



**PROPOSED MIXED DEVELOPMENT IN THE TOWN OF
KWAMBONAMBI, KWAZULU-NATAL**

TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT REPORT

18th June 2022

Prepared by:



Prepared for:



DECLARATION

I, **Bryan Walter Paul**, declare that -

- I act as the independent specialist in this matter;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- 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 National Environmental Management Act (Act 107 of 1998) (NEMA), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the NEMA Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity; and
- 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 report are true and correct.

Signature of the specialist:

Draft -18/06/2022

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LIST OF ACRONYMS AND ABBREVIATIONS

ADU	ANIMAL DEMOGRAPHY UNIT
CBA	CRITICAL BIODIVERSITY AREA
ECO	ENVIRONMENTAL COMPLIANCE OFFICER
EIA	ENVIRONMENTAL IMPACT ASSESSMENT
EKZNW	EZEMVELO KZN WILDLIFE
ESA	ECOLOGICAL SUPPORT AREA
HA	HECTARE
IUCN	INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE
M	METRE
M²	METRES SQUARED
NEM:BA	NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT
NEMA	NATIONAL ENVIRONMENTAL MANAGEMENT ACT
NFA	NATIONAL FOREST ACT
PAOI	PROJECT AREA OF INFLUENCE
POSA	PLANTS OF SOUTH AFRICA
QDS	QUARTER DEGREE SQUARE
SANBI	SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE
SCC	SPECIES OF CONSERVATION CONCERN
TOPS	NATIONAL LIST OF THREATENED OR PROTECTED SPECIES

INDEMNITY

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SPECIALIST REPORT REQUIREMENTS

Specialist reports are required to be undertaken in line with Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental Authorisation, dated 20 March 2020. The Protocol for the specialist assessment and impacts on terrestrial biodiversity applies.

EXECUTIVE SUMMARY

Afzelia Environmental Consultants (Pty) Ltd was appointed by Mondli Consulting Services (Pty) Ltd to conduct a Terrestrial Biodiversity Impact Assessment for the Proposed Mixed Development located within the town of KwaMbonambi, KwaZulu-Natal (KZN), South Africa. The proposed development will entail the construction of the following key structures:

- *Entertainment Complex;*
- *Retail Outlet;*
- *Parking bays, pavements and road access;*
- *General infrastructure (sewage, security fence, water & electricity);*
- *Motel; and*
- *Fuel Outlet.*

Based on the findings of the Department of Forestry, Fisheries and the Environment (DFFE) Environmental Screening Tool, the entire study area contained a “Low” Terrestrial Ecological Theme, a “High Animal Species Theme and a “Low” Plant Species theme. As such, a full Terrestrial Ecological Impact Assessment commissioned by the Applicant, for submission with the Application for Environmental Authorisation (EA), and Basic Assessment Report (BAR) for consideration.

According to KwaZulu-Natal Biodiversity Spatial Planning Terms and Processes, Version 3.3 (2016) the proposed development falls outside of any Critical Biodiversity Areas (CBA) or Ecological Supports Areas (ESA).

According to the latest Important Bird and Biodiversity Areas dataset, study area does not occur within any Important Bird and Biodiversity Areas, or formally protected areas or Protected Area Expansion Strategy Focus (NPAES).

According to the “Schedule of Threatened Terrestrial Ecosystems in South Africa” (promulgated under NEMBA Government Notice 1002 of 2011) the proposed development falls outside of any Threatened Ecosystems.

The proposed development was found to occur within only one (1) national vegetation types, namely the Maputaland Coastal Belt. According to the National Biodiversity Assessment (Skowno, 2018), this vegetation type is considered to be vulnerable and in need of protection. Based on the outcome of the field assessment, no primary vegetation was found and therefore the clearance of vegetation during the construction phase will not jeopardise the conservation goals that may be associated with this vegetation type.

A terrestrial ecological assessment was conducted by the specialist on the 7th of April 2022. During this assessment the project footprint and Project Area of Influence (PAOI) was walked on foot. This assessment was used to verify the presence or absence of species predicted to occur within the surroundings areas and record any habitat which may occur within the study area. The assessment has been carried out within the recommended season and timing made by South African National Biodiversity Institute (SANBI, 2020) and according to the latest species assessment guidelines set out by SANBI

in 2020.

A preliminary floral assessment was conducted using The South African National Biodiversity Institute's (SANBI) Plants of South Africa (POSA) database of all plants collected and recorded from specific locations throughout South Africa. Consultation of the POSA database revealed that 158 individual species were recorded within the greater surround, with following main families being observed:

- Asteraceae (Daisy Family) – 20 species (3 endemics and 2 Species of Conservation Concern);
- Fabaceae (Pea Family) – 16 species (1 endemic); and
- Poaceae (Grass Family) – 20 species (no endemics).

During the field assessment only one (1) protected species was identified, and would need to be considered during the construction phase of the development. The species in question is known to be protected under the KwaZulu-Natal Conservation Ordinance, a permit application must be submitted to Ezemvelo KZN Wildlife before removing and/ destroying any of these species. In order to prevent further decline of these species, a plant search and rescue process must take place prior to the implementation construction.

According to the records available on Animal Demography Unit (ADU, 2022) and the outcome of the DFFE Online Screening Report, the following species were identified as species, which **may** be found within the study area.

Scientific Name	Common Name	Conservation Status	Likelihood of Occurrence (Low, Medium, High)
Mammals			
<i>Cephalophus natalensis</i>	Natal Red Duiker	NT	Low
Sensitive Species 7	N/A	VU	Low
Herpetofauna			
<i>Hemisis guttatus</i>	Spotted Burrowing Frog	NT	Low
<i>Dendroaspis angusticeps</i>	Green Mamba	VU	Low
<i>Kinixys natalensis</i>	KwaZulu-Natal Hinge-backed Tortoise	VU	Low
Avifauna			
<i>Circaetus fasciolatus</i>	Southern Banded Snake Eagle	CR	Low

Based on the findings of the field assessment no faunal SCC were recorded. It was the opinion of the specialist that the fieldwork conducted on 7 April 2022 sufficiently describe the site, and that no further surveys would be required.

Based on the assessment of the proposed development, all activities are likely to have a medium impact on the receiving environmental prior to the application of mitigation techniques. Of the identified impact, the potential for alien vegetation to proliferate and affect surrounding plant communities have been regarded as the most severe, and should be viewed in a

serious light by the ECO and Applicant.

It is the specialist's opinion therefore that the proposed development should receive a favourable outcome for the Environmental Application lodged with EDTEA, provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the project Life-cycle.

1 INTRODUCTION

1.1 Background and Project Specifications

Afzelia Environmental Consultants (Pty) Ltd was appointed by Mondli Consulting Services (Pty) Ltd to conduct a Terrestrial Biodiversity Impact Assessment for the Proposed Mixed Development located within the town of KwaMbonambi, KwaZulu-Natal (KZN), South Africa. The proposed development will entail the construction of the following key structures:

- Entertainment Complex;
- Retail Outlet;
- Parking bays, pavements and road access;
- General infrastructure (sewage, security fence, water & electricity);
- Motel; and
- Fuel Outlet.

The proposed development is situated within a small town, which is entirely enclosed by timber plantations on all side. Access to the development site will be from the west, along Acacia Road, which is conveniently located, less than 500 metres (m) away from the National Toll Route 2 (N2) to the east. Figure 1 below provides an illustration of the proposed development in relation to the greater surrounds.



Figure 1: Locality map of the study area.

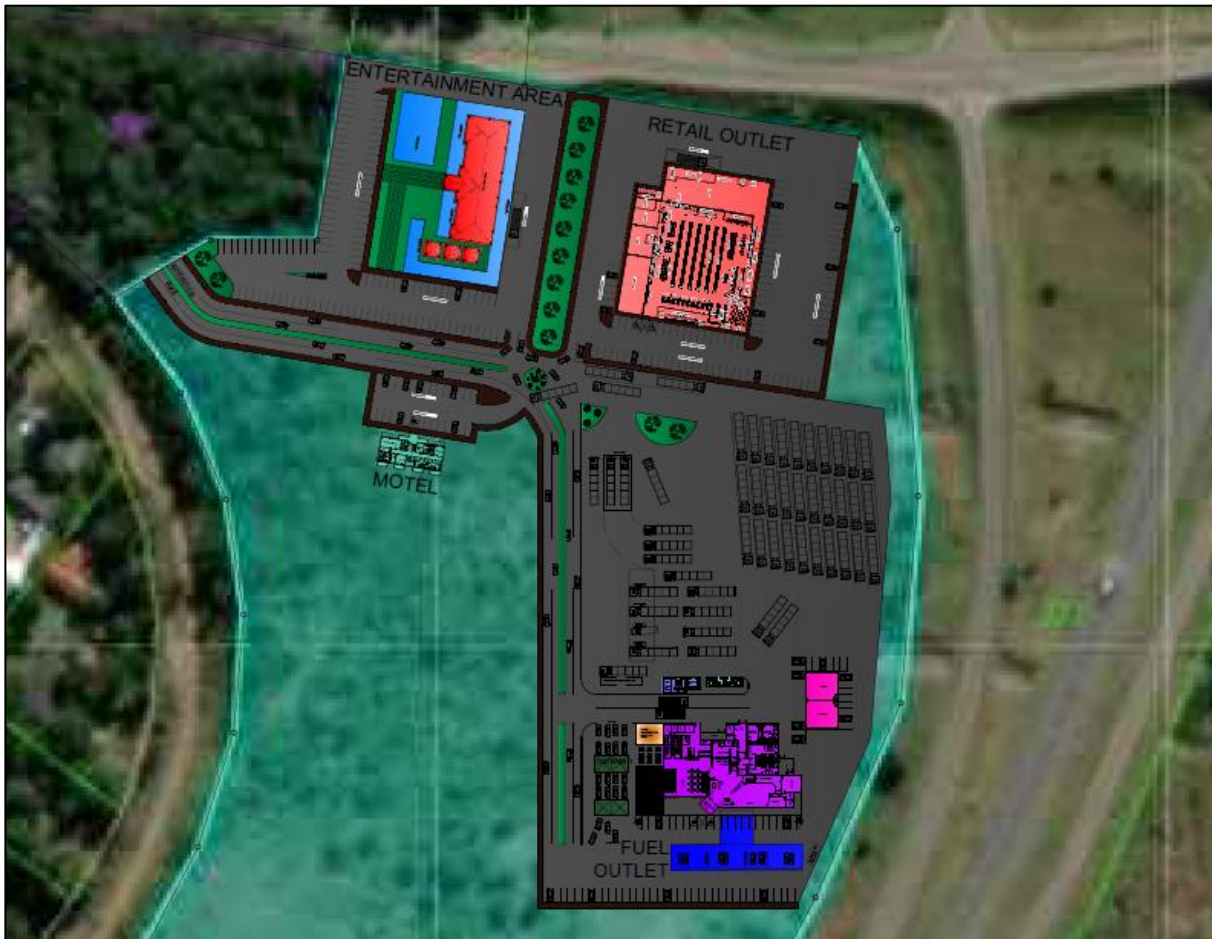


Figure 2: Proposed development plan (December 2021)

1.2 Aim of the Assessment

A terrestrial ecological impact assessment serves to determine the current ecological state of a site, including vegetation and habitats, and then determines the likely impacts of the proposed development on that ecology. In addition, mitigation measures are recommended to reduce negative, and enhance positive impacts. For the purposes of this study, a full ecological assessment has been completed, which identifies potentially sensitive areas as well as any potential fatal flaws that would halt any development.

1.3 Assumptions and Limitations

- A 25m Project Area of Influence (PAOI) has been determined for the nature and scale of this project.
- The fieldwork for this assessment has been conducted between the 7th of April 2022. All fieldwork was conducted during an appropriate “wet season” for the area and where significant rainfall has been experienced throughout the months that preceded the assessment date.
- The vegetation units identified at a desktop level will differ to those observed *in-situ* as the site has historically been used for agricultural purposes, and has recently been cleared.
- Plant species display a range of morphological and physiological attributes that determine their growth, reproduction

and survival. It is therefore unlikely that all plant species identified on site will remain the same over temporal and spatial scales.

- An accurate delineation of the surrounding watercourses was not a part of the specialist's scope, but all nearby potential watercourses have been considered in this assessment in terms of their ecological significance (if applicable).
- Evaluation of the significance of impacts with mitigation takes into account mitigation measures provided in this report and standard mitigation measures included in the project-specific Environmental Management Programme (EMPr).
- To accurately record the species on site, long-term field assessments would have to be conducted to consider seasonal and temporal variations and provide more accuracy. This assessment however, is considered appropriate for the scale and nature of the proposed development.

1.4 Applicable Legislation and Policies

The study was undertaken in accordance with the guidelines provided in the Guidelines Document: EIA Regulations (DEAT, 1998) and the NEMA principles in addition to the legislation provided in Table 1 to provide a holistic framework to guide decision-making on future developments, ensuring the protection and conservation of threatened ecosystems, whilst taking into account the interconnectedness of society and the environment. The following legislation, outlined in Table 1 below, has been deemed applicable to the proposed development.

Table 1: Legislation deemed applicable to the proposed development.

Legislation	Definition
KwaZulu-Natal Nature Conservation Management Amendment Act, 1999 (KZN CMAA; Act No. 5 of 1999).	This act amends the KwaZulu-Natal Nature Conservation Management Act in a wide variety of matters relating to the establishment and powers and functions of the KwaZulu-Natal Nature Conservation Board, the organization of the KwaZulu-Natal Conservation Services, powers of honorary officers, protected area and other aspects such as hunting.
Conservation of Agricultural Resources Act (CARA; Act No. 43 of 1983)	This act provides a legal framework to control the utilization of natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants, and for matters connected therewith.
National Environmental Management: Protected Areas Act (NEMPAA; Act No. 57)	This act provides a list of the protected areas which may fall on, or within close proximity to the proposed development site.

of 2003)	
Threatened or Protected Species Regulations (2015)	These regulations, made under the National Environmental Management Biodiversity Act, 2004, provide for the protection and conservation of threatened species (including marine plants and animals).
National Environmental Management Biodiversity Act (NEM:BA) (No. 10 of 2004 as amended) (DEA, 2004)	<p>This Act seeks to manage and conserve biodiversity within the framework of the National Environmental Management Act, 1998. The developer has a responsibility for limiting the loss of biodiversity and ecosystems by adhering to the following legislation and restricted activities. The following legislation may be consulted throughout the various phases of the proposed development:</p> <ul style="list-style-type: none"> • GNR 324 of Government Gazette No. 37596 of 2014 provides the Amendment to the Threatened or Protected Species Regulations. • GNR 1002 of Government Gazette No. 34809 of 2011, provides a national list of terrestrial ecosystems that are threatened and in need of protection. • GNR 151 of Government Gazette No. 29657 of 2007 and GNR 1187 in Government Gazette 30568 of 2007 provides a list of critically endangered, endangered, vulnerable and protected species. • GNR 988 of Government Gazette No. 41919 of 2018 provides amendments to the alien and invasive species list as well as the critically endangered, endangered, vulnerable and protected species. • GNR 599 of Government Gazette No. 37886 of 2014 and GNR 864 of Government Gazette No. 40166 of 2016 provides a list of invasive and alien plant species • GNR 598 of Government Gazette No. 37885 of 2014 provides the Alien and Invasive Species Regulations. GNR 112 of Government Gazette No. 41445 of 2018 provides the draft alien and invasive species regulations in terms of categories, potential eradication and control techniques and the requirements for the application of permits. • GNR 529 of Government Gazette No. 40889 of 2017 provides the most updated amendments to the Regulations on the Convention of International Trade in Endangered Species (CITES) of wild fauna and flora. • Section 76 of the NEM:BA (No. 10 of 2004) provides guidelines for monitoring, control and eradication plans for species listed as invasive in terms of Section 70 of this Act.
KwaZulu-Natal Nature Conservation Ordinance No. 15 of 1974	This is the relevant statute in KwaZulu-Natal, which aims to manage the removal and destruction of rare and endangered species. Whilst this ordinance is in need of an update, it provides specialists with a basic tool to highlight both protected and specifically protected species which will require permits to relocate.
National Forests Act (NFA) (No. 84 of 1998) (DAFF, 1998)	<p>Section 15(1) of the NFA:</p> <p>No person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Contravention of this declaration is regarded as a first category offence that may result in a person</p>

	who is found guilty being sentenced to a fine or imprisonment for a period up to three years, or to both a fine and imprisonment.
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2 METHODOLOGY

This terrestrial biodiversity impact assessment has been undertaken in line within the “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental Authorisation, dated 20 March 2020”.

According to the findings of the Department of Forestry, Fisheries and the Environment (DFFE) Online Environmental Screening Report the following site sensitivities were applicable for the site:

- Animal Sensitivity – High
- Plant Species Sensitivity – Low
- Terrestrial Biodiversity Sensitivity – Low

A site verification was conducted on 7 April 2022, and it was concluded that a full Terrestrial Biodiversity Impact Assessment Report would be produced for this application and the aforementioned procedures would be followed.

2.1 Desktop Assessment

Available desktop information was assessed to best contextualize the site, and several databases and mapping tools were used. The following is a summary of the desktop information sources used:

- Google Earth imagery was used to determine the current land cover and existing land uses.
- Conservation Planning Tools such as the “List of Ecosystems that are Threatened and in Need of Protection”, Wetlands dataset (NFEPA) and the KwaZulu-Natal Biodiversity Plan were mapped for the study area.
- A list of possible Species of Conservation Concern (SCC) was provided by the POSA list of plant species recorded in the greater study area which is checked against both international, national and provincial lists of SCC species and/ or protected species:
 - The National Red Data List for Amphibians;
 - The National Red Data List for Mammals;
 - The National Red Data List for Avifauna;
 - The Provincial Protected Plant Species List (Nature Conservation Ordinance No. 15 of 1974;
 - National Protected Tree List (Government Gazette Vol. 593, 21 November 2014, No. 38215); and
 - The National Protected Species List or TOPS (R 1187 of 2007).
- The National Vegetation Map developed by Mucina and Rutherford (2018) was consulted to determine the expected vegetation type.
- The Department of Forestry, Fisheries and the Environment (DFFE) Online Environmental Screening Report.

- National Biodiversity Assessment (NBA, 2018) which provides a threat status as well as protection level for the vegetation occurring within the project area (Skowno et al. 2019).
- The South African Protected Areas Database (SAPAD, 2020) and South African Conservation Areas Database (SACAD, 2020).
- The National Protected Area Expansion Strategy (NPAES, 2010).

2.2 Ecological Survey

The specialist conducted a terrestrial ecological assessment on 7 April 2022. This assessment was used to verify the presence or absence of species predicted to occur on the site and record any habitat which may occur within the study area. The assessment has been carried out within the recommended season and timing made by the Species Environmental Assessment Guideline (SANBI, 2020).

The site was first surveyed at a desktop level, using Google Earth imagery and then divided into areas of specific vegetation communities as per stratified random sampling methodology. Each of these vegetation communities were assessed during the field assessment. For sampling of flora and fauna, timed meanders were used until no new species were recorded within each community as guided by rapid assessment best practise. The entire site was accessible on foot, and therefore no access related limitations were recorded.

For the purposes of this study, faunal data collected during the field assessment makes use of opportunistic sightings as well as evidence of faunal activity (where applicable):

- Spoor (tracks);
- Dung;
- Burrows; and
- Alarm and/or breeding calls.

The lack of suitable habitat in conjunction with the absence of animal spoor did not necessitate the need to use passive infrared triggered camera traps on site. The specialist is confident that there will be no limitations or gaps in information by not using this passive monitoring technique.

2.3 Ecological Impact Ratings

The objective of impact assessments is to identify and assess all impacts that may potentially arise as a result of undertaking activities associated with the proposed development. The significance of potential impacts will guide local authorities on whether the activity should commence i.e. be authorised, whether it will be subject to the mitigation measures implemented or if it will be denied given the large irreversible potential impact it will have on the environment.

The significance (quantification) of potential environmental impacts identified during the Ecological Assessment has been

assessed in terms of the following criteria (Guideline Documentation on EIA Regulation, Department of Environmental Affairs and Tourism, 2014). This is the rating scale developed by Afzelia for use in our reports. To determine the significance of impacts identified for a project, there are several parameters that need to be assessed. These include four factors, which, when plugged into a formula, will give a significance score. The following four parameters were assessed:

1. **Duration** - which is the relationship of the impact to temporal scale. This parameter determines the timespan of the impact and can range from very short term (less than a year) to permanent.
2. **Extent** - which is the relationship of the impact to spatial scales. Each impact can be defined as occurring in minor extent (limited to the footprint of very small projects) to International, where an impact has global repercussions (an example could be the destruction of habitat for an IUCN CR listed species).
3. **Magnitude** - which is used to rate the severity of impacts. This is done with and without mitigation, so that the residual impact (with mitigation) can be rated. The Magnitude, although usually rated as negative, can also be positive.
4. **Probability** - which is the likelihood of impacts taking place. These include unlikely impacts (such as the rate of roadkill of frogs, for example) or definite (such as the loss of vegetation within the direct construction footprint of a development).

Each of these aspects is rated according to Table 2 below. Where Duration, Extent and Magnitude are assessed first, followed by Likelihood.

Table 2: Table of Evaluation criteria ranking

Score	Label	Criteria
Duration		
1	Very short term	0 -1 years
2	Short term	2 – 5 years
3	Medium term	5 – 15 years
4	Long term	>15 years
5	Permanent	Permanent
Extent		
1	Minor	Limited to the immediate site of the development
2	Local	Within the general area of the town, or study area, or a defined Area of Impact
3	Regional	Affecting the region, municipality, or province
4	National	Country level
5	International	International level
Magnitude		
0	Negligible	Very small to no effect on the environment
2	Minor	Slight impact on the environment
4	Low	Small impact on the environment
6	Moderate	A moderate impact on the environment
8	High	The impacts on the environment are large
10	Very high	The impacts are extremely high and could constitute a fatal flaw
Probability		
1	Very improbable	Probably will not happen
2	Improbable	Some possibility, but low likelihood

3	Probable	Distinct possibility
4	Highly probable	Most likely
5	Definite	The impact will occur

Once each of these aspects is rated, the overall significance can be scored (based on the score for Effect). The significance is calculated by combining the criteria in the following formula:

$$S = (D+E+M) P$$

S = Significance weighting

D = Duration

E = Extent

M = Magnitude

P = Probability

The explanation for each of the overall significance ratings are presented in Table 3, with the layout of all possible scores and their overall significance presented in Table 4.

Table 3: Significance weighting

Score	Label	Motivation
<10	Negligible	The impact is very small to absent
10-20	Low	Where this impact would not have a direct influence on the decision to develop in the area
20-50	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated
50 -70	High	Where the impact must have an influence on the decision process to develop in the area
>70	Very high	Where the impact may constitute a fatal flaw for the project

Table 4: Possible significance scores based on Effect x Likelihood.

Likelihood	Effect																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Very improbable(1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Improbable (2)	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Probable(3)	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
Highly Probable(4)	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
Definite (5)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Each impact was assessed based on the methodology above, and a table produced, indicating the scores and the overall significance rating both without and with mitigation. Where relevant, mitigation measures are recommended.

2.4 Site Ecological Importance (SEI) – Combined (Flora and Fauna)

SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation / fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience {RR}). The site sensitivity has been assessed according the “Species Environmental Assessment Guidelines” produced in 2020 by SANBI. The habitats and species of conservation concern in the project area were assessed based on their conservation importance, functional integrity and receptor resilience.

The combination of these three criteria produces the rating of SEI and interpretation of mitigation requirements based on the ratings, as expressed in Table 5 below.

Table 5: Description of the sensitivity classes applied to the study area

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

3 DESKTOP ASSESSMENT

3.1 National and Provincial Conservation Planning

Ezemvelo KZN Wildlife’s Systematic Conservation Assessment (SCA) identifies area that varies in terms of conservation importance as identified and mapped under the KwaZulu-Natal (KZN) biodiversity spatial planning terms and processes (EKZNW, 2016). According to this assessment, areas within KZN are subdivided into Planning Units (PUs) of varying spatial scales each associated with biodiversity features (e.g. vegetation types, ecosystems and species of conservation importance etc.).

The SCA classifies area of biodiversity value/ importance using two main categories, namely Critical Biodiversity Area’s (CBA’s) and Ecological Support Areas (ESA’s). CBAs comprise of two subcategories, as described by EKZNW (2016), namely CBA: Irreplaceable and CBA: Optimal. ESA’s other hand are not subdivided, but represent areas that support and sustain the ecological functioning of the CBAs thereby ensuring the persistence and maintenance of biodiversity patterns and ecological processes.

Table 6: Description of the CBA categories, which have been used within this report.

Critical Biodiversity Area Category	Critical Biodiversity Area Category Explanation
CBA: Irreplaceable	Represent the only localities where conservation targets for specific biodiversity features can be met under the current conservation planning scenario. From a conservation perspective, these areas are considered “irreplaceable” in terms of maintaining biodiversity targets and should ideally be avoided.
CBA: Optimal	Represent the best localities that provide critical linkages for CBA: Irreplaceable areas.
Ecological Support Areas (ESAs)	These areas represent portions of the study area which are functional, but are not necessarily regarded as areas which are naturally intact. They are however required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within Critical Biodiversity Areas.

During the desktop assessment and according to Figure 3 below it was confirmed that the study area does not overlap with any of categories listed under the BSP (eKZNW, 2016).



Figure 3: Illustration of the applicable areas of conservational importance found within the study area

According to the National EIA Screening Tool generated for the proposed development (Appendix D) the study area was found to contain the following site sensitivities:

Table 7: Summary of the environmental sensitivities listed within the National Screening Tool Report (DFFE, 2022)

Theme	Sensitivity Rating	Feature	Observed
Animal Species Theme	High	<i>Circaetus fasciolatus</i>	N
	Medium	<i>Kinixys natalensis</i>	N
	Medium	<i>Arytropteris basalis</i>	N
	Medium	<i>Pomatonota dregii</i>	N
	Medium	<i>Doratogonus zuluensis</i>	N
	Medium	<i>Hyperolius pickersgilli</i>	N
	Medium	<i>Deloneura millari millari</i>	N
	Medium	<i>Lolaus diametra natalica</i>	N
	Medium	<i>Teriomima zuluana</i>	N
	Medium	Sensitive species 7	N
Plant Species Theme	Low	Low	Y
Terrestrial Biodiversity Theme	Low	Low	Y

In terms of the Best Practise Reporting guidelines, species listed above which have been referred to as “sensitive species with their unique identifies” have been excluded from this report. The names have been withheld as these species may be prone to illegal harvesting and must be protected.

The National Environmental Management: Biodiversity Act (Act 10 of 2004) lists Threatened or Protected Ecosystems, in one of four categories:

- Critically Endangered (CR);
- Endangered (EN);
- Vulnerable (VU); or
- Protected.

The main purpose of listing Threatened ecosystems is to reduce the rate of ecosystem and species extinction and includes the prevention of further degradation and loss of structure, function and composition of Threatened Ecosystems.

According to the “Schedule of Threatened Terrestrial Ecosystems in South Africa” (promulgated under NEMBA Government Notice 1002 of 2011) and Figure 4 below, the site does not occur within a Threatened Terrestrial Ecosystem.

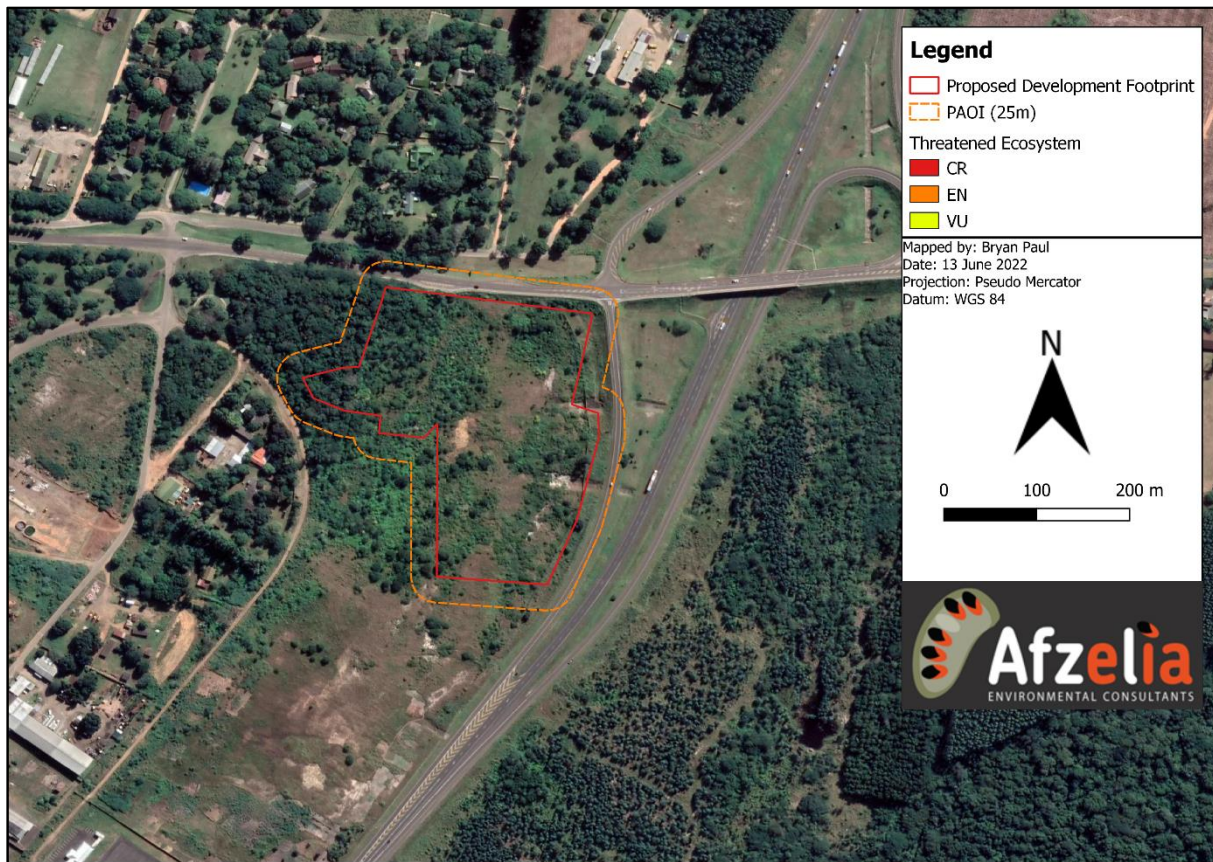


Figure 4: Illustration of the Threatened Ecosystem Status associated within the study area

3.2 Protected Areas and Important Bird and Biodiversity Areas (IBAs)

Important Bird and Biodiversity Areas (IBAs), as defined by BirdLife International, 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 nationally through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria. Essentially, these are the most important sites for conserving.

According to Figure 5 below, it is evident that the study area does not contain any Important Bird and Biodiversity Areas, which must be considered, or assessed further under this application. Further analysis of the Figure 5 also confirms that the site is not located within 10km of a formal protected area, a National Protected Area Expansion Strategy (NPAES) Focus Area or protected areas found within the South Africa Project Area Database.

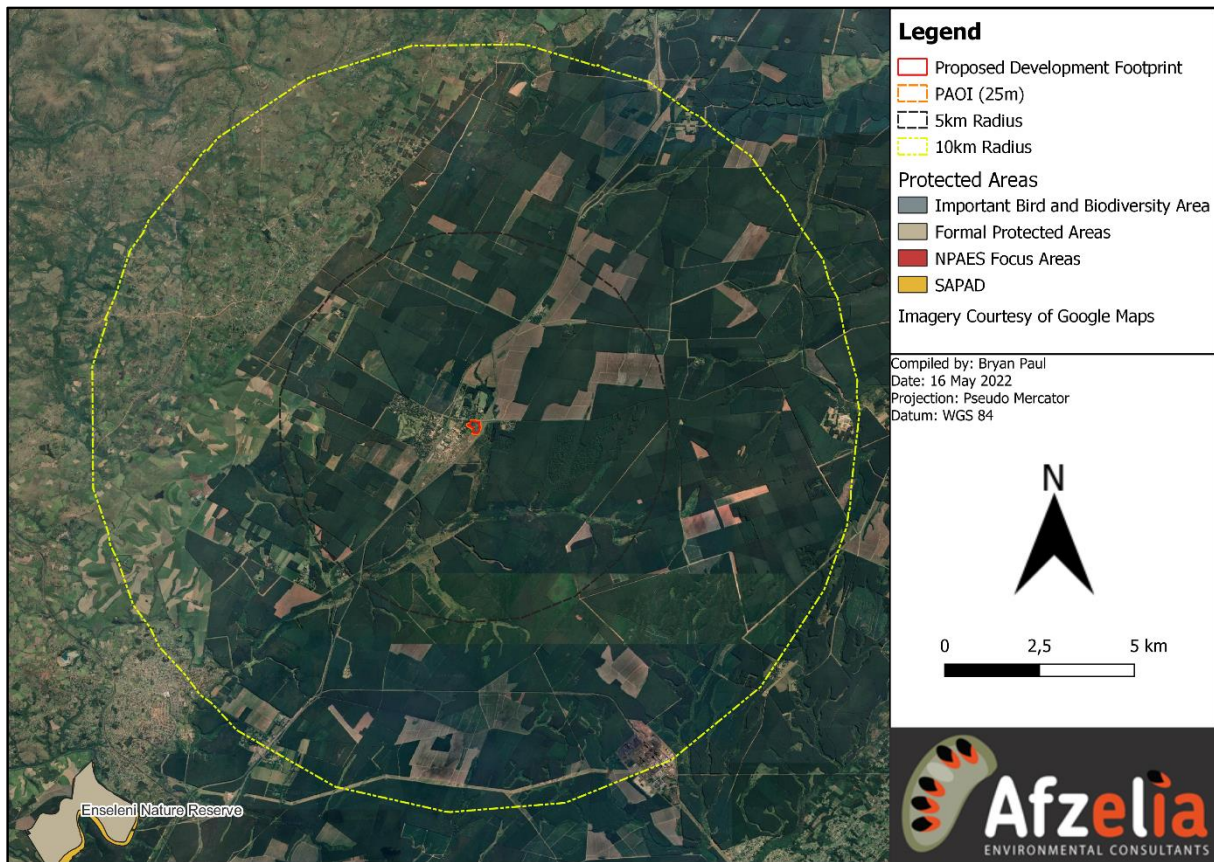


Figure 5: illustration of nationally protected areas within 10 km of study area.

3.3 Vegetation Types

Plant species are often affiliated to specific habitats based on their morphological and physiological traits (Coles-Ritchie et al., 2007). Hence, spatial and temporal variability of habitats is often represented in changes to vegetation. The National Vegetation Map of South Africa (VEGMAP), developed by Mucina and Rutherford (2018), is a geographical classification of plant communities across South Africa that is constantly updated to keep record of changes to the boundaries of vegetation units and their threat status, which is often determined by land use.

According to Figure 6 below, the study area contains only one of the national vegetation types, namely the Maputland Coastal Belt (CB1). In the South Africa, the CB1 vegetation type may be found in a broad strip along the coast of the Indian Ocean, stretching from the Mozambique border in the north to the town of Mtunzini in the south (20m – 120 m altitude). The habitat present within these areas are associated with a flat coastal plain containing pockets of various forest types, thickets, primary and secondary grasslands and extensive commercial plantations and sugar cane fields.

According to Mucina and Rutherford (2011) approximately 15% of this vegetation type has been statutorily conserved in the Greater iSimangaliso Wetland Park (formally the Great St Lucia Wetland Park), as well as in the Silza, Enseleni and Amathikulu Nature reserve, which are located more than 12 to 15 km away from the site boundaries and will remain unaffected by the proposed development activities.

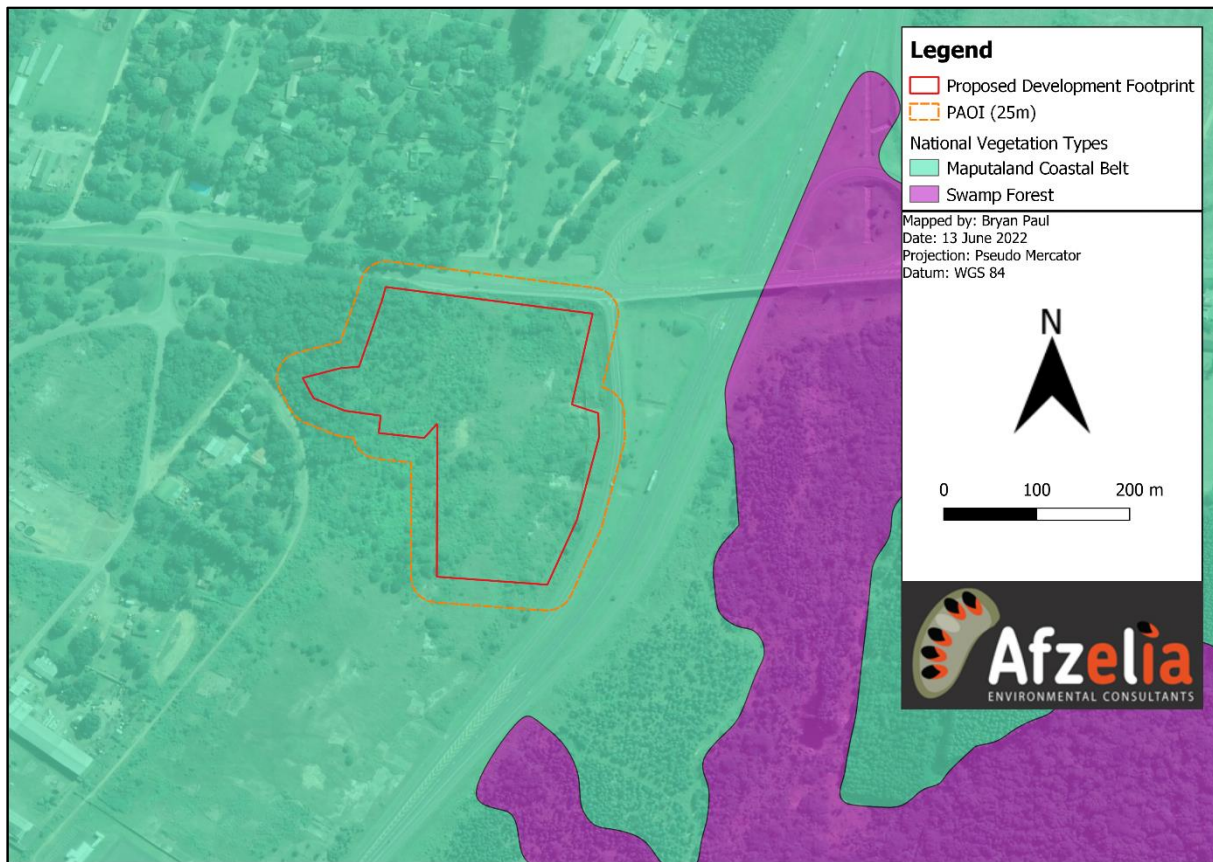


Figure 6: Vegetation types associated with the study area (Mucina and Rutherford, 2018)

The following table provides additional key characteristics of the CB1, which may be used to define this vegetation type.

Table 8: Unique features that define the impacted vegetation type (Mucina & Rutherford, 2011)

Feature	Description
Maputaland Coastal Belt (CB1)	
Climate	Weak rainfall seasonality near the coast tending toward summer rainfall towards the interior. Relatively high precipitation attaining annual values up to 1 200 mm in coastal localities, decreasing rapidly to the interior. High humidity and temperature. Mean maximum and minimum monthly temperature for Lake St Lucia Research Centre are 35.3°C and 5.5°C (for January and June, respectively). No incidence of frost.
Conservation	<ul style="list-style-type: none"> - Endangered (Skowno, 2018) - Endangered as the Maputaland Coastal Belt (Jewitt, 2018). - Moderately Protected (Skowno, 2018)
Important Taxa	<p>Low Shrubs: <i>Agathisanthemum bojeri, Helichrysum kraussii, Tephrosia longipes.</i></p> <p>Small Trees & Tall Shrubs: <i>Syzygium cordatum, Acacia natalitia, Annona senegalensis, Apodytes dimidiata, Bridelia cathartica, Canthium inerme, Chrysanthemoides monilifera subsp. rotundata, Euclea</i></p>

	<p><i>natalensis</i> subsp. <i>natalensis</i>, <i>Ficus burtt-davyi</i>, <i>Kraussia floribunda</i>, <i>Phoenix reclinata</i>, <i>Rhus natalensis</i>, <i>Sclerocroton integerrimum</i>, <i>Strychnos spinosa</i>.</p> <p>Woody Climbers: <i>Abrus precatorius</i> subsp. <i>africanus</i>, <i>Smilax anceps</i>.</p> <p>Herbs: <i>Achyranthes aspera</i>, <i>Centella asiatica</i>, <i>Chamaecrista plumosa</i>, <i>Hermbsstaedtia odorata</i> var. <i>aurantiaca</i>, <i>Vernonia centaureoides</i>, <i>V. oligocephala</i>.</p> <p>Graminoids: <i>Diheteropogon amplexans</i>, <i>Eragrostis sclerantha</i>, <i>Ischaemum fasciculatum</i>, <i>Themeda triandra</i>, <i>Urelytrum agropyroides</i>, <i>Aristida stipitata</i> subsp. <i>gracilliflora</i>, <i>Cymbopogon pospischilii</i>, <i>Elionurus muticus</i>, <i>Eragrostis inamoena</i>, <i>E. lappula</i>, <i>Sporobolus subulatus</i>, <i>Trachypogon spicatus</i>, <i>Trichoneura grandiglumis</i>, <i>Tristachya leucothrix</i>.</p>
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3.4 Biophysical Attributes

3.4.1 Soils, Geology and topography

Soils found within the study area are likely to greyish, sandy soils that are imperfectly drained. The Maputaland Coastal Plain are underlain by a succession of littoral marine deposits related to coastal processes influenced by glacio-eustatis sea-level fluctuations and epeirogenic uplift during the period from the mid Miocene to the Holocene.

At a desktop level, it is clear that the site does not contain any significant geological structures or drainage lines. The site is mostly flat, with areas of increased steepness to the north. The construction of the N2 highly and nearby provincial road should have significantly altered portions of the site, especially in terms of surface runoff, natural habitat and connectivity.

3.4.2 Hydrology

The assessment of hydrology within this report is based on information available at a desktop level, and observation made during the field assessment (mostly from a vegetation perspective). No soil sampling / augering was conducted by the specialist, and the wetland study produced for this application should be consulted for further information on any freshwater ecosystems that may be found within the 500m regulated area.

According to Figure 7 below the study area does not contain any watercourses. However, within the 500m regulated area a large Unchannelled Valley Bottom (UVB) wetland may be found more 100m way from the site boundary, in an easterly direction. During the field assessment, no culvert passing from the site through to the UVB was recorded, and therefore it is unlikely that the proposed development would have any notable impact on the nearby system. All dust and noise related impacts should therefore be monitored during construction, and adequately mitigated throughout the project life-cycle.

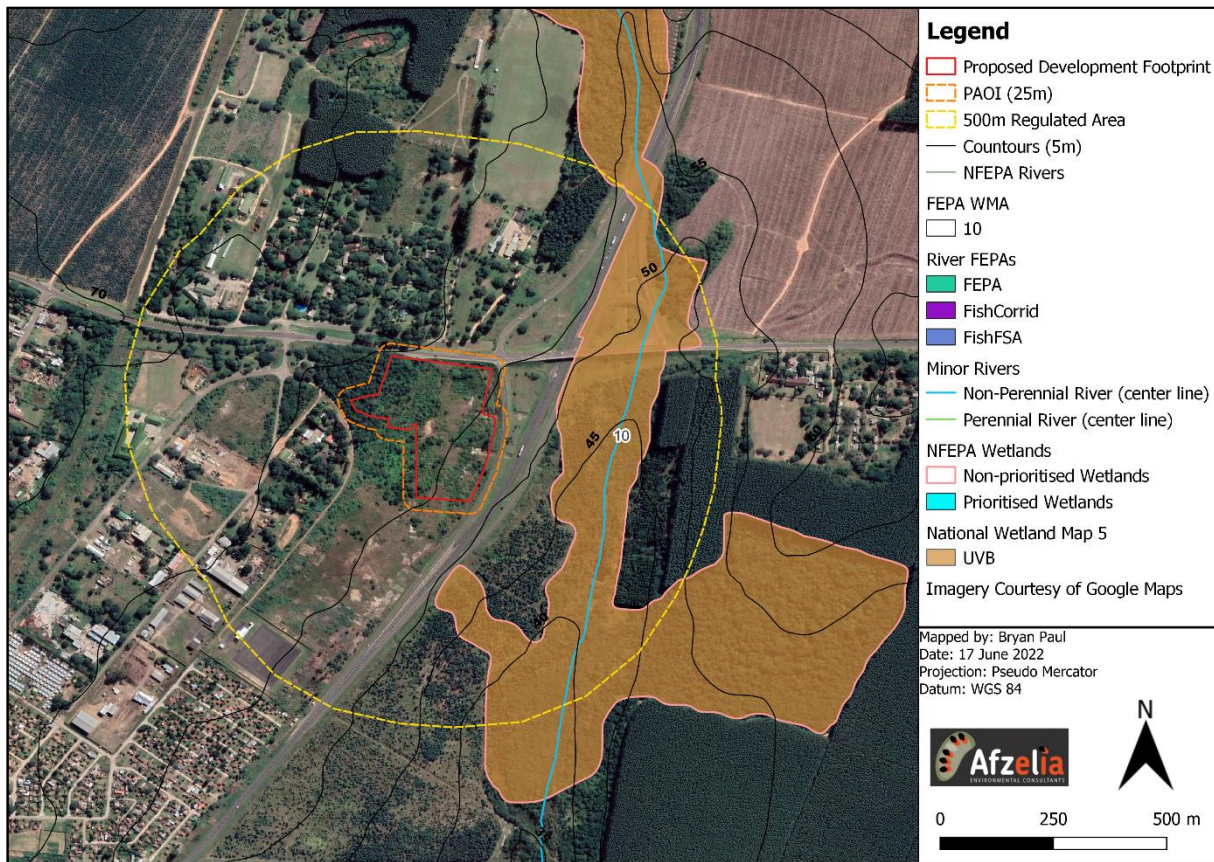


Figure 7: Illustration of the existing hydrological features associated with the proposed development (south)

3.3.3 Land Cover

According to the National Landcover Dataset (DEA, 2020), eight (8) landcover classes may found with greater surrounds of the site.

- Contiguous Low Forest & Thicket;
- Dense Forest and Woodland;
- Contiguous & Dense Planted Forest;
- Temporary Unplanted Forest;
- Natural Grassland;
- Other Bare;
- Residential Formal (Tree); and
- Industrial.

According to Figure 8 below, Natural Grassland and Contiguous & Dense Planted Forest account for the majority of the landcover. The data recorded during the field assessment however, does not fully correlate with the distribution of Contiguous & Dense Plant Forest, which is more representative of disturbed thicket or the mosaic of subsistence cropland (mostly legumes), dense stands of alien vegetation and small patches of secondary grassland, which have now replaced

the distribution of natural grassland within the study area.

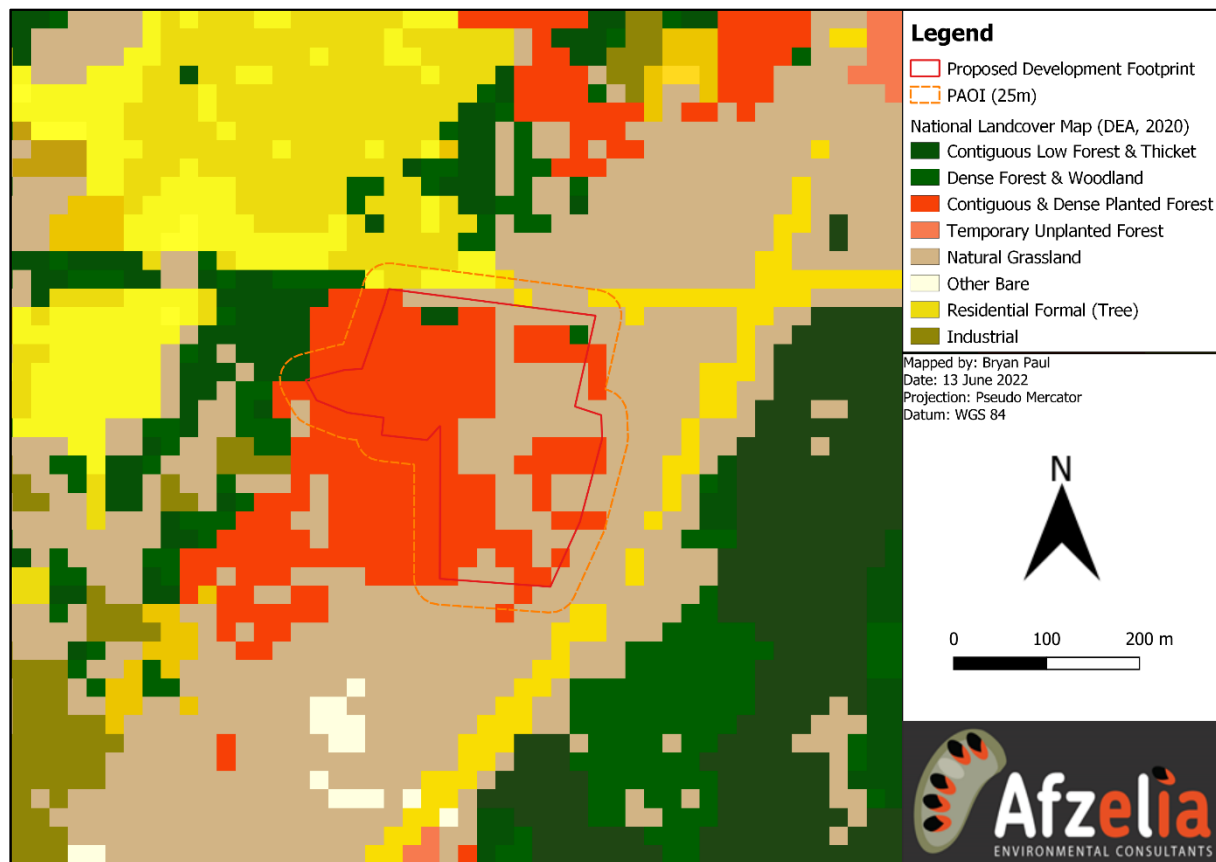


Figure 8: National Landcover Map of the study area (DEA, 2020)

4 RESULT OF THE SITE INVESTIGATION

The field work for this terrestrial ecological impact assessment has been completed in order to comply with the “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes of Sections 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation.

The findings of this study are based on the fieldwork conducted by the specialist on the 7th of April 2022, where the proposed development footprint and Project Area of Influence (25m radius around the footprint) was traversed on foot. The specialist confirms that the assessment was undertaken during an appropriate season, where most plant and faunal species would be observable. Heavy rainfall was experienced in study area prior to, and during the site visit. This further enhanced the probability of observing more cryptic species which may not be found during another season, or time of year. Heavy rainfall experience during the fieldwork did prevent the specialist from using a lens and camera to record faunal species that were observed during the fieldwork. Instead, the species that we observed were recorded in writing.

4.1 Floral Assessment

During the desktop assessment, a plant species list was generated (Appendix A) for the proposed site and nearby surrounds.

This list was generated using the South African National Biodiversity Institute's (SANBI) Plants of South Africa (POSA) database of all plants collected and recorded from specific locations throughout South Africa and contained a total of 158 individual species recorded within the greater surrounds. Figure 9 below provides a visual illustration of the area which was assessed using the POSA species database.

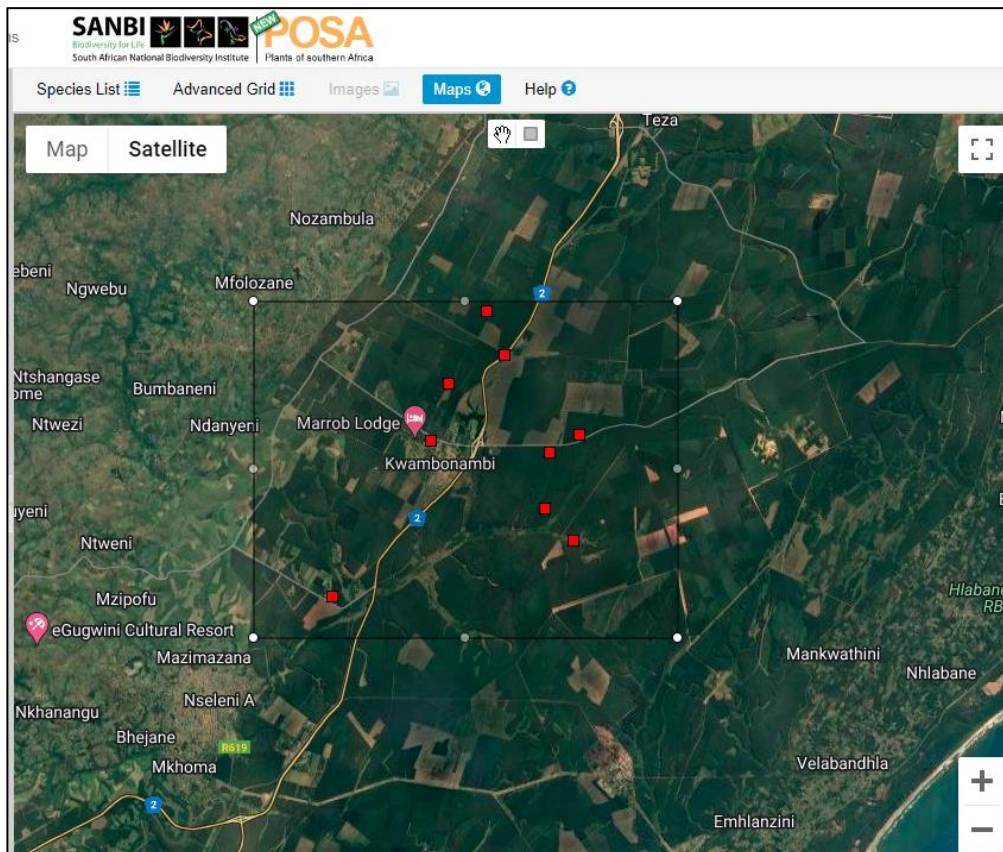


Figure 9: Illustration of the areas included in the POSA species search for the proposed development.

According to the database search, the following plant families were noted to be most prominent:

1. Asteraceae (Daisy Family) – 20 species (3 endemics and 2 Species of Conservation Concern);
2. Fabaceae (Pea Family) – 16 species (1 endemic); and
3. Poaceae (Grass Family) – 20 species (no endemics).

4.2 Habitat Analysis

The site was found to occur within only one (1) national vegetation type, namely the Maputaland Coastal Belt (CB1). This vegetation unit is characterised by a number of habitats namely forest, thicket and grasslands. As a result of the construction of the N2 highway, the establishment of timber plantations nearby and the expansion of the town of Kwambonambi, intact habitat is infrequent and often extremely fragmented. In the context of the site, no primary vegetation was observed, and all habitat consisted of secondary habitat, which either resembles degraded thicket or secondary grassland. Figure 10 below provides a visual illustration of the present-day landcover found within the study area.

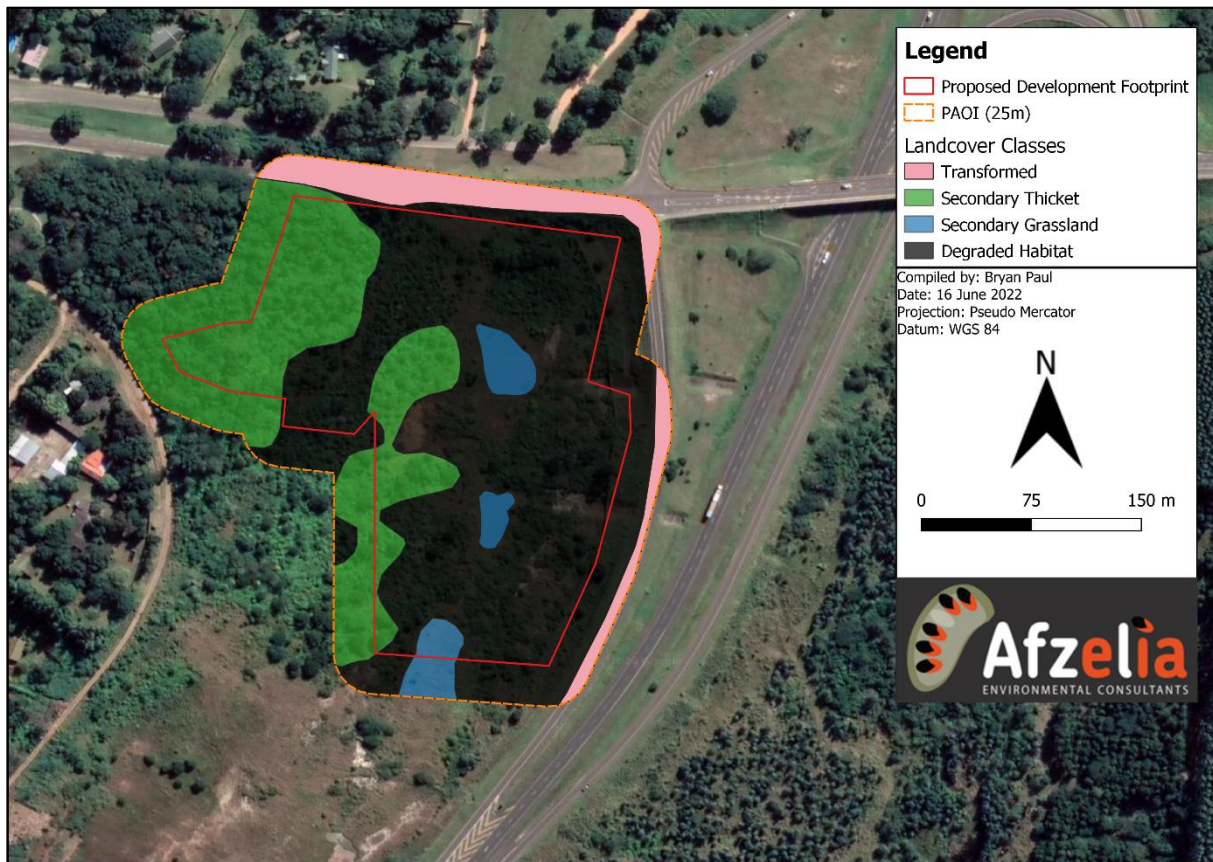


Figure 10: Land cover map of the existing land cover classes identified during the field assessment.

4.2.2 Secondary Grassland

Three (3) distinct patches of secondary grassland were observed along the centre-line of the study area. Smaller patches do also exist between dense stands of alien plant species and cleared open spaces used for subsistence farming, but are not noteworthy. The plant communities found within these areas are dominated by common graminoid species, which form good cover with a moderate basal height.



Figure 11: Illustration of the secondary grassland habitat present within the study area.

Although not all of the grass species were identifiable, species like *Ischaemum fasciculatum*, *Cymbopogon pospischilii*, *Trachypogon spicatus*, *Tristachya leucothrix*, *Melinis repens* and *Imperata cylindrica* were most commonly seen, with patches of *Eragrostis superba* occurring infrequently. The frequent distribution of *Imperata cylindrica* may be an indicator of impounding water, and poor drainage from site as a result of the nearby highway.

4.2.2 Transformed Areas

Transformed areas represent parts of the study area which has little to no remaining habitat, in some areas being completely cleared with no ecological value. Land cover such as roads and bare open ground have been included under this category.

4.2.4 Secondary Thicket

This category refers to portions of the study area which contain a woody plant community component and range from open (consisting mostly of a few well-spaced *Vachellia sp.*) to closed thicket, which consists of a species which would have been planted adjacent to the road surface and after the cessation of growing commercial timber on this property. In Most cases the open thicket is dominated by Alien Invasive Plant Species (AIPS), where indigenous species compete for space, nutrients and access to light. In more closed thicket, the fringe areas are dominated by AIPS, which shifts to natural after 10 to 15m. On the northern most boundary of the site canopy forming trees like *Albizia adianthifolia var. adianthifolia* track an existing stormwater canal found adjacent to the road surface. Where possible, large trees found within this area should be incorporated in to the landscaping of the proposed development to lessen the immediate impact to avifauna, which would benefit from such a species.



Figure 12: Illustration of thicket habitat present within the study area.

4.2.5 Degraded Habitat

Degraded habitat accounts for the largest landcover category illustrated in Figure 10 above. Species composition is representative of disturbed veld, mostly consisting of alien plant species such as *Lantana camara*, *Chromolaena odorata* and *Solanum mauritianum* which form dense, and often impassable stands within the study area. In addition to clumps of alien plants, subsistence farming also takes place within the proposed development footprint, whereby large patches of land

have either been cleared for future sowing, or contain legumes which would be harvest in June. The establishment of these subsistence croplands have resulted in the removal of grassland habitat and would presumably be occupied by alien plant species when not in use.



Figure 13: Example of the degraded habitat present within the study area

4.2 Plant Species of Conservation Concern (SCC)

During the field assessment no rare or endangered species were identified, however, one (1) species protected by the KZN Conservation Ordinance (KZNCO) were observed and will be directly impacted upon by the proposed development.

The following is a list of the protected species observed during the field assessment:

Table 9: Summary of the protected plant species observed during the field assessment

Scientific Name	Conservation Status	Approximate Frequency
<i>Aristea torulosa</i>	LC - KZNCO	<50

As the species included on the list above is often illegally harvested for the horticultural trade, the exact position will not be disclosed in this report and only shared with the appointed Environmental Assessment Practitioner (EAP), Contractor and Environmental Compliance Officer (ECO).

4.3 Ecological Drivers and Ecological Connectivity

Habitat loss may lead to the fragmentation of habitat, which will have an impact on the ability of habitat to support faunal species and promote ecological connectivity within the greater study area. As such, the fieldwork and desktop assessment was not restricted to the project footprint, PAOI and extended into the great surrounds to better understand the functioning of the habitat present on site. The field data confirmed that proposed development will take place within habitat which has already been subjected to similar activities which are proposed under this application, such as the movement of vehicle nearby, dust creation, noise, vibrations, clearing of vegetation and the proliferation of alien vegetation. The proposed construction activities will take place within a site which does not contain primary vegetation, representative of the benchmark vegetation

types described by Mucina and Rutherford (2006). Site specific landuses, and those which take place on nearby properties have already limited the sites ecological connectivity, and natural drivers. However, in saying this the site will still function as habitat for a number of faunal species, and does contain a moderate diversity of flora (however common). The following ecological drivers are expected to still occur within parts of the study area:

- Grazing (livestock);
- Seed dispersal;
- Animal-plant interactions; and
- Occasion application of fire.

The establishment of the proposed development will have a low impact of the drivers above, but are expected to have a site-specific impacts, without compromising surrounding habitat.

In terms of ecological connectivity, the site is situated within area surrounded by man-made structures and barriers which make it difficult for ground bound animal (specifically antelope) to make use of the site. Therefore, faunal activity is likely to consist mostly of bird species and limited reptile species in search of pray like small rodents and birds. Therefore the construction of the mixed use development would have a limited impact on the current animal communities, such as reduced forage grounds and refuge. All of which are found on the portion of the property that will not be developed, and further north where more lush and diverse habitat may be found.

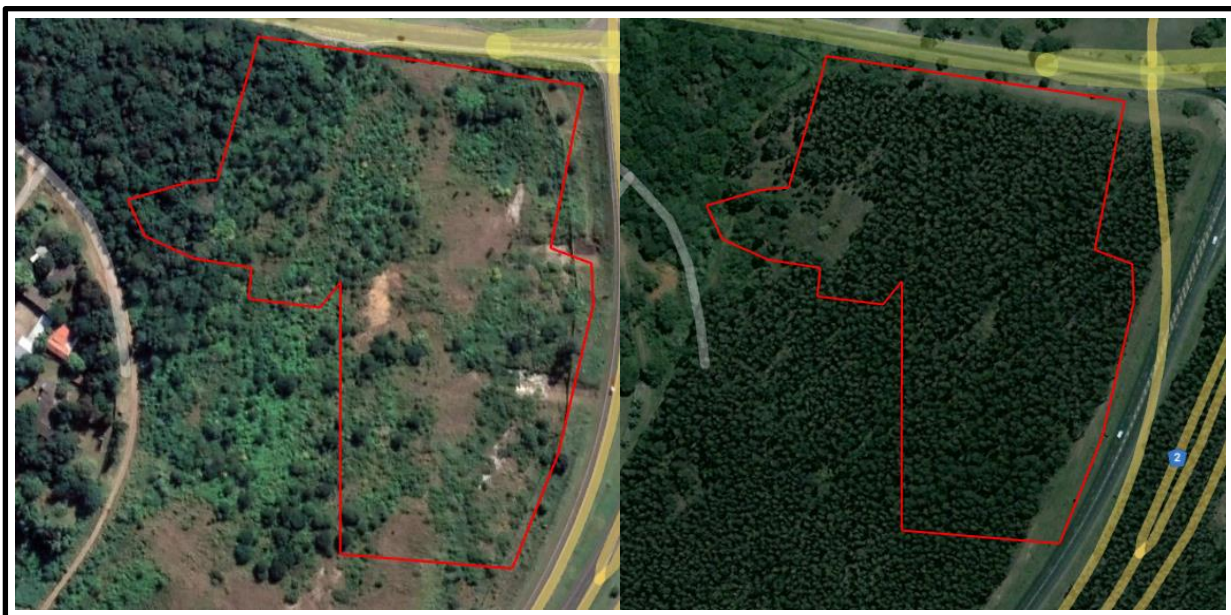


Figure 14: Historic imagery extracted from Google Earth demonstrating the landcover changes over the past 18 years.

As demonstrated in the historical imagery above (between 2004 and 2021), the proposed development footprint has undergone significant landcover and landuse changes. Prior to the end of 2006, the site was exclusively used for the production of commercial timber. At the end of 2006 the trees were felled and the property exploited for soil and used as a

laydown area during the construction of the nearby interchanged. Since 2012 the site was left untouched, and through natural succession has resulted in the plant communities observed today.

4.4 Faunal Species Assessment

An understanding of species abundance, distribution and occurrence is highly valued when considering the implementation of conservation strategies. This knowledge is fundamentally linked to planning land-uses and ensuring sustainable developments within South Africa. In this report, the assessment of the available micro-habitats will be conducted in conjunction with the most recent faunal species distribution data. Whilst the objectives of this report focus specifically on Red Data Species, it must be noted that non-red data species will also be affected by the development and thus will benefit greatly from the mitigation techniques mentioned in this report.

4.4.1 Mammals

According to the records found on the Animal Demography Unit (2022) database for 2832CA, a total of 22 species have been recorded within this quadrant. Of these species recorded, only two (2) Species of Conservation Concern (SCC) have been recorded and summarised within Table 10 below.

Table 10: Red List mammal species recorded within each of the QDS associated with the study area.

Scientific Name and Common Name	Conservation Status (IUCN & TOPS)	Likelihood of Occurrence (Low, Medium High)	Preferred Habitat and Findings
<i>Cephalophus natalensis</i> (Natal Red Duiker)	NT	Low	Across their range, Natal Red Duikers occur within indigenous forests and dense thickets, including coastal, riverine, swamp and montane slope forests and forest clumps, as well as wooded ravines (Bowland 1997; Skinner & Chimimba 2005). They have been recorded at elevations of up to 200 m asl (Rowe-Rowe 1994). Natal Red Duikers occasionally wander into more open grasslands to forage, but will immediately return to the shelter of forested regions at any sign of disturbance (Bowland 1997).
Sensitive Species 7 (N/A)	VU	Low	N/A – Site does not contain suitable habitat.

4.4.2 Herpetofauna

The study area was assessed using an active searching technique whereby suitable habitat such as crevices, rocks or

boulders, holes in trees and river beds were inspected for herpetofauna. During the fieldwork, no herpetofaunal species were observed.

Based on the information extracted from the Animal Demography Unit (ADU, 2022) the study area is expected to have a moderately high herpetofauna diversity with approximately 70 individual species known to occur within the QDS 2832CA. Of the recorded species recorded however, only three (3) are SCC.

Table 11: Red List herpetofaunal species recorded within each of the QDS associated with the study area.

Scientific Name and Common Name	Conservation Status (IUCN & TOPS)	Likelihood of Occurrence (Low, Medium High)	Preferred Habitat and Findings
<i>Hemius guttatus</i> (Spotted Burrowing Frog)	NT	Low	It inhabits grassland and savanna. It breeds in seasonal pans, swampy areas, and in pools near rivers. It nests in burrows in wet soil close to temporary water, and tadpoles move to water to develop (SANBI, 2022).
<i>Dendroaspis angusticeps</i> (Green Mamba)	VU	Low	Strictly arboreal and restricted to forest, occurring from sea level to 200 m (Bates et al. 2014).
<i>Kinixys natalensis</i> (KwaZulu-Natal Hinge-backed Tortoise)	VU	Low	<i>Kinixys natalensis</i> prefers dry rocky habitat in thornveld, valley bushveld, dry thicket or bushveld savanna at elevations between 50 and 1,200 m and is generally absent from coastal regions, deep sand and forest (Boycott and Bourquin 2000, Bourquin 2004, Branch 2008, Boycott 2014).

Based on the assessment of the present habitat occurring within the confines of the study area, it was found that none of the species listed above would be directly impacted upon by the proposed development. A rapid sweep of dense foliage is still recommended however, to address the possibility of more common species being impacted by clearing activities on site during the construction phases. Most species will be able to vacate the footprint, and occupy more suitable habitat that is available on either site of the site.

4.4.3 Avifauna

A baseline avifauna assessment was conducted within the proposed development footprint, PAOI and nearby habitat. A desktop assessment, in combination with a mixed survey approach (vantage point, driven transect & walked transect) was used by the species to assess the presence or absence of certain species recorded nearby. During the fieldwork, no bird SCC were observed and all species recorded were common species that are frequently observed throughout KwaZulu-Natal.

The latest avifauna data was also consulted for this assessment (ADU, 2022). It revealed that a total of 133 bird species have been recorded within the locus 2835_3205. Of these species, only one (1) was listed as a bird SCC which may occur nearby. Table 12 below provides a summary of this species conservation status and known habitat.

Table 12: Red List bird species likely to occur within the study area

Scientific Name and Common Name	Conservation Status (IUCN & TOPS)	Likelihood of Occurrence (Low, Medium High)	Preferred Habitat and Findings
<i>Circaetus fasciolatus</i> (Southern Banded Snake Eagle)	CR	Low	The Southern Banded Snake Eagle occur in coastal lowlands below 500 masl with a preference for Sand Forest thickets, lowland Coastal Dune Forest margins interspersed with clearings and coastal grasslands. It has been known to make use of exotic plantations. It is a resident species but immature birds appear to wander in search of breeding territories (Chittenden 2005).

The proximity of the site to the iSimangaliso Wetland Park may enhance the chances of fly-overs by this species, but as the site lacks suitable forest thicket and is largely disturbed, the likelihood of this species occurring within the confines of this site is low. Clearance of habitat within the proposed development footprint should not affect the availability of food for this, *Circaetus fasciolatus* or potential nesting opportunities, which occur in abundance elsewhere, and are more suitable outside of the study area.

For all of the animal themes listed above, the careful implementation of mitigation coupled with the avoidance of sensitive areas (most of which have been regarded as no-go area) will ensure that the project is executed in a sustainable manner.

5 SITE ECOLOGICAL IMPORTANCE AND SENSITIVITY

Vegetation has been used as a common biological indicator to identify the Present Ecological State (PES) or ecological health of ecosystems, given their overall ability to respond rapidly to disturbance. Conservative plant species are the most commonly affected species given their high conservatism status, high sensitivity, narrow distribution ranges and low tolerance to disturbance, these species are the first to be eradicated in disturbed conditions (Rocchio, 2007). The following table (Table 11) provides a summary of the Site Ecological Importance (SEI), which was assessed using the latest assessment methodology prescribed by SANBI (20220).

Table 13: Summary of the Site Ecological Importance (SEI) assessment

Habitat	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience (RR)	Site Ecological Importance (SEI)
Secondary Grassland	Medium	High	Medium	Medium	Medium
Secondary Thicket	Medium	High	Medium	Medium	Medium
Degraded Habitat	Medium	Low	Medium	High	Low
Transformed	Medium	Low	Low	High	Very Low

The following sensitivity map (Figures 15) has been produced using the outcome of the impact assessment provided in Table 13 above.

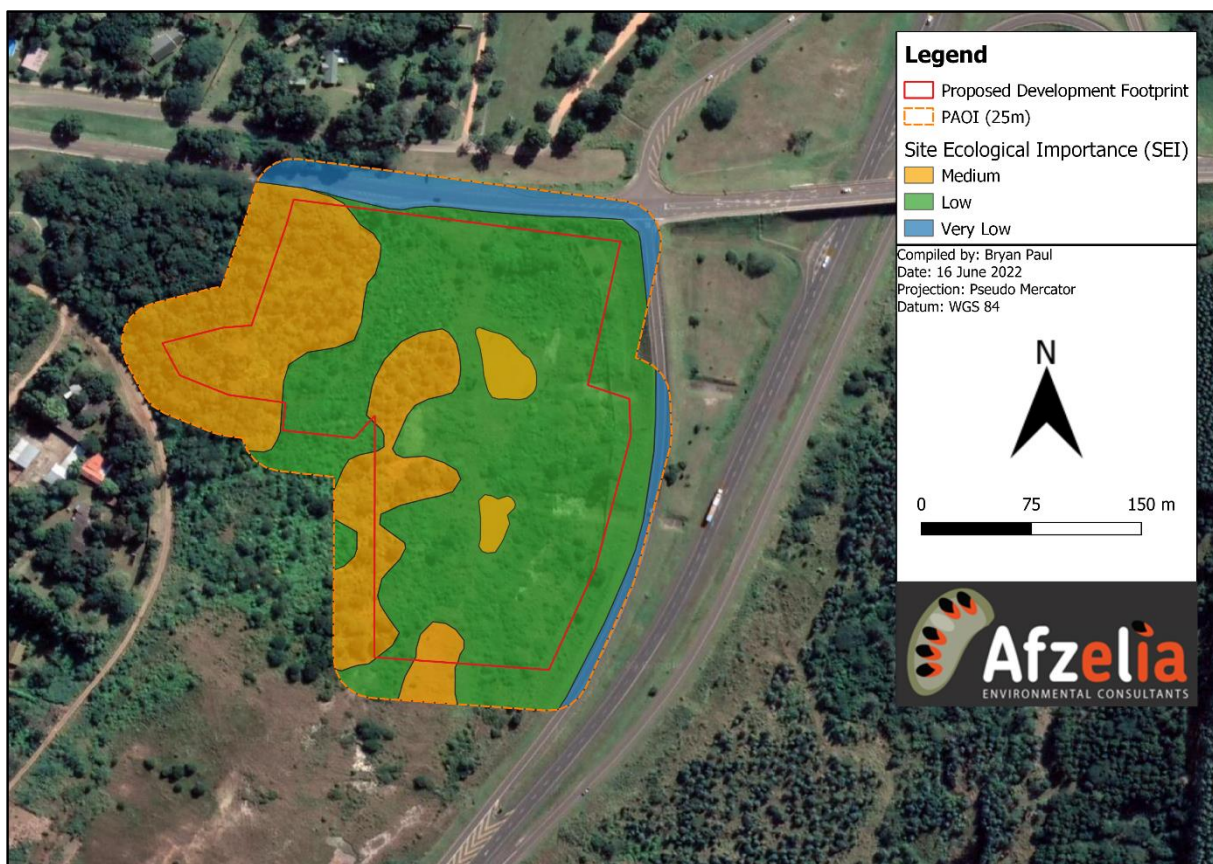


Figure 15: Site Ecological Importance (SEI) for the study area

6 Potential Impact of the Proposed Development

6.1 Impacts Likely to Arise from the Proposed Development

Ecosystems are naturally dynamic and subject to long-term stresses and changes to their nutrient, water and sediment supply. The way in which ecosystems respond to such perturbations is complex and variable, depending on the resilience and nature of these systems. According to Walker and Salt (2006), resilience is defined as the ability of a system to retain

and maintain its essential structure, function, and feedbacks in the face of disturbance. Increased resilience of a system will reduce the likelihood of regime shifts which entails large, abrupt changes to the structure and function of systems, causing a shift from one stable state to another. Connected systems enable the dispersal of genes, individuals and communities of plant species, which enables high diversity within ecosystems (Evidentiary, 2015). Fragmented ecosystems, which are often the result of road networks, expansion of towns and the exchange of habitat for agriculture, hinder movement of plant species and should disturbance take place, i.e. IAPS encroachment, plant species become out competed, particularly conservative species that have low resilience or tolerance to disturbances (Evidentiary, 2015).

The potential impacts associated with the proposed development were assessed using a quantitative impact assessment methodology which has been formalised to comply with Regulation 31(2)(l) of the NEMA (No. 107 of 1998). The aim of this assessment was to identify and assess the significance of all the potential impacts which may arise as a result of the proposed development. The methodology employed makes use of the following procedure:

1. Identification and assessment of potential impacts;
2. Prediction of the nature, duration, extent, likelihood and significance;
3. Identification of mitigation measures that could be implemented to reduce the significance of the potential impact; and
4. Evaluation of the significance of the potential impacts following the implementation of mitigation measures.

The significance is determined through a synthesis of the characteristics described above. The significance weightings for each potential impact are outlined in methodology section, in Table 1 above. Tables 14 to 18 below provides the potential impacts of the proposed development and the likely significance of impacts before and after the implementation mitigation measures.

6.1.1. Impact 1: Loss of Vegetation Communities

The proposed development footprint is situated within an area, which has undergone significant landcover changes over the past two decades. These changes have result in the shift from commercial timber to land, which has remained fallow and unused. Parts of the study area have formed secondary thicket and grassland, whilst other sections are now dominated by ruderal species, which form dense and often impassable stands. Clearing activities proposed in the initial state of the development will result in low-moderate impact on the existing plant communities, which have little ecological significance.

The careful application of mitigation techniques and the **meaningful** application of rehabilitation, landscaping and alien invasive plant species clearing will ensure that the losses are significantly reduced and that the proposed development will not result in a “net-loss in biodiversity”.

Table 14: Impact Assessment for the loss of vegetation communities within the study area

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Without mitigation	Direct	2	2	4	4	32	Medium -
With mitigation	Direct	1	2	2	3	15	Low -

6.1.2. Impact 2: Loss of Plant Species of Conservation Concern (SCC)

During the field, assessment one (1) protected plant species was found within the study area. It is highly likely that the initiate clearing activities will directly impact more 50 individual plants, and which will be permanently lost without intervention during the construction phase of the development. As this species has a conservation status of “least concern”, and is not of real conservation significant layout amendment are not recommended but rather that a search and rescue operation is conducted prior to the construction phase of the development. A specialist should conduct a walk-through prior to construction (during any appropriate season) to ensure that the precise location and accurate number of impact species are identified, marked and relocated outside of the impact zone of the development.

Table 15: Impact Assessment for the loss of plant SCC within the study area

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Without mitigation	Direct and Indirect	2	2	4	5	40	Medium -
With mitigation	Direct and Indirect	1	1	2	3	12	Low -

6.1.3. Impact 3: Loss of Faunal Species of Conservation Concern (SCC)

Based on the findings of the Environmental Screening Report (DFFE, 2022) and the desktop assessment conducted by the specialist, the proposed development footprint may house a number of faunal SCC either permanently or only seasonally. The field assessment confirmed that the proposed development would not affect any unique or important habitat associated with any of the SCC listed within report. The careful application of mitigation techniques are therefore sufficient enough address the impacts associated with the proposed development.

Table 16: Impact Assessment for the loss of faunal SCC

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Without mitigation	Direct and Indirect	2	2	8	4	48	Medium -

With mitigation	Direct and Indirect	1	2	2	3	15	Low -
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6.1.4. Impact 4: Fragmentation, Loss of Ecosystem Function and Edge Effects

During the field assessment, it was confirmed that the study area is already associated with moderate to high levels of fragmentation, which have led to limitations in ecological connectivity. To the east and north, the N2 and main provincial roadways limit movement of fauna from outlying areas. Although less limiting, residential area located to the south and west will significantly limit connectivity for medium to large mammals, which are likely to be absent from the study area altogether. No notable movement corridors existing within the development footprint, and the current arrangement of the site infrastructure proposed within the development plan should not impact the movement of species (common and rare) through the study area.

Controlling both the direct and indirect impacts of the proposed development will be key in ensuring the sustainability of this development. Edge effects whilst unavoidable should be carefully controlled by applying mitigation techniques early, and loss of ecosystem function should be controlled by careful monitoring and avoidance of any activities from taking place outside of the proposed development footprint.

Table 17: Impact Assessment for the likely fragmentation and edge effects within the study area

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Without mitigation	Direct and Indirect	2	3	4	3	27	Medium -
With mitigation	Direct and Indirect	1	2	2	2	10	Low -

6.1.5. Impact 5: Invasion of Alien Invasive Plant Species (AIPS)

During the field assessment, Alien Invasive Plant Species (AIPS) were found to be common, and in cases the dominant landcover. Executing construction activities within the study area will rapidly encourage the growth of AIPS and noxious weeds. If the appointed Contractor does not implement control AIPS control measures at the onset of construction, these species will begin to proliferate and influence areas outside of the footprint.

The systematic application of an AIPS control programme is regarded as a sufficient tool for dealing with the threat of IAPS. An ECO should be appointed to monitor the application of this plan throughout the construction phase, and until the defects liability period.

Table 18: Impact Assessment for the invasion of alien plant species

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Without mitigation	Direct and Indirect	2	4	6	4	48	Medium -
With mitigation	Direct and Indirect	1	2	2	3	15	Low -

6.2 Recommended Mitigation Technique and Management Outcomes

The following is a summary of the recommended mitigation techniques and the management outcomes for each to be included within the site specific Environmental Management Programme (EMPr).

Table 19: Mitigation Measures and Management Outcomes

Management Outcomes: Loss of Vegetation Communities			
Management Action	Responsible Party	Phase	Monitoring Frequency
The construction and operational footprint of the development must not extend past the footprint demonstrated within the proposed development plan. All construction laydown areas should be placed within existing disturbed areas and not within any sensitive habitat located nearby.	Applicant and Contractor	Construction and Operational Phases	Ongoing
All access to the proposed development must be limited to existing access roads and pathways where possible. No adhoc roadways should be permitted, without first being authorised by the ECO and the CA.	Applicant and Contractor	Pre-construction Phase and Construction	Ongoing
Management Outcomes: Loss of Plant Species of Conservation Concern (SCC)			
No plant species (SCC or common) should be harvested or removed from site without approval from the ECO or Applicant in writing.	Contractor / Applicant / ECO	All phases	Ongoing
If any protected plant species are found within the construction footprint, permits (Ezemvelo KZN Wildlife) must be received before construction commences on site.	Applicant	Pre-construction	Once
If any protected species die during the translocation process, specimen loss must be offset at a ratio of 1:3.	Contractor / Applicant / ECO	All phases	Ongoing
Management Outcomes: Loss of Faunal Species of Conservation Concern (SCC)			
No killing of fauna must be tolerated.	Contractor / Applicant /	All phases	Ongoing

	ECO		
<p>Environmental awareness training must be conducted by the ECO before any new staff commence with work on site. This must include the adequate identification of the following species:</p> <ul style="list-style-type: none"> • <i>Circaetus fasciolatus</i>; • <i>Kinixys natalensis</i>; • <i>Doratogonus zuluensis</i> (when clearing secondary thicket habitat); and • <i>Sensitive species 7</i> <p>Any recorded sightings of these species must immediately be reported to the ECO immediately (especially if breeding or nesting nearby). Any nesting activities recorded within the development footprint must result in the immediate cessation of construction activities until instructed to commence again by the ECO and when safe to do so again.</p> <p>Any recorded mortalities of the aforementioned species should be report to the CA and construction should be halted pending an investigation.</p>	ECO	Construction	Ongoing
Any excavations or holes must be checked regularly for fauna that may have either occupied the area or may fallen in accidentally. The design of deep excavations should consider nearby fauna (especially reptiles).	Contractor	Construction	Ongoing
Construction should not take place during the evening and should be restricted between 07h00 and 16h30.	Contractor	Construction	Ongoing
Any lighting must not point outwards toward any natural habitat and should be focus downwards or towards the development.	Contractor	All Phases	Ongoing
Management Outcomes: Fragmentation, Loss of Ecosystem Function and Edge Effects			
All areas outside of the development footprint must be regarded as no-go area.	Applicant and Contractor	Pre-construction	Once
The proposed development footprint must be	ContractorB2NMG	Construction	Ongoing

kept as small as possible and ensure that all non-operational areas are rehabilitate to a suitable condition.			
Rehabilitation must extend into the PAOI and not only the proposed development footprint.	Contractor	Construction	Ongoing
Management Outcomes: Invasion of Alien Plant Species			
An Alien Invasive Plant Species Control Plan must be developed by the Contractor and include both construction and operational phase requirements.	Applicant	Construction and Operational Phases	Once (improvement ongoing)
No dumping of cleared alien vegetation must be allowed on site. All cleared material must be appropriately disposed of at a registered landfill.	Contractor	Construction and Operational Phases	Ongoing
Alien invasive plant control regimes must include the entire site and PAOI.	Applicant / Developer	Construction and Operation Phases	According to Rehabilitation Plan

7 CONDITIONS TO BE INCLUDED IN THE ENVIRONMENTAL AUTHORISATION

- Any animal fatalities (intentional or accidental) must be reported to the ECO and an incident report compiled.
- Stormwater control measures must be put in place by the Contractor to prevent sediment from smothering nearby vegetation outside of the development footprint.
- An ECO must be appointed during both the pre-construction and construction phase to ensure that the conditions of the Environmental Authorisation are sufficiently complied with.
- The appointed Contractor responsible for completing the development must be legally responsible for complying with the approved EMPr and EA.
- The Contractor must include environmental topics within the toolbox talks at least once a month, and should be made aware of the protected plant and faunal species located nearby.
- A consolidated Alien Plant Species Plan, Rehabilitation Plan and Landscaping Plan should be compiled to assist both the Contractor and Applicant in ensuring that no residual impacts take place, and that the positive impacts of the development are enhanced throughout the project Life-cycle.
- All natural habitat found outside the development footprint must remain untouched, and listed as a no-go area, unless for management and maintenance purposes (e.g. IAPS control).
- No construction activities should take place during the evening.
- The Applicant should carefully manage herbicide usage for Alien Plant Species control. The Contractor appointed for this process must take into consideration wind direction and speeds to avoid impact areas outside of the development footprint.

8 CONCLUSION AND IMPACT STATEMENT

A site verification and field assessment were conducted concurrently on the 7th of April 2022. During this assessment, the approach was refined using the latest species assessment guidelines compiled by SANBI (2020) and each theme (Plant Species, Animal and Terrestrial Biodiversity Theme) was reported on in this report.

Based on these findings of the field assessment, no faunal Species of Conservation Concern (SCC) were observed. It was also confirmed that the proposed development should not cause any permanent harm to, or jeopardise any SCC populations, which may occur nearby. The site in its current state was found to be highly transformed, offering limited ecological resources, whilst also being highly constrained in terms of ecological connectivity.

The fieldwork did reveal however, that one (1) protected species occurs throughout the property and although this species is common to this area, it is still protected under the provincial conservation ordinance. Permit applications must be submitted by the Applicant at least three (3) month prior to construction to legalise the safe removal and translocation of each individual plant to suitable habitat found outside of the development footprint, or PAOI.

Based on the assessment of the proposed development, all activities are likely to have a medium impact on the receiving environmental prior to the application of mitigation techniques. Of the identified impact, the potential for alien vegetation to proliferate and impact surrounding plant communities has been regarded as the most severe, and should be viewed in a serious light by the ECO and Applicant. However, as the application of mitigation techniques sufficient address the negative impact anticipated for this development, there will be a “no net-loss in biodiversity” scenario which is supported by the application of a consolidated Alien Invasive Plant Species (AIPS) Plan, Rehabilitation Plan and Landscaping Plan throughout the project Life-cycle.

It is the specialist's opinion therefore that the proposed development should receive a favourable outcome for the Environmental Application lodged with the Competent Authority (CA), provided that the conditions and mitigation techniques set out in this report are carefully implemented by the Applicant throughout the project Life-cycle.

The specialist sees the no-go alternative in a negative light, as the current property on which the development has been proposed was historically used as a timber plantation, which without consistent intervention will continue to deteriorate over the coming years, posing a risk to intact habitat located nearby.

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10 APPENDIX A: SPECIES LISTS

Table A.1: Plant species recorded within the study area (POSA, 2022)

Family Name	Botanical Name	Conservation Status (IUCN)
Acanthaceae	<i>Asystasia gangetica</i> subsp. <i>micrantha</i>	LC
	<i>Phaulopsis imbricate</i> subsp. <i>imbricata</i>	LC
Achariaceae	<i>Xylothea kraussiana</i>	LC
Agavaceae	<i>Chlorophytum saundersiae</i>	LC (Endemic)
Amaranthaceae	<i>Amaranthus thunbergii</i>	LC
Amarylidaceae	<i>Scadoxus membranaceus</i>	LC (Endemic)
Anacardiaceae	<i>Searsia nebulosa</i> forma <i>nebulosa</i>	LC (Endemic)
Annonaceae	<i>Artabotrys monteiroae</i>	LC
Apiaceae	<i>Centella coriacea</i>	LC (Endemic)
Apocynaceae	<i>Ancylobothrys petersiana</i>	LC
	<i>Asclepias albens</i>	LC
	<i>Asclepias gordon-grayae</i>	EN
	<i>Aspidoglossum woodii</i>	LC (Endemic)
	<i>Gomphocarpus physocarpus</i>	LC
	<i>Raphionacme palustris</i>	LC (Endemic)
	<i>Vincetoxicum anomalum</i>	LC
Asparagaceae	<i>Voacanga thouarsii</i>	LC
	<i>Asparagus aethiopicus</i>	LC
	<i>Asparagus densiflorus</i>	LC
Asphodelaceae	<i>Asparagus racemosus</i>	LC
	<i>Aloe linearifolia</i>	NT
Aspleniaceae	<i>Aloe sharoniae</i>	LC
	<i>Asplenium prionitis</i>	LC
Asteraceae	<i>Brachylaena discolor</i>	LC
	<i>Crassocephalum rubens</i> var. <i>rubens</i>	LC
	<i>Erigeron canadensis</i>	LC
	<i>Helichrysum adenocarpum</i> subsp. <i>ammophilum</i>	LC
	<i>Helichrysum appendiculatum</i>	LC
	<i>Helichrysum athrixifolium</i>	LC
	<i>Helichrysum auronitens</i>	LC
	<i>Helichrysum decorum</i>	LC
	<i>Helichrysum kraussii</i>	LC
	<i>Helichrysum longifolium</i>	LC
	<i>Helichrysum mixtum</i> var. <i>mixtum</i>	LC
	<i>Helichrysum nudifolium</i> var. <i>nudifolium</i>	LC
	<i>Helichrysum nudifolium</i> var. <i>oxyphyllum</i>	LC
	<i>Helichrysum nudifolium</i> var. <i>pilosellum</i>	LC
	<i>Helichrysum tongense</i>	LC
	<i>Nidorella auriculata</i>	LC
	<i>Senecio natalicola</i>	EN (Endemic)
	<i>Senecio ngoyanus</i>	VU (Endemic)
	<i>Senecio polyanthemoides</i>	LC
<i>Senecio sandersonii</i>	LC (Endemic)	
Campanulaceae	<i>Wahlenbergia abyssinica</i> subsp. <i>abyssinica</i>	LC
Caparaceae	<i>Cadaba natalensis</i>	LC
Celastraceae	<i>Gymnosporia senegalensis</i>	LC
	<i>Salacia kraussii</i>	LC
Ceratophyllaceae	<i>Ceratophyllum demersum</i> var. <i>demersum</i>	LC
Combretaceae	<i>Terminalia sericea</i>	LC
Convolvulaceae	<i>Astripomoea malvacea</i> var. <i>malvacea</i>	LC

Crassulaceae	<i>Crassula pellucida</i> subsp. <i>brachypetala</i>	LC
Cucurbitaceae	<i>Zehneria parvifolia</i>	LC
Cyperaceae	<i>Bulbostylis contexta</i>	LC
	<i>Fuirena umbellata</i>	LC
	<i>Pycneus nitidus</i>	LC
	<i>Rhynchospora barrosiana</i>	LC
	<i>Rhynchospora holoschoenoides</i>	LC
	<i>Rhynchospora rubra</i> subsp. <i>africana</i>	LC
Ebenaceae	<i>Euclea daphnoides</i>	LC
	<i>Euclea natalensis</i> subsp. <i>natalensis</i>	LC
Euphorbiaceae	<i>Shirakiopsis elliptica</i>	LC
Fabaceae	<i>Abrus laevigatus</i>	LC
	<i>Aeschynomene brevifolia</i>	LC
	<i>Aspalathus chortophila</i>	LC
	<i>Bauhinia tomentosa</i>	LC
	<i>Dichrostachys cinerea</i> subsp. <i>africana</i>	LC
	<i>Eriosema cordatum</i>	LC
	<i>Eriosema psoraleoides</i>	LC
	<i>Eriosema salignum</i>	LC
	<i>Eriosema zuluense</i>	LC (Endemic)
	<i>Sesbania sesban</i> subsp. <i>sesban</i> var. <i>nubica</i>	LC
	<i>Tephrosia purpurea</i> subsp. <i>canescens</i>	LC
	<i>Tephrosia purpurea</i> subsp. <i>leptostachya</i> var. <i>leptostachya</i>	LC
	<i>Vachellia gerrardii</i> subsp. <i>gerrardii</i> var. <i>gerrardii</i>	LC
	<i>Vachellia karroo</i>	LC
<i>Vachellia robusta</i> subsp. <i>clavigera</i>	LC	
<i>Zornia capensis</i> subsp. <i>capensis</i>	LC	
Fissidentaceae	<i>Fissidens aciphyllus</i>	LC (Endemic)
	<i>Fissidens gladiolus</i>	LC
Hydrocharitaceae	<i>Najas horrida</i>	LC
Iridaceae	<i>Aristea torulosa</i>	LC
	<i>Freesia laxa</i> subsp. <i>laxa</i>	LC
Lamiaceae	<i>Ocimum filamentosum</i>	LC
	<i>Pycnostachys reticulata</i>	LC
Lecythidaceae	<i>Barringtonia racemosa</i>	LC
Lentibulariaceae	<i>Utricularia stellaris</i>	LC
Lobeliaceae	<i>Lobelia anceps</i>	LC
	<i>Lobelia coronopifolia</i>	LC (Endemic)
	<i>Lobelia erinus</i>	LC
	<i>Lobelia tomentosa</i>	LC (Endemic)
	<i>Strychnos spinosa</i> subsp. <i>spinosa</i>	LC
Lycopodiaceae	<i>Pseudolycopodiella caroliniana</i>	LC
Lythraceae	<i>Ammannia radicans</i> var. <i>floribunda</i>	LC
Malvaceae	<i>Corchorus confusus</i>	LC
	<i>Waltheria indica</i>	LC
Melastomataceae	<i>Antherotoma phaeotricha</i>	LC
Molluginaceae	<i>Psammotropha myriantha</i>	LC
Myricaceae	<i>Morella serrata</i>	LC
Myrtaceae	<i>Eugenia albanensis</i>	LC (Endemic)
	<i>Eugenia capensis</i> subsp. <i>capensis</i>	LC
Ochnaceae	<i>Ochna natalitia</i>	LC
	<i>Ochna serrulata</i>	LC
Onagraceae	<i>Ludwigia leptocarpa</i>	LC
Orchidaceae	<i>Eulophia hians</i> var. <i>nutans</i>	LC

	<i>Eulophia horsfallii</i>	LC
	<i>Eulophia speciosa</i>	LC
Papaveraceae	<i>Argemone mexicana forma mexicana</i>	Invasive
Passifloraceae	<i>Adenia gummifera var. gummifera</i>	LC
Petiveriaceae	<i>Rivina humilis</i>	Invasive
Phyllanthaceae	<i>Bridelia cathartica subsp. cathartica</i>	LC
Poaceae	<i>Acroceras macrum</i>	LC
	<i>Andropogon eucomus</i>	LC
	<i>Andropogon gayanus var. polycladus</i>	LC
	<i>Andropogon schirensis</i>	LC
	<i>Bothriochloa bladonii</i>	LC
	<i>Digitaria diversinervis</i>	LC
	<i>Digitaria natalensis</i>	LC
	<i>Digitaria scalarum</i>	LC
	<i>Digitaria ternata</i>	LC
	<i>Eragrostis capensis</i>	LC
	<i>Eragrostis ciliaris</i>	LC
	<i>Eragrostis curvula</i>	LC
	<i>Monocymbium cerasiiforme</i>	LC
	<i>Panicum maximum</i>	LC
	<i>Paspalum distichum</i>	LC
	<i>Paspalum urvillei</i>	Exotic
	<i>Setaria incrassata</i>	LC
	<i>Sorghastrum stipoides</i>	LC
<i>Sorghum bicolor subsp. arundinaceum</i>	LC	
<i>Themeda triandra</i>	LC	
Podocarpaceae	<i>Afrocarpus falcatus</i>	LC
Polygonaceae	<i>Persicaria madagascariensis</i>	LC
Potamogetonaceae	<i>Potamogeton octandrus</i>	LC
	<i>Potamogeton pectinatus</i>	LC
	<i>Potamogeton schweinfurthii</i>	LC
Pottiaceae	<i>Leptophascum leptophyllum</i>	LC
Proteaceae	<i>Grevillea banksia</i>	Invasive
Restionaceae	<i>Restio zuluensis</i>	VU
Rubiaceae	<i>Catunaregam obovata</i>	LC
	<i>Kraussia floribunda</i>	LC
	<i>Pentanisia prunelloides subsp. prunelloides</i>	LC
	<i>Pentas micrantha subsp. wyliei</i>	LC
	<i>Rothmannia globosa</i>	LC
	<i>Vangueria venosa</i>	LC
	<i>Eriospermum mackenii subsp. mackenii</i>	LC
Ruscaceae	<i>Sansevieria hyacinthoides</i>	LC
Santalaceae	<i>Thesium polygaloides</i>	VU (Endemic)
	<i>Thesium virens</i>	LC (Endemic)
Sapindaceae	<i>Allophylus africanus var. africanus</i>	LC
Sapotaceae	<i>Mimusops zeyheri</i>	LC
Scrophulariaceae	<i>Nemesia denticulata</i>	LC (Endemic)
	<i>Selago peduncularis</i>	LC (Endemic)
Verbenaceae	<i>Priva meyeri var. meyeri</i>	LC
Violaceae	<i>Afrohybanthus enneaspermus</i>	LC
Vitaceae	<i>Rhoicissus digitata</i>	LC
Xyridaceae	<i>Xyris capensis</i>	LC
	<i>Xyris natalensis</i>	LC

Table A.2: Plant species observed within the study area

Family Name	Botanical Name	Conservation Status	Frequency On Site
Acanthaceae	<i>Asystasia gangetica</i>	LC	Very Common
Amaranthaceae	<i>Achyranthes aspera</i>	LC	Common
Anacardiaceae	<i>Schinus terebinthifolia</i>	NEMBA Cat 1b	Very Common
Apiaceae	<i>Centella asiatica</i>	LC	Common
Apocynaceae	<i>Catharanthus roseus</i>	NEMBA Cat 1b	Uncommon
Apocynaceae	<i>Gomphocarpus physocarpus</i>	LC	Common
Arecaceae	<i>Phoenix reclinata</i>	LC	Uncommon
Asteraceae	<i>Chromolaena odorata</i>	NEMBA Cat 1b	Very Common
Asteraceae	<i>Brachylaena discolor subsp. discolor</i>	LC	Common
Asteraceae	<i>Osteospermum moniliferum</i>	LC	Very Common
Casuarinaceae	<i>Casuarina equisetifolia</i>	NEMBA Cat 2	3
Commelinaceae	<i>Commelina benghalensis</i>	LC	Very Common
Commelinaceae	<i>Commelina africana</i>	LC	Common
Convolvulaceae	<i>Ipomoea crassipes</i>	LC	Common
Convolvulaceae	<i>Ipomoea indica</i>	NEMBA Cat 1b	Very Common
Euphorbiaceae	<i>Ricinus communis</i> ,	NEMBA Cat 1b	Common
Fabaceae	<i>Delonix regia</i>	Exotic	5
Fabaceae	<i>Tephrosia shiluwanensis</i>	LC	Common
Fabaceae	<i>Albizia adianthifolia</i>	LC	Common
Fabaceae	<i>Erythrina lysistemon</i>	LC	Less Common
Fabaceae	<i>Dichrostachys cinerea</i>	LC	Common
Fabaceae	<i>Abrus precatorius subsp. africanus</i>	LC	Common
Fabaceae	<i>Chamaecrista plumosa</i>	LC	Very Common
Iridaceae	<i>Aristea torulosa</i>	LC (Protected)	Common (clumps in one area)
Loganiaceae	<i>Strychnos spinosa</i> .	LC	1
Meliaceae	<i>Melia azedarach</i>	NEMBA Cat 1b	Common
Moraceae	<i>Ficus lutea</i>	LC	2
Myrtaceae	<i>Eucalyptus diversicolor</i>	Category 2 (relic)	<10
Myrtaceae	<i>Syzygium cordatum</i>	LC	Common
Poaceae	<i>Sorghastrum stipoides</i>	LC	Common
Poaceae	<i>Setaria megaphylla</i>	LC	Very Common (thicket only)
Poaceae	<i>Zea mays</i>	Exotic Crop	Very Common
Poaceae	<i>Cynodon dactylon</i>	LC	Very Common
Poaceae	<i>Panicum maximum</i>	LC	Common
Poaceae	<i>Digitaria eriantha</i>	LC	Common
Poaceae	<i>Eragrostis curvula</i>	LC	Common
Rubiaceae	<i>Agathisanthemum bojeri</i>	LC	Very Common
Rubiaceae	<i>Canthium inerme</i>	LC	1
Ruscaceae	<i>Dracaena aletriformis</i>	LC	<3
Solanaceae	<i>Solanum mauritianum</i>	NEMBA Cat 1b	Common
Strelitziaceae	<i>Strelitzia nicolai</i>	LC	Common
Verbenaceae	<i>Lantana camara</i>	NEMBA Cat 1b	Very Common

Table A.3: Bird species likely to occur within the study area (2835_3205)

Scientific Name	Conservation Status Red List of SA / TOPS / KZNCO
<i>Accipiter melanoleucus</i>	LC

<i>Accipiter minullus</i>	LC
<i>Accipiter tachiro</i>	LC
<i>Acridotheres tristis</i>	LC
<i>Alopochen aegyptiaca</i>	LC
<i>Amblyospiza albifrons</i>	LC
<i>Andropadus importunus</i>	LC
<i>Anhinga rufa</i>	LC
<i>Anthus cinnamomeus</i>	LC
<i>Apalis flavida</i>	LC
<i>Apalis ruddi</i>	LC
<i>Apalis thoracica</i>	LC
<i>Apaloderma narina</i>	LC
<i>Apus affinis</i>	LC
<i>Ardea melanocephala</i>	LC
<i>Aviceda cuculoides</i>	LC
<i>Batis molitor</i>	LC
<i>Bostrychia hagedash</i>	LC
<i>Buteo buteo</i>	LC
<i>Bycanistes bucinator</i>	LC
<i>Calendulauda sabota</i>	LC
<i>Camaroptera brachyura</i>	LC
<i>Campethera abingoni</i>	LC
<i>Ceblepyris caesius</i>	LC
<i>Cecropis abyssinica</i>	LC
<i>Centropus burchellii</i>	LC
<i>Cercotrichas leucophrys</i>	LC
<i>Ceuthmochares australis</i>	LC
<i>Chalcomitra amethystina</i>	LC
<i>Chalcomitra senegalensis</i>	LC
<i>Chlorocichla flaviventris</i>	LC
<i>Chlorophoneus olivaceus</i>	LC
<i>Chlorophoneus sulfureopectus</i>	LC
<i>Chrysococcyx caprius</i>	LC
<i>Chrysococcyx cupreus</i>	LC
<i>Chrysococcyx klaas</i>	LC
<i>Ciconia episcopus</i>	LC
<i>Cinnyricinclus leucogaster</i>	LC
<i>Cinnyris bifasciatus</i>	LC

<i>Cinnyris talatala</i>	LC
<i>Circaetus fasciolatus</i>	CR
<i>Circus ranivorus</i>	LC
<i>Cisticola chiniana</i>	LC
<i>Colius striatus</i>	LC
<i>Columba arquatrix</i>	LC
<i>Columba larvata</i>	LC
<i>Columba livia</i>	LC
<i>Corvus albus</i>	LC
<i>Cossypha natalensis</i>	LC
<i>Crithagra mozambica</i>	LC
<i>Crithagra sulphurata</i>	LC
<i>Cuculus clamosus</i>	LC
<i>Cuculus solitarius</i>	LC
<i>Cyanomitra olivacea</i>	LC
<i>Cyanomitra veroxii</i>	LC
<i>Cypsiurus parvus</i>	LC
<i>Dendropicos fuscescens</i>	LC
<i>Dicrurus adsimilis</i>	LC
<i>Dicrurus ludwigii</i>	LC
<i>Dryoscopus cubla</i>	LC
<i>Estrilda astrild</i>	LC
<i>Eurystomus glaucurus</i>	LC
<i>Gallirex porphyreolophus</i>	LC
<i>Glaucestrilda perreini</i>	LC
<i>Guttera pucherani</i>	LC
<i>Halcyon albiventris</i>	LC
<i>Hedydipna collaris</i>	LC
<i>Hieraaetus wahlbergi</i>	LC
<i>Hirundo rustica</i>	LC
<i>Iduna natalensis</i>	LC
<i>Indicator minor</i>	LC
<i>Indicator variegatus</i>	LC
<i>Ispidina picta</i>	LC
<i>Kaupifalco monogrammicus</i>	LC
<i>Laniarius ferrugineus</i>	LC
<i>Lanius collaris</i>	LC
<i>Lophaetus occipitalis</i>	LC

<i>Lybius torquatus</i>	LC
<i>Macronyx croceus</i>	LC
<i>Malaconotus blanchoti</i>	LC
<i>Mandingoa nitidula</i>	LC
<i>Melaenornis pammelaina</i>	LC
<i>Melaenornis silens</i>	LC
<i>Melaniparus niger</i>	LC
<i>Merops persicus</i>	LC
<i>Milvus aegyptius</i>	LC
<i>Mirafra africana</i>	LC
<i>Motacilla aguimp</i>	LC
<i>Motacilla capensis</i>	LC
<i>Muscicapa adusta</i>	LC
<i>Muscicapa caerulescens</i>	LC
<i>Nicator gularis</i>	LC
<i>Notopholia corusca</i>	LC
<i>Oriolus larvatus</i>	LC
<i>Oriolus oriolus</i>	LC
<i>Passer diffusus</i>	LC
<i>Passer domesticus</i>	LC
<i>Pernis apivorus</i>	LC
<i>Phoeniculus purpureus</i>	LC
<i>Phyllastrephus terrestris</i>	LC
<i>Platysteira peltata</i>	LC
<i>Plectropterus gambensis</i>	LC
<i>Ploceus bicolor</i>	LC
<i>Ploceus cucullatus</i>	LC
<i>Ploceus ocularis</i>	LC
<i>Ploceus subaureus</i>	LC
<i>Pogoniulus bilineatus</i>	LC
<i>Pogoniulus pusillus</i>	LC
<i>Polyboroides typus</i>	LC
<i>Prinia subflava</i>	LC
<i>Psalidoprocne pristoptera holomelas</i>	LC
<i>Pternistis natalensis</i>	LC
<i>Pycnonotus tricolor</i>	LC
<i>Sarothrura elegans</i>	LC
<i>Saxicola torquatus</i>	LC

<i>Spermestes cucullata</i>	LC
<i>Spermestes nigriceps</i>	LC
<i>Stactolaema leucotis</i>	LC
<i>Stephanoaetus coronatus</i>	VU
<i>Streptopelia semitorquata</i>	LC
<i>Tauraco livingstonii</i>	LC
<i>Tchagra senegalus</i>	LC
<i>Telophorus viridis</i>	LC
<i>Terpsiphone viridis</i>	LC
<i>Trachyphonus vaillantii</i>	LC
<i>Treron calvus</i>	LC
<i>Trochocercus cyanomelas</i>	LC
<i>Turdus libonyana</i>	LC
<i>Turtur chalcospilos</i>	LC
<i>Turtur tympanistria</i>	LC
<i>Upupa africana</i>	LC
<i>Vidua macroura</i>	LC
<i>Zosterops virens</i>	LC

Table A.4: Mammal species likely to occur within the study area (ADU, 2022) – 2832CA

Scientific Name	Conservation Status (IUCN & TOPS)	Likelihood of Occurrence (Low, Medium High)
<i>Aepyceros melampus</i>	LC	Low
<i>Aethomys ineptus</i>	LC	Medium
<i>Cephalophus natalensis</i>	NT	Low
<i>Chlorocebus pygerythrus</i>	LC	High
<i>Connochaetes taurinus taurinus</i>	LC	Low
<i>Crocidura cyanea</i>	LC	Medium
<i>Epomophorus wahlbergi</i>	LC	Medium
<i>Equus quagga</i>	LC	Low
<i>Giraffa camelopardalis</i>	LC	Low
<i>Kobus ellipsiprymnus</i>	LC	Low
<i>Mastomys natalensis</i>	LC	High
<i>Mus minutoides</i>	LC	Low
<i>Myosorex varius</i>	LC	Medium
<i>Pipistrellus hesperidus</i>	LC	Low
<i>Rattus rattus</i>	LC	High
<i>Redunca arundinum</i>	LC	Low
<i>Saccostomus campestris</i>	LC	Medium

Species 7	VU	Low
<i>Suncus infinitesimus</i>	LC	Low
<i>Sylvicapra grimmia</i>	LC	Low
<i>Tragelaphus angasii</i>	LC	Low
<i>Tragelaphus scriptus</i>	LC	Low

Table A.5: Reptile species likely to occur within the study area (ADU, 2022) - 2832CA

Scientific Name	Conservation Status (IUCN & TOPS)	Likelihood of Occurrence (Low, Medium High)
<i>Acanthocercus atricollis</i>	LC	High
<i>Acontias plumbeus</i>	LC	Low
<i>Afrotyphlops schlegelii</i>	LC	Low
<i>Agama aculeata distanti</i>	LC	Medium
<i>Bitis arietans arietans</i>	LC	Medium
<i>Bitis gabonica</i>	LC	Low
<i>Causus rhombeatus</i>	LC	High
<i>Chamaeleo dilepis</i>	LC	Medium
<i>Chamaesaura macrolepis</i>	LC	Low
<i>Crotaphopeltis hotamboeia</i>	LC	High
<i>Dasypeltis inornata</i>	LC	Medium
<i>Dendroaspis angusticeps</i>	VU	Medium
<i>Dendroaspis polylepis</i>	LC	Medium
<i>Dispholidus typus typus</i>	LC	Medium
<i>Duberria lutrix lutrix</i>	LC	Medium
<i>Duberria variegata</i>	LC	Low
<i>Gerrhosaurus flavigularis</i>	LC	Low
<i>Hemidactylus mabouia</i>	LC	High
<i>Kinixys natalensis</i>	VU	Low
<i>Kinixys zombensis</i>	LC	Low
<i>Limaformosa capensis</i>	LC	Medium
<i>Lycodonomorphus rufulus</i>	LC	Low
<i>Lygodactylus capensis</i>	LC	High
<i>Naja annulifera</i>	LC	Medium
<i>Naja mossambica</i>	LC	High
<i>Naja subfulva</i>	LC	Medium
<i>Pachydactylus maculatus</i>	LC	High
<i>Pelomedusa galeata</i>	LC	None
<i>Pelusios rhodesianus</i>	LC	None
<i>Philothamnus hoplogaster</i>	LC	High

<i>Philothamnus natalensis</i>	LC	Medium
<i>Psammophis mossambicus</i>	LC	High
<i>Psammophylax rhombeatus</i>	LC	Medium
<i>Pseudaspis cana</i>	LC	Medium
<i>Python natalensis</i>	LC (TOPS)	Low-medium
<i>Stigmochelys pardalis</i>	LC (TOPS)	Low
<i>Thelotornis capensis capensis</i>	LC	Medium
<i>Trachylepis damarana</i>	LC	High
<i>Trachylepis striata</i>	LC	High
<i>Varanus niloticus</i>	LC	Medium

Table A.6: Amphibian species likely to occur within the study area (ADU, 2022) - 2832CA

Scientific Name	Conservation Status (IUCN & TOPS)	Likelihood of Occurrence (Low, Medium High)
<i>Afrixalus delicatus</i>	LC	Medium
<i>Afrixalus fornasinii</i>	LC	Medium
<i>Afrixalus spinifrons</i>	LC	Low
<i>Amietia delalandii</i>	LC	Low
<i>Arthroleptis wahlbergi</i>	LC	Medium
<i>Cacosternum boettgeri</i>	LC	Low-Medium
<i>Cacosternum striatum</i>	LC	Low
<i>Chiromantis xerampelina</i>	LC	High
<i>Hemisus guttatus</i>	NT	Low
<i>Hylambates maculatus</i>	LC	Low
<i>Hyperolius argus</i>	LC	Low
<i>Hyperolius marmoratus</i>	LC	Low
<i>Hyperolius marmoratus taeniatus</i>	LC	Low
<i>Hyperolius microps</i>	LC	Low
<i>Hyperolius pickersgilli</i>	EN	Low
<i>Hyperolius pusillus</i>	LC	Low
<i>Hyperolius tuberilinguis</i>	LC	Low
<i>Kassina senegalensis</i>	LC	Low
<i>Leptopelis mossambicus</i>	LC	Medium
<i>Leptopelis natalensis</i>	LC	High
<i>Phrynobatrachus mababiensis</i>	LC	Low
<i>Phrynobatrachus natalensis</i>	LC	Low
<i>Phrynomantis bifasciatus</i>	LC	Low
<i>Ptychadena anchietae</i>	LC	Low
<i>Ptychadena mascareniensis</i>	LC	Low

<i>Ptychadena oxyrynchus</i>	LC	High
<i>Ptychadena taenioscelis</i>	LC	Low
<i>Schismaderma carens</i>	LC	High
<i>Sclerophrys garmani</i>	LC	High
<i>Sclerophrys gutturalis</i>	LC	High
<i>Tomopterna natalensis</i>	LC	Medium
<i>Xenopus laevis</i>	LC	Low

11 APPENDIX B: CV OF THE SPECIALIST

12 APPENDIX C: SUMMARY OF COMPLIANCE WITH SECTIONS 24(5)(A) AND (H) AND 44 OF NEMA

No.	Minimum Report Content Requirements	Relevant Section in Report
2	Terrestrial Biodiversity Species Assessment	
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	Compliant
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	Compliant
2.3	The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:	
2.3.1	A description of the ecological drivers or processes of the system and how the proposed development will impact these.	Section 4.3
2.3.2	Ecological functioning and ecological processes (e.g. fire, migration, pollination, etc.) that operate within the preferred site.	Section 4.3
2.3.3	The ecological corridors that the proposed development would impede including migration and movement of flora and fauna.	Section 4.3
2.3.4	The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA) sub-catchments).	Section 3.4.2 and Section 4.3
2.3.5	A description of terrestrial biodiversity and ecosystems on the preferred site, including: (a) main vegetation types; (b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified; (c) ecological connectivity, habitat fragmentation, ecological processes and fine - scale habitats; and (d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified.	Section 3
2.3.6	The assessment must identify any alternative development footprints within the preferred site which would be of a low sensitivity as identified by the screening tool and verified through the site sensitivity verification.	N/A – No site alternatives available
2.3.7	The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:	
2.3.7.1	Terrestrial Critical Biodiversity Areas (CBAs), including: (a) the reasons why an area has been identified as a CBA; (b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation; (c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s); (d) the impact on ecosystem threat status; (e) the impact on explicit subtypes in the vegetation; (f) the impact on overall species and ecosystem diversity of the site; and (g) the impact on any changes to threat status of populations of species of conservation concern in the CBA.	Section 3
2.3.7.2	Terrestrial Ecological Support Areas (ESAs), including: (a) the impact on the ecological processes that operate within or across the site;	Section 4

	(b) the extent the proposed development will impact on the functionality of the ESA; and (c) loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna.	
2.3.7.3	Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- (a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan.	Section 3
2.3.7.4	Priority areas for protected area expansion, including- (a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network.	Section 3
2.3.7.5	SWSAs including: (a) the impact(s) on the terrestrial habitat of a SWSA; and (b) the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses).	N/A
2.3.7.6	FEPA sub-catchments, including- (a) the impacts of the proposed development on habitat condition and species in the FEPA sub-catchment.	N/A
2.3.7.7	Indigenous forests, including: (a) impact on the ecological integrity of the forest; and (b) percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.	N/A - No forest directly impacted.
2.4	The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.	Compliant
3	Terrestrial Biodiversity Specialist Assessment Report	
3.1	The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:	
3.1.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Appendix B
3.1.2	A signed statement of independence by the specialist;	Compliant
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 3 & 4
3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Section 3
3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Section 1.3
3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	N/A – No no-go areas recommended.
3.1.7	Additional environmental impacts expected from the proposed development;	N/A
3.1.8	Any direct, indirect and cumulative impacts of the proposed development;	Section 6
3.1.9	The degree to which impacts and risks can be mitigated;	Section 6
3.1.10	The degree to which the impacts and risks can be reversed;	Section 6
3.1.11	The degree to which the impacts and risks can cause loss of irreplaceable resources;	Section 6
3.1.12	Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 6

3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	N/A
3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Section 8
3.1.15	Any conditions to which this statement is subjected.	Section 7
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	Noted.
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	Noted.

13 APPENDIX D: EIA SCREENING REPORT