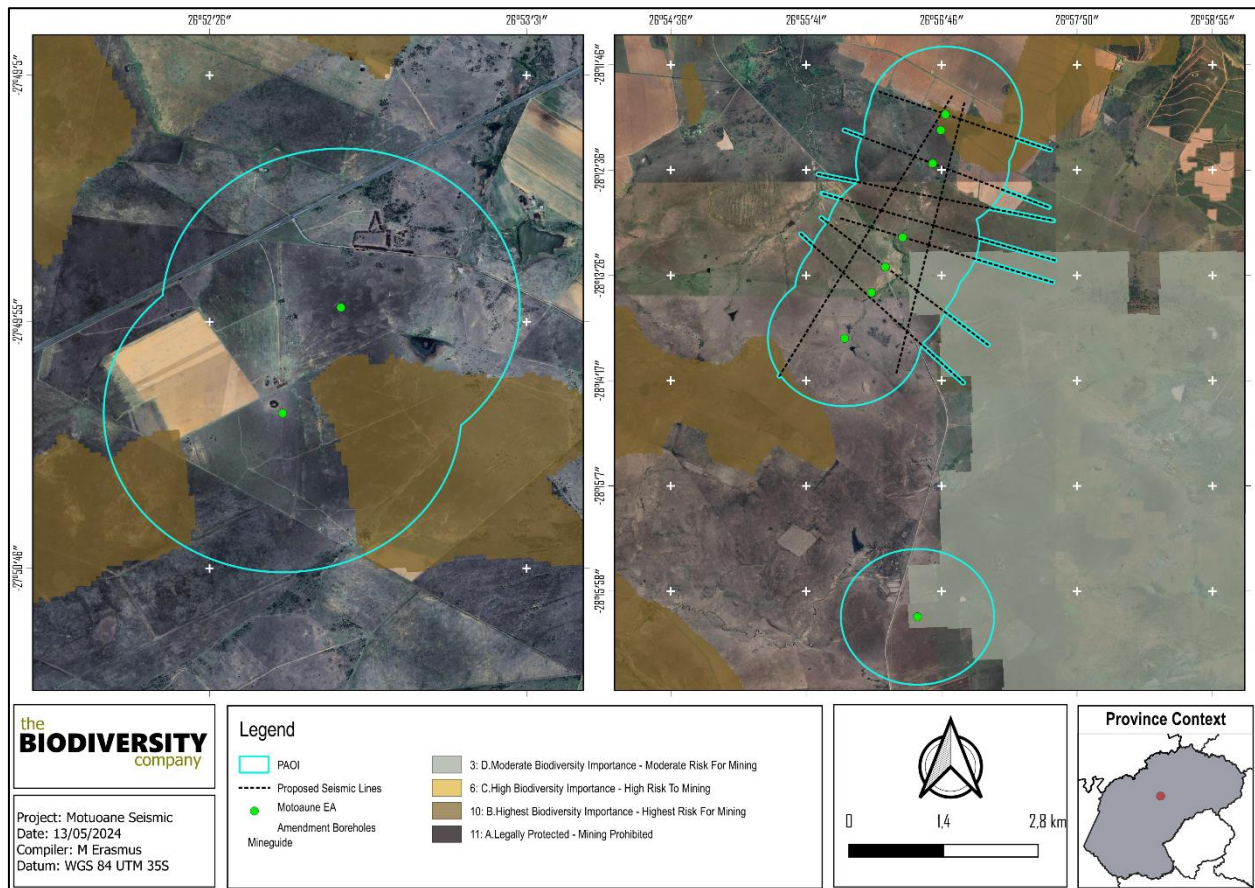


Figure 3-7 The PAOI in relation to the Mining and Biodiversity Guidelines

3.1.2 Flora Assessment

This section is divided into a description of the vegetation type expected under natural conditions and the expected flora species.

3.1.2.1 Vegetation Type

The project area is situated within the Grassland biome.

Grassland biome

In South Africa, the Grassland Biome occurs mainly on the high central plateau (Highveld), the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal (KZN) and the central parts of the Eastern Cape (Mucina & Rutherford, 2006). However, grasslands can also be found below the Drakensberg, both in KZN and the Eastern Cape, with floristic links to the high-altitude Drakensberg grassland (Mucina & Rutherford, 2006). The topography is mainly flat to rolling, but also includes mountainous regions and the Escarpment (Mucina & Rutherford, 2006). Altitude is mostly from about 300 to 400 m.a.s.l, but reaches up to 3 482 m on Thabana Ntlenyana, the highest mountain in southern Africa (Mucina & Rutherford, 2006).

In terms of climate, the temperate grasslands of the Highveld in South Africa have cold and dry conditions, with rainfall during the summer (which can sometimes be a strong summer rainfall) and winter drought (Mucina & Rutherford, 2006). Frost is common and there is a high risk of lightning-induced fires (Mucina & Rutherford, 2006).

In terms of vegetation structural composition, grasslands are characteristically dominated by grasses of the Poaceae Family (Mucina & Rutherford, 2006). On the Lesotho Plateau and highest peaks of the

Drakensberg, grassland plants xeromorphic characteristics due to the severity of the climate in these places (Mucina & Rutherford, 2006).

On a fine-scale vegetation type, the project area overlaps with the Central Free State Grassland, Highveld Alluvial Vegetation and Vaal-Vet Sandy Grassland (Figure 3-8).

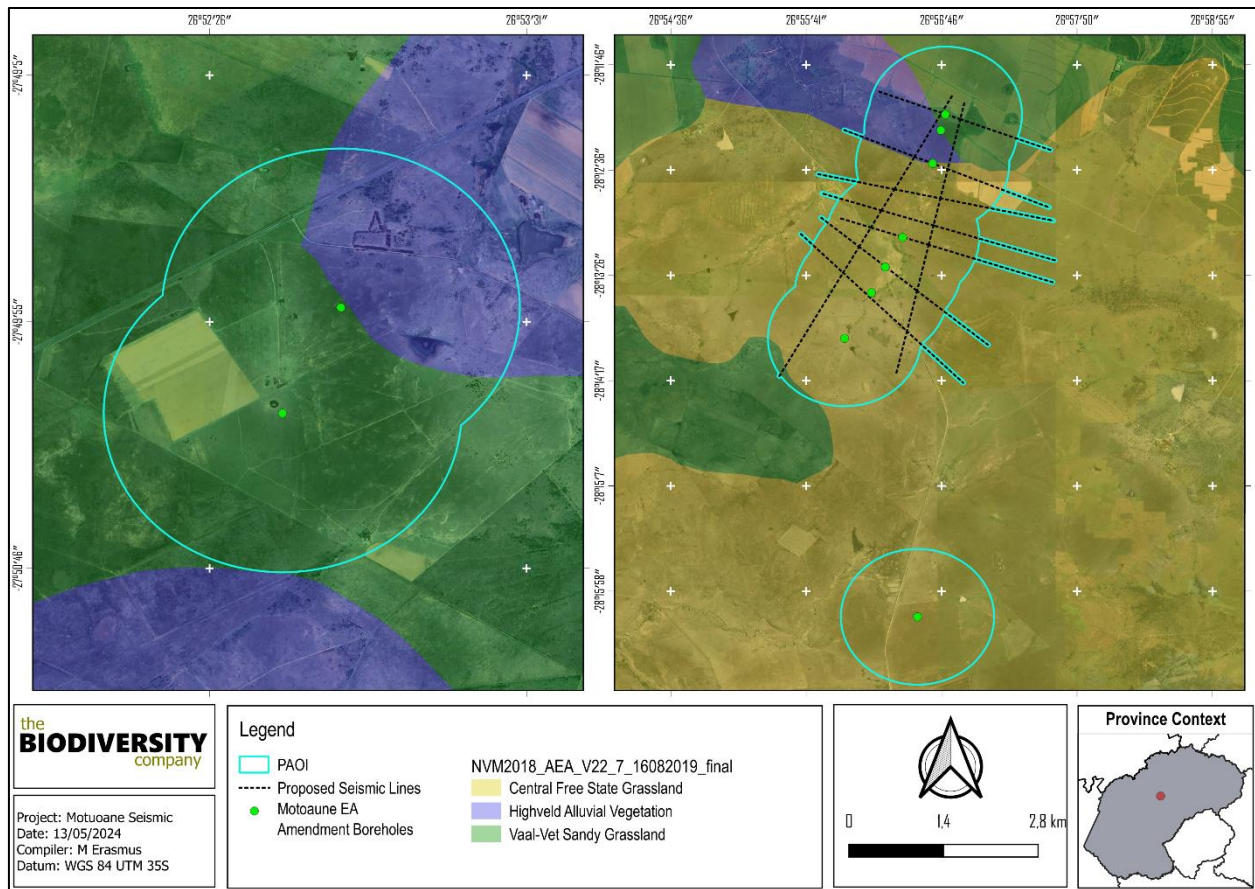


Figure 3-8 Map illustrating the vegetation type associated with the project area.

3.1.2.1.1 Central Free State Grassland

Central Free State Grassland is undulating plains supporting short grassland, in natural condition dominated by *Themeda triandra* while *Eragrostis curvula* and *E. chloromelas* become dominant in degraded habitats.

Important 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 Free State Grassland vegetation type:

Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *Cynodon dactylon* (d), *Eragrostis chloromelas* (d), *E. curvula* (d), *E. plana* (d), *Panicum coloratum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Agrostis lachnantha*, *Andropogon appendiculatus*, *Aristida bipartita*, *A. canescens*, *Cymbopogon pospischilii*, *Cynodon transvaalensis*, *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis lehmanniana*, *E. micrantha*, *E. obtusa*, *E. racemosa*, *E. trichophora*, *Heteropogon contortus*, *Microchloa caffra*, *Setaria incrassata*, *Sporobolus discosporus*.

Herbs: *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Conyza pinnata*, *Crabbea acaulis*, *Geigeria aspera* var. *aspera*, *Hermannia depressa*, *Hibiscus pusillus*, *Pseudognaphalium luteoalbum*, *Salvia stenophylla*, *Selago densiflora*, *Sonchus dregeanus*.

Geophytic Herbs: *Oxalis depressa*, *Raphionacme dyeri*.

Succulent Herb: *Tripteris aghillana* var. *integrifolia*.

Low Shrubs: *Felicia muricata* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *Melolobium candicans*, *Pentzia globosa*.

Conservation Status of the Vegetation Type

The national conservation target is 24%. Only small portions enjoy statutory conservation (Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves) as well as some protection in private nature reserves. The conservation status of this vegetation community was listed by Mucina and Rutherford (2006) as Vulnerable.

3.1.2.1.2 Highveld Alluvial Vegetation

The highveld alluvial vegetation type is characterised by flat topography supporting riparian thickets dominated by *Vachellia karroo*. This vegetation type can be found in the Free State, North West, Mpumalanga and Gauteng Province. It is embedded in the Grassland and Savanna biomes.

Important Taxa:

The important taxa are divided into the main growth areas namely: Riparian thicket, Reed Beds, Flooded grasslands & herblands and Open water.

Riparian thickets

Small Trees: *Vachellia karroo*, *Salix mucronata* subsp. *mucronata*, *S. mucronata* subsp. *woodii* (d, within subescarpment grasslands of KwaZulu-Natal), *Ziziphus mucronata*, *Celtis africana*, *Searsia lancea*.

Tall Shrubs: *Gymnosporia buxifolia*, *Rhus pyroides*, *Diospyros lycioides*, *Ehretia rigida*, *Grewia flava*.

Low Shrubs: *Asparagus laricinus*, *A. suaveolens*.

Woody Climber: *Clematis brachiata*.

Succulent Shrub: *Lycium hirsutum*

Graminoids: *Setaria verticillata*, *Panicum maximum*.

Herb: *Pollichia campestris*.

Reed beds

Megagraminoid: *Phragmites australis*

Flooded grasslands & herblands

Low Shrubs: *Gomphocarpus fruticosus*, *Felicia muricata*.

Succulent Shrub: *Salsola rabieana*.

Graminoids: *Agrostis lachnantha*, *Andropogon eucomus*, *Chloris virgata*, *Cynodon dactylon*, *Eragrostis plana*, *Hemarthria altissima*, *Imperata cylindrica*, *Ischaemum fasciculatum*, *Miscanthus junceus*, *Paspalum distichum*, *Andropogon appendiculatus*, *Brachiaria marlothii*, *Cyperus denudatus*, *C. longus*, *Echinochloa holubii*, *Eragrostis obtusa*, *E. porosa*, *Fimbristylis ferruginea*, *Panicum coloratum*, *Pycneus mundii*, *Sporobolus africanus*, *S. fimbriatus*, *Themeda triandra*, *Urochloa panicoides*.

Herbs: *Persicaria lapathifolia*, *Alternanthera sessilis*, *Barleria macrostegia*, *Corchorus asplenifolius*, *Equisetum ramosissimum*, *Galium capense*, *Hibiscus pusillus*, *Lobelia angolensis*, *Nidorella resedifolia*, *Persicaria amphibia*, *P. hystricula*, *Pseudognaphalium oligandrum*, *Pulicaria scabra*, *Rorippa fluvialis* var. *fluvialis*, *Senecio inornatus*, *Stachys hyssopoides*, *Vahlia capensis*.

Geophytic Herbs: *Crinum bulbispermum*, *Haplocarpha lyrata*.

Open water

Aquatic Herb: *Myriophyllum spicatum*.

Conservation Status

According to Mucina & Rutherford (2006), this vegetation type is classified as LT. The national target for conservation protection for both these vegetation types is 31%, with nearly 10% statutorily conserved in the Barberspan (a Ramsar site), Bloemhof Dam, Christiana, Faan Meintjes, Sandveld, Schoonspruit, Soetdoring and Wolwespruit Nature Reserves.

3.1.2.1.3 Vaal-Vet Sandy Grassland

The Vaal-Vet Sandy Grassland occurs on a plains-dominated landscape with some scattered, slightly irregular undulating plains and hills (Mucina & Rutherford, 2006). In terms of plant types, it consists mainly of low-tussock grasslands with an abundant karroid element (Mucina & Rutherford, 2006). It occurs in the North-West and Free State Provinces at altitudes of 1 260 to 1 360 m (Mucina & Rutherford, 2006).

Important Taxa (d = dominant)

Graminoids: *Antheophora pubescens* (d), *Aristida congesta* (d), *Chloris virgata* (d), *Cymbopogon caesius* (d), *Cynodon dactylon* (d), *Digitaria argyrograptia* (d), *Elionurus muticus* (d), *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. plana* (d), *E. trichophora* (d), *Heteropogon contortus* (d), *Panicum gilvum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Tragus berteronianus* (d), *Brachiaria serrata*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *E. obtusa*, *E. superba*, *Panicum coloratum*, *Pogonarthria squarrosa*, *Trichoneura grandiglumis*, *Triraphis andropogonoides*.

Herbs: *Stachys spathulata* (d), *Barleria macrostegia*, *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Geigeria aspera* var. *aspera*, *Helichrysum caespititium*, *Hermannia depressa*, *Hibiscus pusillus*, *Monsonia burkeana*, *Rhynchosia adenodes*, *Selago densiflora*, *Vernonia oligocephala*.

Geophytic Herbs: *Bulbine narcissifolia*, *Ledebouria marginata*.

Succulent Herb: *Tripteris aghillana* var. *integrifolia*.

Low Shrubs: *Felicia muricata* (d), *Pentzia globosa* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *H. paronychioides*, *Ziziphus zeyheriana*.

Endemic Taxa

Herb: *Lessertia phillipsiana*.

Conservation Status

This vegetation is classified as EN, with a conservation target of 24% (Mucina & Rutherford, 2006).

3.1.2.2 Expected Flora Species

The POSA database indicates that 463 species of indigenous plants are expected to occur within the project area. Appendix A provides the list of species and their respective conservation status and endemism. Of these 463 plant species, no species are listed as being Species of Conservation Concern (SCC). No sensitive species were highlighted by the screening assessment.

3.1.3 Faunal Assessment

3.1.3.1 Amphibians

Based on the AmphibianMap, 15 amphibian species are expected to occur within the area (Appendix B). One of these species are regarded as SCC. No sensitive species were highlighted by the screening assessment.

Table 3-2 *Threatened amphibian species that are expected to occur within the project area.*

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional	Global	
<i>Pyxicephalus adspersus</i>	Giant Bull Frog	NT	LC	Low

3.1.3.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 47 reptile species are expected to occur within the area (Appendix C). Two (2) are regarded as threatened. No sensitive species were highlighted by the screening assessment.

Table 3-3 *Threatened reptile species that are expected to occur within the project area*

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	LC	Moderate
<i>Psammophis leightoni</i>	Cape Sand Snake	VU	LC	Unlikely

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.

3.1.3.3 Mammals

The MammalMap database lists 89 mammal species that could be expected to occur within the area (Appendix D). This list excludes large mammal species that are normally limited to protected areas, however still included in the appendices. Ten (10) of these expected species are regarded as SCC, with one species having a high likelihood of occurrence. One sensitive species was highlighted by the screening assessment, marked with *

Table 3-4 *List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses.*

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	Low
<i>Atelerix frontalis</i>	South Africa Hedgehog	NT	LC	Low
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC	NT	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Low
<i>Hydricotis maculicollis</i> *	Spotted-necked Otter	VU	NT	Low
<i>Leptailurus serval</i>	Serval	NT	LC	High
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Low
<i>Panthera pardus</i>	Leopard	VU	VU	Low

<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC	Low

Leptailurus serval (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2023). 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. Due to the presence of likely habitat within the PAOI, the likelihood of occurrence for this species is rated as High.

3.1.3.4 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 236 bird species have the potential to occur in the vicinity of the project area. The full list of potential bird species is provided in Appendix E. The SCC expected can be seen in Table 3-5; and one of these has a moderate-high likelihood of occurrence based on the suitable habitat and food sources present in the project area. Two species were confirmed during the field assessment.

Table 3-5 *List of bird species of regional or global conservation importance that are expected to occur in close vicinity to the project area*

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT	Low
<i>Charadrius pallidus</i>	Plover, Chestnut-banded	NT	NT	Low
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC	Low
<i>Ciconia nigra</i>	Stork, Black	VU	LC	Low
<i>Eupodotis caerulea</i>	Korhaan, Blue	LC	NT	Confirmed
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	Moderate
<i>Gyps africanus</i>	Vulture, White-backed	CR	CR	Low
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC	Low
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	VU	Low
<i>Phoeniconaias minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Phoenicopterus roseus</i>	Flamingo, Greater	NT	LC	Low
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC	Low
<i>Sagittarius serpentarius</i>	Secretarybird	EN	EN	Confirmed

Eupodotis caerulea (Blue Korhaan) is listed as NT according to the IUCN (2023). Their moderately rapid decline is accredited to habitat loss that is a result of intensive agriculture. They are found in high grassveld in close proximity to water, usually above an altitude of 1 500m (del Hoyo *et al.*, 1996). The species nests in bare open ground, situated in thick grass or cropland. The species was confirmed present¹ in the area during the October 2023 field assessment.

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 solitary. Their diet is mainly composed of small birds such as pigeons and

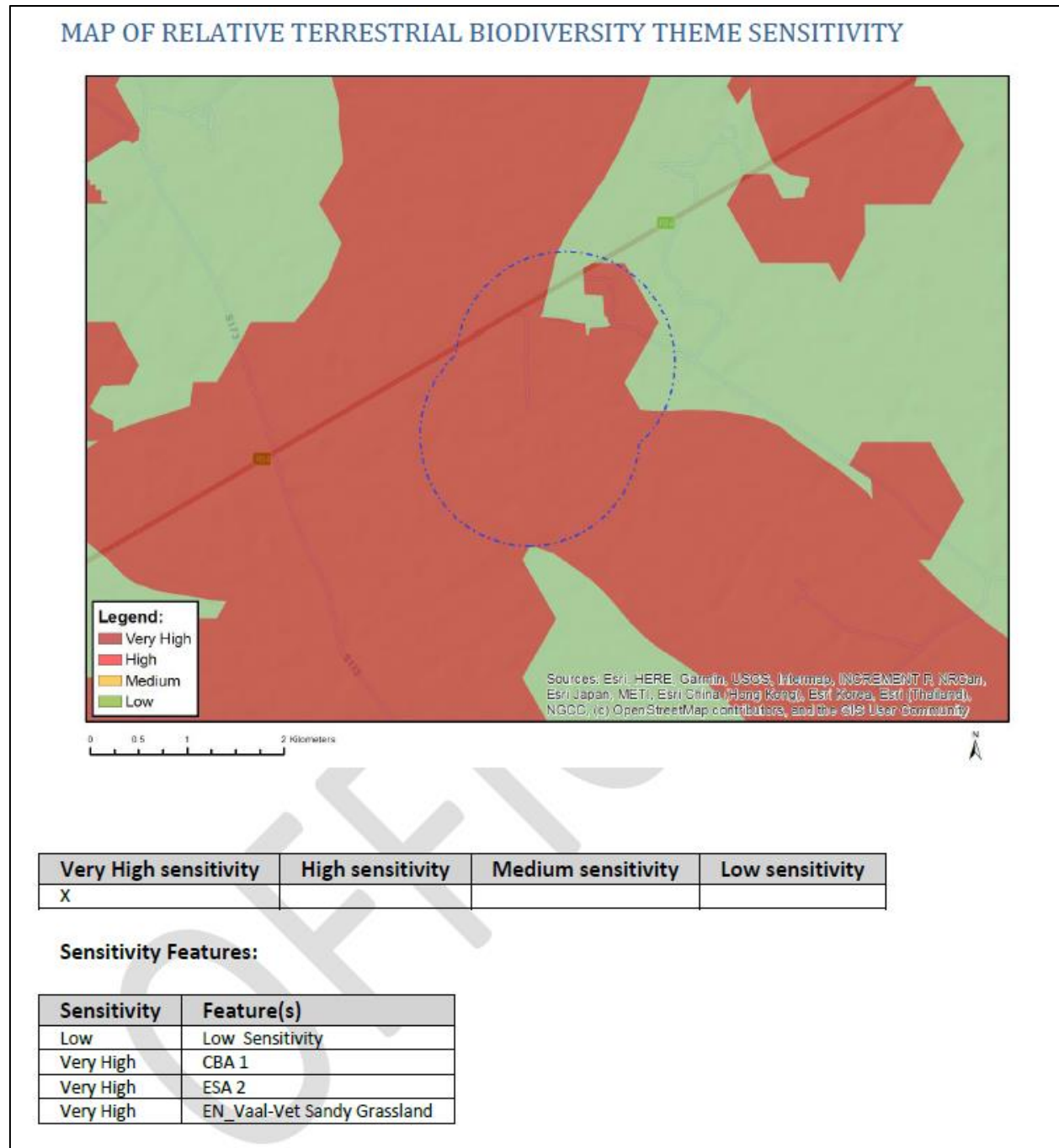
¹ Confirmed observation by Martinus Erasmus

francolins. The likelihood of incidental records of this species in the project area is rated as moderate due to the presence of many bird species on which Lanner Falcons may predate.

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, 2023). The species was confirmed present² in the area during the October 2023 field assessment.

3.1.4 Environmental Screening Tool

The terrestrial biodiversity theme sensitivity, as indicated in the National Web based Environmental Screening Tool (NWBEST) Report, was derived to be Very High, (Figure 3-9 to Figure 3-11), while the animal theme was classified as medium and plant species theme low sensitivity for the PAOI, ((Figure 3-12 to Figure 3-14) and (Figure 3-15 to Figure 3-17)).



² Confirmed observation by Martinus Erasmus

Figure 3-9 *Terrestrial Biodiversity Theme Sensitivity, northern section.*

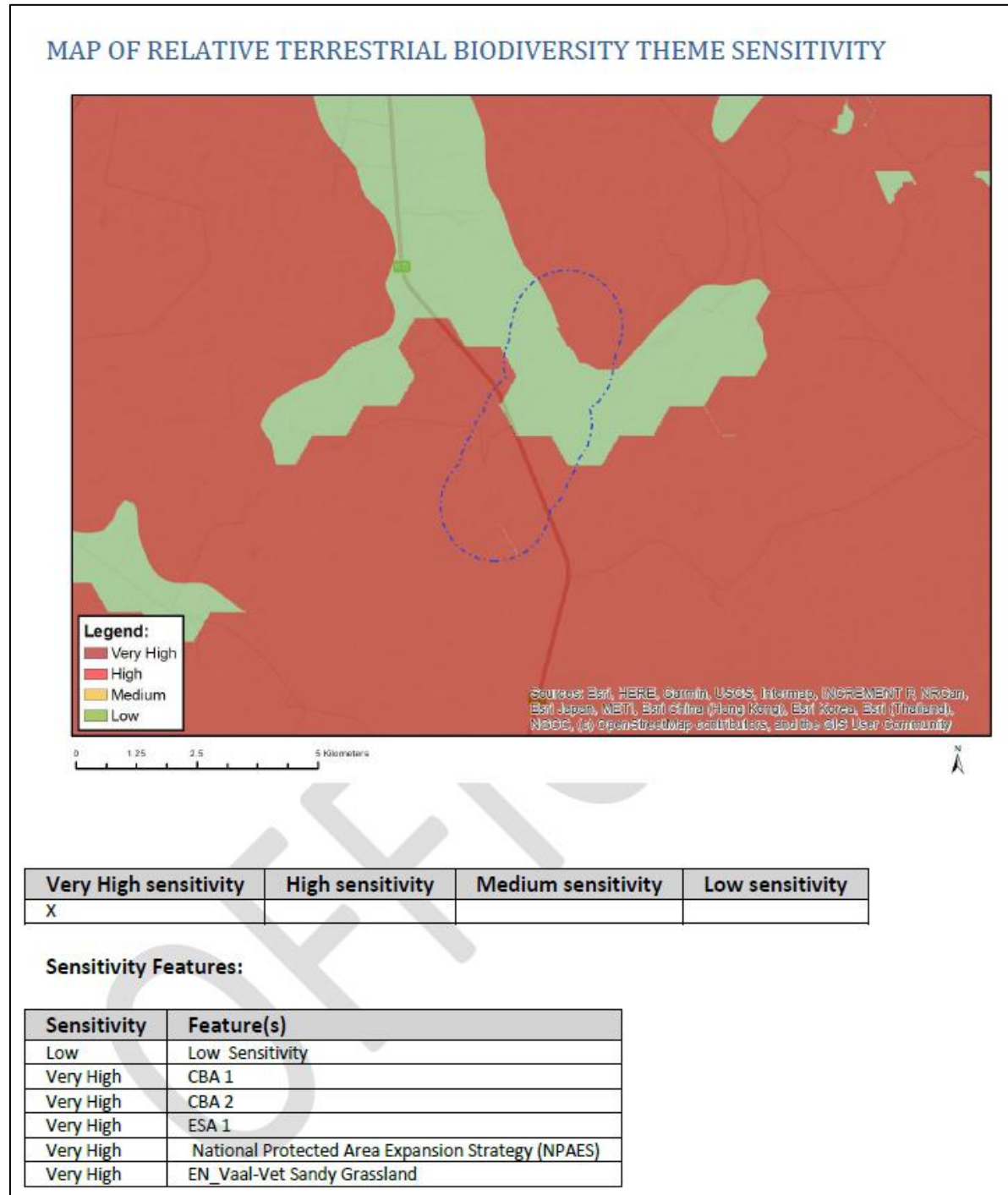


Figure 3-10 *Terrestrial Biodiversity Theme Sensitivity, southern cluster*

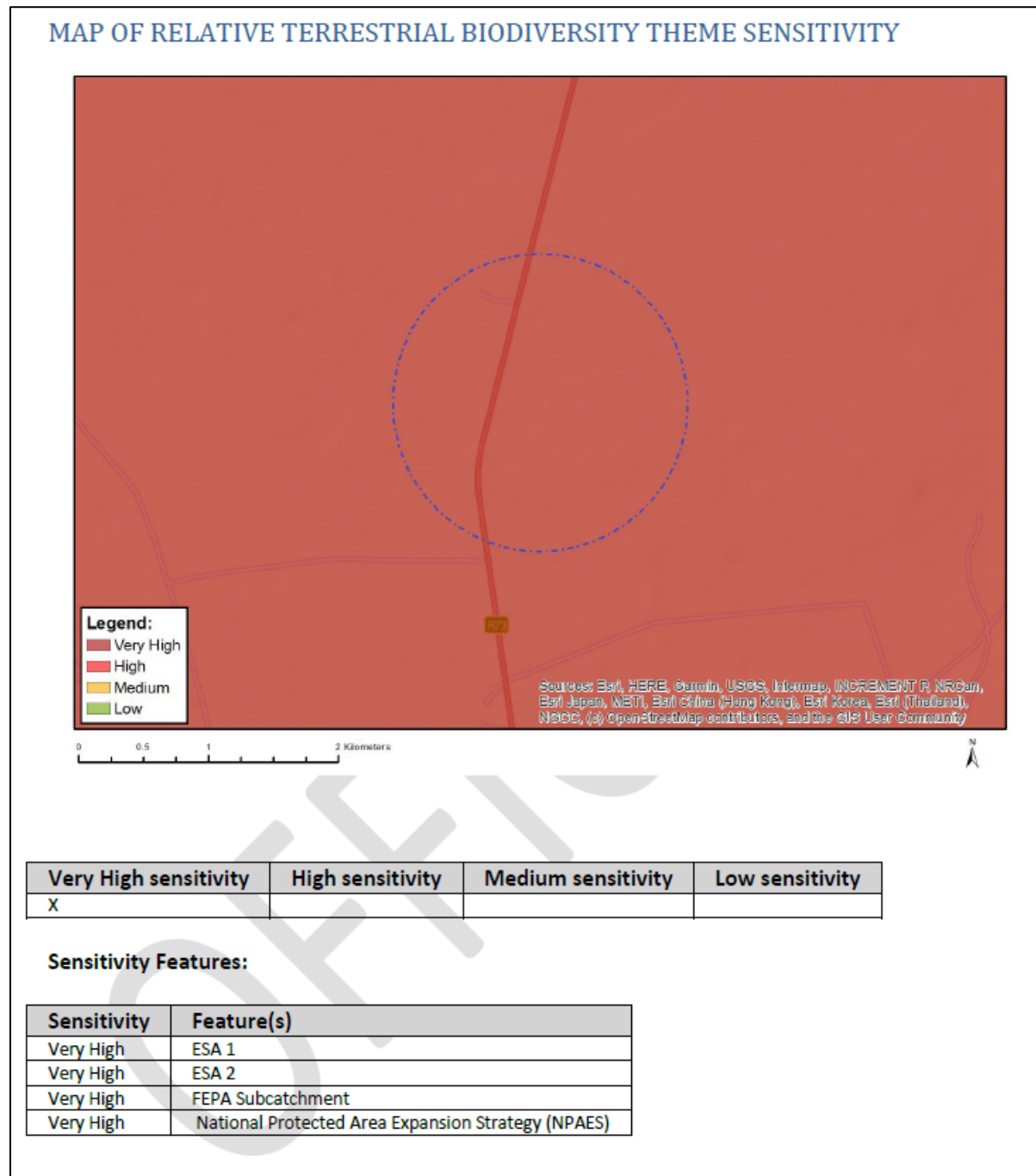


Figure 3-11 Terrestrial Biodiversity Theme Sensitivity, far south section

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Figure 3-12 Plant Theme Sensitivity, northern section.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Figure 3-13 Plant Theme Sensitivity, southern cluster.

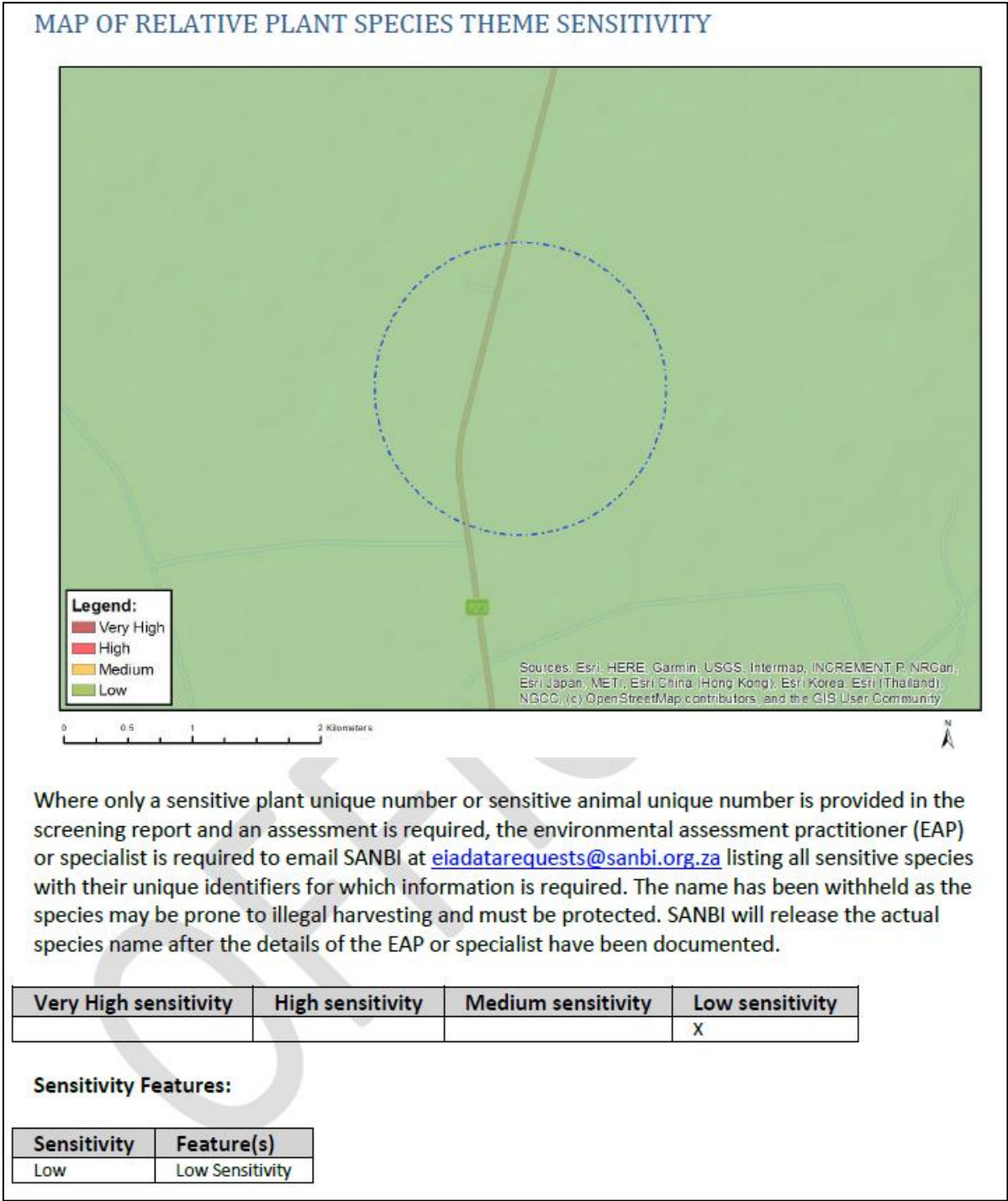
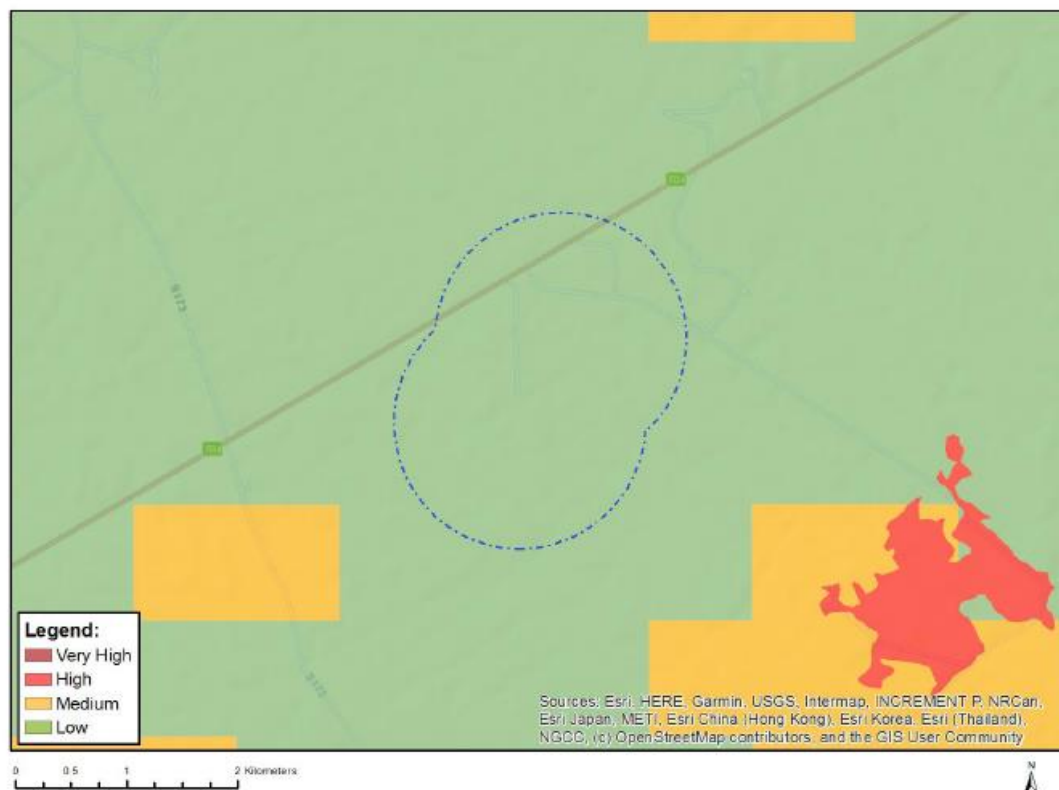


Figure 3-14 Plant Theme Sensitivity, far south section.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Subject to confirmation

Figure 3-15 *Animal Species Theme Sensitivity, northern section.*

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Subject to confirmation
Medium	Mammalia-Hydricis maculicollis

Figure 3-16 *Animal Species Theme Sensitivity, southern cluster.*

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Subject to confirmation
Medium	Mammalia-Hydricis maculicollis

Figure 3-17 Animal Species Theme Sensitivity, far south section.

3.2 Field Assessment

The following sections provide the results from the field survey for the proposed development that was undertaken.

3.2.1 Flora Assessment

This section is divided into two sections:

- Indigenous flora; and
- Invasive Alien Plants (IAPs).

3.2.1.1 Indigenous Flora

The vegetation assessment was conducted throughout the extent of the project area. A total of 75 tree, shrub, herbaceous and graminoid plant species were recorded in the project area during the field assessment (Table 3-6).

The list of plant species recorded to is by no means comprehensive, and repeated surveys during different phenological periods not covered may likely yield up to 30% additional flora species for the project area. However, floristic analysis conducted to date is regarded as a sound representation of the local flora for the project area.

3.2.1.1.1 Protected plant species

Several individuals of five protected plant species that are protected by the Free State Nature Conservation Ordinance 8 of 1969 were observed in various parts of the project area. According to the list of protected species under Schedule, if any individuals of these plant species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA).

Table 3-6 *Trees, shrub and herbaceous plant species recorded in the project area.*

Family	Scientific Name	Threat Status	SA Endemic
Acanthaceae	<i>Blepharis squarrosa</i>	LC	Endemic
Acanthaceae	<i>Crabbea angustifolia</i>	LC	Endemic
Agavaceae	<i>Chlorophytum cooperi</i>	LC	Not Endemic
Aizoaceae	<i>Delosperma herbeum</i>	LC	Not Endemic
Amaryllidaceae	<i>Boophone disticha</i>	LC-Schedule 6 Protected	Not Endemic
Amaryllidaceae	<i>Crinum bulbisperrum</i>	LC-Schedule 6 Protected	Not Endemic
Amaryllidaceae	<i>Ammocharis coranica</i>	LC-Schedule 6 Protected	Not Endemic
Anacardiaceae	<i>Searsia lancea</i>	LC	Not Endemic
Anacardiaceae	<i>Searsia pyroides</i>	LC	Not Endemic
Apocynaceae	<i>Gomphocarpus fruticosus</i>	LC	Not Endemic
Apocynaceae	<i>Asclepias stellifera</i>	LC	Not Endemic
Asparagaceae	<i>Asparagus cooperi</i>	LC	Not Endemic
Asparagaceae	<i>Asparagus laricinus</i>	LC	Not Endemic
Asphodelaceae	<i>Bulbine abyssinica</i>	LC	Not Endemic
Asphodelaceae	<i>Bulbine narcissifolia</i>	LC	Endemic
Asphodelaceae	<i>Aloe sp</i>		
Asteraceae	<i>Berkheya onopordifolia</i> var. <i>onopordifolia</i>	LC	Not Endemic
Asteraceae	<i>Berkheya pinnatifida</i>	LC	Not Endemic
Asteraceae	<i>Berkheya radula</i>	LC	Not Endemic
Asteraceae	<i>Cotula anthemoides</i>	LC	Not Endemic
Asteraceae	<i>Dicoma anomala</i> Sond. subsp. <i>anomala</i>	LC	Not Endemic
Asteraceae	<i>Felicia muricata</i> subsp. <i>muricata</i>	LC	Not Endemic
Asteraceae	<i>Geigeria burkei</i>	LC	Not Endemic
Asteraceae	<i>Hilliardiella elaeagnoides</i>	LC-Sched 6 Protected	Not Endemic

Asteraceae	<i>Nidorella anomala</i>	LC	Not Endemic
Asteraceae	<i>Pentzia incana</i>	LC	Not Endemic
Asteraceae	<i>Pentzia globosa</i>	LC	Not Endemic
Asteraceae	<i>Pseudognaphalium oligandrum</i>	LC	Not Endemic
Asteraceae	<i>Litogyne gariepina</i>	LC	Not Endemic
Asteraceae	<i>Osteospermum muricatum</i> subsp. <i>muricatum</i>	LC	Not Endemic
Boraginaceae	<i>Trichodesma angustifolium</i> subsp. <i>angustifolium</i>	LC	Not Endemic
Colchicaceae	<i>Colchicum roseum</i>	LC	Not Endemic
Crassulaceae	<i>Crassula capitella</i>	LC	Not Endemic
Cyperaceae	<i>Cyperus rupestris</i>	LC	Not Endemic
Euphorbiaceae	<i>Acalypha angustata</i>	LC	Not Endemic
Fabaceae	<i>Vachellia karroo</i>	LC	Not Endemic
Fabaceae	<i>Elephantorrhiza elephantina</i>	LC	Not Endemic
Fabaceae	<i>Melolobium microphyllum</i>	LC	Not Endemic
Hyacinthaceae	<i>Ledebouria marginata</i>	LC	Not Endemic
Hyacinthaceae	<i>Albuca setosa</i>	LC	Not Endemic
Hyacinthaceae	<i>Ledebouria luteola</i>	LC	Not Endemic
Hypoxidaceae	<i>Hypoxis hemerocallidea</i>	LC	Not Endemic
Hypoxidaceae	<i>Hypoxis iridifolia</i>	LC	Not Endemic
Hypoxidaceae	<i>Hypoxis argentea</i>	LC	Not Endemic
Hypoxidaceae	<i>Schizocarphus nervosus</i>	LC-Sched 6 Protected	Not Endemic
Malvaceae	<i>Hermannia depressa</i>	LC	Not Endemic
Oleaceae	<i>Menodora africana</i>	LC	Not Endemic
Poaceae	<i>Aristida adscensionis</i>	LC	Not Endemic
Poaceae	<i>Aristida congesta</i> subsp. <i>congesta</i>	LC	Not Endemic
Poaceae	<i>Aristida junciformis</i>	LC	Not Endemic

Poaceae	<i>Aristida stipitata</i>	LC	Not Endemic
Poaceae	<i>Bewisia biflora</i>	LC	Not Endemic
Poaceae	<i>Cymbopogon caesius</i>	LC	Not Endemic
Poaceae	<i>Cynodon dactylon</i>	LC	Not Endemic
Poaceae	<i>Digitaria eriantha</i>	LC	Not Endemic
Poaceae	<i>Eragrostis chloromelas</i>	LC	Not Endemic
Poaceae	<i>Eragrostis curvula</i>	LC	Not Endemic
Poaceae	<i>Eragrostis gummiflua</i>	LC	Not Endemic
Poaceae	<i>Eragrostis lehmanniana</i>	LC	Not Endemic
Poaceae	<i>Eragrostis racemosa</i>	LC	Not Endemic
Poaceae	<i>Eragrostis superba</i>	LC	Not Endemic
Poaceae	<i>Hyparrhenia hirta</i>	LC	Not Endemic
Poaceae	<i>Loudetia simplex</i>	LC	Not Endemic
Poaceae	<i>Melinis repens</i>	LC	Not Endemic
Poaceae	<i>Panicum maximum</i>	LC	Not Endemic
Poaceae	<i>Setaria sphacelata</i> var. <i>sericea</i>	LC	Not Endemic
Poaceae	<i>Setaria sphacelata</i> var. <i>sphacelata</i>	LC	Not Endemic
Poaceae	<i>Sporobolus africanus</i>	LC	Not Endemic
Poaceae	<i>Themeda triandra</i>	LC	Not Endemic
Pteridaceae	<i>Pellaea calomelanos</i>	LC	Not Endemic
Rhamnaceae	<i>Ziziphus mucronata</i> subsp. <i>mucronata</i>	LC	Not Endemic
Scrophulariaceae	<i>Jamesbrittenia aurantiaca</i>	LC	Not Endemic
Scrophulariaceae	<i>Selago densiflora</i>	LC	Not Endemic
Scrophulariaceae	<i>Aptosimum elongatum</i>	LC	Endemic
Solanaceae	<i>Lycium cinereum</i>	LC	Not Endemic

3.2.1.2 Invasive Alien Plants

Invasive Alien Plants (IAPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

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 NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182, 24th of February 2021. The legislation calls for the removal and / or control of IAP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, 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 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 Alien and Invasive Species 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 NEMBA;
 - The relevant invasive species management programme developed in terms of regulation 4; and
 - Any directive issued in terms of section 73(3) of the NEMBA.

Nine (9) IAP species were recorded within the PAOI. These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b and Not Indigenous (Exotic) respectively. The three (3) species in green (Table 3-7), are IAP species that must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA, as stated above.

Table 3-7 Summary of AIP recorded within the PAOI of Influence (PAOI) during the field survey period.

Family	Scientific Name	Alien Category
Papaveraceae	<i>Argemone ochroleuca</i>	NEMBA Category 1b.
Asteraceae	<i>Bidens pilosa</i>	Naturalized exotic
Asteraceae	<i>Cirsium vulgare</i>	NEMBA Category 1b.
Asteraceae	<i>Conyza bonariensis</i>	Naturalized exotic
Amaranthaceae	<i>Gomphrena celosioides</i>	Naturalized exotic
Asteraceae	<i>Schkuhria pinnata</i>	Naturalized exotic
Asteraceae	<i>Tagetes minuta</i>	Naturalized exotic
Verbenaceae	<i>Verbena astrigera</i>	Naturalized exotic
Verbenaceae	<i>Verbena bonariensis</i>	NEMBA Category 1b.

3.2.2 Faunal Assessment

Herpetofauna, mammal and avifauna observations and recordings fall under this section.

3.2.2.1 Amphibians and Reptiles

Two (2) herpetofauna species were recorded during the survey period (Table 3-8). However, there is the possibility of more species being present, due to the seasonality of the survey and the fact that certain reptile species are secretive and require long-term surveys to ensure capture. Sensitive species 15 was recorded and is threatened.

Table 3-8 Summary of herpetofauna species recorded within the PAOI.

Family	Scientific Name	Common Name	Conservation Status	
			Regional	Global
Reptiles				
Sensitive Species 15				
Pseudaspidae	<i>Pseudaspis cana</i>	Mole Snake	LC	LC
Gekkonidae	<i>Lygodactylus capensis</i>	Common Dwarf Gecko	LC	LC
Elapidae	<i>Hemachatus haemachatus</i>	Rinkhals	LC	LC

3.2.2.2 Mammals

Nineteen (19) mammal species were recorded during this survey of the project area (Table 3-9) based on either direct observation, the presence of visual tracks and signs as well as personal communication with farm owners/managers (Figure 3-18). Ten (10) are listed provincially. The larger mammal species, such as Blue Wildebeest, were kept as game on one of the properties (Wildskamp 5), marked with a *, which include SSCs.

Table 3-9 Summary of mammal species recorded within the project area.

Species	Common Name	Conservation Status		Free Conservation of 1969	State Ordinance 8	Nature
		Regional	IUCN			
<i>Aepyceros melampus</i>	Impala	LC	LC		Schedule 2	
<i>Alcelaphus buselaphus</i>	Red Hartebeest	LC	LC		Schedule 2	
<i>Antidorcas marsupialis</i> *	Springbok	LC	LC		Schedule 2	

<i>Connochaetes taurinus</i>*	Blue Wildebeest	LC	LC	Schedule 2
<i>Cryptomys hottentotus</i>	Common Mole-rat	LC	LC	
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC	
<i>Damaliscus pygargus</i>	Blesbok	LC	LC	Schedule 2
<i>Herpestes sanguineus</i>	Slender Mongoose	LC	LC	
<i>Hippotragus niger</i>	Sable Antelope	VU	LC	Schedule 1
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC	
<i>Kobus leche</i>	Southern Lechwe	N/A	NT	
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC	Schedule 2
<i>Orycteropus afer</i>	Aardvark	LC	LC	Schedule 1
<i>Oryx gazella</i>	Gemsbok	LC	LC	
<i>Phacochoerus africanus</i>	Common Warthog	LC	LC	
<i>Raphicerus campestris</i>	Steenbok	LC	LC	Schedule 2
<i>Suricata suricatta</i>	Suricate	LC	LC	
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC	Schedule 2
<i>Xerus inauris</i>	Cape Ground Squirrel	LC	LC	



Figure 3-18 Photograph illustrating some of the mammal species recorded in the project area. A) *Raphicerus campestris* (Steenbok), B) *Hystrix africaeaustralis* (Cape Porcupine), C) *Antidorcas marsupialis* (Springbok), D) *Phacochoerus africanus* (Common Warthog), E) *Suricata suricatta* (Suricate)

3.2.2.3 Avifauna

Forty-two (42) species were recorded in the project area during the survey based on either direct observation, vocalisations, or the presence of visual tracks & signs, (Table 3-10) (Figure 3-19). Two (2) (red text) species are rated as SCC, whereas 30 are listed provincially.

Table 3-10 A list of avifaunal species recorded for the project area.

Species	Common Name	Conservation Status		Free State Nature Conservation Ordinance 8 of 1969
		Regional	IUCN	
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC	-
<i>Afrotis afraoides</i>	Korhaan, Northern Black	Unlisted	LC	Schedule 1
<i>Alopochen aegyptiaca</i>	Goose, Egyptian	Unlisted	LC	Schedule 1/2
<i>Amadina erythrocephala</i>	Finch, Red-headed	Unlisted	LC	Schedule 1
<i>Anas undulata</i>	Duck, Yellow-billed	Unlisted	LC	Schedule 1/2
<i>Apus apus</i>	Swift, Common	Unlisted	LC	Schedule 1
<i>Ardea cinerea</i>	Heron, Grey	Unlisted	LC	Schedule 1
<i>Ardea intermedia</i>	Egret, Yellow-billed (Intermediate)	Unlisted	LC	Schedule 1
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC	Schedule 1
<i>Bostrychia hagedash</i>	Ibis, Hadedda	Unlisted	LC	Schedule 1
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC	Schedule 1
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC	Schedule 1
<i>Columba livia</i>	Dove, Rock	Unlisted	LC	-
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC	-
<i>Egretta ardesiaca</i>	Heron, Black	Unlisted	LC	Schedule 1
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC	Schedule 1
<i>Estrilda astrild</i>	Waxbill, Common	Unlisted	LC	Schedule 1
<i>Euplectes progne</i>	Widowbird, Long-tailed	Unlisted	LC	-
<i>Eupodotis caerulea</i>	Korhaan, Blue	LC	NT	Schedule 1
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC	Schedule 1
<i>Lamprolaima bicolor</i>	Starling, Pied	Unlisted	LC	-
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC	Schedule 1
<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC	Schedule 1
<i>Myrmecocichla formicivora</i>	Chat, Anteater	Unlisted	LC	Schedule 1
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC	Schedule 1/2
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC	-
<i>Platalea alba</i>	Spoonbill, African	Unlisted	LC	Schedule 1
<i>Plectropterus gambensis</i>	Goose, Spur-winged	Unlisted	LC	Schedule 1/2
<i>Ploceus mahali</i>	Sparrow-weaver, White-browed	Unlisted	LC	-
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC	-
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's	Unlisted	LC	Schedule 1/2
<i>Sagittarius serpentarius</i>	Secretarybird	EN	EN	Schedule 1

<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC	Schedule 1
<i>Spilopelia senegalensis</i>	Dove, Laughing	Unlisted	LC	-
<i>Sporopipes squamifrons</i>	Finch, Scaly-feathered	Unlisted	LC	-
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC	-
<i>Sturnus vulgaris</i>	Starling, Common	Unlisted	LC	Schedule 1
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC	Schedule 1
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC	Schedule 1
<i>Urocolius indicus</i>	Mousebird, Red-faced	Unlisted	LC	Schedule 1
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC	Schedule 1
<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC	Schedule 1



Figure 3-19 Some of the avifaunal species recorded; A) *Plectropterus gambensis* (Goose, Spur-winged) , B) *Afrotis afraoides* (Korhaan, Northern Black) and C) *Sagittarius serpentarius* (Secretarybird)(EN), D) *Elanus caeruleus* (Kite, Black-shouldered).

4 Site Sensitivity Verification

4.1 Site Ecological Importance

Four (4) primary terrestrial habitat types were delineated within the PAOI, as well as a set of wetland/water resource habitats as per the wetland report (Figure 4-1& Figure 4-2). These habitats are discussed in Table 4-1 and Table 4-2, whereas photo illustrations can be seen in Figure 4-3 to Figure 4-8.

Based on the criteria provided in Section 2.3 of this report, all habitats within the assessment area of the proposed project were allocated a sensitivity category. The sensitivities of the habitat types delineated are illustrated in Figure 4-9.

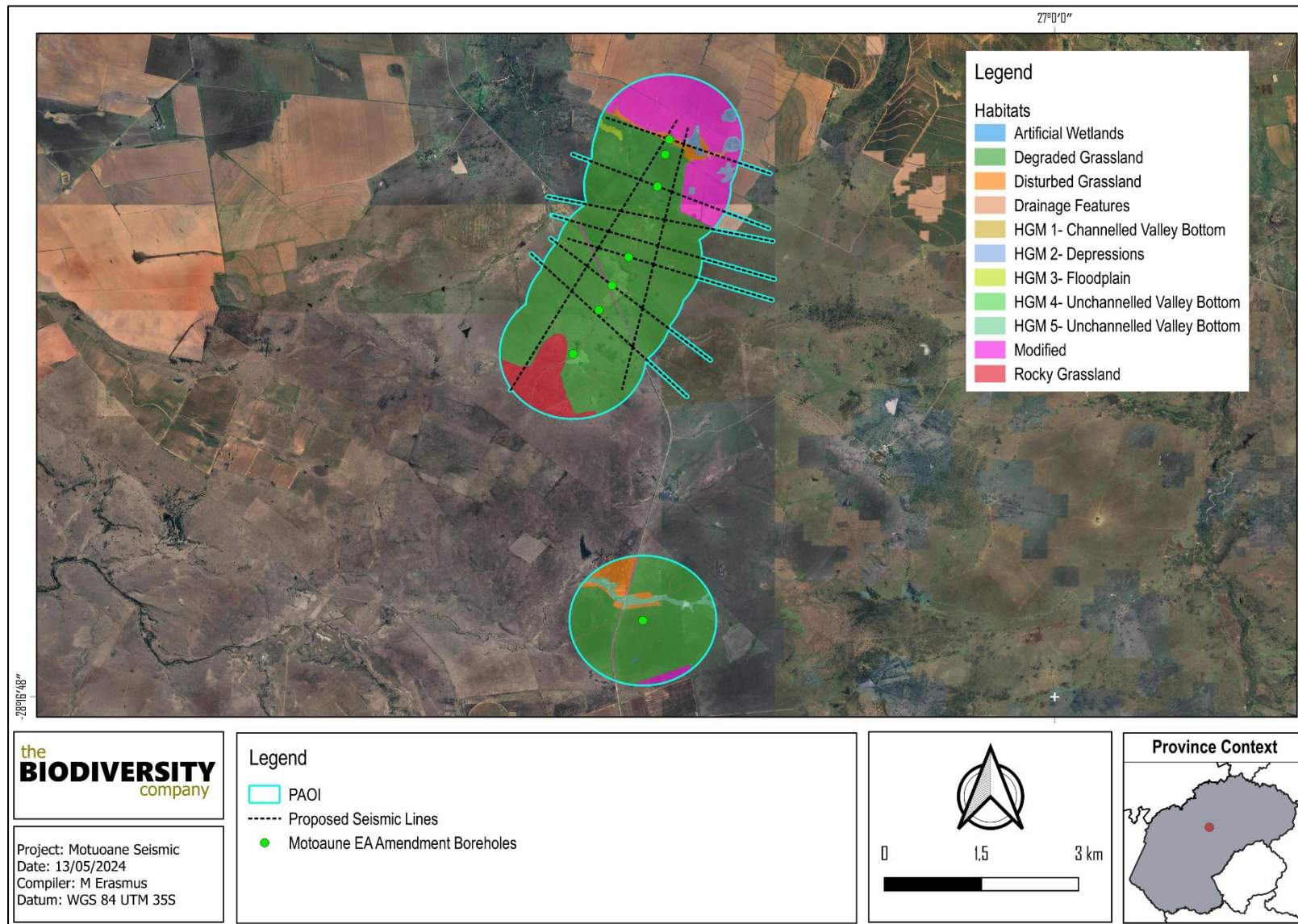


Figure 4-1 Photographs illustrating the rocky grassland habitat type delineated within the Project Area of Influence.

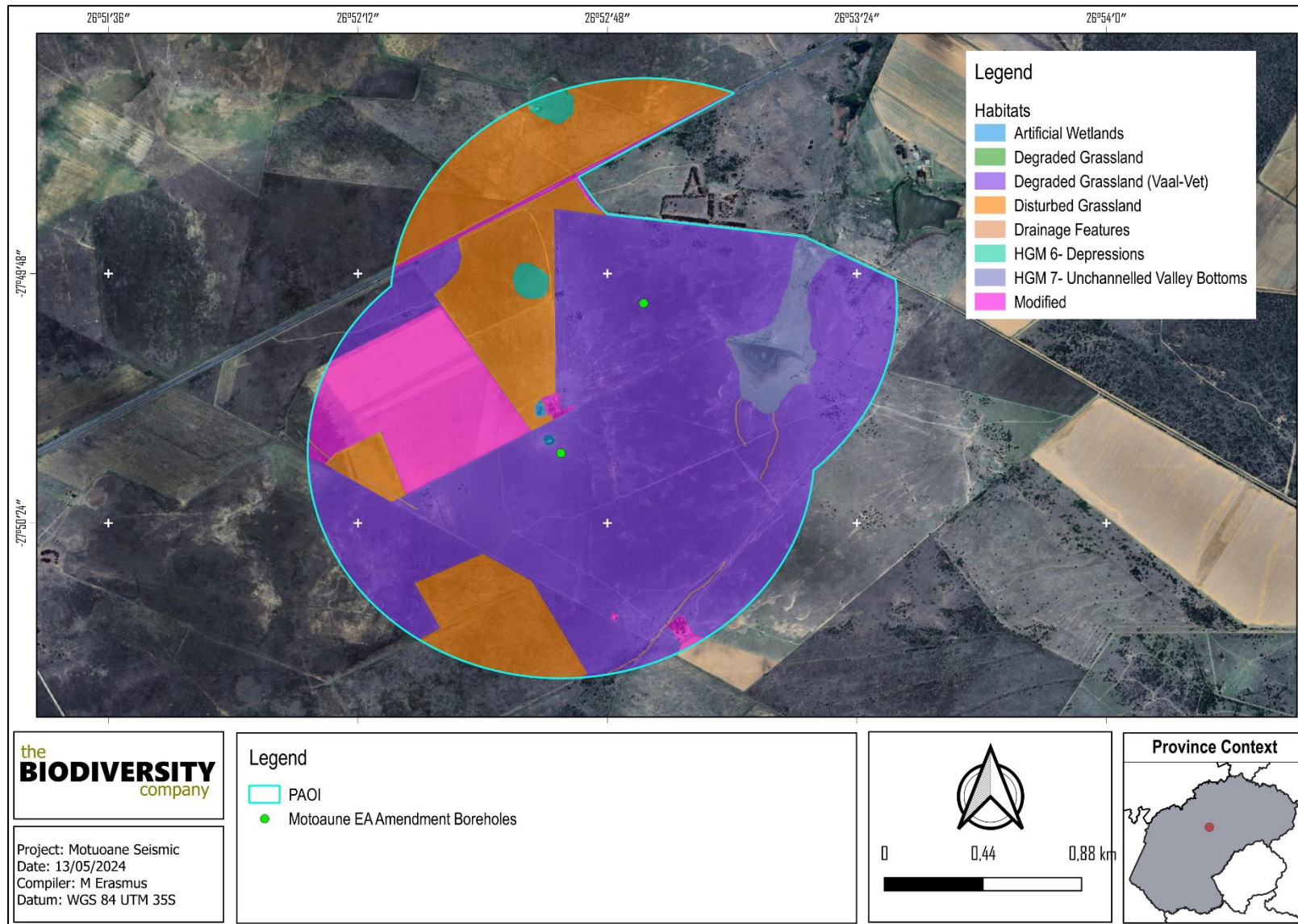


Figure 4-2 Photographs illustrating the rocky grassland habitat type delineated within the Project Area of Influence.



Figure 4-3 *Photographs illustrating the rocky grassland habitat type delineated within the Project Area of Influence.*



Figure 4-4 *Photographs illustrating an example of a water resource habitat type delineated within the Project Area of Influence.*



Figure 4-5 *Photographs illustrating the disturbed Grassland habitat type delineated within the Project Area of Influence.*



Figure 4-6 *Photographs illustrating the degraded grassland habitat type delineated within the PAOI.*



Figure 4-7 *Photographs illustrating the degraded Vaal Vet Sandy grassland habitat type delineated within the PAOI.*



Figure 4-8 *Photographs illustrating the modified habitat type delineated within the Project Area of Influence.*

Table 4-1 *Summary of habitat types delineated within field assessment area of project area.*

Habitat	Description and condition	Ecosystem Processes and Services
Rocky Grassland	This habitat includes areas that are stony and rocky ridges/hills with varying slopes and bedrock protruding from the soil layer. The current ecological condition of this habitat regarding the main driving forces, are intact, only being slightly disturbed by edge effect and infringement. The intact state is evident in the amount and importance of the species recorded in the faunal assessment; and the high species diversity and number of plant species recorded. Current human infringement occurs, especially in areas close to roads, however it is limited.	The rocky grassland habitat is used by faunal species as fine-scale habitats and is important for several life stages. These habitats can be considered as ecological hotspots being an important habitat for fauna and flora, especially plants as well as reptiles. This habitat forms part of a unique landscape within the region and provides refugia, food and a more natural environment. The unit also serves as a movement corridor for fauna within a landscape fragmented. Contributes as viable CBA
Water Resources	Impacted permanently to seasonally wet portions of land as delineated by the wetland specialist. Even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system locally and regionally and an important habitat for various fauna and flora.	Provides surface water resources within the landscape. Aids in trapping sediment and nutrients carried by surface runoff. Corridor for fauna dispersion within the landscape and important foraging and nesting habitat.
Disturbed Grassland	The habitat isn't entirely modified but in a constant disturbed state and can't recover to a more natural state due to historic and ongoing disturbances and impacts received from grazing, edge effects from land use and mismanagement.	Provides limited grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. Important corridor for fauna dispersion within the landscape. The areas may be used as a movement corridor and in many cases form a barrier between the more degraded and the modified areas.
Degraded Grassland	Degraded Grassland habitat type is regarded as semi-natural, but disturbed due to fragmentation, grazing by livestock and human infringement in areas close to roads. The condition difference within this habitat depends on the extent of the disturbance in some areas being more severe, usually related to one being more overgrazed than the other. Variable in the presence or absence of Woody species and shrub density. Semi-natural, but slightly disturbed due to the grazing by livestock and also human infringement. including woody plant species in form of trees and shrubs.	The current ecological condition of this habitat, regarding the driving forces, are inconsistent due to the different land uses Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. Important corridor for fauna dispersion within the landscape. Supports SCCs.
Modified	The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current agriculture, roads and mismanagement. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.	The ecological services provided by this habitat are limited due to the extensive cover of impermeable surfaces and the large amount of bare land. Locally common bird species will forage and nest in the larger trees, and parts of the area may be considered a movement corridor.

Table 4-2 *SEI of habitat types delineated within field assessment area of project area.*

Habitat Type	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Project Component relation in to habitat type	Receptor Resilience (RR)	Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities
Rocky Grassland HGM 1- Channled Valley Bottom	<u>Medium</u> > 50% of receptor contains natural habitat with potential to support SCC.	<u>Medium</u> Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential	Medium	Seismic Transect and drilling wells	<u>Low</u> Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality.	<u>High</u> Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Degraded Grassland (Vaal Vet Sandy Grassland)	<u>Medium</u> > 50% of receptor contains natural habitat with potential to support SCC. Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	<u>High</u> Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.	Medium	Area outside 50 meters of drilling well	<u>Low</u> Species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.	<u>High</u> Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
				Within 50 m of the drill site	<u>Medium</u> Species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.	<u>Medium</u>
Degraded Grassland HGM 2- Depression	<u>Medium</u> > 50% of receptor contains natural habitat with potential to support SCC.	<u>Medium</u> Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential	Medium	Clearing of seismic transect road	<u>Low</u> Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality.	<u>High</u> Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
			Medium	2 track roads over the surface and drilling wells	<u>Medium</u> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	<u>Medium</u>

Habitat Type	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Project Component relation in to habitat type	Receptor Resilience (RR)	Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities
Disturbed Grassland Drainage Features	Low < 50% of receptor contains natural habitat with limited potential to support SCC.	Medium Larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Low	Seismic Transect and drilling wells	Medium	Low
Modified	Very Low No natural habitat remaining.	Very Low Several major current negative ecological impacts.	Very Low	Seismic Transect and drilling wells	Medium	<u>Very Low</u>

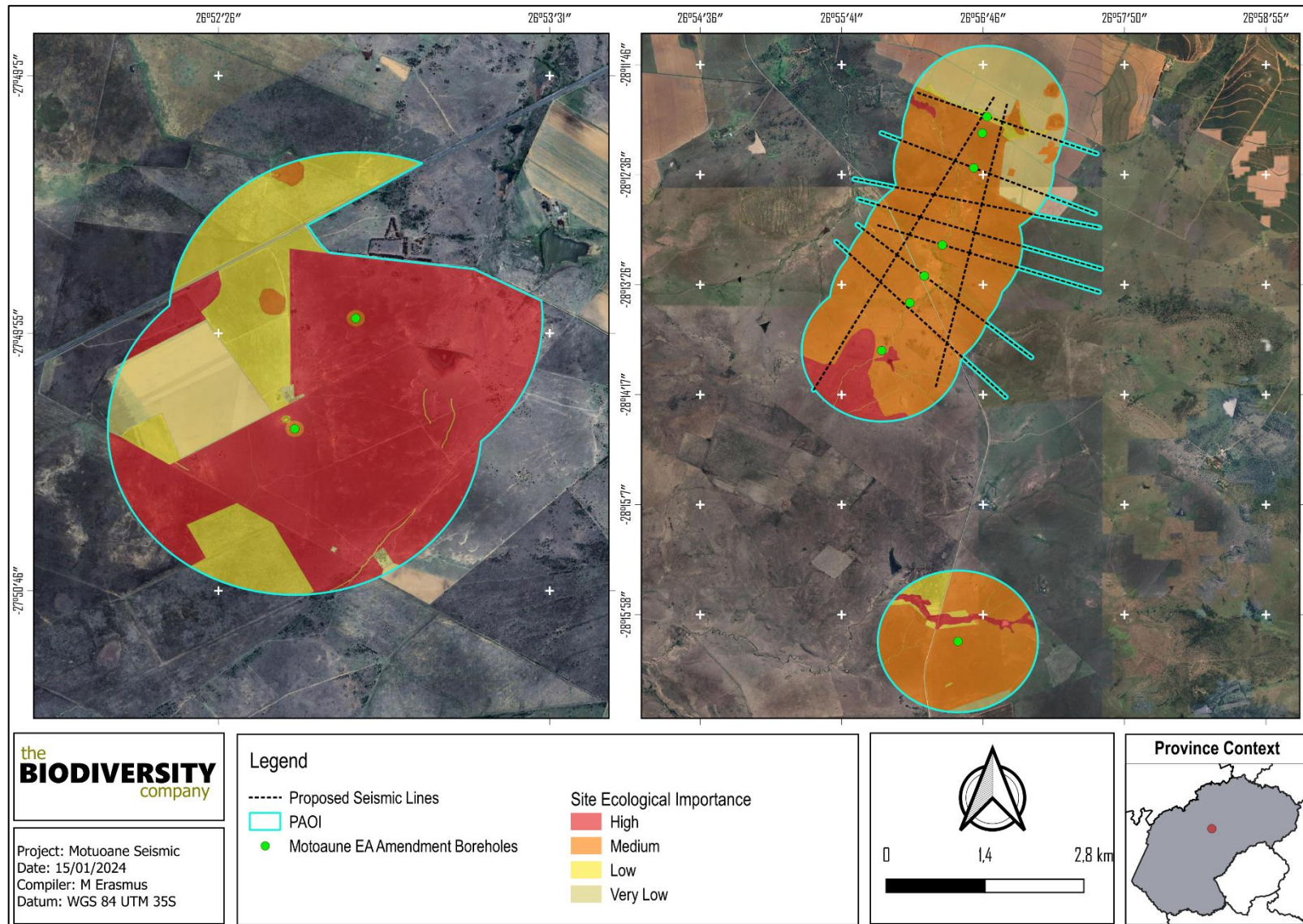


Figure 4-9 Site Ecological Importance of the PAOI.

4.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall Project Area in Table 4-3 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. The screening tool terrestrial theme sensitivity can be seen in below.

Table 4-3 *Summary of the screening tool vs. specialist assigned sensitivities.*

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	Medium	High	Validated – Certain habitats are generally intact, and SCC were recorded. Avifauna SCC may forage in specific areas. use. Sensitive species 15 recorded
Plant Theme	Low	Low	Validated - The composition, species diversity and number of plant species recorded.
Terrestrial Theme	Very High	Very Low-High	Disputed – Certain habitat sensitivities are regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area being more fragmented locally, this is however not for the entire PAOI.

5 Impact Assessment

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the project area, specifically the proposed development footprint area. The relevant impacts were then subjected to a prescribed impact assessment methodology. The details of this methodology can be provided on request.

Impacts were assessed in terms of the construction/operational phases. Mitigation measures were only applied to impacts deemed relevant based on the impact analysis and can be seen in section 6.

5.1 Impact Assessment Methodology

An impact assessment methodology was provided by EIMS to determine the environmental risk associated with various aspects related to the proposed activities. This impact assessment takes the following components into consideration.

- The nature of the associated impact (positive or negative);
- The extent of the proposed activities;
- The duration of the proposed activities;
- The magnitude of the effects caused by the proposed activities;
- The reversibility of associated impacts; and
- The probability of relevant aspects affecting sensitive receptors.

Each one of the above-mentioned components are given a rating, which cumulatively provides the specialist with a pre-mitigation environmental risk rating. These components are then scored again taking into consideration mitigating factors. The cumulative impact and irreplaceable loss to sensitive receptors are then scored to ultimately indicate a “Priority Factor” score.

5.2 Current Impacts

The current impacts observed during surveys are listed below. Photographic evidence of a selection of these impacts is shown in Figure 5-1.

- Fences;
- Overgrazing and trampling of natural vegetation and wetlands by livestock;
- Farm roads and highways (and associated traffic and wildlife road mortalities);
- Erosion;
- Unregulated burning
- Alien and/or Invasive Plants (AIP);
- Servitudes and infrastructure (powerlines)
- Vegetation removal

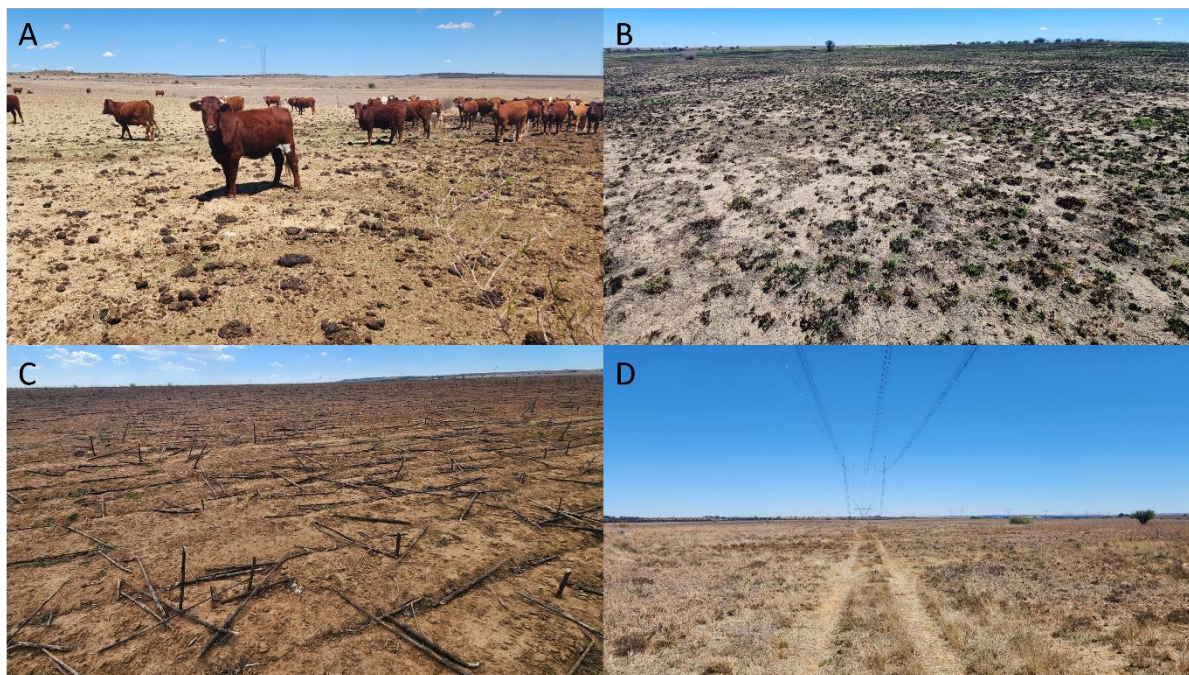


Figure 5-1 *Negative impacts identified across the project area: A) Livestock, B) Unmanaged burns C) modification and D) Existing OHLs and their servitudes.*

5.3 Anticipated Impacts

The impacts anticipated for the proposed activities are considered in order to predict and quantify these impacts and assess & evaluate the magnitude on the identified terrestrial biodiversity (Table 5-1).

Table 5-1 *Anticipated impacts for the proposed activities on terrestrial biodiversity*

Main Impact	Project activities that can cause loss of habitat (especially with regard to the potential clearing of roads):	Secondary impacts anticipated
1. Destruction, fragmentation and degradation of habitats and ecosystems	Physical removal of vegetation	Displacement/loss of flora & fauna (including SCC) Increased potential for soil erosion Habitat fragmentation Increased potential for establishment of alien & invasive vegetation
	Access roads and servitudes	
	Soil dust precipitation	
	Leakages	
	Dumping of waste products	
	Random events such as fire (cooking fires or cigarettes)	
Main Impact	Project activities that can cause the spread and/or establishment of alien and/or invasive species	Secondary impacts anticipated
2. Spread and/or establishment of alien and/or invasive species	Vegetation removal	Habitat loss for native flora & fauna (including SCC) Spreading of potentially dangerous diseases due to invasive and pest species Alteration of fauna assemblages due to habitat modification
	Vehicles potentially spreading seed	
	Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents	
	Creation of infrastructure suitable for breeding activities of alien and/or invasive birds	
Main Impact	Project activities that can cause the Direct mortality of fauna	Secondary impacts anticipated
3. Direct mortality of fauna	Clearing of vegetation	Loss of ecosystem services Increase in rodent populations and associated disease risk
	Roadkill due to vehicle collision	
	Pollution of water resources due to dust effects, chemical spills or hydrocarbon leakages	

Main Impact	Project activities that can cause reduced dispersal/migration of fauna	Secondary impacts anticipated
4.. Reduced dispersal/migration of fauna	Loss of landscape used as corridor	Loss of ecosystem services Reduced plant seed dispersal
	Compacted roads	
	Removal of vegetation	
	Light, noise and dust disturbance	
Main Impact	Project activities that can cause pollution in water courses and the surrounding environment	Secondary impacts anticipated
5. Environmental pollution due to water/ mine drainage runoff	Chemical (organic/inorganic) spills	Faunal mortality (direct and indirectly) Groundwater pollution Loss of ecosystem services
	Erosion	
Main Impact	Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance and dust.	Secondary impacts anticipated
6. Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and light pollution.	Operation of machinery (Large earth moving machinery, generators)	Loss of ecosystem services
	Vehicles	
Main Impact	Project activities that can cause staff to interact directly with potentially dangerous fauna	Secondary impacts anticipated
8. Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	All unregulated/supervised activities outdoors	Harm to fauna and/or staff

5.4 Unplanned Events

The planned activities will have anticipated impacts as discussed; however, unplanned events may occur on any project and may have potential impacts which will need management.

Table 5-2 is a summary of the findings of an unplanned event assessment from a terrestrial ecology perspective. Note, not all potential unplanned events may be captured herein, and this must therefore be managed throughout all phases according to recorded events.

Table 5-2 Summary of unplanned events for terrestrial biodiversity

Unplanned Event	Potential Impact	Mitigation
Hydrocarbon spills into the surrounding environment	Contamination of habitat as well as water resources associated with spillage.	A spill response kit must be available at all times. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations.
Fire	Uncontrolled/unmanaged fire that spreads to the surrounding natural grassland and wetlands	Appropriate/Adequate fire management plan need to be implemented.

5.4.1 Alternatives Considered

- No Alternatives were considered.

5.5 Loss of Irreplaceable Resources

The proposed activities will be conducted over the several habitats. These areas encompass indigenous vegetation that may be considered largely functional in nature and as such any irresponsible and/or medium to high impact activities will likely result in the loss of the following resources:

- CBA 1 and 2;
- SCC fauna species (through direct mortality during clearing and construction activities);

5.6 Assessment of Impact Significance

5.6.1 Construction/Operational Phase

The following potential impacts on the biodiversity were considered for the construction/operational phase of the project. Due to the nature of the project, only one phase of impacts is expected, and refers to the period during which the seismic studies are conducted. This phase usually has the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered.

5.6.1.1 Destruction, further loss and fragmentation of the vegetation community

Through potential site clearing, more of the vegetation communities will be lost. Unmitigated, this will also lead to habitat fragmentation and the establishment of alien invasive species as well as soil erosion.

Activities that will contribute to this impact:

- Driving/moving outside of designated areas;
- Physical removal of vegetation;
- Temporary site establishment (laydown, chemical toilets etc.);
- Soil dust precipitation as a result of site establishment;
- Dumping of waste products;
- Hydrocarbon storage and leakages; and
- Random events such as fire (cooking fires or cigarettes).

5.6.1.1.1 Cumulative Impacts

- Further loss of vegetation type;

5.6.1.1.2 Irreplaceable Loss of Resources

- Loss of CBA.

5.6.1.2 Introduction of alien species, especially plants

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. It can also contribute to the spreading of potentially dangerous diseases due to invasive - and pest species. Overall, the fauna assemblage will be changed. Activities that will contribute to this impact:

- Vegetation removal and disturbance of soil;
- Vehicles potentially spreading seed;
- Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive; and
- Eating area increasing pest species such as rats and flies.

5.6.1.2.1 Cumulative Impacts

- Loss of habitat for indigenous species; and
- Spread of disease to surrounding areas.

5.6.1.2.2 Irreplaceable Loss of Resources

- Loss of CBA habitat.

5.6.1.3 Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).

Faunal community will be influenced in a number of ways, including the loss of habitat, disturbances that will either make them move out of the area if possible or have to adapt and possible deaths due to physical harm or indirect harm. Activities that will contribute to this impact:

- Clearing of vegetation;
- Roadkill due to vehicle collision;
- Pollution of water resources due to dust effects and run-off;
- Intentional killing of fauna for food (hunting) or otherwise (killing of snakes);
- Disease caused by increased dust levels;
- Increase in pest species in the area due to new food source created; and
- Vibrations and noise due to the proposed activities.

5.6.1.3.1 Cumulative Impacts

- Loss of habitat for indigenous species.

5.6.1.3.2 Irreplaceable Loss of Resources

- Loss of faunal SCCs.

5.6.1.4 Potential leaks, discharges, pollutant from machinery and storage leaching into the surrounding environment.

Hydrocarbons leaching into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species. This will also result in the contamination of the topsoil and reduce the likelihood of successful rehabilitation of an area.

Activities that will contribute to this impact:

- Loss of vegetation; and
- Loss of topsoil.

5.6.1.4.1 Cumulative Impacts

- Loss of usable water resources for fauna species; and
- Loss of viable habitat.

5.6.1.4.2 Irreplaceable Loss of Resources

- Loss of usable water resources for fauna species resulting in loss of SCC and other species.

5.6.2 Closure Phase

This phase will initially involve the rehabilitation of any cleared/disturbed areas, seismic studies has been completed.

5.6.2.1 Continued encroachment of an indigenous and vegetation community by alien invasive plant species as well as erosion due to disturbed soils

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss. Activities that will contribute to this impact:

- Vehicles potentially spreading seed;

5.6.2.1.1 Cumulative Impacts

- Loss of habitat; and
- Loss of indigenous flora species due to competition.

5.6.2.1.2 Irreplaceable Loss of Resources

- Loss of habitat and food sources for Fauna SCCs.

5.6.2.2 Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).

- Habitat loss; and
- The disruption of natural faunal movement corridors

5.6.2.2.1 Cumulative Impacts

- Loss of suitable habitat.

5.6.2.2.2 Irreplaceable Loss of Resources

- Loss of faunal SCCs.

5.7 No-Go Scenario

The current land use is predominantly agriculture and livestock grazing and the associated impacts caused by this to the terrestrial ecology is considered to be medium. If the land use is well managed, then the long-term impacts to the local ecology will continue to be low - this will require that grazing areas are rotated, grazing capacities are sustained, and stocking densities are controlled. Under the current circumstances, the 'no-go' alternative is considered to represent a low-medium long-term negative impact on the environment. However, it is noted that if the current land uses are left unmanaged for the foreseeable future, it is probable that the ecological integrity and functioning of the grassland area will deteriorate.

Table 5-3 Assessment of significance of impacts on the terrestrial fauna and flora associated with the construction phase.

Identifier	Impact	Pre-mitigation ER	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
Construction/Operational Phase								
5,6,1,1	Destruction, further loss and fragmentation of the vegetation community	-12	-5.25	High	2	2	1.25	-6.56
Mitigation	<ul style="list-style-type: none"> Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be avoided where possible, otherwise minimized. All activities must be restricted within the very low-medium sensitivity areas. No further loss of high sensitivity areas and associated buffers should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. Minimise vegetation clearing to the minimum required. Areas should be cleared and disturbed on a needs basis only, as opposed to clearing and disturbing a number of sites simultaneously. Vegetation clearing to commence only after the necessary permits have been obtained. All construction/operational and access must make use of the existing roads as much as possible, the creation of new roads should be avoided; <ul style="list-style-type: none"> The seismic transect lines should not be cleared for roads, all vehicles should use existing roads as much as possible, however 2 track roads over the surface are acceptable. Make use of existing roads to crossing the wetlands and drainage features. Crossing of these features should only be considered in the dry season (April-August) All laydown, chemical toilets etc. should be restricted to Very Low SEI areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No permanent structures should be permitted sites. No storage 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. This will also reduce the likelihood of encroachment by alien invasive plant species Any cleared/disturbed footprints to be rehabilitated after phase is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type <ul style="list-style-type: none"> Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. A fire action plan needs to be complied and implemented to restrict the impact unplanned fires might have on the surrounding areas. 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 The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into highly sensitive areas and the surrounding environments, i.e the wetlands and High SEI areas; <ul style="list-style-type: none"> Signs must be put up to enforce this 							
5,6,1,2	Introduction of alien species, especially plants	-12	-3.5	High	1	1	1.00	-3.5
Mitigation	<ul style="list-style-type: none"> 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 Compile and implement a Solid Waste Management Plan. Waste management must be a priority and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis as a minimum. 							
5,6,1,3	Displacement of faunal community (including SSCs) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	-16	-6	High	1	2	1.13	-6,75
Mitigation	<ul style="list-style-type: none"> Any access or activity in the Nooitgedact and Wildskamp drilling wells areas are to be restricted to existing roads, and within 50 m of the provided well location. If possible, the well should be drilling in the centre of the existing jeep (2 track) road. The custodian for sensitive species 15 (Endangered Wildlife Trust (EWT)) must be informed of the presence of the species. A 							

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	<p>walkdown by a suitable specialist (EWT) should be done in the area surrounding the two northern drilling wells (Nooitgedacht M2 and Wildskamp 5); prior to any activities, mainly to confirm that SCCS are not present or will be harmed</p> <ul style="list-style-type: none"> Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories. 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 No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this. The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna Prior to commencing work each day, two individuals should traverse the working area in order to disturb any fauna and so they have a chance to vacate. Road users and contractors to undergo/receive Environmental Awareness Training. Discussions/training must include: <ul style="list-style-type: none"> Speed limits (speed limit of maximum 40 km/h to avoid collisions) General rules of road use, not limited to avoiding the widening of the road and environmental sensitivity of surrounding habitat Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons. <ul style="list-style-type: none"> Activities should take place during the day <i>Eupodotis caerulea</i> (Korhaan, Blue) breed from September to February, the project must avoid this period. Any holes/deep excavations must be done in a progressive manner on a needs basis only. No holes/excavations may be left open overnight. In the event holes/excavations are required to remain open overnight, these areas must be covered to prevent fauna falling into these areas and subsequently inspected prior to backfilling. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and dumps especially. No non-environmentally friendly suppressants may be used as this could result in pollution of the environment, especially water sources 							
5,6,1,4	Potential leaks, discharges, pollutant from machinery and storage leaching into the surrounding environment.	-14	-4	High	1	2	1.13	-4.50
Mitigation	<ul style="list-style-type: none"> A hydrocarbon 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 Inspect vehicles and machinery on a daily basis for fuel and oil leakages and repair such. All mine vehicles to have spill kits to absorb medium sized oil or fuel spills <ul style="list-style-type: none"> Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair Litter, spills, fuels, chemicals and human waste in and around the project area must be reduced as much as possible 							
Rehab and Closure								
5,6,2,1	Continued encroachment of an indigenous and vegetation community by alien invasive plant species as well as erosion due to disturbed soils	-9	-3.5	Medium	2	2	1.25	-4.38
Mitigation	<ul style="list-style-type: none"> All access must make use of the existing roads as much as possible, the creation of new roads should be limited. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation, to rehabilitate as well as prevent erosion. There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas 							
5,6,2,2	Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).	-8.25	-3.5	Medium	1	2	1.13	-3.94

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Mitigation	<ul style="list-style-type: none"> • All access must make use of the existing roads as much as possible, the creation of new roads should be limited. • All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions • Any excavations should not be left open. Limiting the closure and rehabilitation activities to the footprint areas only. Avoid entry/access to previously undisturbed or already rehabilitated areas.
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6 Conclusion and Impact Statement

6.1 Conclusion

The project area has been altered both currently and historically. The current agricultural and livestock as well as other land uses have had an impact on both the fauna and the flora in the area with degraded Vaal-Vet Sandy Grassland, rocky grassland and water resource habitats still present being impacted on in some way or another. These habitat units can be regarded as important, not only within the within the local landscape, but also regionally; as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by agriculture and mining to more natural areas where they may reproduce. The habitat sensitivity of these habitats is regarded as high, due to floral and faunal species recorded as well as the role of this intact habitat to biodiversity within a very fragmented local landscape, not to mention the sensitivity according various ecological datasets, the very high and high sensitivity areas still:

- Serve as and represent CBA1 and 2, as identified by the conservation plan;
- Serves as a viable, functional constituent of a EN ecosystem;
- Serve as NPAES;
- Serve as important water resources; and
- Support various organisms, including SSCs and may play an important role in the ecosystem if left to recover from the superficial impacts;

The completion of the terrestrial biodiversity assessment confirmed the sensitivity of the project area and therefore corroborates the screening report in regard to the degraded Vaal-Vet Sandy Grassland, rocky grassland and water resource habitats. The ecological integrity, importance and functioning of these areas play a crucial role and an important habitat for various fauna and flora. The preservation of this systems is the most important aspect to consider for the proposed project, even more so due to the sensitivity of the areas. These habitats need to be protected and improved due to the role of this crucial and limited habitat.

Sensitive species 15 was recorded present in the two northern section wells (Nooitgedacht M2 and Wildskamp 5); considering the 'superficial' project components and nature (drilling wells), and assuming that avoidance mitigation, informing of the custodian and walkdown mitigation outlined will be strictly followed, no buffers were added to this species' population in order to avoid any opportunity to divulge their location.

6.2 Impact Statement

The main expected impacts of the proposed infrastructure will include the following:

- Habitat loss and fragmentation;
- Degradation of surrounding habitat;
- Disturbance and displacement caused during the construction and maintenance phases; and
- Direct fauna mortality during the construction phase.

There are areas within the PAOI that possess a 'High' SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design and activity to limit the amount of habitat impacted. The maintenance of basal vegetation cover is important for the project, so complete clearance of roads for activities is not recommended. Project planning according to mitigation may provide favourable avoidance mitigation. Considering the above-mentioned information, no fatal flaws are evident for the proposed project. It is the opinion of the specialists that

the proposed project, may be favourably considered on condition that all prescribed mitigation measures and supporting recommendations are implemented.

The exploration project is expected to have an overall low residual impact. If mitigation measures as described in this report in addition to the existing EMPs are implemented, it will reduce the significance of the risk to an acceptable level.

7 References

- Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J & de Villiers, M.S. (Eds). 2014. Atlas and Red List of Reptiles of South Africa, Lesotho and Swaziland. Suricata 1. South African Biodiversity Institute, Pretoria.
- Beatty, B., Macknick, J., McCall, J. and Braus, G. 2017. Native Vegetation Performance under a Solar PV Array at the National Wind Technology Center. National Renewable Energy Laboratory. Technical Report No: NREL/TP-1900-66218
- BGIS (Biodiversity GIS). (2017). <http://bgis.sanbi.org/>
- BODATSA-POSA. (2021). Plants of South Africa - an online checklist. POSA ver. 3.0. <http://newposa.sanbi.org/>.
- Boycott, R. and Bourquin, R. 2000. The Southern African Tortoise Book – A Guide to Southern African Tortoises, Terrapins and Turtles. Revised Edition. Hilton.
- Branch, W.R. (1998). Field Guide to Snakes and Other Reptiles of Southern Africa. Struik, Cape Town.
- Du Preez, L. & Carruthers, V. (2009) A Complete Guide to the Frogs of Southern Africa. Struik Nature, Cape Town.
- EWT. (2016). Mammal Red List 2016. www.ewt.org.za
- Fish, L., Mashau, A.C., Moeaha, M.J. & Nembudani, M.T. (2015). Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions. SANBI, Pretoria.
- FitzPatrick Institute of African Ornithology. 2023a. FrogMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=FrogMAP>
- FitzPatrick Institute of African Ornithology. 2023b. ReptileMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=ReptileMAP>
- FitzPatrick Institute of African Ornithology. 2023c. MammalMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=MammalMAP>
- IUCN. (2021). The IUCN Red List of Threatened Species. www.iucnredlist.org
- Johnson, S. & Bytebier, B. (2015). Orchids of South Africa: A Field Guide. Struik publishers, Cape Town.
- Mouton, P. Le F. N (2008). Proposed Wind energy facility and associated infrastructure: Terrestrial Fauna. Eskom
- Mucina, L. & Rutherford, M.C. (Eds.). 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria, South African.
- Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). 2007. Vegetation map of South Africa, Lesotho and Swaziland. 1:1 000 000 scale sheet maps. 2nd ed. South African National Biodiversity Institute, Pretoria.
- Nemai (2019). Botanical survey at ESKOM Skaapvlei substation included in the west coast group of battery energy storage system (BESS) project, Western Cape Province.
- Nick Holme Botanical Surveys (2007). Specialist Impact Assessment for proposed ESKOM wind facility on the cape west coast: terrestrial vegetation component.
- Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Raimonde, D. (2009). Red list of South African Plants. SANBI, Pretoria.

SADAP (South Africa Protected Areas Database) and SACAD (South Africa Conservation Areas Database) (2023). <http://egis.environment.gov.za>

SANBI-BGIS. 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning.

Sinha, P., Hoffman, B., Sakers, J. & Althouse, L. 2018. Best practices in responsible land use for improving biodiversity at a utility-scale solar facility. *Case Studies in the Environment* 2(1): 1–12. <https://doi.org/10.1525/cse.2018.001123>

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

Van Deventer, H., Smith-Adao, L., Collins, N.B., Grenfell, M., Grundling, A., Grundling, P-L., Impson, D., Job, N., Lötter, M., Ollis, D., Petersen, C., Scherman, P., Sieben, E., Snaddon, K., Tererai, F. and Van der Colff D. 2019. *South African National Biodiversity Assessment 2018: Technical Report*. Volume 2b: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20.500.12143/6230>.

Van Deventer, H., Smith-Adao, L., Mbona, N., Petersen, C., Skowno, A., Collins, N.B., Grenfell, M., Job, N., Lötter, M., Ollis, D., Scherman, P., Sieben, E. & Snaddon, K. 2018. South African National Biodiversity Assessment 2018: Technical Report. Volume 2a: South African Inventory of Inland Aquatic Ecosystems (SAIIAE). Version 3, final released on 3 October 2019. Council for Scientific and Industrial Research (CSIR) and South African National Biodiversity Institute (SANBI): Pretoria, South Africa.

8 Appendix Items

8.1 Appendix A – Flora species expected to occur in the project area.

Family	Taxon	Author	IUCN	Ecology
Malvaceae	<i>Abutilon galpinii</i>	A.Meeuse	LC	Indigenous
Malvaceae	<i>Abutilon</i> sp.			
Cucurbitaceae	<i>Acanthosicyos naudinianus</i>	(Sond.) C.Jeffrey	LC	Indigenous
Amaranthaceae	<i>Achyranthes aspera</i> var. <i>aspera</i>	L.		Not indigenous; Naturalised
Amaranthaceae	<i>Achyranthes aspera</i> var. <i>sicula</i>	L.		Indigenous
Cyperaceae	<i>Afroscirpoides dioeca</i>	(Kunth) Garcia-Madr.		Indigenous; Endemic
Poaceae	<i>Agrostis lachnantha</i> var. <i>lachnantha</i>	Nees	LC	Indigenous
Amaranthaceae	<i>Alternanthera sessilis</i>	(L.) DC.		Not indigenous; Naturalised; Invasive
Amaranthaceae	<i>Amaranthus hybridus</i> subsp. <i>hybridus</i>	L.		Not indigenous; Naturalised
Amaranthaceae	<i>Amaranthus thunbergii</i>	Moq.	LC	Indigenous
Anacampserotaceae	<i>Anacampseros filamentosa</i> subsp. <i>filamentosa</i>	(Haw.) Sims		Indigenous; Endemic
Anacampserotaceae	<i>Anacampseros ustulata</i>	E.Mey. ex Fenzl	LC	Indigenous; Endemic
Boraginaceae	<i>Anchusa riparia</i>	A.DC.	LC	Indigenous; Endemic
Poaceae	<i>Andropogon appendiculatus</i>	Nees	LC	Indigenous
Poaceae	<i>Andropogon schirensis</i>	Hochst. ex A.Rich.	LC	Indigenous
Poaceae	<i>Antheophora pubescens</i>	Nees	LC	Indigenous
Rubiaceae	<i>Anthospermum</i> sp.			
Menispermaceae	<i>Antizoma angustifolia</i>	(Burch.) Miers ex Harv.	LC	Indigenous; Endemic
Aponogetonaceae	<i>Aponogeton junceus</i>	Lehm.	LC	Indigenous
Scrophulariaceae	<i>Aptosimum elongatum</i>	(Hiern) Engl.	LC	Indigenous; Endemic
Asteraceae	<i>Arctotis stoechadifolia</i>	P.J.Bergius	LC	Indigenous; Endemic
Poaceae	<i>Aristida adscensionis</i>	L.	LC	Indigenous
Poaceae	<i>Aristida bipartita</i>	(Nees) Trin. & Rupr.	LC	Indigenous
Poaceae	<i>Aristida canescens</i> subsp. <i>canescens</i>	Henrard	LC	Indigenous
Poaceae	<i>Aristida congesta</i> subsp. <i>barbicollis</i>	Roem. & Schult.	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
Poaceae	<i>Aristida junciformis</i> subsp. <i>junciformis</i>	Trin. & Rupr.	LC	Indigenous; Endemic
Poaceae	<i>Aristida meridionalis</i>	Henrard	LC	Indigenous
Poaceae	<i>Aristida stipitata</i> subsp. <i>graciliflora</i>	Hack.	LC	Indigenous
Asteraceae	<i>Artemisia afra</i> var. <i>afra</i>	Jacq. ex Willd.	LC	Indigenous
Apocynaceae	<i>Asclepias meyeriana</i>	(Schltr.) Schltr.	LC	Indigenous; Endemic
Asparagaceae	<i>Asparagus laricinus</i>	Burch.	LC	Indigenous

Asparagaceae	<i>Asparagus setaceus</i>	(Kunth) Jessop	LC	Indigenous
Asparagaceae	<i>Asparagus suaveolens</i>	Burch.	LC	Indigenous
Apocynaceae	<i>Aspidoglossum interruptum</i>	(E.Mey.) Bullock	LC	Indigenous
Aspleniaceae	<i>Asplenium adiantum-nigrum</i> var. <i>adiantum-nigrum</i>	L.	LC	Indigenous
Aspleniaceae	<i>Asplenium aethiopicum</i>	(Burm.f.) Bech.	LC	Indigenous
Aspleniaceae	<i>Asplenium capense</i>	(Kunze) Bir, Fraser-Jenk. & Lovis	LC	Indigenous
Asteraceae	<i>Aster</i> sp.			
Amaranthaceae	<i>Atriplex nummularia</i> subsp. <i>nummularia</i>	Lindl.		Not indigenous; Naturalised; Invasive
Amaranthaceae	<i>Atriplex semibaccata</i>	R.Br.		Not indigenous; Naturalised; Invasive
Amaranthaceae	<i>Atriplex suberecta</i>	I.Verd.	LC	Not indigenous; Naturalised; Invasive
Iridaceae	<i>Babiana hypogaea</i>	Burch.	LC	Indigenous
Acanthaceae	<i>Barleria macrostegia</i>	Nees	LC	Indigenous
Amaranthaceae	<i>Bassia indica</i>	(Wight) A.J.Scott		Not indigenous; Naturalised
Elatinaceae	<i>Bergia</i> sp.			
Asteraceae	<i>Berkheya onopordifolia</i> var. <i>onopordifolia</i>	(DC.) O.Hoffm. ex Burt Davy	LC	Indigenous; Endemic
Asteraceae	<i>Berkheya pinnatifida</i> subsp. <i>stobaeoides</i>	(Thunb.) Thell.	LC	Indigenous; Endemic
Asteraceae	<i>Bidens pilosa</i>	L.		Not indigenous; Naturalised
Acanthaceae	<i>Blepharis squarrosa</i>	(Nees) T.Anderson	LC	Indigenous; Endemic
Fabaceae	<i>Bolusia acuminata</i>	(DC.) Polhill	LC	Indigenous; Endemic
Amaryllidaceae	<i>Boophone disticha</i>	(L.f.) Herb.	LC	Indigenous
Poaceae	<i>Brachiaria eruciformis</i>	(Sm.) Griseb.	LC	Indigenous
Poaceae	<i>Brachiaria nigropedata</i>	(Ficalho & Hiern) Stapf	LC	Indigenous
Poaceae	<i>Brachiaria serrata</i>	(Thunb.) Stapf	LC	Indigenous
Poaceae	<i>Bromus catharticus</i>	Vahl	NE	Not indigenous; Naturalised; Invasive
Poaceae	<i>Bromus leptoclados</i>	Nees	LC	Indigenous
Poaceae	<i>Bromus</i> sp.			
Amaryllidaceae	<i>Brunsvigia radulosa</i>	Herb.	LC	Indigenous; Endemic
Bryaceae	<i>Bryum argenteum</i>	Hedw.		Indigenous
Bryaceae	<i>Bryum dichotomum</i>	Hedw.		Indigenous
Asphodelaceae	<i>Bulbine abyssinica</i>	A.Rich.	LC	Indigenous
Asphodelaceae	<i>Bulbine narcissifolia</i>	Salm-Dyck	LC	Indigenous; Endemic
Cyperaceae	<i>Bulbostylis hispidula</i> subsp. <i>pyriformis</i>	(Vahl) R.W.Haines	LC	Indigenous
Apiaceae	<i>Bupleurum mundtii</i>	Cham. & Schltdl.	LC	Indigenous; Endemic
Fabaceae	<i>Calpurnia sericea</i>	Harv.	LC	Indigenous; Endemic
Cyperaceae	<i>Carex glomerabilis</i>	V.I.Krecz.	LC	Indigenous; Endemic
Cyperaceae	<i>Carex spartea</i>	Wahlenb.		Indigenous
Cyperaceae	<i>Carex uhligii</i>	K.Schum. ex C.B.Clarke		Indigenous

Cannabaceae	<i>Celtis africana</i>	Burm.f.	LC	Indigenous
Poaceae	<i>Cenchrus sphacelatus</i>	(Nees) Morrone	LC	Indigenous
Apocynaceae	<i>Ceropegia differens subsp. grata</i>	Bruyns		Indigenous; Endemic
Solanaceae	<i>Cestrum aurantiacum</i>	Lindl.		Not indigenous; Naturalised; Invasive
Scrophulariaceae	<i>Chaenostoma neglectum</i>	J.M.Wood & M.S.Evans	LC	Indigenous; Endemic
Scrophulariaceae	<i>Chaenostoma patrioticum</i>	(Hiern) Kornhall	LC	Indigenous; Endemic
Verbenaceae	<i>Chascanum pinnatifidum var. pinnatifidum</i>	(L.f.) E.Mey.	LC	Indigenous
Aizoaceae	<i>Chasmatophyllum musculinum</i>	(Haw.) Dinter & Schwantes	LC	Indigenous; Endemic
Pteridaceae	<i>Cheilanthes eckloniana</i>	(Kunze) Mett.	LC	Indigenous
Poaceae	<i>Chloris gayana</i>	Kunth	LC	Indigenous
Poaceae	<i>Chloris pycnothrix</i>	Trin.	LC	Indigenous
Poaceae	<i>Chloris virgata</i>	Sw.	LC	Indigenous
Apiaceae	<i>Choritaenia capensis</i>	Benth.	LC	Indigenous; Endemic
Asteraceae	<i>Chrysocoma sp.</i>			
Asteraceae	<i>Cirsium vulgare</i>	(Savi) Ten.		Not indigenous; Naturalised; Invasive
Cleomaceae	<i>Cleome rubella</i>	Burch.	LC	Indigenous
Peraceae	<i>Clutia natalensis</i>	Bernh.	LC	Indigenous; Endemic
Peraceae	<i>Clutia pulchella var. pulchella</i>	L.	LC	Indigenous
Commelinaceae	<i>Commelina africana var. africana</i>	L.	LC	Indigenous
Commelinaceae	<i>Commelina africana var. lancispatha</i>	L.	LC	Indigenous
Commelinaceae	<i>Commelina livingstonii</i>	C.B.Clarke	LC	Indigenous
Commelinaceae	<i>Commelina subulata</i>	Roth	LC	Indigenous
Nyctaginaceae	<i>Commicarpus pentandrus</i>	(Burch.) Heimerl	LC	Indigenous
Convolvulaceae	<i>Convolvulus boedeckerianus</i>	Peter	LC	Indigenous; Endemic
Asteraceae	<i>Conyza podocephala</i>	DC.		Indigenous; Endemic
Malvaceae	<i>Corchorus aspleniifolius</i>	Burch.	LC	Indigenous
Malvaceae	<i>Corchorus schimperi</i>	Cufod.	LC	Indigenous
Apocynaceae	<i>Cordylogyne globosa</i>	E.Mey.	LC	Indigenous; Endemic
Rubiaceae	<i>Cordylostigma virgatum</i>	(Willd.) Groeninckx & Dessein		Indigenous
Caryophyllaceae	<i>Corrigiola litoralis subsp. litoralis</i>	L.	NE	Indigenous
Asteraceae	<i>Cotula anthemoides</i>	L.	LC	Indigenous; Endemic
Acanthaceae	<i>Crabbea angustifolia</i>	Nees	LC	Indigenous; Endemic
Acanthaceae	<i>Crabbea hirsuta</i>	Harv.	LC	Indigenous
Asteraceae	<i>Crassosiphon protecta</i>	(Dinter) B.Nord.	LC	Indigenous; Endemic
Crassulaceae	<i>Crassula corallina subsp. corallina</i>	Thunb.	LC	Indigenous; Endemic
Crassulaceae	<i>Crassula lanceolata subsp. transvaalensis</i>	(Eckl. & Zeyh.) Endl. ex Walp.	LC	Indigenous
Crassulaceae	<i>Crassula nudicaulis var. nudicaulis</i>	L.	LC	Indigenous; Endemic

Crassulaceae	<i>Crassula sp.</i>			
Crassulaceae	<i>Crassula tabularis</i>	Dinter	LC	Indigenous; Endemic
Fabaceae	<i>Crotalaria burkeana</i>	Benth.	LC	Indigenous
Fabaceae	<i>Crotalaria sphaerocarpa subsp. sphaerocarpa</i>	Perr. ex DC.	LC	Indigenous
Fabaceae	<i>Crotalaria virgulata subsp. grantiana</i>	Klotzsch	LC	Indigenous
Cucurbitaceae	<i>Cucumis myriocarpus subsp. myriocarpus</i>	Naudin	LC	Indigenous
Asteraceae	<i>Curio radicans</i>	(L.f.) P.V.Heath	LC	Indigenous; Endemic
Convolvulaceae	<i>Cuscuta campestris</i>	Yunck.		Not indigenous; Naturalised; Invasive
Araliaceae	<i>Cussonia paniculata subsp. sinuata</i>	Eckl. & Zeyh.	LC	Indigenous; Endemic
Commelinaceae	<i>Cyanotis speciosa</i>	(L.f.) Hassk.	LC	Indigenous
Amaranthaceae	<i>Cyathula uncinulata</i>	(Schrad.) Schinz	LC	Indigenous
Poaceae	<i>Cymbopogon caesius</i>	(Hook. & Arn.) Stapf	LC	Indigenous
Poaceae	<i>Cymbopogon marginatus</i>	(Steud.) Stapf ex Burt Davy	LC	Indigenous; Endemic
Poaceae	<i>Cymbopogon pospischilii</i>	(K.Schum.) C.E.Hubb.	NE	Indigenous
Apocynaceae	<i>Cynanchum viminale subsp. viminale</i>	(L.) L.		Indigenous
Poaceae	<i>Cynodon dactylon</i>	(L.) Pers.	LC	Indigenous
Poaceae	<i>Cynodon incompletus</i>	Nees	LC	Indigenous; Endemic
Poaceae	<i>Cynodon transvaalensis</i>	Burt Davy	LC	Indigenous
Cyperaceae	<i>Cyperus capensis</i>	(Steud.) Endl.	LC	Indigenous; Endemic
Cyperaceae	<i>Cyperus decurvatus</i>	(C.B.Clarke) C.Archer & Goetgh.	LC	Indigenous; Endemic
Cyperaceae	<i>Cyperus denudatus</i>	L.f.	LC	Indigenous
Cyperaceae	<i>Cyperus difformis</i>	L.	LC	Indigenous
Cyperaceae	<i>Cyperus eragrostis</i>	Lam.		Not indigenous; Naturalised
Cyperaceae	<i>Cyperus esculentus var. esculentus</i>	L.	LC	Indigenous
Cyperaceae	<i>Cyperus fastigiatus</i>	Rottb.	LC	Indigenous; Endemic
Cyperaceae	<i>Cyperus laevigatus</i>	L.	LC	Indigenous
Cyperaceae	<i>Cyperus longus var. tenuiflorus</i>	L.	NE	Indigenous
Cyperaceae	<i>Cyperus marginatus</i>	Thunb.	LC	Indigenous
Cyperaceae	<i>Cyperus semitrifidus</i>	Schrad.	LC	Indigenous; Endemic
Cyperaceae	<i>Cyperus usitatus</i>	Burch.	LC	Indigenous
Lobeliaceae	<i>Cyphia triphylla</i>	E.Phillips	LC	Indigenous; Endemic
Amaranthaceae	<i>Cyphocarpa angustifolia</i>	(Moq.) Lopr.	LC	Indigenous
Poaceae	<i>Dactyloctenium aegyptium</i>	(L.) Willd.	LC	Indigenous
Aizoaceae	<i>Delosperma sp.</i>			
Asteraceae	<i>Denekia capensis</i>	Thunb.	LC	Indigenous
Apiaceae	<i>Deverra burchellii</i>	(DC.) Eckl. & Zeyh.	LC	Indigenous
Caryophyllaceae	<i>Dianthus basuticus subsp. basuticus</i>	Burt Davy	NE	Indigenous; Endemic
Caryophyllaceae	<i>Dianthus micropetalus</i>	Ser.	LC	Indigenous; Endemic

Acanthaceae	<i>Dicliptera leistneri</i>	K.Balkwill	LC	Indigenous; Endemic
Asteraceae	<i>Dicoma anomala</i> subsp. <i>anomala</i>	Sond.	LC	Indigenous
Urticaceae	<i>Didymodoxa caffra</i>	(Thunb.) Friis & Wilmot-Dear	LC	Indigenous
Poaceae	<i>Digitaria argyrograpta</i>	(Nees) Stapf	LC	Indigenous
Poaceae	<i>Digitaria eriantha</i>	Steud.	LC	Indigenous
Poaceae	<i>Digitaria sanguinalis</i>	(L.) Scop.	NE	Not indigenous; Naturalised
Poaceae	<i>Digitaria tricholaenoides</i>	Stapf	LC	Indigenous; Endemic
Poaceae	<i>Diheteropogon amplexens</i> var. <i>amplexens</i>	(Nees) Clayton	LC	Indigenous
Asteraceae	<i>Dimorphotheca zeyheri</i>	Sond.	LC	Indigenous; Endemic
Ebenaceae	<i>Diospyros austroafricana</i> var. <i>microphylla</i>	De Winter	LC	Indigenous; Endemic
Ebenaceae	<i>Diospyros lycioides</i> subsp. <i>lycioides</i>	Desf.	LC	Indigenous
Hyacinthaceae	<i>Dipcadi longifolium</i>	(Ker Gawl.) Baker	LC	Indigenous
Fabaceae	<i>Dolichos angustifolius</i>	Eckl. & Zeyh.	LC	Indigenous; Endemic
Fabaceae	<i>Dolichos linearis</i>	E.Mey.	LC	Indigenous; Endemic
Hyacinthaceae	<i>Drimia elata</i>	Jacq. ex Willd.	DD	Indigenous
Hyacinthaceae	<i>Drimia</i> sp.			
Dryopteridaceae	<i>Dryopteris inaequalis</i>	(Schltdl.) Kuntze	LC	Indigenous; Endemic
Iridaceae	<i>Duthiastrum linifolium</i>	(E.Phillips) M.P.de Vos	LC	Indigenous; Endemic
Amaranthaceae	<i>Dysphania multifida</i>	(L.) Mosyakin & Clemants		Not indigenous; Naturalised; Invasive
Poaceae	<i>Echinochloa crus-galli</i>	(L.) P.Beauv.	LC	Indigenous
Poaceae	<i>Echinochloa holubii</i>	(Stapf) Stapf	LC	Indigenous
Poaceae	<i>Ehrharta erecta</i> var. <i>natalensis</i>	Lam.	LC	Indigenous; Endemic
Cyperaceae	<i>Eleocharis limosa</i>	(Schrad.) Schult.	LC	Indigenous
Poaceae	<i>Eleusine coracana</i> subsp. <i>africana</i>	(L.) Gaertn.	LC	Indigenous
Poaceae	<i>Eleusine indica</i>	(L.) Gaertn.	LC	Indigenous
Poaceae	<i>Elionurus muticus</i>	(Spreng.) Kunth	LC	Indigenous
Poaceae	<i>Enneapogon desvauxii</i>	P.Beauv.	LC	Indigenous
Poaceae	<i>Enneapogon scoparius</i>	Stapf	LC	Indigenous
Poaceae	<i>Eragrostis barrelieri</i>	Daveau	NE	Not indigenous; Naturalised
Poaceae	<i>Eragrostis bicolor</i>	Nees	LC	Indigenous
Poaceae	<i>Eragrostis biflora</i>	Hack. ex Schinz	LC	Indigenous
Poaceae	<i>Eragrostis capensis</i>	(Thunb.) Trin.	LC	Indigenous
Poaceae	<i>Eragrostis chloromelas</i>	Steud.	LC	Indigenous; Endemic
Poaceae	<i>Eragrostis cilianensis</i>	(All.) Vignolo ex Janch.	LC	Indigenous
Poaceae	<i>Eragrostis curvula</i>	(Schrad.) Nees	LC	Indigenous
Poaceae	<i>Eragrostis gummiflua</i>	Nees	LC	Indigenous
Poaceae	<i>Eragrostis lappula</i>	Nees	LC	Indigenous
Poaceae	<i>Eragrostis lehmanniana</i> var. <i>lehmanniana</i>	Nees	LC	Indigenous

Poaceae	<i>Eragrostis mexicana</i> subsp. <i>virescens</i>	(Hornem.) Link	NE	Not indigenous; Naturalised
Poaceae	<i>Eragrostis micrantha</i>	Hack.	LC	Indigenous
Poaceae	<i>Eragrostis nindensis</i>	Ficalho & Hiern	LC	Indigenous
Poaceae	<i>Eragrostis obtusa</i>	Munro ex Ficalho & Hiern	LC	Indigenous; Endemic
Poaceae	<i>Eragrostis plana</i>	Nees	LC	Indigenous
Poaceae	<i>Eragrostis planiculmis</i>	Nees	LC	Indigenous; Endemic
Poaceae	<i>Eragrostis pseudobtusa</i>	De Winter	NE	Indigenous; Endemic
Poaceae	<i>Eragrostis racemosa</i>	(Thunb.) Steud.	LC	Indigenous
Poaceae	<i>Eragrostis remotiflora</i>	De Winter	LC	Indigenous; Endemic
Poaceae	<i>Eragrostis</i> sp.			
Poaceae	<i>Eragrostis stapfii</i>	De Winter	LC	Indigenous
Poaceae	<i>Eragrostis superba</i>	Peyr.	LC	Indigenous
Poaceae	<i>Eragrostis tef</i>	(Zuccagni) Trotter	NE	Not indigenous; Naturalised
Poaceae	<i>Eragrostis trichophora</i>	Coss. & Durieu	LC	Indigenous
Poaceae	<i>Eriochloa fatmensis</i>	(Hochst. & Steud.) Clayton	LC	Indigenous
Brassicaceae	<i>Erucastrum strigosum</i>	(Thunb.) O.E.Schulz	LC	Indigenous; Endemic
Ebenaceae	<i>Euclea crispa</i> subsp. <i>crispa</i>	(Thunb.) Gurke	LC	Indigenous
Euphorbiaceae	<i>Euphorbia clavarioides</i>	Boiss.	LC	Indigenous; Endemic
Euphorbiaceae	<i>Euphorbia inaequilatera</i>	Sond.	LC	Indigenous
Euphorbiaceae	<i>Euphorbia pulvinata</i>	Marloth	LC	Indigenous; Endemic
Euphorbiaceae	<i>Euphorbia rhombifolia</i>	Boiss.	LC	Indigenous; Endemic
Euphorbiaceae	<i>Euphorbia spartaria</i>	N.E.Br.	LC	Indigenous
Euphorbiaceae	<i>Euphorbia striata</i>	Thunb.	LC	Indigenous; Endemic
Asteraceae	<i>Euryops empetrifolius</i>	DC.	LC	Indigenous; Endemic
Asteraceae	<i>Euryops</i> sp.			
Poaceae	<i>Eustachys paspaloides</i>	(Vahl) Lanza & Mattei	LC	Indigenous
Asteraceae	<i>Felicia burkei</i>	(Harv.) L.Bolus	LC	Indigenous; Endemic
Cyperaceae	<i>Fimbristylis dichotoma</i> subsp. <i>dichotoma</i>	(L.) Vahl	LC	Indigenous
Poaceae	<i>Fingerhuthia africana</i>	Lehm.	LC	Indigenous; Endemic
Phyllanthaceae	<i>Flueggea virosa</i> subsp. <i>virosa</i>	(Roxb. ex Willd.) Royle	LC	Indigenous
Frankeniaceae	<i>Frankenia pulverulenta</i>	L.	LC	Indigenous
Cyperaceae	<i>Fuirena pubescens</i> var. <i>pubescens</i>	(Poir.) Kunth	LC	Indigenous
Rubiaceae	<i>Galium capense</i> subsp. <i>garipense</i>	Thunb.	NE	Indigenous; Endemic
Asteraceae	<i>Garuleum pinnatifidum</i>	(Thunb.) DC.	LC	Indigenous; Endemic
Asteraceae	<i>Gazania krebsiana</i> subsp. <i>krebsiana</i>	Less.	LC	Indigenous
Asteraceae	<i>Geigeria aspera</i> var. <i>aspera</i>	Harv.	LC	Indigenous; Endemic
Asteraceae	<i>Geigeria burkei</i> subsp. <i>burkei</i>	Harv.	NE	Indigenous
Iridaceae	<i>Gladiolus dalenii</i> subsp. <i>dalenii</i>	Van Geel	LC	Indigenous
Iridaceae	<i>Gladiolus ecklonii</i>	Lehm.	LC	Indigenous; Endemic

Iridaceae	<i>Gladiolus permeabilis</i> subsp. <i>edulis</i>	D.Delaroche	LC	Indigenous
Verbenaceae	<i>Glandularia aristigera</i>	(S.Moore) Tronc.		Not indigenous; Naturalised; Invasive
Asteraceae	<i>Gnaphalium filagopsis</i>	Hilliard & B.L.Burt	LC	Indigenous
Thymelaeaceae	<i>Gnidia</i> sp.			
Scrophulariaceae	<i>Gomphostigma virgatum</i>	(L.f.) Baill.	LC	Indigenous
Malvaceae	<i>Grewia flava</i>	DC.	LC	Indigenous
Malvaceae	<i>Grewia occidentalis</i> var. <i>occidentalis</i>	L.	LC	Indigenous
Celastraceae	<i>Gymnosporia buxifolia</i>	(L.) Szyszyl.	LC	Indigenous
Amaryllidaceae	<i>Haemanthus humilis</i> subsp. <i>humilis</i>	Jacq.	LC	Indigenous; Endemic
Asteraceae	<i>Haplocarpha scaposa</i>	Harv.	LC	Indigenous
Asteraceae	<i>Helichrysum cerastioides</i> var. <i>cerastioides</i>	DC.	LC	Indigenous
Asteraceae	<i>Helichrysum nudifolium</i> var. <i>nudifolium</i>	(L.) Less.	LC	Indigenous
Asteraceae	<i>Helichrysum paronychioides</i>	DC.	LC	Indigenous; Endemic
Asteraceae	<i>Helichrysum pumilio</i> subsp. <i>pumilio</i>	(O.Hoffm.) Hilliard & B.L.Burt	LC	Indigenous; Endemic
Asteraceae	<i>Helichrysum zeyheri</i>	Less.	LC	Indigenous; Endemic
Rhamnaceae	<i>Helinus integrifolius</i>	(Lam.) Kuntze	LC	Indigenous
Brassicaceae	<i>Heliophila carnosa</i>	(Thunb.) Steud.	LC	Indigenous
Boraginaceae	<i>Heliotropium lineare</i>	(A.DC.) Gurke	LC	Indigenous
Poaceae	<i>Hemarthria altissima</i>	(Poir.) Stapf & C.E.Hubb.	LC	Indigenous
Malvaceae	<i>Hermannia bicolor</i>	Engl. & Dinter	LC	Indigenous; Endemic
Malvaceae	<i>Hermannia depressa</i>	N.E.Br.	LC	Indigenous
Malvaceae	<i>Hermannia</i> sp.			
Asteraceae	<i>Hertia ciliata</i>	(Harv.) Kuntze	LC	Indigenous; Endemic
Apiaceae	<i>Heteromorpha arborescens</i> var. <i>abyssinica</i>	(Spreng.) Cham. & Schltdl.	LC	Indigenous
Poaceae	<i>Heteropogon contortus</i>	(L.) Roem. & Schult.	LC	Indigenous
Malvaceae	<i>Hibiscus calyphyllus</i>	Cav.	LC	Indigenous
Malvaceae	<i>Hibiscus microcarpus</i>	Garcke	LC	Indigenous
Malvaceae	<i>Hibiscus pusillus</i>	Thunb.	LC	Indigenous
Malvaceae	<i>Hibiscus trionum</i>	L.		Not indigenous; Naturalised
Asteraceae	<i>Hilliardiella capensis</i>	(Houtt.) H.Rob., Skvarla & V.A.Funk		Indigenous
Apocynaceae	<i>Huernia</i> sp.			
Poaceae	<i>Hyparrhenia anamesa</i>	Clayton	LC	Indigenous
Poaceae	<i>Hyparrhenia dregeana</i>	(Nees) Stapf ex Stent	LC	Indigenous
Poaceae	<i>Hyparrhenia hirta</i>	(L.) Stapf	LC	Indigenous
Hypericaceae	<i>Hypericum lalandii</i>	Choisy	LC	Indigenous
Asteraceae	<i>Hypochoeris microcephala</i> var. <i>albiflora</i>	(Sch.Bip.) Cabrera		Not indigenous; Naturalised
Fabaceae	<i>Indigofera alternans</i> var. <i>alternans</i>	DC.	LC	Indigenous
Fabaceae	<i>Indigofera daleoides</i> var. <i>daleoides</i>	Benth. ex Harv.	NE	Indigenous

Fabaceae	<i>Indigofera filipes</i>	Benth. ex Harv.	LC	Indigenous
Fabaceae	<i>Indigofera sessilifolia</i>	DC.	LC	Indigenous; Endemic
Fabaceae	<i>Indigofera torulosa</i> var. <i>angustiloba</i>	E.Mey.	LC	Indigenous; Endemic
Fabaceae	<i>Indigofera zeyheri</i>	Spreng. ex Eckl. & Zeyh.	LC	Indigenous; Endemic
Convolvulaceae	<i>Ipomoea oblongata</i>	E.Mey. ex Choisy	LC	Indigenous
Convolvulaceae	<i>Ipomoea oenotheroides</i>	(L.f.) Raf. ex Hallier f.	LC	Indigenous; Endemic
Convolvulaceae	<i>Ipomoea simplex</i>	Thunb.	LC	Indigenous
Acanthaceae	<i>Isoglossa woodii</i>	C.B.Clarke	LC	Indigenous; Endemic
Scrophulariaceae	<i>Jamesbrittenia albiflora</i>	(I.Verd.) Hilliard	LC	Indigenous; Endemic
Scrophulariaceae	<i>Jamesbrittenia atropurpurea</i> subsp. <i>atropurpurea</i>	(Benth.) Hilliard	LC	Indigenous
Scrophulariaceae	<i>Jamesbrittenia aurantiaca</i>	(Burch.) Hilliard	LC	Indigenous
Scrophulariaceae	<i>Jamesbrittenia stricta</i>	(Benth.) Hilliard	LC	Indigenous; Endemic
Juncaceae	<i>Juncus rigidus</i>	Desf.	LC	Indigenous
Acanthaceae	<i>Justicia orchoides</i> subsp. <i>glabrata</i>	L.f.	LC	Indigenous; Endemic
Crassulaceae	<i>Kalanchoe thyrsiflora</i>	Harv.	LC	Indigenous; Endemic
Achariaceae	<i>Kiggelaria africana</i>	L.	LC	Indigenous
Poaceae	<i>Koeleria capensis</i>	(Steud.) Nees	LC	Indigenous
Cyperaceae	<i>Kyllinga alata</i>	Nees	LC	Indigenous
Cyperaceae	<i>Kyllinga alba</i>	Nees	LC	Indigenous
Verbenaceae	<i>Lantana rugosa</i>	Thunb.	LC	Indigenous
Iridaceae	<i>Lapeirousia plicata</i> subsp. <i>foliosa</i>	(Jacq.) Diels		Indigenous; Endemic
Araceae	<i>Lemna gibba</i>	L.	LC	Indigenous
Fabaceae	<i>Leobordea adpressa</i> subsp. <i>adpressa</i>	(N.E.Br.) B.-E.van Wyk & Boatwr.	LC	Indigenous; Endemic
Brassicaceae	<i>Lepidium bonariense</i>	L.		Not indigenous; Naturalised
Poaceae	<i>Leptochloa fusca</i>	(L.) Kunth	LC	Indigenous
Fabaceae	<i>Lessertia depressa</i>	Harv.	LC	Indigenous; Endemic
Fabaceae	<i>Lessertia frutescens</i> subsp. <i>microphylla</i>	(L.) Goldblatt & J.C.Manning	LC	Indigenous; Endemic
Fabaceae	<i>Lessertia stricta</i>	L.Bolus	LC	Indigenous; Endemic
Linaceae	<i>Linum thunbergii</i>	Eckl. & Zeyh.	LC	Indigenous
Fabaceae	<i>Listia heterophylla</i>	E.Mey.	LC	Indigenous
Fabaceae	<i>Listia marlothii</i>	(Engl.) B.-E.van Wyk & Boatwr.	LC	Indigenous; Endemic
Boraginaceae	<i>Lithospermum hirsutum</i>	E.Mey. ex A.DC.	LC	Indigenous; Endemic
Boraginaceae	<i>Lithospermum scabrum</i>	Thunb.	LC	Indigenous; Endemic
Lobeliaceae	<i>Lobelia erinus</i>	L.	LC	Indigenous
Lobeliaceae	<i>Lobelia sonderiana</i>	(Kuntze) Lammers	LC	Indigenous
Lobeliaceae	<i>Lobelia thermalis</i>	Thunb.	LC	Indigenous
Fabaceae	<i>Lotononis divaricata</i>	(Eckl. & Zeyh.) Benth.	NE	Indigenous; Endemic
Solanaceae	<i>Lycium arenicola</i>	Miers	LC	Indigenous

Solanaceae	<i>Lycium cinereum</i>	Thunb.	LC	Indigenous; Endemic
Solanaceae	<i>Lycium hirsutum</i>	Dunal	LC	Indigenous; Endemic
Solanaceae	<i>Lycium horridum</i>	Thunb.	LC	Indigenous; Endemic
Malvaceae	<i>Malva neglecta</i>	Wallr.		Not indigenous; Naturalised
Malvaceae	<i>Malva pusilla</i>	Sm.		Not indigenous; Naturalised
Scrophulariaceae	<i>Manulea parviflora</i> var. <i>limonioides</i>	Benth.	LC	Indigenous; Endemic
Hyacinthaceae	<i>Massonia jasminiflora</i>	Burch. ex Baker	LC	Indigenous; Endemic
Celastraceae	<i>Maytenus undata</i>	(Thunb.) Blakelock	LC	Indigenous
Poaceae	<i>Melica decumbens</i>	Thunb.	LC	Indigenous; Endemic
Poaceae	<i>Melica racemosa</i>	Thunb.	LC	Indigenous; Endemic
Poaceae	<i>Melinis nerviglumis</i>	(Franch.) Zizka	LC	Indigenous
Poaceae	<i>Melinis repens</i> subsp. <i>repens</i>	(Willd.) Zizka	LC	Indigenous
Lamiaceae	<i>Mentha longifolia</i> subsp. <i>capensis</i>	(L.) Huds.	LC	Indigenous
Lamiaceae	<i>Mentha longifolia</i> subsp. <i>polyadena</i>	(L.) Huds.	LC	Indigenous; Endemic
Aizoaceae	<i>Mestoklema arboriforme</i>	(Burch.) N.E.Br. ex Glen	LC	Indigenous; Endemic
Poaceae	<i>Microchloa caffra</i>	Nees	LC	Indigenous
Mniaceae	<i>Mielichhoferia subnuda</i>	Sim		Indigenous
Phrymaceae	<i>Mimulus gracilis</i>	R.Br.	LC	Indigenous
Iridaceae	<i>Moraea pallida</i>	(Baker) Goldblatt	LC	Indigenous; Endemic
Myrsinaceae	<i>Myrsine africana</i>	L.	LC	Indigenous
Scrophulariaceae	<i>Nemesia fruticans</i>	(Thunb.) Benth.	LC	Indigenous
Rubiaceae	<i>Nenax microphylla</i>	(Sond.) T.M.Salter	LC	Indigenous; Endemic
Amaryllidaceae	<i>Nerine laticoma</i>	(Ker Gawl.) T.Durand & Schinz	LC	Indigenous
Asteraceae	<i>Nolletia ciliaris</i>	(DC.) Steetz	LC	Indigenous; Endemic
Asteraceae	<i>Oedera humilis</i>	(Less.) N.G.Bergh		Indigenous; Endemic
Onagraceae	<i>Oenothera indecora</i>	Cambess.		Not indigenous; Naturalised; Invasive
Onagraceae	<i>Oenothera tetraptera</i>	Cav.		Not indigenous; Naturalised; Invasive
Rubiaceae	<i>Oldenlandia herbacea</i>	(L.) Roxb.		Indigenous
Oleaceae	<i>Olea europaea</i> subsp. <i>cuspidata</i>	L.		Indigenous
Resedaceae	<i>Oligomeris dregeana</i>	(Mull.Arg.) Mull.Arg.	LC	Indigenous; Endemic
Ophioglossaceae	<i>Ophioglossum polyphyllum</i> var. <i>polyphyllum</i>	A.Braun	LC	Indigenous
Poaceae	<i>Oropetium capense</i>	Stapf	LC	Indigenous
Asteraceae	<i>Osteospermum leptolobum</i>	(Harv.) Norl.	LC	Indigenous; Endemic
Asteraceae	<i>Osteospermum muricatum</i> subsp. <i>muricatum</i>	E.Mey. ex DC.	LC	Indigenous
Asteraceae	<i>Osteospermum scariosum</i> var. <i>scariosum</i>	DC.	NE	Indigenous; Endemic
Santalaceae	<i>Osyris lanceolata</i>	Hochst. & Steud.	LC	Indigenous
Poaceae	<i>Panicum coloratum</i>	L.	LC	Indigenous
Poaceae	<i>Panicum deustum</i>	Thunb.	LC	Indigenous

Poaceae	<i>Panicum maximum</i>	Jacq.	LC	Indigenous
Poaceae	<i>Panicum schinzii</i>	Hack.	LC	Indigenous
Poaceae	<i>Panicum sp.</i>			
Poaceae	<i>Panicum stapfianum</i>	Fourc.	LC	Indigenous; Endemic
Papaveraceae	<i>Papaver aculeatum</i>	Thunb.	LC	Indigenous; Endemic
Poaceae	<i>Paspalum dilatatum</i>	Poir.	NE	Not indigenous; Naturalised; Invasive
Poaceae	<i>Paspalum distichum</i>	L.	LC	Not indigenous; Naturalised; Invasive
Geraniaceae	<i>Pelargonium dolomiticum</i>	R.Knuth	LC	Indigenous; Endemic
Pteridaceae	<i>Pellaea calomelanos var. calomelanos</i>	(Sw.) Link	LC	Indigenous
Asteraceae	<i>Pentzia globosa</i>	Less.	LC	Indigenous; Endemic
Polygonaceae	<i>Persicaria lapathifolia</i>	(L.) Delarbre		Not indigenous; Naturalised; Invasive
Poaceae	<i>Phragmites australis</i>	(Cav.) Steud.	LC	Indigenous
Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>	L.	LC	Indigenous
Asteraceae	<i>Platycarphella parvifolia</i>	(S.Moore) V.A.Funk & H.Rob.	LC	Indigenous; Endemic
Poaceae	<i>Pogonarthria squarrosa</i>	(Roem. & Schult.) Pilg.	LC	Indigenous
Polygalaceae	<i>Polygala hottentotta</i>	C.Presl	LC	Indigenous
Portulacaceae	<i>Portulaca quadrifida</i>	L.	LC	Indigenous
Potamogetonaceae	<i>Potamogeton pectinatus</i>	L.	LC	Indigenous
Rosaceae	<i>Potentilla supina</i>	L.		Indigenous
Fabaceae	<i>Prosopis glandulosa var. glandulosa</i>	Torr.	NE	Not indigenous; Naturalised
Pedaliaceae	<i>Pterodiscus speciosus</i>	Hook.	LC	Indigenous
Ranunculaceae	<i>Ranunculus trichophyllus</i>	Chaix	LC	Indigenous
Apocynaceae	<i>Raphionacme dyeri</i>	Retief & Venter	LC	Indigenous; Endemic
Resedaceae	<i>Reseda lutea subsp. lutea</i>	L.	NE	Not indigenous; Naturalised; Invasive
Rhamnaceae	<i>Rhamnus prinoides</i>	L'Her.	LC	Indigenous
Vitaceae	<i>Rhoicissus tridentata subsp. cuneifolia</i>	(L.f.) Wild & R.B.Drumm.	NE	Indigenous
Fabaceae	<i>Rhynchosia adenodes</i>	Eckl. & Zeyh.	LC	Indigenous; Endemic
Fabaceae	<i>Rhynchosia pentheri var. pentheri</i>	Schltr. ex Zahlbr.	LC	Indigenous; Endemic
Fabaceae	<i>Rhynchosia totta var. totta</i>	(Thunb.) DC.	LC	Indigenous
Ricciaceae	<i>Riccia albolimbata</i>	S.W.Arnell		Indigenous
Ricciaceae	<i>Riccia albovestita</i>	O.H.Volk		Indigenous
Ricciaceae	<i>Riccia argenteolimbata</i>	O.H.Volk & Perold		Indigenous
Ricciaceae	<i>Riccia atropurpurea</i>	Sim		Indigenous
Ricciaceae	<i>Riccia cavernosa</i>	Hoffm.		Indigenous
Ricciaceae	<i>Riccia okahandjana</i>	S.W.Arnell		Indigenous
Ricciaceae	<i>Riccia pottsiana</i>	Sim		Indigenous; Endemic
Ricciaceae	<i>Riccia simii</i>	Perold		Indigenous
Ricciaceae	<i>Riccia volkii</i>	S.W.Arnell		Indigenous

Rosaceae	<i>Rosa rubiginosa</i>	L.		Not indigenous; Naturalised; Invasive
Rubiaceae	<i>Rubia petiolaris</i>	DC.	LC	Indigenous
Aizoaceae	<i>Ruschia indurata</i>	(L.Bolus) Schwantes	LC	Indigenous; Endemic
Aizoaceae	<i>Ruschia rigens</i>	L.Bolus	LC	Indigenous; Endemic
Aizoaceae	<i>Ruschia sp.</i>			
Salicaceae	<i>Salix babylonica</i> var. <i>babylonica</i>	L.		Not indigenous; Naturalised
Amaranthaceae	<i>Salsola aphylla</i>	L.f.	LC	Indigenous
Amaranthaceae	<i>Salsola glabrescens</i>	Burt Davy	LC	Indigenous; Endemic
Amaranthaceae	<i>Salsola kali</i>	L.		Not indigenous; Naturalised; Invasive
Lamiaceae	<i>Salvia repens</i> var. <i>repens</i>	Burch. ex Benth.	LC	Indigenous; Endemic
Lamiaceae	<i>Salvia repens</i> var. <i>transvaalensis</i>	Burch. ex Benth.	LC	Indigenous; Endemic
Lamiaceae	<i>Salvia runcinata</i>	L.f.	LC	Indigenous
Lamiaceae	<i>Salvia verbenaca</i>	L.	LC	Not indigenous; Naturalised; Invasive
Asteraceae	<i>Schistostephium crataegifolium</i>	(DC.) Fenzl ex Harv.	LC	Indigenous
Asteraceae	<i>Schkuhria pinnata</i>	(Lam.) Kuntze ex Thell.		Not indigenous; Naturalised
Cyperaceae	<i>Schoenoplectus corymbosus</i>	(Roth ex Roem. & Schult.) J.Raynal	LC	Indigenous
Cyperaceae	<i>Schoenoplectus muricinix</i>	(C.B.Clarke) J.Raynal	LC	Indigenous
Cyperaceae	<i>Schoenoxiphium sp.</i>			
Salicaceae	<i>Scolopia zeyheri</i>	(Nees) Harv.	LC	Indigenous
Anacardiaceae	<i>Searsia burchellii</i>	(Sond. ex Engl.) Moffett	LC	Indigenous; Endemic
Anacardiaceae	<i>Searsia ciliata</i>	(Licht. ex Schult.) A.J.Mill.	LC	Indigenous; Endemic
Anacardiaceae	<i>Searsia dentata</i>	(Thunb.) F.A.Barkley	LC	Indigenous
Anacardiaceae	<i>Searsia lancea</i>	(L.f.) F.A.Barkley	LC	Indigenous
Anacardiaceae	<i>Searsia leptodictya</i> forma <i>leptodictya</i>	(Diels) T.S.Yi, A.J.Mill. & J.Wen	NE	Indigenous
Anacardiaceae	<i>Searsia pyroides</i> var. <i>pyroides</i>	(Burch.) Moffett	LC	Indigenous
Anacardiaceae	<i>Searsia tridactyla</i>	(Burch.) Moffett	LC	Indigenous; Endemic
Convolvulaceae	<i>Seddera capensis</i>	(E.Mey. ex Choisy) Hallier f.	LC	Indigenous
Asteraceae	<i>Senecio achilleifolius</i>	DC.	LC	Indigenous; Endemic
Asteraceae	<i>Senecio affinis</i>	DC.	LC	Indigenous; Endemic
Asteraceae	<i>Senecio consanguineus</i>	DC.	LC	Indigenous; Endemic
Asteraceae	<i>Senecio coronatus</i>	(Thunb.) Harv.	LC	Indigenous
Asteraceae	<i>Senecio hastatus</i>	L.	LC	Indigenous; Endemic
Amaranthaceae	<i>Sericorema remotiflora</i>	(Hook.f.) Lopr.	LC	Indigenous
Fabaceae	<i>Sesbania notialis</i>	J.B.Gillett	LC	Indigenous; Endemic
Poaceae	<i>Setaria incrassata</i>	(Hochst.) Hack.	LC	Indigenous
Poaceae	<i>Setaria nigrirostris</i>	(Nees) T.Durand & Schinz	LC	Indigenous
Poaceae	<i>Setaria pumila</i>	(Poir.) Roem. & Schult.	LC	Indigenous
Poaceae	<i>Setaria sp.</i>			

Poaceae	<i>Setaria sphacelata</i> var. <i>sphacelata</i>	(Schumach.) Stapf & C.E.Hubb. ex M.B.Moss	LC	Indigenous
cccccc	<i>Setaria sphacelata</i> var. <i>torta</i>	(Schumach.) Stapf & C.E.Hubb. ex M.B.Moss	LC	Indigenous
Poaceae	<i>Setaria verticillata</i>	(L.) P.Beauv.	LC	Indigenous
Malvaceae	<i>Sida dregei</i>	Burt Davy	LC	Indigenous
Caryophyllaceae	<i>Silene undulata</i>	Aiton		Indigenous
Brassicaceae	<i>Sisymbrium capense</i>	Thunb.	LC	Indigenous; Endemic
Solanaceae	<i>Solanum campylacanthum</i>	Hochst. ex A.Rich.		Indigenous
Solanaceae	<i>Solanum retroflexum</i>	Dunal	LC	Indigenous; Endemic
Poaceae	<i>Sporobolus discosporus</i>	Nees	LC	Indigenous
Poaceae	<i>Sporobolus fimbriatus</i>	(Trin.) Nees	LC	Indigenous
Poaceae	<i>Sporobolus ioclados</i>	(Trin.) Nees	LC	Indigenous
Poaceae	<i>Sporobolus ludwigii</i>	Hochst.	LC	Indigenous; Endemic
Poaceae	<i>Sporobolus</i> sp.			
Lamiaceae	<i>Stachys spathulata</i>	Burch. ex Benth.	LC	Indigenous
Apocynaceae	<i>Stapelia grandiflora</i> var. <i>grandiflora</i>	Masson	LC	Indigenous; Endemic
Poaceae	<i>Stipagrostis uniplumis</i> var. <i>neesii</i>	(Licht.) De Winter	LC	Indigenous
Aizoaceae	<i>Stomatium ermininum</i>	(Haw.) Schwantes	LC	Indigenous; Endemic
Orobanchaceae	<i>Striga bilabiata</i> subsp. <i>bilabiata</i>	(Thunb.) Kuntze	LC	Indigenous
Orobanchaceae	<i>Striga</i> sp.			
Asteraceae	<i>Tagetes minuta</i>	L.		Not indigenous; Naturalised; Invasive
Tamaricaceae	<i>Tamarix chinensis</i>	Lour.		Not indigenous; Naturalised; Invasive
Asteraceae	<i>Tarchonanthus camphoratus</i>	L.	LC	Indigenous
Asteraceae	<i>Tarchonanthus minor</i>	Less.	LC	Indigenous; Endemic
Poaceae	<i>Tarigidia aequiglumis</i>	(Gooss.) Stent	LC	Indigenous; Endemic
Fabaceae	<i>Tephrosia capensis</i> var. <i>capensis</i>	(Jacq.) Pers.	LC	Indigenous
Fabaceae	<i>Tephrosia</i> sp.			
Poaceae	<i>Themeda triandra</i>	Forssk.	LC	Indigenous
Santalaceae	<i>Thesium resedoides</i>	A.W.Hill	LC	Indigenous
Asphodelaceae	<i>Trachyandra asperata</i> var. <i>asperata</i>	Kunth	LC	Indigenous; Endemic
Poaceae	<i>Tragus berteronianus</i>	Schult.	LC	Indigenous
Poaceae	<i>Tragus koelerioides</i>	Asch.	LC	Indigenous
Poaceae	<i>Tragus racemosus</i>	(L.) All.	LC	Indigenous
Aizoaceae	<i>Trianthema parvifolia</i> var. <i>parvifolia</i>	E.Mey. ex Sond.	LC	Indigenous
Aizoaceae	<i>Trianthema salsoloides</i> var. <i>transvaalensis</i>	Fenzl ex Oliv.	LC	Indigenous
Zygophyllaceae	<i>Tribulus terrestris</i>	L.	LC	Indigenous
Boraginaceae	<i>Trichodesma angustifolium</i> subsp. <i>angustifolium</i>	Harv.	LC	Indigenous
Poaceae	<i>Trichoneura grandiglumis</i>	(Nees) Ekman	LC	Indigenous

Pottiaceae	<i>Trichostomum brachydontium</i>	Bruch		Indigenous
Poaceae	<i>Triraphis andropogonoides</i>	(Steud.) E.Phillips	LC	Indigenous; Endemic
Poaceae	<i>Trisetopsis imberbis</i>	(Nees) Roser, A.Wolk & Veldkamp		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; Endemic
Fabaceae	<i>Vachellia karroo</i>	(Hayne) Banfi & Galasso	LC	Indigenous
Verbenaceae	<i>Verbena bonariensis</i>	L.		Not indigenous; Naturalised; Invasive
Santalaceae	<i>Viscum rotundifolium</i>	L.f.	LC	Indigenous
Campanulaceae	<i>Wahlenbergia albens</i>	(Spreng. ex A.DC.) Lammers	LC	Indigenous; Endemic
Campanulaceae	<i>Wahlenbergia androsacea</i>	A.DC.	LC	Indigenous
Xyridaceae	<i>Xyris gerrardii</i>	N.E.Br.	LC	Indigenous
Apocynaceae	<i>Xysmalobium undulatum</i> var. <i>undulatum</i>	(L.) W.T.Aiton	LC	Indigenous
Rhamnaceae	<i>Ziziphus mucronata</i> subsp. <i>mucronata</i>	Willd.	LC	Indigenous
Fabaceae	<i>Zornia capensis</i> subsp. <i>capensis</i>	Pers.	LC	Indigenous

8.2 Appendix B – Amphibian species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional	IUCN
<i>Amietia delalandii</i>	Delalande's River Frog	LC	Unlisted
<i>Amietia fuscigula</i>	Cape River Frog	LC	LC
<i>Amietia poyntoni</i>	Poynton's River Frog	LC	LC
<i>Cacosternum boettgeri</i>	Common Caco	LC	LC
<i>Kassina senegalensis</i>	Bubbling Kassina	LC	LC
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC	LC
<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad	LC	LC
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	NT	LC
<i>Sclerophrys capensis</i>	Raucous Toad	LC	LC
<i>Sclerophrys gutturalis</i>	Guttural Toad	LC	LC
<i>Sclerophrys poweri</i>	Power's Toad	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

8.3 Appendix C – Reptile species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	LC	LC
<i>Afroedura nivaria</i>	Drakensberg Flat Gecko	LC	LC
<i>Agama aculeata distantii</i>	Eastern Ground Agama	LC	LC
<i>Agama atra</i>	Southern Rock Agama	LC	LC
<i>Agama hispida</i>	Southern Spiny Agama	LC	LC
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	LC	LC
<i>Bitis arietans arietans</i>	Puff Adder	LC	Unlisted
<i>Boaedon capensis</i>	Brown House Snake	LC	LC
<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC	LC
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	LC	Unlisted
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	LC
<i>Elapsoidea sundevallii</i>	Sundevall's Garter Snake	LC	Unlisted
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	LC	Unlisted
<i>Hemachatus haemachatus</i>	Rinkhals	LC	LC
<i>Homopus femoralis</i>	Greater Dwarf Tortoise	LC	LC
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	LC
<i>Karusasaurus polyzonus</i>	Southern Karusa Lizard	LC	LC
<i>Lamprophis aurora</i>	Aurora House Snake	LC	LC
<i>Leptotyphlops scutifrons scutifrons</i>	Peters' Thread Snake	LC	Unlisted
<i>Lycophidion capense capense</i>	Cape Wolf Snake	LC	Unlisted
<i>Lygodactylus capensis</i>	Common Dwarf Gecko	LC	Unlisted
<i>Monopeltis capensis</i>	Cape Worm Lizard	LC	LC
<i>Naja nivea</i>	Cape Cobra	LC	Unlisted
<i>Nucras holubi</i>	Holub's Sandveld Lizard	LC	Unlisted
<i>Nucras intertexta</i>	Spotted Sandveld Lizard	LC	Unlisted
<i>Pachydactylus capensis</i>	Cape Gecko	LC	Unlisted
<i>Pachydactylus mariquensis</i>	Common Banded Gecko	LC	LC
<i>Panaspis wahlbergi</i>	Wahlberg's Snake-eyed Skink	LC	Unlisted
<i>Pedioplanis burchelli</i>	Burchell's Sand Lizard	LC	LC
<i>Pedioplanis lineocellata lineocellata</i>	Spotted Sand Lizard	LC	Unlisted
<i>Pelomedusa galeata</i>	South African Marsh Terrapin	Not evaluated	Unlisted
<i>Prosymna ambigua</i>	Angolan Shovel-snout	Unlisted	LC
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	LC	LC
<i>Psammobates oculifer</i>	Serrated Tent Tortoise	LC	Unlisted
<i>Psammophis crucifer</i>	Cross-marked Grass Snake	LC	LC
<i>Psammophis leightoni</i>	Cape Sand Snake	VU	LC

<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	LC	Unlisted
<i>Psammophylax tritaeniatus</i>	Striped Grass Snake	LC	LC
<i>Pseudaspis cana</i>	Mole Snake	LC	Unlisted
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	LC	Unlisted
<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	LC
<i>Trachylepis capensis</i>	Cape Skink	LC	Unlisted
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC	LC
<i>Trachylepis punctulata</i>	Speckled Sand Skink	LC	Unlisted
<i>Trachylepis varia</i>	Variable Skink	LC	LC
<i>Varanus albigularis albigularis</i>	Southern Rock Monitor	LC	Unlisted
<i>Varanus niloticus</i>	Water Monitor	LC	Unlisted

8.4 Appendix D – Mammal species expected to occur within the project area

Species	Common Name	Conservation Status	
		Regional	IUCN
<i>Aethomys ineptus</i>	Tete Veld Rat	LC	LC
<i>Aethomys namaquensis</i>	Namaqua rock rat	LC	LC
<i>Antidorcas marsupialis</i>	Sclater's Shrew	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>Crociodura cyanea</i>	Reddish-grey Musk Shrew	LC	LC
<i>Crociodura fuscomurina</i>	Tiny Musk Shrew	LC	LC
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC
<i>Desmodillus auricularis</i>	Short-tailed Gerbil	LC	LC
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC	NT
<i>Elephantulus myurus</i>	Eastern Rock Sengi	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>Herpestes sanguineus</i>	Slender Mongoose	LC	LC
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC
<i>Ichneumia albicauda</i>	White-tailed Mongoose	LC	LC
<i>Ictonyx striatus</i>	Striped Polecat	LC	LC
<i>Leptailurus serval</i>	Serval	NT	LC
<i>Lepus capensis</i>	Cape Hare	LC	LC
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
<i>Lepus victoriae</i>	African Savanna Hare	LC	LC
<i>Malacothrix typica</i>	Gerbil Mouse	LC	LC
<i>Mastomys coucha</i>	Multimammate Mouse	LC	LC
<i>Mellivora capensis</i>	Honey Badger	LC	LC
<i>Mus musculus</i>	House Mouse	Unlisted	LC
<i>Mus orangiae</i>	Free State Pygmy Mouse	NE	Unlisted
<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 zuluensis</i>	Aloe Bat	LC	LC
<i>Orycteropus afer</i>	Aardvark	LC	LC
<i>Otocyon megalotis</i>	Bat-eared Fox	LC	LC
<i>Otomys irroratus</i>	Vlei Rat (Fynbos type)	LC	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>Phacochoerus africanus</i>	Common Warthog	LC	LC
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC
<i>Procavia capensis</i>	Rock Hyrax	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>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>Saccostomus campestris</i>	Pouched Mouse	LC	LC
<i>Scotophilus dinganii</i>	Yellow House Bat	LC	LC
<i>Steatomys krebsii</i>	Krebs's Fat Mouse	LC	LC
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC	LC
<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>Thryonomys swinderianus</i>	Greater Cane Rat	LC	LC
<i>Vulpes chama</i>	Cape Fox	LC	LC
<i>Xerus inauris</i>	Cape Ground Squirrel	LC	LC

8.5 Appendix E – Avifauna species expected to occur within the project area

Species	Common Name	Conservation Status	
		Regional	IUCN
<i>Apalis thoracica</i>	Apalis, Bar-throated	Unlisted	LC
<i>Recurvirostra avosetta</i>	Avocet, Pied	Unlisted	LC
<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied	Unlisted	LC
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Batis pririt</i>	Batis, Pririt	Unlisted	LC
<i>Merops apiaster</i>	Bee-eater, European	Unlisted	LC
<i>Merops bullockoides</i>	Bee-eater, White-fronted	Unlisted	LC
<i>Euplectes orix</i>	Bishop, Southern Red	Unlisted	LC
<i>Euplectes afer</i>	Bishop, Yellow-crowned	Unlisted	LC
<i>Ixobrychus minutus</i>	Bittern, Little	Unlisted	LC
<i>Telophorus zeylonus</i>	Bokmakierie, Bokmakierie	Unlisted	LC
<i>Pycnonotus nigricans</i>	Bulbul, African Red-eyed	Unlisted	LC
<i>Emberiza tahapisi</i>	Bunting, Cinnamon-breasted	Unlisted	LC
<i>Buteo buteo</i>	Buzzard, Common (Steppe)	Unlisted	LC
<i>Buteo rufofuscus</i>	Buzzard, Jackal	Unlisted	LC
<i>Crithagra atrogularis</i>	Canary, Black-throated	Unlisted	LC
<i>Crithagra flaviventris</i>	Canary, Yellow	Unlisted	LC
<i>Myrmecocichla formicivora</i>	Chat, Anteating	Unlisted	LC
<i>Oenanthe familiaris</i>	Chat, Familiar	Unlisted	LC
<i>Emarginata sinuata</i>	Chat, Sickie-winged	Unlisted	LC
<i>Cisticola textrix</i>	Cisticola, Cloud	Unlisted	LC
<i>Cisticola aridulus</i>	Cisticola, Desert	Unlisted	LC
<i>Cisticola tinniens</i>	Cisticola, Levallant's	Unlisted	LC
<i>Cisticola chiniana</i>	Cisticola, Rattling	Unlisted	LC
<i>Cisticola juncidis</i>	Cisticola, Zitting	Unlisted	LC
<i>Petrochelidon spilodera</i>	Cliff-swallow, South African	Unlisted	LC
<i>Fulica cristata</i>	Coot, Red-knobbed	Unlisted	LC
<i>Microcarbo africanus</i>	Cormorant, Reed	Unlisted	LC
<i>Phalacrocorax lucidus</i>	Cormorant, White-breasted	Unlisted	LC
<i>Centropus burchellii</i>	Coucal, Burchell's	Unlisted	Unlisted
<i>Rhinoptilus africanus</i>	Courser, Double-banded	Unlisted	LC
<i>Cursorius temminckii</i>	Courser, Temminck's	Unlisted	LC
<i>Zapornia flavirostra</i>	Crake, Black	Unlisted	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Chrysococcyx caprius</i>	Cuckoo, Diderick	Unlisted	LC

<i>Clamator jacobinus</i>	Cuckoo, Jacobin	Unlisted	LC
<i>Chrysococcyx klaas</i>	Cuckoo, Klaas's	Unlisted	LC
<i>Cuculus solitarius</i>	Cuckoo, Red-chested	Unlisted	LC
<i>Anhinga rufa</i>	Darter, African	Unlisted	LC
<i>Spilopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Oena capensis</i>	Dove, Namaqua	Unlisted	LC
<i>Streptopelia semitorquata</i>	Dove, Red-eyed	Unlisted	LC
<i>Columba livia</i>	Dove, Rock	Unlisted	LC
<i>Anas sparsa</i>	Duck, African Black	Unlisted	LC
<i>Dendrocygna bicolor</i>	Duck, Fulvous	Unlisted	LC
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	VU
<i>Thalassornis leuconotus</i>	Duck, White-backed	Unlisted	LC
<i>Dendrocygna viduata</i>	Duck, White-faced Whistling	Unlisted	LC
<i>Anas undulata</i>	Duck, Yellow-billed	Unlisted	LC
<i>Hieraaetus pennatus</i>	Eagle, Booted	Unlisted	LC
<i>Bubo africanus</i>	Eagle-owl, Spotted	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Ardea alba</i>	Egret, Great	Unlisted	LC
<i>Egretta garzetta</i>	Egret, Little	Unlisted	LC
<i>Ardea intermedia</i>	Egret, Yellow-billed (Intermediate)	Unlisted	LC
<i>Falco amurensis</i>	Falcon, Amur	Unlisted	LC
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC
<i>Falco peregrinus</i>	Falcon, Peregrine	Unlisted	LC
<i>Amadina erythrocephala</i>	Finch, Red-headed	Unlisted	LC
<i>Sporopipes squamifrons</i>	Finch, Scaly-feathered	Unlisted	LC
<i>Lagonosticta rhodopareia</i>	Firefinch, Jameson's	Unlisted	LC
<i>Lagonosticta senegala</i>	Firefinch, Red-billed	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC
<i>Haliaeetus vocifer</i>	Fish-eagle, African	Unlisted	LC
<i>Phoenicopterus roseus</i>	Flamingo, Greater	NT	LC
<i>Phoeniconaias minor</i>	Flamingo, Lesser	NT	NT
<i>Stenostira scita</i>	Flycatcher, Fairy	Unlisted	LC
<i>Melaenornis silens</i>	Flycatcher, Fiscal	Unlisted	LC
<i>Muscicapa striata</i>	Flycatcher, Spotted	Unlisted	LC
<i>Scleroptila gutturalis</i>	Francolin, Orange River	Unlisted	LC
<i>Anser anser</i>	Goose, Domestic	Unlisted	LC
<i>Alopochen aegyptiaca</i>	Goose, Egyptian	Unlisted	LC
<i>Plectropterus gambensis</i>	Goose, Spur-winged	Unlisted	LC
<i>Micronisus gabar</i>	Goshawk, Gabar	Unlisted	LC

<i>Melierax canorus</i>	Goshawk, Southern Pale Chanting	Unlisted	LC
<i>Podiceps nigricollis</i>	Grebe, Black-necked	Unlisted	LC
<i>Podiceps cristatus</i>	Grebe, Great Crested	Unlisted	LC
<i>Tachybaptus ruficollis</i>	Grebe, Little	Unlisted	LC
<i>Chlorocichla flaviventris</i>	Greenbul, Yellow-bellied	Unlisted	LC
<i>Tringa nebularia</i>	Greenshank, Common	Unlisted	LC
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC
<i>Chroicocephalus cirrocephalus</i>	Gull, Grey-headed	Unlisted	LC
<i>Larus dominicanus</i>	Gull, Kelp	Unlisted	LC
<i>Scopus umbretta</i>	Hamerkop, Hamerkop	Unlisted	LC
<i>Polyboroides typus</i>	Harrier-Hawk, African	Unlisted	LC
<i>Egretta ardesiaca</i>	Heron, Black	Unlisted	LC
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC
<i>Ardea goliath</i>	Heron, Goliath	Unlisted	LC
<i>Ardea cinerea</i>	Heron, Grey	Unlisted	LC
<i>Ardea purpurea</i>	Heron, Purple	Unlisted	LC
<i>Ardeola ralloides</i>	Heron, Squacco	Unlisted	LC
<i>Indicator indicator</i>	Honeyguide, Greater	Unlisted	LC
<i>Upupa africana</i>	Hoopoe, African	Unlisted	LC
<i>Lophoceros nasutus</i>	Hornbill, African Grey	Unlisted	LC
<i>Threskiornis aethiopicus</i>	Ibis, African Sacred	Unlisted	LC
<i>Plegadis falcinellus</i>	Ibis, Glossy	Unlisted	LC
<i>Bostrychia hagedash</i>	Ibis, Hadedda	Unlisted	LC
<i>Vidua funerea</i>	Indigobird, Dusky	Unlisted	LC
<i>Vidua chalybeata</i>	Indigobird, Village	Unlisted	LC
<i>Actophilornis africanus</i>	Jacana, African	Unlisted	LC
<i>Falco rupicoloides</i>	Kestrel, Greater	Unlisted	LC
<i>Falco naumanni</i>	Kestrel, Lesser	Unlisted	LC
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	LC
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded	Unlisted	LC
<i>Megaceryle maxima</i>	Kingfisher, Giant	Unlisted	Unlisted
<i>Corythornis cristatus</i>	Kingfisher, Malachite	Unlisted	Unlisted
<i>Ceryle rudis</i>	Kingfisher, Pied	Unlisted	LC
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC
<i>Eupodotis caerulea</i>	Korhaan, Blue	LC	NT
<i>Afrotis afraoides</i>	Korhaan, Northern Black	Unlisted	LC
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC
<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC
<i>Mirafra fasciolata</i>	Lark, Eastern Clapper	Unlisted	LC

<i>Calandrella cinerea</i>	Lark, Red-capped	Unlisted	LC
<i>Mirafra africana</i>	Lark, Rufous-naped	Unlisted	LC
<i>Calendulauda sabota</i>	Lark, Sabota	Unlisted	LC
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Unlisted	LC
<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC
<i>Riparia paludicola</i>	Martin, Brown-throated	Unlisted	LC
<i>Ptyonoprogne fuligula</i>	Martin, Rock	Unlisted	Unlisted
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC
<i>Gallinula chloropus</i>	Moorhen, Common	Unlisted	LC
<i>Urocolius indicus</i>	Mousebird, Red-faced	Unlisted	LC
<i>Colius striatus</i>	Mousebird, Speckled	Unlisted	LC
<i>Colius colius</i>	Mousebird, White-backed	Unlisted	LC
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Cisticola fulvicapilla</i>	Neddicky, Neddicky	Unlisted	LC
<i>Nycticorax nycticorax</i>	Night-Heron, Black-crowned	Unlisted	LC
<i>Struthio camelus</i>	Ostrich, Common	Unlisted	LC
<i>Tyto alba</i>	Owl, Barn	Unlisted	LC
<i>Asio capensis</i>	Owl, Marsh	Unlisted	LC
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC
<i>Cypsiurus parvus</i>	Palm-swift, African	Unlisted	LC
<i>Terpsiphone viridis</i>	Paradise-flycatcher, African	Unlisted	LC
<i>Vidua paradisaea</i>	Paradise-whydah, Long-tailed	Unlisted	LC
<i>Anthoscopus minutus</i>	Penduline-tit, Cape	Unlisted	LC
<i>Columba guinea</i>	Pigeon, Speckled	Unlisted	LC
<i>Anthus cinnamomeus</i>	Pipit, African	Unlisted	LC
<i>Anthus leucophrys</i>	Pipit, Plain-backed	Unlisted	LC
<i>Charadrius pallidus</i>	Plover, Chestnut-banded	NT	NT
<i>Charadrius hiaticula</i>	Plover, Common Ringed	Unlisted	LC
<i>Pluvialis squatarola</i>	Plover, Grey	Unlisted	LC
<i>Charadrius pecuarius</i>	Plover, Kittlitz's	Unlisted	LC
<i>Charadrius tricollaris</i>	Plover, Three-banded	Unlisted	LC
<i>Netta erythrophthalma</i>	Pochard, Southern	Unlisted	LC
<i>Prinia flavicans</i>	Prinia, Black-chested	Unlisted	LC
<i>Pytilia melba</i>	Pytilia, Green-winged	Unlisted	LC
<i>Coturnix coturnix</i>	Quail, Common	Unlisted	LC
<i>Ortygospiza atricollis</i>	Quailfinch, African	Unlisted	LC
<i>Quelea quelea</i>	Quelea, Red-billed	Unlisted	LC
<i>Rallus caerulescens</i>	Rail, African	Unlisted	LC
<i>Acrocephalus baeticatus</i>	Reed-warbler, African	Unlisted	Unlisted

<i>Acrocephalus arundinaceus</i>	Reed-warbler, Great	Unlisted	LC
<i>Cossypha caffra</i>	Robin-chat, Cape	Unlisted	LC
<i>Coracias caudatus</i>	Roller, Lilac-breasted	Unlisted	LC
<i>Calidris pugnax</i>	Ruff	Unlisted	LC
<i>Actitis hypoleucos</i>	Sandpiper, Common	Unlisted	LC
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT
<i>Tringa stagnatilis</i>	Sandpiper, Marsh	Unlisted	LC
<i>Tringa glareola</i>	Sandpiper, Wood	Unlisted	LC
<i>Rhinopomastus cyanomelas</i>	Scimitarbill, Common	Unlisted	LC
<i>Cercotrichas paena</i>	Scrub-robin, Kalahari	Unlisted	LC
<i>Cercotrichas coryphoeus</i>	Scrub-robin, Karoo	Unlisted	LC
<i>Sagittarius serpentarius</i>	Secretarybird	VU	EN
<i>Tadorna cana</i>	Shelduck, South African	Unlisted	LC
<i>Spatula smithii</i>	Shoveler, Cape	Unlisted	LC
<i>Lanius minor</i>	Shrike, Lesser Grey	Unlisted	LC
<i>Lanius collurio</i>	Shrike, Red-backed	Unlisted	LC
<i>Gallinago nigripennis</i>	Snipe, African	Unlisted	LC
<i>Passer melanurus</i>	Sparrow, Cape	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed	Unlisted	LC
<i>Accipiter melanoleucus</i>	Sparrowhawk, Black	Unlisted	LC
<i>Eremopterix leucotis</i>	Sparrowlark, Chestnut-backed	Unlisted	LC
<i>Plocepasser mahali</i>	Sparrow-weaver, White-browed	Unlisted	LC
<i>Platalea alba</i>	Spoonbill, African	Unlisted	LC
<i>Pternistis natalensis</i>	Spurfowl, Natal	Unlisted	LC
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's	Unlisted	LC
<i>Lamprotornis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Sturnus vulgaris</i>	Starling, Common	Unlisted	LC
<i>Lamprotornis bicolor</i>	Starling, Pied	Unlisted	LC
<i>Onychognathus morio</i>	Starling, Red-winged	Unlisted	LC
<i>Creatophora cinerea</i>	Starling, Wattled	Unlisted	LC
<i>Himantopus himantopus</i>	Stilt, Black-winged	Unlisted	LC
<i>Calidris minuta</i>	Stint, Little	LC	LC
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC
<i>Ciconia nigra</i>	Stork, Black	VU	LC
<i>Ciconia ciconia</i>	Stork, White	Unlisted	LC
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst	Unlisted	LC

<i>Cinnyris fuscus</i>	Sunbird, Dusky	Unlisted	LC
<i>Cinnyris talatala</i>	Sunbird, White-bellied	Unlisted	LC
<i>Hirundo rustica</i>	Swallow, Barn	Unlisted	LC
<i>Cecropis cucullata</i>	Swallow, Greater Striped	Unlisted	LC
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC
<i>Cecropis semirufa</i>	Swallow, Red-breasted	Unlisted	LC
<i>Hirundo albigularis</i>	Swallow, White-throated	Unlisted	LC
<i>Porphyrio madagascariensis</i>	Swamphe, African Purple	Unlisted	Unlisted
<i>Acrocephalus gracilirostris</i>	Swamp-warbler, Lesser	Unlisted	LC
<i>Apus barbatus</i>	Swift, African Black	Unlisted	LC
<i>Tachymarpis melba</i>	Swift, Alpine	Unlisted	LC
<i>Apus apus</i>	Swift, Common	Unlisted	LC
<i>Apus affinis</i>	Swift, Little	Unlisted	LC
<i>Apus caffer</i>	Swift, White-rumped	Unlisted	LC
<i>Tchagra australis</i>	Tchagra, Brown-crowned	Unlisted	LC
<i>Anas capensis</i>	Teal, Cape	Unlisted	LC
<i>Spatula hottentota</i>	Teal, Hottentot	Unlisted	LC
<i>Anas erythrorhyncha</i>	Teal, Red-billed	Unlisted	LC
<i>Chlidonias hybrida</i>	Tern, Whiskered	Unlisted	LC
<i>Chlidonias leucopterus</i>	Tern, White-winged	Unlisted	LC
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC
<i>Turdus smithi</i>	Thrush, Karoo	Unlisted	LC
<i>Melaniparus cinerascens</i>	Tit, Ashy	Unlisted	LC
<i>Curruca subcoerulea</i>	Tit-babbler, Chestnut-vented	Unlisted	Unlisted
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Gyps africanus</i>	Vulture, White-backed	CR	CR
<i>Motacilla capensis</i>	Wagtail, Cape	Unlisted	LC
<i>Phylloscopus trochilus</i>	Warbler, Willow	Unlisted	LC
<i>Brunhilda erythronotos</i>	Waxbill, Black Cheeked	Unlisted	LC
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC
<i>Estrilda astrild</i>	Waxbill, Common	Unlisted	LC
<i>Amandava subflava</i>	Waxbill, Orange-breasted	Unlisted	Unlisted
<i>Granatina granatina</i>	Waxbill, Violet-eared	Unlisted	LC
<i>Oenanthe pileata</i>	Wheatear, Capped	Unlisted	LC
<i>Myrmecocichla monticola</i>	Wheatear, Mountain	Unlisted	LC
<i>Zosterops virens</i>	White-eye, Cape	Unlisted	LC
<i>Zosterops pallidus</i>	White-eye, Orange River	Unlisted	LC
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC
<i>Vidua regia</i>	Whydah, Shaft-tailed	Unlisted	LC

<i>Euplectes progne</i>	Widowbird, Long-tailed	Unlisted	LC
<i>Euplectes albonotatus</i>	Widowbird, White-winged	Unlisted	LC
<i>Phoeniculus purpureus</i>	Wood-hoopoe, Green	Unlisted	LC
<i>Dendropicos fuscescens</i>	Woodpecker, Cardinal	Unlisted	LC
<i>Jynx ruficollis</i>	Wryneck, Red-throated	Unlisted	LC

8.6 Appendix F Specialist Declarations

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

Ecologist

The Biodiversity Company

October 2023

DECLARATION

I, Andrew Husted, 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.



Andrew Husted

Ecologist

The Biodiversity Company

October 2023