



# **Terrestrial Biodiversity Compliance Statement for the Thabazimbi Extension 75 Residential Development**

## **Thabazimbi, Limpopo Province**

August 2022

CLIENT



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<b>Declaration</b>	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>

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## 1 Introduction

The Biodiversity Company was commissioned by Naledzi Environmental Consultants to conduct a terrestrial ecology (fauna and flora) assessment for the proposed residential township to be known as Thabazimbi Extension 75 on Portion 129 of the farm Doornhoek 318KQ, Thabazimbi, Limpopo Province. In order to assess the baseline ecological state of the project area and to present a detailed description of the receiving environment, both a desktop assessment as well as a field survey were conducted during July 2022. Furthermore, the assessment and survey both involved the detection, identification and description of any locally relevant sensitive receptors, and the manner in which these sensitive receptors may be affected by the proposed development was also investigated.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 30 October 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation". The National Web based Environmental Screening Tool has characterised the terrestrial biodiversity theme for the project area as 'Very High' sensitivity (National Environmental Screening Tool, 2022). Note that based on the observations made by the specialist, it is the opinion of the specialist that a Compliance Statement was sufficient for this assessment.

The purpose of the assessment is to provide relevant input into the environmental application process. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the project and the impacts that its implementation may have on the natural environment.

### 1.1 Project Information

According to Naledzi Environmental Consultants (2022) the intention is to establish a 2.4 hectare (ha) residential township comprising 35 stands on Portion 129 of the farm Doornhoek 318KQ which will utilise municipal services except for electricity which will be provided by Eskom.

The township will consist of the following:

- 33 "Residential 1" erven with varying sizes (500 m<sup>2</sup> and 700 m<sup>2</sup>) for dwellings;
- 1 "Special" erf for the purposes of a Guard House/Access Control of approximately 150 m<sup>2</sup>; and
- 1 "Private Road" erf for the internal road network with a width of 5 metres within a 10 m road reserve.

The development density will be low with a ratio of 13.74 units per ha and will be limited to a building height of 2-storeys. The township construction period will be 24 months.

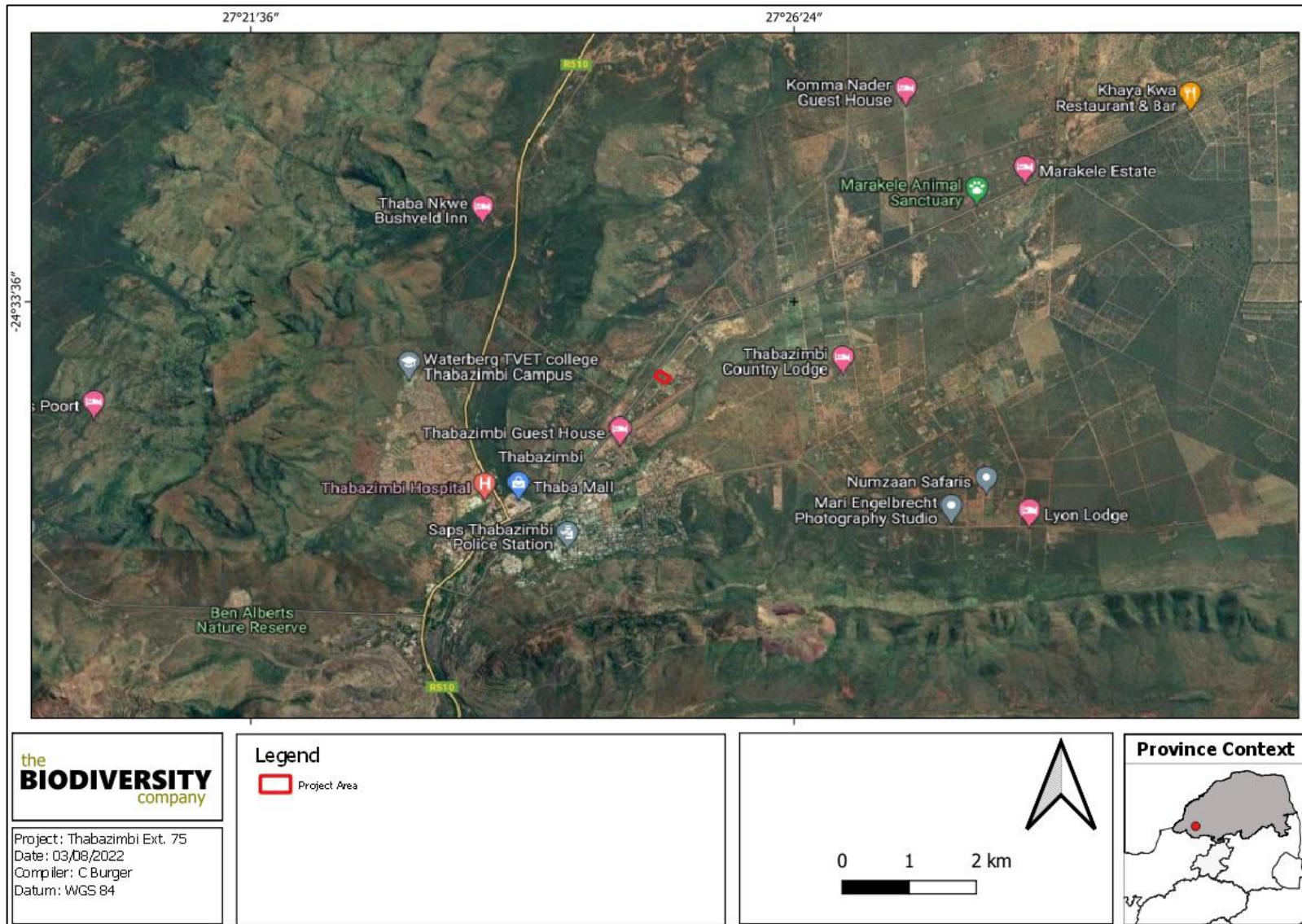


Figure 1-1 Map illustrating the regional overview of the project area

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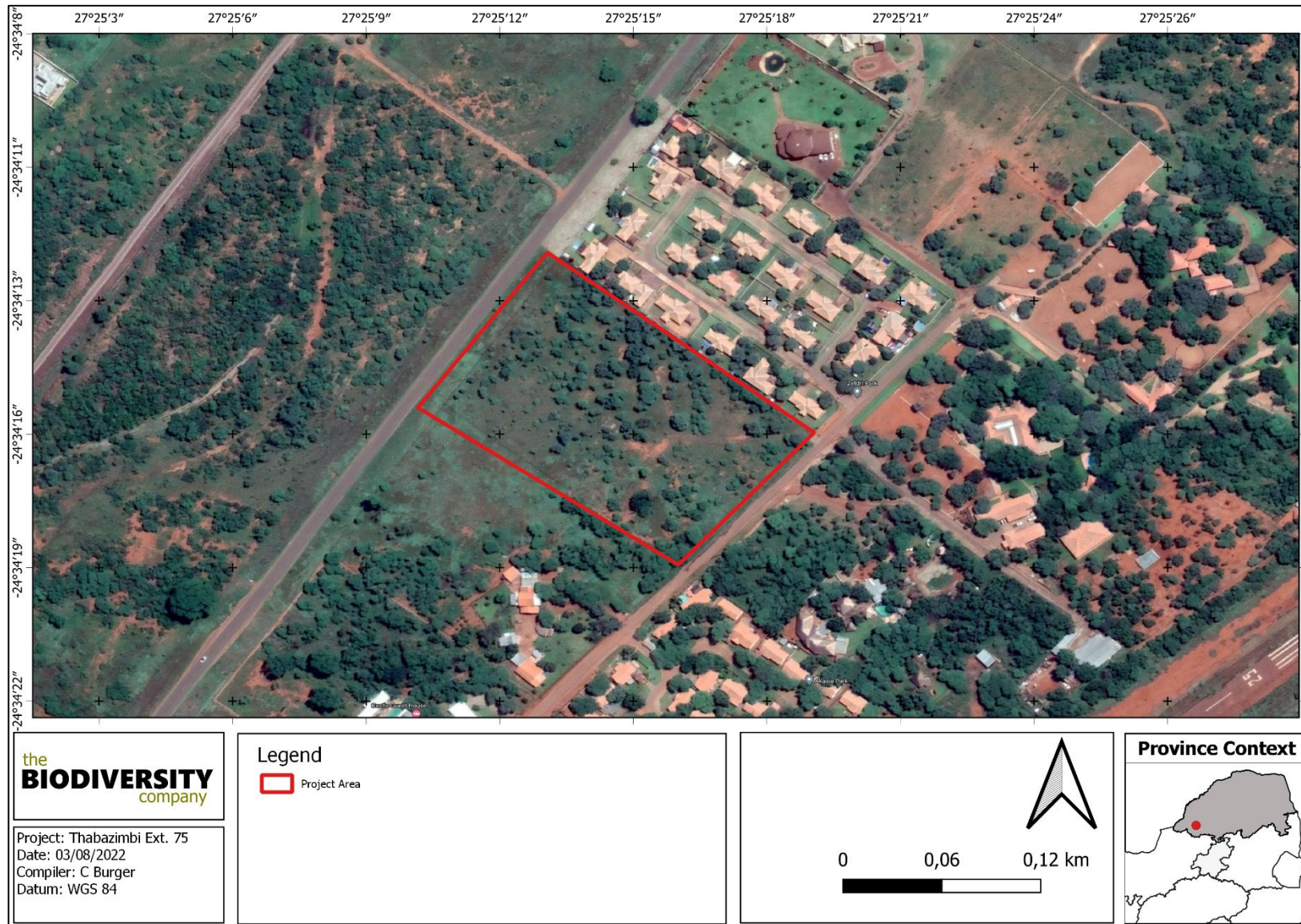


Figure 1-2 Map illustrating the location of the proposed Project area

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## 1.2 Terms of Reference

The principal aim of the assessment was to adequately assess the current state of the terrestrial biodiversity in order to identify any significant and/or sensitive ecological receptors that may be impacted upon by the proposed activity. The following are the Terms of Reference that guide the project aim:

- Description of the baseline receiving environment specific to the field of expertise (including the general surrounding area as well as the site-specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (i.e., terrestrial biodiversity) that occur in the project area, and the manner in which these sensitive receptors may be affected by the activity. Provide a map illustrating the location and extent of these sensitive receptors, if any, in the project area;
- Screening to identify any critical issues (potential fatal flaws) that may result in a rejection of the application; and
- Presentation of recommend mitigation measures (outcomes to be included in the Management Plan) that should be used to mitigate or minimise impacts from the activity, either on terrestrial habitat or ecology directly.

## 2 Key Legislative Requirements

The legislation, policies and guidelines listed below are applicable to the current project in terms of biodiversity and ecological support systems. The list provided, although extensive, is not exhaustive and other legislation, policies and guidelines may apply in addition to those listed below (Table 2-1).

*Table 2-1 A list of key legislative requirements relevant to ecosystems and biodiversity in Limpopo Province*

Region	Legislation
National	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24, No 42946 (January 2020)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24, No 43110 (March 2020)
	The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
	The National Environmental Management: Waste Act (Act No. 59 of 2008)
	The Environment Conservation Act (Act No. 73 of 1989) and associated EIA Regulations
	National Environmental Management Air Quality Act (Act No. 39 of 2004)
	National Protected Areas Expansion Strategy (NPAES, 2016)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (Act No. 101 of 1998)
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP 2015 - 2025)
	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
Threatened or Protected Species Regulations, 2007 (TOPS)	
National Water Act (Act No. 36 of 1998)	
Provincial	Limpopo Conservation Plan (2018)
	Limpopo Environmental Management Act (2003)

### 2.1 Report Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" – section 3, subsection 1:

- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however
- Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey, confirmed that the site (project area) is of a 'Low' sensitivity. Therefore, a Terrestrial Biodiversity Compliance Statement will be completed and submitted for this project.

As per sections 2 and 3 of the protocol discussed above, a Terrestrial Biodiversity Compliance Statement must contain the information as presented in Table 2-2 below.

*Table 2-2 Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report*

Information to be Included (as per GN 320, 20 March 2020)	Report Section
Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used	4
Description of the assumptions and any uncertainties or gaps in knowledge or data	5
A baseline profile description of biodiversity and ecosystems of the site	6
Site sensitivity verification: Desktop Analysis using satellite imagery and available information	6.1
A statement on the duration, date and season of the site inspection	6.2
Site sensitivity verification: Onsite inspection, include a description of current land use and vegetation found on-site	6.2
Site sensitivity verification: Photographs/evidence of environmental sensitivity	6.2
Screening tool confirmation/dispute: The assessment must verify the "low" sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes	6.2.2
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	7
Indicate whether or not the proposed development will have any impact on the terrestrial environment, animals and/or plants	8
A signed statement of independence by the specialist	10
Specialist details, including a CV	11

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

### 3 Definitions

#### 3.1 Species of Conservation Concern

In accordance with the National Red List of South African Plants website, managed and maintained by the South African National Biodiversity Institute (SANBI), a Species of Conservation Concern (SCC) is species that has a high conservation importance in terms of preserving South Africa's rich biodiversity. This classification covers a range of red list categories as illustrated in Figure 3-1 below.

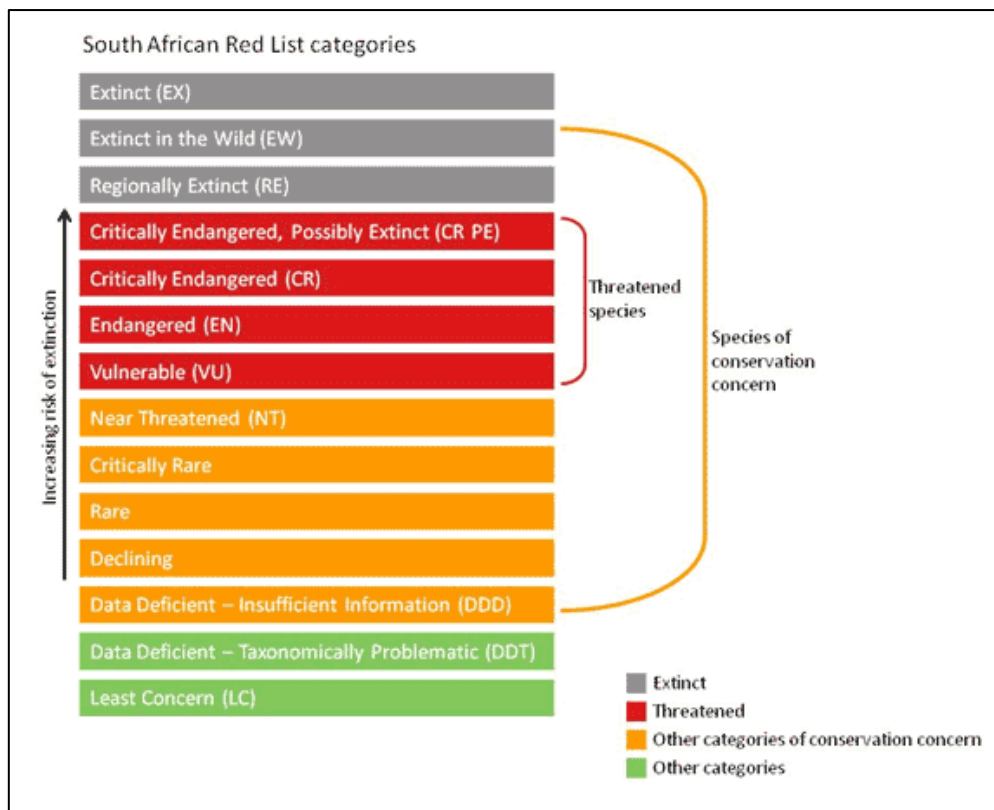


Figure 3-1 Threatened species and Species of Conservation Concern (SANBI, 2016)

South Africa uses the internationally endorsed International Union for Conservation of Nature (IUCN) Red List Categories and Criteria (IUCN, 2012). This scientific system is designed to measure species' risk of extinction and its purpose is to highlight those species that are in need of critical conservation action. As this system has been adopted from the IUCN, the definition of an SCC as described and categorised above is extended to all red list classifications relevant to fauna as well as the IUCN categories, for the purposes of this report.

### 3.2 Protected Species

Protected species include both floral and faunal species that are protected according to some form of relevant legislation, be it provincial, national, or international. Provincial legislation may include that which is published in the form of a provincial ordinance or a bill, national legislation includes that which is published in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) or the National Forest Act (Act No. 84 of 1998). Relevant national legislation includes the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 2021).

## 4 Methods

### 4.1 Geographic Information Systems (GIS) Mapping

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

- The Limpopo Conservation Plan the (Limpopo Department of Economic Development, Environment & Tourism (LEDET), 2018);
- 2018 National Biodiversity Assessment (NBA 2018) (Skowno *et al.*, 2019);

- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018);
- SA Protected and Conservation Areas Databases, 2021 (DFFE, 2021 & DFFE-2, 2021);
- National Protected Areas Expansion Strategy, 2016 (DEA, 2016);
- Important Bird and Biodiversity Areas, 2015 (Marnewick *et al.*, 2015);
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Awuah, 2018 & Van Deventer *et al.*, 2018);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel, 2011); and
- Strategic Water Source Areas, 2021 (Lötter & Le Maitre, 2021).

Brief descriptions of the standardised methods applied are provided below. More detailed descriptions of survey methodologies are available upon request.

## 4.2 Desktop Vegetation and Botanical Assessment

The desktop vegetation and botanical assessment encompassed an assessment of all the vegetation units and habitat types within the project area. The focus was on an ecological assessment of pre-anthropogenic habitat types as well as the identification of any Red Data and protected species within the known distribution of the project area. The South African National Biodiversity Institute (SANBI) provides an electronic database system, namely the Botanical Database of Southern Africa (BODATSA-POSA, 2019), which was used to access distribution records on Southern African plants and generate an expected species list. This new database replaces the old Plants of Southern Africa database which provided distribution data of flora at the quarter degree square resolution. The Red List of South African Plants website (SANBI, 2016) was used to provide the most current account of the national conservation status of flora.

Additional information regarding ecosystems, vegetation types, protected flora and Species of Conservation Concern (SCC) was obtained from the following sources:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2012);
- Red List of South African Plants (Raimondo *et al.*, 2009; SANBI, 2016);
- Provincially Protected Plant Species (Limpopo Environmental Management Act 2003, Act 7 Of 2003); and
- List of Protected Tree Species (DFFE 2, 2021).

## 4.3 Floristic Fieldwork Survey and Analysis

The dry season fieldwork (completed during July 2022) and sample sites were placed within targeted areas (i.e., target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork was therefore to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site. Emphasis was placed on sensitive habitats, especially those overlapping with the proposed project area.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps. The floristic diversity and search for protected plants and flora SCC were conducted through timed meanders within representative habitat units delineated during the desktop assessment. Emphasis was placed on any sensitive habitats overlapping with the proposed project area.

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

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

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

- A field guide to Wild flowers (Pooley, 1998);
- Field Guide to the Wild Flowers of the Highveld (van Wyk & Malan, 1998);
- Orchids of South Africa (Johnson & Bytebier, 2015);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Mesembs of the World (Smith *et al.*, 1998);
- Medicinal Plants of South Africa (Van Wyk *et al.*, 2013);
- Freshwater Life: A field guide to the plants and animals of southern Africa (Griffiths & Day, 2016);
- Aquatic and Wetland Plants of Southern Africa (van Ginkel & Cilliers, 2020);
- Identification guide to southern African grasses. An identification manual with keys, descriptions and distributions (Fish *et al.*, 2015); and
- Field guide to trees of Southern Africa, Struik Publishers (Van Wyk & Van Wyk, 1997).

The field work methodology included the following survey techniques:

- Timed meanders;
- Sensitivity analysis based on structural and species diversity;
- Identification of protected floral species; and
- Identification of floral red-data or red-listed species (Species of Conservation Concern).

## 4.4 Faunal Assessment

### 4.4.1 Desktop Assessment

The faunal desktop assessment involved the following:

- Compilation of expected species lists;
- Identification of any red-data/red-listed species or Species of Conservation Concern potentially occurring in the area and their likelihood of occurrence.

Distribution and SCC data were obtained from the following information sources:

- Animal Demography Unit (ADU, 2020);
- Southern African Bird Atlas Project 2 (SABAP2, 2019);
- South African Reptile Conservation Assessment (SARCA) (sarca.adu.org);
- Atlas and Red list of Reptiles of South Africa, Lesotho and Swaziland (Bates *et al.*, 2014);
- Red Data Book of Birds (Birdlife South Africa, 2015);
- Atlas and Red Data Book of Frogs of South Africa (Minter *et al.*, 2004);
- South Africa's official site for Species Information and National Red Lists (SANBI, 2022);
- The 2016 Red List of Mammals of South Africa (EWT, 2016); and
- The International Union for Conservation of Nature's Red List of Threatened Species. Version 2021-3 (IUCN, 2021).

#### 4.4.2 Field Survey

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

- Visual observations (involving the use of binoculars and specialist camera equipment);
- Active hand-searches, used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.);
- Identification of tracks and signs; and
- Utilization of local knowledge.

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

- Roberts Bird Guide, Second Edition (Chittenden *et al.*, 2016);
- A Guide to the Reptiles of Southern Africa (Alexander & Marais, 2007);
- Field guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Frogs of Southern Africa (du Preez & Carruthers, 2009);
- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Bats of Southern and Central Africa (Monadjem *et al.*, 2010);
- Spiders of Southern Africa (Leroy & Leroy, 2003); and
- Tortoises, Terrapins, and Turtles of Africa (Branch, 2008).

#### 4.5 Site Ecological Importance

The different habitat types within the assessment area were delineated and identified based on observations during the field assessment as well as information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of Species of Conservation Concern (SCC) and their ecosystem processes.

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

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 4-1 and Table 4-2, respectively.

*Table 4-1 Summary of Conservation Importance criteria*

Conservation Importance	Fulfilling Criteria
<b>Very High</b>	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km <sup>2</sup> . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
<b>High</b>	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km <sup>2</sup> . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
<b>Medium</b>	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
<b>Low</b>	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
<b>Very Low</b>	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

*Table 4-2 Summary of Functional Integrity criteria*

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



<b>Very Low</b>	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.
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BI can be derived from a simple matrix of CI and FI as provided in Table 4-3.

*Table 4-3 Matrix used to derive Biodiversity Importance from Functional Integrity and Conservation Importance*

Biodiversity Importance		Conservation Importance				
		Very high	High	Medium	Low	Very low
Functional Integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor as summarised in Table 4-4

*Table 4-4 Summary of Receptor Resilience criteria*

Resilience	Fulfilling Criteria
<b>Very High</b>	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
<b>High</b>	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
<b>Medium</b>	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
<b>Low</b>	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
<b>Very Low</b>	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

After the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 4-5.

*Table 4-5 Matrix used to derive Site Ecological Importance from Receptor Resilience and Biodiversity Importance*

Site Ecological Importance		Biodiversity Importance				
		Very high	High	Medium	Low	Very low
Receptor Resilience	Very Low	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low

Site Ecological Importance		Biodiversity Importance				
		Very high	High	Medium	Low	Very low
Very High	Medium	Low	Very low	Very low	Very low	

Interpretation of the SEI in the context of the proposed activities is provided in Table 4-6.

Table 4-6 Guidelines for interpreting Site Ecological Importance in the context of the proposed activities

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

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

## 5 Limitations and Assumptions

The following limitations and assumptions should be noted for the assessment:

- The assessment area was based on the area provided by the client and any alterations and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The area was only surveyed during a single site visit and therefore, this assessment does not consider temporal trends, however, is considered sufficient to derive meaningful baseline;
  - Only a single season survey was conducted for the study, this would constitute a dry season survey with its limitations;
  - Flora identification was limited due to the lack of aboveground plant parts used to determine species as it's a dry season site visit;
  - The Project Area of Influence (PAOI) comprised of the proposed development area;
- Whilst every effort is made to cover as much of the site as possible, it is possible that some plant and animal species that are present on site were not recorded during the field investigations due to the inherent secretive nature of fauna species or the lack of material required for flora species identification.

## 6 Receiving Environment

### 6.1 Desktop Spatial Assessment

Table 6-1 below has been produced as a result of the spatial data collected and analysed (as provided by various sources such as the national and provincial environmental authorities and SANBI). It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or project area. Where a feature is regarded as relevant it is considered an ecologically important landscape feature and discussed further as part of the sub-sections that follow.

*Table 6-1 Desktop spatial features examined*

Desktop Information Considered	Relevant/Irrelevant	Section
<b>Ecosystem Threat Status</b>	Irrelevant – Overlaps with a Least Concern Ecosystem	6.1.1
<b>Ecosystem Protection Level</b>	Irrelevant – Overlaps with a Well Protected Ecosystem	6.1.2
<b>Protected Areas</b>	Relevant – Located 4 km east of the Thabazimbi Private Nature Reserve and 3 km west of the Waterberg Biosphere Reserve.	6.1.3
<b>Renewable Energy Development Zones</b>	Irrelevant – Does not overlap with any REDZs.	-
<b>Powerline Corridor</b>	Irrelevant – The project area does not overlap with any powerline corridor.	-
<b>Limpopo CBA</b>	Relevant – The project area overlaps with an Ecological Support Area 1.	6.1.4
<b>National Protected Areas Expansion Strategy</b>	Irrelevant – The project area does not overlap with any NPAES areas.	6.1.5
<b>Important Bird and Biodiversity Areas</b>	Irrelevant – Located 6 km from the nearest IBA.	6.1.6
<b>South African Inventory of Inland Aquatic Ecosystems (SAIIAE)</b>	Relevant – The 500 m regulated area overlaps with a EN river.	6.1.7
<b>National Freshwater Ecosystem Priority Areas</b>	Relevant – The 500 m regulated area overlaps with an unclassified FEPA river.	6.1.8
<b>Strategic Water Source Areas</b>	Irrelevant – The project area is 16 km from the closest SWSA	.

#### 6.1.1 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset, the proposed project area overlaps with a LC ecosystem (Figure 6-1).

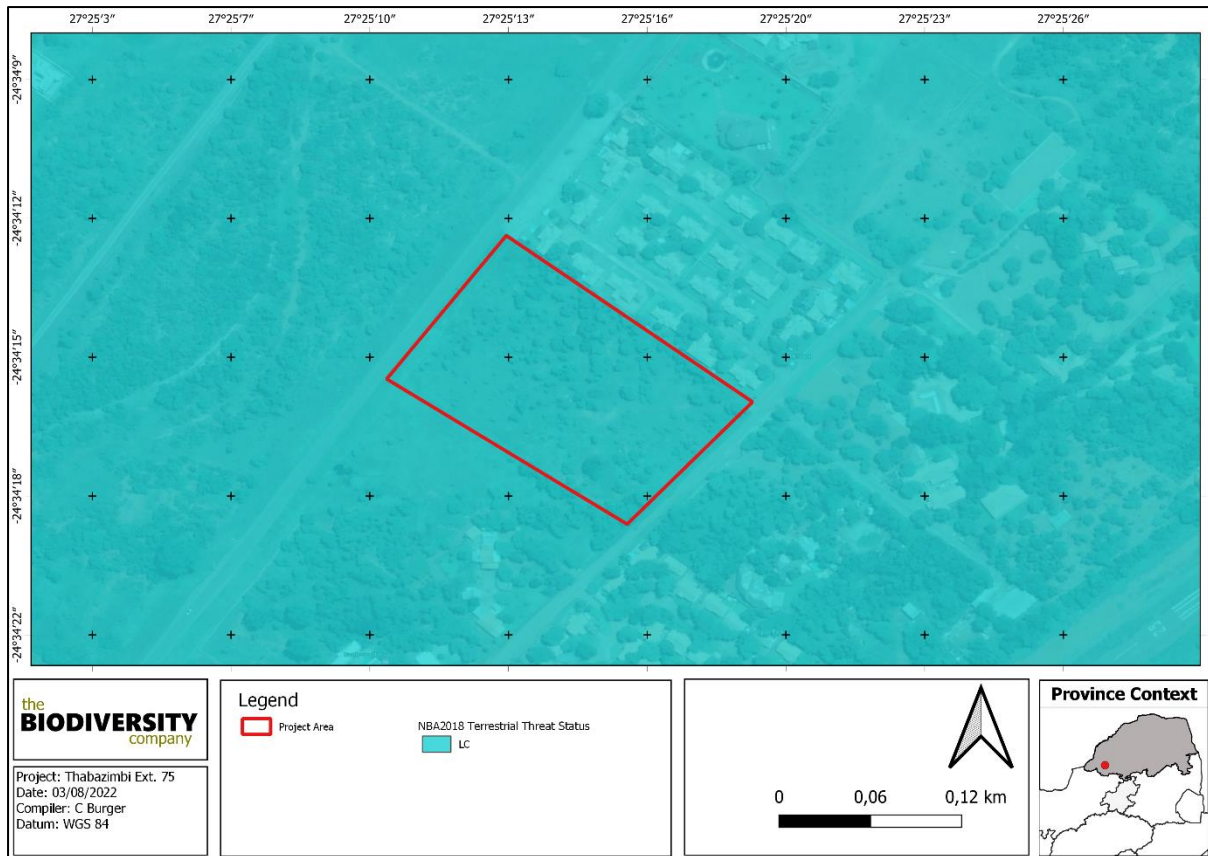


Figure 6-1 Map illustrating the ecosystem threat status associated with the project area

### 6.1.2 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project overlaps with a Well Protected ecosystem (Figure 6-2).



Figure 6-2 Map illustrating the ecosystem protection level associated with the project area

### 6.1.3 Protected Areas

According to the spatial data for SAPAD (2021) and SACAD (2021), the project area does not overlap with any protected areas or conservation areas. The project area lies 4 km east of the Thabazimbi Private Nature Reserve and 3 km west of the Waterberg Biosphere Reserve and as such within the 5 km Protected Area Buffer Zone of a protected area (Figure 6-3).

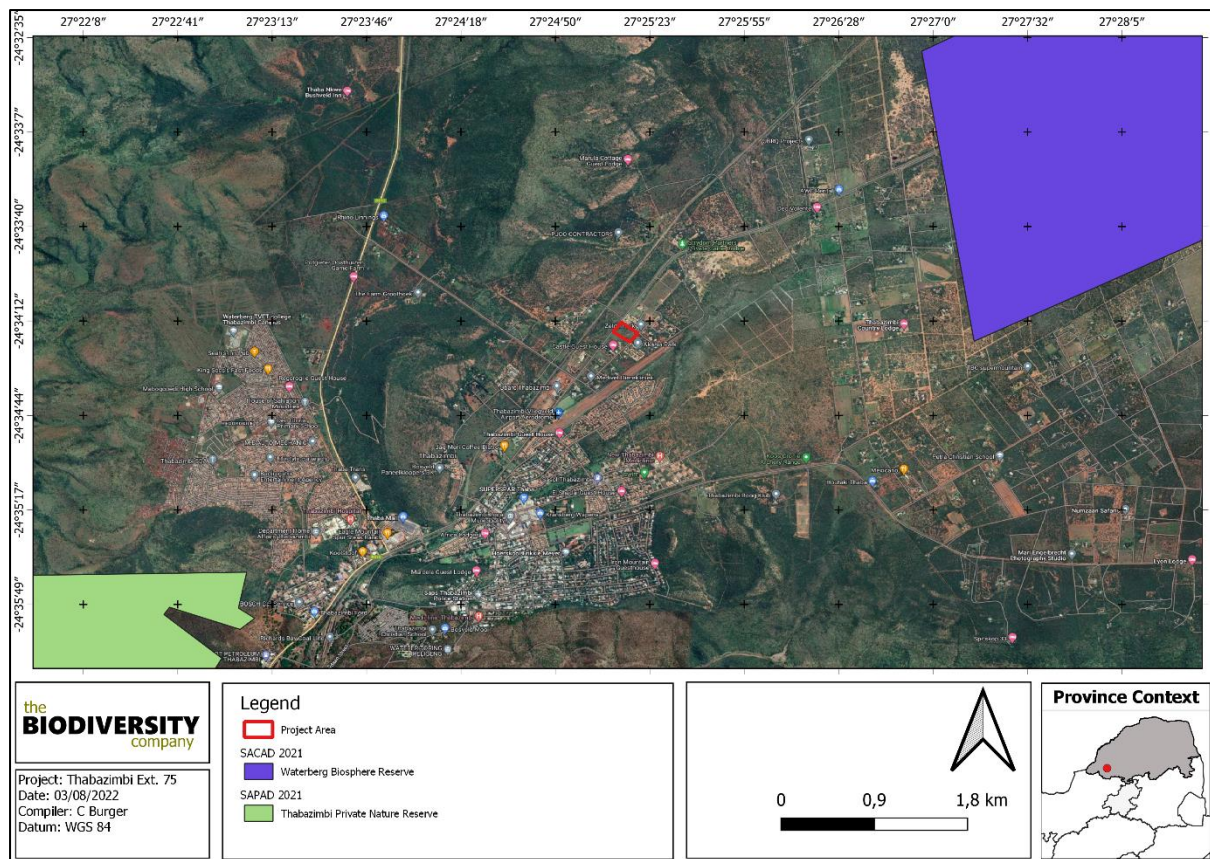


Figure 6-3 Map illustrating the project area in relation to the nearest protected areas

### 6.1.4 Waterberg District Bioregional Plan and Limpopo Conservation Plan

The Waterberg District Bioregional Plan covers the Waterberg District located within the Limpopo Province of South Africa. The spatial component of the Bioregional Plan is based on a provincial systematic biodiversity plan, the Limpopo Conservation Plan version 2 (LCPv2), undertaken by the Limpopo Department of Economic Development, Environment and Tourism (LEDET).

The purpose of the Limpopo Conservation Plan (2018) and bioregional plan is to inform land-use planning, environmental assessments and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land-use planning and decision-making guidelines. These are classified into different categories, namely Protected Areas, CBA1 areas, CBA2 areas, ESA1 areas, ESA2 areas, Other Natural Areas (ONAs) and areas with No Natural Habitat Remaining (NNR) based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

Figure 6-4 shows the project area superimposed on the Waterberg District Bioregional Plan and the Limpopo Conservation Plan (2018) CBA. The project area overlaps with an ESA1. ESAs are features that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or no necessary to meet them in natural or near-natural areas (SANBI, 2016). Any alteration to these features through landuse changes and other anthropogenic activities will result in the

loss of biodiversity targets and ecosystem functioning. The proposed development will lead to destruction of the ESA, and the footprint will no longer be congruent with this feature.

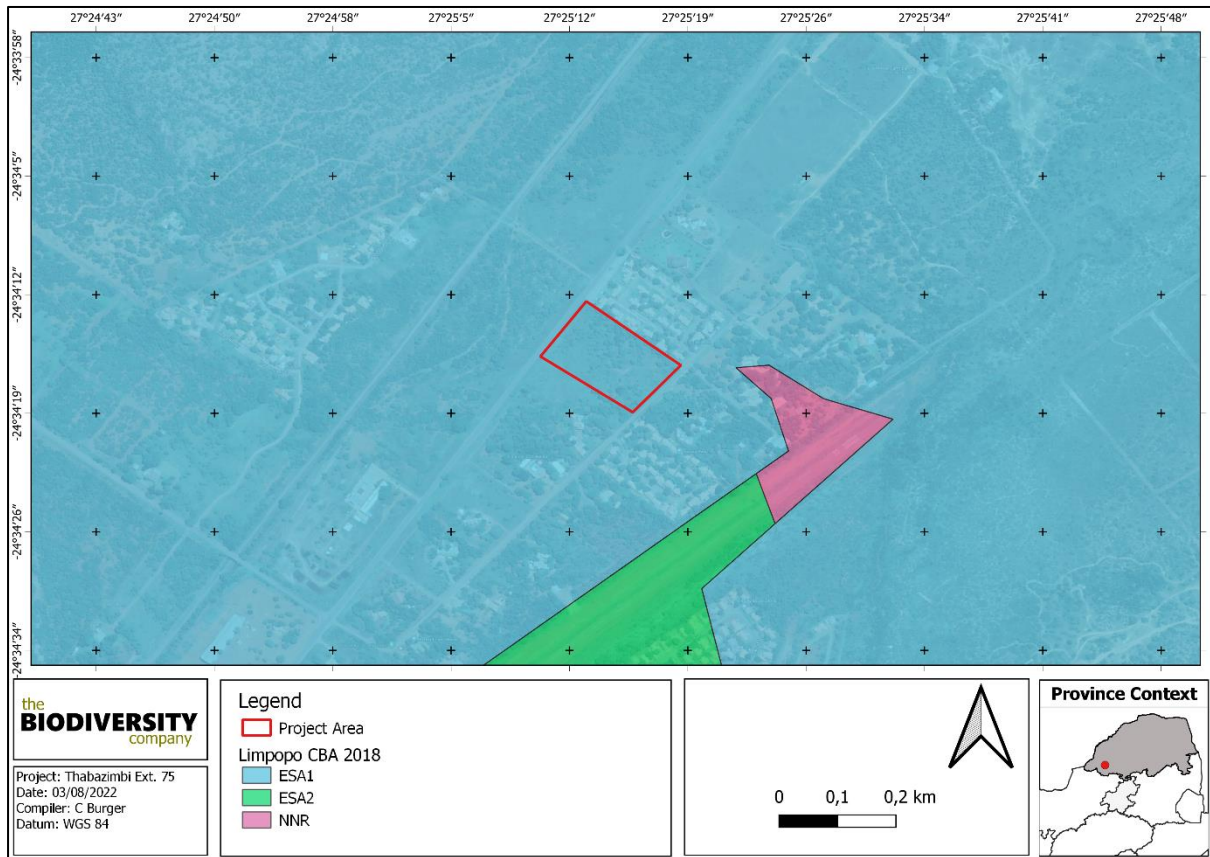


Figure 6-4 Map illustrating the project area in relation to the Limpopo CBA

### 6.1.5 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2017 (NPAES) were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for finescale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2017). The project area does not overlap with any NPAES areas (Figure 6-5).

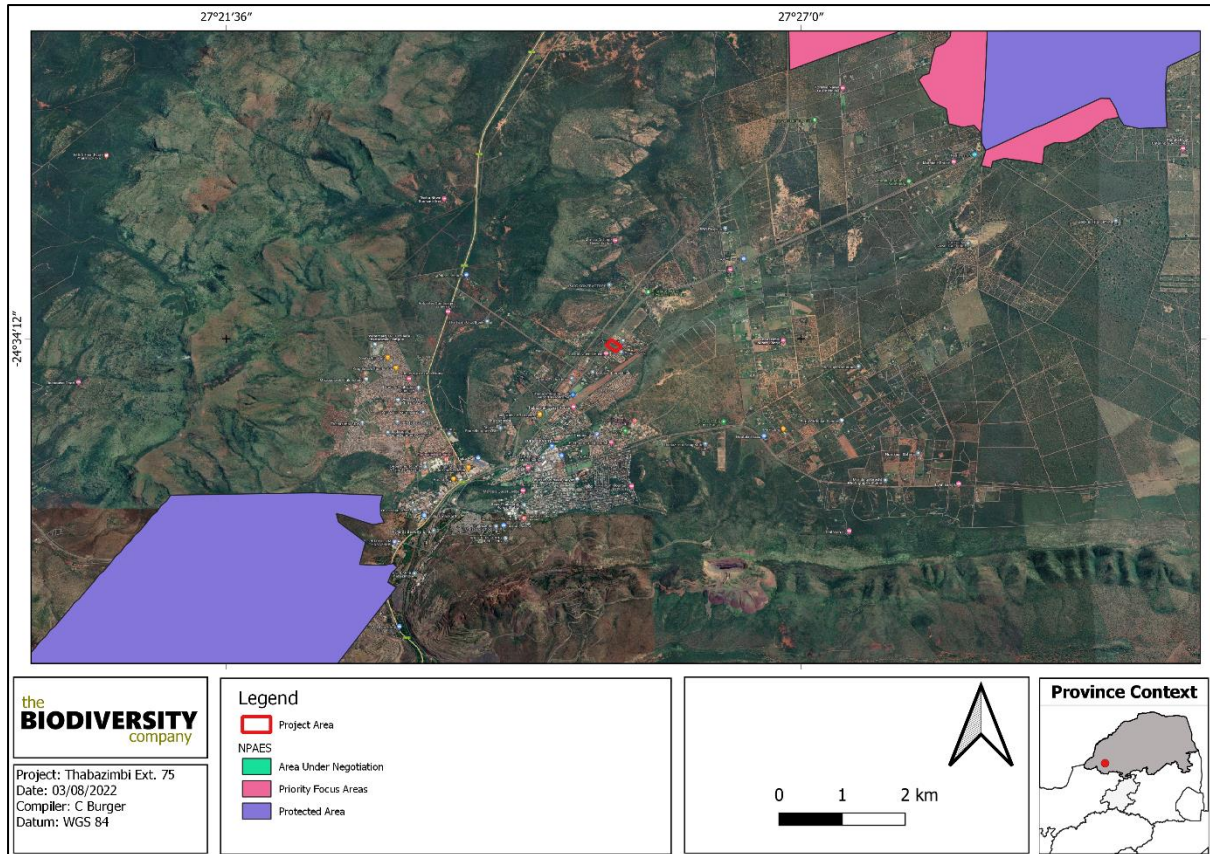


Figure 6-5 The project area in relation to the National Protected Area Expansion Strategy

### 6.1.6 Important Bird and Biodiversity Area

Important Bird & Biodiversity Areas (IBAs) are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (Birdlife, 2017). The project area is situated 6 km west of the nearest IBA, the Waterberg System (Figure 6-6).



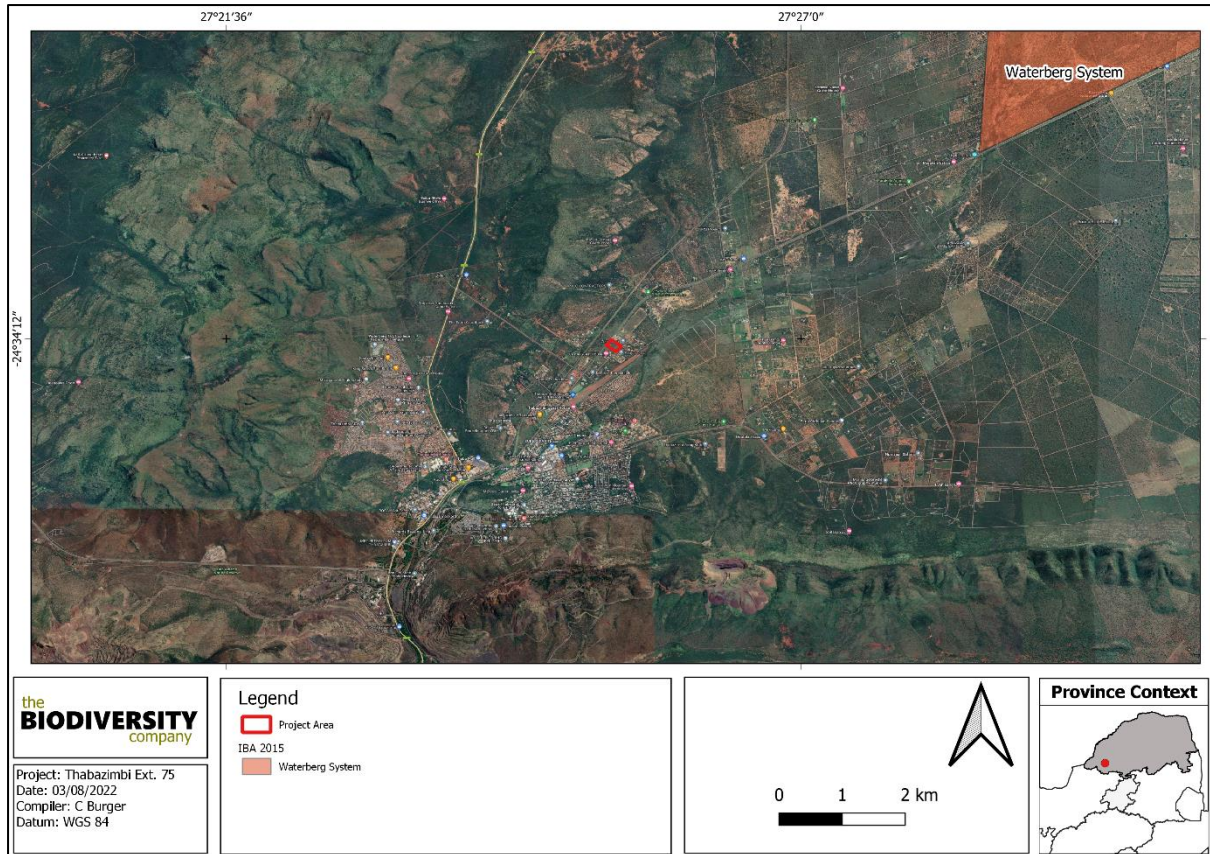


Figure 6-6 The project area in relation to the Waterberg System IBA

### 6.1.7 Hydrological Setting

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019). The project areas 500 m regulated area overlaps with an EN river (Figure 6-7).

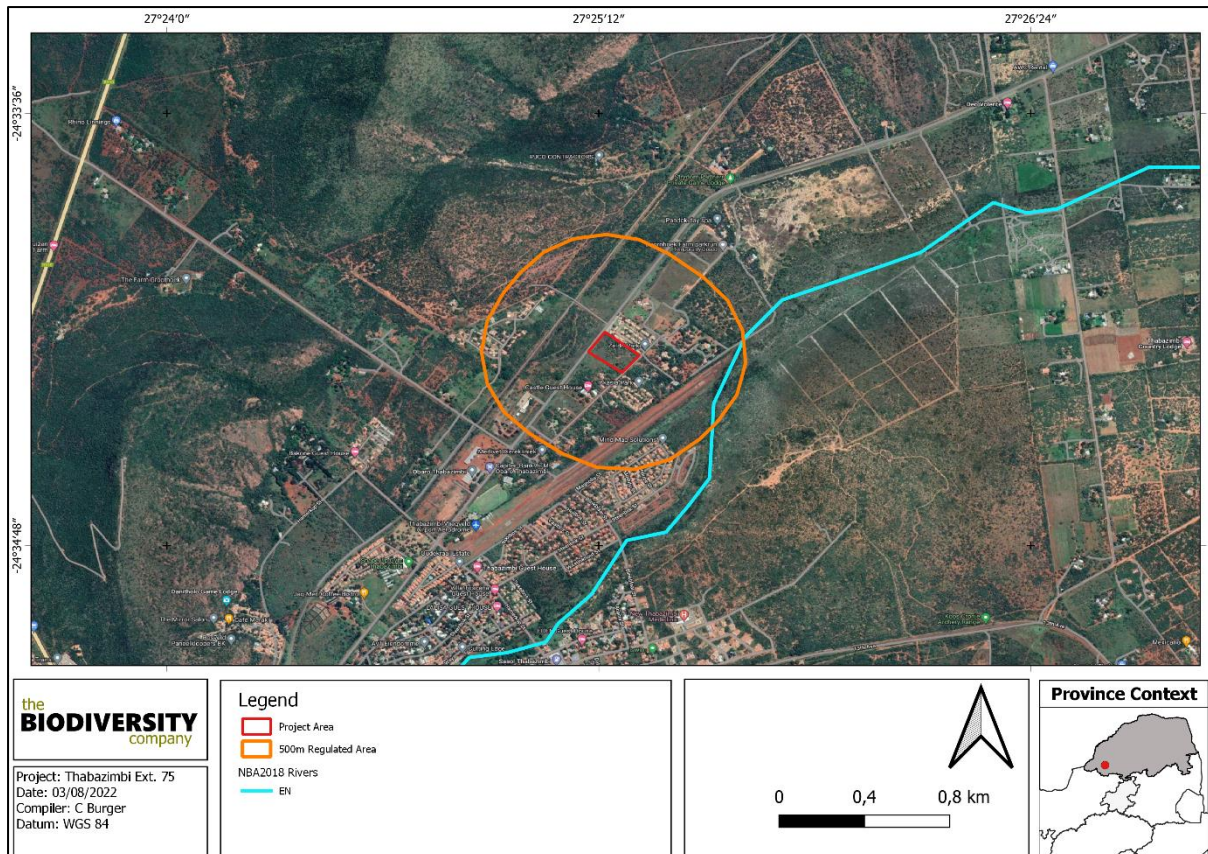


Figure 6-7 Map illustrating ecosystem threat status of rivers and wetland ecosystems in the project area

### 6.1.8 National Freshwater Ecosystem Priority Area Status

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

Figure 6-8 shows that the project areas 500 m regulated area overlaps with a non-FEPA River.

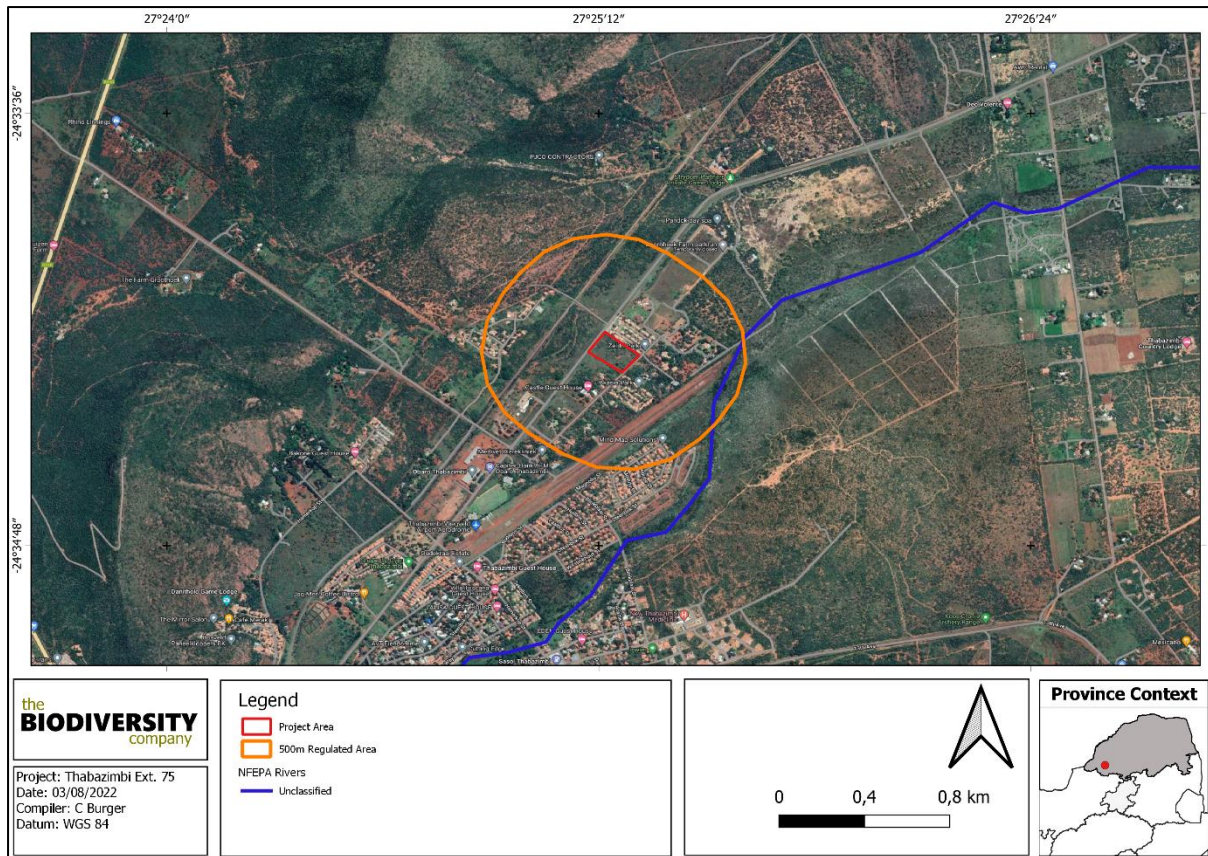


Figure 6-8 The project area in relation to the National Freshwater Ecosystem Priority Areas.

## 6.1.9 Flora Assessment

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

### 6.1.9.1 Vegetation Type

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

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

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

The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, over-topped by a discontinuous, but distinct woody plant layer. At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Acacia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

On a fine-scale vegetation type, the project area overlaps with the Western Sandy Bushveld (Figure 6-9).

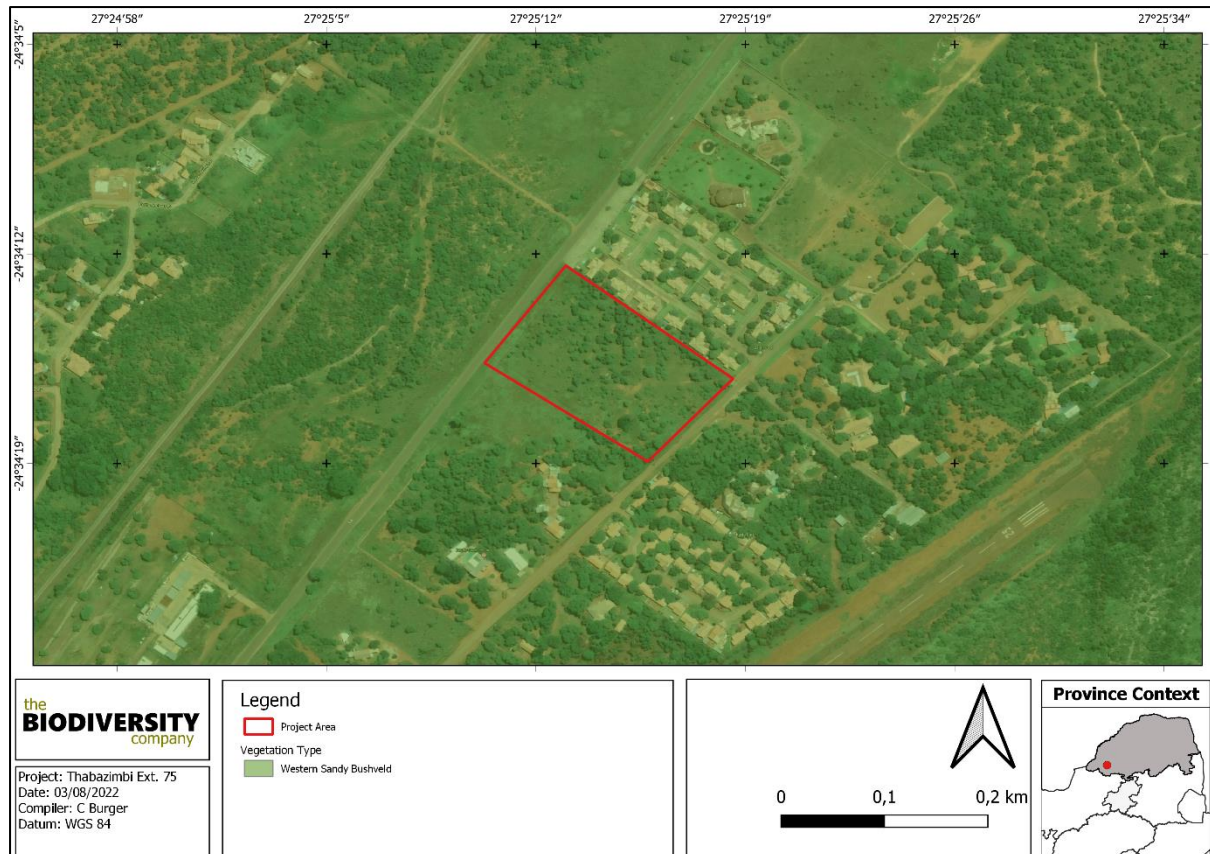


Figure 6-9 Map illustrating the vegetation type associated with the project area.

### 6.1.9.1.1 Western Sandy Bushveld

The Western Sandy Bushveld is characterised by tall open woodland to low woodland, with broad-leaved as well as microphyllous tree species being prominent. Dominant species include *Acacia erubescens* on flat areas, *Combretum apiculatum* on shallow soils of gravelly upland sites and *Terminalia sericea* on deep sandy soils (Mucina & Rutherford, 2006).

#### Important Taxa (d = dominant)

Tall Trees: *Acacia erioloba*, *A. nigrescens*, *Sclerocarya birrea* subsp. *caffra*.

Small Trees: *Acacia erubescens* (d), *A. mellifera* subsp. *detinens* (d), *A. nilotica* (d), *A. tortilis* subsp. *heteracantha* (d), *Combretum apiculatum* (d), *C. imberbe* (d), *Terminalia sericea* (d), *Combretum zeyheri*, *Lannea discolor*, *Ochna pulchra*, *Peltophorum africanum*.

Tall Shrubs: *Combretum hereroense* (d), *Euclea undulata* (d), *Coptosperma supra-axillare*, *Dichrostachys cinerea*, *Grewia bicolor*, *G. flava*, *G. monticola*.

Low Shrubs: *Clerodendrum ternatum*, *Indigofera filipes*, *Justicia flava*.

Graminoids: *Anthephora pubescens* (d), *Digitaria eriantha* subsp. *eriantha* (d), *Eragrostis pallens* (d), *E. rigidior* (d), *Schmidtia pappophoroides* (d), *Aristida congesta*, *A. diffusa*, *A. stipitata* subsp. *graciliflora*, *Eragrostis superba*, *Panicum maximum*, *Perotis patens*.

Herbs: *Blepharis integrifolia*, *Chamaecrista absus*, *Evolvulus alsinoides*, *Geigeria burkei*, *Kyphocarpa angustifolia*, *Limeum fenestratum*, *L. viscosum*, *Lophiocarpus tenuissimus*, *Monsonia angustifolia*.

#### Conservation Status

This vegetation is classified as LC, with a conservation target of 19% (Mucina & Rutherford, 2006). About 6% is statutorily conserved, just over half of which is in the Marakele National Park and approximately 4% is transformed, mainly by cultivation (Mucina & Rutherford, 2006).

### 6.1.9.2 Expected Flora Species

Based on the Plants of Southern Africa (BODATSA-POSA, 2019) database, over 300 plant species have the potential to occur within the project area and its surroundings. Of these species, three are listed as being an SCC. Table 6-2 below outlines the SCC species identified through the desktop assessment.

Table 6-2 Plant Species of Conservation Concern potentially occurring in the project area

Family	Taxon	Author	National Red-List (SANBI, 2016a)	IUCN	Ecology	Likelihood of Occurrence
Fabaceae	<i>Albizia tanganyicensis</i> subsp. <i>tanganyicensis</i>	Baker f.	NT	LC	Indigenous	Moderate
Fabaceae	<i>Albizia anthelmintica</i>	(A.Rich.) Brongn.	NT	LC	Indigenous	Moderate
Hyacinthaceae	<i>Albuca abyssinica</i>	Jacq.	NT	LC	Indigenous	Low

### 6.1.10 Faunal Assessment

Largely based on the South African Bird Atlas Project Version 2 (SABAP2, 2017), IUCN Digital Distribution Maps (IUCN, 2016), and the Animal Demography Unit (ADU, 2020) databases, Table 6-3 summarises the total number of animal species that have the potential to occur in or around the project area, and the corresponding number of SCC.

Table 6-3 Total number of potential fauna species present, and corresponding SCC

Fauna Type	Total Potential No.	Total SCC
Avifauna	258	8
Mammals	98	19
Herpetofauna (Reptiles and Amphibians)	132	5

These numbers exclude any animals that only occur within nature reserves and private reserves. Of the eight avifaunal SCC, three have a low-moderate likelihood of project area occurrence; *Neotis denhami* (Denham's Bustard), *Gyps coprotheres* (Cape Vulture), and *Gyps africanus* (White-backed Vulture). The other five SCC are unlikely to occur within the project area due to a lack of suitable habitat and the associated disturbed nature of the project area and surrounds (Table 6-4).

Table 6-4 Threatened avifauna species that may occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Sagittarius serpentarius</i>	Secretarybird	VU	EN	Low
<i>Neotis denhami</i>	Bustard, Denham's	VU	NT	Moderate
<i>Crithagra mozambica</i>	Seedeater, Protea (Canary)	NT	NT	Low
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	EN	Low
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC	Low
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN	Moderate

<i>Gyps africanus</i>	Vulture, White-backed	CR	CR	Moderate
<i>Brunhilda erythronotos</i>	Warbler, Knysna	VU	VU	Low

Of the nineteen total mammal SCC listed, none are expected to occur across the project area due to the area being fenced off and within a residential area.

No amphibian SCC are expected to occur within the project area while two reptile SCC; *Pseudocordylus transvaalensis* (Northern Crag Lizard) and *Lygodactylus waterbergensis* (Waterberg dwarf gecko) have a low-moderate likelihood of occurring across the project area (Table 6-5).

Table 6-5 Threatened reptile species that may occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Crocodylus niloticus</i>	Nile crocodile	VU	LC	Low
<i>Pseudocordylus transvaalensis</i>	Northern Crag Lizard	NT	LC	Low-Moderate
<i>Lygodactylus waterbergensis</i>	Waterberg Dwarf Gecko	NT	LC	Low-Moderate

## 6.2 Field Survey

This section details the observations recorded during an on-site field survey conducted to ground truth the floral, faunal, and habitat features of the project area. These observations pertain to the current state of the area as of July 2022.

### 6.2.1 Terrestrial Fauna and Flora

During the terrestrial survey the floral and faunal communities within the project area were assessed and photographs were captured, some of which are provided in this section of the report. For ease of reading, the observations and discussions pertaining to the floral and the faunal species recorded are separated below.

#### 6.2.1.1 Flora and Vegetation

During the field assessment one habitat unit was identified and included Degraded Bushveld habitat that encompasses the entire project area.

#### Degraded Bushveld Habitat

The whole project area comprised off degraded bushveld habitat (Figure 6-10). This habitat is regarded as areas that have been impacted on by historic mismanagement, land use and anthropogenic related activities. The habitat comprised of several indigenous tree species such as *Terminalia sericea*, *Vachellia erioloba*, *Combretum molle* and *Burkea africana*. Several graminoid species such as *Eragrostis curvula*, *Hyparrhenia hirta* and *Hyparrhenia anamesa* were observed across the area which are all considered to be Increaser 1, which are unpalatable, climax species commonly associated with areas being underutilised. This habitat isn't entirely transformed but in a constant disturbed state, as it can't recover to a more natural state due to ongoing disturbances and impacts received from anthropogenic activities.

It is important to note that the tree species *Vachellia erioloba* was found within the project area (Figure 6-11). The species is protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). In terms of the NFA, 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. The locations of the individuals recorded in the project area can be seen in Figure 6-12

The area is situated on the outskirts of the town Thabazimbi, and as such has been completely fragmented from large open natural areas. Additionally, the area has been fenced off and is being utilised for grazing (Figure 6-13). Historical impacts associated with the area also included the establishment of several residential developments adjacent to the project area which has led to edge effect such as alien and invasive proliferation in the area (Figure 6-14 and Figure 6-15).



*Figure 6-10 Degraded Bushveld habitat associated with the project area*



Figure 6-11 Protected Tree *Vachellia erioloba* (Camel Thorn) found within the project area

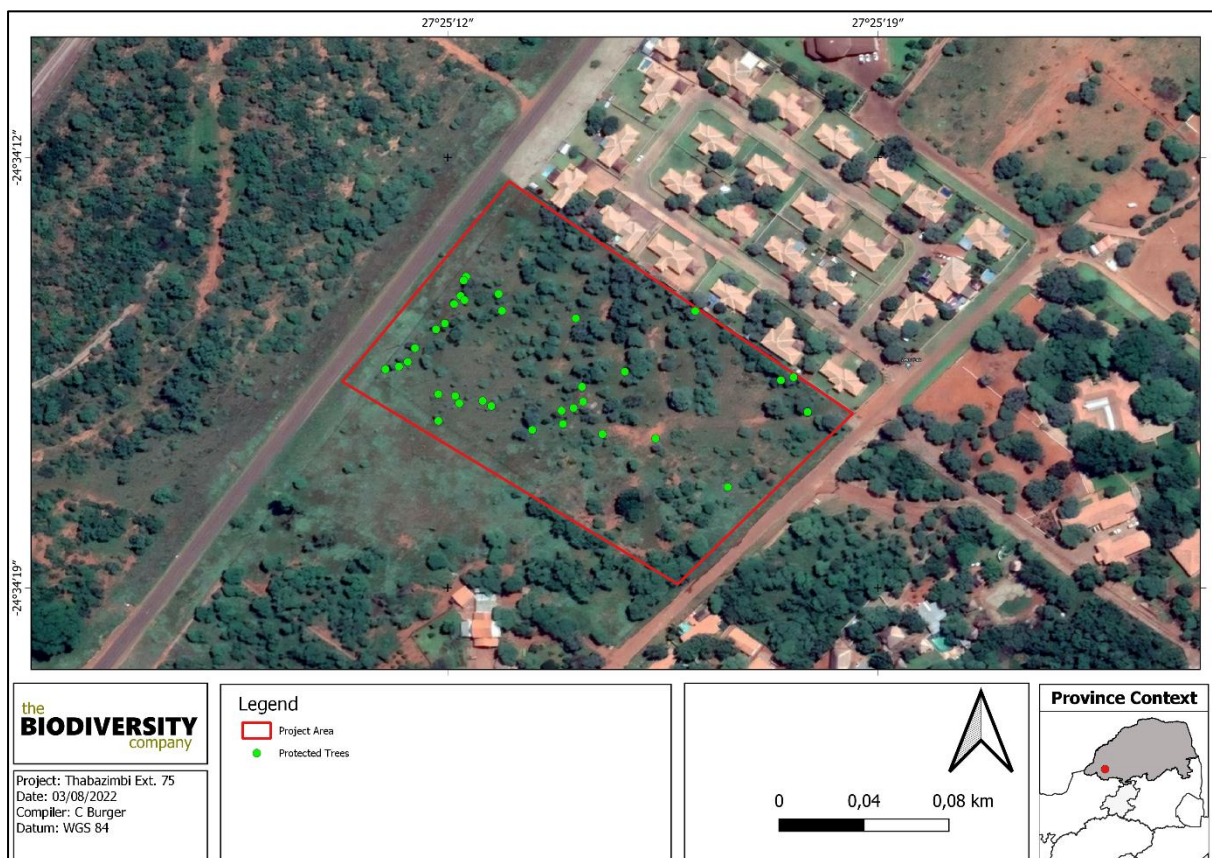


Figure 6-12 Location of protected trees within the project area





*Figure 6-13 Current grazing of the project area*



*Figure 6-14 Adjacent residential development*



Figure 6-15 Alien and invasive species, *Opuntia ficus-indica* observed within the project area

### 6.2.1.2 Fauna

Due to the project area being situated on the outskirts of the town of Thabazimbi only common faunal species associated with residential areas were observed during the assessment. Some of the species included Grey Lourie (*Corythaixoides concolor*), Common Bulbul (*Pycnonotus barbatus*), Cape Turtle Dove (*Streptopelia capicola*), Hoopoes (*Upupa africana*) and Rock Pigeons (*Columba guinea*) (Figure 6-16). No avifaunal SCC were observed; however, it is noted that certain local SCC may forage within the adjacent natural areas from time to time, as the town of Thabazimbi is situated close to the Waterberg IBA System.

Mammal activity was low and only one mammal species was observed during the assessment, *Tragelaphus angasii* (Nyala), which has been introduced to the area for grazing purposes (Figure 6-17). The low level of mammal activity can most likely be attributed to the fact that the project area is situated within a residential area and is fenced off. There is, however, the possibility of common mammal species being present. No herpetofauna species (reptiles and amphibians) were observed within the project area. However, there is the possibility of some common reptile species being present due to suitable habitat in the area. Certain reptile species are secretive and longer-term surveys are required in order to ensure adequate sampling. Due to the close proximity of the project area to town and the limited intact and suitable habitat found within the project area it is unlikely that any mammal or herpetofauna SCC will occur nearby.



Figure 6-16 Photographs illustrating some of the avifauna recorded across the project area. A) Cape Turtle Dove (*Streptopelia capicola*), B) Rock Pigeon (*Columba guinea*), C) Grey Lourie (*Corythaixoides concolor*), and D) Common bulbul (*Pycnonotus barbatus*).



Figure 6-17 *Tragelaphus angasii* (Nyala) observed within the project area

## 6.2.2 Habitat Survey and Site Ecological Importance

The main habitat types identified across the project area were initially identified and pre-delineated largely based on aerial imagery from early 2022. These habitat types were then refined based on the field coverage and data collected during the survey. A single habitat unit was delineated for the project area: degraded bushveld habitat.

The degraded bushveld habitat encompasses the whole project area. Impacts recorded across this area include the fact that the area is situated on the outskirts of the town Thabazimbi, and as such has been completely fragmented from large open natural areas. Additionally, the area has been fenced off and is being utilised for grazing. Historical impacts associated with the area also included the establishment of several residential developments adjacent to the project area which has led to edge effect such as alien and invasive proliferation in the area.

Based on the criteria provided in section 4.5 of this report, the delineated habitat type has been allocated a sensitivity category, or SEI, and this breakdown is presented in Table 6-6 below. In order to identify and spatially present sensitive features in terms of the relevant specialist discipline, the sensitivities of each of the habitat type delineated within the project area are mapped in Figure 6-18.

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

Table 6-6 *Site Ecological Importance assessment summary of the habitat types delineated within the project area*

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Degraded Bushveld	Low - No confirmed or highly likely populations of	Low - Almost no habitat connectivity but	Low	Medium	Low

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
	SCC. No confirmed or highly likely populations of range-restricted species.	migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area.			

Consider the following guidelines when interpreting SEI in the context of any proposed development or disturbance activities:

- Low: Minimisation and restoration mitigation - Development activities of medium to high impact acceptable followed by appropriate restoration activities.

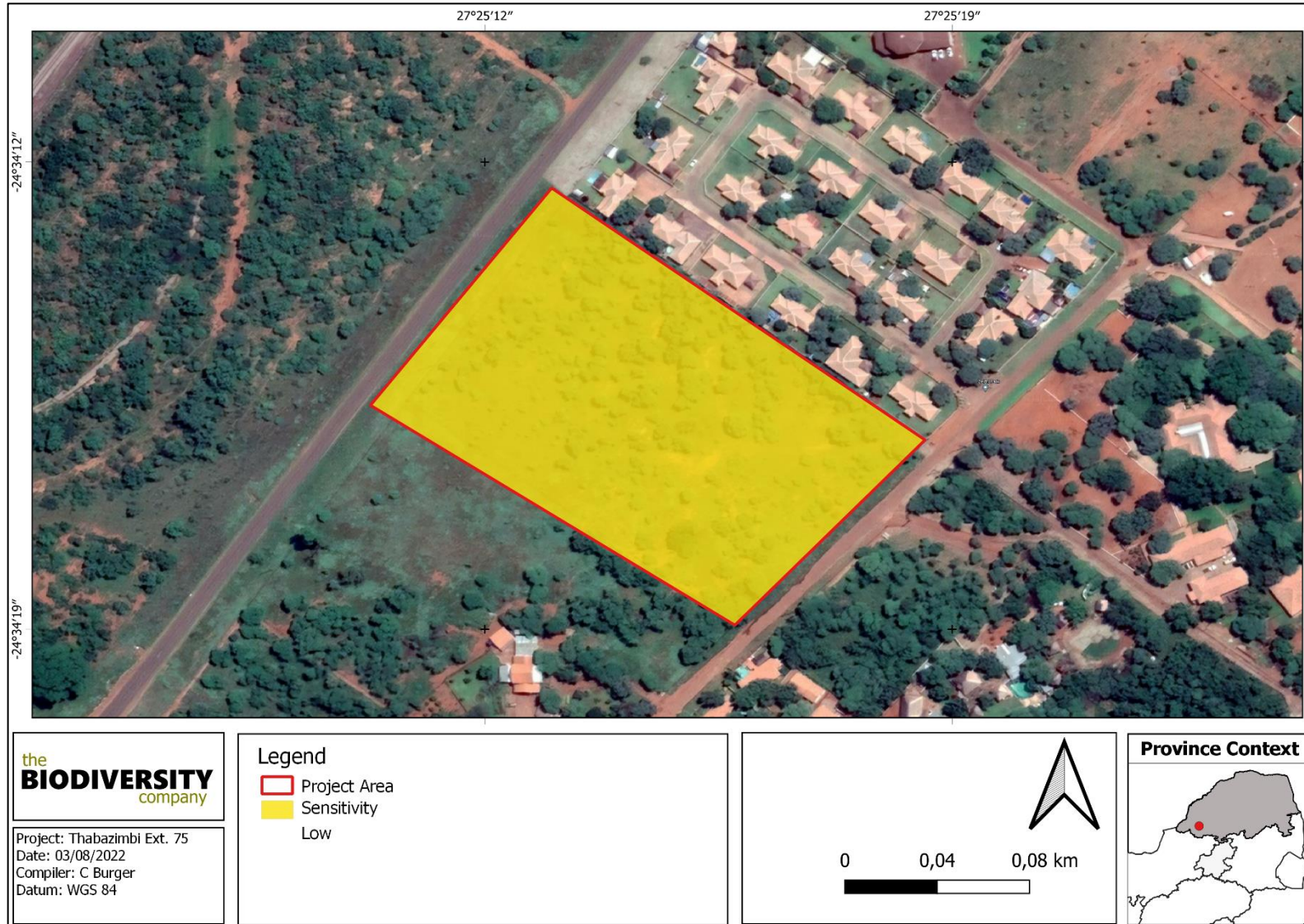


Figure 6-18 Map illustrating the Site Ecological Importance of the project area

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The terrestrial biodiversity theme sensitivity as indicated in the screening report (compiled by the National Web based Environmental Screening Tool) was derived to be 'Very High' (Figure 6-19), mainly due to the fact that the project area lies within an ESA1.

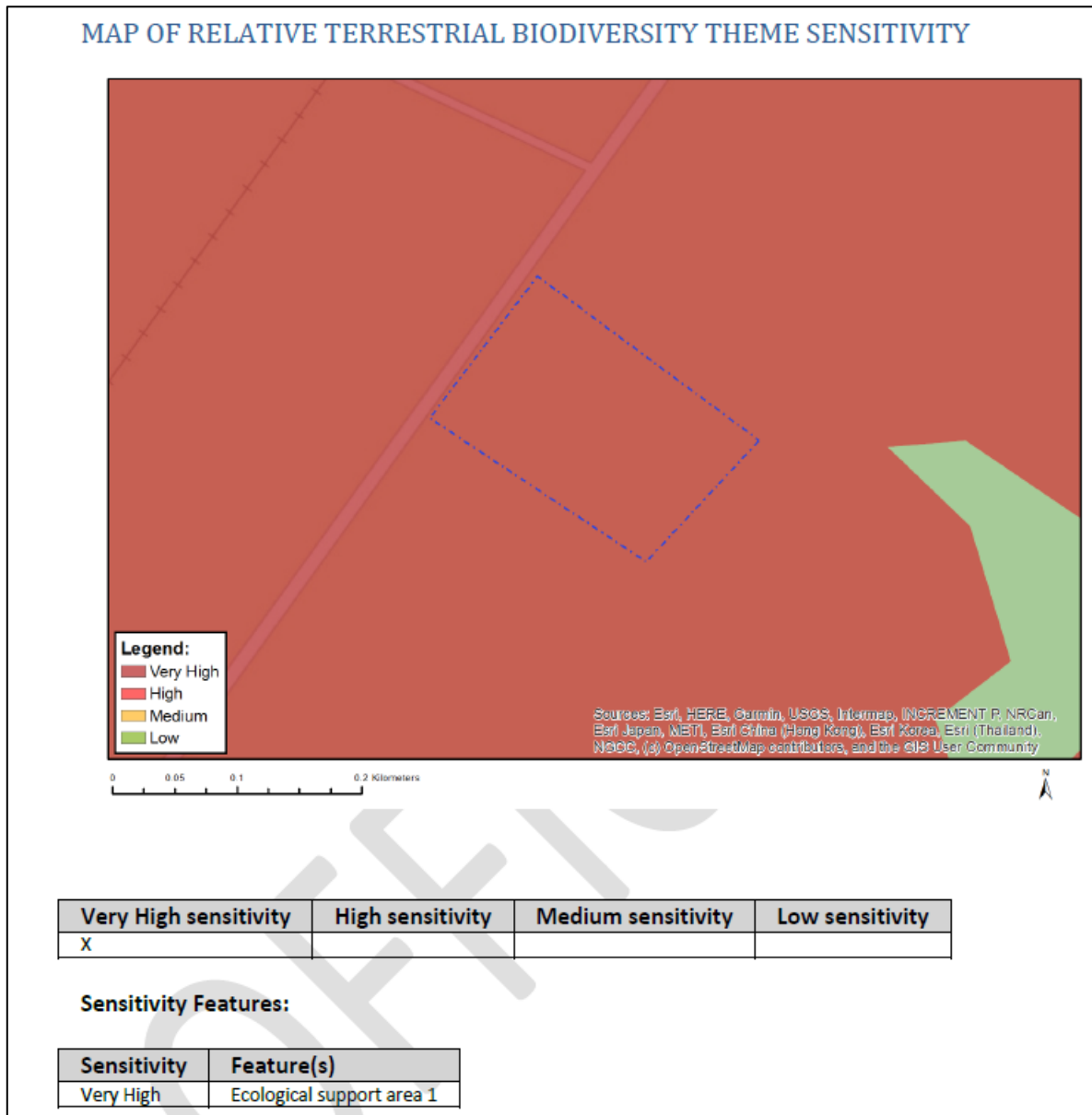


Figure 6-19 Biodiversity Sensitivity of the project area according to the Screening Report

The completion of the terrestrial desktop and field studies disputes the 'Very High' sensitivity presented by the screening report. As discussed above, the project area is largely degraded and as such is assigned a sensitivity rating of 'Low'.

The screening report classified the animal species theme sensitivity as being of a 'Medium' sensitivity and the plant species theme as 'Low' sensitivity. Following the findings of the field survey, both the animal and plant species themes may be classified as having 'Low' sensitivities. This is due to the fact that there is very little suitable habitat available to support the occurrence of any SCC within the project area and its isolation from natural habitats within the broader landscape.



## 7 Proposed Impact Management Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr) for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 7-1 presents the recommended mitigation measures and the respective timeframes, targets, and performance indicators relative to the terrestrial study.

The focus of mitigation measures is to reduce the significance of expected impacts associated with the development and thereby to:

- Prevent the further loss and fragmentation of vegetation communities within the adjacent natural areas in the vicinity of the project area;
- Reduce the negative fragmentation effects of the development and enable the safe movement of faunal species; and
- Prevent the direct and indirect loss and disturbance of floral and faunal species and communities (including any potential Species of Conservation Concern).

Special attention must be paid to the 'Vegetation and Habitats' and 'Fauna' sections below as these sections provide recommended and important mitigation measures pertaining to the protected species that occur within the project area.

Table 7-1 Mitigation measures from the terrestrial assessment; including requirements for timeframes, roles, and responsibilities

Management outcome: Vegetation and Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
It is recommended that areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon. Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further.	Planning Phase, Construction Phase	Project manager, Environmental Officer	Construction footprint	During phase
	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles. All laydown, chemical toilets etc. should be restricted to 'Low' sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded.	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	During phase
	Construction/Operational Phase	Environmental Officer & Design Engineer	Laydown areas and material storage & placement	During phase
Areas that are denuded during construction that are not within the proposed footprint area need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds and to support the adjacent habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. It should be made an offence for any staff to take/bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair. A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas.	Life of operation	Environmental Officer & Contractor	Leaks and spills	Ongoing
	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping	Ongoing
<ul style="list-style-type: none"> <li>The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.</li> <li>Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.</li> <li>No servicing of equipment is to take place on site unless necessary.</li> </ul>	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping	Ongoing

<ul style="list-style-type: none"> <li>All contaminated soil shall be treated in situ or removed and be placed in containers.</li> <li>It is important to appropriately contain any diesel storage tanks and/or machinery spills (e.g., accidental spills of hydrocarbons, oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.</li> </ul>	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
<p>Consult a fire expert and compile and implement a fire management plan to minimise the risk of veld fires around the project area.</p> <p>Any individual of the protected plants that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any protected trees in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. Where possible, large <i>Vachellia erioloba</i> individuals must be incorporated into the layout design and/or landscaping.</p>	Life of operation	Project manager, Environmental Officer	Protected Tree species	Ongoing

**Management outcome: Fauna**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this. These actions are illegal in terms of provincial environmental legislation.</p> <p>A qualified environmental control officer must be on site when clearing begins. The area must be walked through by a qualified ecologist prior to construction to ensure that no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.</p> <p>Any holes/deep excavations must be dug in a progressive manner in order to allow burrowing animals time to move off and to prevent trapping. Should the holes remain open overnight they must be covered temporarily to ensure no fauna species fall in.</p> <p>The proposed area to be developed must be disturbed by walking the area, prior to clearing of the area. This will allow fauna to move off from the area.</p> <p>The areas to be developed (or activity areas) must be specifically demarcated to prevent the movement of staff or equipment/vehicles into the surrounding environments. Signs must be put up to enforce this.</p>	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
	Pre-Construction, Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal species	During phase
	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
	Life of Operation	Environmental Officer, Contractor, and estate manager	Fauna	Construction phase
	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into surrounding areas	During phase

The duration of the construction should be minimized to as short a term as possible, to reduce the period of disturbance on fauna.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Construction timeframe	During phase
Outside lighting should be designed and limited to minimize impacts on fauna. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Light pollution and period of light	During phase
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. Speed bumps should be built to force slow speeds.	Construction Phase	Health and Safety Officer	Compliance to the training	During phase
Noise must be kept to a minimum during the evenings/ at night to minimize all possible disturbances to amphibian species and nocturnal mammals.	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
Signs must be put up in order to show the importance and sensitivity of surrounding areas and their functions.	Life of operation	Environmental Officer	Presence and condition of signs	Ongoing
Only use environmentally friendly dust suppressant products.	Construction and operation	Environmental Officer & Contractor, Engineer	Presence of chemicals in and around the project area	Ongoing

**Management outcome: Alien Vegetation and Fauna**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
The implementation of an Alien Invasive Plant management plan is important, especially because of the invasive species identified on site which, if left unchecked, will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within the project area.	Life of operation	Project manager, Environmental Officer & Contractor	Assess and control presence and encroachment of alien vegetation	Quarterly monitoring
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas.	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	During phase

**Management outcome: Dust**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Dust-reducing mitigation measures must be put in place and must be strictly adhered to, particularly for all dirt roads and any earth dumps. This includes the wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated. Only environmentally friendly suppressants may be used to avoid the pollution of water sources. Speed limits	Construction Phase and Life of operation	Contractor	Dustfall	Ongoing, as per a dust monitoring program

must be put in place to reduce erosion, and speed bumps should also be constructed.				
<b>Management outcome: Waste Management</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.</p> <ul style="list-style-type: none"> <li>• Refuse bins must be emptied and secured;</li> <li>• Recycling must be encouraged</li> <li>• Temporary storage of domestic waste shall be in covered waste skips; and</li> <li>• Maximum domestic waste storage period must be 10 days.</li> </ul> <p>Any litter, spills, fuels, chemical and human waste in and around the project area must be removed and disposed of timeously and responsibly.</p> <p>It must be made an offence to litter or dump any material outside of specially demarcated and managed zones. Signs and protocols must be established to explain and enforce this.</p> <p>Portable toilets must be provided in the ratio provided in the Health and Safety Act. Portable toilets must be regularly pumped dry to ensure that the system does not degrade over time and spill into the surrounding area.</p> <p>The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.</p> <p>Where a registered disposal facility is not available close to the project area, the Contractor/property owner shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site. Waste may never be stored in an open pit where it is susceptible to the elements such as wind and rain.</p>	Life of operation	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation
	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
	Life of operation	Contractor, Environmental Officer & Health and Safety Officer	Presence of Waste and Dumping	Daily, Ongoing
	Construction Phase	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
	Life of operation	Environmental Officer & Health and Safety Officer, Contractor	Availability of bins and the collection of waste	Ongoing
Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of waste	Ongoing	
<b>Management outcome: Environmental Awareness Training</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All personnel are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on all sensitive environmental receptors within the project area to inform contractors and site staff of the presence of sensitive	Life of operation	Environmental Officer, Health and Safety Officer	Compliance to the training	Ongoing

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habitat features, and management requirements in line with the Environmental Authorisation and within the EMP.

## 8 Conclusion

The majority of the project area has historically been exposed to various forms of anthropogenic related impacts and as such remain in a degraded state. It does, however, remain important that the management outcomes presented above be adhered to, in order to mitigate the negative expected environmental impacts that will stem from the development activities. These include:

- The loss and fragmentation of vegetation communities;
- The safe movement of faunal species; and
- The direct and indirect loss and disturbance of floral and faunal species and communities.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The project area has instead been assigned a 'Low' sensitivity, due to the fact that the project area is situated within a residential area and has subsequently been exposed to various anthropogenic activities rendering the area in a degraded state and unlikely to provide habitat to SCC.

### 8.1 Specialist Recommendations

The degraded Bushveld habitat that is classified as having a sensitivity rating of "Low" is likely to face minimal further impacts from any development activities in terms of terrestrial ecology. As such, it is the specialist's opinion that the proposed project can proceed on the condition that the recommendations made within this report as well as the prescribed mitigation measures be adhered to.

The project area occurs within the 500 m regulation area of a river and as such in accordance with GN 509 of the National Water Act (Act no. 36 of 1998) a General Authorisation (GA) may be required.

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## 10 Appendix A: Specialist Declarations

### DECLARATION

I, Carami Burger, declare that:

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

*CB*

Carami Burger

Ecologist

The Biodiversity Company

August 2022

## DECLARATION

I, Andrew Husted, declare that:

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



Andrew Husted

Ecologist

The Biodiversity Company

August 2022

## 11 Appendix F Specialists CVs

# Carami Burger

B.Sc. Honours – Ecological Interactions and  
Ecosystem Resilience (Cum Laude)

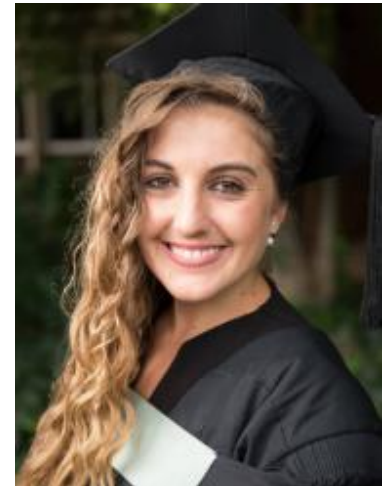
(Cand Sci Nat)

Cell: +27 83 630 9077

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

Identity Number: 9606250185084

Date of birth: 25 June 1996



### Profile Summary

Working experience in South Africa and Mozambique.

Specialist experience with infrastructure development, road development, renewable energy, mining and prospecting.

Specialist expertise include terrestrial ecology, wetland resources, rehabilitation and management plans, environmental compliance and monitoring.

### Areas of Interest

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

### Key Experience

- Environmental Impact Assessments (EIA)
- Basic Assessments
- Terrestrial Ecological Assessments
- Wetland Delineation and Ecological Assessments
- Environmental Management Programmes (EMPr)
- Rehabilitation Plans
- Invasive Species Plans
- Search and Rescue Plans
- Environmental Compliance Audits
- Water Use License Applications
- Dust Fallout Monitoring
- Water Quality Monitoring

### Countries worked in

South Africa  
Mozambique

### Nationality

South African

### Languages

English – Proficient  
Afrikaans – Proficient

### Qualifications

- BSc Hons Ecological Interactions and Ecosystem Resilience.
- BSc Botany and Zoology.
- Cand Sci Nat (121757)

## **SELECTED PROJECT EXPERIENCE**

### **Project Name: The Central Térmica de Temane (CTT) Project - Management Plans**

**Client:** TSK

**Personal position / role on project:** Author

**Location:** Inhambane Province, Mozambique

**Main project features:** Compile a Plant Search and Rescue Plan, Site Clearance Plan, Invasive Alien Species Plan and a Rehabilitation Plan for the Central Térmica de Temane (CTT) project

### **Project Name: The Central Térmica de Temane (CTT) Project - Flora and Fauna Survey and Report**

**Client:** TSK

**Personal position / role on project:** Terrestrial Specialist

**Location:** Inhambane Province, Mozambique

**Main project features:** Conduct a Flora and Fauna survey and report during the dry and wet season for the Central Térmica de Temane (CTT) project, located in the vicinity of the town of Inhassoro, Inhambane Province, Mozambique

### **Project Name: Sikhwetha Lodge - Ridge and Terrestrial Ecological Assessment**

**Client:** Neels Bezuidenhout Architects

**Personal position / role on project:** Terrestrial Specialist

**Location:** Roodeplaat, Gauteng

**Main project features:** Conduct a Ridge And Terrestrial Ecological Assessment as part of the Environmental Authorisation process for the proposed Sikhwetha Lodge located on Portion 2 of the Farm Doornfontein 291 JR.

### **Project Name: Rama City Bulk Service Infrastructure Development - Watercourse Delineation and Assessment**

**Client:** RCDC

**Personal position / role on project:** Wetland Ecologist

**Location:** Ga-Rankuwa Gauteng

**Main project features:** Conduct a Watercourse Delineation and Assessment for the Rama City Bulk Service Infrastructure Development.

### **Project Name: Katoloso Minerals Prospecting Right – Terrestrial and Wetland Ecological Opinion**

**Client:** Katoloso Minerals



Personal position / role on project: Terrestrial/ Wetland Ecologist

Location: Ventersdorp North West

Main project features: To conduct a terrestrial and wetland ecological opinion for the proposed Prospecting Right.

**Project Name: Wetland Assessment as part of the Environmental Authorisation process for the proposed construction of residential units on Portion 9 of the farm Olievenhoutbosch 389-JR, Gauteng Province.**

Personal position / role on project: Avifaunal specialist

Location: Olievenhoutbosch, Gauteng Province.

Main project features: To conduct a wetland assessment for the proposed construction of residential units.

**Project Name: Copperton Wind Farm Project - Rehabilitation Method Statement**

Personal position / role on project: Terrestrial Ecologist

Location: Copperton Northern Cape Province.

Main project features: To compile a rehabilitation method statement for the Copperton Wind Farm Project located on the farm Nelspoortjie (Farm No. 103 Portion 4 (a portion of portion 2) and 7 (a portion of portion 5) near Copperton in the Northern Cape Province.

**Project Name: Wonderfontein Road Diversion - Terrestrial Ecological Scan**

Personal position / role on project: Terrestrial Ecologist.

Location: Belfast, Mpumalanga Province

Main project features: To conduct a terrestrial ecological scan as part of the Environmental Authorisation Process for the Proposed Wonderfontein Road Diversion Near Wonderfontein Colliery.

**Project Name: Terrestrial Ecological Report for the proposed construction of a crematorium on a portion of the remaining extent of the Farm Vulcania 279 IR, Gauteng Province**

Personal position / role on project: Terrestrial Ecologist

Location: Springs, Gauteng

Main project features: Conduct a detailed terrestrial ecology basic assessment for the proposed construction of a crematorium.

**Project Name: Wetland study as part of the Environmental Authorisation process for the proposed construction of a crematorium on a portion of the remaining extent of the Farm Vulcania 279 IR, Gauteng Province.**

Personal position / role on project: Wetland Ecologist

Location: Springs, Gauteng

Main project features: To conduct a wetland delineation and ecological assessment for the proposed construction of a crematorium.

## OVERVIEW

An overview of the specialist technical expertise includes the following:

- Terrestrial Ecological Assessments.
- Faunal surveys which include mammals, birds, amphibians and reptiles.
- Wetland Ecological Assessment.
- Management plan compilation (Plant Search and Rescue, Rehabilitation, Site Clearance, Alien Invasive Species Plans).
- Compliance audits.
- Water Use Licenses.
- Water Quality and Dust Fall Monitoring.

## EMPLOYMENT EXPERIENCE

### **CURRENT EMPLOYMENT: The Biodiversity Company (May 2022 - Present)**

Terrestrial Ecological Assessments, Wetland Ecological Assessment and management Plans.

### **EMPLOYMENT: EP3 Environmental - Senior Consultant and Ecologist (June 2019 - April 2022)**

Responsibilities:

- Specialist studies
- Environmental Procedures
- Basic Assessment Reports
- Environmental Impact Assessment Reports
- Water Use License Applications
- Environmental Management Programmes
- Environmental Control Officer Audits and Reports
- Surface Water Quality Monitoring Reports
- Groundwater Quality Monitoring Reports
- Dust Fallout Monitoring Reports

### **EMPLOYMENT: Scientific Aquatic Services (SAS)- Internship (November 2018 - June 2019)**

Responsibilities:

- Specialist studies
- Background Information, Mapping (ArcGIS) and Desktop Studies

## **ACADEMIC QUALIFICATIONS**

**North-West University of Potchefstroom (2017):** BACCALAUREUS SCIENTIAE IN NATURAL AND ENVIRONMENTAL SCIENCES. Majors: Botany and Zoology.

**North-West University of Potchefstroom (2013):** BACCALAUREUS SCIENTIAE HONORIBUS (Hons) – Ecological Interactions and Ecosystem Resilience (Cum Laude)

Title: Mini-Dissertation on ecological information in Environmental Impact Assessments (EIA) at Mooi River Mall.

# Andrew Husted

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

Cell: +27 81 319 1225

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

Identity Number: 7904195054081

Date of birth: 19 April 1979



### Profile Summary

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

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

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

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

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

### Areas of Interest

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

Publication of scientific journals and articles.

### Key Experience

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

### Country Experience

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

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Conversational

German - Basic

### Qualifications

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

## SELECTED PROJECT EXPERIENCE

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

Client: WSP

Personal position / role on project: Project Manager.

Location: Swaziland

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

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

Client: IHE Delft Institute for Water Education

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

Location: Tanzania

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

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

Client: WSP

Personal position / role on project: Project Manager.

Location: Mozambique

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

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

Client: SRK Consulting.

Personal position / role on project: Project Manager.

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

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

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

Client: WSP.

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

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

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

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

Client: Mott MacDonald.

Personal position / role on project: Project Manager.

Location: Sofala Province, Mozambique (2017).

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

**EMPLOYMENT EXPERIENCE**

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

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

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

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

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

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

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

- **Project management** for single as well as multi-disciplinary studies on a national and international scale. This included legislation and commitments for the respective country being operated in, as well as included the World Bank (WB), EP and IFC requirements.
- **Individual and/or team management** in order to provide mentoring and supportive structures for development and growth in support of the company's strategic objectives.
- **Scientific report writing** to ensure that the relevant standards and requirements have been attained, namely local country legislation, as well as WB, EP and IFC requirements.

- **Report reviewing** in order to ensure compliance and consideration of relevant legislation and guidelines and also quality control.
- **Specialist management** to facilitate the collaboration and integration of specialist skills for the respective projects. This also included the development of Biodiversity and Land Management Plan for clients.
- **Client Resource Manager** for numerous clients in order to establish as well as maintain working relationships.

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

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

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

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

#### **ADDITIONAL EXPERIENCE**

<i>Compliance audits</i>	Conducting site investigations in order to determine the level of compliance attained, ensuring that the client maintains an appropriate measure of compliance with environmental regulations by means of a legislative approach
<i>Control officer</i>	Acting as an independent Environmental Control Officer (ECO), acting as a quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts
<i>Screening studies</i>	Project investigations in order to determine the level of complexity for the environmental and social studies required for a project. This is a form of risk assessment to guide the advancement of the project.
<i>Public consultation</i>	The provision of specialist input in order to communicate project findings as well as assist with providing feedback if and when required.

<b>Water use licenses</b>	Consultation with the relevant authorities in order to establish the project requirements, as well as provide specialist (aquatics/wetland) input for the application in order to achieve authorisation.
<b>Closure</b>	Primarily the review of closure projects, with emphasis on the closure cost calculations. Support was also provided by assisting with the measurements of structures during fieldwork.
<b>Visual</b>	The review of visual studies as well as the collation of field data to be considered for the visual interpretation for the project.

## ACADEMIC QUALIFICATIONS

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

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

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

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

## PUBLICATIONS

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

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

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

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

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

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