The Terrestrial Ecology Compliance Statement for the proposed Su Casa Burial Estate

Farm Doornrug 302 JS Portion 22, Emalahleni, Nkangala District Municipality, Mpumalanga

February 2022

CLIENT

AmberEarth

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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

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)	46-52	Appendix B
Must include contact details, CV, SACNASP number and field of expertise of specialist	48-52	
Signed statement of independence	46	Appendix A
Initial site sensitivity verification: - **Desktop Analysis using satellite imagery and available information** - **Onsite inspection, to include a description of current land use, vegetation found on-site and status quo of screening tool confirmation/dispute** - **Include photographs/evidence of land and environmental sensitivity**	15-34	Section 4
The methodology used to undertake the site survey and prepare compliance statement, including equipment and modelling relevant	12-15	Section 3
The assessment must verify the "low" sensitivity of the site, this would be in terms of terrestrial, animal and plant	34	Section 4.2.4
Indicate whether or not the proposed development will have any impact on the terrestrial environment, animals and/or plants	42	Section 5
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	38-40	Section 5
Description of the assumptions and any uncertainties or gaps in knowledge or data	15	Section 3.4
Statement of timing and intensity of site inspection	7	Section 1
Any conditions to which the statement is subjected	7	Section 1

1 Introduction

The Biodiversity Company was appointed to conduct a terrestrial biodiversity assessment as part of the environmental authorisation (EA) process for the proposed Su Casa Burial Estate on Farm Doornrug 302 JS Portion 22, in Emalahleni Municipality in the Mpumalanga Province.

The proposed activities entail but are not limited to the following:

- Su Casa Burial site;
- Chapel;
- Dining hall;
- Ablution facilities;
- Admin offices;
- Cross landmark;
- Fencing
- Landscaping;
- Ash scattering garden;
- Upgrade of the existing borehole;
- Establishment of a new borehole;
- Establishment of two ponds;
- Wall of remembrance; and U
- upgrade of the existing road.

A single day wet season survey was conducted on the 28th of January 2022. 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 Very High 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);
- 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.

1.2 Project Area

The project area covers approximately 26 ha farm in Emalahleni municipality in the Mpumalanga Province. The project area is approximately 2 km South of the N4 and about 17 km West of the town Emalahleni. The area surrounding the project area consists

predominantly of agricultural fields and mining operations. The project area is shown in Figure 1-1 and the project areas location can be viewed in Figure 1-2.

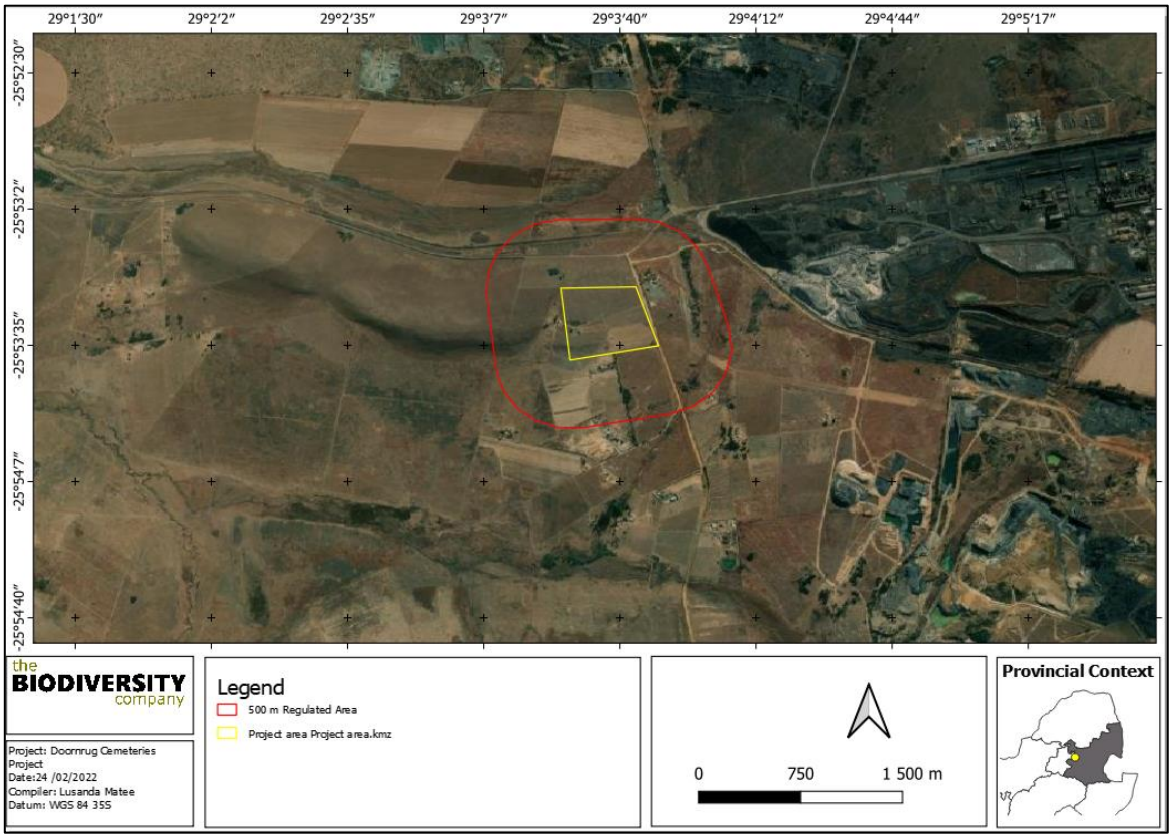

Figure 1-1 Project area map

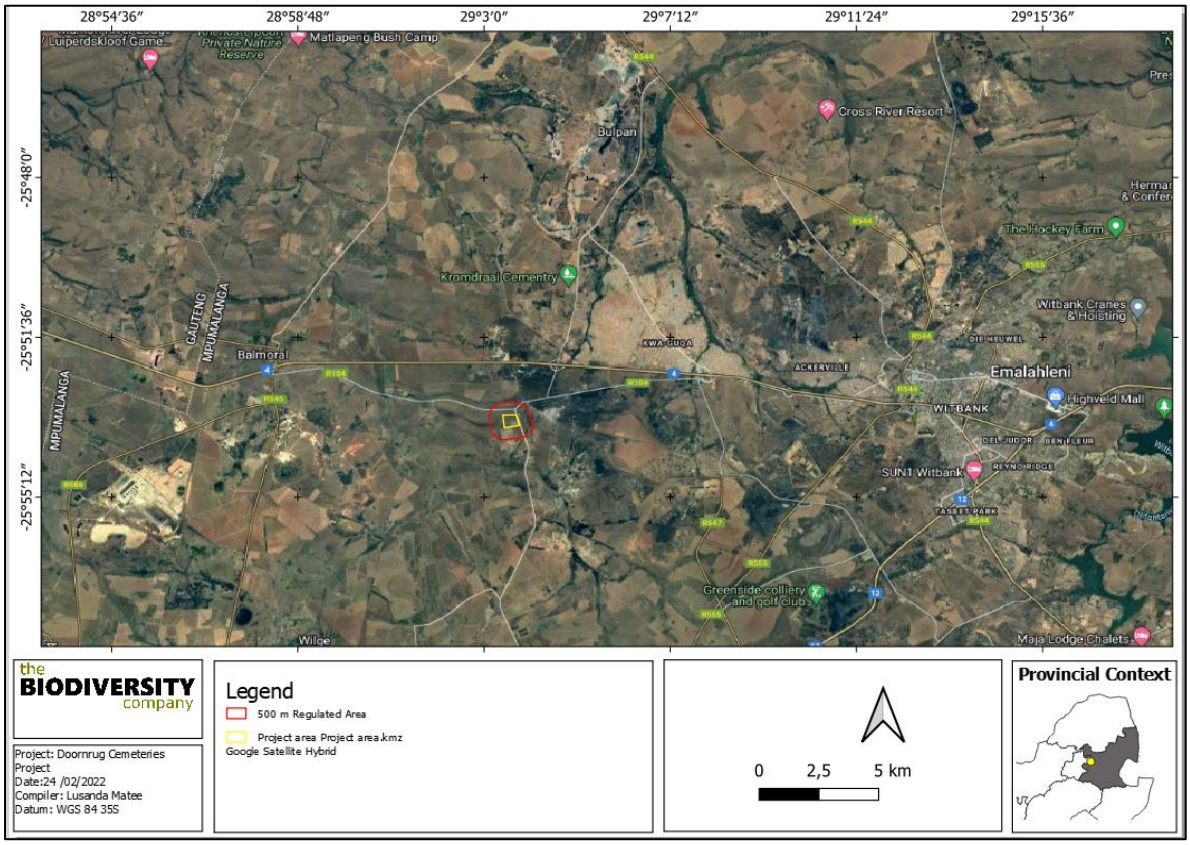

Figure 1-2 Project area location map

Specialist Details

Report Name	**The Terrestrial Ecology Compliance Statement for the proposed Su Casa Burial Estate**
Submitted to	AmberEarth
Report writer	**Lusanda Matee**  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.
Report reviewer	**Andrew Husted**  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.
Declaration	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.

2 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* 2-1 A list of *key legislative* requirements relevant *to* biodiversity and conservation in the Mpumalanga Province

Region	Legislation
International	Convention on Biological Diversity (CBD, 1993)
	The Convention on Wetlands (RAMSAR Convention, 1971)
	The United Nations Framework Convention on Climate Change (UNFCC,1994)
	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)
National	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management 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)
	Environmental Conservation Act (Act No. 73 of 1983)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
	National Water Act (NWA, 1998)
Provincial	Mpumalanga Parks Board Act 6 of 1995

	Mpumalanga Conservation Act, 1998 (Act 10 of 1998)
	Mpumalanga Tourism and Parks Agency Act, No 5 of 2005
	Mpumalanga Conservation Plan (C-plan 2)
	Mpumalanga Biodiversity Sector Plan

Table 2-1 A list of key legislative requirements relevant to biodiversity and conservation in the Mpumalanga Province

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	Mpumalanga Biodiversity Sector Plan

3 Methods

3.1 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.

3.1.1 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 attributes 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.

- A regional conservation plan was produced by the Mpumalanga Tourism and Parks Agency (MTPA). This plan indicated several areas requiring some level of conservation within the strategic premise to either systematically include these areas into conservation areas or to protect these areas from irresponsible development. The MBSP CBA map delineates Critical Biodiversity Areas, Ecological Support Areas, Other Natural Areas, Protected Areas, and areas that have been irreversibly modified from their natural state (MTPA, 2014). The MBSP uses the following terms to categorise the various land use types according to their biodiversity and environmental importance:
  - Critical Biodiversity Area (CBA);
  - Ecological Support Area (ESA);
  - Other Natural Area (ONA);
  - Protected Area (PA); and
  - Moderately or Heavily Modified Areas (MMA's or HMA's).
- 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.

3.1.2 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.

3.2 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.

3.3 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., vegetation clearing, cropping, 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.

3.4 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.

4 Results & Discussion

4.1 Desktop Assessment

4.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed development to ecologically important landscape features are summarised in Table 4-1.

Table 4-1 Summary of the relevance of the proposed project to ecologically important landscape features

Desktop Information Considered	Relevant/Irrelevant	Section
Ecosystem Threat Status	Relevant – Overlaps with VU ecosystems	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.	4.1.1.3
Mpumalanga Biodiversity Sector Plan (MBSP)	Relevant –The project area traverses areas that are classified as CBA areas, Heavily Modified Areas (HMA); and Other Natural Areas.	4.1.1.4
National Threatened Ecosystems (2011)	Relevant- The project area does traverse two National Threatened Ecosystems (2011).	4.1.1.5
Important Bird and Biodiversity Areas	Irrelevant – More than 10 from the closest IBAs	-
South African Inventory of Inland Aquatic Ecosystems	The project area does not overlap or traverse any NBA River or NBA wetlands, it is however close to CR Rivers and CR wetlands	4.1.1.7
National Freshwater Priority Area	The NFEPA spatial data indicates that no FEPA rivers were identified within the project area however the closest FEPA wetland (Unclassified) is less than a km from the project area	6.1.1.8

4.1.1.1 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 a VU ecosystem (Figure 4-1).

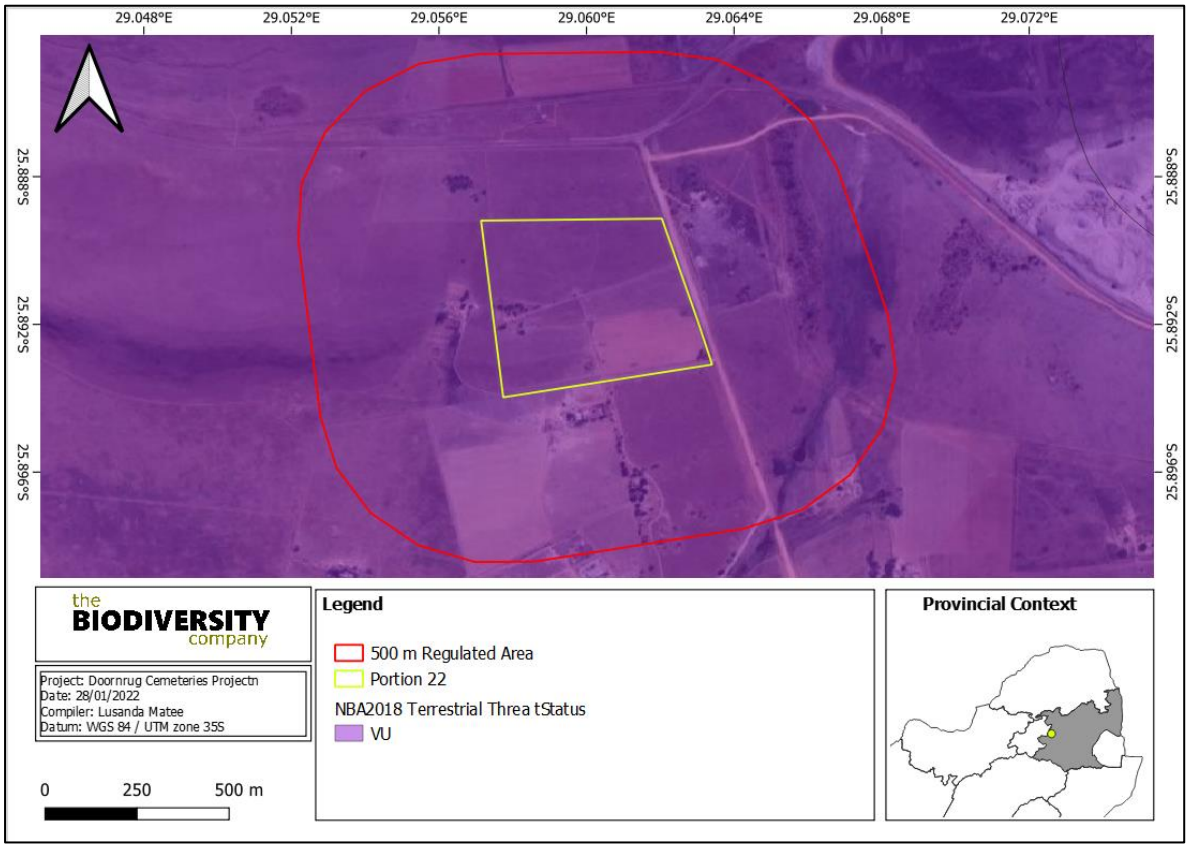

Figure 4-1 Map illustrating the ecosystem threat status associated with the proposed project area

4.1.1.2 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 4-2).

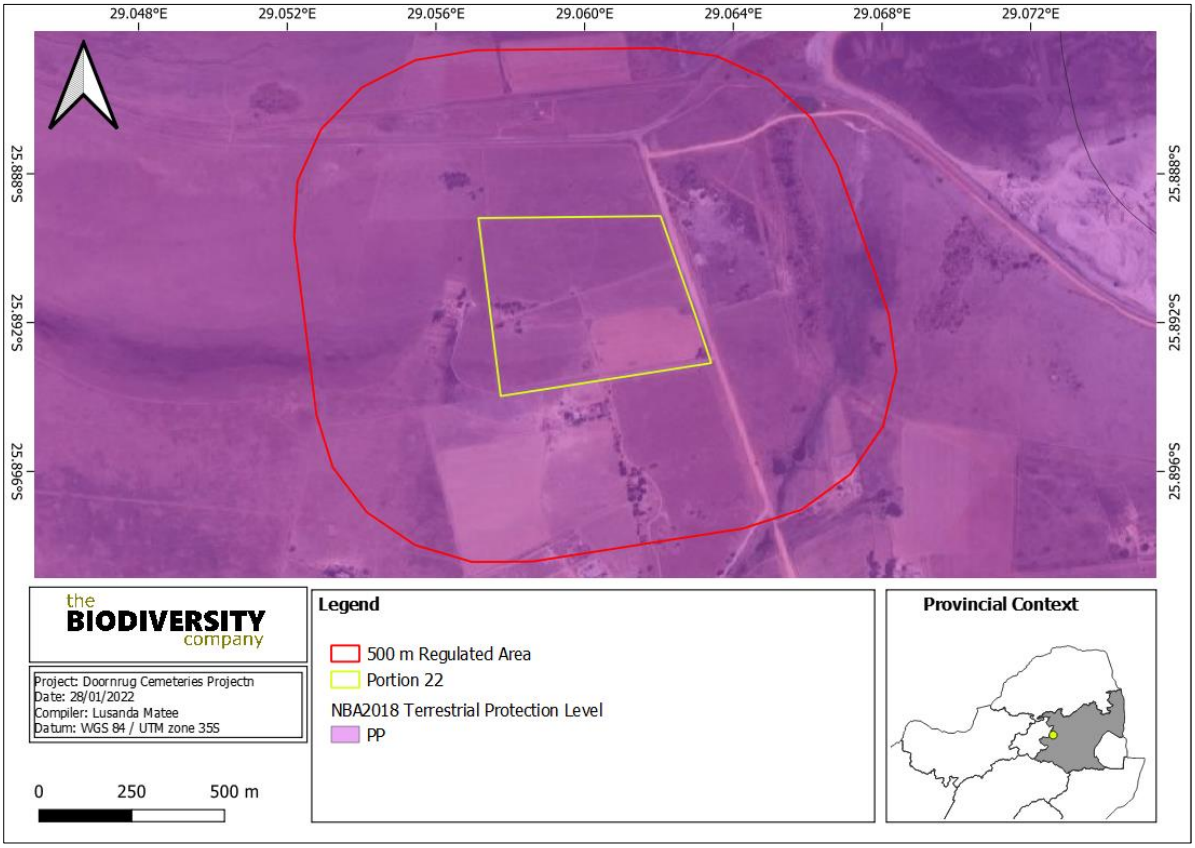

Figure 4-2 Map illustrating the ecosystem protection level associated with the proposed project area

4.1.1.3 Protected Areas

According to the protected area spatial dataset from SAPAD (2021), SACAD (2021) and SAMPAZ (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.

4.1.1.4 Terrestrial Critical Biodiversity Areas (CBAs)

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

- CBA;
- ESA;
- ONA;
- PA; and
- Moderately or Heavily Modified Areas (MMA's or HMA's).

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

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

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

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

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

Moderately or Heavily Modified Areas (sometimes called 'transformed' areas) are areas that have been heavily modified by human activity so that they are by-and-large no longer natural, and do not contribute to biodiversity targets (MTPA, 2014). Some of these areas may still provide limited biodiversity and ecological infrastructural functions but, their biodiversity value has been significant, and in many cases irreversibly, compromised. Figure 4-3 shows the project area superimposed on the MBSP Terrestrial CBA map. Based on this, the proposed development areas will potentially overlap with:

- CBA: Irreplaceable;
- CBA: Optimal;
- Moderately modified- old lands;
- Heavily Modified Areas (HMA); and
- Other Natural Areas.

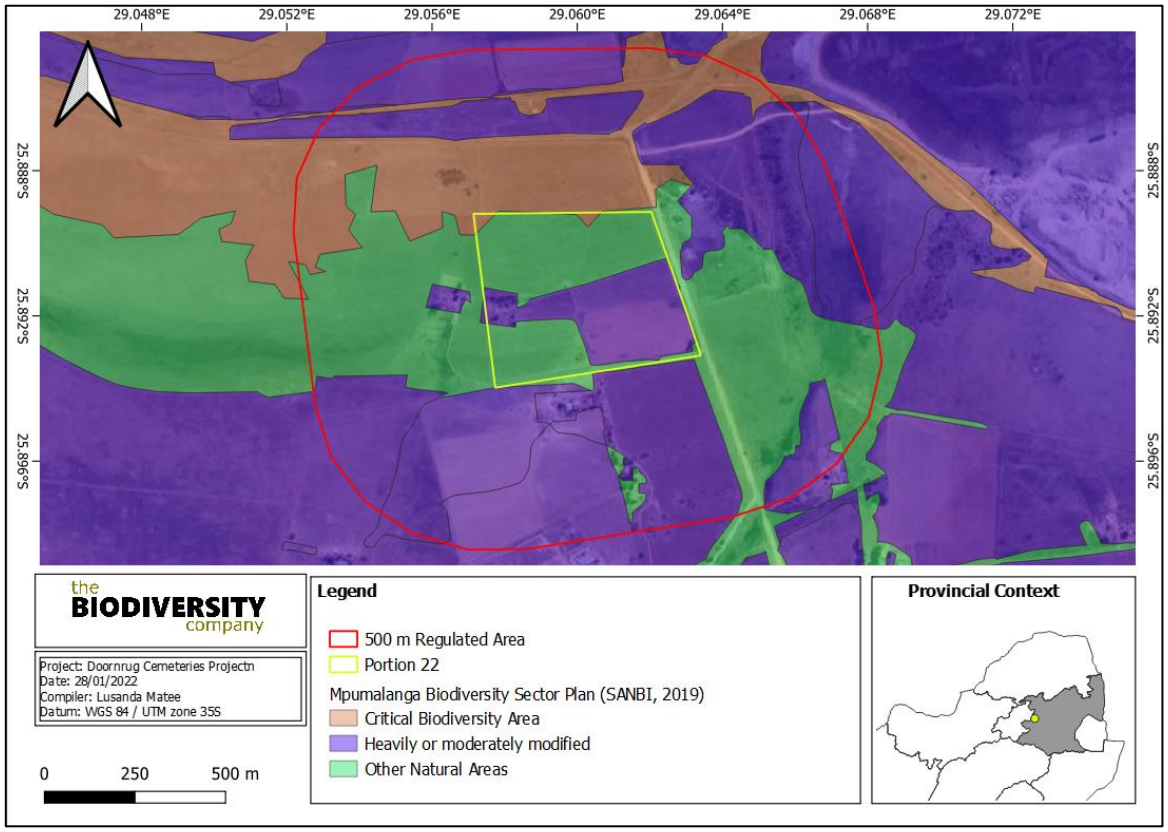

Figure 4-3 The project areas superimposed on the MBSP(MTPA,2015)

4.1.1.5 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 categorize 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 ecosystems are summarized in Table 4-2.

Table 4-2 Criteria used to identify threatened terrestrial ecosystems

Criterion	Critically Endangered	Endangered	Vulnerable
A1: Irreversible loss of natural habitat	Remaining natural habitat < biodiversity target	Remaining natural habitat < biodiversity target + 15%	Remaining natural habitat < 60% of the original area
A2: Ecosystem A2: Ecosystem degradation and loss of integrity	> 60% of ecosystem significantly degraded	> 40% of ecosystem significantly degraded	> 20% of ecosystem significantly degraded
C: Limited extent and C: Limited extent and imminent threat	-	Ecosystem extent < 3000ha and imminent threat	

D1: Threatened plant D: Threatened plant species associations	> 80 threatened Red List plant species	> 60 threatened Red List plant species	Ecosystem extent < 6000 ha and imminent threat > 40 threatened Red List plant species
F: Priority areas for meeting explicit biodiversity targets as defined in a systematic biodiversity plan	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 Su Casa Burial Estate project and associated infrastructure traverse Rand Highveld Grassland which is listed as Vulnerable under criterion A1 due to irreversible loss of natural habitat (Figure 4-4). Loss of natural habitat includes outright loss, for example, the removal of natural habitat for cultivation, building of infrastructure, mining etc., as well as severe degradation. An ecosystem is categorised as vulnerable if the extent of the remaining natural habitat in the ecosystem is less than or equal to 60% of the original extent of the ecosystem. For this purpose, habitat is considered severely degraded if it would be unable to recover to a natural or near-natural state following the removal of the cause of the degradation (e.g., invasive aliens, over-grazing), even after very long periods. For EIAs, the 2011 National list of Threatened Ecosystems remains the trigger for a Basic Assessment in terms of Listing Notice 3 of the EIA Regulations published under the NEMA.

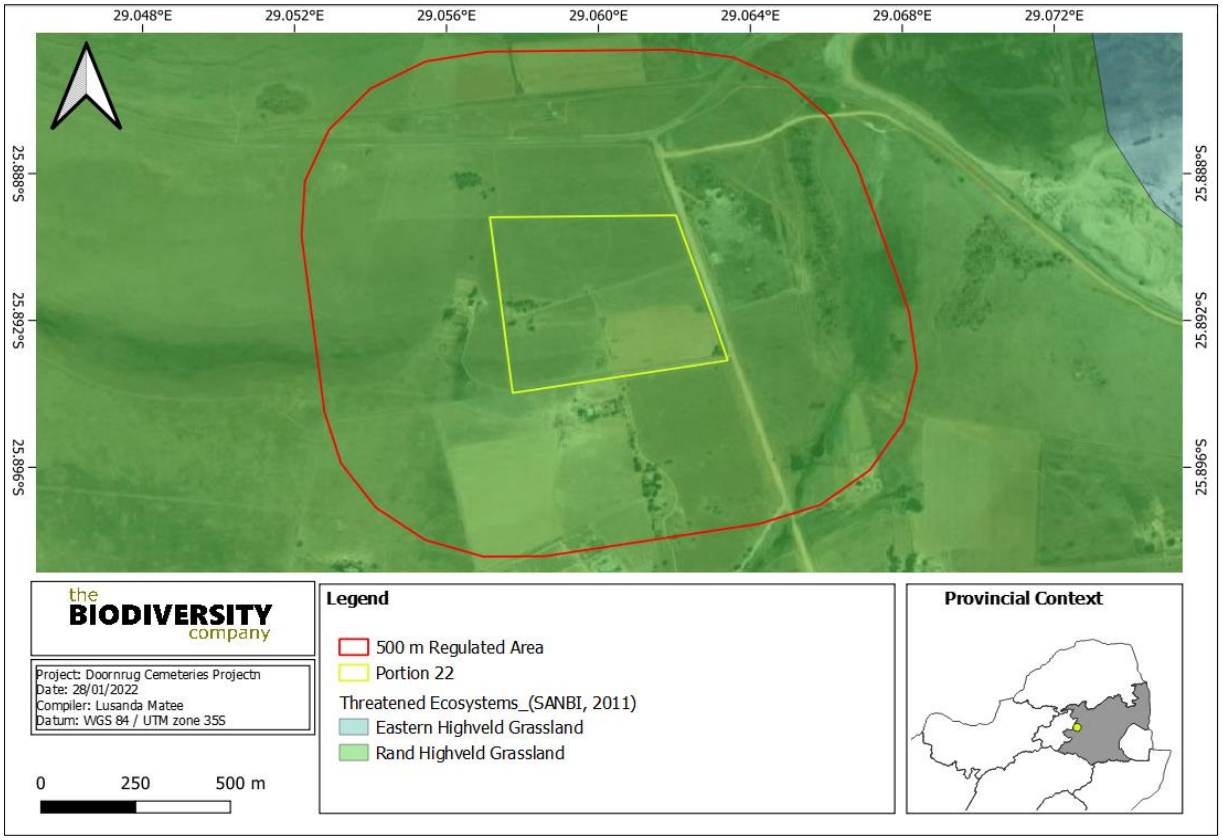

Figure 4-4 The Doornrug Cemeteries Project in relation to National Threatened or Protected Ecosystems.

4.1.1.6 Important Bird & Biodiversity Areas

The Doornrug Cemeteries Project area is not located within an IBA nor is there one within the immediate landscape.

4.1.1.7 Hydrological Setting

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. The ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.,* 2019; Skowno *et al.,* 2019). The project area does not overlap or traverse any NBA River or NBA wetlands, it is however close to CR Rivers and CR wetlands (Figure 4-5).

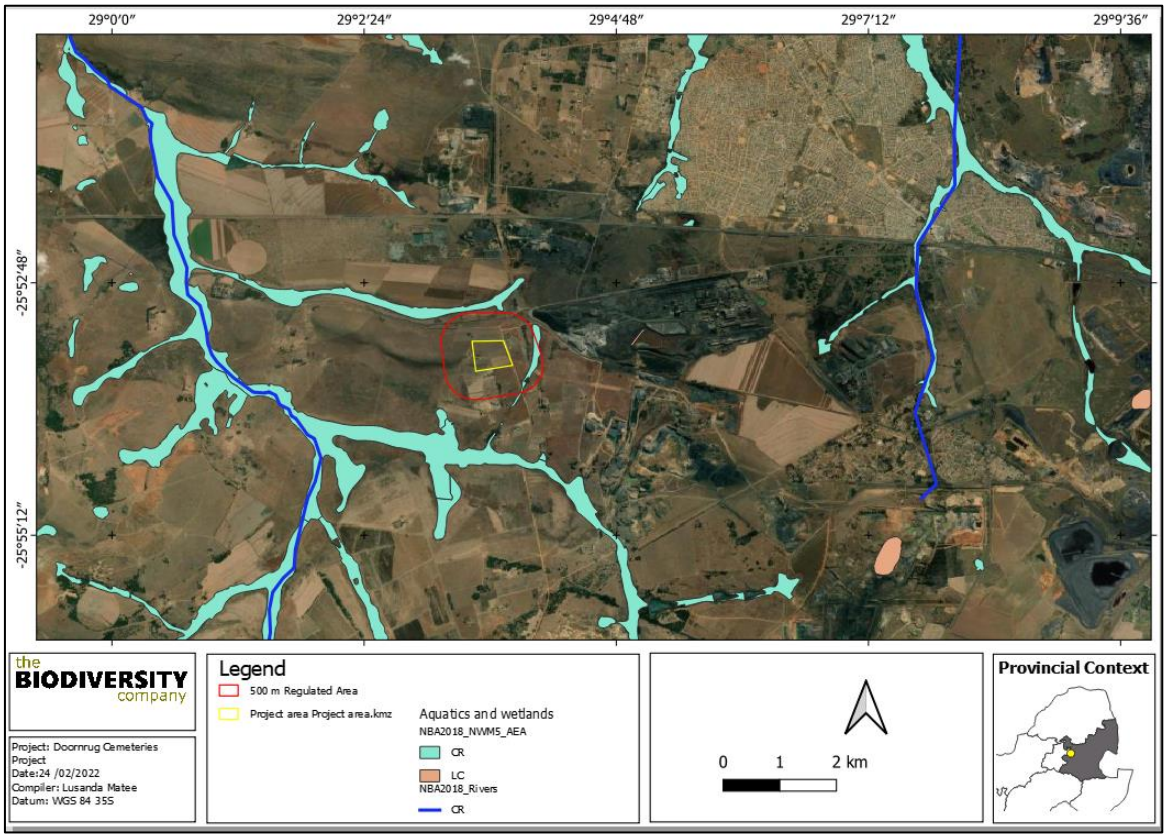

Figure 4-5 Map illustrating ecosystem threat status of river and wetland ecosystems in the project area.

4.1.1.8 National Freshwater Ecosystem Priority Area Status

The NFEPA spatial data has been incorporated in the above mentioned SAIIAE spatial data set. However, to ensure that these data sets are considered we included them as the Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al*., 2011) are intended to be conservation support tools and are envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act (NEM: BA) biodiversity goals (Nel *et al.,* 2011). The NFEPA spatial data indicates that no FEPA rivers were identified within the project area however the closest FEPA wetland (Unclassified) is less than a km from the project area (Figure 4-6).

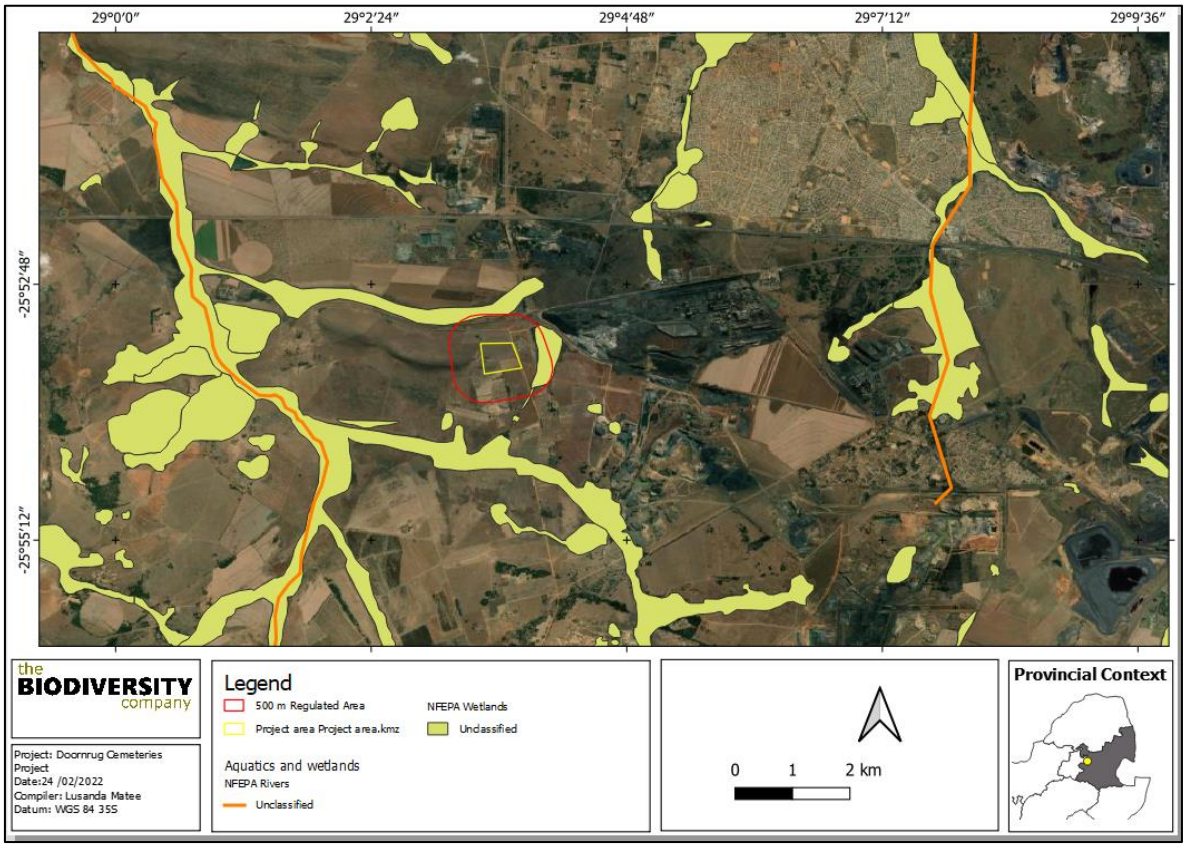

Figure 4-6 The project area in relation to the National Freshwater Ecosystem Priority Areas.

4.1.1.9 Flora Assessment

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

4.1.1.9.1 Regional Vegetation

According to Mucina & Rutherford, the vegetation type that is predominate within the project area is the Rand Highveld Grassland (Figure 4-7), which is in the Mesic Highveld Grassland Bioregion of the Grassland Biome (Mucina & Rutherford 2006; SANBI,2018). The Rand Highveld Grassland Type is virtually confined to Mpumalanga Province, although both also extend marginally into eastern Gauteng.

Rand Highveld Grassland (Gm11)

This vegetation type occurs on highly variable landscapes with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The vegetation is species-rich, wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. This vegetation type can be found in Gauteng, North-West, Free State and Mpumalanga Provinces, between rocky ridges from Pretoria to Witbank, extending onto ridges in the Stoffberg and Roossenekal regions as well as west of Krugersdorp centred in the vicinity of Derby and Potchefstroom, extending southwards and north-eastwards from there (Mucina & Rutherford, 2006).

Important Plant Taxa

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

The following species are important in the **Rand Highveld Grassland** vegetation type:

Graminoids: *Ctenium concinnum, Cynodon dactylon, Digitaria monodactyla , Diheteropogon amplectens , Eragrostis chloromelas , Heteropogon contortus , Loudetia simplex , Monocymbium ceresiiforme , Panicum natalense , Schizachyrium sanguineum , Setaria sphacelata , Themeda triandra , Trachypogon spicatus , Tristachya biseriata , T. rehmannii , Andropogon schirensis, Aristida aequiglumis, A. congesta, A. junciformis subsp. galpinii, Bewsia biflora, Brachiaria nigropedata, B. serrata, Bulbostylis burchellii, Cymbopogon caesius, Digitaria tricholaenoides, Elionurus muticus, Eragrostis capensis, E. curvula, E. gummiflua, E. plana, E. racemosa, Hyparrhenia hirta, Melinis nerviglumis, M. repens subsp. repens, Microchloa caffra, Setaria nigrirostris, Sporobolus pectinatus, Trichoneura grandiglumis, Urelytrum agropyroides.*

Herbs: *Acanthospermum australe , Justicia anagalloides , Pollichia campestris, Acalypha angustata, Chamaecrista mimosoides, Dicoma anomala, Helichrysum caespititium, H. nudifolium var. nudifolium, H. rugulosum, Ipomoea crassipes, Kohautia amatymbica, Lactuca inermis, Macledium zeyheri subsp. argyrophyllum, Nidorella hottentotica, Oldenlandia herbacea, Rotheca hirsuta, Selago densiflora, Senecio coronatus, Sonchus dregeanus, Vernonia oligocephala, Xerophyta retinervis* .

Geophytic Herbs: *Boophone disticha, Cheilanthes hirta, Haemanthus humilis subsp. humilis, Hypoxis rigidula var. pilosissima, Ledebouria ovatifolia, Oxalis corniculate.*

Succulent Herb: *Aloe greatheadii var. davyana.*

Low Shrubs: *Anthospermum rigidum subsp. pumilum, Indigofera comosa, Rhus magalismontana, Stoebe plumosa. Succulent Shrub: Lopholaena coriifolia*.

Geoxylic Suffrutex: *Elephantorrhiza elephantina*.

Conservation Status of the Vegetation Type

According to Mucina and Rutherford (2006), this vegetation type is classified as Endangered. The national target for conservation protection for both these vegetation types is 24%, but only a few patches are protected in statutory reserves (Kwaggavoetpad, Van Riebeeck Park, Bronkhorstspruit, Boskop Dam Nature Reserves) and in private conservation areas (e.g. Doornkop, Zemvelo, Rhenosterpoort and Mpopomeni).

Almost half of this vegetation type has been transformed mostly by cultivation, plantations, urbanisation or dam-building. Cultivation may also have had an impact on an additional portion of the surface area of the unit where old lands are currently classified as grasslands in land-cover classifications and poor land management has led to degradation of significant portions of the remainder of this unit.

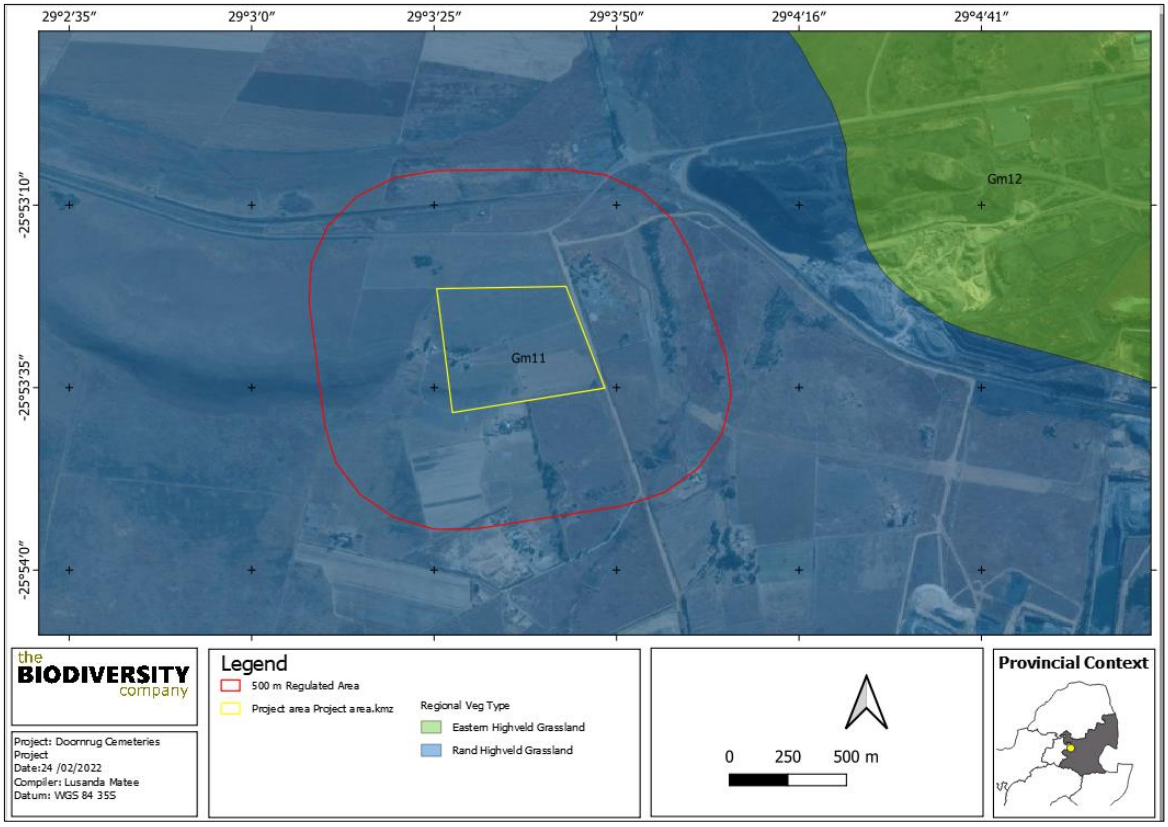

Figure 4-7 Map illustrating the vegetation type associated with the project area

4.1.1.9.2 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 4-3 below (according to the relevant POSA Grid Squares)(Figure 4-8).

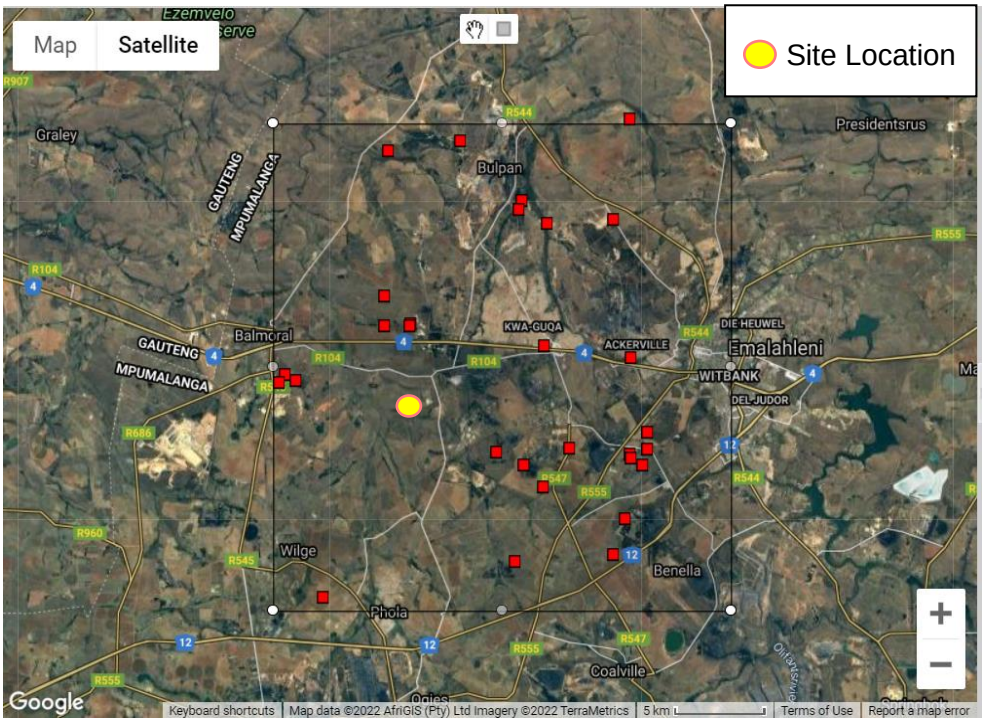

Figure 4-8 Map showing the grid drawn to compile an expected species list (BODATSA-POSA, 2016)

Table 4-3 Threatened flora species that may occur within the assessment area associated with the proposed project area. VU= Vulnerable, DD=Data Deficient

Family	Species	IUCN	Ecology
Iridaceae	*Gladiolus paludosus*	VU	Indigenous; Endemic
Asphodelaceae	*Aloe bergeriana*	DD	Indigenous; Endemic
Apocynaceae	*Aspidoglossum validum*	DD	Indigenous; Endemic

Gladiolus paludosus is categorised as VU according to the Red List of South African Plants (SANBI, 2017). It occurs in wetlands and marshes in high altitude grasslands, where it is threatened by habitat loss and degradation.

4.2 Field Assessment

The following sections provide the results from the field survey for the proposed development that was undertaken in 27th of January of 2022.

4.2.1 Flora Assessment

A total of 54 woody, graminoid, shrub and herbaceous plant species were recorded in the project area during the field assessment (Table 4-4). 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 whilst Category 2 appear in blue. Some of the plant species recorded can be seen in Figure 4-9..

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

Scientific Name	Common Name	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
Acalypha villicaulis	Hairy-stemmed Acalypha	LC	Indigenous, Not Endemic	
Acalypha punctata	Sticky Brooms and Brushes	LC	Indigenous, Not Endemic	
Albuca setosa	Soldier-In-The-Box	LC	Indigenous, Not Endemic	
Albuca setosa	Thick Slime-Lily	LC	Indigenous, Not Endemic	
Aloe castanea	Cat's Tail Aloe	LC	South African endemic	
Aristida congesta	Tassel Three-Awn	LC	Indigenous, Not Endemic	
Aristida junciformis	Gongoni Three-awn	LC	Indigenous, Not Endemic	
Asparagus laricinus	Clusterleaf Asparagus	LC	Indigenous, Not Endemic	
Bidens pilosa	Blackjack	NE	Not Indigenous; Naturalized exotic weed	
Brachiaria serrata	Velvet Signal Grass	LC	Indigenous, Not Endemic	
Bromus catharticus	Rescue Brome	NE	Indigenous, Not Endemic	
Ceratotheca triloba	South African Foxglove	LC	Not Endemic	
Cereus jamacaru	Queen-of-the-Night	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Cirsium vulgare	Spear Thistle, Scotch Thistle	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Cucumis zeyheri	South African Spiny Cucumber	LC	Indigenous, Not Endemic	
Cynodon dactylon	Bermuda Grass	LC	Indigenous, Not Endemic	
Cyperus esculentus	Yellow Nut Sedge	LC	Indigenous, Not Endemic	
Datura ferox	Large Thorn Apple	NE	Indigenous, Not Endemic	NEMBA Category 1b.
Digitaria tricholaenoides	Purple Finger Grass	LC	Indigenous, Not Endemic	
Elionurus muticus	Wire Grass	LC	Indigenous, Not Endemic	
Eragrostis chloromelas	Blue Love Grass	LC	Indigenous, Not Endemic	
Eragrostis curvula	Weeping Love Grass	LC	Indigenous, Not Endemic	
Eragrostis racemosa	Narrow Heart Love Grass,	LC	Indigenous, Not Endemic	

Eragrostis superba	Flat-Seed Love Grass	LC	Indigenous, Not Endemic	
Eucalyptus camaldulensis	Red River Gum	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Gladiolus ecklonii	Sheath Glad	LC	Not Endemic	
Gleditsia triacanthos	Honey Locust	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Gomphocarpus fruticosus subsp. fruticosus	Cotton Milkweed, Firesticks, Milkweed	LC	Indigenous, Not Endemic	
Harpochloa falx	Caterpillar Grass	LC	Indigenous, Not Endemic	
Helichrysum nudifolium	Hottentot Tea Everlasting	LC	Indigenous, Not Endemic	
Heteropogon contortus	Tanglehead	LC	Indigenous, Not Endemic	
Hibiscus aethiopicus	Cape Hibiscus	LC	Indigenous, Not Endemic	
Hypoxis hemerocallidea	Star-flower	LC	Indigenous; Endemic	
Imperata cylindrica	Beady Grass, Bedding Grass, Cotton-Wool Grass, Silky Grass	LC	Indigenous, Not Endemic	
Indigofera comosa	Crown Indigo	LC	Indigenous, Not Endemic	
Ipomoea papilio		LC	Indigenous, Not Endemic	
Ledebouria ovatifolia	Icubudwana	LC	Indigenous; Endemic	
Lion's Ear Leonotis nepetifolia	Lion's Ear	LC	Indigenous, Not Endemic	
Loudetia simplex	Common Russet Grass	LC	Indigenous, Not Endemic	
Melinis nerviglumis	Bristle-leaved Red-top Grass	LC	Indigenous, Not Endemic	
Opuntia ficus-indica	Sweet prickly pear	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Pinus patula	Jelecote Pine	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 2
Schinus molle	Peruvian Pepper Tree	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Senna occidentalis	Coffee Senna	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Setaria sphacelata var. sphacelata	Common bristle grass; Golden Timothy Grass	LC	Indigenous, Not Endemic	
Sporobolus africanus	Ratstail Dropseed; Rush Grass	LC	Indigenous, Not Endemic	
Sporobolus fimbriatus	Fringed Dropseed	LC	Indigenous, Not Endemic	
Stoebe vulgaris (Seriphium plumosum)	Slangbos	LC	Indigenous, Not Endemic	
Tagetes minuta	Khaki Bush, Khaki Weed, African Marigold		Not Indigenous; Naturalized exotic weed	

Themeda triandra	Kangaroo Grass	LC	Indigenous, Not Endemic	
Trachypogon spicatus	Spiked Crinkleawn	LC	Indigenous, Not Endemic	
Trichanthecium natalense	Natal Buffalo Grass	LC	Indigenous, Not Endemic	
Urochloa mosambicensis	Bushveld Signal Grass	LC	Indigenous, Not Endemic	
Verbena bonariensis	Purpletop Vervain	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Zinnia peruviana	Peruvian Zinnia	NE	Not Indigenous; Naturalized exotic weed	

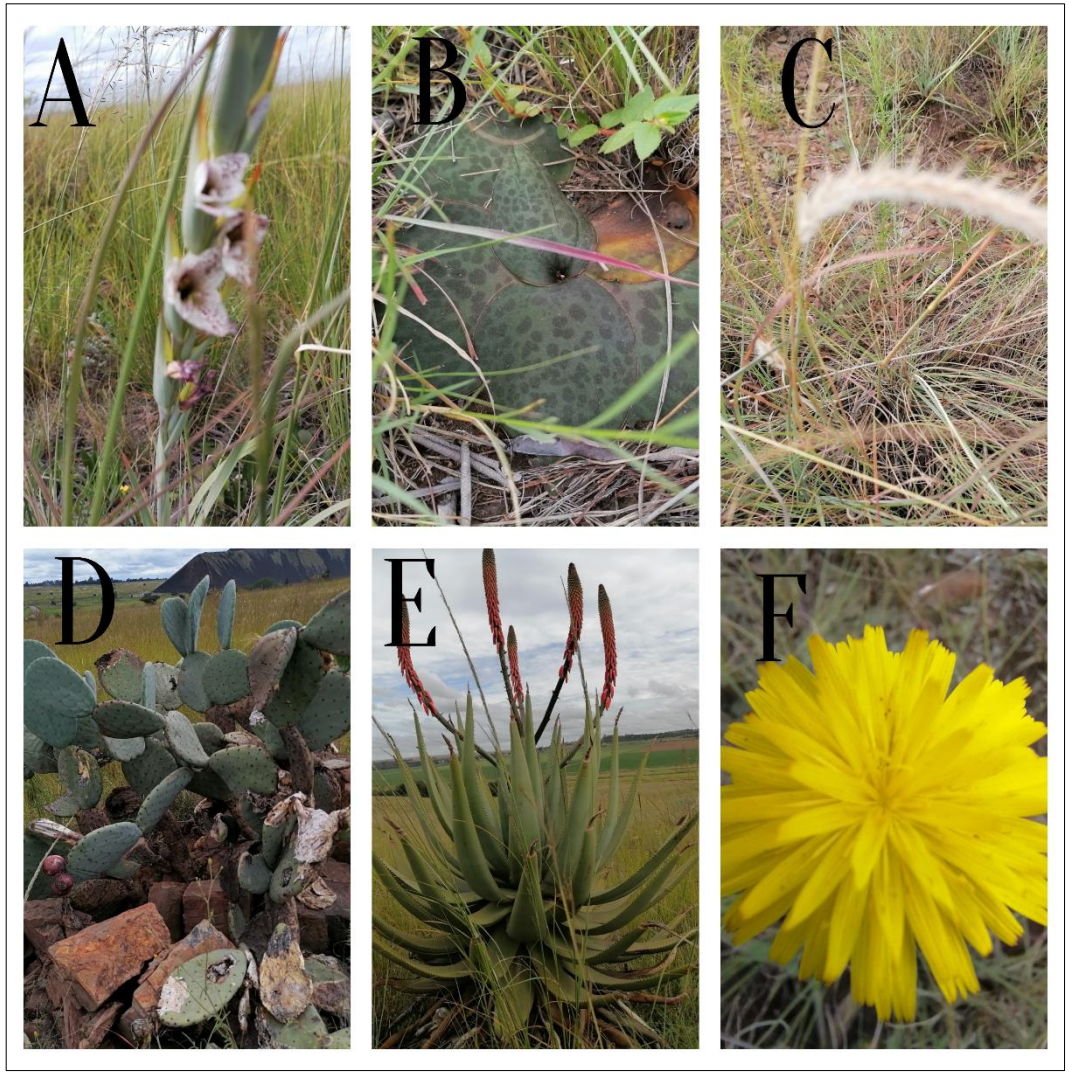

Figure 4-9 Photographs illustrating some of the flora recorded within the assessment area. A) Gladiolus ecklonii (Sheath Glad), B) Ledebouria ovatifolia (Flat-leaved African Hyacinth)., C) Elionurus muticus (Wire Grass)., D) Opuntia ficus-indica (Sweet prickly pear).,E) Aloe castanea (Cat's Tail Aloe) and F) Hypochaeris radicata (Cat's ear)

4.2.1.1 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, 24th 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.

10 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, whilst category 2 appear in blue (Table 4-4).

Table 4-5 IAPs recorded in the project area

Scientific Name	Common Name	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
Cereus jamacaru	Queen-of-the-Night	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Cirsium vulgare	Spear Thistle, Scotch Thistle	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Datura ferox	Large Thorn Apple	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Eucalyptus camaldulensis	Red River Gum	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Gleditsia triacanthos	Honey Locust	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Opuntia ficus-indica	Sweet prickly pear	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Pinus patula	Jelecote Pine	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 2
Schinus molle	Peruvian Pepper Tree	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Senna occidentalis	Coffee Senna	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.
Verbena bonariensis	Purpletop Vervain	NE	Not Indigenous; Naturalized exotic weed	NEMBA Category 1b.

4.2.1.2 Species of conservation concern (SCC)

Species of conservation concern (SCC) are either categorized as Red Data Listed species (RDL species), according to specific scientifically researched criteria and administered by the South African National Biodiversity Institute (SANBI), as protected trees by the National Forests Act (NFA)(Act No. 84 of 1998), or as Protected Trees and Plants by The NEMBA Threatened or Protected Species Regulations 152 of 2007 ("TOPS Regulations") and the Lists of Critically Endangered, Endangered, Vulnerable and Protected Species (TOPS Lists) and the provincial nature conservation legislation. No SCC was recorded in the project area.

4.2.2 Faunal Assessment

4.2.2.1 Avifauna

A total of thirty-three (33) 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 Grassland Biome, which therefore suggests that the sensitivity of the site, from an avian perspective, will not be of any great significance. One species of SCC was however recorded, namely *Falco biarmicus* (Lanner Falcon)

Table 4-6 Avifaunal species recorded in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Acridotheres tristis	Myna, Common	Unlisted	LC
Acrocephalus schoenobaenus	Warbler, Sedge	Unlisted	LC
Alopochen aegyptiaca	Goose, Egyptian	Unlisted	LC
Anas undulata	Duck, Yellow-billed	Unlisted	LC
Ardea intermedia	Egret, Yellow-billed (Intermediate)	Unlisted	LC
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC
Bubulcus ibis	Egret, Cattle	Unlisted	LC
Buteo rufofuscus	Buzzard, Jackal	Unlisted	LC
Cisticola juncidis	Cisticola, Zitting	Unlisted	LC
Columba guinea	Pigeon, Speckled	Unlisted	LC
Dendrocygna viduata	Duck, White-faced Whistling	Unlisted	LC
Dicrurus adsimilis	Drongo, Fork-tailed	Unlisted	LC
Euplectes orix	Bishop, Southern Red	Unlisted	LC
Falco biarmicus	Falcon, Lanner	VU	LC
Hirundo fuligula	Martin, Rock	Unlisted	Unlisted
Hirundo rustica	Swallow, Barn	Unlisted	LC
Mirafra africana	Lark, Rufous-naped	Unlisted	LC
Mirafra africana	Lark, Rufous-naped	Unlisted	LC
Oenanthe pileata	Wheatear, Capped	Unlisted	LC
Passer diffusus	Sparrow, Southern Grey-headed	Unlisted	LC
Ploceus cucullatus	Weaver, Village	Unlisted	LC
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC
Pternistis swainsonii	Spurfowl, Swainson's	Unlisted	LC
Pycnonotus tricolor	Bulbul, Dark-capped	Unlisted	Unlisted
Saxicola torquatus	Stonechat, African	Unlisted	LC
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC
Streptopelia senegalensis	Dove, Laughing	Unlisted	LC
Threskiornis aethiopicus	Ibis, African Sacred	Unlisted	LC
Vanellus albiceps	Lapwing, White-crowned	Unlisted	LC
Vanellus armatus	Lapwing, Blacksmith	Unlisted	LC
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC

4.2.2.2 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, the past human settlements and adjacent mining areas. No indigenous tree species occur on the site; hence the lack of arboreal reptiles.

4.2.2.3 Mammals

A total of three mammal species were recorded in the project area possibly due to sampling effort as a result of time constraints. No small mammal trappings were conducted due to time constraints. The presence of humans, overgrazing by livestock as well as the frequent burning of the grassland vegetation reduces available refuge habitat and expose remaining smaller terrestrial mammals to increased predation levels, this may have also contributed to the low diversity observed in the project area. The Species recorded are listed in Table 4-7.

Table 4-7 Mammal species recorded in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Herpestes sanguineus	Slender Mongoose	LC	LC
Hystrix africaeaustralis	Cape Porcupine	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC

4.2.3 Habitat Summary and Sensitivity

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 27th of January 2021. Four habitats were recorded in the project area (Figure 4-10):

Transformed: These include areas classified that have been transformed and are considered to no longer represent functioning ecosystems with intact or near-intact ecological and evolutionary processes. These areas are not in climax condition due to factors other than physical disturbance. This habitat unit represents the area that has been cleared of all vegetation or transformed to cropland and the high disturbance levels in such habitats have provided the necessary conditions for alien and invasive plant (AIP) species to proliferate and dominate the landscape. This habitat is regarded as transformed due to the nature of the modification of the area to an extent where it would not be able to return to its previous state.

Degraded Grassland: This habitat unit includes grassland communities that have not been historically transformed but the various sections have received different historical and current impacts. This habitat unit is degraded to some degree and some areas are within a recovering state and mainly consist of pioneer species and IAPs.

Grassland: The grassland habitat type identified in the project area was the remaining natural grassland after the majority of the project area was utilized for agricultural activities, predominantly maize farming and pasture fields. From a grass succession perspective, climax and sub climax grass species were more prominent than pioneer species, indicating an established grass sword moving towards a climax state, from a successional aspect. Although not completely degraded or transformed, this habitat unit did display some forms of disturbance.

Rocky Outcrop Habitat Unit: Occasional ridges or rocky outcrops interrupt the grassland cover. The Rocky Outcrop Habitat Unit comprises scattered rocky outcrops within the proposed Su Casa Burial Estate project area. The vegetation occurring within these areas is almost similar to that of the grassland habitat unit. This habitat unit has several small rocky outcrops, with largely intact vegetation composition and structure, a high diversity of floral species and

increased diversity and abundance of floral species. There is a similarity between the two vegetation units, with a few species occurring within this habitat unit which are typical of the rocky outcrops of the area.

4.2.3.1 Areas of Concern

The following concerns are associated with the two feasibility areas:

- According to the spatial dataset, the proposed development overlaps with a VU ecosystems; and
- Traverses a protected area expansion area;

4.2.4 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 4-8 Summary of habitat types delineated within field assessment area of the project area

Habitat (Area)	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Transformed	High	Low	Medium	Very High	Very Low
Degraded Grassland	High	Low	Medium	High	Low
Grassland	High	Medium	Medium	Medium	Medium
Rocky Outcrop	High	Medium	Medium	Low	High

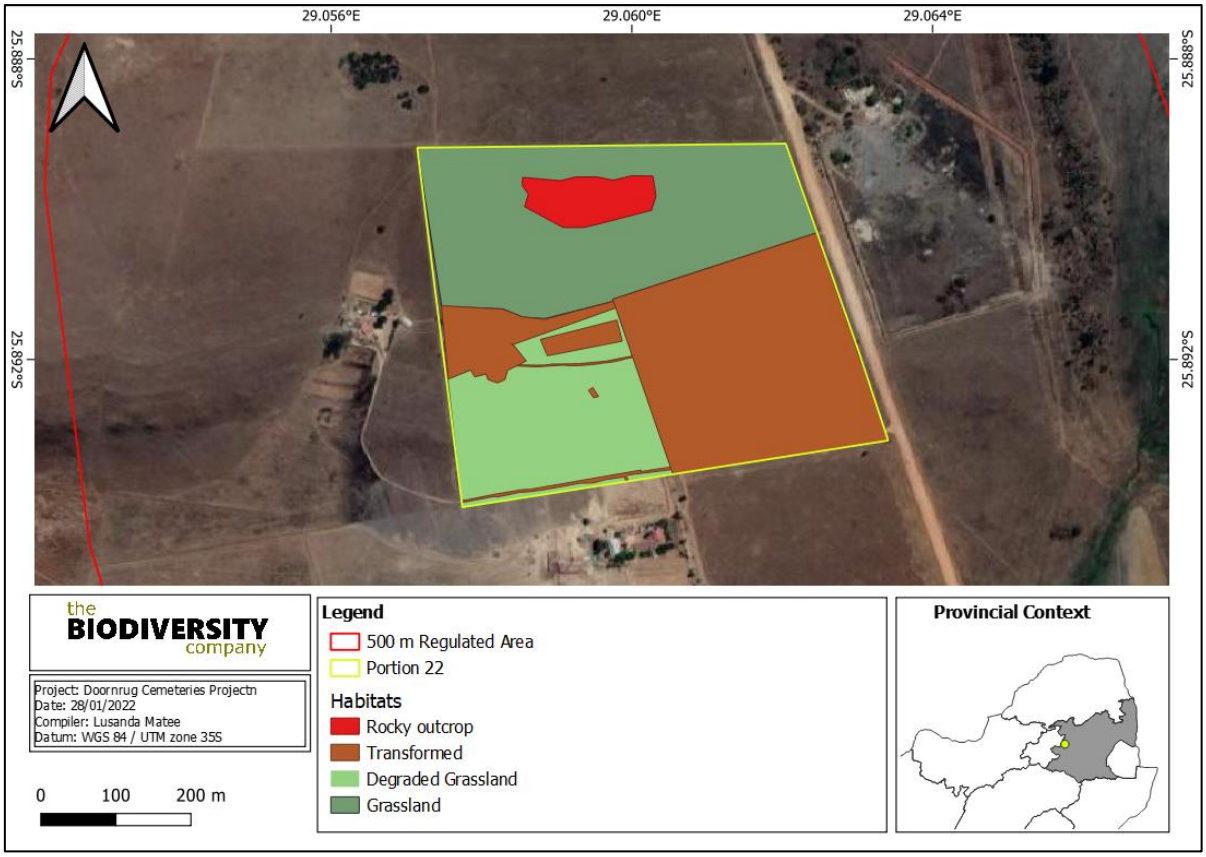

Figure 4-10 The habitat units identified in the project area

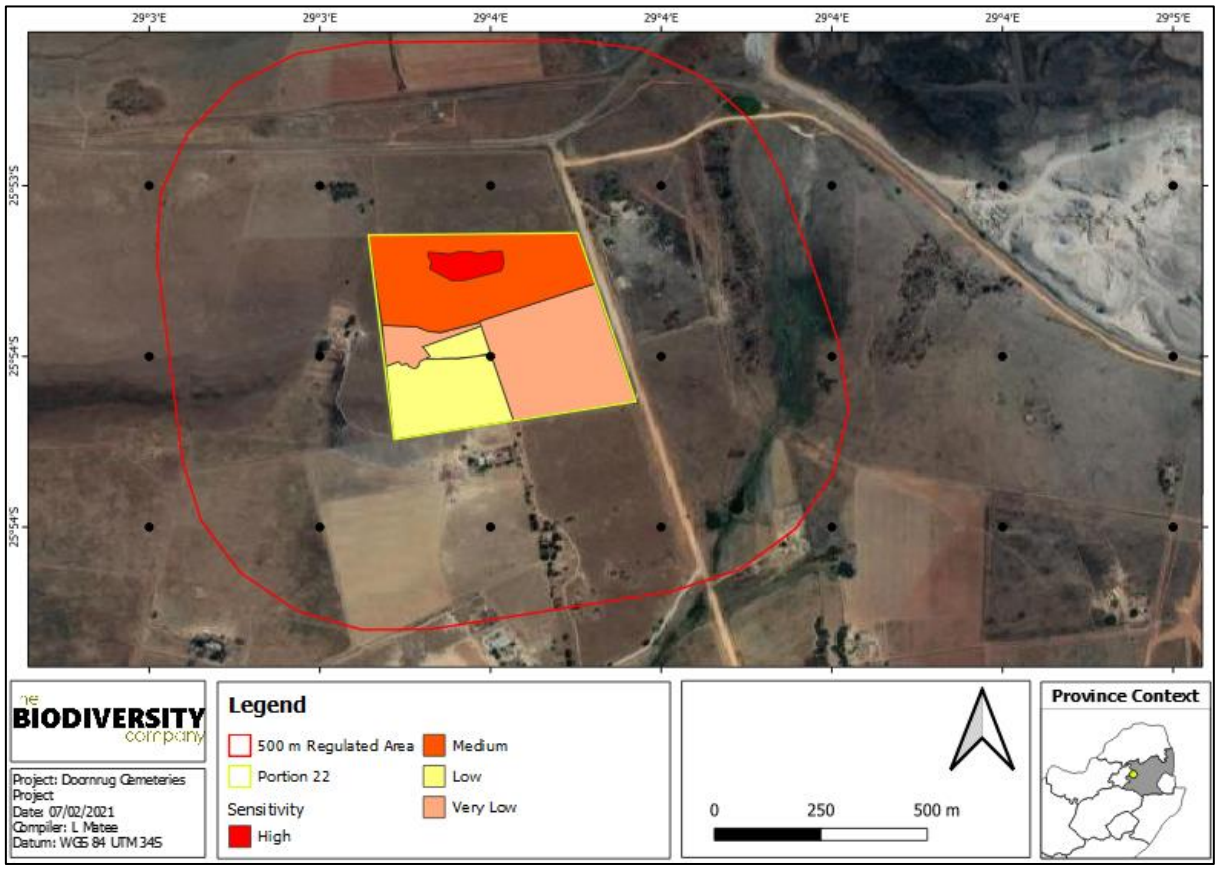

Figure 4-11 The sensitivity of the project area

4.2.4.1 Sensitivity

According to the Screening Tool Report generated (Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended), the following sensitivity classifications were from the National Web-based Environmental Screening Tool (to Figure 4-14):

- Terrestrial Biodiversity Theme is Very High 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.

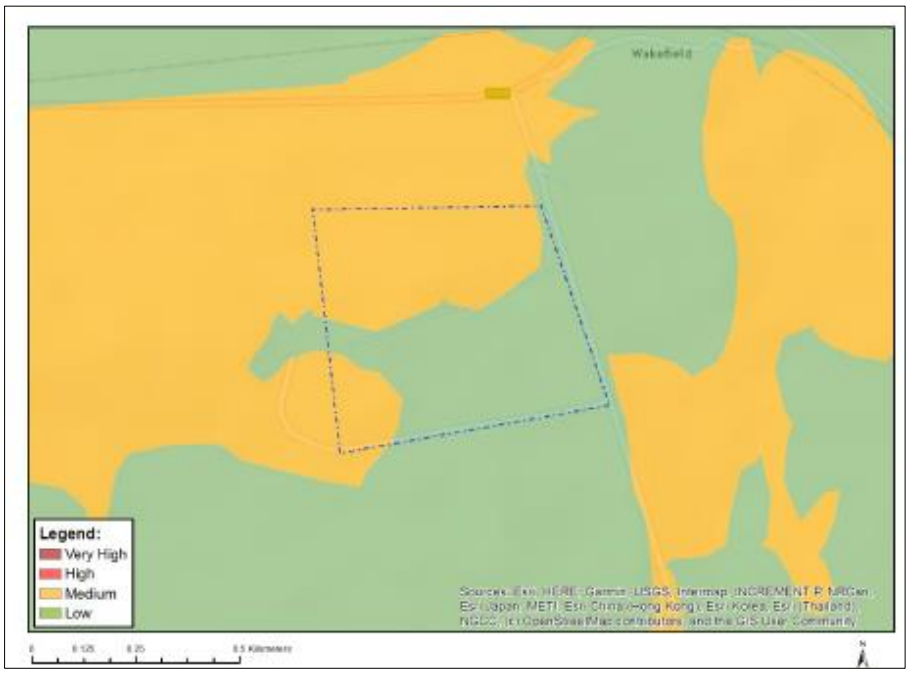

Figure 4-12 Map depicting relative plant theme sensitivity of the proposed project (National Environmental Screening Tool, 2021).

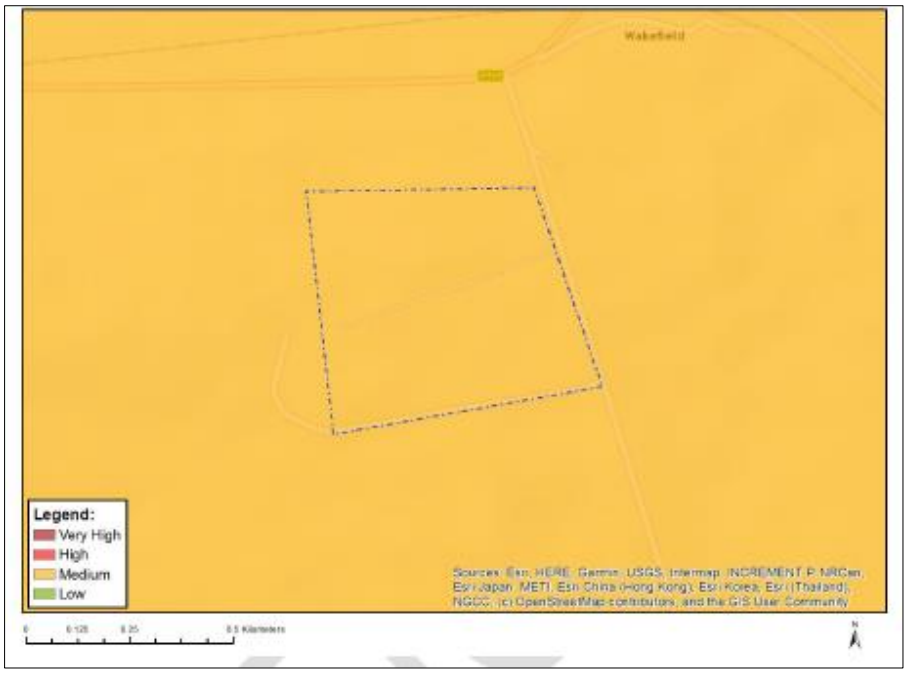

Figure 4-13 Map depicting relative animal theme sensitivity of the proposed project (National Environmental Screening Tool, 2021).

Figure 4-14 Map showing the relative terrestrial biodiversity sensitivity of the site for the proposed project

The medium to low sensitivity for the Plant Species Theme is confirmed, areas presented in the specialist sensitivity map (Figure 4-11) indicates the true sensitivity confirmed on site. The medium Animal Species Theme sensitivity is disputed as only three faunal species were recorded in the project area, with the exception of avifaunal species. The high sensitivity terrestrial biodiversity sensitivity is disputed as the site has been highly transformed and the species composition of the transformed habitats and degraded grassland have been completely altered as such, has a very low conservation value and ecological sensitivity from both a faunal and floral perspective.

5 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 5-1).

Table 5-1 Impact Management Outcomes

Management outcome: Vegetation and Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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.	Construction	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing
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);	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation surrounding the proposed development	Ongoing
Should any indigenous vegetation be removed outside the designated areas or direct project footprint, the Contractor must notify the relevant person on site, i.e., the PM, and the site must be rehabilitated if required and the structures replaced	Construction	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing
Regionally protected (SCC species) must be marked for rescue and relocation, or removal (where permit application would then apply) before any vegetation removal commences	Post Construction/Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Protection of SCC floral species	Throughout phase
Where possible, existing access routes and walking paths must be made use of, and the development of new routes limited.	All phases	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
Disturbed sites must be rehabilitated as soon as construction in an area is complete or near-complete and not left until the end of the project to be rehabilitated (concurrent rehabilitation)	Post Construction/Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Site rehabilitation	Throughout phase
Effective landscaping must be conducted in areas affected by erosion/ sedimentation. The developer must ensure that any open spaces are rehabilitated, and the appropriate indigenous vegetation is introduced	Post Construction/Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Site rehabilitation	Throughout phase
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.	Construction/Operational Phase	Environmental Officer & Design Engineer	Laydown areas and material storage & placement.	Ongoing
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.	Construction	Environmental Officer & Design Engineer	Site footprint and vegetation	Ongoing
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	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

equipment on-site during construction unless necessary. All contaminated soil/yard stone shall be treated in situ or removed and be placed in containers				
Leaking equipment and vehicles must be repaired immediately or be removed from the project areas to facilitate the repair	Life of operation	Environmental Officer & Contractor	Leaks and spills	Ongoing
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.	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
Management outcome: Fauna				
Impact Management Actions	Implementation	Monitoring	Impact Management Actions	Implementation
	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
Management outcome: Alien Vegetation				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
An Alien Invasive Plant management plant must be developed and implemented because of the invasive species identified on site which, if left unchecked, will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within the project area.	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
Management outcome: Waste management				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Formal waste management and sewerage systems must be put in place for contractors	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	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily

waste facility. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site				
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
Management outcome: Environmental awareness training				
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 possible presence of SSC, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMPr. 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
The Contractor must provide method statements on the protocols to be followed and contingencies to be implemented	Construction Phase	Environmental Officer, contractor & Design Engineer	Emergencies, non-compliance and communication	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 minimization and control measures should be implemented on the construction site at regular intervals. This includes wetting of exposed soft soil surfaces. No water may be abstracted from any water source without an applicable License from DWS. The frequency of implementation of dust suppression measures should be increased when it is expected that high wind conditions will develop.	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

Vegetation clearing should only occur immediately prior to the commencement of construction activities in an area to minimize the amount of exposed soil on the site. Stockpiles and spoil heaps must be covered with tarps or straw to prevent fugitive dust	Construction Phase	Contractor	Erosion	Ongoing

5.1 Recommended Actions

Through the analysis of various database and satellite imagery as well as the infield screening assessment it was determined that although majority of the site is degraded to different degrees it still possess quite a number of sensitive ecological receptors. These sensitivity receptors relate to being located in VU ecosystems, traversing two threatened ecosystems and traversing a protected area. In addition to this the **Lanner Falcon** (*Falco biarmicus*) listed as VU was also recorded in the project area. The rocky outcrop was assigned a high sensitivity. It is therefore recommended that it is demarcated as a no-go area and no laydown areas, access roads or other project activities must occur within this area during either the construction or operational phase.

The majority of 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.

5.2 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 and a follow-up survey is not considered essential for decision-making. 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.

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7 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

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 Ecologyand 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: 1st Language

isiXhosa: Home language

isiNdebele: Conversational and written command

isiZulu: Conversational and written command

Employment

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): TerrestrialBiodiversity (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 BiodiversityInstitute (SANBI)

Professional bodies and memberships

South African Council for Natural Scientific Professions*, Cand Natural Scientist in the fieldof 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). Characterizationand 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	Senorian 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**
2021	WSP	Mortimer Smelter Contractor Laydown Area Vegetation Assessment	Flora Specialist and Compilation of Report	**South Africa**
2021	WSP	Two Rivers Platinum Mine Pipeline rerouting Terrestrial Biodiversity Assessment	Fauna & Flora Specialist and Compilation of Report	**South Africa**

Andrew Husted

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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

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

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: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs

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.

Publication of scientific journals and articles.

Democratic Republic of Congo

Ghana, Ivory Coast, Lesotho

Liberia, Mali, Mozambique

Nigeria, Republic of Armenia, Senegal

Sierra Leone, South Africa

Swaziland, Tanzania

and Forestry for the River Health Programme

- EcoStatus application for rivers and streams

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

Compliance audits	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
Control officer	Acting as an independent Environmental Control Officer (ECO), acting as a quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts
Screening studies	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.
Public consultation	The provision of specialist input in order to communicate project findings as well as assist with providing feedback if and when required.
Water use licenses	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.
Closure	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.
Visual	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'Iviore. 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).

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

Family	Genus	Sp1	Author1	Rank1	Sp2	IUCN	Ecology
Fabaceae	Listia	solitudinis	(Dummer) B.-E.van Wyk & Boatwr.			LC	Indigenous; Endemic
Cyperaceae	Kyllinga	alba	Nees			LC	Indigenous
Cyperaceae	Schoenoplectus	corymbosus	(Roth ex Roem. & Schult.) J.Raynal			LC	Indigenous
Aneuraceae	Riccardia	fastigiata	(Lehm.) Trevis.				Indigenous
Cyperaceae	Schoenoplectus	decipiens	(Nees) J.Raynal			LC	Indigenous
Poaceae	Eragrostis	plana	Nees			LC	Indigenous
Apocynaceae	Aspidoglossum	glabrescens	(Schltr.) Kupicha			LC	Indigenous; Endemic
Pilotrichaceae	Cyclodictyon	vallis-gratiae	(Hampe ex Mull.Hal.) Kuntze				Indigenous
Lobeliaceae	Lobelia	sonderiana	(Kuntze) Lammers			LC	Indigenous
Ricciaceae	Riccia	volkii	S.W.Arnell				Indigenous
Cyperaceae	Bulbostylis	contexta	(Nees) M.Bodard			LC	Indigenous
Apocynaceae	Pentarrhinum	insipidum	E.Mey.			LC	Indigenous
Lobeliaceae	Lobelia	erinus	L.			LC	Indigenous
Cyperaceae	Eleocharis	dregeana	Steud.			LC	Indigenous
Asteraceae	Xanthium	strumarium	L.				Not indigenous; Naturalised; Invasive
Anacardiaceae	Ozoroa	paniculosa	(Sond.) R.Fern. & A.Fern.	var.	paniculosa	LC	Indigenous
Iridaceae	Afrosolen	sandersonii	(Baker) Goldblatt & J.C.Manning	subsp.	sandersonii		Indigenous
Solanaceae	Solanum	sisymbriifolium	Lam.				Not indigenous; Naturalised; Invasive
Solanaceae	Solanum	nigrum	L.				Not indigenous; Naturalised
Potamogetonaceae	Potamogeton	trichoides	Cham. & Schltdl.			LC	Indigenous
Orchidaceae	Satyrium	parviflorum	Sw.			LC	Indigenous
Orobanchaceae	Sopubia	cana	Harv.	var.	cana	LC	Indigenous
Apocynaceae	Gomphocarpus	glaucophyllus	Schltr.			LC	Indigenous
Asteraceae	Tolpis	capensis	(L.) Sch.Bip.			LC	Indigenous
Polygalaceae	Polygala	producta	N.E.Br.			LC	Indigenous
Fabaceae	Eriosema	gunniae	C.H.Stirt.			LC	Indigenous; Endemic
Orchidaceae	Disa	versicolor	Rchb.f.			LC	Indigenous
Hypericaceae	Hypericum	lalandii	Choisy			LC	Indigenous
Cyperaceae	Bulbostylis	schlechteri	C.B.Clarke			LC	Indigenous; Endemic
Xyridaceae	Xyris	gerrardii	N.E.Br.			LC	Indigenous
Convolvulaceae	Convolvulus	sagittatus	Thunb.			LC	Indigenous
Portulacaceae	Portulaca	hereroensis	Schinz			LC	Indigenous
Amaryllidaceae	Cyrtanthus	breviflorus	Harv.			LC	Indigenous

Asteraceae	Helichrysum	cephaloideum	DC.			LC	Indigenous
Poaceae	Panicum	hygrocharis	Steud.			LC	Indigenous
Rubiaceae	Pentanisia	prunelloides	(Klotzsch ex Eckl. & Zeyh.) Walp.	sub sp.	prunelloides	LC	Indigenous
Asphodelaceae	Kniphofia	porphyrantha	Baker			LC	Indigenous
Scrophulariaceae	Chaenostoma	floribundum	Benth.			LC	Indigenous
Apocynaceae	Aspidoglossum	interruptum	(E.Mey.) Bullock			LC	Indigenous
Haloragaceae	Laurembergia	repens	P.J.Bergius	sub sp.	brachypoda	LC	Indigenous
Poaceae	Ischaemum	fasciculatum	Brongn.			LC	Indigenous
Commelinaceae	Commelina	modesta	Oberm.			LC	Indigenous
Hypoxidaceae	Hypoxis	hemerocallidea	Fisch., C.A.Mey. & Ave-Lall.			LC	Indigenous
Fabaceae	Indigofera	mollicoma	N.E.Br.			LC	Indigenous
Malvaceae	Hermannia	sp.					
Polygalaceae	Polygala	houtboshiana	Chodat			LC	Indigenous
Cyperaceae	Fimbristylis	complanata	(Retz.) Link			LC	Indigenous
Asteraceae	Berkheya	pinnatifida	(Thunb.) Thell.	sub sp.	ingrata	LC	Indigenous; Endemic
Portulacaceae	Portulaca	quadrifida	L.			LC	Indigenous
Fabaceae	Rhynchosia	monophylla	Schltr.			LC	Indigenous
Asphodelaceae	Kniphofia	ensifolia	Baker	sub sp.	ensifolia	LC	Indigenous
Poaceae	Hyparrhenia	hirta	(L.) Stapf			LC	Indigenous
Thymelaeaceae	Lasiosiphon	capitatus	(L.f.) Burtt Davy			LC	Indigenous
Poaceae	Phalaris	arundinacea	L.			NE	Not indigenous; Naturalised
Lamiaceae	Syncolostemon	pretoriae	(Gurke) D.F.Otieno			LC	Indigenous
Fabaceae	Chamaecrista	comosa	E.Mey.	var.	capricornia	LC	Indigenous
Asphodelaceae	Bulbine	favosa	(Thunb.) Schult. & Schult.f.			LC	Indigenous
Rubiaceae	Vangueria	thamnus	(Robyns) Lantz			LC	Indigenous; Endemic
Polygonaceae	Persicaria	decipiens	(R.Br.) K.L.Wilson			LC	Indigenous
Cyperaceae	Cyperus	decurvatus	(C.B.Clarke) C.Archer & Goetgh.			LC	Indigenous
Cyperaceae	Schoenoplectus	scirpoides	(Schrad.) Browning			LC	Indigenous
Fabaceae	Vigna	vexillata	(L.) A.Rich.	var.	vexillata	LC	Indigenous
Agavaceae	Chlorophytum	fasciculatum	(Baker) Kativu			LC	Indigenous
Apocynaceae	Ceropegia	rubella	(E.Mey.) Bruyns				Indigenous
Scrophulariaceae	Melanospermum	transvaalense	(Hiern) Hilliard			LC	Indigenous; Endemic
Cyperaceae	Cyperus	marginatus	Thunb.			LC	Indigenous
Malvaceae	Hibiscus	aethiopicus	L.	var.	ovatus	LC	Indigenous
Aizoaceae	Mossia	intervallaris	(L.Bolus) N.E.Br.			LC	Indigenous

Asteraceae	Helichrysum	auronitens	Sch.Bip.			LC	Indigenous
Apocynaceae	Orbea	miscella	(N.E.Br.) Meve			LC	Indigenous; Endemic
Asteraceae	Senecio	harveianus	MacOwan			LC	Indigenous
Rutaceae	Zanthoxylum	thorncroftii	(I.Verd.) P.G.Waterman			LC	Indigenous; Endemic
Asteraceae	Helichrysum	nudifolium	(L.) Less.	var.	nudifolium	LC	Indigenous
Crassulaceae	Crassula	setulosa	Harv.	var.	setulosa	NE	Indigenous
Gentianaceae	Chironia	purpurascens	(E.Mey.) Benth. & Hook.f.	subsp.	humilis	LC	Indigenous
Cyperaceae	Cyperus	margaritaceus	Vahl	var.	margaritaceus	LC	Indigenous
Acanthaceae	Dyschoriste	costata	(Nees) Kuntze			LC	Indigenous; Endemic
Iridaceae	Gladiolus	elliotii	Baker			LC	Indigenous
Geraniaceae	Pelargonium	minimum	(Cav.) Willd.			LC	Indigenous
Juncaceae	Juncus	oxycarpus	E.Mey. ex Kunth			LC	Indigenous
Poaceae	Koeleria	capensis	(Steud.) Nees			LC	Indigenous
Fabaceae	Indigofera	oxytropis	Benth. ex Harv.			LC	Indigenous
Malvaceae	Hermannia	geniculata	Eckl. & Zeyh.			LC	Indigenous
Poaceae	Sporobolus	africanus	(Poir.) Robyns & Tournay			LC	Indigenous
Orchidaceae	Disa	rhodantha	Schltr.			LC	Indigenous
Polygalaceae	Polygala	transvaalensis	Chodat	subsp.	transvaalensis	LC	Indigenous
Hyacinthaceae	Ledebouria	cooperi	(Hook.f.) Jessop			LC	Indigenous
Poaceae	Chloris	gayana	Kunth			LC	Indigenous
Solanaceae	Solanum	giganteum	Jacq.			LC	Indigenous
Hyacinthaceae	Dipcadi	gracillimum	Baker			LC	Indigenous
Fabaceae	Leobordea	foliosa	(Bolus) B.-E.van Wyk & Boatwr.			LC	Indigenous
Pittosporaceae	Pittosporum	viridiflorum	Sims			LC	Indigenous
Caryophyllaceae	Dianthus	mooiensis	F.N.Williams	subsp.	mooiensis	NE	Indigenous; Endemic
Scrophulariaceae	Zaluziansky a	spathacea	(Benth.) Walp.			LC	Indigenous
Cyperaceae	Pycreus	macranthus	(Boeckeler) C.B.Clarke			LC	Indigenous
Fabaceae	Neorautanenia	ficifolia	(Benth.) C.A.Sm.			LC	Indigenous
Cyperaceae	Fuirena	pubescens	(Poir.) Kunth	var.	pubescens	LC	Indigenous
Ebenaceae	Diospyros	lycioides	Desf.	subsp.	guerkei	LC	Indigenous
Orchidaceae	Schizochilus	zeyheri	Sond.			LC	Indigenous
Asteraceae	Gazania	krebsiana	Less.	subsp.	serrulata	LC	Indigenous
Hyacinthaceae	Dipcadi	viride	(L.) Moench			LC	Indigenous
Orobanchaceae	Alectra	sessiliflora	(Vahl) Kuntze			LC	Indigenous
Asteraceae	Callilepis	leptophylla	Harv.			LC	Indigenous

Scrophulariaceae	Jamesbrittenia	aurantiaca	(Burch.) Hilliard			LC	Indigenous
Pilotrichaceae	Callicostella	tristis	(Mull.Hal.) Broth.				Indigenous
Ricciaceae	Riccia	atropurpurea	Sim				Indigenous
Oxalidaceae	Oxalis	obliquifolia	Steud. ex A.Rich.			LC	Indigenous
Poaceae	Eragrostis	curvula	(Schrad.) Nees			LC	Indigenous
Fossombroniaceae	Fossombronia	crispa	Nees				Indigenous
Asphodelaceae	Trachyandra	asperata	Kunth	var.	nataglencoensis	LC	Indigenous
Lamiaceae	Acrotome	hispida	Benth.			LC	Indigenous
Verbenaceae	Chascanum	hederaceum	(Sond.) Moldenke	var.	hederaceum	LC	Indigenous
Amaryllidaceae	Cyrtanthus	tuckii	Baker				Indigenous
Asteraceae	Lasiospermum	pedunculare	Lag.			LC	Indigenous; Endemic
Pteridaceae	Actiniopteris	radiata	(J.Koenig ex Sw.) Link			LC	Indigenous
Asteraceae	Berkheya	radula	(Harv.) De Wild.			LC	Indigenous
Cyperaceae	Eleocharis	limosa	(Schrad.) Schult.			LC	Indigenous
Lythraceae	Ammannia	schinzii	(Koehne) S.A.Graham & Gandhi				Indigenous
Alliaceae	Tulbaghia	leucantha	Baker			LC	Indigenous
Asteraceae	Nidorella	hottentotica	DC.			LC	Indigenous
Malvaceae	Hermannia	depressa	N.E.Br.			LC	Indigenous
Asteraceae	Ursinia	sp.					
Pedaliaceae	Dicerocarium	senecioides	(Klotzsch) Abels			LC	Indigenous
Asteraceae	Gerbera	ambigua	(Cass.) Sch.Bip.			LC	Indigenous
Asteraceae	Senecio	inaequidens	DC.			LC	Indigenous
Poaceae	Eragrostis	inamoena	K.Schum.			LC	Indigenous
Asteraceae	Senecio	coronatus	(Thunb.) Harv.			LC	Indigenous
Colchicaceae	Camptorrhiza	strumosa	(Baker) Oberm.			LC	Indigenous
Apiaceae	Alepidea	setifera	N.E.Br.			LC	Indigenous
Aytoniaceae	Asterella	wilmsii	(Steph.) S.W.Arnell				Indigenous
Apocynaceae	Asclepias	albens	(E.Mey.) Schltr.			LC	Indigenous
Thelypteridaceae	Thelypteris	confluens	(Thunb.) C.V.Morton			LC	Indigenous
Commelinaceae	Cyanotis	speciosa	(L.f.) Hassk.			LC	Indigenous
Asteraceae	Euryops	gilfillanii	Bolus			LC	Indigenous; Endemic
Asteraceae	Gazania	linearis	(Thunb.) Druce	var.	linearis	LC	Indigenous
Apocynaceae	Periglossum	angustifolium	Decne.			LC	Indigenous
Apocynaceae	Asclepias	adscendens	(Schltr.) Schltr.			LC	Indigenous
Apocynaceae	Aspidoglossum	biflorum	E.Mey.			LC	Indigenous
Ebenaceae	Euclea	sp.					
Convolvulaceae	Ipomoea	oenotherae	(Vatke) Hallier f.				Indigenous
Poaceae	Oropetium	capense	Stapf			LC	Indigenous

Geraniaceae	Pelargonium	luridum	(Andrews) Sweet			LC	Indigenous
Poaceae	Leptochloa	fusca	(L.) Kunth			LC	Indigenous
Cyperaceae	Kyllinga	erecta	Schumach.	var.	erecta	LC	Indigenous
Cyperaceae	Cyperus	obtusiflorus	Vahl	var.	obtusiflorus	LC	Indigenous
Fossombroniaceae	Fossombronia	gemmifera	Perold				Indigenous
Polygalaceae	Polygala	spicata	Chodat			LC	Indigenous
Orobanchaceae	Rhamphicarpa	brevipedicellata	O.J.Hansen			LC	Indigenous
Poaceae	Cynodon	dactylon	(L.) Pers.			LC	Indigenous
Cyperaceae	Cyperus	difformis	L.			LC	Indigenous
Convolvulaceae	Ipomoea	ommanneyi	Rendle			LC	Indigenous
Campanulaceae	Wahlenbergia	undulata	(L.f.) A.DC.			LC	Indigenous
Convolvulaceae	Falkia	oblonga	Bernh. ex C.Krauss			LC	Indigenous
Asparagaceae	Asparagus	flavicaulis	(Oberm.) Fellingham & N.L.Mey.	sub sp.	flavicaulis	LC	Indigenous
Asteraceae	Lactuca	inermis	Forssk.			LC	Indigenous
Apocynaceae	Asclepias	crispa	P.J.Bergius	var.	crispa	LC	Indigenous; Endemic
Menyanthaceae	Nymphoides	thunbergiana	(Griseb.) Kuntze			LC	Indigenous
Fabaceae	Melolobium	wilmsii	Harms			LC	Indigenous; Endemic
Proteaceae	Protea	gaguedi	J.F.Gmel.			LC	Indigenous
Juncaceae	Juncus	exsertus	Buchenau			LC	Indigenous
Asteraceae	Dicoma	macrocephala	DC.			LC	Indigenous
Asteraceae	Berkheya	zeyheri	Oliv. & Hiern	sub sp.	rehmannii		Indigenous
Iridaceae	Gladiolus	paludosus	Baker			VU	Indigenous
Cyperaceae	Cyperus	denudatus	L.f.			LC	Indigenous
Iridaceae	Gladiolus	papilio	Hook.f.			LC	Indigenous
Convolvulaceae	Ipomoea	bathycolpos	Hallier f.			LC	Indigenous; Endemic
Malvaceae	Hermannia	transvaalensis	Schinz			LC	Indigenous; Endemic
Fabaceae	Elephantorrhiza	elephantina	(Burch.) Skeels			LC	Indigenous
Lamiaceae	Platostoma	rotundifolium	(Briq.) A.J.Paton			LC	Indigenous
Apocynaceae	Asclepias	brevipes	(Schltr.) Schltr.			LC	Indigenous; Endemic
Thymelaeaceae	Lasiosiphon	microphyllus	(Meisn.) Meisn.			LC	Indigenous; Endemic
Santalaceae	Thesium	pallidum	A.DC.			LC	Indigenous
Fabaceae	Rhynchosia	totta	(Thunb.) DC.	var.	totta	LC	Indigenous
Hyacinthaceae	Dipcadi	marlothii	Engl.			LC	Indigenous
Apocynaceae	Asclepias	eminens	(Harv.) Schltr.			LC	Indigenous
Iridaceae	Crocosmia	paniculata	(Klatt) Goldblatt			LC	Indigenous
Ranunculaceae	Ranunculus	multifidus	Forssk.			LC	Indigenous

Rubiaceae	Pygmaeothamnus	zeyheri	(Sond.) Robyns	var.	rogersii	LC	Indigenous; Endemic
Asteraceae	Senecio	gregatus	Hilliard			LC	Indigenous
Hyacinthaceae	Ledebouria	marginata	(Baker) Jessop			LC	Indigenous
Verbenaceae	Verbena	brasiliensis	Vell.				Not indigenous; Naturalised; Invasive
Hypoxidaceae	Hypoxis	rigidula	Baker	var.	rigidula	LC	Indigenous
Oxalidaceae	Oxalis	latifolia	Kunth				Not indigenous; Naturalised; Invasive
Moraceae	Ficus	thonningii	Blume				Indigenous
Caryophyllaceae	Polycarpaea	corymbosa	(L.) Lam.	var.	corymbosa		Not indigenous; Naturalised
Apocynaceae	Raphionacme	hirsuta	(E.Mey.) R.A.Dyer			LC	Indigenous
Orchidaceae	Satyrium	longicauda	Lindl.	var.	longicauda	NE	Indigenous
Orchidaceae	Orthochilus	milnei	(Rchb.f.) Bytebier			LC	Indigenous
Asteraceae	Coreopsis	lanceolata	L.				Not indigenous; Cultivated; Naturalised; Invasive
Ricciaceae	Riccia	natalensis	Sim				Indigenous; Endemic
Polygonaceae	Oxygonum	dregeanum	Meisn.	subsp.	canescens	NE	Indigenous; Endemic
Amaryllidaceae	Nerine	rehmannii	(Baker) L.Bolus			LC	Indigenous
Sphagnaceae	Sphagnum	sp.					
Cyperaceae	Bulbostylis	scleropus	C.B.Clarke			LC	Indigenous
Scrophulariaceae	Manulea	parviflora	Benth.	var.	parviflora	LC	Indigenous
Apocynaceae	Sisyranthus	randii	S.Moore			LC	Indigenous
Rubiaceae	Fadogia	homblei	De Wild.			LC	Indigenous
Caryophyllaceae	Silene	burchellii	Otth ex DC.	subsp.	pilosellifolia		Indigenous
Convolvulaceae	Merremia	verecunda	Rendle			LC	Indigenous
Iridaceae	Gladiolus	woodii	Baker			LC	Indigenous
Asphodelaceae	Aloe	bergeriana	(Dinter) Boatwr. & J.C.Manning			DD	Indigenous
Campanulaceae	Wahlenbergia	virgata	Engl.			LC	Indigenous
Asteraceae	Geigeria	aspera	Harv.	var.	aspera	LC	Indigenous
Apocynaceae	Cordylogyne	globosa	E.Mey.			LC	Indigenous
Apocynaceae	Aspidoglossum	validum	Kupicha			DD	Indigenous
Fabaceae	Eriosema	cordatum	E.Mey.			LC	Indigenous
Orchidaceae	Satyrium	hallackii	Bolus	subsp.	ocellatum	LC	Indigenous
Orchidaceae	Eulophia	hians	Spreng.	var.	hians	LC	Indigenous
Lythraceae	Ammannia	sagittifolia	(Sond.) S.A.Graham & Gandhi	var.	sagittifolia		Indigenous
Poaceae	Leersia	hexandra	Sw.			LC	Indigenous
Euphorbiaceae	Jatropha	lagarinthoides	Sond.			LC	Indigenous; Endemic
Fabaceae	Indigofera	atrata	N.E.Br.			LC	Indigenous

Thymelaeaceae	Lasiosiphon	kraussianus	(Meisn.) Meisn.				Indigenous
Asteraceae	Senecio	sp.					
Fabaceae	Melolobium	alpinum	Eckl. & Zeyh.			LC	Indigenous
Scrophulariaceae	Selago	sp.					
Dioscoreaceae	Dioscorea	dregeana	(Kunth) T.Durand & Schinz			LC	Indigenous
Rhamnaceae	Helinus	integrifolius	(Lam.) Kuntze			LC	Indigenous
Poaceae	Melinis	nerviglumis	(Franch.) Zizka			LC	Indigenous
Hyacinthaceae	Albuca	shawii	Baker			LC	Indigenous
Polygonaceae	Oxygonum	dregeanum	Meisn.	subsp.	canescens	NE	Indigenous
Ericaceae	Erica	drakensbergensis	Guthrie & Bolus			LC	Indigenous
Fabaceae	Eriosema	salignum	E.Mey.			LC	Indigenous
Convolvulaceae	Ipomoea	crassipes	Hook.	var.	crassipes	LC	Indigenous
Anacardiaceae	Searsia	zeyheri	(Sond.) Moffett			LC	Indigenous; Endemic
Rubiaceae	Kohautia	amatymbica	Eckl. & Zeyh.			LC	Indigenous
Orchidaceae	Habenaria	nyikana	Rchb.f.	subsp.	nyikana	LC	Indigenous
Rubiaceae	Pentanisia	angustifolia	(Hochst.) Hochst.			LC	Indigenous
Asteraceae	Osteospermum	striatum	Burtt Davy			LC	Indigenous; Endemic
Iridaceae	Watsonia	bella	N.E.Br. ex Goldblatt			LC	Indigenous
Santalaceae	Thesium	spartioides	A.W.Hill			LC	Indigenous
Fabaceae	Indigofera	velutina	E.Mey.			LC	Indigenous
Orobanchaceae	Striga	bilabiata	(Thunb.) Kuntze	subsp.	bilabiata	LC	Indigenous
Lamiaceae	Teucrium	trifidum	Retz.			LC	Indigenous
Fabaceae	Senegalia	caffra	(Thunb.) P.J.H.Hurter & Mabb.			LC	Indigenous
Fabaceae	Eriosema	burkei	Benth. ex Harv.	var.	burkei	LC	Indigenous
Iridaceae	Gladiolus	vinosomaculatus	Kies			LC	Indigenous; Endemic
Asphodelaceae	Aloe	jeppeae	Klopper & Gideon F.Sm.			LC	Indigenous
Orobanchaceae	Cycnium	tubulosum	(L.f.) Engl.	subsp.	tubulosum	LC	Indigenous
Sapotaceae	Englerophytum	magalismontanum	(Sond.) T.D.Penn.			LC	Indigenous
Gesneriaceae	Streptocarpus	dunnii	Hook.f.			LC	Indigenous
Asteraceae	Schistostephium	crataegifolium	(DC.) Fenzl ex Harv.			LC	Indigenous
Polygalaceae	Polygala	sp.					
Poaceae	Stiburus	conrathii	Hack.			LC	Indigenous
Asteraceae	Senecio	glanduloso-pilosus	Volkens & Muschl.			LC	Indigenous; Endemic
Cyperaceae	Bulbostylis	oritrephes	(Ridl.) C.B.Clarke			LC	Indigenous
Lamiaceae	Rotheca	hirsuta	(Hochst.) R.Fern.			LC	Indigenous
Asteraceae	Helichrysum	acutatum	DC.			LC	Indigenous

Juncaceae	Juncus	lomatophyllus	Spreng.			LC	Indigenous
Iridaceae	Gladiolus	antholyzoides	Baker			LC	Indigenous; Endemic
Asteraceae	Dimorphotheca	spectabilis	Schltr.			LC	Indigenous; Endemic
Cyperaceae	Scleria	catophylla	C.B.Clarke			LC	Indigenous
Fabaceae	Tephrosia	semiglabra	Sond.			LC	Indigenous
Iridaceae	Dierama	mossii	(N.E.Br.) Hilliard			LC	Indigenous
Apocynaceae	Asclepias	gibba	(E.Mey.) Schltr.	var.	gibba	LC	Indigenous
Fabaceae	Eriosema	psoraleoides	(Lam.) G.Don			LC	Indigenous
Solanaceae	Withania	somnifera	(L.) Dunal			LC	Indigenous
Brassicaceae	Sisymbrium	turczaninowii	Sond.			LC	Indigenous
Poaceae	Phalaris	canariensis	L.			NE	Not indigenous; Naturalised
Droseraceae	Drosera	madagascariensis	DC.			LC	Indigenous
Asteraceae	Dimorphotheca	caulescens	Harv.			LC	Indigenous
Fabaceae	Smithia	erubescens	(E.Mey.) Baker f.			LC	Indigenous
Fabaceae	Pearsonia	cajanifolia	(Harv.) Polhill	subsp.	cajanifolia	LC	Indigenous; Endemic
Asteraceae	Haplocarpha	lyrata	Harv.			LC	Indigenous; Endemic
Acanthaceae	Blepharis	innocua	C.B.Clarke			LC	Indigenous; Endemic
Apiaceae	Afrosciadium	magalismontanum	(Sond.) P.J.D.Winter			LC	Indigenous
Asteraceae	Sonchus	dregeanus	DC.			LC	Indigenous
Velloziaceae	Xerophyta	retinervis	Baker			LC	Indigenous
Asteraceae	Ursinia	nana	DC.	subsp.	leptophylla	LC	Indigenous
Asteraceae	Hilliardiella	elaeagnoides	(DC.) Swelank. & J.C.Manning				Indigenous
Hyacinthaceae	Schizocarphus	nervosus	(Burch.) Van der Merwe			LC	Indigenous
Malvaceae	Hermannia	lancifolia	Szyszyl.			LC	Indigenous; Endemic
Cyperaceae	Carex	glomerabilis	V.I.Krecz.			LC	Indigenous
Iridaceae	Afrosolen	sandersonii	(Baker) Goldblatt & J.C.Manning				Indigenous
Hyacinthaceae	Albuca	virens	(Ker Gawl.) J.C.Manning & Goldblatt	subsp.	virens	LC	Indigenous
Fabaceae	Indigofera	egens	N.E.Br.			LC	Indigenous; Endemic
Myrtaceae	Syzygium	cordatum	Hochst. ex C.Krauss				Indigenous
Orchidaceae	Satyrium	trinerve	Lindl.			LC	Indigenous
Commelinaceae	Commelina	africana	L.	var.	africana	LC	Indigenous
Asteraceae	Afroaster	serrulatus	(Harv.) J.C.Manning & Goldblatt			LC	Indigenous
Poaceae	Cenchrus	ciliaris	L.			LC	Indigenous
Cyperaceae	Afroscirpoides	dioeca	(Kunth) Garcia-Madr.				Indigenous
Asphodelaceae	Trachyandra	saltii	(Baker) Oberm.	var.	saltii	LC	Indigenous

Agavaceae	Chlorophytum	calyptrocarpum	(Baker) Kativu			LC	Indigenous
Polygonaceae	Persicaria	lapathifolia	(L.) Delarbre				Not indigenous; Naturalised; Invasive
Ruscaceae	Eriospermum	porphyrovalve	Baker			LC	Indigenous
Asteraceae	Hilliardiella	nudicaulis	(DC.) H.Rob.			LC	Indigenous; Endemic
Lentibulariaceae	Utricularia	livida	E.Mey.			LC	Indigenous
Asteraceae	Senecio	polyodon	DC.	var.	polyodon	LC	Indigenous
Fabaceae	Indigofera	oxalidea	Welw. ex Baker			LC	Indigenous
Potamogetonaceae	Potamogeton	octandrus	Poir.			LC	Indigenous
Apocynaceae	Huernia	loesenerian a	Schltr.			LC	Indigenous
Lamiaceae	Ocimum	obovatum	E.Mey. ex Benth.	subsp.	obovatum	NE	Indigenous
Asphodelaceae	Aloe	ecklonis	Salm-Dyck			LC	Indigenous
Fabaceae	Zornia	linearis	E.Mey.			LC	Indigenous
Brassicaceae	Heliophila	rigidiuscula	Sond.			LC	Indigenous
Pallaviciniaceae	Symphyogyna	brasiliensis	Nees & Mont.				Indigenous
Fabaceae	Tephrosia	capensis	(Jacq.) Pers.	var.	capensis	LC	Indigenous
Orchidaceae	Eulophia	ovalis	Lindl.	var.	ovalis	LC	Indigenous
Hyacinthaceae	Dipcadi	rigidifolium	Baker			LC	Indigenous
Asteraceae	Helichrysum	subglomeratum	Less.			LC	Indigenous
Potamogetonaceae	Potamogeton	pectinatus	L.			LC	Indigenous
Apocynaceae	Asclepias	fallax	(Schltr.) Schltr.			LC	Indigenous; Endemic
Asteraceae	Nidorella	anomala	Steetz			LC	Indigenous
Asteraceae	Senecio	hieracioides	DC.			LC	Indigenous
Brassicaceae	Rorippa	fluviatilis	(E.Mey. ex Sond.) R.A.Dyer	var.	fluviatilis	LC	Indigenous
Solanaceae	Solanum	retroflexum	Dunal			LC	Indigenous
Poaceae	Sporobolus	albicans	(Nees ex Trin.) Nees			LC	Indigenous
Asteraceae	Hilliardiella	hirsuta	(DC.) H.Rob.			LC	Indigenous
Juncaceae	Juncus	dregeanus	Kunth	subsp.	dregeanus	LC	Indigenous
Gentianaceae	Chironia	krebsii	Griseb.			LC	Indigenous