



# THE TERRESTRIAL ECOLOGY COMPLIANCE STATEMENT FOR THE GLENCORE ENERGY CONVERSION PROJECT

## Sekhukhune District, Limpopo Province

January 2022

CLIENT

nettZero 

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### Table of Acronyms

Acronym/Abbreviation	Definition
ARC	Agricultural Research Counsel
CBA	Critical Biodiversity Area
CR	Critically Endangered
DEA	Department of Environmental Affairs
DEFF	Department of Environment, Forestry and Fisheries
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Integrity and Sensitivity
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
IBA	Important Bird Area
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004 NFA National Forest Act, Act 84 of 1998
NFEPA	National Freshwater Ecosystem Protection Assessment
NNR	No Natural Habitat Remaining
NSBA	National Spatial Biodiversity Assessment
ONAs	Other Natural Areas
SANBI	South African National Biodiversity Institute
SCC:	Species of Conservation Concern
ToR	Terms of reference
VU	Vulnerable

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## Executive Summary

Nettzero (Pty) Ltd (hereafter referred to as Nettzero) appointed The Biodiversity Company to undertake a specialist terrestrial biodiversity assessment for the proposed Glencore energy conversion project. The project area is situated along the provincial R555 road approximately 12 km southwest of the town Steelpoort in the Fetakgomo-Greater Tubatse Municipality (F-GTM), Sekhukhune District, Limpopo Province.

In accordance with the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, an initial site sensitivity verification has been undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool). The purpose of this report/statement is to verify the site sensitivity as identified by the screening tool and compile a statement confirming the identified impacts and any changes with the revised layout.

The following is deduced from the National Web-based Environmental Screening Tool:

- Terrestrial Biodiversity Theme is Low for the proposed project;
- Plant Species Theme ranges from Medium to Low for the project (Mostly Low) with several sensitive species predicted to be present; and
- Animal Species Theme is Medium for the proposed project with several sensitive species being said to occur.

The medium to low sensitivity for the Plant Species Theme is confirmed, areas presented in the specialist sensitivity map indicates the true sensitivity confirmed on site. The medium-high Animal Species Theme sensitivity is disputed as no faunal species or signs of any were recorded in the project area, with the exception of avifaunal species. The Low sensitivity terrestrial biodiversity sensitivity is confirmed. As stated above the vegetation structure and species composition of the two habitats have been completely altered as such, has a very low conservation value and ecological sensitivity from both a faunal and floral perspective.

It is the opinion of the ecologists that the proposed development is feasible, and no ecological constraints present a fatal flaw. The SCC must be marked for rescue and relocation, or removal (where permit application would then apply). These SCC can either be relocated to similar suitable habitat within the surrounding area, but outside the development footprint and utilised within the landscaping plan of the project or moved to registered nurseries with guidance from the Agricultural Research Counsel (ARC) or the South African National Biodiversity Institute (SANBI).

It is the opinion of the Ecologist that the overall impact of the Energy project, on the terrestrial biodiversity and plant species resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorised and no further specialist studies are deemed necessary for the proposed development.

## Document Guide

The Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA (GNR 320), as gazetted on 20 March 2020 provides guidelines on information that must be found in a compliance statement. These requirements are listed below.

Item	Pages	Comment
The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP)	42-43	Appendix B
Must include contact details, CV, SACNASP number and field of expertise of specialist	42-43	
Signed statement of independence	40	Appendix A
<b>Initial site sensitivity verification:</b>		
<ul style="list-style-type: none"> <li>- Desktop Analysis using satellite imagery and available information</li> <li>- Onsite inspection, to include a description of current land use, vegetation found on-site and status quo of screening tool confirmation/dispute</li> <li>- Include photographs/evidence of land and environmental sensitivity</li> </ul>	15-36	Section 4
Methodology used to undertake the site survey and prepare compliance statement, including equipment and modelling relevant	13-15	Section 3
The assessment must verify the “low” sensitivity of the site, this would be in terms of terrestrial, animal and plant	34	Section 4.3.2
Indicate whether or not the proposed development will have any impact on the terrestrial environment, animals and/or plants	31	Section 6
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	34	Section 5
Description of the assumptions and any uncertainties or gaps in knowledge or data	16	Section 3.4
Statement of timing and intensity of site inspection	8	Section 1
Any conditions to which the statement is subjected	8	Section 1

## 1 Introduction

The Biodiversity Company was appointed to conduct a terrestrial biodiversity assessment for the proposed Glencore energy conversion project. The project area is situated along the provincial R555 road approximately 12 km southwest of the town Steelpoort in the Fetakgomo-Greater Tubatse Municipality (F-GTM), Sekhukhune District, Limpopo Province (Figure 1-1 and Figure 1-2). The town of Burgersfort is located approximately 27 km northeast of the project area, whilst Lydenburg is ca. 47 km southwest of the project area.

A single day wet season survey was conducted in December 2021. The survey focused on the project footprint and the areas directly adjacent to the project area, hereafter referred to as the “project area”. Furthermore, identification and description of any sensitive receptors were recorded across the project area, and how these sensitive receptors may be affected by the proposed development were also investigated

This assessment was conducted per 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). This report was compiled to fulfil the requirement for a Terrestrial Biodiversity Assessment as per the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA (GNR 320), as gazetted on 20 March 2020. This report is undertaken as supporting information as part of a greater environmental application process and is compliant in terms of the requirements in the above regulations in terms of Terrestrial Biodiversity. In terms of the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted on 30 October 2020, relating to requirements relating specifically to the Terrestrial Plant and Animal (species) themes, this report includes these requirements.

The following is deduced from the National Web-based Environmental Screening Tool:

- Terrestrial Biodiversity Theme is Low for the proposed project;
- Plant Species Theme ranges from Medium to Low for the project (Mostly Low) with several sensitive species predicted to be present; and
- Animal Species Theme is Medium for the proposed project with several sensitive species being said to occur.

The purpose of the specialist studies is to provide relevant input into the authorisation process and to provide a report for the proposed activities associated with the project. 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.

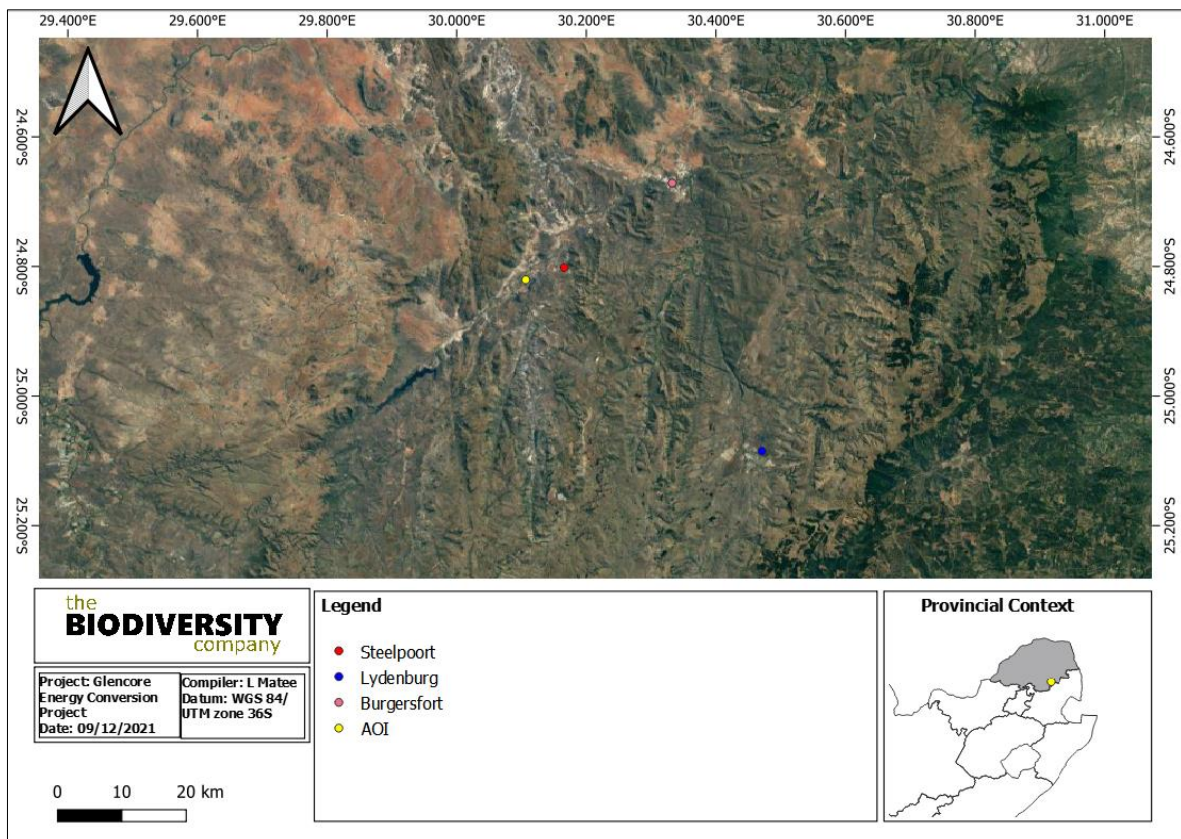
### 1.1 Terms of Reference

The Terms of Reference (ToR) included the following:

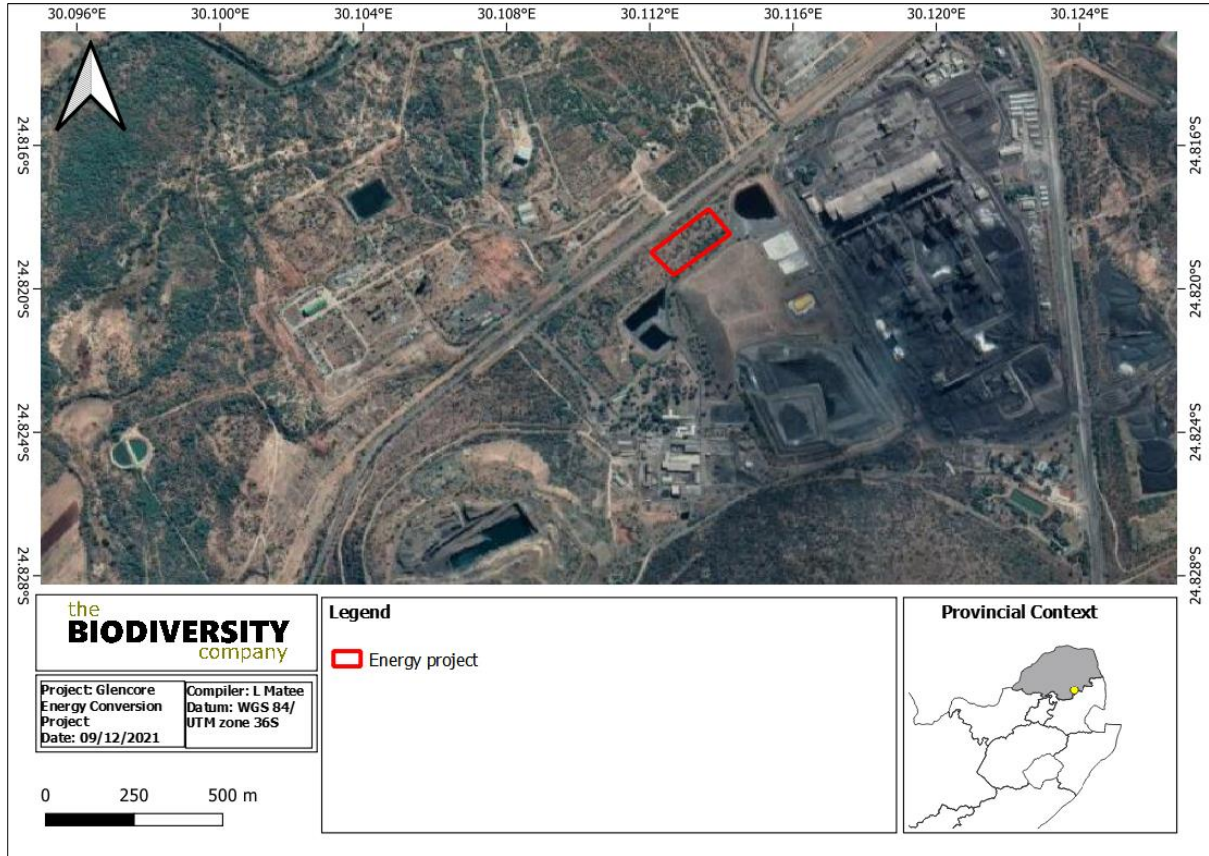
- Description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as the site-specific environment);



- Verification/confirmation of current use of the land and the potential environmental sensitivity of the site under consideration as identified by the National Web-Based Screening Tool
- Undertaking an on-site inspection to identify if there are any discrepancies with the identified environmental sensitivity as depicted on the National Web-Based Screening Tool and what is present on site.
- Identification and description of any sensitive receptors in terms of relevant specialist discipline (flora) that occur in the project area, and how these sensitive receptors may be affected by the activity;
- Identify 'significant' ecological, botanical 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; and
- Provide outcomes to be included in the Management plan.






**Figure 1-1** The project area in relation to nearest towns



**Figure 1-2** The project area

## 2 Specialist Details

<b>Report Name</b>	THE TERRESTRIAL ECOLOGY COMPLIANCE STATEMENT FOR THE GLENCORE ENERGY CONVERSION PROJECT
<b>Submitted to</b>	
<b>Report writer</b>	<p><b>Lusanda Matee</b> </p> <p>Lusanda Matee is a registered scientist (119257/2018) in the fields of Biological Science (Cand Nat.) and Ecological Science (Cand Nat.). He is a specialist terrestrial ecologist and botanist who conducts floral surveys faunal surveys which include mammals, birds, amphibians, and reptiles. He has 4 years of experience in environmental consulting. He received a Bachelor of Science, Honours, and MSc in Biological Sciences from the University of KwaZulu-Natal.</p>
<b>Report reviewer</b>	<p><b>Andrew Husted</b> </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 12 years of experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.</p>
<b>Declaration</b>	<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 principles of science.</p>

### 3 Key Legislative Requirements

The legislation, policies and guidelines listed below apply to the current project in terms of biodiversity and ecological support systems. The list below, although extensive, is not exhaustive and other legislation, policies and guidelines may apply in addition to those listed below (Table 3-1).

**Table 3-1 A list of key legislative requirements relevant to these studies in Limpopo**

Region	Legislation
International	Convention on Biological Diversity (CBD, 1993)
	The Convention on Wetlands (RAMSAR Convention, 1971)
	The United Nations Framework Convention on Climate Change (UNFCCC, 1994)
	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)
	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24, No 42946 (January 2020)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24, No 43110 (March 2020)
	The National Environmental Management Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management Biodiversity Act (Act No. 10 of 2004)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989) and associated EIA Regulations
	National Environmental Management Air Quality Act (No. 39 of 2004)
National Protected Areas Expansion Strategy (NPAES)	
National	Environmental Conservation Act (Act No. 73 of 1983)
	<b>Natural Scientific Professions Act (Act No. 27 of 2003)</b>
	National Biodiversity Framework (NBF, 2009)
	<b>National Forest Act (Act No. 84 of 1998)</b>
	National Veld and Forest Fire Act (101 of 1998)
	<b>National Spatial Biodiversity Assessment (NSBA)</b>
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
National Water Act (NWA, 1998)	
Provincial	<b>Limpopo Environmental Management Act 7 of 2003</b>

## 4 Methods

### 4.1 Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (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.

#### 4.1.1 Ecologically Important Landscape Features

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

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on the 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 – 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), 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.
  - Ecosystem Protection Level – 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. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
  - South Africa Protected Areas Database (SAPAD) (DEA, 2020) – The South African Protected Areas Database (SAPAD) 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 continuously 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.
  - National Protected Areas Expansion Strategy (NPAES) (SANBI, 2017) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are, therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- The Limpopo Conservation Plan, Version 2 (LCPv2), was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet *et al.*, 2018). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e., map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet *et al.*, 2018). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration, and requirement for meeting targets for both biodiversity pattern and ecological processes:
  - Critical Biodiversity Area 1 (CBA1);
  - Critical Biodiversity Area 2 (CBA2);
  - Ecological Support Area 1 (ESA1);
  - Ecological Support Area 2 (ESA2);
  - Other Natural Area (ONA);
  - Protected Area (PA); and
  - No Natural Remaining (NNR).
- 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
- 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 Assessment of 2018. It is a collection of data layers that represent the extent of the river and inland wetland ecosystem types as well as pressures on these systems.

#### 4.1.2 Desktop Flora Assessment

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) 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 proposed development area and surrounding landscape. 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.

#### 4.2 Botanical Assessment

The botanical assessment encompassed an assessment of all the vegetation units and habitat types within the project area. The focus was on an ecological assessment of habitat types as well as identification of any Red Data species within the known distribution of the project area. The 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 that replaces the old Plants of Southern Africa (POSA) database. The POSA database provided distribution data of flora at the quarter degree square (QDS) resolution. The Red List of South African Plants website (SANBI, 2017) was utilized to provide the most current account of the national status of flora. Relevant field guides and texts consulted for identification purposes in the field during the surveys included the following:

- Field Guide to the Wild Flowers of the Highveld (Van Wyk & Malan, 1997);
- A field guide to Wildflowers (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) included 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 fieldwork methodology included the following survey techniques:

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

### 4.3 Floristic Analysis

A single day wet season field assessment was undertaken, 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 was therefore to maximise coverage and navigate to each target site in the field to perform rapid vegetation and ecological assessment at each sample site. Emphasis was 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 were conducted through timed meanders within representative habitat units delineated during the scoping fieldwork. Emphasis was placed mostly on sensitive habitats overlapping with the proposed project areas.

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 habitats for SCC were 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., mining, 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.

#### 4.4 Limitations

The following limitations should be noted for the assessment:

- Only a single-season one day survey was conducted for the respective studies, this would constitute an early wet season survey; and
- This assessment has not assessed any temporal trends for the project.

### 5 Results & Discussion

#### 5.1 Desktop Assessment

##### 5.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed development to ecologically important landscape features are summarised in Table 5-1.

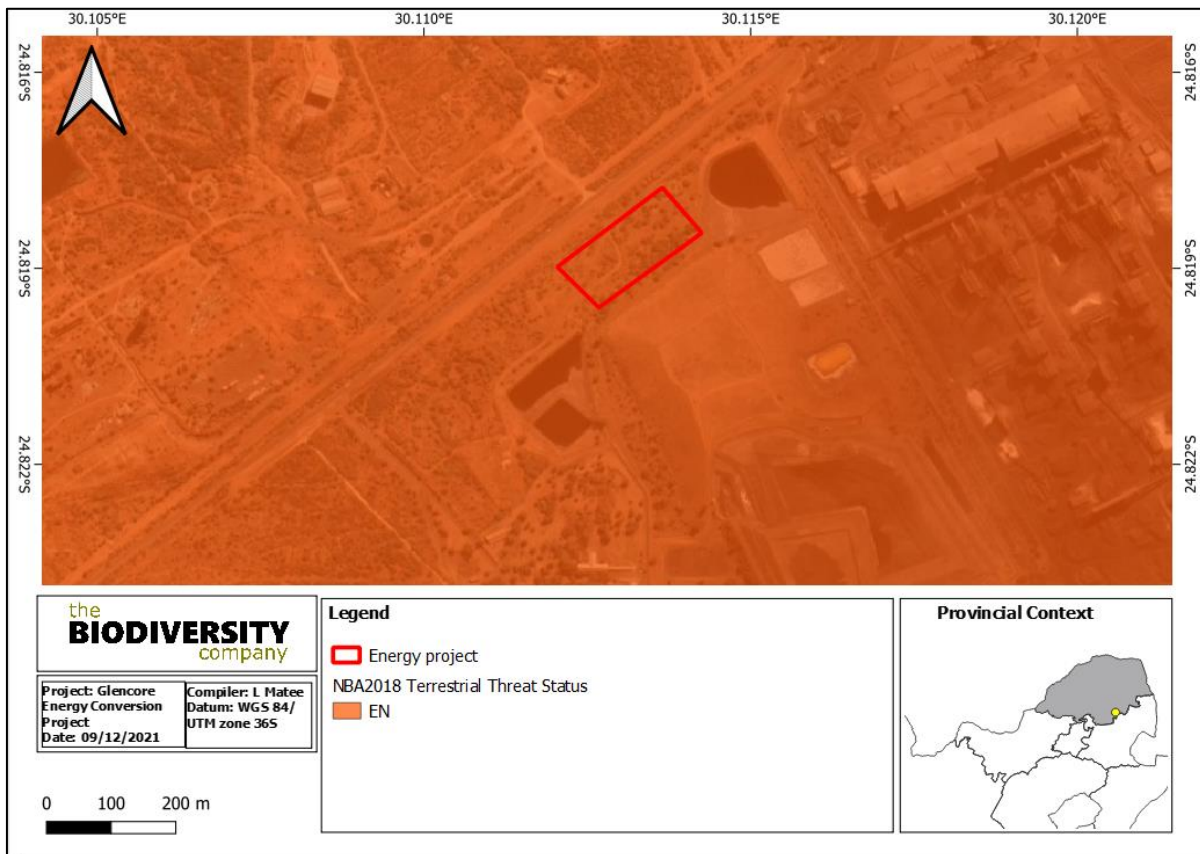
**Table 5-1 Summary of relevance of the proposed project to ecologically important landscape features**

Desktop Information Considered	Relevant/Irrelevant	Section
Ecosystem Threat Status	Relevant – Overlaps with an EN ecosystem.	4.1.1.1
Ecosystem Protection Level	Relevant – Overlaps mainly with a Poorly Protected Ecosystem.	4.1.1.2
Protected Areas	Irrelevant – The proposed development does not occur within any protected area and there is no protected area in close proximity to the project area. The De Hoop Private Nature Reserve is more than 20 km away from the project area.	4.1.1.3
Limpopo Conservation Plan	Relevant –The project area traverses areas that are classified as NNR areas	4.1.1.4
National Threatened Ecosystems (2011)	Irrelevant - The project area does not fall within any National Threatened Ecosystems (2011).	4.1.1.5
Important Bird and Biodiversity Areas	Irrelevant – More than 10 from the closest IBAs	-



### 5.1.1.1 Ecosystem Threat Status

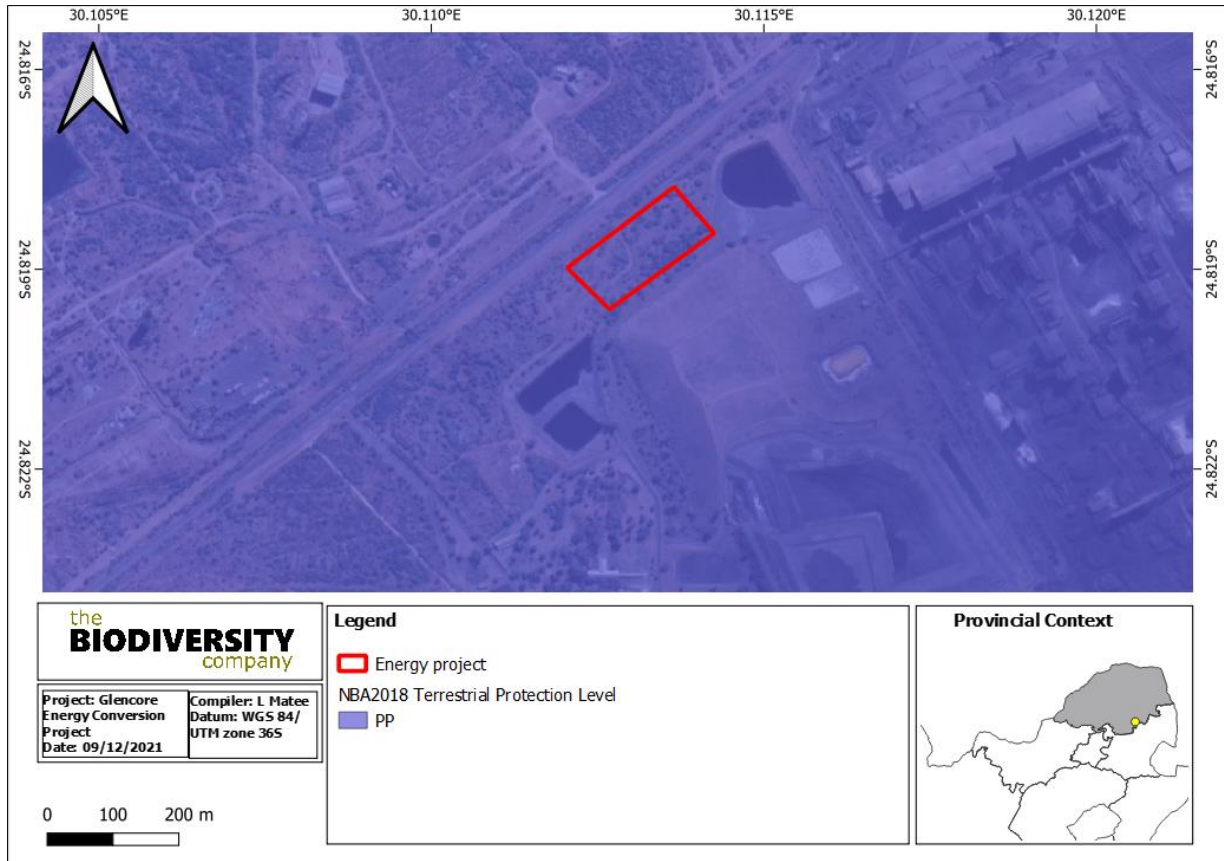
The Ecosystem Threat Status is an indicator of an ecosystem’s wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset, the proposed development overlaps with an EN ecosystem (Figure 5-1).



**Figure 5-1** Map illustrating the ecosystem threat status associated with the proposed project area

### 5.1.1.2 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. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems. The proposed development overlaps with a PP ecosystem (Figure 5-2).



**Figure 5-2** Map illustrating the ecosystem protection level associated with the proposed project area

### 5.1.1.3 Protected Areas

According to the protected area spatial dataset from SAPAD (2021), SACAD (2021) and SAMPАЗ (2021), The proposed development does not occur within any protected area and there is no protected area in close proximity to the project area. The De Hoop Private Nature Reserve is more than 20 km away from the project area.

### 5.1.1.4 Terrestrial Critical Biodiversity Areas (CBAs)

The purpose of the Limpopo C-Plan is to inform land-use planning and development on a provincial scale and to aid in natural resource management and one of the outputs is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely Protected Areas, CBA1 areas, CBA2 areas, ESA1 areas, ESA2 areas, Other Natural Areas (ONAs) and areas with No Natural Habitat Remaining (NNR) based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

CBA2 are areas selected to meet biodiversity targets and “must be maintained in a natural state with limited or no biodiversity loss” (SANBI, 2016).

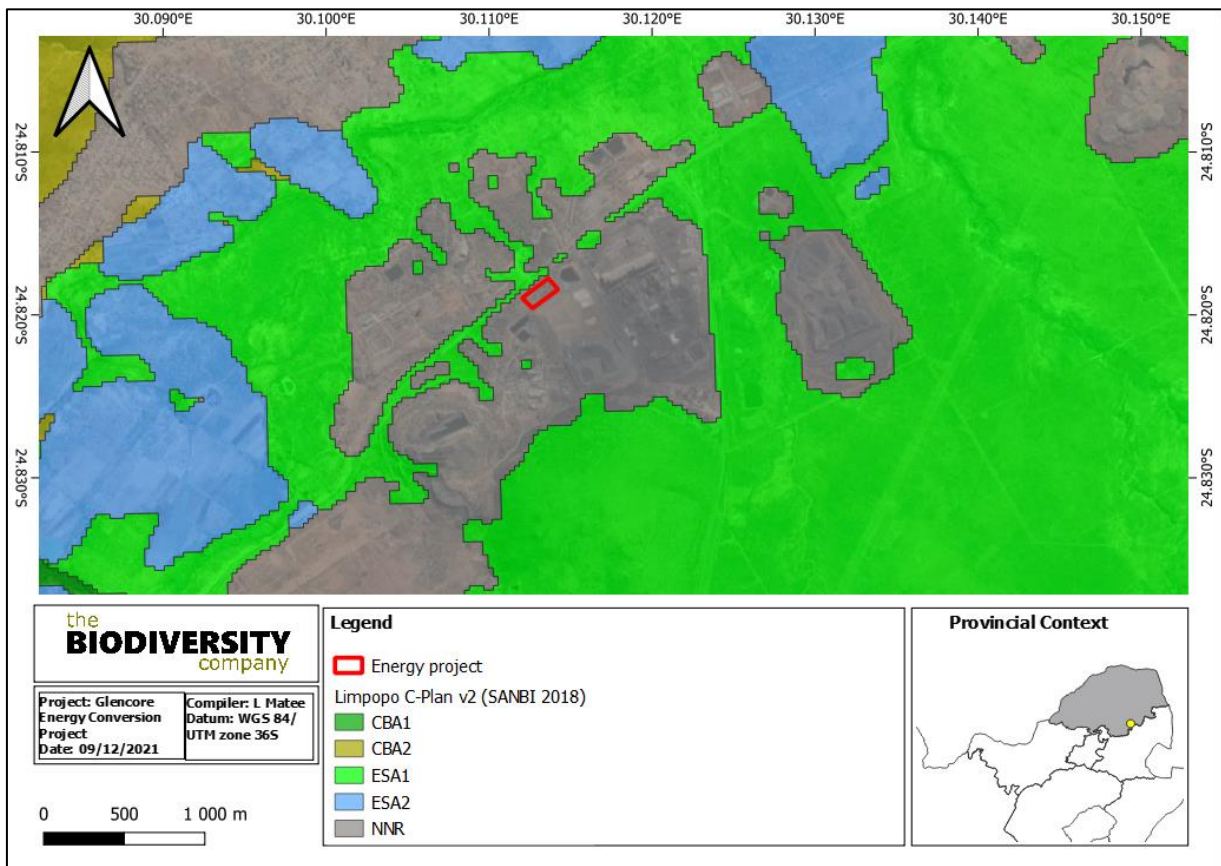
ESAs are areas that “must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity

targets for ecosystem types or species when it is not possible or necessary to meet them in natural or near-natural areas” (SANBI, 2016).

ONAs are areas that are “in good or fair ecological condition (natural, near-natural or semi-natural) that is not required to meet biodiversity targets for ecosystem types, species or ecological processes” (SANBI, 2016).

NNR areas are areas with no significant direct biodiversity value. Not Natural or degraded natural areas that are not required as ESAs, including intensive agriculture, urban, industry; and human infrastructure (SANBI, 2016).

Figure 5-3 shows the project area superimposed on the terrestrial CBA map. The project area overlaps with NNR areas.



**Figure 5-3** Map illustrating the locations of Critical Biodiversity Areas proximal to the proposed project area

### 5.1.1.5 The National List of Threatened Terrestrial Ecosystems

The National List of Threatened Terrestrial Ecosystems for South Africa (NEM:BA: National list of ecosystems that are threatened and in need of protection, (GN 34809, GN 1002), 9 December 2011) was published in terms of NEM: BA and the list categorizes ecosystems into Critically Endangered (CR) which have undergone severe degradation; Endangered (EN) which have undergone lesser degradation; Vulnerable (VU), which are at a high risk of undergoing degradation and protected which are of high conservation importance. The criteria used for identifying threatened terrestrial ecosystems was done through extensive stakeholder

engagement and based on the best available science. The criteria for thresholds for critically endangered, endangered and vulnerable ecosystems are summarized in

Table 5-2.

**Table 5-2 Criteria used to identify threatened terrestrial ecosystems**

Criterion	Critically Endangered	Endangered	Vulnerable
<b>A1: Irreversible loss of natural habitat</b>	Remaining natural habitat < biodiversity target	Remaining natural habitat < biodiversity target + 15%	Remaining natural habitat < 60% of the original area
<b>A2: Ecosystem degradation and loss of integrity</b>	> 60% of ecosystem significantly degraded	> 40% of ecosystem significantly degraded	> 20% of ecosystem significantly degraded
<b>C: Limited extent and imminent threat</b>	-	Ecosystem extent < 3000ha and imminent threat	Ecosystem extent < 6000ha and imminent threat
<b>D: Threatened plant species associations</b>	> 80 threatened Red List plant species	> 60 threatened Red List plant species	> 40 threatened Red List plant species
<b>F: Priority areas for meeting explicit biodiversity targets as defined in a systematic biodiversity plan</b>	Very high irreplaceability and high threat	Very high irreplaceability and medium threat	Very high biodiversity and low threat

There are four main types of implications of listed ecosystems on development:

- Planning related implications, linked to the requirement in the National Environmental Management Biodiversity Act (NEM: BA) for listed ecosystems to be considered in municipal Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs);
- Environmental authorisation implications, especially in terms of NEMA and EIA regulations;
- Proactive management implications, in terms of the Biodiversity Act; and
- Monitoring and reporting implications, in terms of the Biodiversity Act.

The project area does not fall within any National Threatened Ecosystems (2011).

### 5.1.1.6 Important Bird & Biodiversity Areas

The Glencore energy conversion project area is not located within an IBA nor is there one within the immediate landscape.

### 5.1.1.7 Flora Assessment

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

#### 5.1.1.7.1 Regional Vegetation

The project area is located within the vast Savanna biome, which covers large parts of southern Africa. At a more intricate spatial scale, it is located within the Sekhukhune Plains Bushveld unit (SVcb 27) (Mucina & Rutherford 2006; SANBI, 2018) previously referred to as the Mixed Bushveld (Acocks, 1953; Low and Rebelo, 1996). It is distributed in the Limpopo and Mpumalanga Provinces and occurs on the low lying areas where the altitude ranges between 700 and 1 100 m. The vegetation unit is described as semiarid plains and open valleys, surrounded by low hills and mountains associated with the escarpment (Mucina and Rutherford, 2006). The vegetation is further described as open to closed Thornveld with Aloe species and succulents with large areas degraded and over exploited. This resulted in encroachment by indigenous and alien species (Mucina and Rutherford, 2006)

#### 5.1.1.7.2 Sekhukhune Plains Bushveld (SVcb 27)

The Sekhukhune Plains Bushveld occurs in the Limpopo and Mpumalanga Provinces, mainly in semi-arid plains and open valleys in between small mountains. The vegetation consists predominantly of open to close thornveld with large numbers of Aloe species.

##### Important Taxa

**Tall Trees:** *Vachellia erioloba*, *Philenoptera violacea*.

**Small Trees:** *Senegalia mellifera* subsp. *detinens*, *Vachellia nilotica*, *V. tortilis* subsp. *heteracantha*, *Boscia foetida* subsp. *rehmanniana*, *Acacia grandicornuta*, *Albizia anthelmintica*, *Balanites maughamii*, *Combretum imberbe*, *Commiphora glandulosa*, *Maerua angolensis*, *Markhamia zanzibarica*, *Mystroxydon aethiopicum* subsp. *schlechteri*, *Ptaeroxylon obliquum*, *Schotia brachypetala*, *Ziziphus mucronata*.

**Succulent Tree:** *Euphorbia tirucalli*.

**Tall Shrubs:** *Searsia engleri*, *Cadaba termitaria*, *Dichrostachys cinerea*, *Ehretia rigida* subsp. *rigida*, *Grewia bicolor*, *Karomia speciosa*, *Maerua decumbens*, *Rhigozum brevispinosum*, *R. obovatum*, *Tinnea rhodesiana*, *Triaspis glaucophylla*.

**Low Shrubs:** *Felicia clavipilosa* subsp. *transvaalensis*, *Seddera suffruticosa*, *Gnidia polycephala*, *Gossypium herbaceum* subsp. *africanum*, *Jamesbrittenia atropurpurea*, *Jatropha latifolia* var. *latifolia*, *Lantana rugosa*, *Melhania rehmannii*, *Monechma divaricatum*, *Myrothamnus flabellifolius*, *Pechuel-Loeschea leubnitziae*, *Plinthus rehmannii*.

**Succulent Shrubs:** *Aloe cryptopoda*, *Euphorbia enormis*, *Kleinia longiflora*, *Aloe castanea*, *A. globuligemma*.

**Woody Succulent Climber:** *Sarcostemma viminalis*.

**Herbaceous Climbers:** *Coccinia rehmannii*, *Decorsea schlechteri*.

**Graminoids:** *Cenchrus ciliaris*, *Enneapogon cenchroides*, *Panicum maximum*, *Urochloa mosambicensis*, *Aristida adscensionis*, *A. congesta*, *Eragrostis barbinodis*, *Paspalum distichum*, *Schmidtia pappophoroides*, *Stipagrostis hirtigluma* subsp. *patula*, *Tragus berteronianus*.

**Herbs:** *Becium filamentosum*, *Phyllanthus maderaspatensis*, *Blepharis integrifolia*, *Corchorus asplenifolius*, *Hibiscus praeteritus*, *Ipomoea magnusiana*.

**Geophytic Herbs:** *Drimys altissima*, *Sansevieria pearsonii*.

##### Biogeographically Important Taxa

Small Tree: *Lydenburgia cassinoides*.

Tall Shrub: *Nuxia gracilis*

Low Shrubs: *Amphiglossa triflora*, *Asparagus fovei*, *Hibiscus barnardii*, *Orthosiphon fruticosus*, *Petalidium oblongifolium*, *Searsia batophylla*.

Woody Climber: *Asparagus sekukuniensis*.

Herb: *Aneilema longirrhizum*.

Geophytic Herb: *Chlorophytum cyperaceum*.

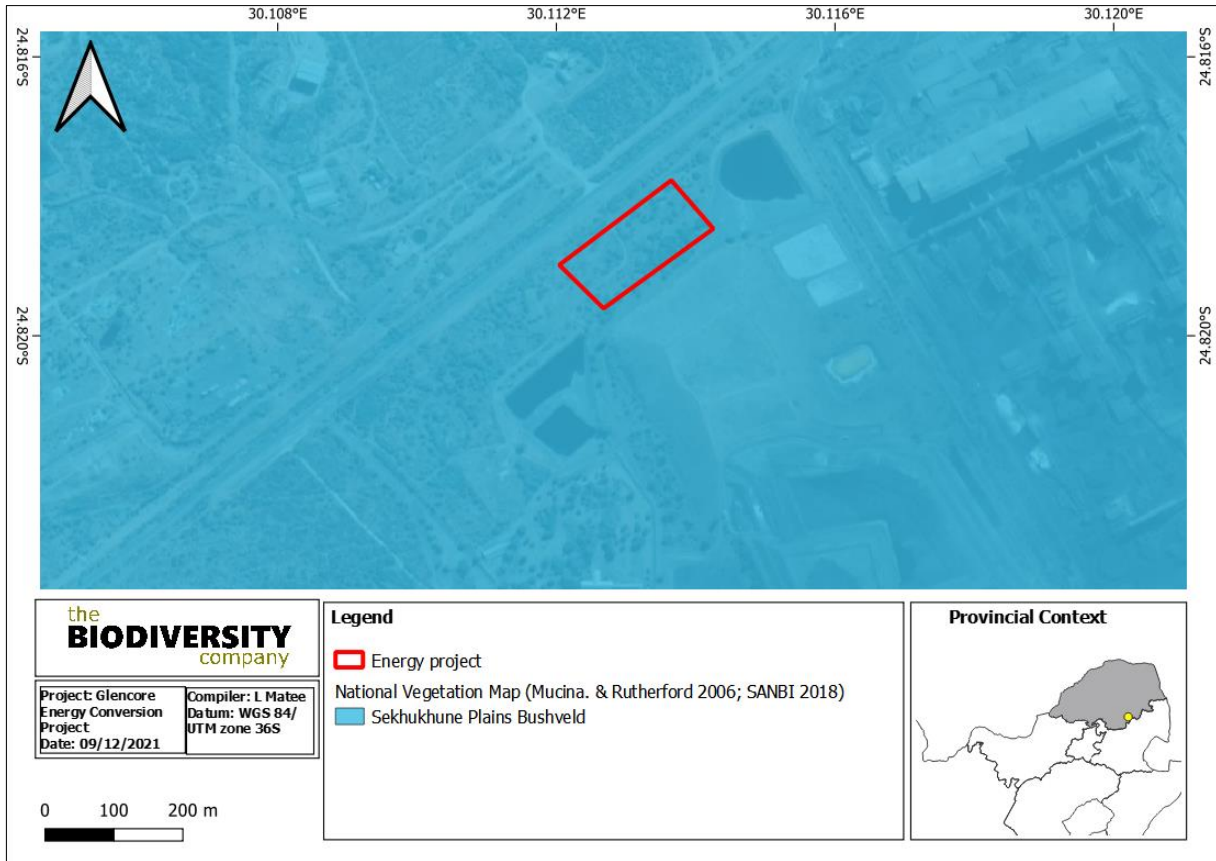
Succulent Herb: *Piранthus atosanguineus*.

### **Conservation Status of the Vegetation Type**

According to Mucina and Rutherford (2006), this vegetation type is classified as VU. The national target for conservation protection for this vegetation type is 19%, with approximately 2% statutorily conserved in Potlake, Bewaarkloof and Wolkberg Caves Nature Reserves. Approximately 25% of this area has been transformed and is mainly under dry-land subsistence cultivation.

#### **5.1.1.7.3 Sekhukhuneland Centre of Plant Endemism**

The project area is situated within the Sekhukhuneland Centre of Plant Endemism (SCPE). SCPE has an extraordinary level of endemism, with 2 000 indigenous species within 4 000 km<sup>2</sup>. This number or rather figure is extraordinary if compared with islands in the world, namely New Zealand has 2 000 species on 268 000 km<sup>2</sup> and Hawaii which has 2000 indigenous species on 16600 km<sup>2</sup>. SCPE comprises a mountainous region with flat to undulating valleys. Sekhukhune land is known for its parallel belts or rocky ridges and mountains, including the Leolo and Dwars River ranges. The core of the Centre is formed by the surface outcrops of the Rustenburg Layered Suite of the eastern Bushveld Complex.

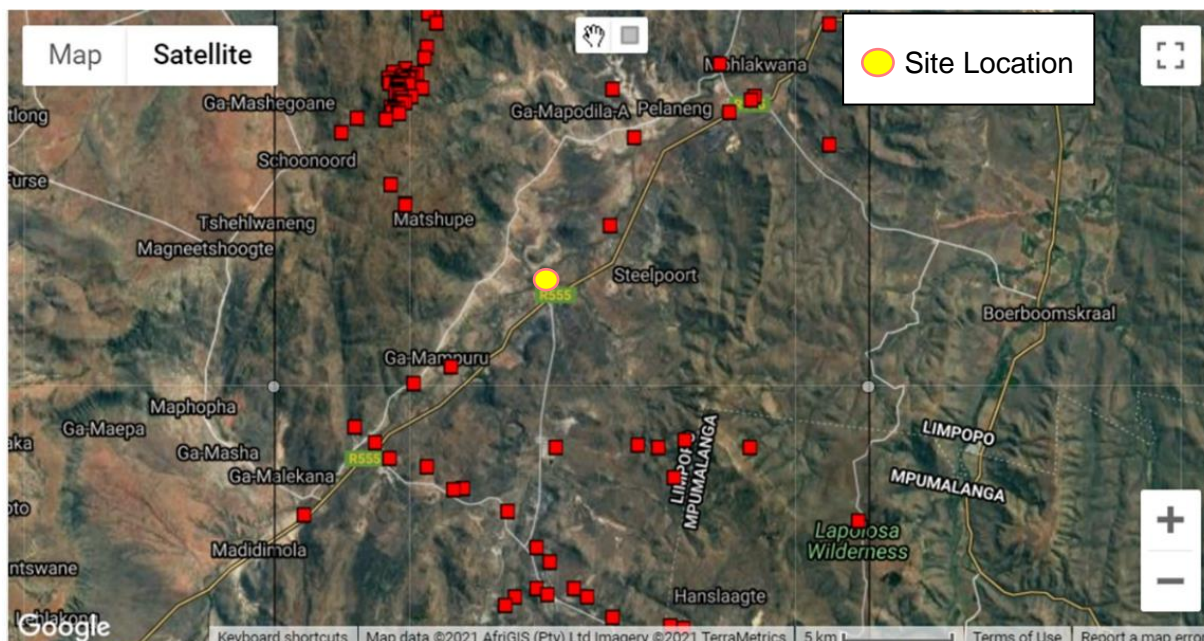


**Figure 5-4** Map illustrating the vegetation type associated with the project area

#### 5.1.1.7.4 Expected Flora Species

According to the new Plants of Southern Africa (POSA) database underpinned by the Botanical Database of Southern Africa (BODATSA), a total of 485 species of indigenous plants are expected to occur within the assessment area and immediate landscape. Appendix C provides the list of species and their respective conservation status and endemism. A total of 8 Red List/SCC according to the IUCN Red List status could be expected to occur within the assessment area and are provided in

Table 5-3 below (according to the relevant POSA Grid Squares).



**Figure 5-5** Map showing the grid drawn to compile an expected species list (BODATSA-POSA, 2016)

**Table 5-3** Threatened flora species that may occur within the assessment area associated with the proposed project area. EN=Endangered

Family	Species	IUCN	Diagnostic	Ecology
Acanthaceae	<i>Dicliptera fruticosa</i>	NT	herb;	Indigenous; Endemic
Iridaceae	<i>Gladiolus reginae</i>	CR	geophyte;	Indigenous; Endemic
Anacardiaceae	<i>Searsia batophylla</i>	VU	shrub;	Indigenous; Endemic
Hyacinthaceae	<i>Ledebouria dolomiticola</i>	VU	geophyte;	Indigenous; Endemic
Passifloraceae	<i>Adenia fruticosa</i>	NT	tree; succulent; climber; shrub;	Indigenous; Endemic
Scrophulariaceae	<i>Nemesia zimbabwensis</i>	EN		Indigenous
Polygalaceae	<i>Polygala sekhukhuniensis</i>	VU		Indigenous
Scrophulariaceae	<i>Jamesbrittenia macrantha</i>	NT	shrub; dwarf shrub;	Indigenous; Endemic

## 5.2 Field Assessment

The following sections provide the results from the field survey for the proposed development that was undertaken on the 15<sup>th</sup> of December 2021.

### 5.2.1 Flora Assessment

A total of 28 woody, graminoid, shrub and herbaceous plant species belonging to were recorded in the project area during the field assessment (Table 5-4). This includes two species that have been assigned alien invader plant categories under the National Environmental Management: Biodiversity Act (NEMBA). Plants listed in Category 1b appear in green. Some of the plant species recorded can be seen in Figure 5-6.



**Table 5-4** *Trees, shrub, graminoid and herbaceous plant species recorded in the project area*

Scientific Name	Common Name	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
<i>Aloe globuligemma</i>	Knoppiesaalwyn	LC	Not Endemic	
<i>Argemone ochroleuca</i>	Mexican Poppy		Not Indigenous; Naturalised; Invasive	NEMBA Category 1b.
<i>Asparagus laricus</i>	Wild asparagus	LC	Indigenous, Not Endemic	
<i>Dichrostachys cinerea subsp. africana</i>	Small-leaved Sickle Bush	LC	Not Endemic	
<i>Digitaria eriantha</i>	Woolly Finger Grass	LC	Not Endemic	
<i>Elephantorrhiza elephantina</i>	Elephant's root	LC	Indigenous, Not Endemic	
<i>Eragrostis chloromelas</i>	Blue Love Grass	LC	Not Endemic	
<i>Eragrostis curvula</i>	Weeping Love Grass	LC	Not Endemic	
<i>Eragrostis gummiflua</i> Nees	Gum Grass	LC	Not Endemic	
<i>Eragrostis superba</i> Peyr.	Heart-seed Grass	LC	Not Endemic	
<i>Euphorbia ingens</i>	Cactus Euphorbia	LC	Indigenous, Not Endemic	
<i>Gomphocarpus tomentosus</i>	Woolly Milkweed	LC	Not Endemic	
<i>Gymnosporia senegalensis</i>	Red Spike-thorn	LC	Indigenous, Not Endemic	
<i>Hibiscus engleri</i>	Wild Hibiscus	LC	Indigenous, Not Endemic	
<i>Jatropha gossypifolia</i>	Bellyache Bush		Not Indigenous; Naturalised; Invasive	
<i>Leonotis nepetifolia</i>	Lion's Ear	LC	Not Endemic	
<i>Opuntia stricta</i>	Shell Mound Pricklypear		Not Indigenous; Naturalised; Invasive	NEMBA Category 1b.
<i>Panicum maximum</i>	Guinea Grass	LC	Indigenous, Not Endemic	
<i>Sansevieria hyacinthoides</i>	Mother-in-law's-tongue	LC	Indigenous, Not Endemic	
<i>Solanum lichtensteinii</i> Willd.	Large Yellow Bitter Apple	LC	Not Endemic	
<i>Tricholaena monachne</i>	Blousaadgras	LC	Not Endemic	
<i>Urochloa mosambicensis</i>	Herringbone Grass	LC	Indigenous, Not Endemic	
<i>Vachellia karroo</i>	Sweet Thorn, Cape Gum	LC	Indigenous, Not Endemic	
<i>Vachellia tortilis</i>	Umbrella Thorn	LC	Not Endemic	
<i>Viscum combreticola</i> Engl.	Bushwillow Mistletoe	LC	Not Endemic	
<i>Xanthium spinosum</i>	Spiny cocklebur		Not Indigenous; Naturalised; Invasive	
<i>Xanthium strumarium</i>	Large Cocklebur		Not Indigenous; Naturalised; Invasive	
<i>Ziziphus mucronata</i>	Buffalo thorn	LC	Not Endemic	



**Figure 5-6** Photographs illustrating some of the flora recorded within the assessment area. A) *Dichrostachys cinerea* subsp. *africana*, B) *Vachellia tortilis*., C) *Euphorbia ingens*., D) *Aloe globuligemma*., and E) *Solanum lichtensteinii* Willd

### 5.2.1.1 Invasive Alien Plants

The National Invasive Species Council (Invasive Species Advisory Committee, 2006) defines alien invasive species that are non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive Alien Plants (IAPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, these plants must be controlled using an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species. Although bush encroachment and invasion are sometimes used loosely and commonly interchangeably it is crucial to recognise that these are different processes. Bush encroachment refers to the spread of plant species into an area where previously it did not occur, thus, bush encroachment could occur even with indigenous species, and it is more defined by plant density than species themselves.

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 Government Gazette No. 44182, 24<sup>th</sup> of February 2021. The legislation calls for the removal and/or control of AIP 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; and
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

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

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

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

Two IAP species listed under the Alien and Invasive Species List 2016, Government Gazette No. 40166 as Category 1b were recorded for the area. These IAP species must be controlled by implementing an Invasive Alien Plant Management Programme in compliance of section 75 of the Act as stated above. Plants listed as Category 1 alien or invasive species under the National Environmental Management: Biodiversity Act (NEMBA) appear in the green text (Table 5-4).

## 5.2.2 Faunal Assessment

### 5.2.2.1 Avifauna

A total of twenty-five (25) bird species were recorded in the project area during the survey based on either direct observation or the presence of visual tracks & signs. Avian diversity within this habitat was relatively poor due to the project area's surrounding land-use. In addition to this, the avian diversity recorded was not considered unique and is typical of what occurs across large areas of the Savannah Biome, which therefore suggests that the sensitivity of the site, from an avian perspective, will not be of any great significance.

**Table 5-5 Avifaunal species recorded in the project area**

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Apus affinis</i>	Swift, Little	Unlisted	LC
<i>Cercotrichas leucophrys</i>	Scrub-robin, White-browed	Unlisted	LC
<i>Columba guinea</i>	Pigeon, Speckled	Unlisted	LC
<i>Corvinella melanoleuca</i>	Shrike, Magpie	Unlisted	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Cossypha humeralis</i>	Robin-chat, White-throated	Unlisted	LC
<i>Dendroperdix sephaena</i>	Francolin, Crested	Unlisted	LC
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed	Unlisted	LC
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC
<i>Lamprotornis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Laniarius atrococcineus</i>	Shrike, Crimson-breasted	Unlisted	LC
<i>Mirafrā africana</i>	Lark, Rufous-naped	Unlisted	LC
<i>Numida meleagris</i>	Guinea fowl, Helmeted	Unlisted	LC
<i>Onychognathus morio</i>	Starling, Red-winged	Unlisted	LC
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed	Unlisted	LC
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped	Unlisted	Unlisted

<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Turdoides bicolor</i>	Babbler, Southern Pied	Unlisted	LC
<i>Turdoides jardineii</i>	Babbler, Arrow-marked	Unlisted	LC
<i>Turdus libonyana</i>	Thrush, Kurrichane	Unlisted	Unlisted
<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC

### 5.2.2.2 Amphibians and Reptiles

No reptile or amphibian species were recorded in the project area during the survey, this can be attributed to the lack of suitable habitat and a river system that is also ephemeral and the lack of water (albeit standing or flowing) and the past human settlements and mining areas.

### 5.2.2.3 Mammals

No mammal species were recorded in the project area due to lack of suitable habitat as well as ecological risk from past or current smelter-related emissions as well as edge effects from smelter related activities resulting in the project area being in a degraded state.

## 5.3 Site verification Outcome and Habitat Summary

The description of vegetation recorded in the project area mainly focuses on vegetation structure and species distribution and does not give an exhaustive list of plant species that occur in the project area.

A one day general habitat sensitivity scan was carried out on the 14<sup>th</sup> of December 2021. This preliminary site visit did not entail intensive surveying or utilisation of any specialised sampling methods and can rather be viewed as being an opportunity to identify sensitive habitats occurring in the project area. One habitats unit is traversed by the project area but two are mapped due to the proximity of the riparian feature to the left of the project area (**Error! Reference source not found.**).

**Drainage lines:** One drainage line was observed to the west of the project area. This drainage line appears to be highly degraded, and no hydrophytes were observed in the drainage lines and the vegetation consists of mainly trees and shrubs with low diversity in graminoid and forb content. Trees observed adjacent to the drainage line include Silver Terminalia (*Terminalia sericea*) and Buffalo-Thorn (*Ziziphus mucronata*) to name a few.

**Secondary Bushveld:** The project area is made up entirely of degraded bushveld which is various stages of succession and degradation. The vegetation is dominated by secondary successional grasses and AIP species. The majority of habitat around the proposed project area has also been transformed although remnant patches remain in small areas. A few individuals of *Aloe globuligemma* were observed along the Southern portion of the project area. All indigenous Aloes are protected plant species in the Limpopo Environmental Management Act (Act No.7 of 2003).

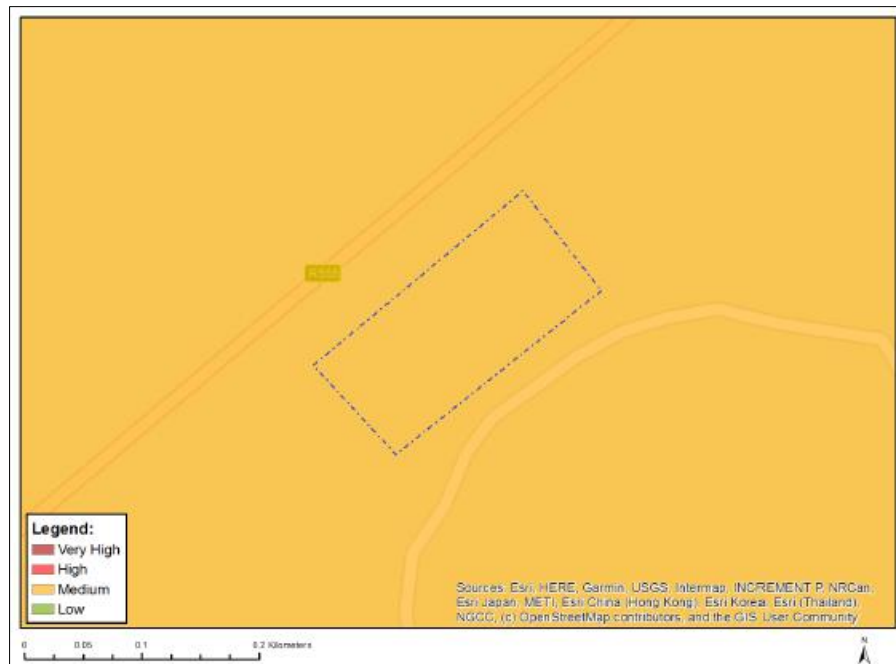
### 5.3.1 Areas of Concern

The following concerns are associated with the two feasibility areas:

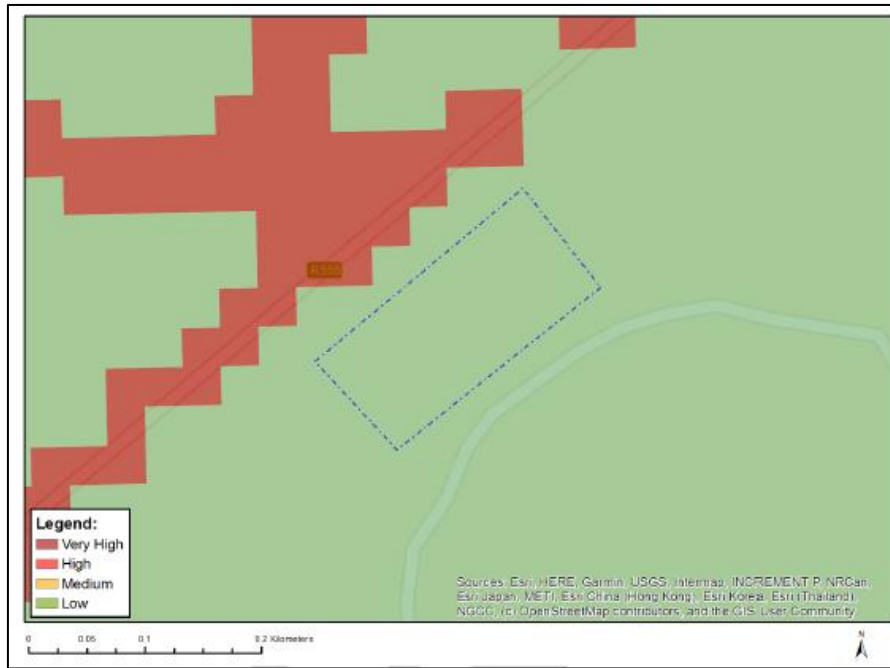
- According to the spatial dataset, the proposed development overlaps with an EN ecosystem; and
- A few individuals of *Aloe globuligemma* were observed along the Southern portion of the project area. All indigenous Aloes are protected plant species in the Limpopo Environmental Management Act (Act No.7 of 2003);



**Figure 5-7** Map depicting relative plant theme sensitivity of the proposed project (National Environmental Screening Tool, 2021).



**Figure 5-8** Map depicting relative animal theme sensitivity of the proposed project (National Environmental Screening Tool, 2021).



**Figure 5-9** Map showing the relative terrestrial biodiversity sensitivity of the site for the proposed project

### 5.3.2 Confirmation of Site Sensitivity

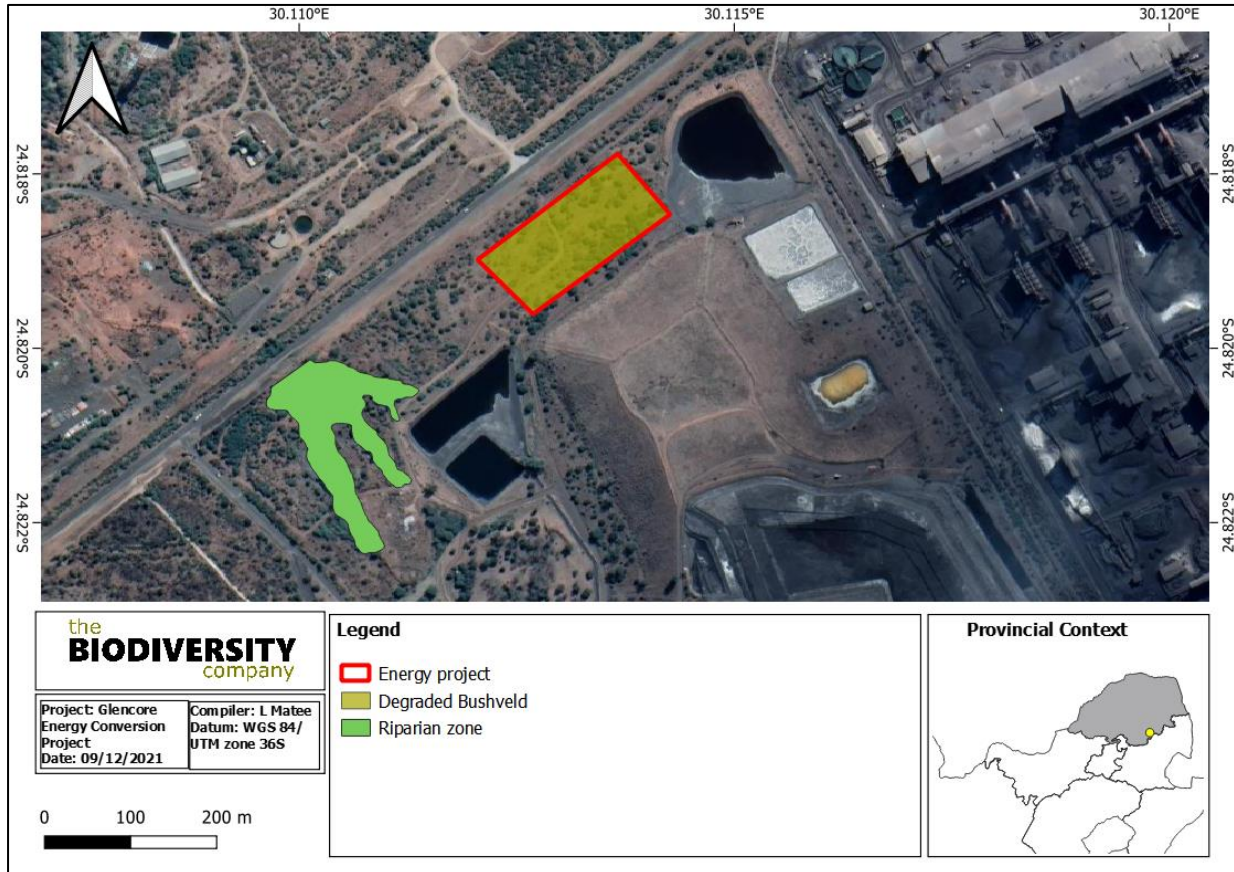
The medium to low sensitivity for the Plant Species Theme is confirmed, areas presented in the specialist sensitivity map (Figure 5-11) indicates the true sensitivity confirmed on site. The medium-high Animal Species Theme sensitivity is disputed as no faunal species or signs of any were recorded in the project area, with the exception of avifaunal species. The Low sensitivity terrestrial biodiversity sensitivity is confirmed. As stated above the vegetation structure and species composition of the two habitats have been completely altered as such, has a very low conservation value and ecological sensitivity from both a faunal and floral perspective.

#### 5.3.2.1 Site Ecological Importance

The vegetation structure and species composition of the two habitats have been completely altered as such, has a very low conservation value and ecological sensitivity from a floral perspective.

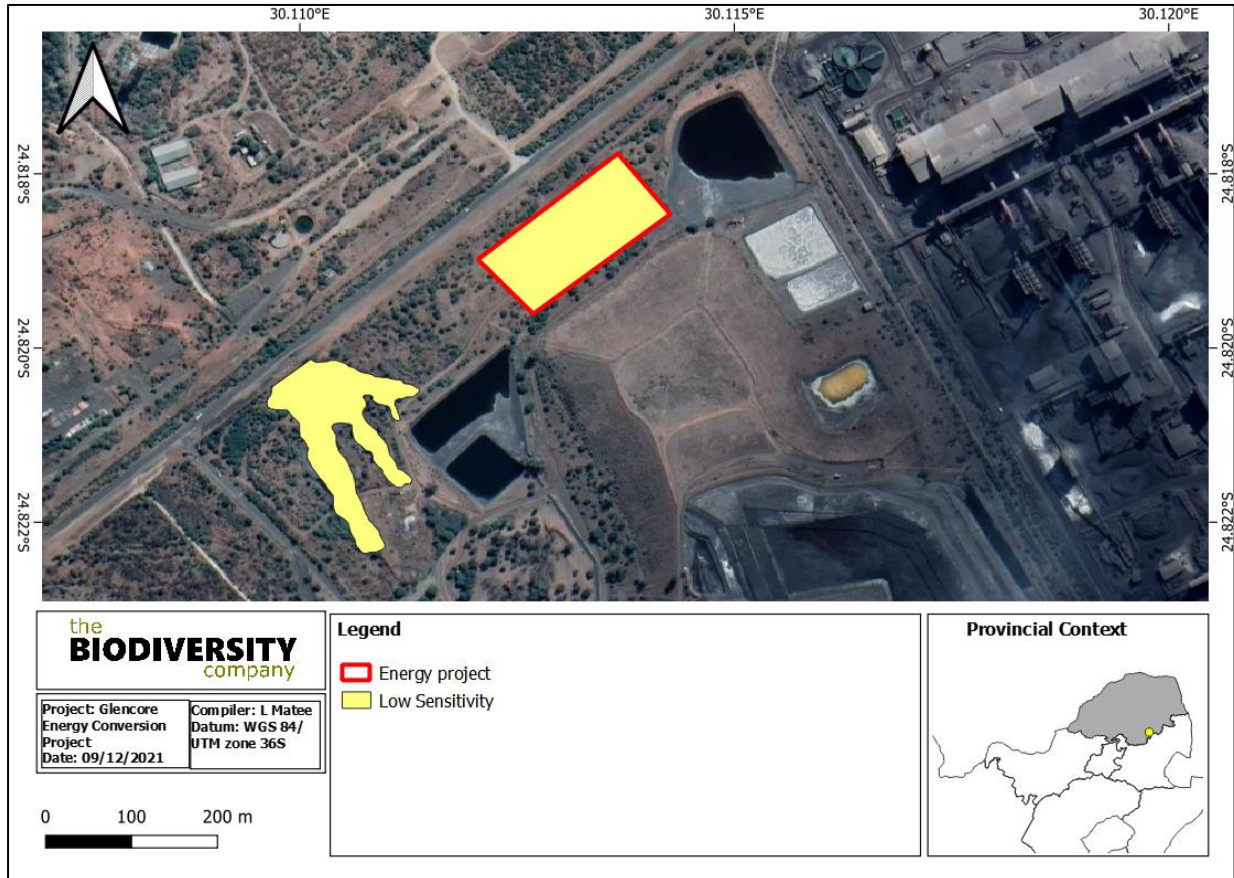
**Table 5-6** Summary of habitat types delineated within field assessment area of the project area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Degraded Bushveld	Low	Low	Low	Medium	Low
Riparian zone	Low	Low	Low	Medium	Low



**Figure 5-10** The habitat units identified in the project area





**Figure 5-11** The sensitivity of the project area

## 6 Proposed Impact Management Outcomes

The area has been altered from its original state however it can still affect species in the surrounding area by means of erosion, dust, fire, alien vegetation introduction and proliferation, poor waste management resulting in increase in pest numbers, as well as chemical spills, therefore, the following generic management outcomes were suggested and should be included into the Environmental Management Programme (EMPr) (Table 6-1).

**Table 6-1 Impact Management Outcomes**

<b>Management outcome: Vegetation and Habitats</b>				
<b>Impact Management Actions</b>	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>All construction activities must be carried out according to the generally accepted environmental best practice and the spatial footprint must be kept to a minimum.</p> <p>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 minimized and avoided where possible. All activities must be restricted within the development footprint sensitivity areas. No loss of areas surrounding the development area. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area);</p> <p>Where possible, existing access routes and walking paths must be made use of, and the development of new routes limited.</p>	Construction	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing
	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation surrounding the proposed development	Ongoing
	All phases	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
<p>Provincially protected (SCC species) must be marked for rescue and relocation, or removal (where permit application would then apply) before any vegetation removal commences</p>	Post Construction/Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Protection of SCC floral species	Throughout phase
<p>Permits need to be obtained from LEDA for the protected plant species that need to be translocated through the search and rescue exercise.</p>	Post Construction/Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Protection of SCC floral species	Throughout phase
<p>All laydown, chemical toilets etc. should be restricted to low sensitivity 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. Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated project areas.</p> <p>It is recommended that the supervisor of the vegetation clearing contractors receive adequate training as to the presence, identity, and management of species of conservation importance, and that a botanical specialist/ECO (Environmental Control Officer) be appointed during vegetation clearing to conduct monthly on-site audits of the vegetation clearing process.</p> <p>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 during construction unless necessary. All contaminated soil/yard stone shall be treated in situ or removed and be placed in containers</p>	Construction/Operational Phase	Environmental Officer & Design Engineer	Laydown areas and material storage & placement.	Ongoing
	Construction	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing
<p>Leaking equipment and vehicles must be repaired immediately or be removed from the project areas to facilitate the repair</p>	Life of operation	Environmental Officer & Contractor	Leaks and spills	Ongoing
<p>A fire prevention and emergency response plan needs to be complied and implemented to restrict the impact fire might have on the project area and it's immediate surrounding.</p>	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
<b>Management outcome: Fauna</b>				

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Phase	Responsible Party
Employees and contractors should be made aware of the presence of, and rules regarding fauna through suitable induction training and on-site signage.	Construction	Environmental Officer & Design Engineer	Faunal mortalities including SCC species	Ongoing
It is recommended that the supervisors of the vegetation clearing, and construction contractors receive adequate training as to the presence, identity and management of on-site fauna	Construction	Environmental Officer & Design Engineer	Faunal mortalities including SCC species	Ongoing
<b>Management outcome: Alien Vegetation</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
AIP species should be managed using the existing mine AIP management plan. Removal AIPs should preferably commence during the pre-construction phase and continue throughout the construction and operational phases. AIPs should be cleared within the project area before any vegetation clearing activities commence, thereby ensuring that no AIP propagules are spread, or soils contaminated with AIP seeds during the construction phase; and the existing mine AIP Management/Control Plan should be implemented by a qualified professional. No chemical control of AIPs to occur without a certified professional.	Life of operation	Project manager, Environmental Officer & Contractor	Assess presence and encroachment of alien vegetation	Quarterly monitoring
Regular monitoring of the implementation of this plan for the rehabilitation of disturbed areas must be conducted by the appointed ECO.	Construction Phase	Project manager, Environmental Officer & Contractor	Assess presence and encroachment of alien vegetation	Quarterly monitoring
<b>Management outcome: Waste management</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Waste must be managed in accordance with the existing waste management procedures.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing
Waste management must be a priority and all waste must be collected and stored effectively.	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed as a result of the construction activities should be reduced, re-used or recycled with disposal to landfill as last resort. No temporary dump sites should be allowed in areas with natural vegetation. It is advised that waste disposal containers and bins be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be carefully collected and disposed of at a separate waste facility.	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
<b>Management outcome: Environmental awareness training</b>				

Impact Management Actions	Implementation			Monitoring
	Phase	Responsible Party	Aspect	Frequency
Ensure that all site personnel have a basic level of environmental awareness training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of SSC, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMP. The avoidance and protection of the surrounding watercourses and riparian areas must be included into a site induction. Contractors and employees must all undergo the induction and be made aware of the areas to be avoided.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing

**Management outcome: Stormwater management**

Impact Management Actions	Implementation			Monitoring
	Phase	Responsible Party	Aspect	Frequency
A Stormwater Management Plan must be developed to control runoff and prevent erosion of the site and its surroundings	Construction	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing
Appropriate stormwater structures alongside a stormwater management plan must be designed to minimise erosion of the surrounding environment and sedimentation of surrounding watercourses.	Life of operation	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing

**Management outcome: Dust and Erosion**

Impact Management Actions	Implementation	Monitoring		
	Phase	Responsible Party	Aspect	Frequency
Dust-reducing mitigation measures as per existing mine procedures must be strictly adhered to, for the road and any burrow pits (if any are required). This includes wetting of exposed soft soil surfaces.	Construction Phase	Contractor	Dustfall	As per the air quality report and the dust monitoring program.
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species	Construction Phase	Contractor	Erosion	Ongoing

## 7 Recommended Actions

Through the analysis of various database and satellite imagery as well as the infield screening assessment it was determined that the project area possess a few sensitive ecological receptors but is highly degraded. These sensitivity receptors relate to being located in an EN ecosystem, traversing threatened ecosystems as well as the recording of one SSC floral species within the project area, *Aloe globuligemma* which is a protected plant species in the Limpopo Environmental Management Act (Act No.7 of 2003). However, the project area is in a highly degraded state as the vegetation structure and species composition has been completely altered as such, has a very low conservation value and ecological sensitivity from a floral perspective.

It is the opinion of the ecologists that the proposed development is feasible, and no ecological constraints present a fatal flaw. The SCC must be marked for rescue and relocation, or removal (where permit application would then apply). These SCC can either be relocated to similar suitable habitat within the surrounding area, but outside the development footprint and utilised within the landscaping plan of the project, or moved to registered nurseries with guidance from the Agricultural Research Counsel (ARC) or the South African National Biodiversity Institute (SANBI).

### 7.1 Impact Statement

No fatal flaws are evident for the proposed project. It is the opinion of the specialists that the project, may be favourably considered for authorisation. All prescribed mitigation measures and supporting recommendations must be considered by the issuing authority. Mitigation measures as described in this report will reduce the significance of the risk to an acceptable level.

### 7.2 Plan of study for Basic

It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the focus area will be made in support of the principle of sustainable development. Furthermore, It is the opinion of the Ecologist that the overall impact of the Energy project, on the terrestrial biodiversity and plant species resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorised and no further specialist studies are deemed necessary for the proposed development.

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## 9 Appendices

### *Appendix A Specialist declarations*

#### DECLARATION

I, Lusanda Matee, 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.



Lusanda Matee

Terrestrial Ecologist

The Biodiversity Company

January 2022

## 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

Terrestrial Ecologist

The Biodiversity Company

January 2022

**Appendix B: Specialists CVs**

# Lusanda Patrick Matee

M.Sc Biological Sciences (*Cand Sci Nat*)

Cell: +27 66 225 6653

Email: [lusanda@thebiodiversitycompany.com](mailto:lusanda@thebiodiversitycompany.com)

Identity Number: 8909175526080

Date of birth: 17 September 1989



## Education

2012: BSc. Biological Sciences      University of KwaZulu-Natal

Research Project: "Mapping the distribution of selected Southern African bat species"

2013: BSc. (Honours) Biological Sciences (Zoology)      University of KwaZulu-Natal

Research Project: "Sleeping patterns in selected South African avian species: Ring-necked Parakeets (*Psittacula krameri*), and Red-winged Starling (*Onychognathus morio*)"

2016: MSc by Research Biological Sciences University of KwaZulu-Natal

Research Project: "Lichen photobiology in relation to climate change: Protection in Peltigeralean lichens against excess ultraviolet (UV) radiation using induced melanins and the effects of UV on melanin synthesizing enzymes"

Master of Science (Masters by Research in Biological Sciences (Botany) SANCOOP Project, collaboration with Norwegian University of Life Sciences Department of Ecology and Natural Resource Management

## Other relevant courses and training

Advanced grassland identification

Riparian Vegetation Response Assessment Index in River EcoClassification (VEGRAI)

First Aid Level 1

## Language Skills

English: 1<sup>st</sup> Language

isiXhosa: Home language

isiNdebele: Conversational and written command

isiZulu: Conversational and written command

## Employment

[info@thebiodiversitycompany.com](mailto:info@thebiodiversitycompany.com)

May 2021- Present: Technical Specialist Subcontractor: Terrestrial Biodiversity (Fauna and Flora), The Biodiversity Company (TBC)

February 2021- May 2021: Freelance Terrestrial Biodiversity (Fauna and Flora) Specialist

September 2020- January 2021: Technical Specialist (Consultant VI): Terrestrial Biodiversity (Fauna and Flora), Digby Wells

November 2017-September 2020: Assistant Ecologist (Consultant), Digby Wells

June 2017- November 2017: Digby Wells Environmental Biophysical Intern (Ecology intern: Fauna and Flora), Digby Wells

2011-2016: Laboratory demonstrator & Teaching Assistant, University of KwaZulu-Natal

2012-2013: DNA Bar-coding Research Intern, South African National Biodiversity Institute (SANBI)

## Professional bodies and memberships

South African Council for Natural Scientific Professions, *Cand Natural Scientist in the field of practice Biological Sciences and Ecological Sciences*, the registration number is 119257 (Pending upgrade)

Golden Key International Honour Society, member ID number is 14254770.

Zoological Society of Southern Africa

South African Association of Botany (SAAB)

## Publications

Matee, L. P., Beckett, R. P., Solhaug, K. A., & Minibayeva, F. V. (2016). Characterization and role of Tyrosinases in the lichen *Lobaria Pulmonaria* (L.) Hoffm. *The Lichenologist*, 48(4), 311-322.

## Selected Project Experience

Year	Client	Project	Responsibility	Location
2017	Sibanye Gold	Long-Term Rehabilitation and Closure Strategy for the Cooke Operations	Update of Rehab and Closure Plan	South Africa
2017	Mutsho Power Company (Pty) Ltd	Proposed Mutsho Power Project Wetland Baseline Scoping Report	Wetland Scoping Report Compilation	South Africa
2017	Randgold Resources	Kibali BLMP Audit	Assisting with Report Compilation	DRC
2017	Randgold Resources	Environmental and Social Impact Assessment for the Massawa and Sofia Gold Project, Senegal	Assisting with the Baseline Report Compilation	Senegal
2017	Exxaro	Exxaro Grootegeluk Coal Mine Exploration Drilling Sites Protected Tree Assessment	Protected Tree Infield Assessment	South Africa
2018	Exxaro	Alien Invasive Vegetation Assessment and Management Plan for the Matla Colliery	Alien Invasive Vegetation Infield Assessment and Compilation of Management Plan	South Africa
2018	Sasol Mining	Alien Invasive Vegetation Assessment and Management Plan for the Sigma: Mooikraal Colliery	Alien Invasive Vegetation Infield Assessment and Compilation of Management Plan	South Africa
2018	Anker Coal and Mineral Holdings SA (Pty) Ltd.	Alien Invasive Vegetation Assessment and Management Plan for the Elandsfontein Colliery	Alien Invasive Vegetation Infield Assessment and Compilation of Management Plan	South Africa
2018	Total East Africa Midstream B. V	Social & Resettlement Services for East Africa Crude Oil Pipeline (Eacop) Project – Tanzania Section Phase 2	Database Manager	Tanzania
2018	Sasol Mining	Sasol Sigma Defunct Colliery Surface Mitigation Project: Proposed River Diversion and Flood Protection Berms	Fauna & Flora Specialist Study	South Africa
2018	Seniorian 4th Investments (Pty) Ltd	Habitat Assessment for Roan Antelope	Flora specialist	South Africa
2019	Anglo American Coal South Africa (hereafter AACSA)	Vegetation assessment as part of a Land capability study	Flora specialist	South Africa
2019	Guard Risk	Technical review of financial provisions for closure (united Manganese of Kalahari)	Technical reviewer	South Africa
2019	PPC Ltd	Financial Provisions for closure update 2019	Calculated FP Estimates	South Africa

2019	Dagsoom Coal Mining (Pty) Ltd	Baseline Input in Support of Environmental Application Process for the Proposed Twyfelaar Coal Mining Project, Mpumalanga Province	Fauna & Flora Specialist Study	South Africa
2020	Debswana	Environmental Impact Assessment for the Jwaneng Post Cut 9 Underground Mine Project	Fauna & Flora Specialist	Botswana
2020	Debswana	Alien Invasive Vegetation Assessment and Management Plan for Debswana's (OLDM) Orapa Letlhakane and Damtshaa Mines	Alien Invasive Vegetation Infield Assessment and Compilation of Management Plan	Botswana
2020	MDT Environmental	Protected Flora Assessment for Exxaro Coal's (Exxaro) No. 3 pump station (existing) to Marapong's Potable Water Reservoir (existing)	Flora Specialist	South Africa
2020	Oklo Resources Limited	Baseline Fauna and Flora Assessment for the Dandoko Gold Exploration Project	Fauna & Flora Specialist	Mali
2020	Sasol Mining	Implementation of the Leeuspruit Risk Mitigation Measures Monitoring Plan and Sigma Environmental Secondment	Alien Invasive Vegetation Infield Assessment and Compilation of Management Plan	South Africa
2021	GreenScene	Vegetation assessment in support of the environmental authorisation process and to inform the development area for Ptn 4 of 14 Marburg	Flora Specialist and Compilation of Report	South Africa
2021	Isolendalo Enviro Consulting	Vegetation assessment in support of the environmental authorisation process and to inform the development area for Erf 1251 Shelley Beach	Flora Specialist and Compilation of Report	South Africa
2021	Velezinhle Consulting and Projects	Terrestrial & Freshwater Ecology Assessment Report for the Proposed Umuziwabantu Sport Field Project	Fauna & Flora Specialist and Compilation of Report	South Africa
2021	Basia Environmental	The Terrestrial Biodiversity Assessment for The Proposed in Die Kom 345JQ and Spruitfontein 341JQ Mining Permit Applications	Fauna & Flora Specialist and Compilation of Report	South Africa
2021	EnviroPro	Barberton Mine Wetland and Terrestrial Baseline and Impact Assessment for proposed Solar PV	Fauna & Flora Specialist and Compilation of Report	South Africa

<b>2021</b>	WSP	Mortimer Smelter Contractor Laydown Area Vegetation Assessment	Flora Specialist and Compilation of Report	<b>South Africa</b>
<b>2021</b>	WSP	Two Rivers Platinum Mine Pipeline rerouting Terrestrial Biodiversity Assessment	Fauna & Flora Specialist and Compilation of Report	<b>South Africa</b>

# Andrew Husted

## M.Sc Aquatic Health (*Pr Sci Nat*)

Cell: +27 81 319 1225

Email: [andrew@thebiodiversitycompany.com](mailto:andrew@thebiodiversitycompany.com)

Identity Number: 7904195054081

Date of birth: 19 April 1979



### Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia.

Specialist experience with on-shore drilling, mining, engineering, hydropower and renewable energy.

Experience with project management of national and international multi-disciplinary projects. Including managing and compiling ESHIAs and EMPs

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements, and international lenders.

Specialist expertise include Instream Flow and Ecological Water Requirements, aquatic ecology and wetlands resources.

### Areas of Interest

Mining, Oil & Gas, Renewable Energy & Bulk Services  
Infrastructure Development,  
Sustainability and Conservation.

### Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Terrestrial Ecological Assessments
- Aquatic Ecological Assessments
- Rehabilitation Plans and Monitoring
- Aquaculture

### Country Experience

Botswana, Cameroon  
Democratic Republic of Congo  
Ghana, Ivory Coast, Lesotho  
Liberia, Mali, Mozambique  
Nigeria, Republic of Armenia, Senegal  
Sierra Leone, South Africa  
Swaziland, Tanzania

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Conversational

German - Basic

### Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondli Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams



Publication of scientific journals  
and articles.

#### **SELECTED PROJECT EXPERIENCE**

##### **Project Name: The Environmental and Social Impact Assessment (ESIA) the proposed Nondvo Dam**

Client: WSP

Personal position / role on project: Project Manager.

Location: Swaziland

Main project features: To conduct a dual season terrestrial and aquatic ecological baseline and impact assessment for the proposed dam. The study was required to meet national and IFC requirements, including a Critical Habitat assessment.

##### **Project Name: The environmental flow assessment for the Mara River system**

Client: IHE Delft Institute for Water Education

Personal position / role on project: Project Manager / Freshwater Ecologist

Location: Tanzania

Main project features: To conduct a dual season campaign to the Lower Mara River Basin in Tanzania to collect hydrological and ecological information as part of an environmental flow assessment on the Tanzanian side of the Mara River in collaboration with GIZ and NBI-NELSAP.

##### **Project Name: The Environmental and Social Impact Assessment (ESIA) the proposed solar photovoltaic facility and transmission in Cuamba**

Client: WSP

Personal position / role on project: Project Manager.

Location: Mozambique

Main project features: To conduct a single season terrestrial and aquatic ecological baseline and impact assessment for the proposed dam. The study was required to meet national and IFC requirements, including a Critical Habitat assessment.

##### **Project Name: A biodiversity baseline assessment for the proposed Siguiri Gold Mine Project, in Kankan Province, Guinea.**

Client: SRK Consulting.

Personal position / role on project: Project Manager.

Location: Siguiri, Guinea, West-Africa (2018).

Main project features: To conduct a dual season ecological baseline assessment for the expected impact footprint area. The study was required to meet national and IFC requirements, including a Critical Habitat assessment.

**Project Name: A biodiversity baseline and impact assessment for the proposed Lesotho Bulk Water Supply Scheme, Lesotho.**

Client: WSP.

Personal position / role on project: Wetland & Aquatic Ecologist, PROBFLO and Project Manager.

Location: Mohale's Hoek, Lesotho (2018).

Main project features: To conduct a dual season terrestrial and aquatic ecological baseline and impact assessment for the pipeline route and proposed weir. The study was required to meet national and IFC requirements, including a Critical Habitat assessment. The study also contributed to prescribing Instream Flow Requirements using PROBFLO for the system.

**Project Name: A biodiversity baseline and impact assessment for the proposed Pavua Hydropower Project, in Sofala Province, Central Mozambique.**

Client: Mott MacDonald.

Personal position / role on project: Project Manager.

Location: Sofala Province, Mozambique (2017).

Main project features: To conduct a dual season terrestrial and aquatic ecological baseline and impact assessment for the expected impact footprint area, including Gorongosa National. The study was required to meet national and IFC requirements, including a Critical Habitat assessment. The study also contributed to prescribing Instream Flow Requirements for the system.

**EMPLOYMENT EXPERIENCE**

**CURRENT EMPLOYMENT: The Biodiversity Company (January 2015 – Present)**

I founded The Biodiversity Company in 2015, now consisting of experienced ecologists who provide technical expertise and policy advice to numerous sectors, such as mining, agriculture, construction and natural resources. The team at The Biodiversity Company have conducted stand-alone specialist studies, and provided overall guidance of studies with a pragmatic approach for the management of biodiversity that takes into account all the relevant stakeholders, most importantly the environment that is potentially affected. We manage risks to the environment to reduce impacts with practical, relevant and measurable methods.

**EMPLOYMENT: Digby Wells Environmental (October 2013 – December 2014)**

Digby Wells assigned me to the role of Country Manager for the united Kingdom. This was a new endeavour for the company as the company's global footprint continues to increase. The primary responsibilities for the role included the following:

- **Client liaison** to be able to interact more efficiently and personally with current mining clients, mining industry service providers, legal firms and banking institutions in order to introduce Digby Wells as a services provider with the aim of securing work.
- **Project management** for international projects which may require a presence in the united Kingdom, this was dependent on the location and needs of the client. These projects would mostly be based on the Equator Principles (EP) and International Finance Corporation (IFC) Performance Standards.
- **Technical input** to provide specialist technical expertise for projects, this included fauna, aquatic ecology, wetlands and rehabilitation. Continued with the design and implementation of Biodiversity and Land Management Plans to assist clients with managing the natural

resources. Responsibilities also included the mentorship and management (including reviewing and guiding) other expertise such as flora, fauna and pedology.

#### **EMPLOYMENT: Digby Wells Environmental (March 2012 – September 2013)**

Manager of a multi-disciplinary department of scientists providing specialist services in support of national and international requirements as well as best practice guidelines, primarily focussing on the mining sector. In addition to managing the department, I was also expected to contribute specialist services, most notably focusing on water resources. Further responsibilities also included the management of numerous projects on a national or international scale. A general overview of the required responsibilities are as follows:

- **Project management** for single as well as multi-disciplinary studies on a national and international scale. This included legislation and commitments for the respective country being operated in, as well as included the World Bank (WB), EP and IFC requirements.
- **Individual and/or team management** in order to provide mentoring and supportive structures for development and growth in support of the company's strategic objectives.
- **Scientific report writing** to ensure that the relevant standards and requirements have been attained, namely local country legislation, as well as WB, EP and IFC requirements.
- **Report reviewing** in order to ensure compliance and consideration of relevant legislation and guidelines and also quality control.
- **Specialist management** to facilitate the collaboration and integration of specialist skills for the respective projects. This also included the development of Biodiversity and Land Management Plan for clients.
- **Client Resource Manager** for numerous clients in order to establish as well as maintain working relationships.

An overview of the tenure working with the company is provided below:

- **October 2013 – December 2014: London Operations Manager** – Deployed to establish a presence for the company (remote office) in the united Kingdom by means of generating project work to support the employment of staff and operation of a business structure.
- **March 2012 – September 2013: Biophysical Department Manager** – Responsible for the development and growth of the department to consist of four specialist units. This included the development of a new specialist unit, namely Rehabilitation.
- **January 2011 - February 2012: Ecological unit Manager** – In addition to implementing aquatic and wetland specialist services, the role required the overall management of additional specialist services which included fauna & flora.
- **June 2010 - December 2010: Aquatic Services Manager** – This required the marketing and implementation of specialist programmes for the client base such as biomonitoring and wetland off-set strategies. In addition to this, this also included expanding on the existing skill set to include services such as toxicity, bioaccumulation and ecological flow assessments.
- **August 2008: Aquatic ecologist** – Employed as a specialist to establish the aquatic services within the company. In addition to this, wetland specialist services were added to the existing portfolio.

#### **PREVIOUS EMPLOYMENT: Econ@UJ (University of Johannesburg)**

- June 2007 – July 2008: Junior aquatic ecologist
  - Researcher
  - Technical assistant for fieldwork
  - Reporting writing
  - Project management

## ADDITIONAL EXPERIENCE

<b>Compliance audits</b>	Conducting site investigations in order to determine the level of compliance attained, ensuring that the client maintains an appropriate measure of compliance with environmental regulations by means of a legislative approach
<b>Control officer</b>	Acting as an independent Environmental Control Officer (ECO), acting as a quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts
<b>Screening studies</b>	Project investigations in order to determine the level of complexity for the environmental and social studies required for a project. This is a form of risk assessment to guide the advancement of the project.
<b>Public consultation</b>	The provision of specialist input in order to communicate project findings as well as assist with providing feedback if and when required.
<b>Water use licenses</b>	Consultation with the relevant authorities in order to establish the project requirements, as well as provide specialist (aquatics/wetland) input for the application in order to achieve authorisation.
<b>Closure</b>	Primarily the review of closure projects, with emphasis on the closure cost calculations. Support was also provided by assisting with the measurements of structures during fieldwork.
<b>Visual</b>	The review of visual studies as well as the collation of field data to be considered for the visual interpretation for the project.

## ACADEMIC QUALIFICATIONS

**University of Johannesburg, Johannesburg, South Africa (2009):** MAGISTER SCIENTIAE (MSc)  
- Aquatic Health:

**Title:** *Aspects of the biology of the Bushveld Smallscale Yellowfish (Labeobarbus polylepis): Feeding biology and metal bioaccumulation in five populations.*

**Rand Afrikaans University (RAU), Johannesburg, South Africa (2004):** BACCALAUREUS SCIENTIAE CUM HONORIBUS (Hons) – Zoology

**Rand Afrikaans University (RAU), Johannesburg, South Africa (2001 - 2004):** BACCALAUREUS SCIENTIAE IN NATURAL AND ENVIRONMENTAL SCIENCES. Majors: Zoology and Botany.

## PUBLICATIONS

Mahomed D, Husted A, Fry C, Downsa CT and O'Brien GC. 2019. Spatial shifts and habitat partitioning of ichthyofauna within the middle-lower region of the Pungwe Basin, Mozambique, *Journal of Freshwater Ecology*, 34:1, 685-702, DOI: 10.1080/02705060.2019.1673221

Tate RB and Husted, A. 2015. Aquatic Biomonitoring in the upper reaches of the Boesmanspruit, Carolina, Mpumalanga, South Africa. *African Journal of Aquatic Science*.

Tate RB and Husted A. 2013. Bioaccumulation of metals in *Tilapia zillii* (Gervai, 1848) from an impoundment on the Badeni River, Cote D'Ivoire. African Journal of Aquatic Science.

O'Brien GC, Bulfin JB, Husted A. and Smit NJ. 2012. Comparative behavioural assessment of an established and new Tigerfish (*Hydrocynus vittatus*) population in two manmade lakes in the Limpopo catchment, Southern Africa. African Journal of Aquatic Science.

Tomschi, H, Husted, A, O'Brien, GC, Cloete, Y, Van Dyk C, Pieterse GM, Wepener V, Nel A and Reisinger U. 2009. Environmental study to establish the baseline biological and physical conditions of the Letsibogo Dam near Selebi Phikwe, Botswana. EC Multiple Framework Contract Beneficiaries.8 ACP BT 13 – Mining Sector (EDMS). Specific Contract N° 2008/166788. Beneficiary Country: Botswana. By: HPC HARRESS PICKEL CONSULT AG

Husted A. 2009. Aspects of the biology of the Bushveld Smallscale Yellowfish (*Labeobarbus polylepis*): Feeding biology and metal bioaccumulation in five populations. The University of Johannesburg (Thesis).

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**Appendix C: List of potential floral species expected to occur in close vicinity to the project area.**

Family	Species	IUCN	Diagnostic	Ecology
Lamiaceae	<i>Clerodendrum ternatum</i>	LC	dwarf shrub;	Indigenous
Oleaceae	<i>Olea europaea</i>			Indigenous
Pteridaceae	<i>Pellaea calomelanos</i>	LC	lithophyte; geophyte; herb;	Indigenous
Malpighiaceae	<i>Triaspis glaucophylla</i>	LC	climber; shrub;	Indigenous; Endemic
Malvaceae	<i>Grewia bicolor</i>	LC	tree; shrub;	Indigenous
Poaceae	<i>Panicum deustum</i>	LC	graminoid;	Indigenous
Poaceae	<i>Triraphis andropogonoides</i>	LC	graminoid;	Indigenous
Crassulaceae	<i>Crassula capitella</i>	LC	succulent; herb;	Indigenous
Orchidaceae	<i>Orthochilus leontoglossus</i>	LC		Indigenous
Commelinaceae	<i>Commelina africana</i>	LC	herb;	Indigenous
Lamiaceae	<i>Leonotis ocyimifolia</i>			Indigenous
Ebenaceae	<i>Euclea sp.</i>			
Lamiaceae	<i>Syncolostemon cinereum</i>	LC	shrub;	Indigenous
Fabaceae	<i>Indigastrum costatum</i>	LC	herb;	Indigenous
Acanthaceae	<i>Dyschoriste erecta</i>	LC	dwarf shrub;	Indigenous; Endemic
Anacardiaceae	<i>Searsia leptodictya</i>	NE	shrub; tree;	Indigenous
Fabaceae	<i>Calpurnia aurea</i>	LC	shrub; tree;	Indigenous
Scrophulariaceae	<i>Jamesbrittenia huillana</i>	LC	shrub; dwarf shrub;	Indigenous
Cyperaceae	<i>Cyperus cyperoides</i>	LC	mesophyte; cyperoid; herb;	Indigenous
Polygalaceae	<i>Polygala wilmsii</i>	LC	herb;	Indigenous
Fabaceae	<i>Leobordea hirsuta</i>	LC		Indigenous; Endemic
Anacardiaceae	<i>Ozoroa sphaerocarpa</i>	LC	shrub; tree;	Indigenous
Polygalaceae	<i>Polygala hottentotta</i>	LC	dwarf shrub; herb;	Indigenous
Rhamnaceae	<i>Rhamnus prinoides</i>	LC	shrub; tree;	Indigenous
Iridaceae	<i>Gladiolus ecklonii</i>	LC	geophyte; herb;	Indigenous
Lamiaceae	<i>Tinnea rhodesiana</i>	LC	shrub;	Indigenous
Lamiaceae	<i>Vitex obovata</i>	LC	tree;	Indigenous
Poaceae	<i>Echinochloa crus-galli</i>	LC	graminoid;	Indigenous
Pteridaceae	<i>Cheilanthes hirta</i>			Indigenous
Pteridaceae	<i>Cheilanthes involuta</i>	LC	lithophyte; geophyte; herb;	Indigenous
Leskeaceae	<i>Lindbergia sp.</i>			
Verbenaceae	<i>Lantana rugosa</i>	LC	shrub;	Indigenous
Orobanchaceae	<i>Alectra sp.</i>			
Asteraceae	<i>Felicia clavipilosa</i>	LC	shrub;	Indigenous
Anacardiaceae	<i>Searsia discolor</i>	LC	shrub; dwarf shrub;	Indigenous
Orchidaceae	<i>Disa cooperi</i>	LC	geophyte; herb;	Indigenous

<b>Acanthaceae</b>	<i>Dicliptera fruticosa</i>	NT	herb;	Indigenous; Endemic
<b>Crassulaceae</b>	<i>Kalanchoe luciae</i>	LC	succulent; shrub;	Indigenous
<b>Pottiaceae</b>	<i>Syntrichia chisosa</i>		bryophyte;	Indigenous
<b>Acanthaceae</b>	<i>Barleria ovata</i>	LC	herb;	Indigenous
<b>Asteraceae</b>	<i>Senecio digitalifolius</i>	LC	herb;	Indigenous
<b>Vitaceae</b>	<i>Rhoicissus sekhukhuniensis</i>	LC	shrub;	Indigenous; Endemic
<b>Iridaceae</b>	<i>Gladiolus reginae</i>	CR	geophyte;	Indigenous; Endemic
<b>Rubiaceae</b>	<i>Pavetta glaucophylla</i>			Indigenous; Endemic
<b>Stilbaceae</b>	<i>Halleria lucida</i>	LC	shrub; tree;	Indigenous
<b>Melastomataceae</b>	<i>Dissotis canescens</i>	LC	shrub; herb;	Indigenous
<b>Vitaceae</b>	<i>Rhoicissus sp.</i>			
<b>Poaceae</b>	<i>Aristida rhiniochloa</i>	LC	graminoid;	Indigenous
<b>Fabaceae</b>	<i>Leobordea foliosa</i>	LC		Indigenous
<b>Santalaceae</b>	<i>Viscum verrucosum</i>	LC	succulent; parasite; shrub;	Indigenous
<b>Acanthaceae</b>	<i>Barleria rotundifolia</i>	LC	dwarf shrub; shrub;	Indigenous; Endemic
<b>Orchidaceae</b>	<i>Habenaria clavata</i>	LC	geophyte; herb;	Indigenous
<b>Asteraceae</b>	<i>Polydora angustifolia</i>	LC		Indigenous
<b>Santalaceae</b>	<i>Thesium impeditum</i>	LC	herb; parasite; shrub;	Indigenous
<b>Rutaceae</b>	<i>Calodendrum capense</i>	LC	tree;	Indigenous
<b>Hypoxidaceae</b>	<i>Hypoxis rigidula</i>	LC	geophyte; herb;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia sekhukhuniensis</i>	LC	shrub;	Indigenous; Endemic
<b>Asteraceae</b>	<i>Euryops brevipapposus</i>	LC	shrub;	Indigenous
<b>Asteraceae</b>	<i>Hilliardiella nudicaulis</i>	LC	geophyte; herb;	Indigenous; Endemic
<b>Fabaceae</b>	<i>Crotalaria sphaerocarpa</i>	LC	herb;	Indigenous
<b>Begoniaceae</b>	<i>Begonia sutherlandii</i>			Indigenous
<b>Fabaceae</b>	<i>Tephrosia polystachya</i>	LC	herb; dwarf shrub; shrub;	Indigenous
<b>Hypoxidaceae</b>	<i>Hypoxis sp.</i>			
<b>Cucurbitaceae</b>	<i>Cucumis zeyheri</i>	LC	herb;	Indigenous
<b>Crassulaceae</b>	<i>Crassula vaginata</i>	LC	succulent; herb;	Indigenous
<b>Poaceae</b>	<i>Enneapogon scoparius</i>	LC	graminoid;	Indigenous
<b>Phyllanthaceae</b>	<i>Phyllanthus sp.</i>			
<b>Iridaceae</b>	<i>Watsonia pulchra</i>	LC	geophyte; herb;	Indigenous
<b>Loranthaceae</b>	<i>Tapinanthus quequensis</i>	LC	parasite; shrub;	Indigenous
<b>Apocynaceae</b>	<i>Ceropegia ampliata</i>	LC	succulent; climber;	Indigenous
<b>Asteraceae</b>	<i>Kleinia stapeliiformis</i>	LC	succulent; herb;	Indigenous; Endemic
<b>Hyacinthaceae</b>	<i>Ornithogalum paludosum</i>	LC	geophyte;	Indigenous
<b>Lamiaceae</b>	<i>Stachys caffra</i>	LC	shrub;	Indigenous; Endemic
<b>Convolvulaceae</b>	<i>Ipomoea bathycolpos</i>	LC	herb;	Indigenous; Endemic
<b>Iridaceae</b>	<i>Freesia grandiflora</i>		geophyte; herb;	Indigenous

<b>Malvaceae</b>	<i>Hermannia montana</i>	LC	dwarf shrub;	Indigenous; Endemic
<b>Lamiaceae</b>	<i>Aeollanthus buchnerianus</i>	LC	succulent; herb; dwarf shrub;	Indigenous
<b>Asteraceae</b>	<i>Tagetes minuta</i>		herb;	Not indigenous; Naturalised; Invasive
<b>Poaceae</b>	<i>Eulalia villosa</i>	LC	graminoid;	Indigenous
<b>Aizoaceae</b>	<i>Delosperma sp.</i>		succulent;	
<b>Hyacinthaceae</b>	<i>Ledebouria atropurpurea</i>	LC		Indigenous; Endemic
<b>Colchicaceae</b>	<i>Ornithoglossum vulgare</i>	LC	geophyte;	Indigenous
<b>Malvaceae</b>	<i>Hermannia modesta</i>	LC	herb; dwarf shrub;	Indigenous
<b>Agapanthaceae</b>	<i>Agapanthus campanulatus</i>			Indigenous
<b>Cyperaceae</b>	<i>Cyperus schlechteri</i>	LC	mesophyte; cyperoid; herb;	Indigenous
<b>Iridaceae</b>	<i>Gladiolus dalenii</i>	LC	geophyte; herb;	Indigenous
<b>Acanthaceae</b>	<i>Crossandra greenstockii</i>	LC	herb; dwarf shrub;	Indigenous
<b>Poaceae</b>	<i>Hyparrhenia anamesa</i>	LC	graminoid;	Indigenous
<b>Orobanchaceae</b>	<i>Striga gesnerioides</i>	LC	parasite; herb;	Indigenous
<b>Santalaceae</b>	<i>Viscum combreticola</i>	LC	succulent; parasite; shrub;	Indigenous
<b>Lamiaceae</b>	<i>Syncolostemon sp.</i>			
<b>Apocynaceae</b>	<i>Schizoglossum bidens</i>	LC	succulent; herb;	Indigenous
<b>Poaceae</b>	<i>Eragrostis capensis</i>	LC	graminoid;	Indigenous
<b>Araceae</b>	<i>Stylochaeton natalensis</i>	LC	herb;	Indigenous
<b>Maesaceae</b>	<i>Maesa lanceolata</i>	LC	shrub; tree;	Indigenous
<b>Orchidaceae</b>	<i>Habenaria tridens</i>	LC	geophyte; herb;	Indigenous
<b>Apocynaceae</b>	<i>Aspidoglossum albocoronatum</i>			Indigenous; Endemic
<b>Cyperaceae</b>	<i>Cyperus congestus</i>	LC	cyperoid; helophyte; herb;	Indigenous
<b>Asteraceae</b>	<i>Laggera decurrens</i>	LC	herb;	Indigenous
<b>Aytoniaceae</b>	<i>Asterella sp.</i>			
<b>Asteraceae</b>	<i>Cirsium vulgare</i>		herb;	Not indigenous; Naturalised; Invasive
<b>Rubiaceae</b>	<i>Anthospermum welwitschii</i>	LC	shrub;	Indigenous
<b>Fabaceae</b>	<i>Dolichos peglerae</i>	LC	climber; herb;	Indigenous; Endemic
<b>Orobanchaceae</b>	<i>Striga asiatica</i>	LC	parasite; herb;	Indigenous
<b>Asteraceae</b>	<i>Senecio oxyriifolius</i>	LC	succulent; herb;	Indigenous
<b>Verbenaceae</b>	<i>Verbena brasiliensis</i>		herb;	Not indigenous; Naturalised; Invasive
<b>Fabaceae</b>	<i>Senna septemtrionalis</i>	NE	dwarf shrub; shrub; tree;	Not indigenous; Naturalised; Invasive
<b>Asphodelaceae</b>	<i>Trachyandra saltii</i>	LC	succulent; geophyte;	Indigenous
<b>Capparaceae</b>	<i>Maerua cafra</i>	LC	shrub; tree;	Indigenous
<b>Asteraceae</b>	<i>Amphiglossa triflora</i>	LC	dwarf shrub;	Indigenous
<b>Neckeraceae</b>	<i>Orthostichella pandurifolia</i>		epiphyte; bryophyte;	Indigenous
<b>Malvaceae</b>	<i>Grewia flava</i>	LC	shrub;	Indigenous
<b>Pteridaceae</b>	<i>Cheilanthes viridis</i>	LC	lithophyte; geophyte; herb;	Indigenous



Lamiaceae	<i>Ocimum tubiforme</i>	LC	shrub;	Indigenous; Endemic
Celastraceae	<i>Maytenus albata</i>	LC	shrub; tree;	Indigenous
Orchidaceae	<i>Eulophia ovalis</i>	LC	geophyte; herb;	Indigenous
Asteraceae	<i>Berkheya subulata</i>	NE	herb;	Indigenous; Endemic
Orchidaceae	<i>Brownleea parviflora</i>	LC	geophyte; herb;	Indigenous
Fabaceae	<i>Crotalaria monteiroi</i>	LC	dwarf shrub; shrub;	Indigenous
Lamiaceae	<i>Orthosiphon fruticosus</i>	LC	shrub;	Indigenous; Endemic
Solanaceae	<i>Lycium horridum</i>	LC	dwarf shrub; shrub;	Indigenous
Vitaceae	<i>Cyphostemma woodii</i>	LC	succulent; herb;	Indigenous
Acanthaceae	<i>Dyschoriste perrottetii</i>		herb; dwarf shrub;	Indigenous
Orchidaceae	<i>Orthochilus aculeatus</i>	LC		Indigenous
Poaceae	<i>Andropogon eucomus</i>	LC	graminoid;	Indigenous
Rubiaceae	<i>Rothmannia capensis</i>	LC	tree;	Indigenous
Pteridaceae	<i>Cheilanthes hirta</i>	LC	lithophyte; geophyte; herb;	Indigenous
Asteraceae	<i>Tarchonanthus sp.</i>			
Euphorbiaceae	<i>Dalechampia galpinii</i>	LC	dwarf shrub; climber; herb;	Indigenous
Geraniaceae	<i>Pelargonium multicaule</i>	LC	dwarf shrub;	Indigenous; Endemic
Apocynaceae	<i>Schizoglossum sp.</i>			
Asteraceae	<i>Helichrysum harveyanum</i>	LC	herb;	Indigenous
Fabaceae	<i>Indigofera alternans</i>	LC	herb;	Indigenous
Cyperaceae	<i>Cyperus keniensis</i>	LC	mesophyte; cyperoid; helophyte; herb;	Indigenous
Orobanchaceae	<i>Alectra orobanchoides</i>	LC		Indigenous
Cleomaceae	<i>Cleome angustifolia</i>	LC	herb;	Indigenous
Asphodelaceae	<i>Aloe longibracteata</i>		succulent;	Indigenous; Endemic
Acanthaceae	<i>Crabbea angustifolia</i>	LC	herb;	Indigenous; Endemic
Salicaceae	<i>Populus alba</i>		tree;	Not indigenous; Naturalised; Invasive
Convolvulaceae	<i>Xenostegia tridentata</i>	LC	herb;	Indigenous
Geraniaceae	<i>Pelargonium dolomiticum</i>	LC	succulent; dwarf shrub;	Indigenous
Rubiaceae	<i>Vangueria infausta</i>	LC	tree;	Indigenous
Lamiaceae	<i>Salvia runcinata</i>	LC	herb;	Indigenous
Orchidaceae	<i>Satyrium hallackii</i>	LC	geophyte; herb;	Indigenous
Aytoniaceae	<i>Plagiochasma rupestre</i>		bryophyte;	Indigenous
Asteraceae	<i>Helichrysum chrysargyrum</i>	LC	herb;	Indigenous
Scrophulariaceae	<i>Buddleja saligna</i>	LC	shrub; tree;	Indigenous
Geraniaceae	<i>Monsonia angustifolia</i>	LC	herb;	Indigenous
Proteaceae	<i>Protea welwitschii</i>	LC	dwarf shrub; shrub;	Indigenous
Bryaceae	<i>Bryum cellulare</i>		bryophyte; hydrophyte;	Indigenous
Aspleniaceae	<i>Asplenium stoloniferum</i>	LC	lithophyte; geophyte; herb;	Indigenous

<b>Apocynaceae</b>	<i>Orbea carnosa</i>	LC	succulent;	Indigenous
<b>Asteraceae</b>	<i>Parapolydora fastigiata</i>			Indigenous
<b>Scrophulariaceae</b>	<i>Tetraselago longituba</i>	LC	herb;	Indigenous
<b>Malvaceae</b>	<i>Hibiscus pusillus</i>	LC	herb;	Indigenous
<b>Apocynaceae</b>	<i>Pachycarpus concolor</i>	LC		Indigenous
<b>Fabaceae</b>	<i>Rhynchosia nitens</i>	LC	shrub;	Indigenous
<b>Ebenaceae</b>	<i>Euclea sekhukhuniensis</i>		suffrutex;	Indigenous
<b>Cyperaceae</b>	<i>Cyperus difformis</i>	LC	helophyte; mesophyte; cyperoid; herb;	Indigenous
<b>Rubiaceae</b>	<i>Pavetta schumanniana</i>	LC	shrub; tree;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia keetii</i>	LC	shrub;	Indigenous; Endemic
<b>Fabaceae</b>	<i>Lotononis laxa</i>	LC	herb;	Indigenous
<b>Lamiaceae</b>	<i>Tetradenia brevispicata</i>	LC	succulent; shrub; tree;	Indigenous
<b>Crassulaceae</b>	<i>Crassula brevifolia</i>	LC	succulent; dwarf shrub;	Indigenous
<b>Poaceae</b>	<i>Bewisia biflora</i>	LC	graminoid;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia batophylla</i>	VU	shrub;	Indigenous; Endemic
<b>Ebenaceae</b>	<i>Diospyros lycioides</i>	LC	shrub;	Indigenous; Endemic
<b>Apocynaceae</b>	<i>Cynanchum ellipticum</i>	LC	climber;	Indigenous
<b>Poaceae</b>	<i>Cynodon dactylon</i>	LC	graminoid;	Indigenous
<b>Polygalaceae</b>	<i>Polygala producta</i>	LC	herb; dwarf shrub;	Indigenous
<b>Iridaceae</b>	<i>Watsonia wilmsii</i>	LC	geophyte; herb;	Indigenous; Endemic
<b>Asteraceae</b>	<i>Gerbera jamesonii</i>	LC	herb;	Indigenous
<b>Fabaceae</b>	<i>Argyrobium wilmsii</i>	LC	shrub;	Indigenous
<b>Pottiaceae</b>	<i>Barbula bolleana</i>		bryophyte;	Indigenous
<b>Asteraceae</b>	<i>Senecio hieracioides</i>	LC	herb;	Indigenous
<b>Bryaceae</b>	<i>Rosulabryum capillare</i>			Indigenous
<b>Hyacinthaceae</b>	<i>Ledebouria dolomiticola</i>	VU	geophyte;	Indigenous; Endemic
<b>Combretaceae</b>	<i>Combretum sp.</i>			
<b>Fabaceae</b>	<i>Indigofera hedyantha</i>	LC	herb;	Indigenous
<b>Proteaceae</b>	<i>Faurea saligna</i>	LC	tree;	Indigenous
<b>Orobanchaceae</b>	<i>Striga bilabiata</i>			Indigenous
<b>Euphorbiaceae</b>	<i>Croton gratissimus</i>	LC	shrub; tree;	Indigenous
<b>Acanthaceae</b>	<i>Dyschoriste fischeri</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Verbenaceae</b>	<i>Lippia wilmsii</i>	LC	shrub;	Indigenous
<b>Apocynaceae</b>	<i>Huernia stapelioides</i>	LC	succulent;	Indigenous
<b>Amaryllidaceae</b>	<i>Cyrtanthus stenanthus</i>		geophyte;	Indigenous
<b>Fabaceae</b>	<i>Pearsonia cajanifolia</i>	LC	herb; dwarf shrub; shrub;	Indigenous
<b>Asteraceae</b>	<i>Arrowsmithia tenuifolia</i>		shrub;	Indigenous; Endemic
<b>Rubiaceae</b>	<i>Pentanisia prunelloides</i>	LC	herb;	Indigenous

<b>Fabaceae</b>	<i>Ormocarpum kirkii</i>	LC	shrub; tree;	Indigenous
<b>Capparaceae</b>	<i>Boscia foetida</i>	LC	tree;	Indigenous
<b>Asteraceae</b>	<i>Brachylaena ilicifolia</i>	LC	shrub; tree;	Indigenous
<b>Ochnaceae</b>	<i>Ochna inermis</i>	LC	shrub; tree;	Indigenous
<b>Acanthaceae</b>	<i>Blepharis subvolubilis</i>	LC	herb; dwarf shrub; shrub;	Indigenous
<b>Moraceae</b>	<i>Ficus sur</i>	LC	tree;	Indigenous
<b>Apocynaceae</b>	<i>Aspidoglossum interruptum</i>	LC	succulent; herb;	Indigenous
<b>Sapindaceae</b>	<i>Hippobromus pauciflorus</i>	LC	shrub; tree;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia engleri</i>	LC	shrub; tree;	Indigenous; Endemic
<b>Leucobryaceae</b>	<i>Campylopus pilifer</i>		bryophyte;	Indigenous
<b>Pedaliaceae</b>	<i>Holubia saccata</i>	LC	succulent; herb;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia rigida</i>	LC	shrub;	Indigenous; Endemic
<b>Acanthaceae</b>	<i>Barleria senensis</i>	LC	herb; dwarf shrub; shrub;	Indigenous
<b>Fabaceae</b>	<i>Pearsonia uniflora</i>	LC	herb;	Indigenous
<b>Hyacinthaceae</b>	<i>Ledebouria humifusa</i>	LC		Indigenous; Endemic
<b>Asphodelaceae</b>	<i>Aloe pretoriensis</i>	LC	succulent; herb; shrub;	Indigenous
<b>Asteraceae</b>	<i>Ursinia nana</i>	LC	herb;	Indigenous
<b>Dipsacaceae</b>	<i>Scabiosa columbaria</i>	LC	herb;	Indigenous
<b>Amaryllidaceae</b>	<i>Haemanthus montanus</i>	LC	geophyte;	Indigenous
<b>Fabaceae</b>	<i>Indigofera lydenburgensis</i>	LC	herb; dwarf shrub;	Indigenous
<b>Solanaceae</b>	<i>Withania somnifera</i>	LC	herb; dwarf shrub; shrub;	Indigenous
<b>Piperaceae</b>	<i>Peperomia retusa</i>	LC	succulent; herb;	Indigenous
<b>Malvaceae</b>	<i>Melhania rehmannii</i>	LC	dwarf shrub;	Indigenous
<b>Malvaceae</b>	<i>Hermannia umbratica</i>	LC	herb;	Indigenous; Endemic
<b>Asteraceae</b>	<i>Pseudopogolettia tenella</i>			Indigenous
<b>Lamiaceae</b>	<i>Plectranthus hadiensis</i>	LC	succulent; herb;	Indigenous
<b>Cucurbitaceae</b>	<i>Cucumis africanus</i>	LC	herb;	Indigenous
<b>Santalaceae</b>	<i>Thesium goetzeanum</i>	LC	shrub; parasite; dwarf shrub;	Indigenous
<b>Malvaceae</b>	<i>Hibiscus meyeri</i>	LC	herb; shrub;	Indigenous
<b>Solanaceae</b>	<i>Solanum retroflexum</i>	LC	herb;	Indigenous
<b>Asphodelaceae</b>	<i>Aloe globuligemma</i>	LC	succulent; dwarf shrub;	Indigenous
<b>Fabaceae</b>	<i>Indigofera frondosa</i>	LC	shrub;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia lucida</i>	NE	tree; shrub;	Indigenous
<b>Solanaceae</b>	<i>Solanum aculeatissimum</i>		shrub;	Not indigenous; Naturalised
<b>Apocynaceae</b>	<i>Asclepias cultriformis</i>	LC	herb;	Indigenous
<b>Myrothamnaceae</b>	<i>Myrothamnus flabellifolius</i>	DD	dwarf shrub; shrub;	Indigenous
<b>Fabaceae</b>	<i>Mundulea sericea</i>	LC	shrub; tree;	Indigenous
<b>Apiaceae</b>	<i>Heteromorpha arborescens</i>			Indigenous

<b>Fabaceae</b>	<i>Vachellia grandicornuta</i>	LC		Indigenous
<b>Oleaceae</b>	<i>Jasminum quinatum</i>	LC	climber; dwarf shrub;	Indigenous; Endemic
<b>Cyperaceae</b>	<i>Cyperus cyperoides</i>	LC	mesophyte; cyperoid; herb;	Indigenous
<b>Polygalaceae</b>	<i>Polygala sp.</i>			
<b>Rutaceae</b>	<i>Thamnosma africana</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Polygalaceae</b>	<i>Polygala krumanina</i>	LC	shrub;	Indigenous; Endemic
<b>Rubiaceae</b>	<i>Pentanisia angustifolia</i>	LC	herb;	Indigenous
<b>Asphodelaceae</b>	<i>Aloe pianaarii</i>		succulent;	Indigenous
<b>Cyperaceae</b>	<i>Fimbristylis dichotoma</i>	LC	mesophyte; cyperoid; helophyte; herb;	Indigenous
<b>Asparagaceae</b>	<i>Asparagus densiflorus</i>	LC	dwarf shrub;	Indigenous
<b>Cucurbitaceae</b>	<i>Cucumis myriocarpus</i>	LC	herb;	Indigenous
<b>Thymelaeaceae</b>	<i>Lasiosiphon capitatus</i>	LC		Indigenous
<b>Celastraceae</b>	<i>Mystroxyton aethiopicum</i>	LC	shrub; tree;	Indigenous
<b>Burseraceae</b>	<i>Commiphora mollis</i>	LC	tree;	Indigenous
<b>Fabaceae</b>	<i>Peltophorum africanum</i>	LC	tree;	Indigenous
<b>Fabaceae</b>	<i>Dichrostachys cinerea</i>	NE	shrub; tree;	Indigenous
<b>Amaranthaceae</b>	<i>Dysphania schraderiana</i>		herb;	Indigenous
<b>Balsaminaceae</b>	<i>Impatiens hochstetteri</i>			Indigenous
<b>Ericaceae</b>	<i>Erica leucopelta</i>	LC	shrub;	Indigenous
<b>Cyperaceae</b>	<i>Kyllinga melanosperma</i>	LC	helophyte; cyperoid; herb;	Indigenous
<b>Asteraceae</b>	<i>Helichrysum nudifolium</i>	LC	herb;	Indigenous
<b>Ranunculaceae</b>	<i>Ranunculus multifidus</i>	LC	herb;	Indigenous
<b>Poaceae</b>	<i>Eragrostis curvula</i>	LC	graminoid;	Indigenous
<b>Bignoniaceae</b>	<i>Rhigozum sp.</i>			
<b>Funariaceae</b>	<i>Funaria bergiana</i>		bryophyte;	Indigenous
<b>Apiaceae</b>	<i>Alepidea setifera</i>	LC	herb;	Indigenous
<b>Scrophulariaceae</b>	<i>Chaenostoma floribundum</i>	LC	herb;	Indigenous
<b>Asteraceae</b>	<i>Ursinia nana</i>	LC	herb;	Indigenous
<b>Leucobryaceae</b>	<i>Campylopus pilifer</i>			Indigenous
<b>Cyperaceae</b>	<i>Cyperus decurvatus</i>	LC	mesophyte; cyperoid; herb;	Indigenous
<b>Orobanchaceae</b>	<i>Graderia subintegra</i>	LC	suffrutex; parasite; herb;	Indigenous
<b>Poaceae</b>	<i>Loudetia simplex</i>	LC	graminoid;	Indigenous
<b>Fabaceae</b>	<i>Crotalaria monteiroi</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Cyperaceae</b>	<i>Fimbristylis ferruginea</i>	LC	cyperoid; helophyte; herb;	Indigenous
<b>Ebenaceae</b>	<i>Euclea crispa</i>	LC	shrub; tree;	Indigenous
<b>Malpighiaceae</b>	<i>Triaspis hypericoides</i>	LC	climber; shrub;	Indigenous
<b>Crassulaceae</b>	<i>Crassula alba</i>	NE	succulent; herb;	Indigenous
<b>Loranthaceae</b>	<i>Tapinanthus forbesii</i>	LC	succulent; parasite; shrub;	Indigenous

<b>Asphodelaceae</b>	<i>Aloe castanea</i>	LC	succulent; shrub; tree;	Indigenous
<b>Celastraceae</b>	<i>Maytenus deflexa</i>	LC	shrub; tree;	Indigenous; Endemic
<b>Anemiaceae</b>	<i>Mohria vestita</i>	LC	lithophyte; geophyte; herb;	Indigenous
<b>Malvaceae</b>	<i>Hermannia cristata</i>	LC	dwarf shrub;	Indigenous
<b>Malvaceae</b>	<i>Hermannia staurostemon</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Convolvulaceae</b>	<i>Merremia kentrocaulos</i>	LC	climber;	Indigenous
<b>Pteridaceae</b>	<i>Cheilanthes dolomiticola</i>	LC	lithophyte; herb;	Indigenous; Endemic
<b>Orchidaceae</b>	<i>Mystacidium capense</i>	LC	epiphyte; herb;	Indigenous
<b>Asteraceae</b>	<i>Seriphium plumosum</i>		shrub;	Indigenous
<b>Cyperaceae</b>	<i>Cyperus austro-africanus</i>	LC	mesophyte; cyperoid; herb;	Indigenous
<b>Lobeliaceae</b>	<i>Lobelia erinus</i>	LC	herb;	Indigenous
<b>Burseraceae</b>	<i>Commiphora glandulosa</i>	LC	shrub; tree;	Indigenous
<b>Hedwigiaceae</b>	<i>Braunia secunda</i>		epiphyte; bryophyte;	Indigenous
<b>Asteraceae</b>	<i>Schistostephium rotundifolium</i>	LC	shrub;	Indigenous
<b>Phyllanthaceae</b>	<i>Flueggea virosa</i>	LC	shrub; tree;	Indigenous
<b>Aquifoliaceae</b>	<i>Ilex mitis</i>	LC	shrub; tree;	Indigenous
<b>Asteraceae</b>	<i>Senecio microglossus</i>	LC	herb; shrub;	Indigenous
<b>Acanthaceae</b>	<i>Justicia odora</i>	LC	herb; dwarf shrub; shrub;	Indigenous
<b>Poaceae</b>	<i>Aristida diffusa</i>	LC	graminoid;	Indigenous
<b>Gentianaceae</b>	<i>Sebaea leiostyla</i>	LC	herb;	Indigenous
<b>Scrophulariaceae</b>	<i>Tetraselago wilmsii</i>	LC	herb;	Indigenous; Endemic
<b>Orchidaceae</b>	<i>Habenaria lithophila</i>	LC	geophyte; herb;	Indigenous
<b>Apocynaceae</b>	<i>Ceropegia stapeliiformis</i>	LC	succulent; climber;	Indigenous
<b>Scrophulariaceae</b>	<i>Hebenstretia dura</i>	LC	shrub; dwarf shrub;	Indigenous
<b>Selaginellaceae</b>	<i>Selaginella mittenii</i>	LC	lithophyte; geophyte; herb;	Indigenous
<b>Acanthaceae</b>	<i>Crabbea acaulis</i>	LC	herb;	Indigenous
<b>Poaceae</b>	<i>Melinis repens</i>	LC	graminoid;	Indigenous
<b>Fabaceae</b>	<i>Senna italica</i>	LC	herb;	Indigenous
<b>Asparagaceae</b>	<i>Asparagus suaveolens</i>	LC	shrub;	Indigenous
<b>Apocynaceae</b>	<i>Carissa bispinosa</i>	LC	shrub;	Indigenous
<b>Malvaceae</b>	<i>Grewia vernicosa</i>	LC	dwarf shrub; shrub;	Indigenous; Endemic
<b>Orchidaceae</b>	<i>Eulophia speciosa</i>	LC	succulent; geophyte; herb;	Indigenous
<b>Fabaceae</b>	<i>Sphenostylis angustifolia</i>	LC	herb; dwarf shrub;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia rigida</i>	LC	tree; shrub;	Indigenous; Endemic
<b>Apocynaceae</b>	<i>Pachycarpus scaber</i>	LC	succulent; herb;	Indigenous
<b>Asteraceae</b>	<i>Helichrysum splendidum</i>	LC	herb; shrub;	Indigenous
<b>Cyperaceae</b>	<i>Schoenoplectus brachyceras</i>	LC	helophyte; cyperoid; emergent hydrophyte; herb;	Indigenous

<b>Fabaceae</b>	<i>Vachellia gerrardii</i>			Indigenous
<b>Bryaceae</b>	<i>Brachymerium pulchrum</i>		bryophyte; epiphyte;	Indigenous
<b>Polygalaceae</b>	<i>Polygala virgata</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Thymelaeaceae</b>	<i>Passerina montana</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Euphorbiaceae</b>	<i>Jatropha latifolia</i>	NE	succulent; herb; dwarf shrub;	Indigenous; Endemic
<b>Hyacinthaceae</b>	<i>Dipcadi viride</i>	LC	geophyte;	Indigenous
<b>Droseraceae</b>	<i>Drosera madagascariensis</i>	LC	carnivore; herb;	Indigenous
<b>Asteraceae</b>	<i>Dicoma anomala</i>	LC	herb;	Indigenous
<b>Apocynaceae</b>	<i>Gomphocarpus tomentosus</i>	LC	herb; shrub;	Indigenous
<b>Apocynaceae</b>	<i>Piarranthus atrosanguineus</i>	LC	succulent;	Indigenous
<b>Asteraceae</b>	<i>Felicia mossamedensis</i>	LC	herb;	Indigenous
<b>Thymelaeaceae</b>	<i>Lasiosiphon caffer</i>	LC		Indigenous
<b>Icacinaceae</b>	<i>Apodytes dimidiata</i>	LC	shrub; tree;	Indigenous
<b>Entodontaceae</b>	<i>Entodon macropodus</i>			Indigenous
<b>Kirkiaceae</b>	<i>Kirkia wilmsii</i>	LC	tree;	Indigenous
<b>Rubiaceae</b>	<i>Pavetta lanceolata</i>	LC	shrub; tree;	Indigenous
<b>Hyacinthaceae</b>	<i>Drimia intricata</i>	LC	geophyte;	Indigenous
<b>Iridaceae</b>	<i>Freesia grandiflora</i>	LC		Indigenous
<b>Geraniaceae</b>	<i>Pelargonium luridum</i>	LC	succulent; geophyte;	Indigenous
<b>Ricciaceae</b>	<i>Riccia okahandjana</i>		bryophyte;	Indigenous
<b>Gesneriaceae</b>	<i>Streptocarpus vandeleurii</i>	LC	lithophyte; herb;	Indigenous; Endemic
<b>Fabaceae</b>	<i>Pseudarthria hookeri</i>	LC	herb; dwarf shrub;	Indigenous
<b>Asteraceae</b>	<i>Berkheya zeyheri</i>	NE	herb;	Indigenous
<b>Passifloraceae</b>	<i>Adenia fruticosa</i>	NT	tree; succulent; climber; shrub;	Indigenous; Endemic
<b>Crassulaceae</b>	<i>Kalanchoe rotundifolia</i>	LC	succulent; dwarf shrub;	Indigenous
<b>Iridaceae</b>	<i>Gladiolus densiflorus</i>	LC	geophyte; herb;	Indigenous
<b>Combretaceae</b>	<i>Combretum molle</i>	LC	tree;	Indigenous
<b>Orchidaceae</b>	<i>Eulophia ovalis</i>	LC	herb; geophyte;	Indigenous
<b>Iridaceae</b>	<i>Freesia laxa</i>	LC	geophyte; herb;	Indigenous
<b>Apocynaceae</b>	<i>Orbea carnosus</i>	LC	succulent;	Indigenous; Endemic
<b>Fabaceae</b>	<i>Indigofera sanguinea</i>	LC	herb;	Indigenous
<b>Malvaceae</b>	<i>Hibiscus trionum</i>		herb;	Not indigenous; Naturalised
<b>Malvaceae</b>	<i>Corchorus asplenifolius</i>	LC	herb;	Indigenous
<b>Celastraceae</b>	<i>Gymnosporia sp.</i>			
<b>Amaranthaceae</b>	<i>Cyphocarpa angustifolia</i>	LC	herb;	Indigenous
<b>Scrophulariaceae</b>	<i>Nemesia zimbabwensis</i>	EN		Indigenous
<b>Asteraceae</b>	<i>Athrixia phyllicoides</i>	LC	shrub;	Indigenous
<b>Rubiaceae</b>	<i>Kohautia caespitosa</i>	LC	herb;	Indigenous
<b>Meliaceae</b>	<i>Turraea obtusifolia</i>	LC	climber; shrub; tree;	Indigenous

<b>Malvaceae</b>	<i>Melhania randii</i>	LC	dwarf shrub;	Indigenous
<b>Bignoniaceae</b>	<i>Tecoma stans</i>	NE	shrub; tree;	Not indigenous; Cultivated; Naturalised; Invasive
<b>Polygonaceae</b>	<i>Rumex sagittatus</i>	LC	climber; herb;	Indigenous
<b>Pottiaceae</b>	<i>Trichostomum brachydontium</i>		bryophyte;	Indigenous
<b>Combretaceae</b>	<i>Combretum hereroense</i>		shrub; tree;	Indigenous
<b>Geraniaceae</b>	<i>Pelargonium acraeum</i>	LC	succulent; shrub;	Indigenous
<b>Apocynaceae</b>	<i>Raphionacme galpinii</i>	LC	succulent; geophyte; herb;	Indigenous
<b>Velloziaceae</b>	<i>Xerophyta retinervis</i>	LC	herb;	Indigenous
<b>Santalaceae</b>	<i>Viscum rotundifolium</i>	LC	succulent; parasite; shrub;	Indigenous
<b>Sapotaceae</b>	<i>Englerophytum magalismontanum</i>	LC	shrub; tree;	Indigenous
<b>Lamiaceae</b>	<i>Premna mooiensis</i>	LC	tree;	Indigenous
<b>Cyperaceae</b>	<i>Fuirena pubescens</i>	LC	mesophyte; cyperoid; helophyte; herb;	Indigenous
<b>Fabaceae</b>	<i>Rhynchosia minima</i>	NE	climber; herb;	Indigenous
<b>Asteraceae</b>	<i>Osteospermum auriculatum</i>	LC	shrub;	Indigenous; Endemic
<b>Asparagaceae</b>	<i>Asparagus larinus</i>	LC	shrub;	Indigenous
<b>Linderniaceae</b>	<i>Craterostigma wilmsii</i>	LC	succulent; herb;	Indigenous; Endemic
<b>Rutaceae</b>	<i>Vepris reflexa</i>	LC	shrub; tree;	Indigenous
<b>Araliaceae</b>	<i>Cussonia paniculata</i>	LC	succulent; tree;	Indigenous
<b>Apocynaceae</b>	<i>Asclepias adscendens</i>	LC	herb;	Indigenous
<b>Leskeaceae</b>	<i>Pseudoleskeopsis claviramea</i>		epiphyte; bryophyte;	Indigenous
<b>Oleaceae</b>	<i>Jasminum multipartitum</i>	LC	climber; dwarf shrub;	Indigenous
<b>Poaceae</b>	<i>Fingerhuthia africana</i>	LC	graminoid;	Indigenous
<b>Hyacinthaceae</b>	<i>Dipcadi rigidifolium</i>	LC	geophyte;	Indigenous
<b>Orchidaceae</b>	<i>Eulophia streptopetala</i>	LC	succulent; geophyte; herb;	Indigenous
<b>Verbenaceae</b>	<i>Priva flabelliformis</i>	LC	herb;	Indigenous
<b>Celastraceae</b>	<i>Maytenus undata</i>	LC	shrub; tree;	Indigenous
<b>Asteraceae</b>	<i>Senecio conrathii</i>	LC	herb;	Indigenous
<b>Acanthaceae</b>	<i>Petalidium oblongifolium</i>	LC	herb; dwarf shrub; shrub;	Indigenous; Endemic
<b>Ricciaceae</b>	<i>Riccia atropurpurea</i>		bryophyte;	Indigenous
<b>Fabaceae</b>	<i>Senegalia ataxacantha</i>	LC		Indigenous
<b>Sapotaceae</b>	<i>Mimusops zeyheri</i>	LC	shrub; tree;	Indigenous
<b>Fabaceae</b>	<i>Argyrolobium transvaalense</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Rhamnaceae</b>	<i>Helinus integrifolius</i>	LC	climber; shrub;	Indigenous
<b>Rhamnaceae</b>	<i>Phyllica paniculata</i>	LC	tree; shrub;	Indigenous
<b>Rhamnaceae</b>	<i>Berchemia zeyheri</i>	LC	tree;	Indigenous
<b>Asteraceae</b>	<i>Berkheya echinacea</i>	LC	herb;	Indigenous
<b>Asteraceae</b>	<i>Afroaster hispidus</i>	LC		Indigenous

<b>Asteraceae</b>	<i>Lactuca inermis</i>	LC	herb;	Indigenous
<b>Rubiaceae</b>	<i>Cephalanthus sp.</i>			
<b>Poaceae</b>	<i>Cymbopogon nardus</i>	LC	graminoid;	Indigenous
<b>Asphodelaceae</b>	<i>Aloe sp.</i>		succulent;	
<b>Euphorbiaceae</b>	<i>Euphorbia schinzii</i>	LC	succulent; dwarf shrub; shrub;	Indigenous
<b>Lamiaceae</b>	<i>Rothea louwalbertsii</i>	LC	herb;	Indigenous
<b>Iridaceae</b>	<i>Hesperantha coccinea</i>	LC	geophyte; herb;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia tumulicola</i>	NE	tree; shrub;	Indigenous
<b>Polypodiaceae</b>	<i>Pleopeltis macrocarpa</i>	LC	lithophyte; epiphyte; herb;	Indigenous
<b>Fabaceae</b>	<i>Bolusanthus speciosus</i>	LC	tree;	Indigenous
<b>Lamiaceae</b>	<i>Syncolostemon concinnus</i>	LC	herb;	Indigenous
<b>Ricciaceae</b>	<i>Riccia nigrella</i>		bryophyte;	Indigenous
<b>Scrophulariaceae</b>	<i>Jamesbrittenia silenoides</i>	LC	herb;	Indigenous; Endemic
<b>Apocynaceae</b>	<i>Aspidoglossum sp.</i>			
<b>Phyllanthaceae</b>	<i>Phyllanthus parvulus</i>	LC	herb; dwarf shrub;	Indigenous
<b>Acanthaceae</b>	<i>Dyschoriste rogersii</i>	LC	dwarf shrub; shrub;	Indigenous
<b>Verbenaceae</b>	<i>Lippia rehmannii</i>	LC	shrub;	Indigenous
<b>Oliniaceae</b>	<i>Olinia rochetiana</i>		shrub; tree;	Indigenous
<b>Ebenaceae</b>	<i>Euclea undulata</i>	LC	shrub; tree;	Indigenous
<b>Fabaceae</b>	<i>Otholobium wilmsii</i>	LC	shrub; tree;	Indigenous
<b>Celastraceae</b>	<i>Gymnosporia tenuispina</i>	LC	shrub;	Indigenous
<b>Asteraceae</b>	<i>Artemisia afra</i>	LC	herb; shrub;	Indigenous
<b>Convolvulaceae</b>	<i>Seddera suffruticosa</i>	LC	herb; dwarf shrub;	Indigenous
<b>Aytoniaceae</b>	<i>Asterella muscicola</i>		bryophyte;	Indigenous
<b>Polygalaceae</b>	<i>Polygala sekhukhuniensis</i>	VU		Indigenous
<b>Lamiaceae</b>	<i>Rabdosiella calycina</i>	LC	herb;	Indigenous
<b>Lamiaceae</b>	<i>Pycnostachys reticulata</i>	LC	herb;	Indigenous
<b>Malvaceae</b>	<i>Waltheria indica</i>	LC	herb;	Indigenous
<b>Orchidaceae</b>	<i>Eulophia parvilabris</i>	LC	geophyte; herb;	Indigenous
<b>Orchidaceae</b>	<i>Eulophia hereroensis</i>	LC	succulent; geophyte; herb;	Indigenous
<b>Lamiaceae</b>	<i>Salvia reflexa</i>		herb;	Not indigenous; Naturalised; Invasive
<b>Scrophulariaceae</b>	<i>Jamesbrittenia macrantha</i>	NT	shrub; dwarf shrub;	Indigenous; Endemic
<b>Lamiaceae</b>	<i>Leonotis ocyimifolia</i>	LC	shrub;	Indigenous
<b>Vitaceae</b>	<i>Rhoicissus tridentata</i>	NE	climber;	Indigenous
<b>Asparagaceae</b>	<i>Asparagus lynetteae</i>	LC	scrambler;	Indigenous
<b>Fabaceae</b>	<i>Vigna vexillata</i>	LC	climber; herb;	Indigenous
<b>Combretaceae</b>	<i>Combretum zeyheri</i>	LC	shrub; tree;	Indigenous
<b>Fabaceae</b>	<i>Elephantorrhiza praetermissa</i>	LC	shrub;	Indigenous; Endemic



<b>Cyperaceae</b>	<i>Cyperus eragrostis</i>		helophyte; cyperoid; herb;	Not indigenous; Naturalised
<b>Pedaliaceae</b>	<i>Sesamum triphyllum</i>	LC	herb;	Indigenous
<b>Malvaceae</b>	<i>Hibiscus microcarpus</i>	LC	herb;	Indigenous
<b>Capparaceae</b>	<i>Boscia albitrunca</i>	LC	shrub; tree;	Indigenous
<b>Cucurbitaceae</b>	<i>Cucumis anguria</i>	LC	climber; herb;	Indigenous
<b>Poaceae</b>	<i>Eragrostis patentipilosa</i>	LC	graminoid;	Indigenous
<b>Orobanchaceae</b>	<i>Striga bilabiata</i>	LC	parasite; herb;	Indigenous
<b>Poaceae</b>	<i>Bothriochloa insculpta</i>	LC	graminoid;	Indigenous
<b>Polygalaceae</b>	<i>Polygala sphenoptera</i>	LC	dwarf shrub; herb;	Indigenous
<b>Fabaceae</b>	<i>Pearsonia aristata</i>	LC	herb;	Indigenous
<b>Agavaceae</b>	<i>Chlorophytum cyperaceum</i>	LC	herb;	Indigenous; Endemic
<b>Piperaceae</b>	<i>Peperomia tetraphylla</i>	LC	succulent; herb;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia zeyheri</i>	LC	shrub;	Indigenous; Endemic
<b>Apocynaceae</b>	<i>Sisyranthus randii</i>	LC	herb;	Indigenous
<b>Oleaceae</b>	<i>Olea capensis</i>	LC	shrub;	Indigenous
<b>Asteraceae</b>	<i>Geigeria burkei</i>	LC	herb;	Indigenous
<b>Cyperaceae</b>	<i>Ficinia stolonifera</i>	LC	mesophyte; cyperoid; herb;	Indigenous
<b>Boraginaceae</b>	<i>Cynoglossum lanceolatum</i>	LC	herb;	Indigenous
<b>Oliniaceae</b>	<i>Olinia emarginata</i>	LC	tree;	Indigenous
<b>Commelinaceae</b>	<i>Commelina africana</i>	LC	herb;	Indigenous
<b>Asphodelaceae</b>	<i>Bulbine latifolia</i>	LC	succulent; geophyte; herb;	Indigenous; Endemic
<b>Sapindaceae</b>	<i>Allophylus africanus</i>	LC	shrub; tree;	Indigenous
<b>Asteraceae</b>	<i>Emilia transvaalensis</i>	LC	suffrutex; herb;	Indigenous
<b>Oxalidaceae</b>	<i>Oxalis semiloba</i>	LC	geophyte;	Indigenous
<b>Asteraceae</b>	<i>Dicoma anomala</i>	LC	herb;	Indigenous
<b>Stilbaceae</b>	<i>Nuxia gracilis</i>	LC	shrub;	Indigenous; Endemic
<b>Cyperaceae</b>	<i>Isolepis costata</i>	LC	helophyte; cyperoid; herb;	Indigenous
<b>Verbenaceae</b>	<i>Lippia javanica</i>	LC	shrub;	Indigenous
<b>Ebenaceae</b>	<i>Euclea linearis</i>	LC	shrub; tree;	Indigenous
<b>Ebenaceae</b>	<i>Diospyros whyteana</i>	LC	shrub; tree;	Indigenous
<b>Rhamnaceae</b>	<i>Ziziphus mucronata</i>	LC	shrub; tree;	Indigenous
<b>Selaginellaceae</b>	<i>Selaginella dregei</i>	LC	lithophyte; geophyte; herb;	Indigenous
<b>Celastraceae</b>	<i>Robsonodendron eucleiforme</i>	LC	tree;	Indigenous
<b>Polygalaceae</b>	<i>Securidaca longepedunculata</i>	LC	shrub; tree;	Indigenous
<b>Euphorbiaceae</b>	<i>Euphorbia enormis</i>	LC	succulent; shrub;	Indigenous; Endemic
<b>Asteraceae</b>	<i>Gymnanthemum corymbosum</i>	LC		Indigenous
<b>Asteraceae</b>	<i>Schistostephium crataegifolium</i>	LC	suffrutex; herb;	Indigenous

<b>Ebenaceae</b>	<i>Euclea daphnoides</i>	LC	shrub; tree;	Indigenous
<b>Hyacinthaceae</b>	<i>Dipcadi papillatum</i>	LC	geophyte;	Indigenous
<b>Asteraceae</b>	<i>Helichrysum aureolum</i>	LC	herb; shrub;	Indigenous
<b>Hypoxidaceae</b>	<i>Hypoxis interjecta</i>	LC	geophyte;	Indigenous; Endemic
<b>Boraginaceae</b>	<i>Cynoglossum hispidum</i>	LC	herb;	Indigenous
<b>Lobeliaceae</b>	<i>Lobelia vanreenensis</i>	LC	herb;	Indigenous
<b>Asteraceae</b>	<i>Psiadia punctulata</i>	LC	shrub;	Indigenous
<b>Ranunculaceae</b>	<i>Clematis hirsuta</i>			Indigenous
<b>Crassulaceae</b>	<i>Crassula sarcocaulis</i>	LC	succulent; dwarf shrub;	Indigenous
<b>Anacardiaceae</b>	<i>Searsia wilmsii</i>	LC	shrub;	Indigenous; Endemic
<b>Poaceae</b>	<i>Stipagrostis hirtigluma</i>	LC	graminoid;	Indigenous
<b>Phyllanthaceae</b>	<i>Phyllanthus parvulus</i>			Indigenous
<b>Apocynaceae</b>	<i>Secamone parvifolia</i>	LC	climber;	Indigenous
<b>Euphorbiaceae</b>	<i>Jatropha latifolia</i>	NE	succulent; herb; dwarf shrub;	Indigenous; Endemic
<b>Crassulaceae</b>	<i>Crassula acinaciformis</i>	LC	succulent; herb;	Indigenous
<b>Polygalaceae</b>	<i>Polygala ohlendoriana</i>	LC	herb;	Indigenous
<b>Scrophulariaceae</b>	<i>Limosella maior</i>	LC	hydrophyte; herb;	Indigenous
<b>Moraceae</b>	<i>Ficus ingens</i>			Indigenous
<b>Pteridaceae</b>	<i>Pteris buchananii</i>	LC	hydrophyte; geophyte; herb;	Indigenous
<b>Lamiaceae</b>	<i>Leonotis pentadentata</i>	LC		Indigenous
<b>Solanaceae</b>	<i>Solanum campylacanthum</i>			Indigenous
<b>Combretaceae</b>	<i>Terminalia prunioides</i>	LC	shrub; tree;	Indigenous
<b>Pottiaceae</b>	<i>Tortula atrovirens</i>		bryophyte;	Indigenous
<b>Araliaceae</b>	<i>Cussonia natalensis</i>	LC	succulent; tree;	Indigenous
<b>Solanaceae</b>	<i>Solanum anguivi</i>	LC	shrub;	Indigenous
<b>Apocynaceae</b>	<i>Huernia zebrina</i>	LC	succulent;	Indigenous; Endemic
<b>Leucobryaceae</b>	<i>Campylopus sp.</i>			
<b>Asteraceae</b>	<i>Helichrysum athrixiifolium</i>	LC	herb;	Indigenous
<b>Lamiaceae</b>	<i>Karomia speciosa</i>	NE	shrub;	Indigenous
<b>Cyperaceae</b>	<i>Cyperus rupestris</i>	LC	mesophyte; cyperoid; herb;	Indigenous
<b>Rubiaceae</b>	<i>Rubia horrida</i>	LC	herb;	Indigenous
<b>Acanthaceae</b>	<i>Dyschoriste sp.</i>			