



## **TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED GHANJA MINING PERMIT**

**Ingquza Hill Local Municipality, OR Tambo District  
Municipality, Eastern Cape Province, South Africa**

03 June 2024

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<b>Report Name</b>	<b>TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED GHANJA MINING PERMIT</b>	
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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, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>	

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## 1 Introduction

### 1.1 Background

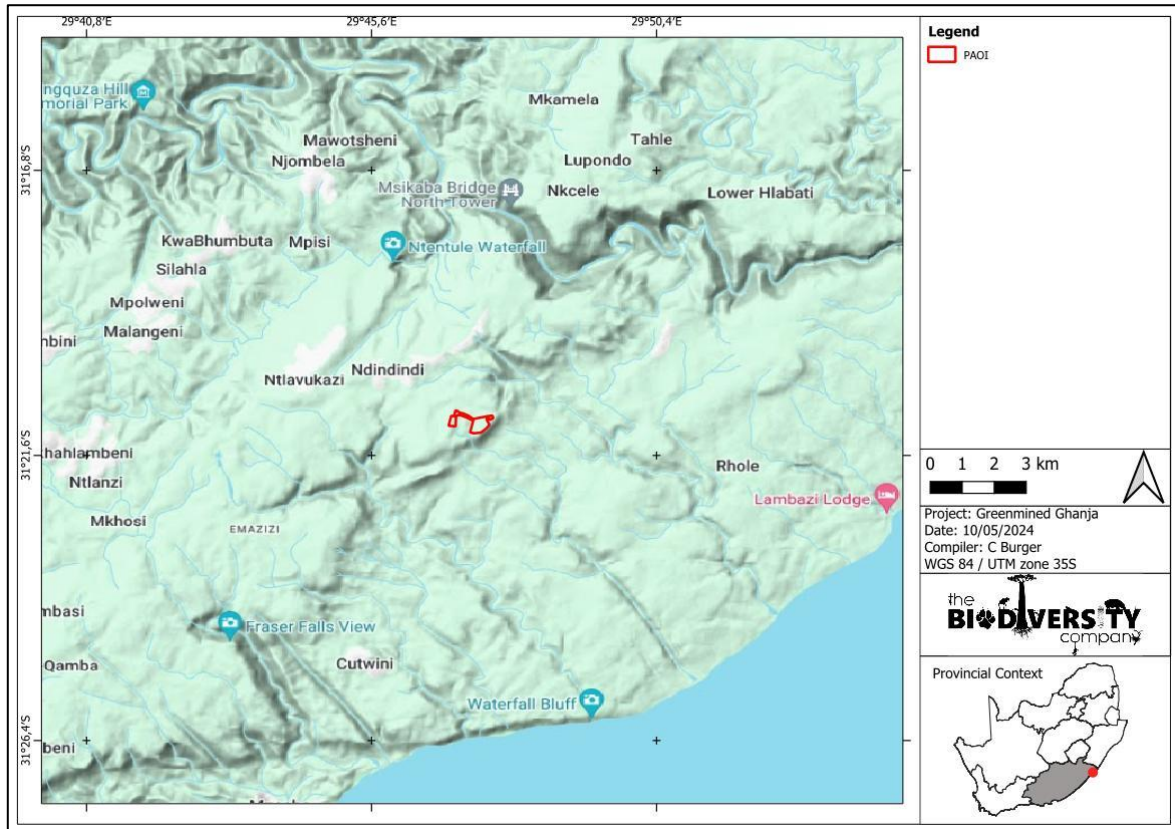
The Biodiversity Company was appointed to undertake a Terrestrial Biodiversity Assessment for the proposed Ghanja Mining Permit Project. The applicant is proposing to apply for a mining permit to mine stone aggregate/ gravel on a portion of Remaining Extent of the Farm 89, Ngquza Hill Local Municipality, Eastern Cape Province.

According to Greenmined (2024): The proposed mining footprint will be 5 ha and will be developed over an undisturbed area of the farm. The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries. The assessment will include the proposed quarry, stockpile area and road. This area will collectively be referred to as the Project Area of Influence (PAOI). The regional context of the PAOI can be seen in Figure 1-1. The proposed PAOI can be seen illustrated in Figure 1-2.

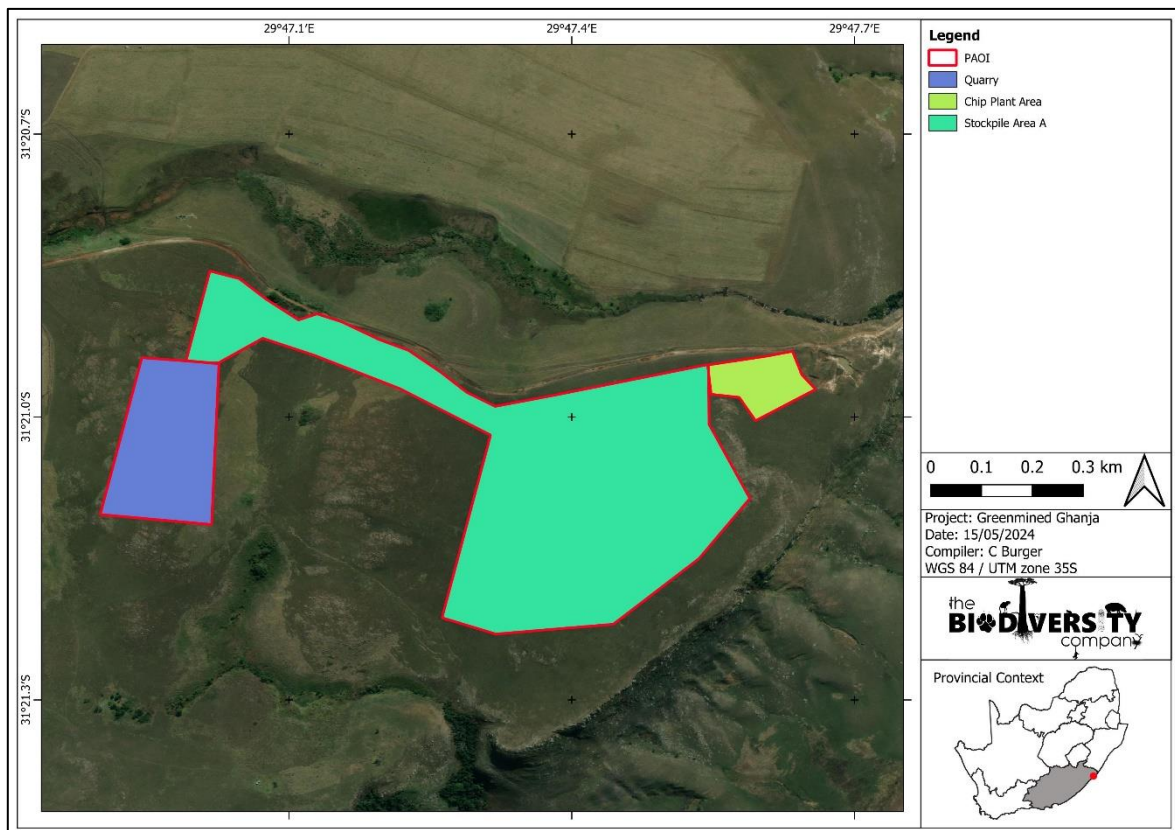
The National Web based Environmental Screening Tool has characterised the Terrestrial Theme Sensitivity of the PAOI as “Very High”. Accordingly, this assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) and GN 1150 (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” (Reporting Criteria).

The purpose of the specialist studies is to provide relevant input into the impact assessment process and to provide a report for the proposed activities associated with the development. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.





**Figure 1-1** Map illustrating the regional context of the PAOI.



**Figure 1-2** Map illustrating the layout associated with the PAOI.

## 1.2 Scope of Work

The aim of the biodiversity assessment was to provide information to guide the risk of the proposed activity to the current state of the associated ecosystems within the development area. This was achieved through the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the PAOI and surrounding landscape;
- Desktop assessment to compile an expected species list and identify possible Species of Conservation Concern (SCC) that occur within the PAOI and surrounding landscape;
- Field survey to record flora and fauna species, especially Species of Conservation Concern (SCC);
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity;
- A biodiversity impact assessment; and
- The prescription of mitigation measures for identified risks, including assigning buffer areas, where necessary.

## 1.3 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client/developer is accurate;
- The specialist was not provided with a project description, architectural plan or any engineering drawings with regard to the planned development activities and, as such, the potential impacts arising from these activities may only be assumed based on previous experience;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI of Influence) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- This assessment does not consider temporal trends (note that the data collected is, however, considered sufficient to derive a meaningful baseline);
- The site visit was conducted during the dry season, which means that certain flora and fauna would not have been present or observable due to seasonal effects;
- Whilst every effort was made to cover as much of the PAOI as possible, it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations. However, it is the opinion of the specialist that an accurate representative sample of the ecological components considered within this assessment was collected; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

#### 1.4 Key Legislative Requirements

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

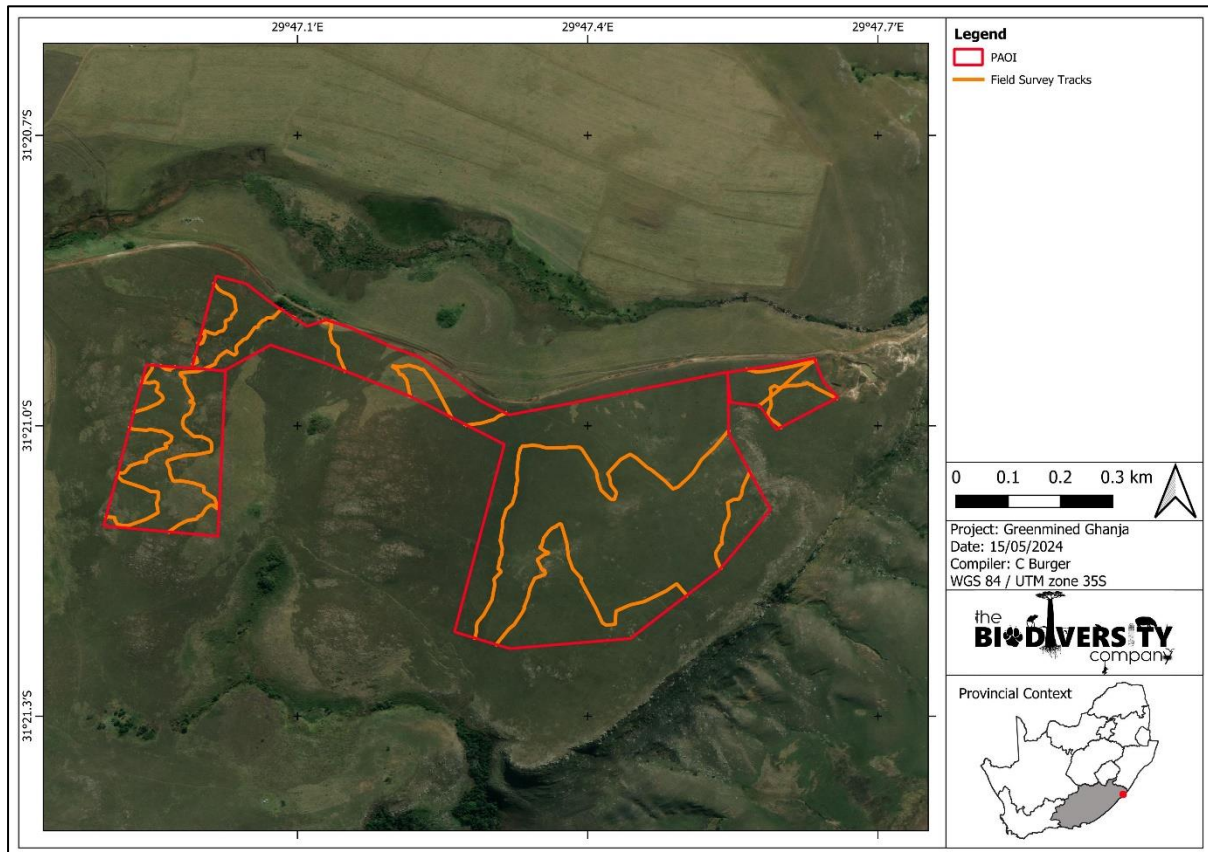
**Table 1-1 A list of key legislative requirements**

Region	Legislation / Guideline	Comment
National	NEMA	Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	Assessment Protocol (March 2020)	The minimum criteria for reporting.
	Assessment Protocol (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	NEMWA;	The regulation of waste management to protect the environment.
	NWA	The regulation of water uses.
	GN 1003 of GG 43726 of 18 Sept 2020	The regulation and management of alien invasive species.
Provincial	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilisation of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants.
	Eastern Cape Environmental Management Bill, in terms of Rule 147 (2019)	To provide for the management and conservation of the Province's biophysical environment and protected areas.
	Transkei Environmental Conservation Decree 9 of 1992 Eastern Cape's Biodiversity Conservation Plan (ECBCP, 2020)	To inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management.

## 2 Fieldwork

### 2.1 Biodiversity Field Assessment

One (1) dry season field survey was undertaken for the project on from the 8<sup>th</sup> to the 9<sup>th</sup> of May 2024 to confirm the presence of SCC, as well as any sensitive habitat features. Effort was made to cover all the different habitat types within the limits of time and access. During the survey, notes were made regarding current impacts, recording of dominant vegetation species and any sensitive or important features (e.g., drainage lines, rock outcrops, termite mounds etc.). Effort was made to cover all the different habitat types, within the limits of time and access (Figure 2-1)



**Figure 2-1** Map illustrating the field tracks of the field survey

### 3 Results & Discussion

#### 3.1 Desktop Assessment

##### 3.1.1 Ecologically Important Landscape Features

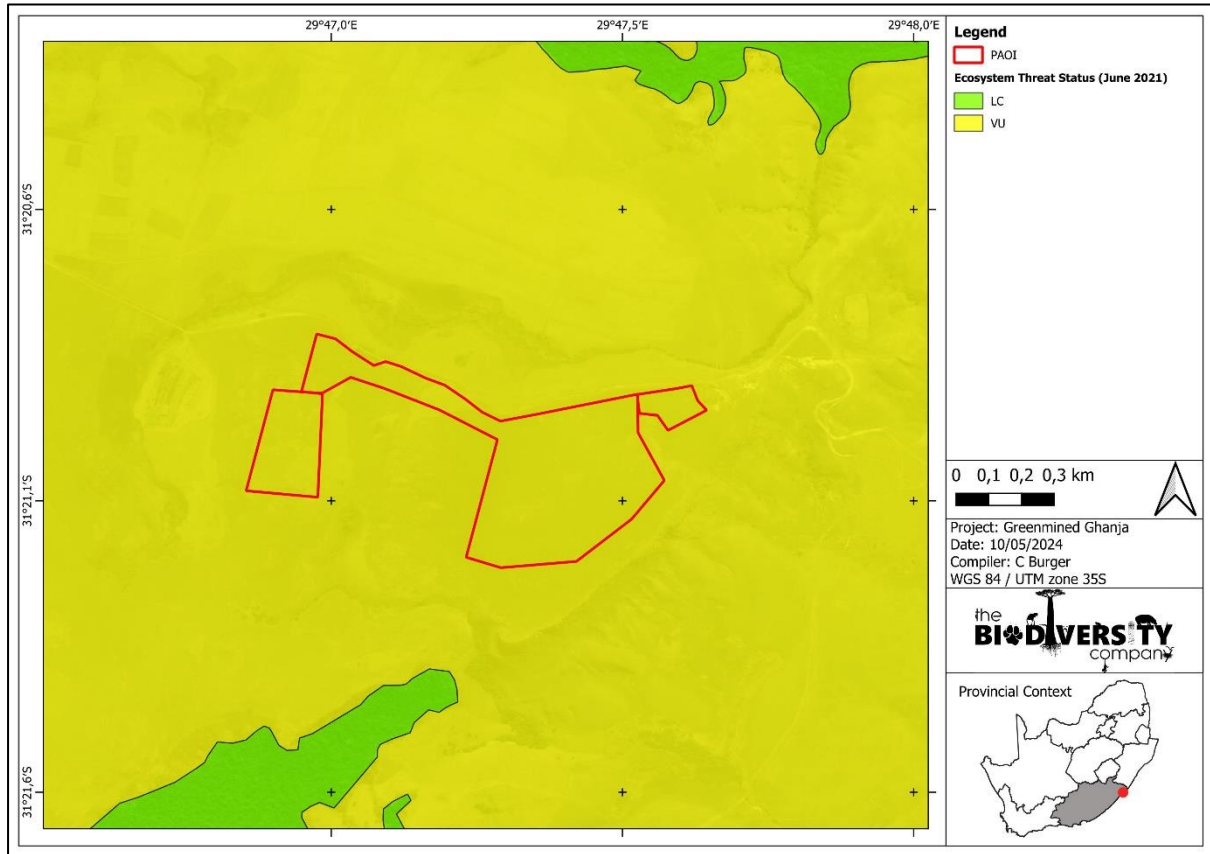
The relevance of the proposed development to ecologically important landscape features are summarised in Table 3-1.

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

Desktop Information Considered	Relevance	Reasoning	Section
Ecosystem Threat Status (RLE 2021)	Relevant	Overlaps with a 'Vulnerable' ecosystem	3.1.1.1
Ecosystem Protection Level	Relevant	Overlaps with a 'Poorly Protected' Ecosystem	3.1.1.2
Provincial Conservation Plan	Relevant	Overlaps with CBA 1	3.1.1.3
SAPAD & SACAD	Irrelevant	The PAOI is not located within 5 km of a Protected or Conservation area.	-
National Protected Areas Expansion Strategy	Relevant	The PAOI overlaps with a NPAES Priority Focus Areas	3.1.1.4
Important Bird & Biodiversity Areas (IBA)	Irrelevant	The PAOI is located 13 km from the nearest IBA	3.1.1.5
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant	500 m Regulated Area overlaps with 'Endangered' River	3.1.1.6
National Freshwater Priority Area	Relevant	500 m Regulated Area overlaps with a FEPA Code 1 River	3.1.1.7
Strategic Water Source Areas (SWSA)	Irrelevant	PAOI does not overlap with any SWSAs	-
Mining and Biodiversity Guidelines	Relevant	According to the Mining and Biodiversity Guidelines spatial dataset (2013), the PAOI is of highest BI and there is therefore a correlating highest risk for mining	3.1.1.8

### 3.1.1.1 Red List of Ecosystems

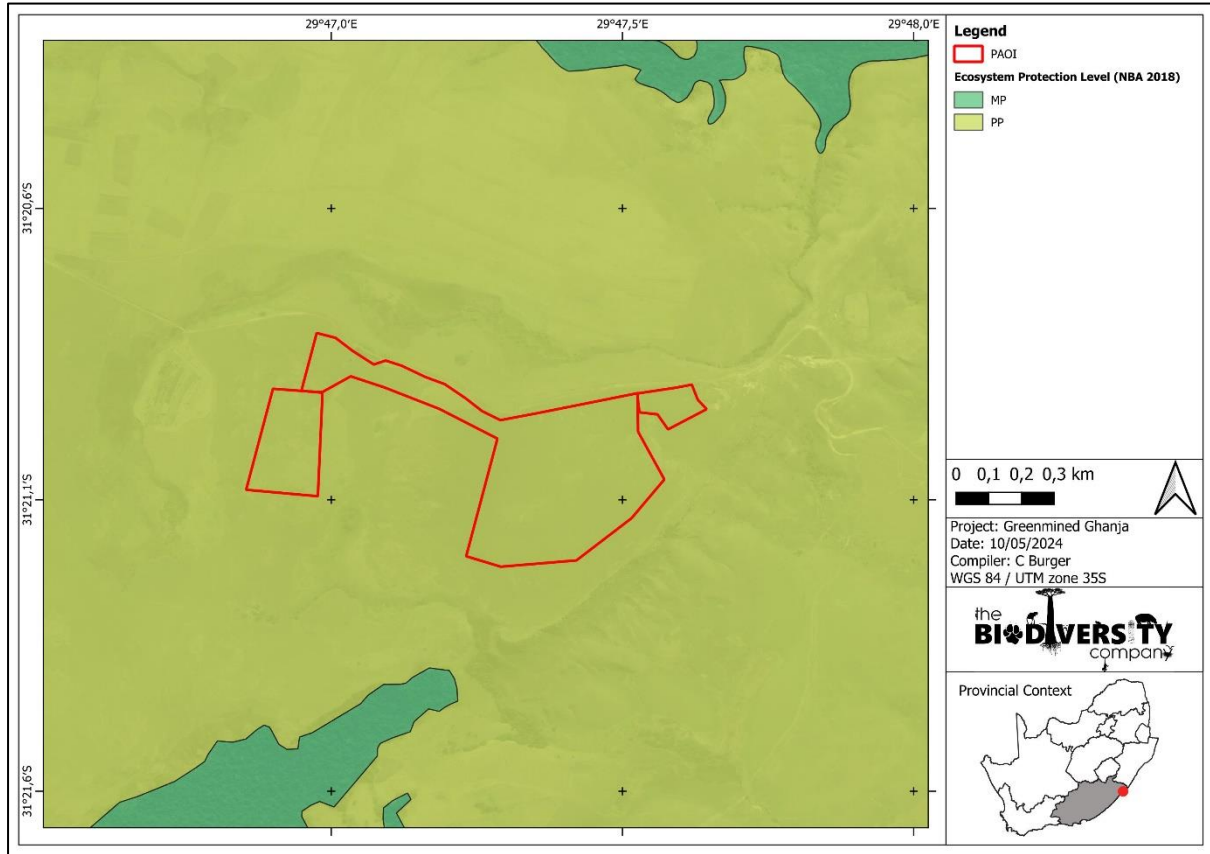
The Ecosystem Threat Status is an indicator of an ecosystem’s wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the Red List of Ecosystems dataset (Skowno & Monyeke, 2021) the proposed development overlaps with a VU ecosystem (Figure 3-1).



**Figure 3-1** Map illustrating the ecosystem threat status associated with the PAOI.

**3.1.1.2 Ecosystem Protection Level**

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

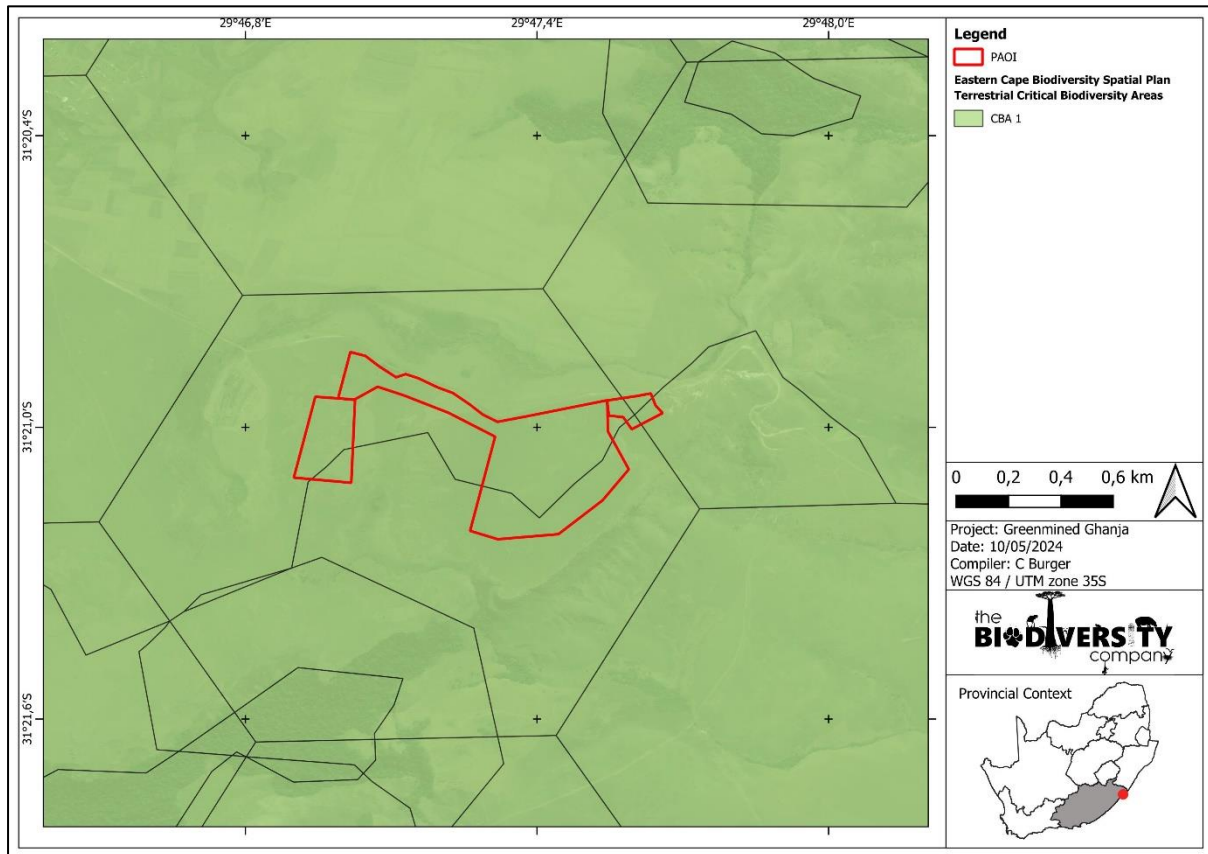


**Figure 3-2** Map illustrating the ecosystem protection level associated with the PAOI.

### 3.1.1.3 Provincial Conservation Plan

The Eastern Cape’s Biodiversity Conservation Plan (Berliner et al 2007) addresses the urgent need to identify and map critical biodiversity areas and priorities for conservation in the province.

The PAOI overlaps with a CBA 1 area (Figure 3-3).

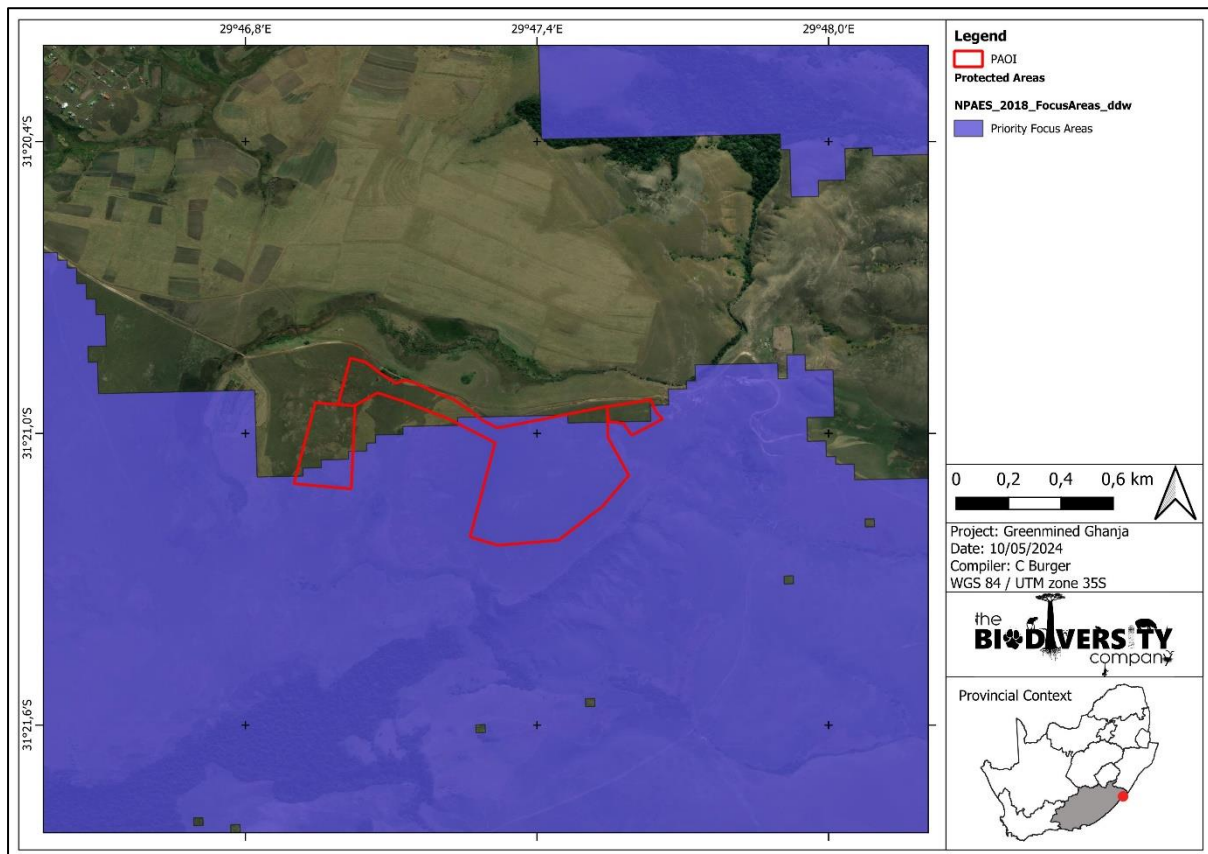


**Figure 3-3** Map illustrating the PAOI in relation to the Northern Cape CBA Map.

### 3.1.1.4 National Protected Areas Expansion Strategy

According to the latest NPAES dataset the PAOI overlaps with a NPAES Priority Focus Areas (Figure 3-4).

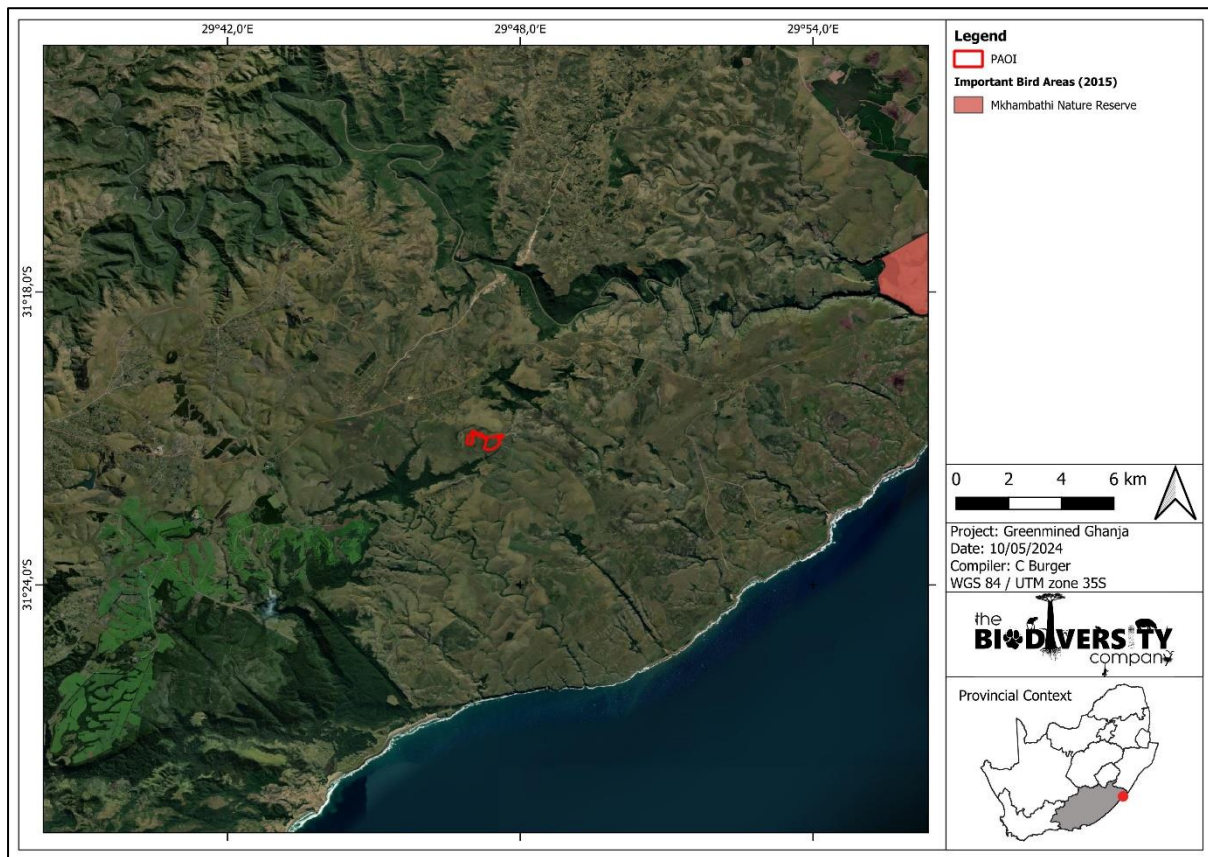




**Figure 3-4** Map illustrating the PAOI location in relation to the latest NPAES dataset.

**3.1.1.5 Important Bird and Biodiversity Areas**

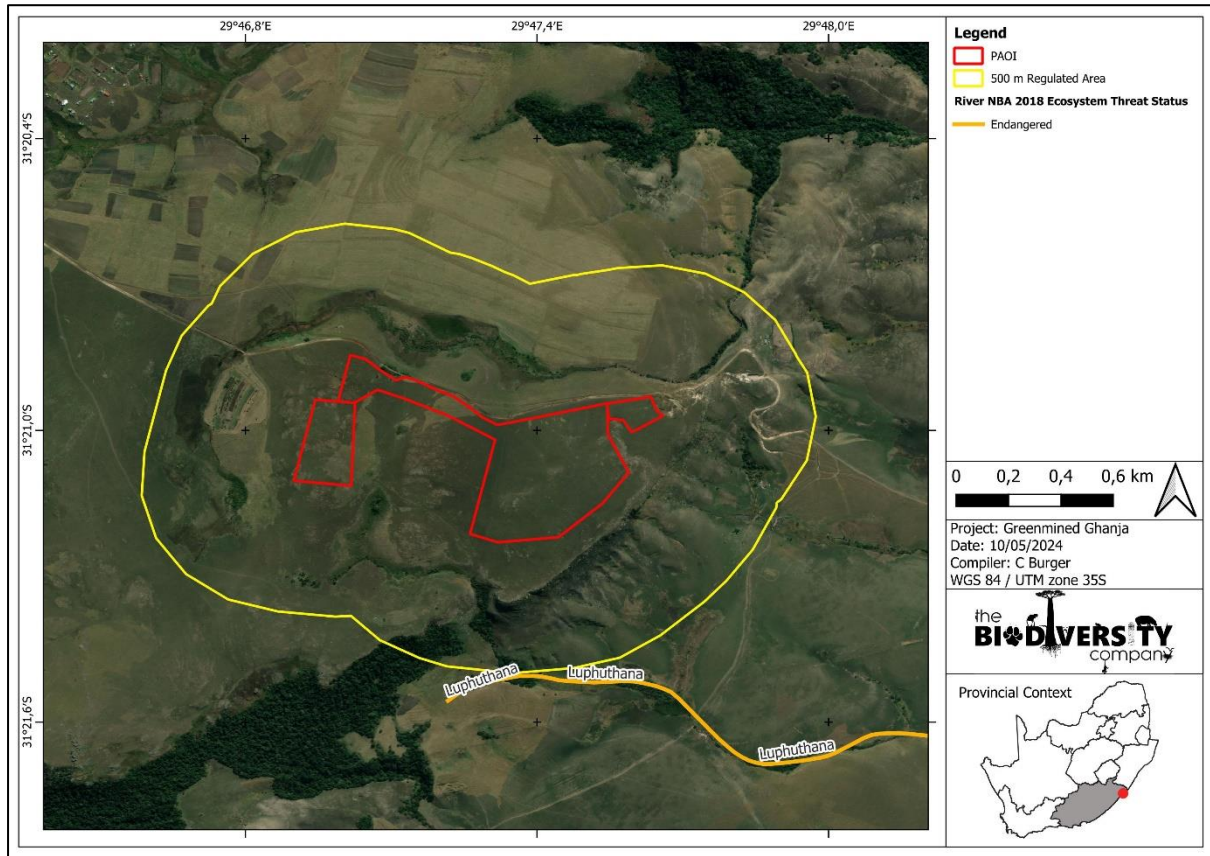
The PAOI is located 13 km from the nearest IBA (Figure 3-5).



**Figure 3-5** Map illustrating the PAOI in relation to the 2015 IBA dataset.

### 3.1.1.6 South African Inventory of Inland Aquatic Ecosystems

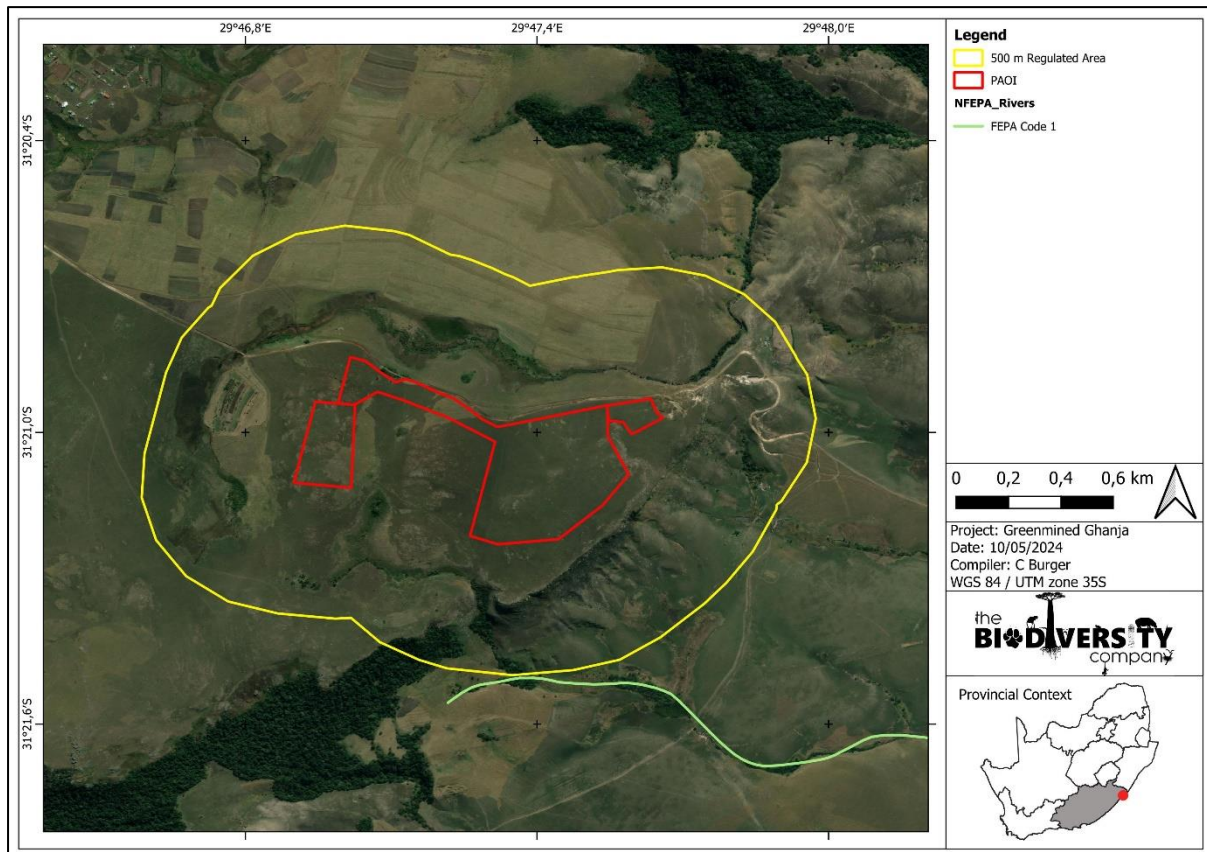
The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised 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 PAOI’s 500 m Regulated Area overlaps with an ‘Endangered’ river (Figure 3-6).



**Figure 3-6** Map illustrating the PAOI in relation to the South African Inventory of Inland Aquatic Ecosystems dataset.

### 3.1.1.7 National Freshwater Ecosystem Priority Area Status

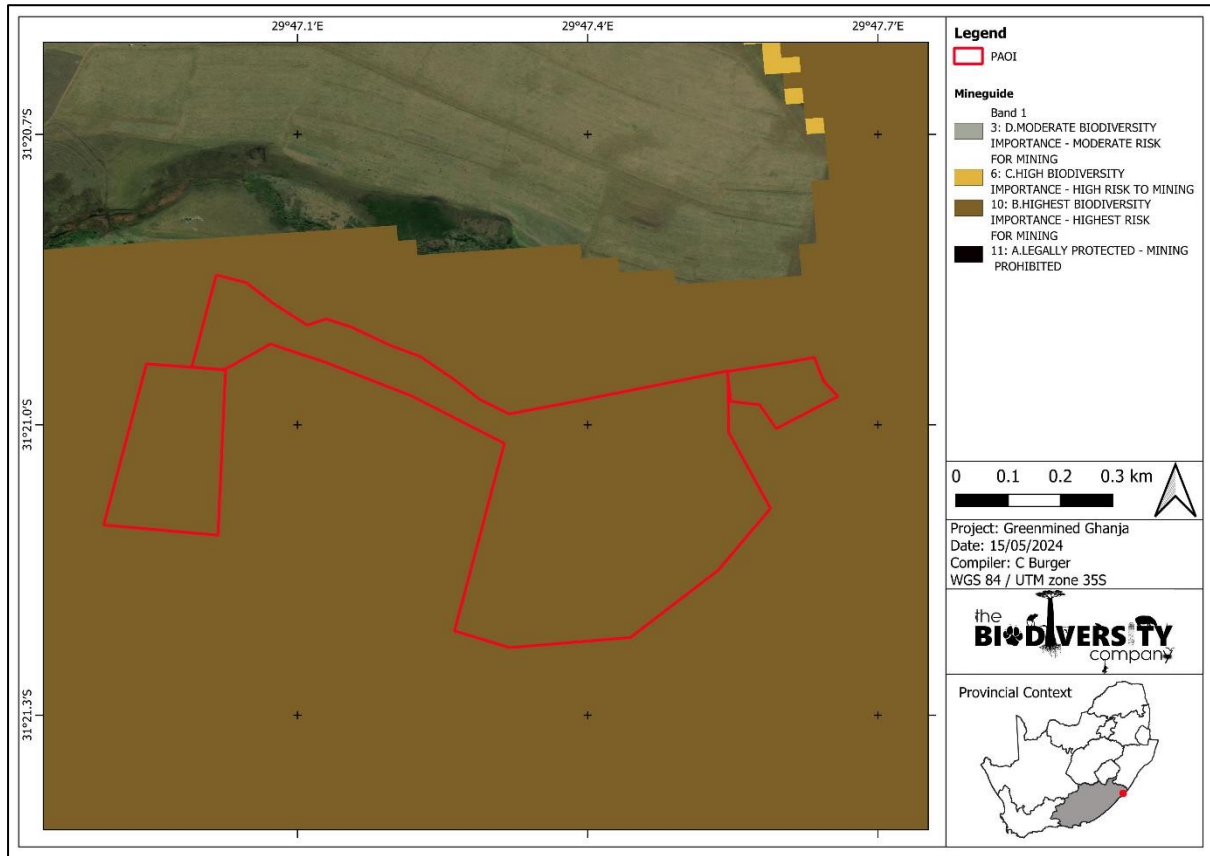
In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et 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). The PAOI's 500 m Regulated Area overlaps with a FEPA Code 1 River (Figure 3-7).



**Figure 3-7** Map illustrating the PAOI in relation to the National Freshwater Ecosystem Priority Area dataset.

### 3.1.1.8 Mining and Biodiversity Guidelines

According to the Mining and Biodiversity Guidelines spatial dataset (2013), the PAOI is of highest BI and there is therefore a correlating high risk for mining (Figure 3-8).



**Figure 3-8** The PAOI in relation to the Mining and Biodiversity Guidelines

### 3.1.2 Flora Assessment

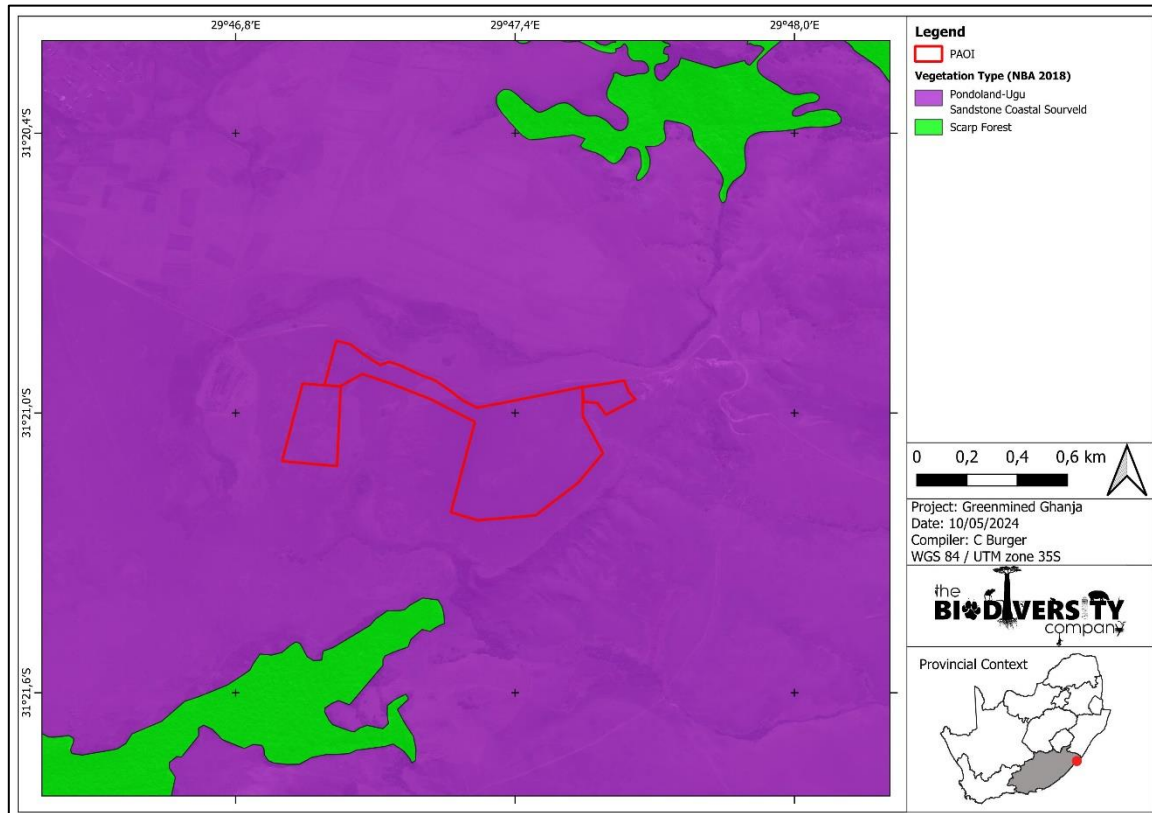
This section is divided into a description of the vegetation type expected under natural conditions and the expected flora species.

#### 3.1.2.1 Vegetation Type

The PAOI falls within the Indian Ocean Coastal Belt (IOCB) Biome. The IOCB occurs as an almost 800 km long coastal strip between the South African border with Mozambique as far south as the mouth of the Great Kei River (near East London). It spans altitudes from 0–450 m (and higher up to 600 m in the Pondoland-Ugu Sandstone Coastal Sourveld). The landscapes of the IOCB are flat (Maputaland) or characterised by alternating rolling hills and deeply incised valleys (coastal stretch between Richards Bay and Port Edward in KwaZulu-Natal and then more markedly further south to Port St Johns as far as the Great Kei River mouth). Elevated plateaus and deep gorges are characteristic of the Pondoland coast and other regions with underlying sandstone geology. The belt is about 35 km wide at some places in the north (somewhat wider in the valley of the Thukela River), narrowing irregularly southwards to <20 km in parts of Pondoland to <10 km in several parts of the Wild Coast.

The east-west gradient of annual precipitation is remarkably steep, especially in Maputaland, with around 1 200 mm on the coast, while about 60 km inland (Ndumo) only about 60% of this amount occurs. Summers are hot to very hot, while winters are mild, with hardly any frost. The pronounced hot and damp tropical character of the climate of the IOCB in summer and its mild and slightly drier subtropical character in winter can be ascribed to the synergistic influence of the unusual southbound shift of the Intertropical Convergence Zone and the warm Agulhas Current flowing close to the eastern coasts of South Africa.

On a fine-scale vegetation type, the proposed development overlaps with the Pondoland-Ugu Sandstone Coastal Sourveld vegetation type according to SANBI (2018) (Figure 3-9).



**Figure 3-9** Map illustrating the vegetation types associated with the PAOI.

### 3.1.2.1.1 Pondoland-Ugu Sandstone Coastal Sourveld

Pondoland-Ugu Sandstone Coastal Sourveld is found on elevated coastal sandstone plateaus from Port St Johns on the Pondoland coast (Eastern Cape) to the vicinity of Port Shepstone (Ugu District, KwaZulu-Natal). Coastal peneplains and partly undulating hills with flat table-lands and very steep slopes of river gorges. These sites support natural, species-rich grassland punctuated with scattered low shrubs or small trees (sometimes with bush clumps, especially in small gullies). Rocky outcrops and krantzes are common and dramatic sea-cliffs occur. Proteaceous trees (*Protea*, *Faurea*) can be locally common where conditions allow (Mucina & Rutherford, 2006).

#### Important Plant Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are important in the Pondoland-Ugu Sandstone Coastal Sourveld;

**Graminoids:** *Alloteropsis semialata* subsp. *eckloniana* (d), *Aristida junciformis* subsp. *galpinii* (d), *Cymbopogon nardus* (d), *Themeda triandra* (d), *Tristachya leucothrix* (d), *Cyperus rupestris*, *Diheteropogon amplexans*, *Elionurus muticus*, *Eragrostis capensis*, *E. plana*, *Eulalia villosa*, *Heteropogon contortus*, *Panicum natalense*, *Trachypogon spicatus*.

**Herbs:** *Chaetacanthus burchellii* (d), *Cyanotis speciosa* (d), *Helichrysum allioides* (d), *H. appendiculatum* (d), *H. krebsianum* (d), *H. spiralepis* (d), *Pentanisia angustifolia* (d), *Rhynchosia totta* (d), *Tephrosia macropoda* (d), *Berkheya speciosa* subsp. *speciosa*, *Cephalaria oblongifolia*, *Chamaecrista mimosoides*, *Eriosema salignum*, *Euphorbia ericoides*, *Helichrysum adenocarpum* subsp. *adenocarpum*, *H. aureum* var. *monocephalum*, *H. herbaceum*, *H. nudifolium* var. *pilosellum*, *H. pallidum*, *Indigofera hiliaris*, *Pentanisia prunelloides* subsp. *latifolia*, *Pimpinella caffra*, *Vernonia capensis* (Mucina & Rutherford, 2006).

**Geophytic Herbs:** *Brachystelma tenellum*, *Eriospermum mackenii* (Mucina & Rutherford, 2006).

**Low Shrubs:** *Athrixia phylloides*, *E. natalensis*, *E. natalitia*, *Gnidia anthylloides*, *G. kraussiana*, *G. nodiflora*, *Leonotis intermedia*, *Polygala hottentotta*.

**Small Trees:** *Euryops brevipapposus*, *Syzygium cordatum*.

**Semiparasitic Shrubs:** *Thesium acutissimum*, *T. cupressoides*.

#### Endemic Taxa:

**Graminoid:** *Fimbristylis variegata*.

**Herbs:** *Eriosema umtamvunense*, *Geranium sparsiflorum*, *Lotononis bachmanniana*, *Selago peduncularis*, *Senecio erubescens* var. *incisus*

**Geophytic Herbs:** *Brachystelma australe*, *B. kerzneri*, *Watsonia inclinata*F, *W. mtamvunae*F.

**Geoxylic Suffrutex:** *Rhus acocksii*.

**Low Shrubs:** *Leucadendron spissifolium* subsp. *natalense*F (d), *L. spissifolium* subsp. *oribinum*F (d), *Acalypha* sp. nov. (Scott-Shaw 636 NU), *Anthospermum streyi*, *Erica abbottii*, *E. cubica* var. *natalensis*F, *Eriosema dregei*, *E. latifolium*, *E. luteopetalum*, *Euryops leiocarpus*, *Gnidia triplinervis*, *Leucadendron pondoense*F, *Leucospermum innovans*F, *Raspalia trigyna*F, *Struthiola pondoensis*F, *Syncolostemon ramulosus*, *Tephrosia bachmannii*.

**Tall Shrub:** *Tephrosia pondoensis*.

### Conservation Status of the Vegetation Type

According to Mucina & Rutherford (2006), this vegetation type is classified as Vulnerable. The national target for conservation protection for this vegetation type is 25%, but only about 7% statutorily conserved in the Mkambati Wildlife Reserve & Marine Sanctuary, and Umtamvuna, Mbumbazi and Oribi Gorge Nature Reserves. About 29% transformed for cultivation and plantations or by urban sprawl. All part statutorily conserved in Ngoye, Mbumbazi and Vernon Crookes Nature Reserves.

#### 3.1.2.2 Expected Flora Species

The Global Biodiversity Information Facility (GBIF) database indicates that 136 species of plants are expected to occur within the PAOI (Appendix D). The GBIF database lists six (6) flora SCC that may occur within the PAOI. The Screening tool lists forty-nine (49) species of Conservation Concern that may occur within the PAOI. These are shown in Table 3-2.

**Table 3-2** Flora SCC expected in the PAOI- CR = Critically Endangered, VU = Vulnerable, and EN = Endangered.

Family	Scientific name	Screening Tool Designation	SANBI	Habitat	Likelihood of occurrence	Reason
Rubiaceae	<i>Anthospermum streyi</i>	Medium	Rare	Occurs in a sheltered habitat among rocks where it is unlikely to be affected by too frequent and intense fire, cultivation or grazing.	Moderate	Some suitable habitat present on site
Iridaceae	<i>Aristea platycaulis</i>	Medium	VU	It occurs in forest margins of coastal forests in partly to fully shaded sites.	Low	No suitable habitat present
Fabaceae	<i>Aspalathus gerrardii</i>	Medium	VU	Coastal grasslands, forest margins, often in damp or marshy sites, on sandstones	Moderate	Suitable habitat present on site
Bruniaceae	<i>Brunia trigyna</i>	Medium	CR	Only known from Umtamvuna Nature Reserve and Mkambati	Moderate	Some suitable habitat present on site
Rhizophoraceae	<i>Cassipourea flanaganii</i>	Medium	EN	Evergreen primary and secondary forests	Low	No suitable habitat present
Rhizophoraceae	<i>Cassipourea gummiflua</i> var. <i>verticillata</i>	Medium	VU	Evergreen forest, riverine and swamp forest. Moist scarp forest and coastal lowland forest. Threats	Low	No suitable habitat present
Gentianaceae	<i>Chironia albiflora</i>	Medium	Rare	Occurs in variable habitats including riverine forests, stream margins, scrubby vegetation on rocky outcrops and, rarely, open grassland	Moderate	Some suitable habitat present on site
Rhamnaceae	<i>Colubrina nicholsonii</i>	Medium	VU	Scarp forest. Climax riverine forest	Low	No suitable habitat present



Family	Scientific name	Screening Tool Designation	SANBI	Habitat	Likelihood of occurrence	Reason
<b>Cyperaceae</b>	<i>Cyathocoma bachmannii</i>	Medium	VU	Wet to damp heavy black soils on the margins of streamlets or isolated wetlands	Low	No suitable habitat present
<b>Orchidaceae</b>	<i>Disperis woodii</i>	Medium	VU	It grows in damp grassland, usually in open places with sandy soils, sometimes within grass tussocks	Moderate	Some suitable habitat present on site
<b>Rubiaceae</b>	<i>Empogona africana</i>	Medium	EN	Pondoland scarp forest, in margins and forest undergrowth on Msikaba Formation Sandstone.	Low	No suitable habitat present
<b>Fabaceae</b>	<i>Eriosema latifolium</i>	Medium	VU	Pondoland coastal grassland	Moderate	Some suitable habitat present on site
<b>Proteaceae</b>	<i>Faurea macnaughtonii</i>	Medium	Rare	This species occurs deep inside mature forest	Low	No suitable habitat present
<b>Celastraceae</b>	<i>Gymnosporia bachmannii</i>	Medium	VU	Pondoland scarp forest on sandstone, rocky banks of streams and rivers	Moderate	Some suitable habitat present on site
<b>Balsaminaceae</b>	<i>Impatiens flanaganiae</i>	Medium	VU	Scarp forest, in leaf litter among large boulders near the base of waterfalls	Low	No suitable habitat present
<b>Proteaceae</b>	<i>Leucadendron spissifolium</i> subsp. <i>oribinum</i>	Medium	VU	Pondoland coastal grassland, on steep grassy slopes above cliffs	Moderate	Confirmed
<b>Proteaceae</b>	<i>Leucospermum innovans</i>	Medium	EN	Pondoland-Natal Sandstone Coastal Sourveld in shallow soils	Moderate	Some suitable habitat present on site
<b>Celastraceae</b>	<i>Maytenus abbottii</i>	Medium	EN	Pondoland scarp forest, along stream banks on sandstone	Moderate	Some suitable habitat present on site
<b>Celastraceae</b>	<i>Maytenus oleosa</i>	Medium	Rare	Occurs in inaccessible places at the bottom of steep gorges	Low	No suitable habitat present
<b>Orchidaceae</b>	<i>Mystacidium aliceeae</i>	Medium	VU	Occurs in thick scrub in hilly regions as a low-level epiphyte in shady conditions	Low	No suitable habitat present
<b>Lauraceae</b>	<i>Ocotea bullata</i>	Medium	EN	Plants grow in high, cool, evergreen Afromontane forests.	Low	No suitable habitat present
<b>Lauraceae</b>	<i>Ocotea kenyensis</i>	Medium	VU	Scarp and mistbelt forest	Low	No suitable habitat present
<b>Lamiaceae</b>	<i>Plectranthus hilliardiae</i> subsp. <i>australis</i>	Medium	VU	Deeply shaded streambanks in forest	Low	No suitable habitat present
<b>Rosaceae</b>	<i>Prunus africana</i>	Medium	VU	Plants grow in evergreen forests near the coast, inland mistbelt forests and afromontane forests	Low	No suitable habitat present
<b>Fabaceae</b>	<i>Psoralea abbottii</i>	Medium	VU	Pondoland coastal grassland on sandstone, in moist	Moderate	Some suitable habitat present on site

Family	Scientific name	Screening Tool Designation	SANBI	Habitat	Likelihood of occurrence	Reason
				sites, forest margins or open grasslands adjacent to marshes		
<b>Violaceae</b>	<i>Rinorea domatiosa</i>	Medium	Rare	Pondoland scarp forest, sometimes among rocks on river banks	Low	No suitable habitat present
	<i>Sensitive species 1083</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 1176</i>	Medium	EN		Low	No suitable habitat present
	<i>Sensitive species 1185</i>	Medium	EN		Low	No suitable habitat present
	<i>Sensitive species 1248</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 1252</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 138</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 150</i>	Medium	Rare		Moderate	Some suitable habitat present on site
	<i>Sensitive species 191</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 466</i>	Medium	VU		High	Suitable habitat present on site
	<i>Sensitive species 609</i>	Medium	VU		Low	No suitable habitat present
	<i>Sensitive species 686</i>	Medium	VU		High	Suitable habitat present on site
	<i>Sensitive species 814</i>	Medium	VU		Low	No suitable habitat present
	<i>Sensitive species 828</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 867</i>	Medium	Rare		Moderate	Some suitable habitat present on site
	<i>Sensitive species 89</i>	Medium	VU		Moderate	Some suitable habitat present on site
	<i>Sensitive species 944</i>	Medium	VU		High	Suitable habitat present on site.
	<i>Sensitive species 950</i>	Medium	VU		Low	No suitable habitat present
	<i>Sensitive species 990</i>	Medium	Rare		Moderate	Some suitable habitat present on site
<b>Gesneriaceae</b>	<i>Streptocarpus lilliputana</i>	Medium	VU	Rock seepages in deeply shaded forested river gorges	Low	No suitable habitat present
<b>Gesneriaceae</b>	<i>Streptocarpus modestus</i>	Medium	Rare	Plants grow wedged in crevices of rocky cliff faces along the lips of some of the forested gorges in Pondoland.	Low	No suitable habitat present

Family	Scientific name	Screening Tool Designation	SANBI	Habitat	Likelihood of occurrence	Reason
Myrtaceae	<i>Syzygium pondoense</i>	Medium	Rare	Pondoland scarp forest. Rocky islands and sandbanks in streams	Low	No suitable habitat present
Fabaceae	<i>Tephrosia pondoensis</i>	Medium	EN	Pondoland scarp forest and adjacent grassland on sandstone, in forest margins, along drainage lines or on rocky outcrops	Moderate	Some suitable habitat present on site
Meliaceae	<i>Turraea pulchella</i>	Medium	VU	Sandstone grasslands, often near the boundary with thicket or Valley Bushveld above river gorges, or on top of sandstone plateau	Moderate	Some suitable habitat present on site

### 3.1.3 Fauna Assessment

#### 3.1.3.1 Mammals

The MammalMap database lists 32 indigenous mammal species that could be expected to occur within the assessment area (Appendix D). This list excludes the larger species that are typically restricted to protected areas, as well as marine mammals. Seven (7) of these expected species are regarded as threatened (Table 3-3). The screening tool lists four (4) SCC that can be expected.

**Table 3-3** *Threatened mammal species that are expected to occur within the assessment area associated with the proposed project area. EN = Endangered, NT= Near Threatened, VU = Vulnerable and LC = Least Concern*

Scientific name	Common name	Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			SANBI	IUCN		
<i>Aonyx capensis</i>	Cape Clawless Otter	-	NT	NT	Low	No suitable water resources present on site
<i>Leptailurus serval</i>	Serval	-	NT	LC	Moderate	Grassland habitat present on site
<i>Otomys auratus</i>	Vlei Rat (Grassland type)	-	NT	NT	Moderate	Grassland habitat present on site
<i>Otomys laminatus</i>	Laminate Vlei Rat	-	NT	NT	Moderate	Some suitable habitat present on site
<i>Ourebia ourebi</i>	Oribi	-	EN	LC	Low	Site falls outside of species extant range
<i>Poecilogale albinucha</i>	African Striped Weasel	-	NT	LC	Low	No suitable water resources present on site
<i>Rhinolophus swinnyi</i>	Swinny's horseshoe bat	-	VU	LC	Moderate	Some suitable habitat present on site
<i>Cercopithecus albogularis labiatus</i>	Blue Monkey	Medium	LC	LC	Low	No suitable habitat present on site
<i>Chrysospalax trevelyani</i>	Giant Golden Mole	Medium	EN	EN	Low	No suitable forest habitat available.
<i>Dendrohyrax arboreus</i>	Eastern Tree Dassie	Medium	EN	LC	Low	No suitable forest habitat available.

<b>Sensitive species 8</b>	Medium	VU	LC	Low	No suitable forest habitat available.
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### 3.1.3.2 Herpetofauna

Based on the data extracted from the FrogMap database, 25 amphibian species are expected to occur within the assessment area (Appendix D). One (1) species is regarded as threatened (Table 3-4). The screening tool lists one (1) SCC that can be expected.

**Table 3-4** *Threatened amphibian species that are expected to occur within the assessment area of the proposed development. EN = Endangered*

Scientific name	Common name	Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			SANBI	IUCN		
<i>Natalobatrachus bonebergi</i>	Kloof Frog	Medium	EN	EN	Medium	Some suitable habitat present on site

Based on the data extracted from the ReptileMap database, 32 reptile species are expected to occur within the assessment area (Appendix D). Two (2) species are regarded as threatened (Table 3-5). The screening tool did not indicate any expected species.

**Table 3-5** *Threatened reptile species that are expected to occur within the assessment area of the proposed development. LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

Scientific name	Common name	Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			SANBI	IUCN		
<i>Bradypodion melanocephalum</i>	KwaZulu Dwarf Chameleon	-	NT	NT	High	Suitable habitat present on site
<i>Dendroaspis angusticeps</i>	Eastern Green Mamba	-	VU	LC	Moderate	Some suitable habitat present on site

### 3.1.3.3 Avifauna

The SABAP2 data for the selected pentads indicate that 272 species of indigenous avifauna are expected to occur within the landscape (Appendix D). Of these expected species, 28 are regarded as threatened (Table 3-6). The screening tool lists seven (7) SCC that can be expected.

**Table 3-6** *Threatened avifauna species that are expected to occur within the assessment area associated with the proposed development. CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable*

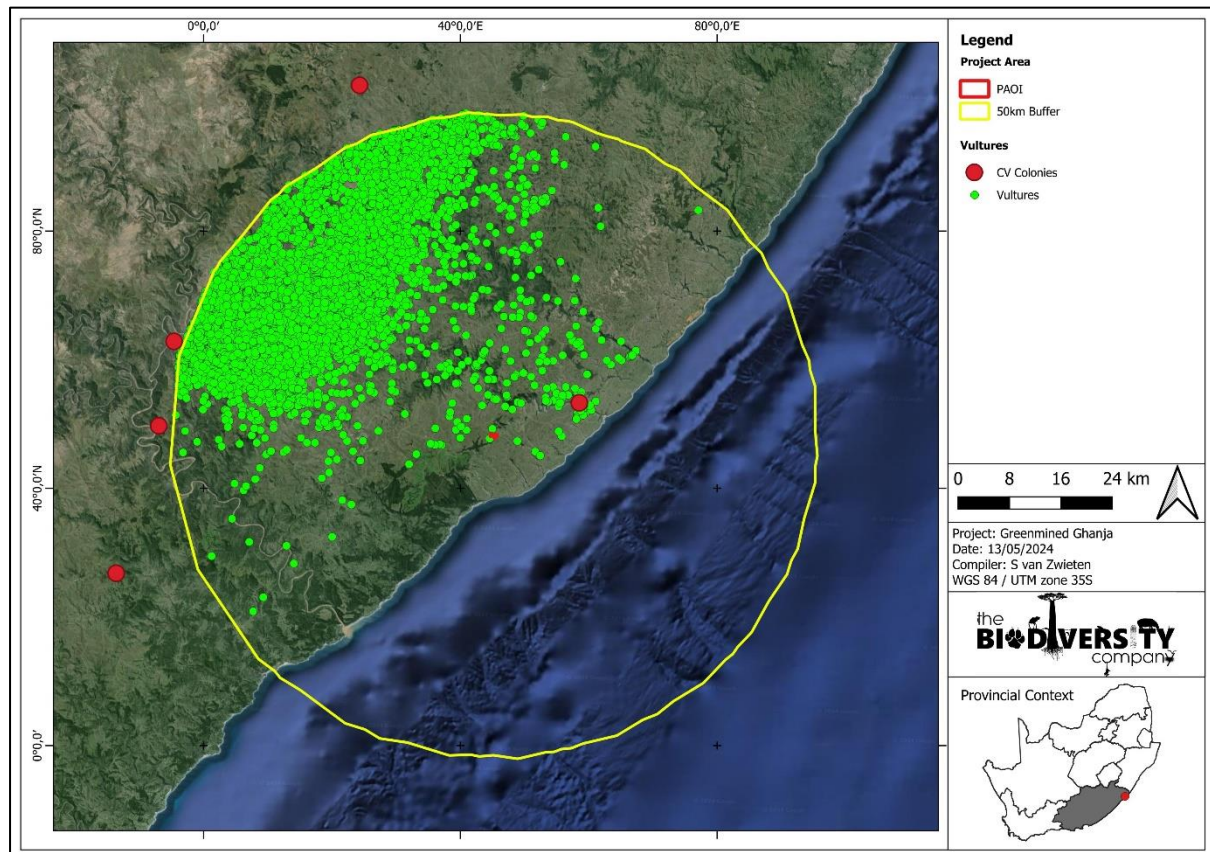
Scientific name	Common name	Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			SANBI	IUCN		
<i>Alcedo semitorquata</i>	Half-collared Kingfisher		NT	LC	Low	No suitable habitat present on site
<i>Ardenna carneipes</i>	Flesh-footed Shearwater		LC	NT	Low	No suitable habitat present on site
<i>Balearica regulorum</i>	Grey Crowned Crane	High	EN	EN	Moderate	Some suitable habitat present on site
<i>Bradypterus sylvaticus</i>	Knysna Warbler		VU	VU	Moderate	Some suitable habitat present on site
<i>Bucorvus leadbeateri</i>	Southern Ground Hornbill	High	EN	VU	High	Suitable habitat present on site

Scientific name	Common name	Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			SANBI	IUCN		
<i>Buteo trizonatus</i>	Forest Buzzard		LC	NT	Low	No suitable habitat present on site
<i>Campethera notata</i>	Knysna Woodpecker		NT	NT	Low	No suitable habitat present on site
<i>Caprimulgus natalensis</i>	Swamp Nightjar		VU	LC	Moderate	Some suitable habitat present on site
<i>Circus ranivorus</i>	African Marsh Harrier	High	EN	LC	High	Suitable habitat present on site
<i>Coracias garrulus</i>	European Roller		NT	LC	Low	No suitable habitat present on site
<i>Falco biarmicus</i>	Lanner Falcon	High	VU	LC	High	Suitable habitat present on site
<i>Falco concolor</i>	Sooty Falcon		NA	VU	Low	No suitable habitat present on site
<i>Geokichla guttata</i>	Spotted Ground Thrush		EN	VU	Low	No suitable habitat present on site
<i>Gyps coprotheres</i>	Cape Vulture		EN	VU	Moderate	Some suitable habitat present on site
<i>Halcyon senegaloides</i>	Mangrove Kingfisher		EN	LC	Low	No suitable habitat present on site
<i>Hydropogone caspia</i>	Caspian Tern		VU	LC	Low	No suitable habitat present on site
<i>Morus capensis</i>	Cape Gannet		VU	EN	Low	No suitable habitat present on site
<i>Neotis denhami</i>	Denham's Bustard	High	VU	NT	High	Suitable habitat present on site
<i>Phalacrocorax capensis</i>	Cape Cormorant		EN	EN	Low	No suitable habitat present on site
<i>Phoenicopterus roseus</i>	Greater Flamingo		NT	LC	Low	No suitable habitat present on site
<i>Poicephalus robustus</i>	Cape Parrot		EN	VU	Low	No suitable habitat present on site
<i>Polemaetus bellicosus</i>	Martial Eagle		EN	EN	Low	No suitable habitat present on site
<i>Procellaria aequinoctialis</i>	White-chinned Petrel		VU	VU	Low	No suitable habitat present on site
<i>Promerops gurneyi</i>	Gurney's Sugarbird		LC	NT	Low	No suitable habitat present on site
<i>Stephanoaetus coronatus</i>	Crowned Eagle	High	VU	NT	Low	No suitable habitat present on site
<i>Stercorarius antarcticus</i>	Brown Skua		EN	LC	Low	No suitable habitat present on site

Scientific name	Common name	Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			SANBI	IUCN		
<i>Turnix nanus</i>	Black-rumped Buttonquail	High	EN	LC	High	Suitable habitat present on site

**3.1.3.4 Avifauna Expected Species**

Figure 3-10 illustrate the PAOI in relation to the nearby Vulture colonies. Based on the data there is a high density of vultures to the North West of the PAOI which may utilise the project area. The tracking data of Cape Vultures, Lappet Faced Vultures and African White-backed Vultures from Movebank as per information provided by VulPro (March 2024) was used to compile Figure 3-10. For mitigations refer to section 5.

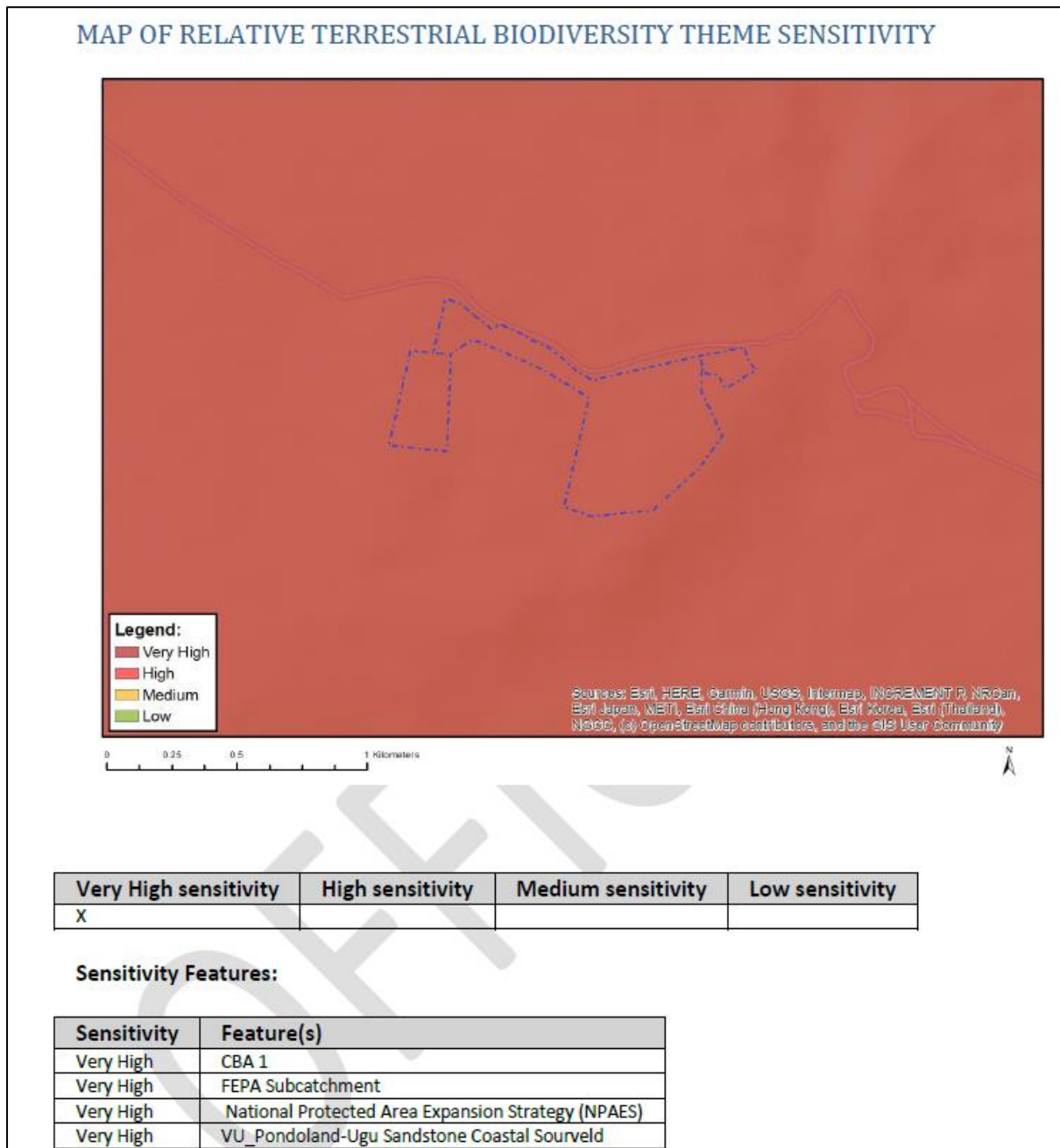


**Figure 3-10 The tracking data of vulture species in and around the PAOI**

**3.1.4 DEA Screening Tool**

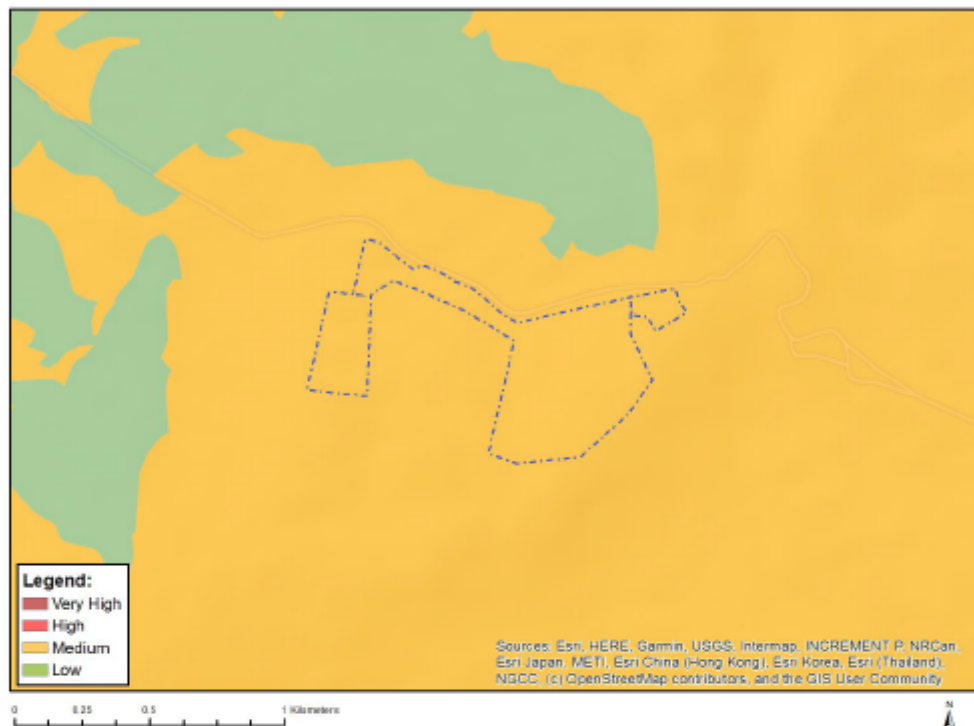
The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Terrestrial Biodiversity Theme sensitivity is ‘Very High’ for the proposed development area, due to it overlapping with an CBA 1, FEPA subcatchment, NPAES area and the VU Pondoland-Ugu Sandstone Coastal Sourveld vegetation type (Figure 3-11);
- Plant Species Theme sensitivity is ‘Medium’ due the presence of several medium sensitivity species (Figure 3-12); and
- Animal Species Theme sensitivity is ‘High’ due to the presence of seven (7) high sensitivity avifauna species and several medium mammal and amphibian species (Figure 3-13).



**Figure 3-11** Terrestrial Biodiversity Theme sensitivity.

**MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY**



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

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

**Sensitivity Features:**

Sensitivity	Feature(s)
Medium	<i>Faurea macnaughtonii</i>
Medium	<i>Ocotea bullata</i>
Medium	Sensitive species 1252
Medium	<i>Psoralea abbottii</i>
Medium	<i>Aspalathus gerrardii</i>
Medium	<i>Tephrosia pondoensis</i>
Medium	<i>Eriosema latifolium</i>
Medium	<i>Brunia trigyna</i>
Medium	<i>Leucadendron spissifolium</i> subsp. <i>oribinum</i>
Medium	<i>Leucospermum innovans</i>
Medium	<i>Ocotea kenyensis</i>
Medium	Sensitive species 89
Medium	<i>Anthospermum streyi</i>



Medium	<i>Aristea platycaulis</i>
Medium	Sensitive species 466
Medium	Sensitive species 138
Medium	<i>Plectranthus hilliardiae</i> subsp. <i>australis</i>
Medium	<i>Maytenus abbottii</i>
Medium	<i>Maytenus oleosa</i>
Medium	<i>Gymnosporia bachmannii</i>
Medium	<i>Chironia albiflora</i>
Medium	Sensitive species 950
Medium	<i>Impatiens flanaganiae</i>
Medium	<i>Syzygium pondoense</i>
Medium	<i>Rinorea domatiosa</i>
Medium	<i>Streptocarpus modestus</i>
Medium	<i>Streptocarpus lilliputana</i>
Medium	Sensitive species 150
Medium	Sensitive species 867
Medium	<i>Colubrina nicholsonii</i>
Medium	Sensitive species 990
Medium	<i>Empogona africana</i>
Medium	Sensitive species 686
Medium	Sensitive species 828
Medium	<i>Turraea pulchella</i>
Medium	<i>Cassipourea flanaganii</i>
Medium	<i>Cassipourea gummiflua</i> var. <i>verticillata</i>
Medium	Sensitive species 609
Medium	Sensitive species 1083
Medium	Sensitive species 814
Medium	Sensitive species 1185
Medium	Sensitive species 1176
Medium	<i>Mystacidium aliceeae</i>
Medium	<i>Disperis woodii</i>
Medium	Sensitive species 1248
Medium	Sensitive species 944
Medium	Sensitive species 191
Medium	<i>Cyathocoma bachmannii</i>
Medium	<i>Prunus africana</i>

**Figure 3-12** *Relative Plant Species Theme Sensitivity*

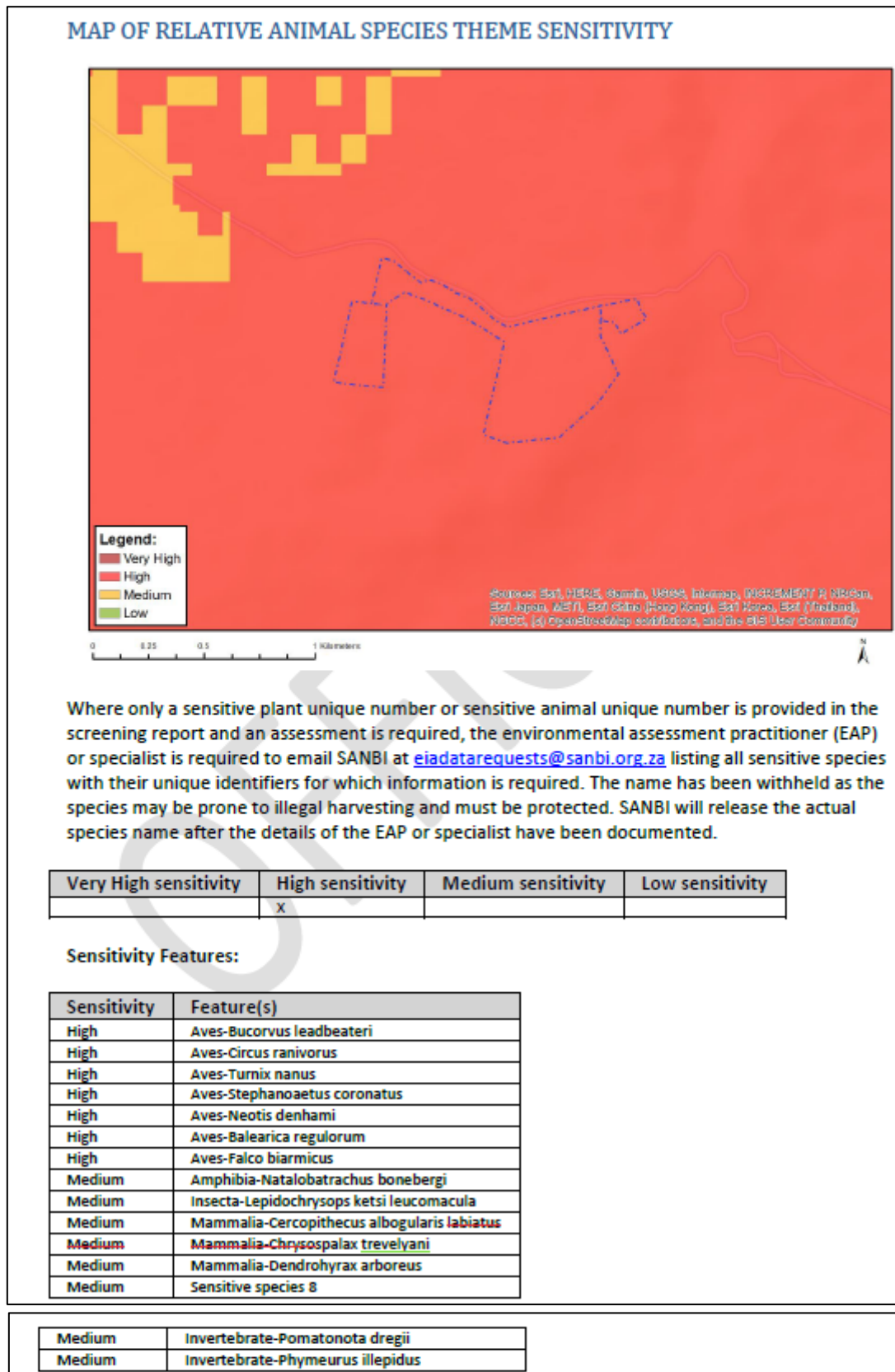


Figure 3-13 Relative Animal Species Theme Sensitivity

### 3.2 Fieldwork Findings

#### 3.2.1 Flora Assessment

Numerous indigenous flora species were recorded for the PAOI (a list can be provided upon request), characteristic of the vegetation types for the site. Some of these species can be seen presented in Figure 3-14.

Three SCC and five protected species were recorded in the PAOI and are presented in section 3.2.1.1 below.

Six (6) Species of alien invasive plant (AIP) was recorded for the PAOI and is discussed further in section 3.2.2.1 below.



**Figure 3-14** Photos illustrating indigenous flora species recorded for the PAOI; A) *Argyrella canescens*, B) *Exochaenium grande*, C) *Zantedeschia aethiopica*, D) *Helichrysum adenocarpum*, E) *Athrixia phyllicoides* and F) *Cheilanthes viridis*.



#### 3.2.1.1 SCC and Protected Species

Three SCC was recorded for the PAOI (Table 3-7).

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

Scientific Name	Conservation Status and Criteria	Ecology and Threats
<i>Stangeria eriopus</i>	VU	This species is widespread along the east coast of South Africa and southern Mozambique, usually occurring within a few kilometres of the ocean. This species grows in open, dry grassland, in light shade under trees in the coastal parkland, or in dense, damp lowland forest. This species has been affected by over collecting (for medicinal and ornamental use). Habitat destruction has also had an effect on the plants in the wild (pineapple and sugar cane farming).

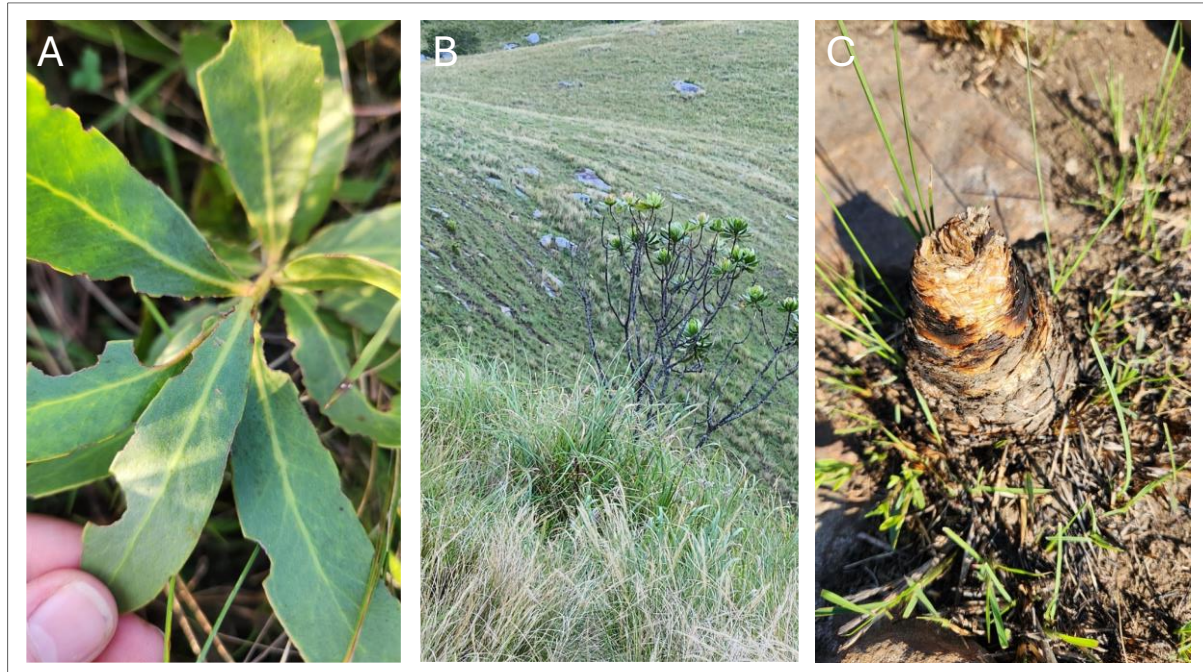
Scientific Name	Conservation Status and Criteria	Ecology and Threats
		
<p><i>Leucadendron spissifolium</i></p>	<p>VU</p>	<p>This subspecies is endemic to the Eastern Cape and KwaZulu-Natal provinces of South Africa, where it occurs from Port Edward to Port St Johns, and Dwessa Forest Reserve. It is localized to damp places in coastal sandstone grassland, at an altitude of 30-500 m. At least 40% of this taxon's habitat is irreversibly modified, due to historical habitat loss from housing development, sugarcane, tea and banana cultivation, and timber plantations.</p>
		
<p><i>Helichrysum pannosum</i></p>	<p>EN</p>	<p>This species occurs in KwaZulu-Natal and Eastern Cape coast, from Stanger southwards to Port St Johns. Also occurs further inland around Durban to Pinetown and Camperdown. It is localised to grassland, often on hill slopes near forest patches. The habitat of this taxon is more than 55% transformed (calculated using GIS), mainly as a result of sugarcane cultivation, urban and coastal development around Durban and the KwaZulu-Natal south coast.</p>

Scientific Name	Conservation Status and Criteria	Ecology and Threats
		

Five (5) species of protected plant were recorded for the PAOI (Table 3-8), some of these species are shown in Figure 3-15. These species are not to be disturbed in any way. Should they need to be removed, the appropriate permits must be procured prior to the relocation or removal of these species.

**Table 3-8 Provincially protected plants recorded.**

Family	Species	SANBI
Amaryllidaceae	<i>Boophone disticha</i>	LC
Asparagaceae	<i>Eucomis autumnalis</i>	LC
Proteaceae	<i>Leucadendron spissifolium</i>	VU
Proteaceae	<i>Protea caffra</i>	LC
Proteaceae	<i>Protea roupelliae</i>	LC



**Figure 3-15** Photographs presenting some of the protected species recorded for the PAOI: A) *Protea caffra*, B) *Protea roupelliae* and C) *Boophone disticha*.

### 3.2.1.2 Alien Invasive Plants

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

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.

- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

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

- Notify the competent authority in writing;
- Take steps to manage the listed invasive species in compliance with:
- Section 75 of the Act;
- The relevant invasive species management programme developed in terms of regulation 4; and
- Any directive issued in terms of section 73(3) of the Act.

Six AIP species of which four (4) NEMBA category AIP species was recorded from the PAOI (Table 3-9 and Figure 3-16).

**Table 3-9 Table presenting the Alien Invasive Species recorded for the PAOI**

Family	Species	Common Name	NEMBA Category
Violaceae	<i>Hybanthus enneaspermus</i>	Pink Ladies-slipper	
Myrtaceae	<i>Psidium guajava</i>	Guava	3
Rubiaceae	<i>Richardia humistrata</i>	Peelton Weed	
Fabaceae	<i>Caesalpinia decapetala</i>	Mauritius thorn	1b
Solanaceae	<i>Solanum mauritianum</i>	Bugweed	1b
Lamiaceae	<i>Plectranthus barbatus</i>	Woolly Plectranthus	1b

Considering that the PAOI includes habitats which likely support a variety of indigenous species, it is recommended that any AIP species that may colonise the area in the future be controlled by implementing an AIP Management Programme in compliance of section 75 of the Act as stated above. This is also pertinent to the development as invasive species are linked to enhanced fire effects and risk (Aslan & Dickson, 2020). The AIP Management Programme must implement the following monitoring framework must be implemented to ensure that AIPs are continually monitored, and progress pertaining to their control is recorded (Table 3-10). The monitoring of the PAOI throughout the process is crucial in order to prevent AIPs growing and spreading out of control, thereby threatening the wellbeing of indigenous flora and fauna. It is also important to note that while herbicide application has been recommended for control, herbicides should not be applied adjacent to the aquatic ecosystems within the PAOI and herbicide application should not be used during windy days to prevent drift.

**Table 3-10 Proposed monitoring framework for the control of alien invasive plants within the PAOI.**

Metric	Frequency	Method	Response
How effective are the control methods?	4-6 months after every operation	Survey the cleared areas and look for regrowth. Before and after photographs are effective for this. Observe for non-target effects of herbicide application.	If the survey reveals that the control methods are effective, e.g., low levels of re-sprouting, continue following the herbicide mixtures and control methods. If non-target plants are dying off where herbicides were applied, ensure appropriate training for

Metric	Frequency	Method	Response
			herbicide applicators, demonstrate the off-target effects to herbicide applicators to ensure they are using the correct methods and herbicides. (If the results show that the control methods are not effective, adapt by e.g., cutting lower above ground or changing herbicides or timing of herbicide application.
<b>Do the infestation levels decrease?</b>	Annually	Survey the cleared areas and record species, densities and size. Before and after pictures are very effective.	If the infestation levels are not decreasing, reconsider clearing intervals and look at clearing methods. If infestation levels are decreasing, then continue current control method.
<b>Quantity of herbicides used</b>	During every operation	Keep track of cost and ensure no wastage. Record herbicide usage	Track usage over time, it will reveal a certain trend in quantities for different infestation levels. Less herbicides should be used when the infestation levels are lower. Record herbicide cost.
<b>Does the indigenous vegetation recover in the cleared areas?</b>	Annually	Survey the cleared areas and look out for indigenous species variety and presence. Before and after pictures are effective.	If there is recovery of indigenous vegetation, then continue current control method. If there is no recovery, consider rehabilitation with local indigenous species.
<b>How many jobs were created?</b>	After every operation	Timesheets	Job creation figures are useful when asking for landowner assistance from WFW or to demonstrate contributions to jobs and socio-economic conditions
<b>How many person days (PD) were spent per operations?</b>	After every operation	Timesheets	Keep track of cost and assist with planning and budgeting. Determine cost per person per day (PD)





**Figure 3-16** Photograph illustrating the alien invasive plant species recorded for the PAOI; A) *Plectranthus barbatus*, B) *Psidium guajava*, C) *Solanum mauritianum* and D) *Hybanthus enneaspermus*.

### 3.2.2 Fauna Assessment

Overall, the faunal community of the PAOI could be regarded as depauperate with a distinctive lack of species diversity. Four (4) avifaunal, one (1) reptile and three (3) mammal species were recorded for the PAOI (Table 3-11).

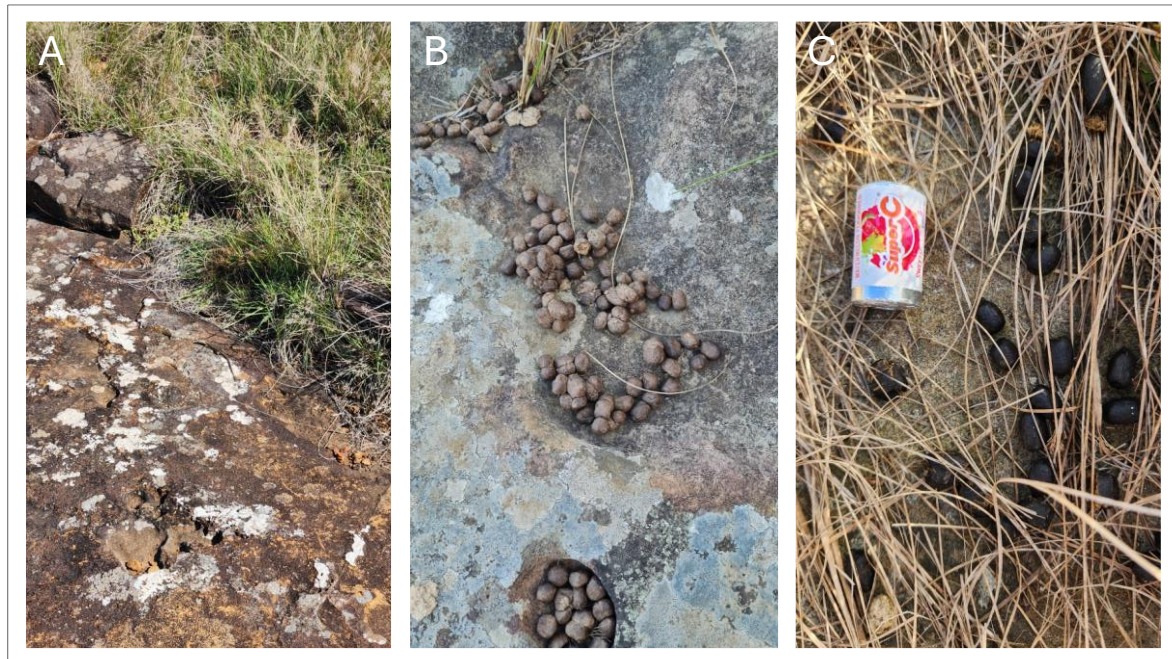
The lack of faunal species must be interpreted with caution as a longer field survey over several seasons is required to acquire a true representative sample, however, due to the close proximity to urban areas the faunal community has been impacted upon in the preceding years.

No fauna SCC were recorded, however a larger number of mammal, avifauna and herpetofauna species are expected to occur in the area, and longer-term multi-season surveys would be required in order to ensure sufficient sampling.

**Table 3-11** Summary of faunal species recorded within the PAOI.

Scientific Name	Common Name	Conservation Status	
		SANBI	IUCN
<b>Avifauna</b>			
<i>Ardea melanocephala</i>	Black-headed Heron	Unlisted	Unlisted
<i>Corvus albicollis</i>	White-necked Raven	Unlisted	Unlisted
<i>Cyanomitra olivacea</i>	Olive Sunbird	Unlisted	Unlisted
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	Unlisted	Unlisted
<b>Reptile</b>			
<i>Trachylepis varia</i>	Variable Skink	LC	LC
<b>Mammals</b>			
<i>Lepus capensis</i>	Cape Hare	LC	LC

<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC
<i>Procavia capensis</i>	Rock Hyrax	LC	LC



**Figure 3-17** Photos illustrating mammal species recorded for the PAOI; A) *Trachylepis varia* (Variable Skink), B) *Procavia capensis* (Rock Hyrax) and C) *Sylvicapra grimmia* (Common Duiker).

### 3.3 Site Sensitivity Verification

#### 3.3.1 Habitat Assessment and Site Ecological Importance

##### 3.3.1.1 Habitats

The main habitat type identified across the PAOI were initially identified largely based on aerial imagery. These main habitat types were refined based on the field coverage and data collected during the survey; the delineated habitats can be seen in Figure 3-18. Emphasis was placed on limiting timed meander searches within the natural habitats and therefore habitats with a higher potential of hosting SCC. One habitat was identified in the PAOI. The habitat identified and descriptions of the habitat unit can be found in Table 3-12.

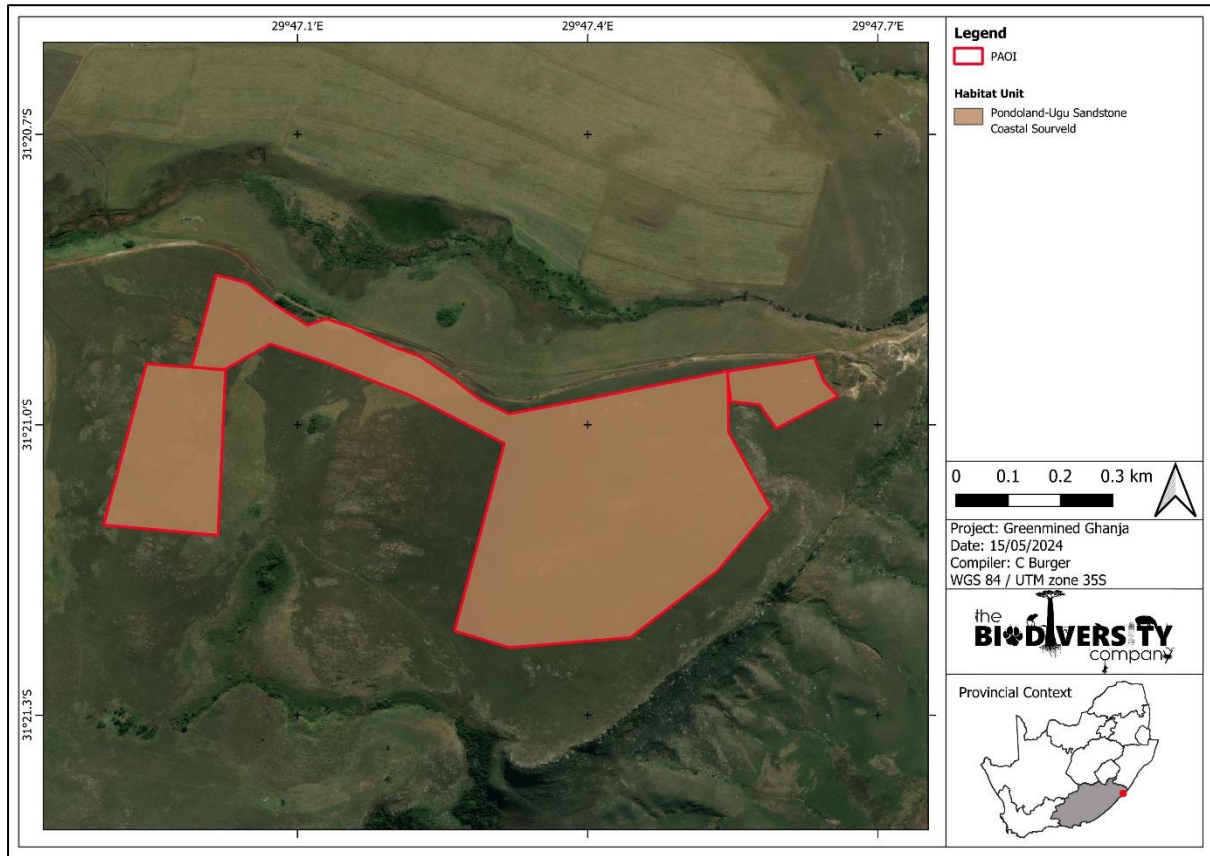


Figure 3-18 Map of the habitats delineated for the PAOI.

**Table 3-12** Table providing descriptions of the habitat types delineated for the PAOI.

Habitat	Description and condition	Ecosystem Processes and Services
Pondoland-Ugu Sandstone Coastal Sourveld	<p>This habitat hosts an indigenous, biodiverse grassland ecosystem interspersed with sporadic low shrubs or small arboreal specimens. Rocky outcrops and kranztes are prevalent in select locations. <i>Aristida junciformis</i> predominates within the grassland, characterizing its vegetation composition. Despite its natural integrity, the habitat lies proximate to an urban enclave and has encountered anthropogenic pressures, notably overgrazing, resulting in partial perturbation of its ecological dynamics, albeit within confined parameters.</p>	<p>This habitat serves as a sanctuary, offering refuge, grazing, and foraging opportunities for both native wildlife and domestic livestock. Additionally, it plays a crucial role in facilitating the filtration of water as it percolates through the soil into drainage systems. Moreover, it acts as a vital corridor for the dispersion of fauna throughout the landscape, serving as a movement pathway. These areas are utilized as thoroughfares by various species, playing a pivotal role in multiple life stages and supporting several Species of Conservation Concern (SCC). Furthermore, they capture and filter precipitation and runoff, enhancing water quality. By introducing greater heterogeneity into the regional habitat and microclimate, this ecosystem contributes significantly to conservation objectives by providing essential habitats for both flora and fauna.</p>



### 3.3.2 Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCCs and their ecosystem processes. As per the terms of reference for the project, GIS sensitivity maps are required in order to identify sensitive features in terms of the relevant specialist discipline/s within the PAOI. Based on the criteria provided in Appendix B of this report, all habitats within the PAOI were assigned a sensitivity category, i.e., a SEI category. (Table 3-13), the guidelines for each category can be seen in Table 3-14. The SEI of the PAOI is illustrated in Figure 3-19.

**Table 3-13 Summary of habitat types delineated within field assessment area.**

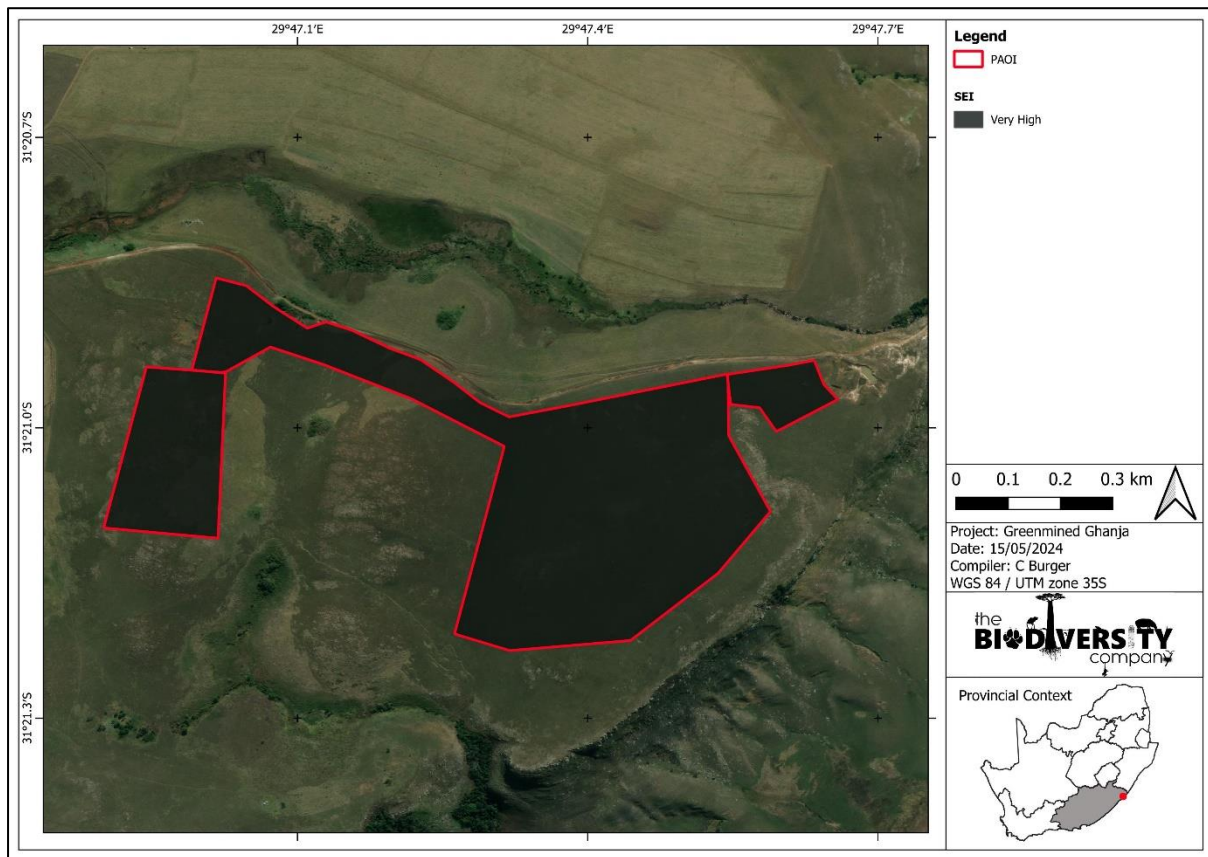
Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance <sup>1</sup>	Project Component in relation to habitat type	Receptor Resilience	Site Ecological Importance <sup>2</sup>
Pondoland-Ugu Sandstone Coastal Sourveld	High	High	High	Quarry, Stockpile area and access road	Low	Very High
	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km <sup>2</sup> .	Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches.			Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.	

**Table 3-14 Guideline for interpreting Site Ecological Importance in the context of proposed project 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.

<sup>1</sup> Considered as the 'sensitivity'

<sup>2</sup> Considered as the sensitivity in relation to the project component.



**Figure 3-19 Site Ecological Importance of the PAOI**

### 3.3.2.1 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in Table 3-15 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species.

**Table 3-15 Summary of the screening tool vs specialist assigned sensitivities.**

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	High	-	High	Validated – Habitat is natural and capable of supporting some expected SCCs.
Plant Theme	Medium	-	High	Disputed – Screened SCC flora confirmed. Habitat is capable of supporting SCCs.
Terrestrial Theme	Very High	Pondoland-Ugu Sandstone Coastal Sourveld	Very High	Validated – CBA 1 habitat is still largely natural and intact. SCC confirmed.

## 4 Impact Risk Assessment

### 4.1 Biodiversity Risk Assessment

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora, and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors, such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

Potential impacts were evaluated against the data captured during the desktop and field assessment to identify relevance to the PAOI. The relevant impacts associated with the proposed construction and operation of the development were then subjected to a prescribed impact assessment method. Impacts were assessed in terms of the construction and operational phases. The operational phase refers to that phase of the project where the construction has been completed. The project activities are set to be long lasting, and a closure phase was not assessed for that reason. It should be noted that the impacts described are not exhaustive, and more impacts may be identified at a later stage. Mitigation measures were only applied to impacts deemed relevant based on the impact analysis.

Impacts were assessed for the following activities:

- Construction Phase; and
- Operational Phase.

### 4.2 Present Impacts

Considering the anthropogenic activities and influences within the landscape, several negative impacts to biodiversity were observed within the PAOI (Figure 4-1). These include:

- Grazing by livestock, and associated infrastructure; and
- Linear infrastructure in the form of gravel roads.



**Figure 4-1** Photographs illustrating current negative impacts associated with the PAOI: A) Gravel roads and B & C) Grazing by livestock.

#### 4.2.1 Alternatives Considered

No alternatives were considered.

#### 4.2.2 Irreplaceable Loss

Any development of the PAOI will result in the irreplaceable loss of:

- CBA 1 areas;
- Fauna and flora SCC;
- Protected species; and
- Indigenous vegetation.

#### 4.3 Identification of Additional Potential Impacts

The following potential activities and potential impacts are expected. A summary of the potential impacts during the construction and operational phases of the proposed activity are presented in Figure 4-1.

**Table 4-1 Summary of potential impacts to biodiversity associated with the proposed activity**

Main Impact	Project Activities	Secondary Impacts Anticipated
<b>Loss of indigenous habitat</b>	<ul style="list-style-type: none"> <li>• Direct loss as a result of construction and operation of the proposed development.</li> <li>• Secondary impacts associated with noise, dust and influx of AIPs into these areas.</li> <li>• Access roads and servitudes.</li> <li>• Prevention of fires or incorrect fire regimes.</li> <li>• Improper solid waste disposal.</li> <li>• Dust precipitation.</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat fragmentation.</li> <li>• Loss of ecosystem services.</li> <li>• Emigration of fauna species, potentially including SCC.</li> <li>• Increased potential for soil erosion.</li> <li>• Habitat fragmentation.</li> <li>• Increased potential for establishment of alien invasive vegetation.</li> </ul>
<b>Encroachment of AIP species in disturbed areas.</b>	<ul style="list-style-type: none"> <li>• Vegetation removal.</li> <li>• Soil disturbance.</li> <li>• Vehicles potentially spreading seed.</li> <li>• Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents.</li> <li>• Creation of infrastructure suitable for breeding activities of alien and/or invasive birds.</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat loss for native flora &amp; fauna (including potential SCC).</li> <li>• Alteration of fauna assemblages due to habitat modification.</li> <li>• Reduced forage quality of grazing habitat.</li> <li>• Spreading of potentially dangerous diseases.</li> </ul>
<b>Direct mortality of fauna species.</b>	<ul style="list-style-type: none"> <li>• Clearing of vegetation.</li> <li>• Roadkill due to vehicle collision.</li> <li>• Preparation of soil with heavy machinery</li> <li>• Soil excavations and soil transportation.</li> <li>• Intentional killing of fauna for food (hunting) or persecution (especially with regard to herpetofauna).</li> <li>• Pollution of water resources due to spilling of hazardous chemicals from heavy machinery during construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of habitat.</li> <li>• Loss of ecosystem services.</li> <li>• Explosion of rodent populations and associated disease risk.</li> </ul>
<b>Emigration of fauna</b>	<ul style="list-style-type: none"> <li>• Disturbance from construction activities.</li> <li>• Loss of habitat and degradation of surrounding habitats.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced population of protected species, and potentially SCC</li> <li>• Loss of ecosystem services.</li> </ul>
<b>Reduced dispersal/migration of fauna</b>	<ul style="list-style-type: none"> <li>• Removal of vegetation</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of ecosystem services</li> </ul>



	<ul style="list-style-type: none"> <li>Loss of landscape used as corridor.</li> <li>Compacted roads.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced plant seed dispersal.</li> </ul>
<b>Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust</b>	<ul style="list-style-type: none"> <li>Operation of machinery (generators, crushers, vehicles).</li> <li>Vehicles operating at night.</li> <li>Large, intense fluorescent and mercury vapor lighting.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of ecosystem services.</li> </ul>
<b>Loss of SCCs and/or protected species</b>	<ul style="list-style-type: none"> <li>All unregulated/unsupervised activities outdoors.</li> <li>Poaching and trapping</li> <li>Staff and others interacting directly with fauna (potentially dangerous), or flora.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of SCC.</li> <li>Harm to people (dangerous fauna).</li> </ul>

#### 4.4 Quantitative Impact Assessment

The various identified impacts are assessed below for the different phases of the development. The impacts assessed here as assessed based on the loss of the full area of the site as well as all habitats present.

The purpose of the impact assessment is to:

- Assess impacts of proposed activities on biodiversity of the proposed development area;
- Assess whether proposed activities are likely to have significant impacts on biodiversity and specifically species of conservation concern; and
- Identify practical, implementable mitigation measures to reduce the significance of proposed activities on biodiversity.

It is important to note that the ratings applied within the risk assessment model, considered impacts to open space or natural habitats within the development area and not for areas already transformed.

##### 4.4.1 Construction Phase

The following potential main impacts on the biodiversity (based on the framework above) were considered for the construction phase of the proposed development. This phase refers to the period during construction when the proposed features are constructed; and is considered to have the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered (Table 4-2):

- 1) Destruction, loss and fragmentation of the of habitats, ecosystems and vegetation community;
- 2) Introduction of alien and invasive species, especially plants; and
- 3) Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching).

**Table 4-2 Impacts to biodiversity associated with the proposed construction phase**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
1	5	3	4	4	5		4	2	4	4	4	
	Permanent	Local area/	Great / harmful	Ecology highly	Definite	High	Permanent		Significant	Ecology highly	Highly likely	Moderate

Ghanja Mining Permit

		within 1 km of the site boundary		sensitive /important			Develop ment specific		sensitive /important			
<ul style="list-style-type: none"> <li>Do not clear areas of indigenous vegetation outside of the authorised development footprint within the PAOI.</li> <li>Vegetation clearing commences only after the necessary permits for SCCs or protected plants have been obtained. Any individual of the SSC or protected plants that were observed needs a relocation or destruction permit in order for any individual to be removed or destroyed due to the development. High visibility flags must be placed near any protected plants 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.</li> <li>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.</li> <li>Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further.</li> <li>All vehicles and personnel must make use of existing roads and walking paths where possible, especially construction/operational vehicles.</li> <li>The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas.</li> <li>Consult a fire expert and compile and implement a fire management plan to minimise the risk of veld fires around the PAOI.</li> <li>Compile and implement a rehabilitation plan from the onset of the Project; <ul style="list-style-type: none"> <li>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by invasive alien plant species. All grazing mammals must be kept out of the areas that have recently been re-planted</li> <li>Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Surplus rehabilitation material can be applied to other others in need of stabilisation and vegetation cover.</li> </ul> </li> <li>Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.</li> <li>No non-environmentally friendly suppressants may be used as this could result in pollution of water sources.</li> <li>Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.</li> <li>Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.</li> <li>A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. <ul style="list-style-type: none"> <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 on site unless necessary.</li> <li>All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.</li> <li>Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.</li> <li>Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.</li> <li>All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.</li> </ul> </li> <li>It must be made an offence for any staff member to take any indigenous plant species out of any portion of the Project area, or to bring any alien plant species into any portion of the Project area except for rehabilitation purposes. This is to prevent the spread of exotic or invasive species or the illegal collection of plants.</li> </ul>												
2	4	3	3	4	4		3	2	2	4	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected <	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Highly likely	<b>Moderately High</b>	One year to five years: Medium Term	Develop ment specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	<b>Low</b>

		1000 m										
<ul style="list-style-type: none"> <li>• Compile and implement an alien vegetation management plan from the onset of construction. The plan must identify areas for action (if any) and prescribe the necessary removal methods and frequencies to be applied. This plan must be also prescribing a monitoring plan and be updated as/when new data is collated;</li> <li>• Implementation of a waste management plan.</li> <li>• Temporary storage of domestic waste shall be in covered waste skips.</li> <li>• Removal of domestic waste on a regular basis, no overspill is permitted.</li> </ul>												
3	4	3	4	4	4		3	2	3	4	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impact a / Linear features affected < 1000 m	Great / harmful	Ecology highly sensitive /important	Highly likely	<b>Moderately High</b>	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Possible	<b>Low</b>
<ul style="list-style-type: none"> <li>• Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers e.g., safety tape, not painted lines, and use signage.</li> <li>• Prior to vegetation clearing activities, the area to be cleared should be walked on foot by 1-2 individuals to create a disturbance in order for fauna to move off. Sites should be disturbed only prior to the area having to be cleared.             <ul style="list-style-type: none"> <li>○ Any fauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist.</li> </ul> </li> <li>• All construction vehicles should adhere to a speed limit of maximum 30 km/h to avoid collisions. 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 still be enforced to ensure that road killings, dust and erosion is limited. Appropriate speed control measures and signs must be erected.</li> <li>• Schedule activities and operations during least sensitive period;             <ul style="list-style-type: none"> <li>○ Construction and driving on roads at night should be restricted in order to reduce or prevent wildlife road mortalities which occur more frequently during this period</li> </ul> </li> <li>• Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.</li> <li>• Minimise vegetation clearing to the minimum required. Areas should be cleared and disturbed on a needs basis only, as opposed to clearing and disturbing a number of sites simultaneously.</li> <li>• Provide all personnel and contractors to undergo Environmental Awareness Training to all personnel and contractors. A signed register of attendance must be kept for proof. Discussions The training must include.</li> <li>• The timing between clearing of an area and subsequent development must be minimized to avoid fauna from re-entering the site to be disturbed.</li> <li>• Any holes/deep excavations must be done in a progressive manner on a needs basis only. No holes/excavations may be left open overnight. In the event holes/excavations are required to remain open overnight, these areas must be covered to prevent fauna falling into these areas and subsequently inspected prior to backfilling</li> <li>• Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.</li> <li>• No construction activity is to occur at night.</li> <li>• Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.</li> </ul>												

**4.4.2 Operational Phase**

It is anticipated that daily activities associated with the operation phase will lead to further spread the AIP, as well as the deterioration of the habitats due to the increase of traffic, dust and edge effect impacts. Dust reduces the ability of plants to photosynthesise and thus leads to

degradation/retrogression of the veld. Moving maintenance vehicles do not only cause sensory disturbances to fauna, affecting their life cycles and movement, but will lead to direct mortalities due to collisions, the roads and fences lead to the barrier effect reducing movement and dispersal. Operation will continue to have an effect on erosion of the site with continued disturbance of natural water flow regimes, resulting in a further loss of habitats.

The following potential impacts were considered (Table 4-3):

- 1) Continued fragmentation and degradation of ecosystems;
- 2) Spread of alien and/or invasive species and reduction of habitat integrity; and
- 3) Ongoing displacement and direct mortalities of faunal community (including possible SCC) due to disturbance (road collisions, noise, light, dust and vibration).

**Table 4-3 Impacts to biodiversity associated with the proposed operational phase**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
1	5	3	3	3	4		4	2	2	3	2	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant	Ecology moderately sensitive / /important	Highly likely	<b>Moderately High</b>	Life of operation or less than 20 years: Long Term	Development specific	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / /important	Possible	<b>Low</b>
<ul style="list-style-type: none"> <li>• It should be made an offence for any staff to /take bring any plant species into/out of any portion of the PAOI. No plant species whether indigenous or exotic should be brought into/taken from the PAOI, to prevent the spread of exotic or invasive species or the illegal collection of plants. Bring plant species into/out of the PAOI should only be allowed for rehabilitation purposes.</li> <li>• A Rehabilitation Plan must be implemented.</li> <li>• Access roads should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>• All erosion observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>• There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous perennial grass, shrubs and trees.</li> </ul>												
2	4	3	3	3	4		4	2	2	3	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive / /important	Highly likely	<b>Moderate</b>	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / /important	Possible	<b>Low</b>

		affected < 1000m										
<ul style="list-style-type: none"> <li>Implementation of an alien vegetation management plan.                             <ul style="list-style-type: none"> <li>Regular monitoring for IAP encroachment during the operation phase to ensure that no alien invasion problems have developed as result of the disturbance. This should be every 3 months during the first two years of the operation phase and every six months for the life of the project.</li> <li>All IAP species must be removed/controlled using the appropriate techniques as indicated in the IAP management plan</li> </ul> </li> <li>Compile and implement a Solid Waste Management Plan. Waste management must be a priority and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis as a minimum.</li> <li>A pest control plan must be implemented; it is imperative that poisons not be used.</li> </ul>												
3	4	3	3	3	3		3	2	2	3	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impact area / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive	Likely	Moderate	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / important	Possible	Low
<ul style="list-style-type: none"> <li>Any outside lighting should be designed and limited to minimize impacts on fauna. Lighting fixtures should be fitted with baffles, hoods or louvres and directed downward. Outside lighting should be directed away from highly sensitive areas such as the wetlands. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (yellow) lights should be used wherever possible;</li> <li>Where feasible, motion detection lighting must be used to minimise the unnecessary illumination of areas</li> <li>No vehicle traffic nor the use of vehicle lights should be permitted during the night.</li> <li>Noise must be kept to a minimum from dusk to dawn to minimize all possible disturbances to amphibian species and nocturnal mammals</li> <li>All personnel and contractors must undergo Environmental Awareness Training and must include awareness about not harming or collecting species.</li> <li>Any fauna threatened by the maintenance and operational activities should be removed to a safe location by an appropriate individual.</li> <li>All vehicles accessing the site should adhere to a max 30 km/h max to avoid collisions. Appropriate signs must be erected.</li> <li>Collisions, especially considering tortoises, should be monitored on a weekly basis.</li> </ul>												

**4.4.3 Cumulative Impacts**

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project’s impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts pre-existing in an area or region, it is appropriate to consider the cumulative effects of development or disturbance activities. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a specific point in time may actually represent a significant change from the original state of the system. This section describes the potential cumulative impacts of the project on local fauna and flora specifically.

Cumulative impacts are assessed within the context of the extent of the proposed PAOI, other similar developments and activities in the area (existing and in-process), and general habitat loss and transformation resulting from any other activities in the area. Localised cumulative impacts include those from operations that are close enough (within 30 km) to potentially cause additive effects on the local environment or any sensitive receptors (relevant operations include nearby large road networks, other mining activities, and power infrastructure). Relevant impacts include the overall reduction of foraging and habitat where reproduction takes place, dust deposition, noise and vibration, disruption of functional corridors of habitat important for movement and migration, disruption of waterways, groundwater drawdown, increase risk of collisions; and groundwater and surface water quality depletion.

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas. In order to spatially quantify the cumulative effects of the proposed development, the project in isolation is compared with the overall effects of surrounding developments (including total transformation and transformation as a result of new and proposed developments of a similar type).

**Table 4-4 Cumulative impact assessment for the project**

Impact	Project in Isolation						Project and Surrounding Projects					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Cumulative habitat loss and ecological processes	4	2	2	4	2		4	4	3	4	2	
	Life of operation or less than 20 years : Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology highly sensitive /important	Possible	<b>Low</b>	Life of operation or less than 20 years : Long Term	Regional within 5 km of the site boundary / < 2000 ha impacted / Linear features affected < 3000 m	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important	Possible	<b>Moderate</b>

## 5 Conclusion

The PAOI has been altered, albeit limited, both currently and historically. Historically, grazing from livestock and mismanagement has led to (limited) deterioration of the area. The area can be regarded as important, not only within the local landscape, but also regionally; as it is used for habitat, foraging and movement corridors for fauna within a landscape fragmented.

Completion of the terrestrial biodiversity assessment led to a corroboration of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool and the following aspects support this corroboration:

- Intact CBA 1 areas;
- Natural state of the area;
- Supports flora SCC; and
- Provides suitable habitat for fauna SCC.

The ecological integrity, importance and functioning of these terrestrial biodiversity areas provide a variety of ecological services considered beneficial, with one key service being the maintenance of biodiversity. The preservation of these systems is an important aspect to consider for the proposed project.

### 5.1 Layout Amendment and Way forward

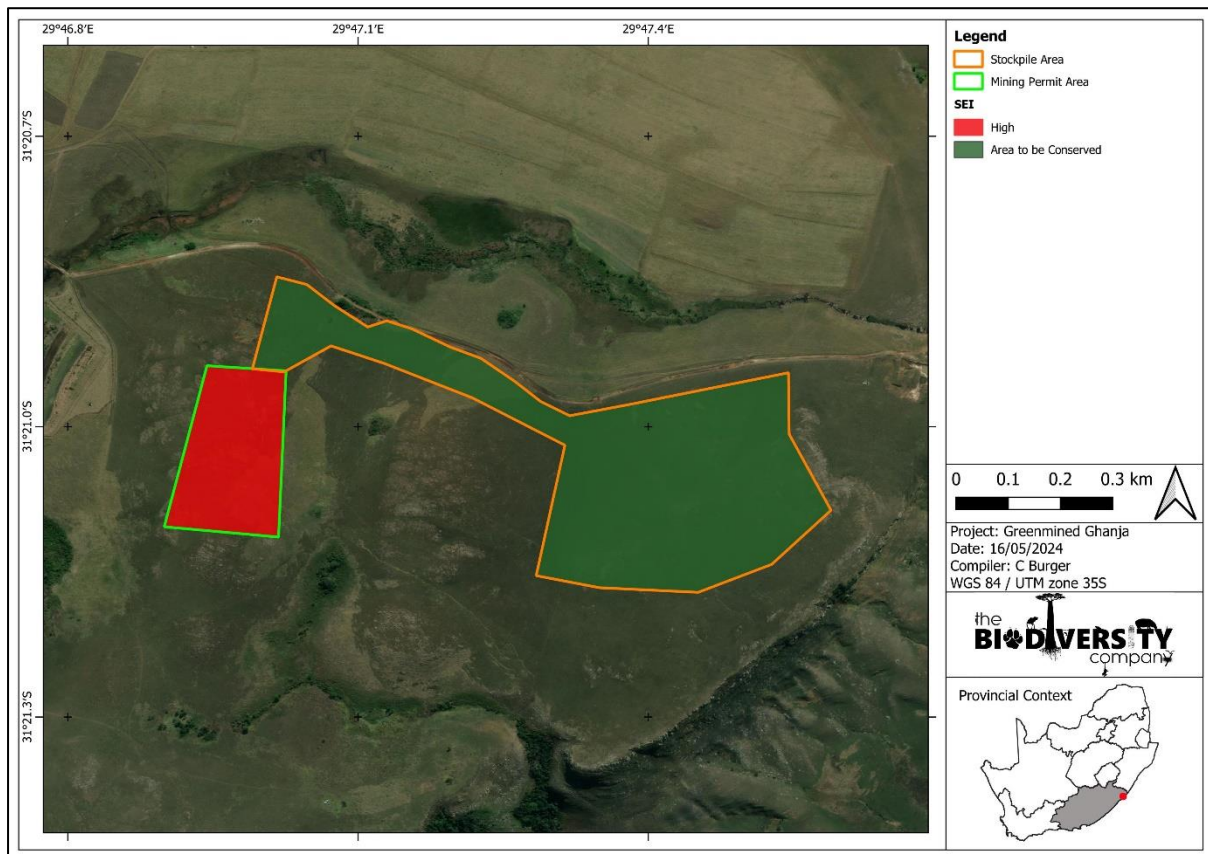
Based on the finding of the assessment the PAOI is categorised as 'Very High' SEI.

It is the specialist recommendation that only the Mining Permit Area as illustrate in Figure 5-1 below be considered for the proposed project (5 ha). Furthermore, the Stockpile area (19 ha) should be designated as an area to be conserved by the applicant. This will reduce the size of the project substantially and may reduce the SEI of the Mining Permit Area to a 'High' SEI (As per the SEI guidelines the FI will be Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type).

It is imperative that the following be implemented:

- A site walkdown must be conducted during the correct flowering season prior to the commencement of construction activities and all protected flora species and flora SCC must be avoided or the relevant permits obtained to carry out a plant search and rescue;
- A Strict Closure Plan must be developed and implemented for the Mining Right Area;
- A Biodiversity Offset must be considered;
- The managing of edge affects will be imperative, and all mitigation measures mention in this report must be implemented; and
- An alternative site must be identified for the stockpile area such as nearby modified areas (cultivated lands).

Please refer to Appendix G for a desktop assessment of the alternative sites identified for the Stockpile area.



**Figure 5-1** Site Ecological Importance of the PAOI based on the amended layout and way forward

## 5.2 Impact Statement

The primary expected impacts of the proposed project will be the loss of habitat, flora SCC and emigration of fauna. Based on the outcomes of the SEI determination, the PAOI possess a 'High' SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design to limit the amount of habitat impacted. Due to the small size of the PAOI (5 ha) should all edge effects be managed by implementing the mitigation measures mentioned in this report, the overall cumulative post mitigation impact significance associated with the proposed project is considered to be low.

Considering that this area has been identified as being of significance for biodiversity maintenance and ecological processes (CBA), development may proceed but offsets might be required by the Competent Authority. The prescribed mitigation measures must be considered by the Competent Authority for the issued authorisation. Considering the above-mentioned information, no fatal flaws are evident for the proposed project.



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## 7 Appendix Items

### 7.1 Appendix A: Methods

#### 7.1.1 Desktop Baseline

##### 7.1.1.1 Ecologically Important Landscape Features

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

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
  - Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).
- Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
  - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2023a) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
  - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Eastern Cape's Biodiversity Conservation Plan (Berliner *et al* 2007) addresses the urgent need to identify and map critical biodiversity areas and priorities for conservation in the province. It also provides land use planning guidelines, recommending biodiversity-friendly activities in priority areas. The ECBCP is intended for use by technical users and decision-makers in the spheres of planning, development and environment. Spatial mapping information can be used both reactively and strategically to guide future development away from sensitive and priority biodiversity areas (Berliner *et al* 2007).
- The key output of a systematic biodiversity plan is a map of biodiversity priority areas. The CBA map delineates Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), Other Natural Areas (ONAs), Protected Areas (PAs), and areas that have been irreversibly modified from their natural state (Berliner *et al* 2007). The ECBCP uses the following terms to categorise the various land used types according to their biodiversity and environmental importance:
  - Critical Biodiversity Area – 1;
  - Critical Biodiversity Area – 2;
  - Critical Biodiversity Area – 3;
  - Other Natural Area (ONA);
  - Protected Area (PA); and
  - **Critical Biodiversity Areas (CBAs)** are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Berliner *et al* 2007).
  - Critical Biodiversity Areas (CBAs) are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species (Berliner *et al* 2007).
  - **Ecological Support Areas (ESAs)** are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic (Berliner *et al* 2007).
  - **Other Natural Areas (ONAs)** consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (Berliner *et al* 2007).
  - Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; and
  - Freshwater Ecology:
    - Strategic Water Source Areas (SWSAs) (Le Maitre *et al*, 2018) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the

effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.*, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.
- National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al.*, 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.
- Mining and Biodiversity Guidelines:
  - The Mining and Biodiversity Guidelines (2013) was developed by the Department of Mineral Resources, the Chamber of Mines, the SANBI and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability. The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining, which will eventually translate into best practice within the mining sector. It provides a tool to facilitate the sustainable development of South Africa's mineral resources, in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. It provides the mining sector with a practical, user- friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where: mining-related impacts are legally prohibited; biodiversity priority areas may present high risks for mining projects; and biodiversity may limit the potential for mining.
  - In identifying biodiversity priority areas, which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:
    - A) Legally protected areas, where mining is prohibited;
    - B) Areas of highest biodiversity importance, which are at the highest risk for mining;
    - C) Areas of high biodiversity importance, which are at a high risk for mining; and
    - D) Areas of moderate biodiversity importance, which are at a moderate risk for mining.

Table 7-1 presents the four different categories and the implications for mining within each of these categories.

**Table 7-1 Summary of the Mining and Biodiversity Guidelines**

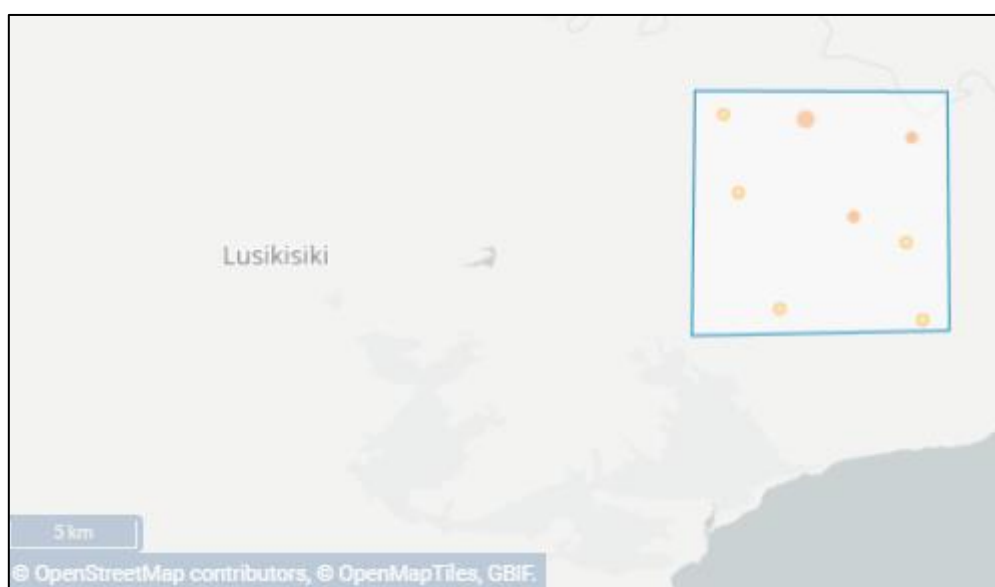
Category	Biodiversity priority areas	Risk for mining	Implications for mining
<b>A. Legally protected</b>	<ul style="list-style-type: none"> <li>Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)</li> </ul>	<b>Mining prohibited</b>	<p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p>
<b>B. Highest biodiversity importance</b>	<ul style="list-style-type: none"> <li>CE and EN</li> <li>CBAs (or equivalent areas) from provincial spatial biodiversity plans</li> <li>River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1 km buffer around these FEPAs</li> <li>Ramsar Sites</li> </ul>	<b>Highest risk for mining</b>	<p>Environmental screening, environmental impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and EAs.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>
<b>C. High biodiversity importance</b>	<ul style="list-style-type: none"> <li>Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves)</li> <li>Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas)</li> <li>Other identified priorities from provincial spatial biodiversity plans</li> <li>High water yield areas</li> <li>Coastal Protection Zone</li> <li>Estuarine functional zone</li> </ul>	<b>High risk for mining</b>	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and maintaining important ecosystem services for particular communities or the country as a whole.</p> <p>An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>
<b>D. Moderate biodiversity importance</b>	<ul style="list-style-type: none"> <li>Ecological support areas</li> <li>Vulnerable ecosystems</li> <li>Focus areas for protected area expansion (land-based and offshore protection)</li> </ul>	<b>Moderate risk for mining</b>	<p>These areas are of moderate biodiversity value.</p> <p>EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.</p>

Category	Biodiversity priority areas	Risk for mining	Implications for mining
			Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.

### 7.1.1.2 Desktop Flora Baseline

The desktop flora assessment encompassed an assessment of all the vegetation units and habitat types within the PAOI, as well as the identification of expected plant species and any locally occurring flora SCC.

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) and the 2018 Terrestrial & Freshwater Assessment by SANBI (2018) was used to identify the vegetation types that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the GBIF database (<https://www.gbif.org/country/ZA/summary>) was accessed to compile a list of expected flora species within the PAOI (Figure 7-1). 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.



**Figure 7-1** Map illustrating extent of area used to obtain the expected flora species list from the GBIF database. The blue square indicates the approximate location of the PAOI.

The latest information regarding provincially, and nationally protected flora was obtained from the following published legislative sources:

- Provincially Protected Plant Species (Schedules 5 & 6 of Transkei Decree No 9 Of 1992);
- Nationally Protected plant species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004); and
- List of Nationally Protected Tree Species (DEFF, 2022).

### 7.1.1.3 Desktop Fauna Baseline

The non-volant faunal desktop assessment comprised of the following:

- Compiling an expected amphibian list generated from the FrogMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2023a) using the 3129 quarter degree square;

- Compiling an expected reptile list generated from the ReptileMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2023b) using the 3129quarter degree square; and
- Compiling an expected mammal list generated from the MammalMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2023c) using the 3129 quarter degree square.
- Compiling an expected avifauna list generated from the South African Bird Atlas Project 2 (SABAP2) (<https://sabap2.birdmap.africa/>) using pentad 3120\_2945, 3115\_2945 and 3120\_2940.
- South Africa's official site for Species Information and National Red Lists (SANBI, 2022) was used to provide the most current national Red-List status of fauna. The latest information regarding provincially, and nationally protected fauna was obtained from the following published legislative lists:
  - Provincially Protected Wildlife Species (Schedule 1 & 2 of Transkei Decree No 9 Of 1992); and
  - Nationally Protected Wildlife species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004).

## 7.1.2 Field Assessment

### 7.1.2.1 Vegetation & Flora Survey

The dry season fieldwork and sample sites were placed within targeted areas (i.e., target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork 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.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps (confirmed during the field survey). 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 sensitive habitats, especially those overlapping with the PAOI.

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 area.

Species were identified in field wherever possible. If they could not be identified in the field, field guides and texts were used. Relevant field guides and texts consulted for identification purposes included, but was not limited, to the following:

- Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions (Fish *et al.*, 2015);



- A Field Guide to Wild Flowers (Pooley, 1998);
- Problem Plants and Alien Weeds of South Africa (Bromilow, 2018);
- Field Guide to Succulents in Southern Africa (Smith *et al.*, 2017);
- Field Guide to Wildflowers of South Africa (Manning, 2009); and
- iNaturalist. Available at <https://www.inaturalist.org/home>

### 7.1.2.2 Fauna Survey

The faunal component of this report pertains only to mammals and herpetofauna (reptiles and amphibians), as a separate avifauna assessment was conducted. The faunal field survey utilised a variety of sampling techniques, including but not limited to:

- Visual and auditory searches: This involves strategic meandering and the use of binoculars and specialist camera equipment to view species from a distance without them being disturbed;
- 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.);
- The identification of tracks and signs, and listening to species calls; and
- Utilization of local knowledge;

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

- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates et al, 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Stuarts' Field Guide to Mammals of Southern Africa including Angola, Zambia & Malawi (Stuart and Stuart, 2015); and
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

## 7.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of 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 in the PAOI) 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 7-2 and Table 7-3 respectively.

**Table 7-2 Summary of Conservation Importance (CI) criteria**

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

**Table 7-3 Summary of Functional Integrity (FI) 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.

BI can be derived from a simple matrix of CI and FI as provided in Table 7-4.

**Table 7-4 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)**

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 7-5.

**Table 7-5 Summary of Receptor Resilience (RR) 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: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
<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: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
<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: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
<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: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
<b>Very Low</b>	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-6.

**Table 7-6 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)**

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
	Very High	Medium	Low	Very Low	Very Low	Very Low

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

**Table 7-7 Guideline for interpreting Site Ecological Importance in the context of proposed activities**

Site Ecological Importance	Interpretation in relation to proposed development activities
<b>Very High</b>	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.
<b>High</b>	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.
<b>Medium</b>	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
<b>Low</b>	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
<b>Very Low</b>	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.

### 7.3 Appendix C: Impact / Risk Assessment

Potential impacts were evaluated against the data captured during the desktop assessment to identify relevance to the PAOI. The relevant impacts associated with the proposed development were then subjected to a prescribed impact assessment methodology which is provided below.

The significance of the identified impacts will be determined using an accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998. As with all impact methodologies, the impact is defined in a semi-quantitative way and will be assessed according to methodology prescribed in the following section (Table 7-8 and Table 7-9), the significance matrix can be seen in Table 7-10.

#### Scale utilised for the evaluation of the Environmental Impact Ratings:

**Table 7-8 Likelihood Descriptors**

Probability of impact	Rating
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	Rating
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ important	3

Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

**Table 7-9 Consequence Descriptors**

Severity of impact	Rating
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5

Spatial scope of impact	Rating
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	2
Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear features affected > 3000m	5

Duration of impact	Rating
One day to one month: Temporary	1
One month to one year: Short Term	2
One year to five years: Medium Term	3
Life of operation or less than 20 years: Long Term	4
Permanent	5

**Table 7-10 Significance Rating Matrix**

LIKELIHOOD (Frequency of activity + Frequency of impact)	CONSEQUENCE (Severity + Spatial Scope + Duration)															
	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Absent
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	Low
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	Moderate
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	Moderately High
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	High
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	

	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	Critical
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

## 7.4 Appendix D: Expected Species Lists

### 7.4.1 Expected Flora Species

Family	Scientific Name	Red List
Acanthaceae	<i>Thunbergia atriplicifolia</i>	NE
Acanthaceae	<i>Dyschoriste setigera</i>	NE
Amaryllidaceae	<i>Cyrtanthus stenanthus</i>	
Anacardiaceae	<i>Searsia dentata</i>	LC
Anacardiaceae	<i>Searsia discolor</i>	NE
Apocynaceae	<i>Aspidoglossum carinatum</i>	NE
Apocynaceae	<i>Pachycarpus grandiflorus</i>	
Apocynaceae	<i>Asclepias albens</i>	NE
Apocynaceae	<i>Ceropegia linearis</i>	NE
Aquifoliaceae	<i>Ilex mitis</i>	
Asparagaceae	<i>Chlorophytum capense</i>	NE
Asteraceae	<i>Inulanthera dregeana</i>	NE
Asteraceae	<i>Senecio rhyncholaenus</i>	NE
Asteraceae	<i>Senecio inaequidens</i>	NE
Asteraceae	<i>Afroaster hispidus</i>	NE
Asteraceae	<i>Senecio oxyriifolius</i>	
Asteraceae	<i>Plecostachys serpyllifolia</i>	NE
Asteraceae	<i>Berkheya rhapontica</i>	NE
Asteraceae	<i>Ageratum conyzoides</i>	NE
Asteraceae	<i>Senecio madagascariensis</i>	NE
Asteraceae	<i>Helichrysum nudifolium</i>	
Asteraceae	<i>Gerbera ambigua</i>	NE
Asteraceae	<i>Helichrysum adenocarpum</i>	
Asteraceae	<i>Tarchonanthus trilobus</i>	
Asteraceae	<i>Osteospermum imbricatum</i>	
Campanulaceae	<i>Lobelia chamaedryfolia</i>	NE
Campanulaceae	<i>Monopsis stellarioides</i>	
Campanulaceae	<i>Lobelia anceps</i>	NE
Campanulaceae	<i>Lobelia tomentosa</i>	NE
Campanulaceae	<i>Wahlenbergia paucidentata</i>	NE
Campanulaceae	<i>Lobelia flaccida</i>	
Campanulaceae	<i>Monopsis unidentata</i>	NE
Campanulaceae	<i>Cyphia elata</i>	
Campanulaceae	<i>Lobelia pteropoda</i>	NE
Campanulaceae	<i>Monopsis scabra</i>	NE
Celastraceae	<i>Gymnosporia bachmannii</i>	VU



<b>Celastraceae</b>	<i>Gymnosporia bachmannii</i>	VU
<b>Commelinaceae</b>	<i>Commelina africana</i>	LC
<b>Crassulaceae</b>	<i>Crassula obovata</i>	NE
<b>Crassulaceae</b>	<i>Crassula perforata</i>	NE
<b>Crassulaceae</b>	<i>Crassula pellucida</i>	NE
<b>Cyperaceae</b>	<i>Rhynchospora barrosiana</i>	NE
<b>Cyperaceae</b>	<i>Rhynchospora brownii</i>	NE
<b>Cyperaceae</b>	<i>Cyperus nigricans</i>	LC
<b>Cyperaceae</b>	<i>Zulustylis hygrophila</i>	NE
<b>Cyperaceae</b>	<i>Isolepis fluitans</i>	
<b>Cyperaceae</b>	<i>Ficinia gracilis</i>	NE
<b>Cyperaceae</b>	<i>Cyperus niveus</i>	
<b>Cyperaceae</b>	<i>Fimbristylis complanata</i>	LC
<b>Cyperaceae</b>	<i>Ficinia laciniata</i>	NE
<b>Cyperaceae</b>	<i>Scleria greigiifolia</i>	LC
<b>Davalliaceae</b>	<i>Davallia chaerophylloides</i>	NE
<b>Euphorbiaceae</b>	<i>Euphorbia flanaganii</i>	NE
<b>Euphorbiaceae</b>	<i>Micrococca capensis</i>	NE
<b>Euphorbiaceae</b>	<i>Acalypha punctata</i>	
<b>Fabaceae</b>	<i>Chamaecrista comosa</i>	
<b>Fabaceae</b>	<i>Millettia grandis</i>	LC
<b>Fabaceae</b>	<i>Eriosema salignum</i>	NE
<b>Fabaceae</b>	<i>Tephrosia brummittii</i>	NE
<b>Fabaceae</b>	<i>Argyrolobium rotundifolium</i>	NE
<b>Fabaceae</b>	<i>Dalbergia obovata</i>	LC
<b>Fabaceae</b>	<i>Tephrosia macropoda</i>	
<b>Fabaceae</b>	<i>Indigofera comosa</i>	NE
<b>Fabaceae</b>	<i>Eriosema dregei</i>	NE
<b>Fabaceae</b>	<i>Abrus laevigatus</i>	NE
<b>Hypericaceae</b>	<i>Hypericum aethiopicum</i>	NE
<b>Iridaceae</b>	<i>Watsonia pillansii</i>	NE
<b>Iridaceae</b>	<i>Aristea ecklonii</i>	NE
<b>Iridaceae</b>	<i>Watsonia bachmannii</i>	NE
<b>Iridaceae</b>	<i>Gladiolus inandensis</i>	NE
<b>Iridaceae</b>	<i>Tritonia gladiolaris</i>	NE
<b>Iridaceae</b>	<i>Gladiolus wilsonii</i>	NE
<b>Iridaceae</b>	<i>Hesperantha modesta</i>	NE
<b>Iridaceae</b>	<i>Dietes butcheriana</i>	NE
<b>Juncaceae</b>	<i>Juncus oxycarpus</i>	LC

Lamiaceae	<i>Aeollanthus parvifolius</i>	NE
Lamiaceae	<i>Coleus calycinus</i>	NE
Lamiaceae	<i>Coleus kirkii</i>	NE
Lamiaceae	<i>Syncolostemon parviflorus</i>	
Lentibulariaceae	<i>Genlisea hispidula</i>	LC
Linaceae	<i>Linum thesioides</i>	NE
Lycopodiaceae	<i>Palhinhaea cernua</i>	NE
Malvaceae	<i>Grewia pondoensis</i>	NE
Melastomataceae	<i>Argyrella canescens</i>	NE
Moraceae	<i>Ficus burtt-davyi</i>	LC
Moraceae	<i>Ficus bizanae</i>	VU
Myricaceae	<i>Morella serrata</i>	NE
Myrtaceae	<i>Syzygium cordatum</i>	LC
Orchidaceae	<i>Polystachya ottoniana</i>	NE
Orchidaceae	<i>Disa woodii</i>	NE
Orchidaceae	<i>Satyrium sphaerocarpum</i>	NE
Orchidaceae	<i>Polystachya pubescens</i>	NE
Orchidaceae	<i>Disa polygonoides</i>	NE
Orchidaceae	<i>Mystacidium capense</i>	NE
Orchidaceae	<i>Disa nervosa</i>	NE
Orchidaceae	<i>Eulophia ensata</i>	NE
Orchidaceae	<i>Disa tripetaloides</i>	NE
Orchidaceae	<i>Eulophia parviflora</i>	NE
Orchidaceae	<i>Tridactyle bicaudata</i>	
Orchidaceae	<i>Habenaria dives</i>	NE
Orobanchaceae	<i>Striga bilabiata</i>	NE
Osmundaceae	<i>Todea barbara</i>	NE
Passifloraceae	<i>Basananthe sandersonii</i>	NE
Piperaceae	<i>Peperomia retusa</i>	NE
Poaceae	<i>Panicum dregeanum</i>	NE
Poaceae	<i>Ischaemum polystachyum</i>	NE
Poaceae	<i>Digitaria diagonalis</i>	
Poaceae	<i>Axonopus fissifolius</i>	NE
Poaceae	<i>Eragrostis inamoena</i>	NE
Poaceae	<i>Trachypogon spicatus</i>	NE
Poaceae	<i>Adenochloa hymeniochila</i>	LC
Poaceae	<i>Ctenium concinnum</i>	NE
Polygalaceae	<i>Muraltia lancifolia</i>	NE
Primulaceae	<i>Maesa lanceolata</i>	LC

Primulaceae	<i>Maesa alnifolia</i>	NE
Primulaceae	<i>Samolus valerandi</i>	LC
Proteaceae	<i>Leucadendron spissifolium</i>	VU
Proteaceae	<i>Leucadendron spissifolium</i>	VU
Proteaceae	<i>Leucadendron spissifolium</i>	LC
Pteridaceae	<i>Pityrogramma austroamericana</i>	
Rubiaceae	<i>Empogona africana</i>	VU
Rubiaceae	<i>Empogona lanceolata</i>	NE
Rubiaceae	<i>Richardia brasiliensis</i>	NE
Rubiaceae	<i>Oldenlandia herbacea</i>	
Rubiaceae	<i>Anthospermum rigidum</i>	
Rubiaceae	<i>Pavetta bowkeri</i>	NE
Rubiaceae	<i>Oxyanthus speciosus</i>	
Rubiaceae	<i>Galopina circaeoides</i>	NE
Rubiaceae	<i>Spermacoce natalensis</i>	NE
Smilacaceae	<i>Smilax anceps</i>	NE
Stilbaceae	<i>Anastrabe integerrima</i>	LC
Thesiaceae	<i>Thesium squarrosus</i>	NE
Thymelaeaceae	<i>Gnidia calocephala</i>	NE
Violaceae	<i>Pigea enneasperma</i>	NE
Zamiaceae	<i>Stangeria eriopus</i>	VU

#### 7.4.2 Expected Mammal Species

Family	Scientific name	Common name	Conservation Status	
			SANBI	IUCN
Bathyergidae	<i>Cryptomys hottentotus</i>	Common Mole-rat	LC	LC
Bathyergidae	<i>Cryptomys hottentotus natalensis</i>	Natal Mole-rat	Unlisted	LC
Bovidae	<i>Ourebia ourebi</i>	Oribi	EN	LC
Bovidae	<i>Philantomba monticola</i>	Blue Duiker	VU	LC
Bovidae	<i>Redunca arundinum</i>	Southern Reedbuck	LC	LC
Cercopithecidae	<i>Cercopithecus albogularis</i>	Samango Monkey	LC	LC
Cercopithecidae	<i>Chlorocebus pygerythrus</i>	Vervet Monkey	LC	LC
Cercopithecidae	<i>Chlorocebus pygerythrus pygerythrus</i>	Vervet Monkey (subspecies pygerythrus)	LC	Unlisted
Cercopithecidae	<i>Papio ursinus</i>	Chacma Baboon	LC	LC
Chrysochloridae	<i>Amblysomus hottentotus</i>	Hottentot's Golden Mole	LC	LC
Felidae	<i>Leptailurus serval</i>	Serval	NT	LC
Herpestidae	<i>Atilax paludinosus</i>	Water Mongoose	LC	LC
Hipposideridae	<i>Hipposideros caffer</i>	Sundevall's Leaf-nosed Bat	LC	LC
Hystriidae	<i>Hystrix africae australis</i>	Cape Porcupine	LC	LC

Family	Scientific name	Common name	Conservation Status	
			SANBI	IUCN
<b>Molossidae</b>	<i>Chaerephon pumilus</i>	Little Free-tailed Bat	LC	LC
<b>Muridae</b>	<i>Mastomys natalensis</i>	Natal Multimammate Mouse	LC	LC
<b>Muridae</b>	<i>Mus (Nannomys) minutoides</i>	Southern African Pygmy Mouse	LC	LC
<b>Muridae</b>	<i>Otomys auratus</i>	Vlei Rat (Grassland type)	NT	NT
<b>Muridae</b>	<i>Otomys laminatus</i>	Laminate Vlei Rat	NT	NT
<b>Muridae</b>	<i>Rhabdomys pumilio</i>	Xeric Four-striped Mouse	LC	LC
<b>Mustelidae</b>	<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT
<b>Mustelidae</b>	<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC
<b>Nesomyidae</b>	<i>Dendromus mystacalis</i>	Chestnut Climbing Mouse	LC	LC
<b>Nycteridae</b>	<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC	LC
<b>Procaviidae</b>	<i>Procavia capensis capensis</i>	Cape Rock Hyrax	LC	LC
<b>Pteropodidae</b>	<i>Epomophorus wahlbergi</i>	Wahlberg's epauletted fruit bat	LC	LC
<b>Rhinolophidae</b>	<i>Rhinolophus clivus</i>	Geoffroy's Horseshoe Bat	LC	LC
<b>Rhinolophidae</b>	<i>Rhinolophus swinnyi</i>	Swinny's horseshoe bat	VU	LC
<b>Soricidae</b>	<i>Myosorex varius</i>	Forest Shrew	LC	LC
<b>Vespertilionidae</b>	<i>Hypsugo anchietae</i>	Anchieta's Pipistrelle	Unlisted	LC
<b>Vespertilionidae</b>	<i>Pipistrellus (Pipistrellus) hesperidus</i>	Dusky Pipistrelle	LC	LC
<b>Vespertilionidae</b>	<i>Scotophilus dinganii</i>	Yellow House Bat	LC	LC

### 7.4.3 Expected Reptile Species

Family	Scientific name	Common name	Conservation Status	
			SANBI	IUCN
<b>Agamidae</b>	<i>Agama atra</i>	Southern Rock Agama	LC	LC
<b>Chamaeleonidae</b>	<i>Bradypodion melanocephalum</i>	KwaZulu Dwarf Chameleon	NT	NT
<b>Chamaeleonidae</b>	<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC	LC
<b>Colubridae</b>	<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	LC	Unlisted
<b>Colubridae</b>	<i>Dasypeltis inornata</i>	Southern Brown Egg-eater	LC	LC
<b>Colubridae</b>	<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	LC
<b>Colubridae</b>	<i>Philothamnus hoplogaster</i>	South Eastern Green Snake	LC	Unlisted
<b>Colubridae</b>	<i>Philothamnus semivariatus</i>	Spotted Bush Snake	LC	Unlisted
<b>Cordylidae</b>	<i>Chamaesaura anguina anguina</i>	Cape Grass Lizard	LC	Unlisted
<b>Elapidae</b>	<i>Dendroaspis angusticeps</i>	Eastern Green Mamba	VU	LC
<b>Elapidae</b>	<i>Dendroaspis polylepis</i>	Black Mamba	LC	LC
<b>Elapidae</b>	<i>Elapsoidea sundevallii sundevallii</i>	Sundevall's Garter Snake	LC	Unlisted
<b>Gekkonidae</b>	<i>Afroedura pondolia</i>	Pondo Flat Gecko	LC	LC
<b>Gekkonidae</b>	<i>Hemidactylus mabouia</i>	Common Tropical House Gecko	LC	Unlisted
<b>Lamprophiidae</b>	<i>Boaedon capensis</i>	Brown House Snake	LC	LC
<b>Lamprophiidae</b>	<i>Duberria lutrix lutrix</i>	South African Slug-eater	LC	LC

Family	Scientific name	Common name	Conservation Status	
			SANBI	IUCN
Lamprophiidae	<i>Lamprophis guttatus</i>	Spotted Rock Snake	LC	LC
Lamprophiidae	<i>Lycodonomorphus rufulus</i>	Brown Water Snake	LC	Unlisted
Lamprophiidae	<i>Macrelaps microlepidotus</i>	Natal Black Snake	LC	LC
Lamprophiidae	<i>Psammodon brevisrostris</i>	Short-snouted Grass Snake	LC	Unlisted
Lamprophiidae	<i>Pseudaspis cana</i>	Mole Snake	LC	Unlisted
Lamprophiidae	<i>Xenocalamus bicolor lineatus</i>	Striped Quill-snouted Snake	LC	Unlisted
Leptotyphlopidae	<i>Leptotyphlops scutifrons conjunctus</i>	Eastern Thread Snake	LC	LC
Leptotyphlopidae	<i>Leptotyphlops scutifrons scutifrons</i>	Peters' Thread Snake	LC	Unlisted
Pelomedusidae	<i>Pelomedusa galeata</i>	South African Marsh Terrapin	Not evaluated	Unlisted
Pythonidae	<i>Python natalensis</i>	Southern African Python	LC	Unlisted
Scincidae	<i>Acontias plumbeus</i>	Giant Legless Skink	LC	LC
Scincidae	<i>Trachylepis varia sensu stricto</i>	Common Variable Skink	LC	LC
Typhlopidae	<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	LC	LC
Varanidae	<i>Varanus albigularis albigularis</i>	Southern Rock Monitor	LC	Unlisted
Varanidae	<i>Varanus niloticus</i>	Water Monitor	LC	Unlisted
Viperidae	<i>Causus rhombeatus</i>	Rhombic Night Adder	LC	LC

#### 7.4.4 Expected Amphibian Species

Family	Scientific name	Common name	Conservation Status	
			SANBI	IUCN
Arthroleptidae	<i>Arthroleptis wahlbergi</i>	Bush Squeaker	LC	LC
Arthroleptidae	<i>Leptopelis natalensis</i>	Natal Tree Frog	LC	LC
Brevicipitidae	<i>Breviceps mossambicus</i>	Mozambique Rain Frog	LC	LC
Brevicipitidae	<i>Breviceps verrucosus</i>	Plaintive Rain Frog	LC	LC
Bufoidea	<i>Schismaderma carens</i>	African Red Toad	LC	LC
Bufoidea	<i>Sclerophrys gutturalis</i>	Guttural Toad	LC	LC
Hyperoliidae	<i>Afrixalus fornasinii</i>	Greater Leaf-folding Frog	LC	Unlisted
Hyperoliidae	<i>Afrixalus spinifrons</i>	Natal Leaf-folding Frog	LC	LC
Hyperoliidae	<i>Hyperolius marmoratus</i>	Painted Reed Frog	LC	LC
Hyperoliidae	<i>Hyperolius microps</i>	Sharp-headed Long Reed Frog	LC	Unlisted
Hyperoliidae	<i>Hyperolius pusillus</i>	Water Lily Frog	LC	LC
Hyperoliidae	<i>Hyperolius semidiscus</i>	Yellowstriped Reed Frog	LC	LC
Hyperoliidae	<i>Hyperolius tuberilinguis</i>	Tinker Reed Frog	LC	LC
Hyperoliidae	<i>Kassina senegalensis</i>	Bubbling Kassina	LC	LC
Hyperoliidae	<i>Semnodactylus wealii</i>	Rattling Frog	LC	LC
Phrynobatrachidae	<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC	LC
Pipidae	<i>Xenopus laevis</i>	Common Platanna	LC	LC
Ptychadenidae	<i>Ptychadena oxyrhynchus</i>	Sharp-nosed Grass Frog	LC	LC

<b>Ptychadenidae</b>	<i>Ptychadena porosissima</i>	Striped Grass Frog	LC	LC
<b>Pyxicephalidae</b>	<i>Amietia delalandii</i>	Delalande's River Frog	LC	Unlisted
<b>Pyxicephalidae</b>	<i>Cacosternum nanum</i>	Bronze Caco	LC	LC
<b>Pyxicephalidae</b>	<i>Natalobatrachus bonebergi</i>	Kloof Frog	EN	EN
<b>Pyxicephalidae</b>	<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC	LC
<b>Pyxicephalidae</b>	<i>Strongylopus grayii</i>	Clicking Stream Frog	LC	LC
<b>Pyxicephalidae</b>	<i>Tomopterna natalensis</i>	Natal Sand Frog	LC	LC

#### 7.4.5 Expected Avifauna Species

Scientific Name	Common Name	Family Name	Regional	Global (IUCN)
<i>Accipiter melanoleucus</i>	Black Sparrowhawk	Accipitridae	Unlisted	Unlisted
<i>Accipiter minullus</i>	Little Sparrowhawk	Accipitridae	Unlisted	Unlisted
<i>Accipiter rufiventris</i>	Rufous-breasted Sparrowhawk	Accipitridae	Unlisted	Unlisted
<i>Accipiter tachiro</i>	African Goshawk	Accipitridae	Unlisted	Unlisted
<i>Acrocephalus gracilirostris</i>	Lesser Swamp Warbler	Acrocephalidae	Unlisted	Unlisted
<i>Acrocephalus palustris</i>	Marsh Warbler	Acrocephalidae	Unlisted	Unlisted
<i>Actitis hypoleucos</i>	Common Sandpiper	Scolopacidae	Unlisted	Unlisted
<i>Actophilornis africanus</i>	African Jacana	Jacanidae	Unlisted	Unlisted
<i>Alcedo semitorquata</i>	Half-collared Kingfisher	Alcedinidae	NT	LC
<i>Alopochen aegyptiaca</i>	Egyptian Goose	Anatidae	Unlisted	Unlisted
<i>Amandava subflava</i>	Orange-breasted Waxbill	Estrildidae	Unlisted	Unlisted
<i>Amblyospiza albifrons</i>	Thick-billed Weaver	Ploceidae	Unlisted	Unlisted
<i>Anas sparsa</i>	African Black Duck	Anatidae	Unlisted	Unlisted
<i>Anas undulata</i>	Yellow-billed Duck	Anatidae	Unlisted	Unlisted
<i>Andropadus importunus</i>	Sombre Greenbul	Pycnonotidae	Unlisted	Unlisted
<i>Anhinga rufa</i>	African Darter	Anhingidae	Unlisted	Unlisted
<i>Anthus cinnamomeus</i>	African Pipit	Motacillidae	Unlisted	Unlisted
<i>Anthus leucophrys</i>	Plain-backed Pipit	Motacillidae	Unlisted	Unlisted
<i>Anthus lineiventris</i>	Striped Pipit	Motacillidae	Unlisted	Unlisted

<i>Anthus nicholsoni</i>	Nicholson's Pipit	Motacillidae	Unlisted	Unlisted
<i>Apalis flavida</i>	Yellow-breasted Apalis	Cisticolidae	Unlisted	Unlisted
<i>Apalis thoracica</i>	Bar-throated Apalis	Cisticolidae	Unlisted	Unlisted
<i>Apaloderma narina</i>	Narina Trogon	Trogonidae	Unlisted	Unlisted
<i>Apus affinis</i>	Little Swift	Apodidae	Unlisted	Unlisted
<i>Apus apus</i>	Common Swift	Apodidae	Unlisted	Unlisted
<i>Apus barbatus</i>	African Black Swift	Apodidae	Unlisted	Unlisted
<i>Apus caffer</i>	White-rumped Swift	Apodidae	Unlisted	Unlisted
<i>Apus horus</i>	Horus Swift	Apodidae	Unlisted	Unlisted
<i>Ardea alba</i>	Great Egret	Ardeidae	Unlisted	Unlisted
<i>Ardea cinerea</i>	Grey Heron	Ardeidae	Unlisted	Unlisted
<i>Ardea melanocephala</i>	Black-headed Heron	Ardeidae	Unlisted	Unlisted
<i>Ardea purpurea</i>	Purple Heron	Ardeidae	Unlisted	Unlisted
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	Procellariidae	LC	NT
<i>Arenaria interpres</i>	Ruddy Turnstone	Scolopacidae	Unlisted	Unlisted
<i>Balearica regulorum</i>	Grey Crowned Crane	Gruidae	EN	EN
<i>Batis capensis</i>	Cape Batis	Platysteiridae	Unlisted	Unlisted
<i>Batis molitor</i>	Chin-spot Batis	Platysteiridae	Unlisted	Unlisted
<i>Bostrychia hagedash</i>	Hadada Ibis	Threskiornithidae	Unlisted	Unlisted
<i>Bradypterus baboecala</i>	Little Rush Warbler	Locustellidae	Unlisted	Unlisted
<i>Bradypterus barratti</i>	Barratt's Warbler	Locustellidae	Unlisted	Unlisted
<i>Bradypterus sylvaticus</i>	Knysna Warbler	Locustellidae	VU	VU
<i>Bubo africanus</i>	Spotted Eagle-Owl	Strigidae	Unlisted	Unlisted
<i>Bubulcus ibis</i>	Western Cattle Egret	Ardeidae	Unlisted	Unlisted
<i>Bucorvus leadbeateri</i>	Southern Ground Hornbill	Bucorvidae	EN	VU
<i>Burhinus capensis</i>	Spotted Thick-knee	Burhinidae	Unlisted	Unlisted

<i>Burhinus vermiculatus</i>	Water Thick-knee	Burhinidae	Unlisted	Unlisted
<i>Buteo buteo</i>	Common Buzzard	Accipitridae	Unlisted	Unlisted
<i>Buteo rufofuscus</i>	Jackal Buzzard	Accipitridae	Unlisted	Unlisted
<i>Buteo trizonatus</i>	Forest Buzzard	Accipitridae	LC	NT
<i>Bycanistes bucinator</i>	Trumpeter Hornbill	Bucerotidae	Unlisted	Unlisted
<i>Calandrella cinerea</i>	Red-capped Lark	Alaudidae	Unlisted	Unlisted
<i>Calonectris borealis</i>	Cory's Shearwater	Procellariidae	Unlisted	Unlisted
<i>Calonectris borealis</i>	Cory's Shearwater	Procellariidae	Unlisted	Unlisted
<i>Camaroptera brachyura</i>	Green-backed Camaroptera	Cisticolidae	Unlisted	Unlisted
<i>Campephaga flava</i>	Black Cuckooshrike	Campephagidae	Unlisted	Unlisted
<i>Campethera abingoni</i>	Golden-tailed Woodpecker	Picidae	Unlisted	Unlisted
<i>Campethera notata</i>	Knysna Woodpecker	Picidae	NT	NT
<i>Campicoloides bifasciatus</i>	Buff-streaked Chat	Muscicapidae	Unlisted	Unlisted
<i>Caprimulgus europaeus</i>	European Nightjar	Caprimulgidae	Unlisted	Unlisted
<i>Caprimulgus natalensis</i>	Swamp Nightjar	Caprimulgidae	VU	LC
<i>Caprimulgus pectoralis</i>	Fiery-necked Nightjar	Caprimulgidae	Unlisted	Unlisted
<i>Caprimulgus tristigma</i>	Freckled Nightjar	Caprimulgidae	Unlisted	Unlisted
<i>Cebblepyris caesius</i>	Grey Cuckooshrike	Campephagidae	Unlisted	Unlisted
<i>Cecropis abyssinica</i>	Lesser Striped Swallow	Hirundinidae	Unlisted	Unlisted
<i>Cecropis cucullata</i>	Greater Striped Swallow	Hirundinidae	Unlisted	Unlisted
<i>Centropus burchellii</i>	Burchell's Coucal	Cuculidae	Unlisted	Unlisted
<i>Cercotrichas leucophrys</i>	White-browed Scrub Robin	Muscicapidae	Unlisted	Unlisted
<i>Cercotrichas signata</i>	Brown Scrub Robin	Muscicapidae	Unlisted	Unlisted
<i>Ceryle rudis</i>	Pied Kingfisher	Alcedinidae	Unlisted	Unlisted
<i>Ceuthmochares australis</i>	Green Malkoha	Cuculidae	Unlisted	Unlisted
<i>Chalcomitra amethystina</i>	Amethyst Sunbird	Nectariniidae	Unlisted	Unlisted



<b><i>Charadrius marginatus</i></b>	White-fronted Plover	Charadriidae	Unlisted	Unlisted
<b><i>Charadrius pecuarius</i></b>	Kittlitz's Plover	Charadriidae	Unlisted	Unlisted
<b><i>Charadrius tricollaris</i></b>	Three-banded Plover	Charadriidae	Unlisted	Unlisted
<b><i>Chlorophoneus olivaceus</i></b>	Olive Bushshrike	Malaconotidae	Unlisted	Unlisted
<b><i>Chlorophoneus sulfureopectus</i></b>	Orange-breasted Bushshrike	Malaconotidae	Unlisted	Unlisted
<b><i>Chrysococcyx caprius</i></b>	Diederik Cuckoo	Cuculidae	Unlisted	Unlisted
<b><i>Chrysococcyx cupreus</i></b>	African Emerald Cuckoo	Cuculidae	Unlisted	Unlisted
<b><i>Chrysococcyx klaas</i></b>	Klaas's Cuckoo	Cuculidae	Unlisted	Unlisted
<b><i>Ciconia ciconia</i></b>	White Stork	Ciconiidae	Unlisted	Unlisted
<b><i>Cinnyris afer</i></b>	Greater Double-collared Sunbird	Nectariniidae	Unlisted	Unlisted
<b><i>Cinnyris chalybeus</i></b>	Southern Double-collared Sunbird	Nectariniidae	Unlisted	Unlisted
<b><i>Cinnyris talatala</i></b>	White-bellied Sunbird	Nectariniidae	Unlisted	Unlisted
<b><i>Circus ranivorus</i></b>	African Marsh Harrier	Accipitridae	EN	LC
<b><i>Cisticola aberrans</i></b>	Lazy Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola ayresii</i></b>	Wing-snapping Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola cinnamomeus</i></b>	Pale-crowned Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola fulvicapilla</i></b>	Neddicky	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola juncidis</i></b>	Zitting Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola lais</i></b>	Wailing Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola natalensis</i></b>	Croaking Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Cisticola tinniens</i></b>	Levaillant's Cisticola	Cisticolidae	Unlisted	Unlisted
<b><i>Coccyzygia melanotis</i></b>	Sweet Waxbill	Estrildidae	Unlisted	Unlisted
<b><i>Colius striatus</i></b>	Speckled Mousebird	Coliidae	Unlisted	Unlisted
<b><i>Columba arquatrix</i></b>	African Olive Pigeon	Columbidae	Unlisted	Unlisted
<b><i>Columba guinea</i></b>	Speckled Pigeon	Columbidae	Unlisted	Unlisted
<b><i>Columba larvata</i></b>	Lemon Dove	Columbidae	Unlisted	Unlisted

<b><i>Columba livia</i></b>	Rock Dove	Columbidae	Unlisted	Unlisted
<b><i>Coracias garrulus</i></b>	European Roller	Coraciidae	NT	LC
<b><i>Corvus albicollis</i></b>	White-necked Raven	Corvidae	Unlisted	Unlisted
<b><i>Corvus albus</i></b>	Pied Crow	Corvidae	Unlisted	Unlisted
<b><i>Corvus capensis</i></b>	Cape Crow	Corvidae	Unlisted	Unlisted
<b><i>Corythornis cristatus</i></b>	Malachite Kingfisher	Alcedinidae	Unlisted	Unlisted
<b><i>Cossypha caffra</i></b>	Cape Robin-chat	Muscicapidae	Unlisted	Unlisted
<b><i>Cossypha dichroa</i></b>	Chorister Robin-chat	Muscicapidae	Unlisted	Unlisted
<b><i>Cossypha natalensis</i></b>	Red-capped Robin-chat	Muscicapidae	Unlisted	Unlisted
<b><i>Coturnix coturnix</i></b>	Common Quail	Phasianidae	Unlisted	Unlisted
<b><i>Creatophora cinerea</i></b>	Wattled Starling	Sturnidae	Unlisted	Unlisted
<b><i>Crithagra gularis</i></b>	Streaky-headed Seedeater	Fringillidae	Unlisted	Unlisted
<b><i>Crithagra mozambica</i></b>	Yellow-fronted Canary	Fringillidae	Unlisted	Unlisted
<b><i>Crithagra scotops</i></b>	Forest Canary	Fringillidae	Unlisted	Unlisted
<b><i>Crithagra sulphurata</i></b>	Brimstone Canary	Fringillidae	Unlisted	Unlisted
<b><i>Cuculus clamosus</i></b>	Black Cuckoo	Cuculidae	Unlisted	Unlisted
<b><i>Cuculus solitarius</i></b>	Red-chested Cuckoo	Cuculidae	Unlisted	Unlisted
<b><i>Cyanomitra olivacea</i></b>	Olive Sunbird	Nectariniidae	Unlisted	Unlisted
<b><i>Cyanomitra veroxii</i></b>	Grey Sunbird	Nectariniidae	Unlisted	Unlisted
<b><i>Cypsiurus parvus</i></b>	African Palm Swift	Apodidae	Unlisted	Unlisted
<b><i>Dendropicos fuscescens</i></b>	Cardinal Woodpecker	Picidae	Unlisted	Unlisted
<b><i>Dendropicos griseocephalus</i></b>	Olive Woodpecker	Picidae	Unlisted	Unlisted
<b><i>Dicrurus adsimilis</i></b>	Fork-tailed Drongo	Dicruridae	Unlisted	Unlisted
<b><i>Dicrurus ludwigii</i></b>	Common Square-tailed Drongo	Dicruridae	Unlisted	Unlisted
<b><i>Dryoscopus cubla</i></b>	Black-backed Puffback	Malaconotidae	Unlisted	Unlisted
<b><i>Egretta garzetta</i></b>	Little Egret	Ardeidae	Unlisted	Unlisted

<i>Elanus caeruleus</i>	Black-winged Kite	Accipitridae	Unlisted	Unlisted
<i>Estrilda astrild</i>	Common Waxbill	Estrildidae	Unlisted	Unlisted
<i>Euplectes ardens</i>	Red-collared Widowbird	Ploceidae	Unlisted	Unlisted
<i>Euplectes axillaris</i>	Fan-tailed Widowbird	Ploceidae	Unlisted	Unlisted
<i>Euplectes capensis</i>	Yellow Bishop	Ploceidae	Unlisted	Unlisted
<i>Euplectes orix</i>	Southern Red Bishop	Ploceidae	Unlisted	Unlisted
<i>Euplectes progne</i>	Long-tailed Widowbird	Ploceidae	Unlisted	Unlisted
<i>Falco amurensis</i>	Amur Falcon	Falconidae	Unlisted	Unlisted
<i>Falco biarmicus</i>	Lanner Falcon	Falconidae	VU	LC
<i>Falco concolor</i>	Sooty Falcon	Falconidae	NA	VU
<i>Falco peregrinus</i>	Peregrine Falcon	Falconidae	Unlisted	Unlisted
<i>Falco rupicolus</i>	Rock Kestrel	Falconidae	Unlisted	Unlisted
<i>Fulica cristata</i>	Red-knobbed coot	Rallidae	Unlisted	Unlisted
<i>Gallinago nigripennis</i>	African Snipe	Scolopacidae	Unlisted	Unlisted
<i>Geokichla guttata</i>	Spotted Ground Thrush	Turdidae	EN	VU
<i>Glaucidium capense</i>	African Barred Owlet	Strigidae	Unlisted	Unlisted
<i>Gyps coprotheres</i>	Cape Vulture	Accipitridae	EN	VU
<i>Haematopus moquini</i>	African Oystercatcher	Haematopodidae	Unlisted	Unlisted
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	Alcedinidae	Unlisted	Unlisted
<i>Halcyon senegaloides</i>	Mangrove Kingfisher	Alcedinidae	EN	LC
<i>Haliaeetus vocifer</i>	African Fish Eagle	Accipitridae	Unlisted	Unlisted
<i>Hedydipna collaris</i>	Collared Sunbird	Nectariniidae	Unlisted	Unlisted
<i>Hieraaetus pennatus</i>	Booted Eagle	Accipitridae	Unlisted	Unlisted
<i>Hirundo albicularis</i>	White-throated Swallow	Hirundinidae	Unlisted	Unlisted
<i>Hirundo rustica</i>	Barn Swallow	Hirundinidae	Unlisted	Unlisted
<i>Hydropogone caspia</i>	Caspian Tern	Laridae	VU	LC

<i>Iduna natalensis</i>	African Yellow Warbler	Acrocephalidae	Unlisted	Unlisted
<i>Indicator indicator</i>	Greater Honeyguide	Indicatoridae	Unlisted	Unlisted
<i>Indicator minor</i>	Lesser Honeyguide	Indicatoridae	Unlisted	Unlisted
<i>Indicator variegatus</i>	Scaly-throated Honeyguide	Indicatoridae	Unlisted	Unlisted
<i>Ispidina picta</i>	African Pygmy Kingfisher	Alcedinidae	Unlisted	Unlisted
<i>Jynx ruficollis</i>	Red-throated Wryneck	Picidae	Unlisted	Unlisted
<i>Lagonosticta rubricata</i>	African Firefinch	Estrildidae	Unlisted	Unlisted
<i>Lamprotornis nitens</i>	Cape Starling	Sturnidae	Unlisted	Unlisted
<i>Laniarius ferrugineus</i>	Southern Boubou	Malaconotidae	Unlisted	Unlisted
<i>Lanius collaris</i>	Southern Fiscal	Laniidae	Unlisted	Unlisted
<i>Lanius collurio</i>	Red-backed Shrike	Laniidae	Unlisted	Unlisted
<i>Larus dominicanus</i>	Kelp Gull	Laridae	Unlisted	Unlisted
<i>Lissotis melanogaster</i>	Black-bellied Bustard	Otididae	Unlisted	Unlisted
<i>Lophaetus occipitalis</i>	Long-crested Eagle	Accipitridae	Unlisted	Unlisted
<i>Lophoceros alboterminatus</i>	Crowned Hornbill	Bucerotidae	Unlisted	Unlisted
<i>Lybius torquatus</i>	Black-collared Barbet	Lybiidae	Unlisted	Unlisted
<i>Macronyx capensis</i>	Cape Longclaw	Motacillidae	Unlisted	Unlisted
<i>Macronyx croceus</i>	Yellow-throated Longclaw	Motacillidae	Unlisted	Unlisted
<i>Malaconotus blanchoti</i>	Grey-headed Bushshrike	Malaconotidae	Unlisted	Unlisted
<i>Mandingoa nitidula</i>	Green Twinspot	Estrildidae	Unlisted	Unlisted
<i>Megaceryle maxima</i>	Giant Kingfisher	Alcedinidae	Unlisted	Unlisted
<i>Melaenornis pammelaina</i>	Southern Black flycatcher	Muscicapidae	Unlisted	Unlisted
<i>Melaenornis silens</i>	Fiscal Flycatcher	Muscicapidae	Unlisted	Unlisted
<i>Melaniparus niger</i>	Southern Black Tit	Paridae	Unlisted	Unlisted
<i>Merops pusillus</i>	Little Bee-eater	Meropidae	Unlisted	Unlisted
<i>Microcarbo africanus</i>	Reed Cormorant	Phalacrocoracidae	Unlisted	Unlisted

<i>Milvus aegyptius</i>	Yellow-billed Kite	Accipitridae	Unlisted	Unlisted
<i>Mirafra africana</i>	Rufous-naped Lark	Alaudidae	Unlisted	Unlisted
<i>Monticola rupestris</i>	Cape Rock Thrush	Muscicapidae	Unlisted	Unlisted
<i>Morus capensis</i>	Cape Gannet	Sulidae	VU	EN
<i>Motacilla aguimp</i>	African Pied Wagtail	Motacillidae	Unlisted	Unlisted
<i>Motacilla capensis</i>	Cape Wagtail	Motacillidae	Unlisted	Unlisted
<i>Motacilla clara</i>	Mountain Wagtail	Motacillidae	Unlisted	Unlisted
<i>Muscicapa adusta</i>	African Dusky Flycatcher	Muscicapidae	Unlisted	Unlisted
<i>Muscicapa caerulescens</i>	Ashy Flycatcher	Muscicapidae	Unlisted	Unlisted
<i>Muscicapa striata</i>	Spotted flycatcher	Muscicapidae	Unlisted	Unlisted
<i>Myrmecocichla monticola</i>	Mountain Wheatear	Muscicapidae	Unlisted	Unlisted
<i>Nectarinia famosa</i>	Malachite Sunbird	Nectariniidae	Unlisted	Unlisted
<i>Neotis denhami</i>	Denham's Bustard	Otididae	VU	NT
<i>Notopholia corusca</i>	Black-bellied Starling	Sturnidae	Unlisted	Unlisted
<i>Numida meleagris</i>	Helmeted Guineafowl	Numididae	Unlisted	Unlisted
<i>Oenanthe familiaris</i>	Familiar Chat	Muscicapidae	Unlisted	Unlisted
<i>Onychognathus morio</i>	Red-winged Starling	Sturnidae	Unlisted	Unlisted
<i>Oriolus larvatus</i>	Black-headed Oriole	Oriolidae	Unlisted	Unlisted
<i>Ortygospiza atricollis</i>	Quailfinch	Estrildidae	Unlisted	Unlisted
<i>Otus senegalensis</i>	African Scops Owl	Strigidae	Unlisted	Unlisted
<i>Pandion haliaetus</i>	Western Osprey	Pandionidae	Unlisted	Unlisted
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	Passeridae	Unlisted	Unlisted
<i>Passer domesticus</i>	House Sparrow	Passeridae	Unlisted	Unlisted
<i>Passer melanurus</i>	Cape Sparrow	Passeridae	Unlisted	Unlisted
<i>Pernis apivorus</i>	European Honey-buzzard	Accipitridae	Unlisted	Unlisted
<i>Phalacrocorax capensis</i>	Cape Cormorant	Phalacrocoracidae	EN	EN

<i>Phalacrocorax lucidus</i>	White-breasted Cormorant	Phalacrocoracidae	Unlisted	Unlisted
<i>Phoenicopterus roseus</i>	Greater Flamingo	Phoenicopteridae	NT	LC
<i>Phoeniculus purpureus</i>	Green Wood Hoopoe	Phoeniculidae	Unlisted	Unlisted
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked Greenbul	Pycnonotidae	Unlisted	Unlisted
<i>Phyllastrephus terrestris</i>	Terrestrial Brownbul	Pycnonotidae	Unlisted	Unlisted
<i>Phylloscopus ruficapilla</i>	Yellow-throated Woodland Warbler	Phylloscopidae	Unlisted	Unlisted
<i>Phylloscopus trochilus</i>	Willow Warbler	Phylloscopidae	Unlisted	Unlisted
<i>Plectropterus gambensis</i>	Spur-winged Goose	Anatidae	Unlisted	Unlisted
<i>Ploceus bicolor</i>	Dark-backed Weaver	Ploceidae	Unlisted	Unlisted
<i>Ploceus capensis</i>	Cape Weaver	Ploceidae	Unlisted	Unlisted
<i>Ploceus cucullatus</i>	Village Weaver	Ploceidae	Unlisted	Unlisted
<i>Ploceus ocularis</i>	Spectacled Weaver	Ploceidae	Unlisted	Unlisted
<i>Ploceus subaureus</i>	Eastern Golden Weaver	Ploceidae	Unlisted	Unlisted
<i>Pluvialis squatarola</i>	Grey Plover	Charadriidae	Unlisted	Unlisted
<i>Pogoniulus pusillus</i>	Red-fronted Tinkerbird	Lybiidae	Unlisted	Unlisted
<i>Pogonocichla stellata</i>	White-starred Robin	Muscicapidae	Unlisted	Unlisted
<i>Poicephalus robustus</i>	Cape Parrot	Psittacidae	EN	VU
<i>Polemaetus bellicosus</i>	Martial Eagle	Accipitridae	EN	EN
<i>Polyboroides typus</i>	African Harrier-Hawk	Accipitridae	Unlisted	Unlisted
<i>Prinia hypoxantha</i>	Drakensberg Prinia	Cisticolidae	Unlisted	Unlisted
<i>Prinia subflava</i>	Tawny-flanked Prinia	Cisticolidae	Unlisted	Unlisted
<i>Procellaria aequinoctialis</i>	White-chinned Petrel	Oceanitidae	VU	VU
<i>Prodotiscus regulus</i>	Brown-backed Honeybird	Indicatoridae	Unlisted	Unlisted
<i>Promerops gurneyi</i>	Gurney's Sugarbird	Promeropidae	LC	NT
<i>Psalidoprocne pristoptera</i>	Black Saw-wing	Hirundinidae	Unlisted	Unlisted
<i>Pternistis afer</i>	Red-necked Spurfowl	Phasianidae	Unlisted	Unlisted

<i>Ptyonoprogne fuligula</i>	Rock Martin	Hirundinidae	Unlisted	Unlisted
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	Pycnonotidae	Unlisted	Unlisted
<i>Riparia paludicola</i>	Brown-throated Martin	Hirundinidae	Unlisted	Unlisted
<i>Sarothrura elegans</i>	Buff-spotted Flufftail	Sarothruridae	Unlisted	Unlisted
<i>Saxicola torquatus</i>	African Stonechat	Muscicapidae	Unlisted	Unlisted
<i>Scleroptila levaillantii</i>	Red-winged Francolin	Phasianidae	Unlisted	Unlisted
<i>Scopus umbretta</i>	Hamerkop	Scopidae	Unlisted	Unlisted
<i>Serinus canicollis</i>	Cape Canary	Fringillidae	Unlisted	Unlisted
<i>Spermestes cucullata</i>	Bronze Mannikin	Estrildidae	Unlisted	Unlisted
<i>Spermestes nigriceps</i>	Red-backed Mannikin	Estrildidae	Unlisted	Unlisted
<i>Sphenoeacus afer</i>	Cape Grassbird	Macrosphenidae	Unlisted	Unlisted
<i>Spilopelia senegalensis</i>	Laughing Dove	Columbidae	Unlisted	Unlisted
<i>Stephanoaetus coronatus</i>	Crowned Eagle	Accipitridae	VU	NT
<i>Stercorarius antarcticus</i>	Brown Skua	Stercorariidae	EN	LC
<i>Sterna hirundo</i>	Common Tern	Laridae	Unlisted	Unlisted
<i>Streptopelia capicola</i>	Ring-necked Dove	Columbidae	Unlisted	Unlisted
<i>Streptopelia semitorquata</i>	Red-eyed Dove	Columbidae	Unlisted	Unlisted
<i>Strix woodfordii</i>	African Wood Owl	Strigidae	Unlisted	Unlisted
<i>Sturnus vulgaris</i>	Common Starling	Sturnidae	Unlisted	Unlisted
<i>Tachymarptis melba</i>	Alpine Swift	Apodidae	Unlisted	Unlisted
<i>Tauraco corythaix</i>	Knysna Turaco	Musophagidae	Unlisted	Unlisted
<i>Tchagra senegalus</i>	Black-crowned Tchagra	Malaconotidae	Unlisted	Unlisted
<i>Tchagra tchagra</i>	Southern Tchagra	Malaconotidae	Unlisted	Unlisted
<i>Telophorus zeylonus</i>	Bokmakierie	Malaconotidae	Unlisted	Unlisted
<i>Terpsiphone viridis</i>	African Paradise Flycatcher	Monarchidae	Unlisted	Unlisted
<i>Thalasseus bergii</i>	Greater Crested Tern	Laridae	Unlisted	Unlisted

<i>Thalasseus sandvicensis</i>	Sandwich Tern	Laridae	Unlisted	Unlisted
<i>Thamnolaea cinnamomeiventris</i>	Mocking Cliff Chat	Muscicapidae	Unlisted	Unlisted
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	Threskiornithidae	Unlisted	Unlisted
<i>Trachyphonus vaillantii</i>	Crested Barbet	Lybiidae	Unlisted	Unlisted
<i>Treron calvus</i>	African Green Pigeon	Columbidae	Unlisted	Unlisted
<i>Tringa glareola</i>	Wood Sandpiper	Scolopacidae	Unlisted	Unlisted
<i>Tringa nebularia</i>	Common Greenshank	Pycnonotidae	Unlisted	Unlisted
<i>Trochocercus cyanomelas</i>	Blue-mantled Crested Flycatcher	Monarchidae	Unlisted	Unlisted
<i>Turdus olivaceus</i>	Olive Thrush	Turdidae	Unlisted	Unlisted
<i>Turnix nanus</i>	Black-rumped Buttonquail	Turnicidae	EN	LC
<i>Turtur chalcospilos</i>	Emerald-spotted Wood Dove	Columbidae	Unlisted	Unlisted
<i>Turtur tympanistria</i>	Tambourine Dove	Columbidae	Unlisted	Unlisted
<i>Tyto alba</i>	Western Barn Owl	Strigidae	Unlisted	Unlisted
<i>Upupa africana</i>	African Hoopoe	Upupidae	Unlisted	Unlisted
<i>Vanellus armatus</i>	Blacksmith Lapwing	Charadriidae	Unlisted	Unlisted
<i>Vanellus melanopterus</i>	Black-winged Lapwing	Charadriidae	Unlisted	Unlisted
<i>Vidua macroura</i>	Pin-tailed Whydah	Viduidae	Unlisted	Unlisted
<i>Zapornia flavirostra</i>	Black Crake	Rallidae	Unlisted	Unlisted
<i>Zosterops virens</i>	Cape White-eye	Zosteropidae	Unlisted	Unlisted



## 7.5 Appendix E: Specialist Declaration of Independence

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.



Carami Burger

Terrestrial Ecologist

The Biodiversity Company

May 2024

I, Rowan Buhrmann 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.



**Rowan Buhrmann**

**Ecologist**

The Biodiversity Company

May 2024

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

May 2024

7.6 Appendix F: Specialist CVs

## Carami Burger

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

(Pr Sci Nat)

Cell: +27 83 630 9077

Email: 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  
Zambia  
Angola  
Sierra Leone

### Nationality

South African

### Languages

English – Proficient  
Afrikaans – Proficient

### Qualifications

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

# Rowan Buhrmann

MSc Biology (Plant Ecophysiology)  
Pr Sci Nat (136853)

Cell: +27 78 558 1124

Email: rowan@thebiodiversitycompany.com

Identity Number: 9111085091086

Date of birth: 08 November 1991



## Profile Summary

Working experience throughout KwaZulu-Natal (South Africa).

Experience in Environmental Consulting as an EAP (EIAs and WULA).

Environmental Control Officer (ECO).

Specialist expertise in Climate Change (elevated temperatures) and Botany.

## Areas of Interest

Aquatic Ecology and Water Resource Management.

Renewable Energy.

Sustainability and Conservation.

Landscape rehabilitation.

Geographic Information Systems.

Experimental Design.

## Key Experience

- Environmental Impact Assessments and Water Use Licence Applications
- Vegetation Assessments
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring

## Countries worked in

South Africa

## Nationality

South African

## Languages

English – Proficient

## Qualifications

- MSc (University of KwaZulu-Natal) – Plant EcoPhysiology.
- BSc Honours (University of KwaZulu-Natal) – Biology
- BSc (University of KwaZulu-Natal) – Biology
- Certificate of Competence: Wetland WET-Health (V2)
- Pr Sci Nat (136853)

# 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 & Serbia.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international multi-disciplinary projects.

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, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

### Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

### Key Experience

- 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
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

### Country Experience

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

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Conversational

German - Basic

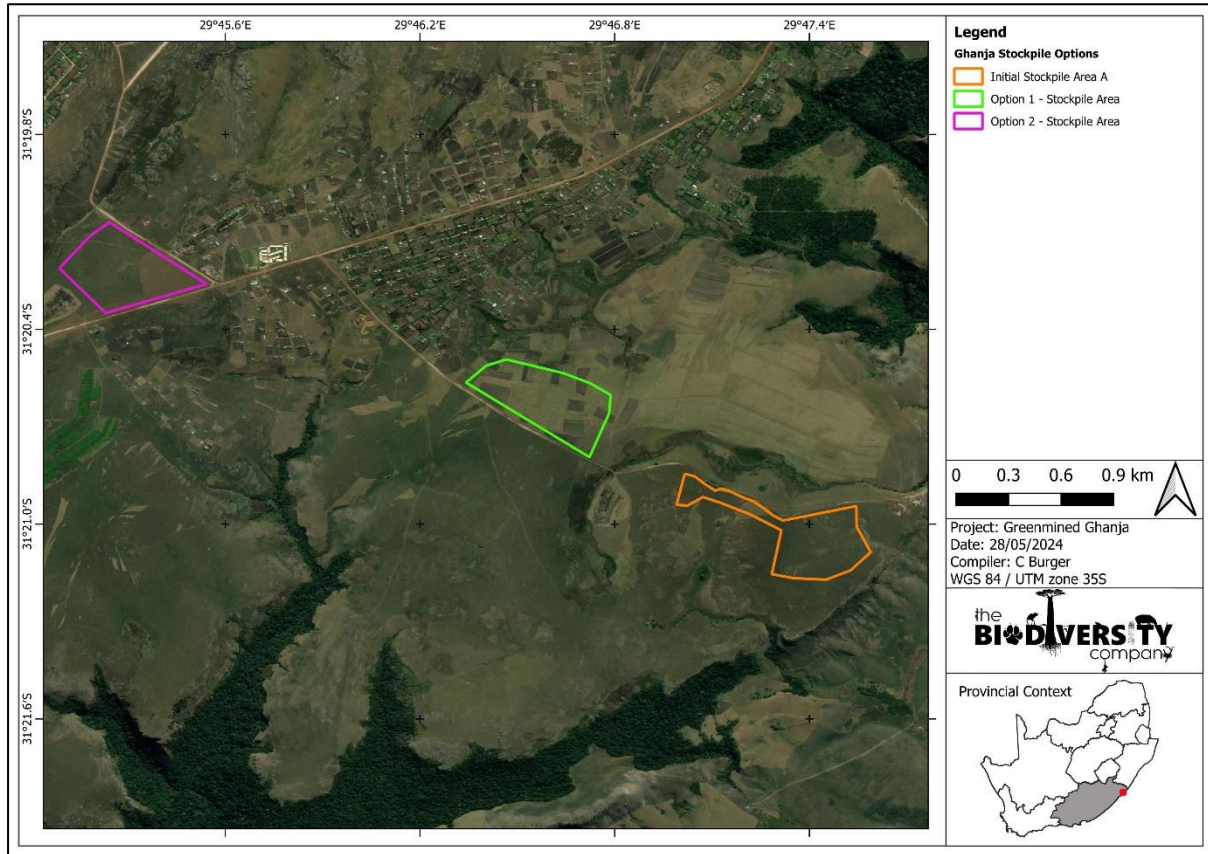
### Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi 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

CURRICULUM VITAE: Andrew Husted

## 7.7 Appendix G: Alternatives Desktop Assessment

Based on the assessment undertaken in this report it was found that the Initial Stockpile Area is not a viable site for development purposes and as such alternative sites had to be considered. Following this, two site alternatives site for the stockpile area were provided by Greenmined (2024) and has been assessed on a desktop basis (Figure 7-2).



**Figure 7-2** Map illustrating the Stockpile Alternatives

### 7.7.1 Desktop Assessment

#### 7.7.1.1 Ecologically Important Landscape Features

The relevance of the proposed development to ecologically important landscape features are summarised in Table 3-1.

**Table 7-11** Summary of relevance of the proposed project to ecologically important landscape features

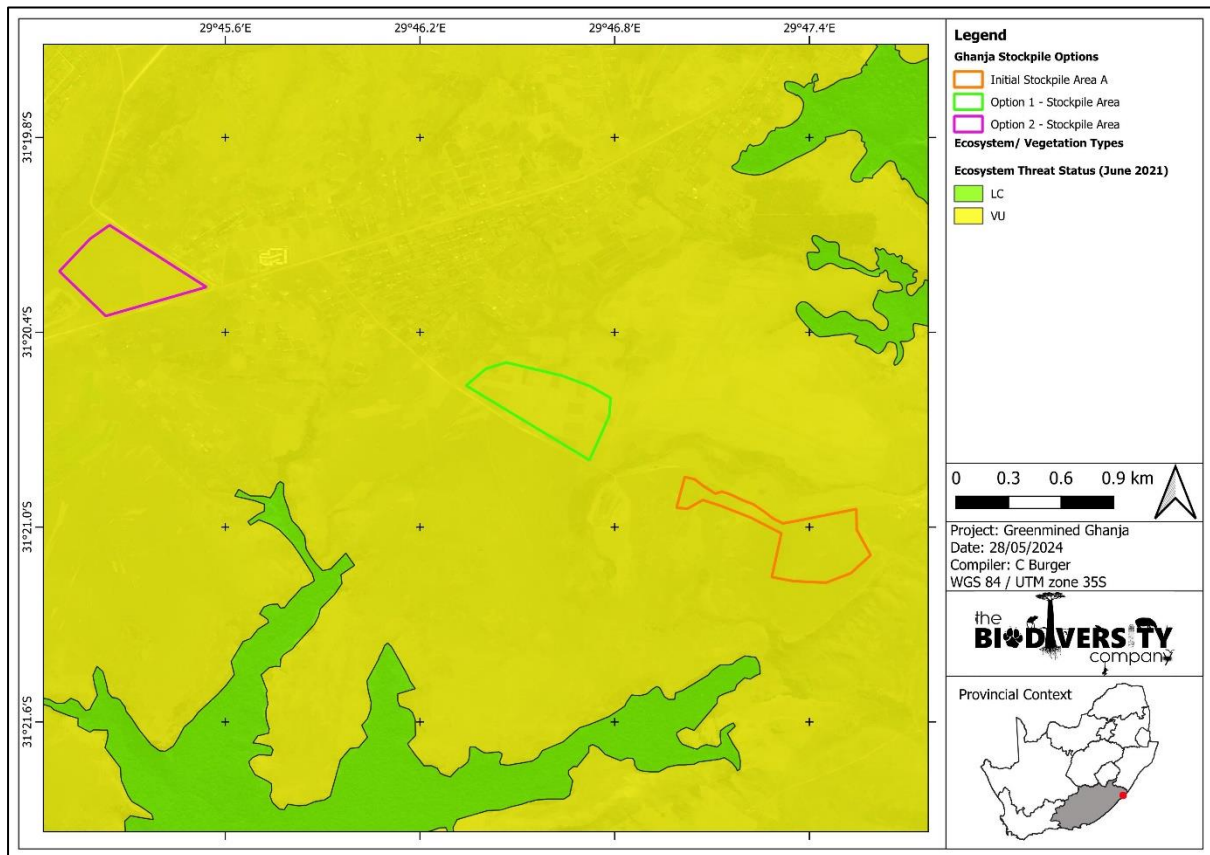
Desktop Information Considered	Stockpile Option 1	Stockpile Option 2	Section
Ecosystem Threat Status (RLE 2021)	Overlaps with a 'Vulnerable' ecosystem	Overlaps with a 'Vulnerable' ecosystem	7.7.1.1
Ecosystem Protection Level	Overlaps with a 'Poorly Protected' Ecosystem	Overlaps with a 'Poorly Protected' Ecosystem	7.7.1.2
Provincial Conservation Plan	Overlaps with CBA 1	Overlaps with CBA 1	7.7.1.3
SAPAD & SACAD	Is not located within 5 km of a Protected or Conservation area.	Is not located within 5 km of a Protected or Conservation area.	-

<b>Desktop Information Considered</b>	<b>Stockpile Option 1</b>	<b>Stockpile Option 2</b>	<b>Section</b>
National Protected Areas Expansion Strategy	Does not overlap with a NPAES area	Overlaps with a NPAES Priority Focus Areas	7.7.1.5
Important Bird & Biodiversity Areas (IBA)	Is located 15 km from the nearest IBA	Is located 14 km from the nearest IBA	7.7.1.6
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	500 m Regulated Area does not overlap with any wetlands or rivers	500 m Regulated Area overlaps with 'Critically Endangered' Wetland	7.7.1.7
National Freshwater Priority Area	Does not overlap with any NFEPA wetlands or rivers	Does not overlap with any NFEPA wetlands or rivers	7.7.1.8
Strategic Water Source Areas (SWSA)	Does not overlap with any SWSAs	Does not overlap with any SWSAs	-
Mining and Biodiversity Guidelines	Does not overlap with areas at risk for mining	According to the Mining and Biodiversity Guidelines spatial dataset (2013), the Stockpile Option 2 is of highest BI and there is therefore a correlating highest risk for mining	7.7.1.9



**7.7.1.2 Red List of Ecosystems**

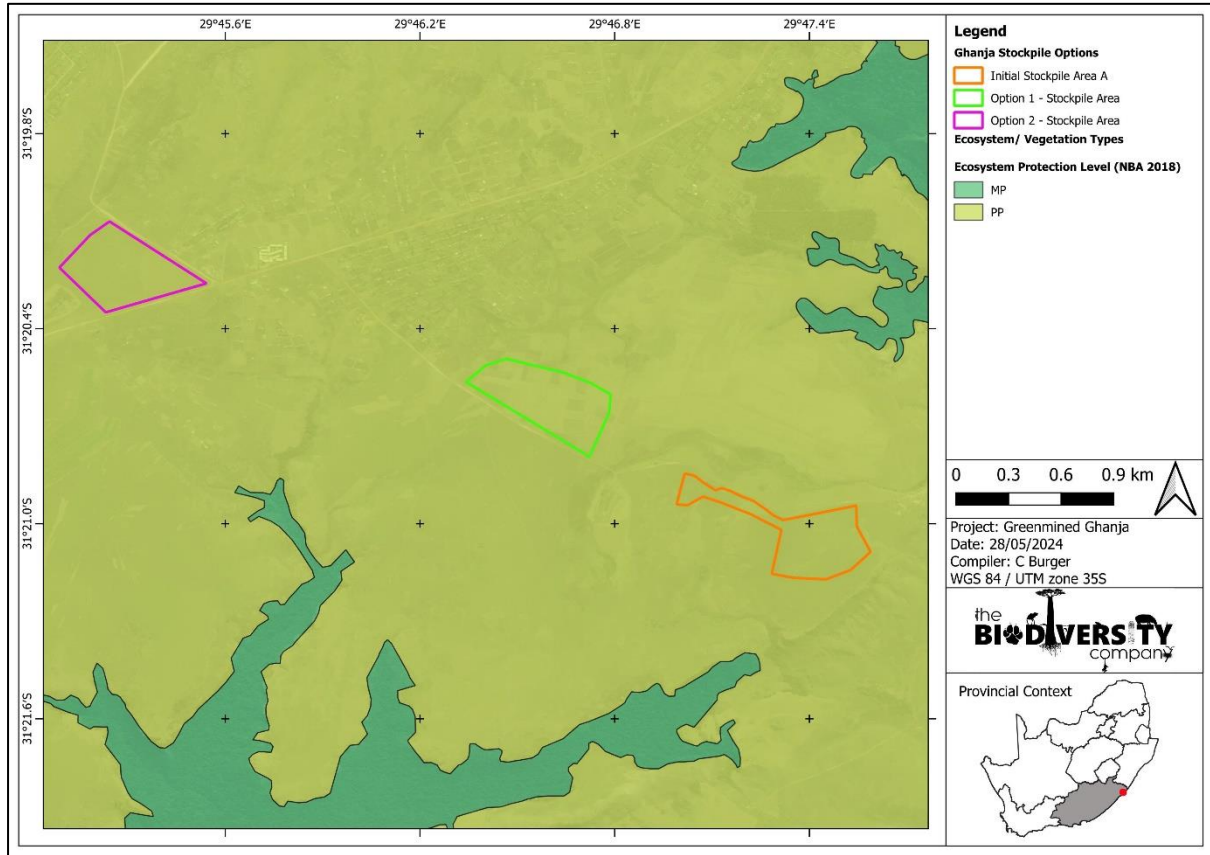
The Ecosystem Threat Status is an indicator of an ecosystem’s wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the Red List of Ecosystems dataset (Skowno & Monyeki, 2021) both Stockpile options overlap with a VU ecosystem (Figure 3-1).



**Figure 7-3** Map illustrating the ecosystem threat status associated with the PAOI.

**7.7.1.3 Ecosystem Protection Level**

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

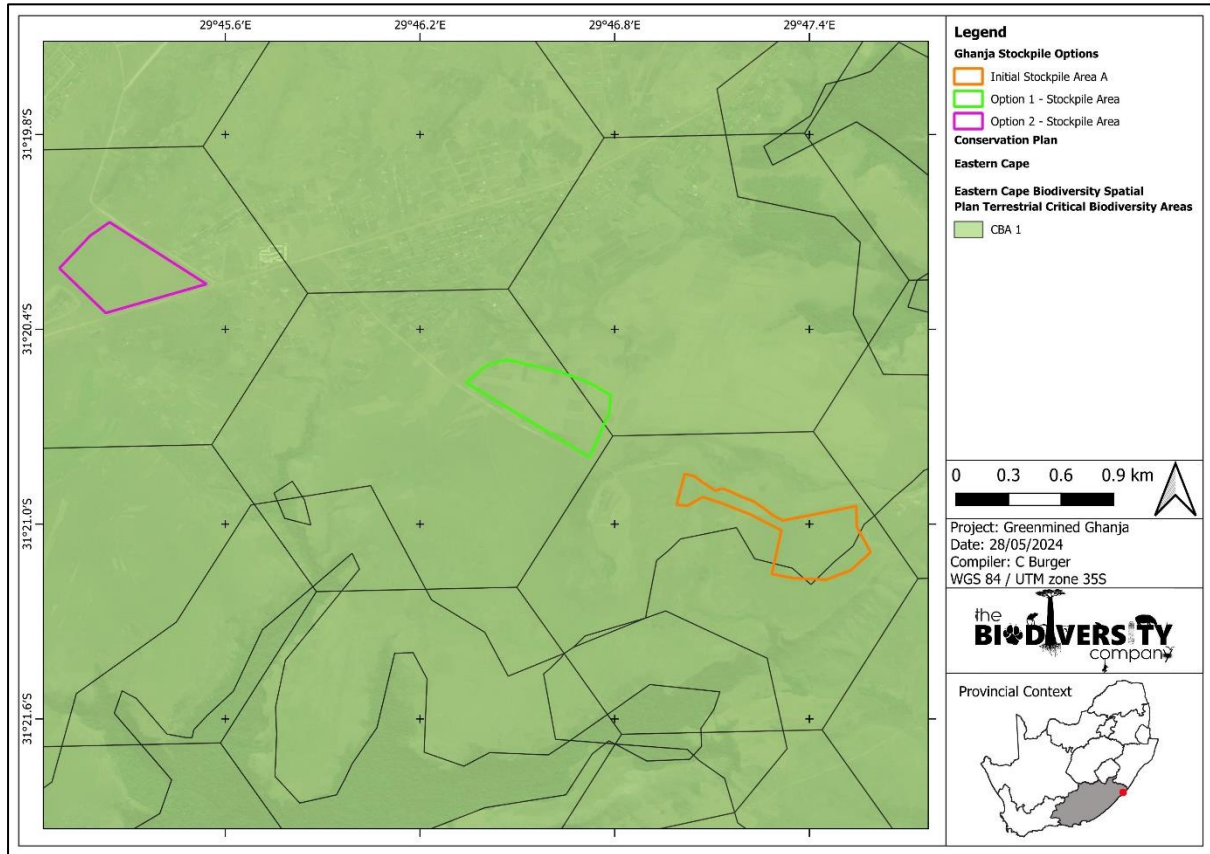


**Figure 7-4** Map illustrating the ecosystem protection level associated with the PAOI.

**7.7.1.4 Provincial Conservation Plan**

The Eastern Cape’s Biodiversity Conservation Plan (Berliner et al 2007) addresses the urgent need to identify and map critical biodiversity areas and priorities for conservation in the province.

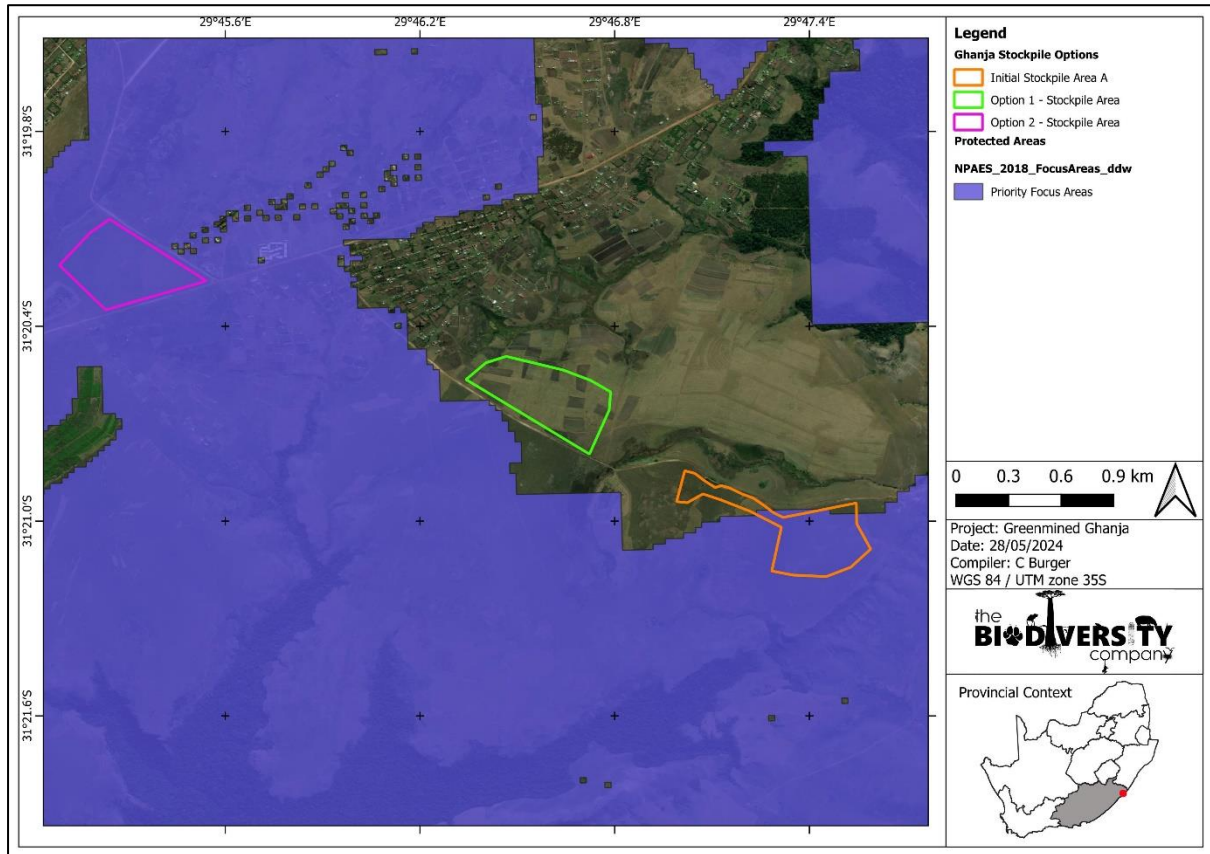
Both Stockpile options overlaps with a CBA 1 area (Figure 3-3).



**Figure 7-5** Map illustrating the PAOI in relation to the Northern Cape CBA Map.

**7.7.1.5 National Protected Areas Expansion Strategy**

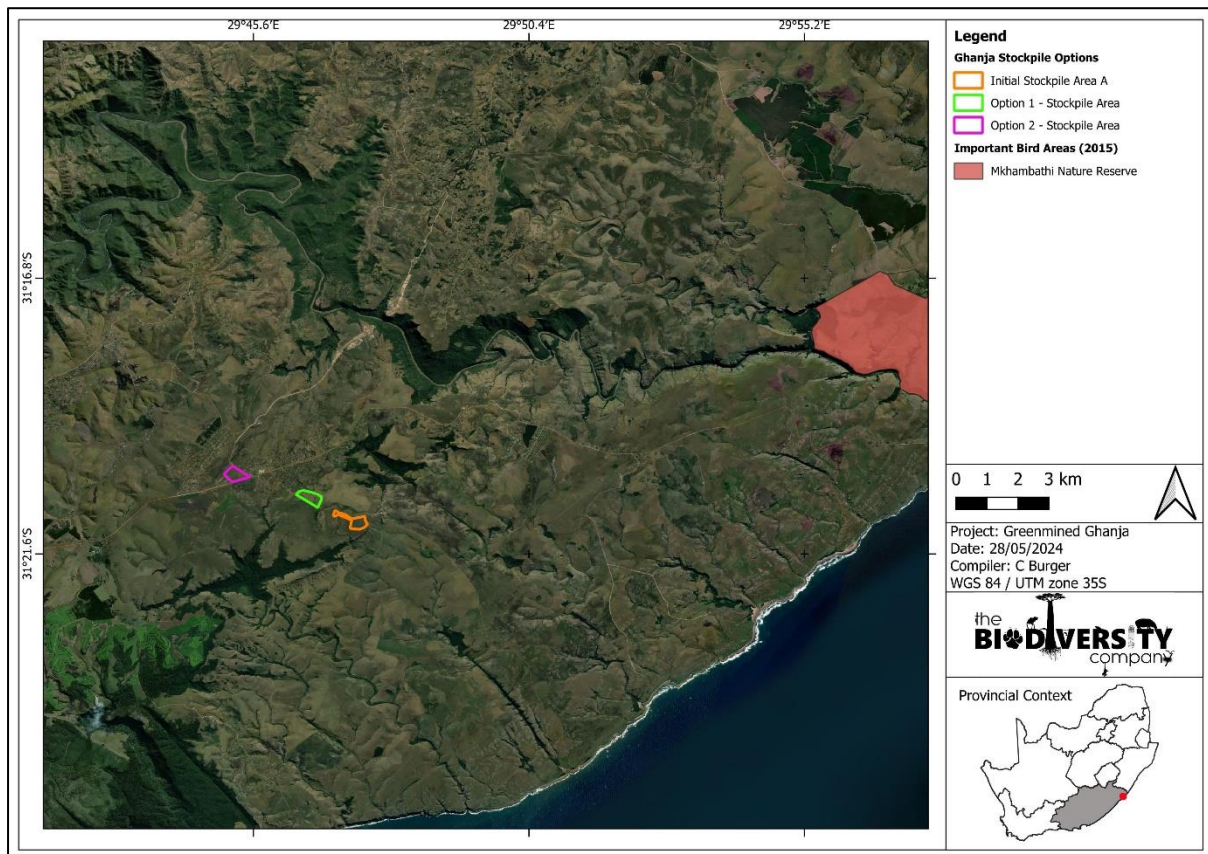
According to the latest NPAES dataset Stockpile Option 1 does not overlap with a NPAES area, while Stockpile Option 2 overlaps with a NPAES Priority Focus Areas (Figure 3-4).



**Figure 7-6** Map illustrating the PAOI location in relation to the latest NPAES dataset.

**7.7.1.6 Important Bird and Biodiversity Areas**

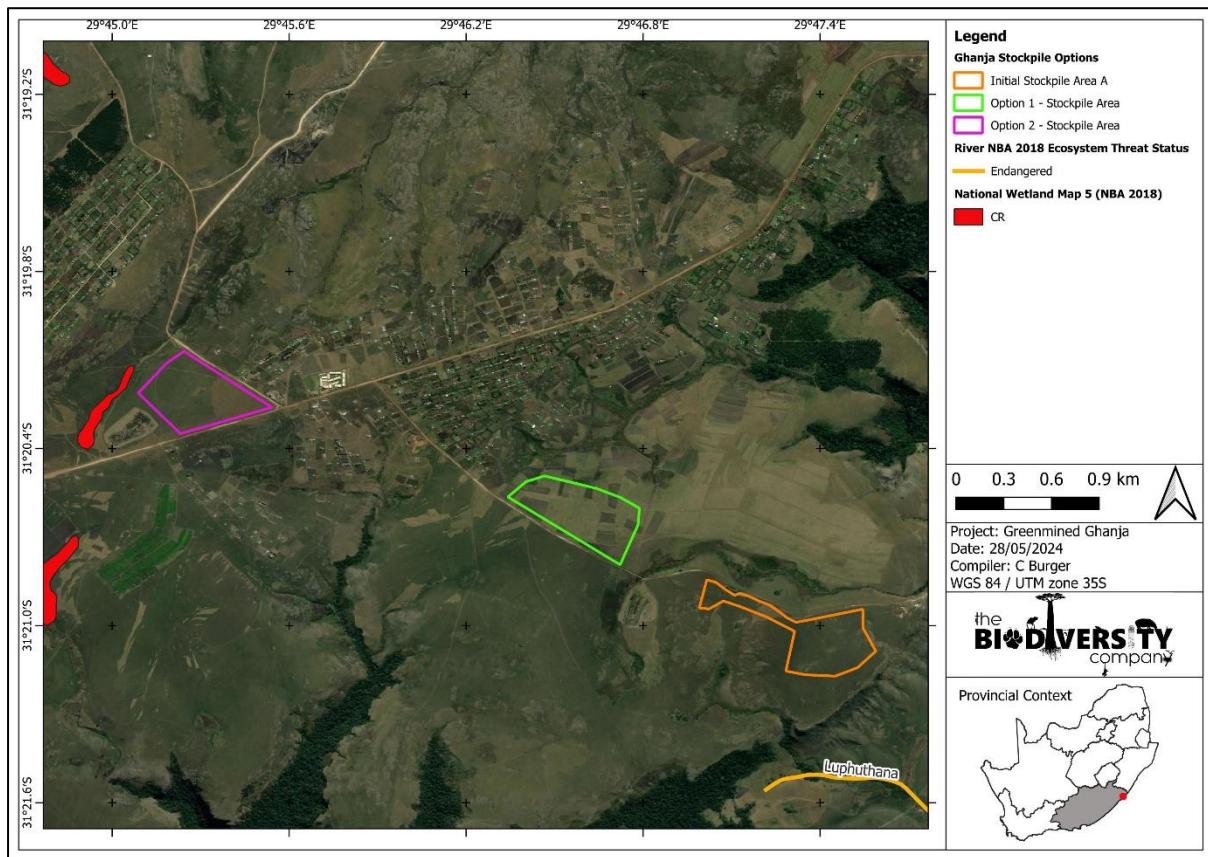
The Stockpile options are located 14 km and 15 km from the nearest IBA, respectively (Figure 3-5).



**Figure 7-7** Map illustrating the PAOI in relation to the 2015 IBA dataset.

### 7.7.1.7 South African Inventory of Inland Aquatic Ecosystems

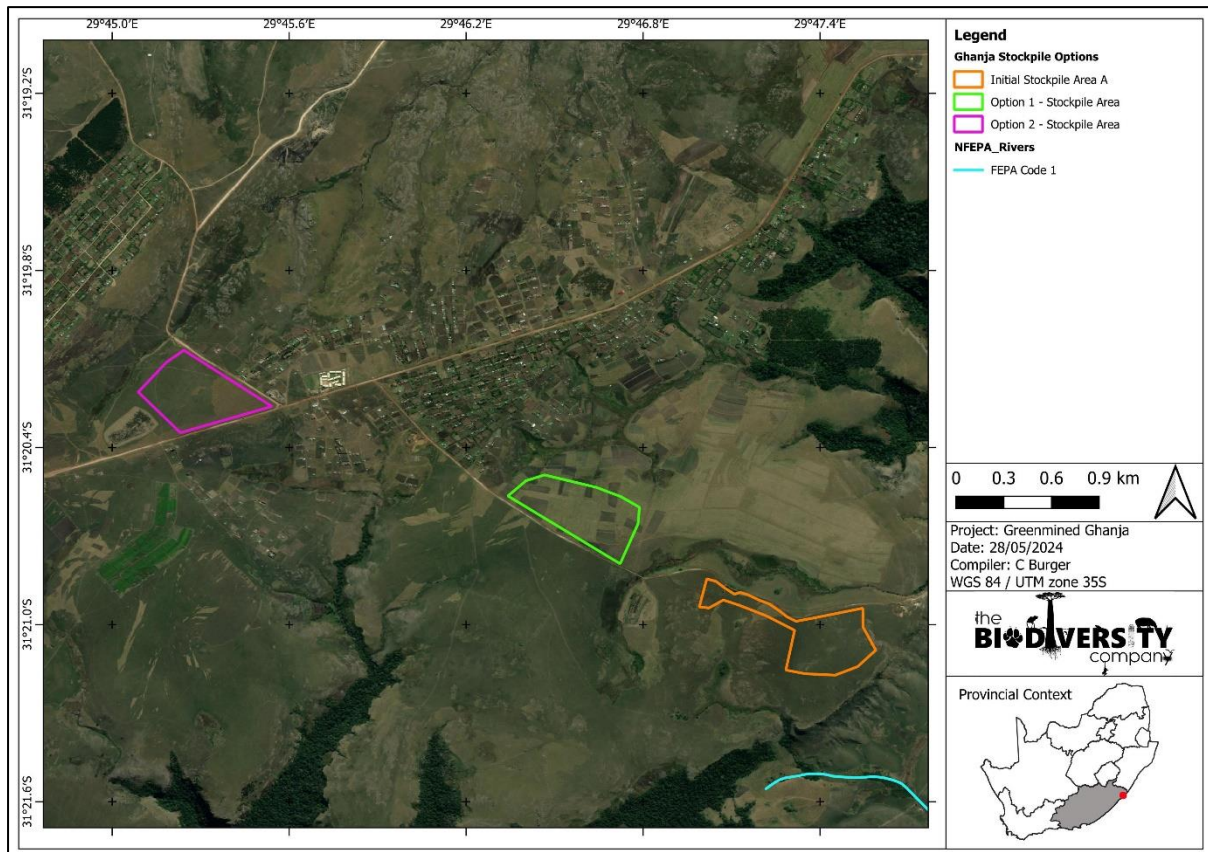
The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised 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). Stockpile Option 1’s 500 m Regulated Area does not overlap with any wetlands or rivers, while Stockpile Option 2’s 500 m Regulated Area overlaps with a ‘Critically Endangered’ Wetland (Figure 3-6).



**Figure 7-8** Map illustrating the PAOI in relation to the South African Inventory of Inland Aquatic Ecosystems dataset.

### 7.7.1.8 National Freshwater Ecosystem Priority Area Status

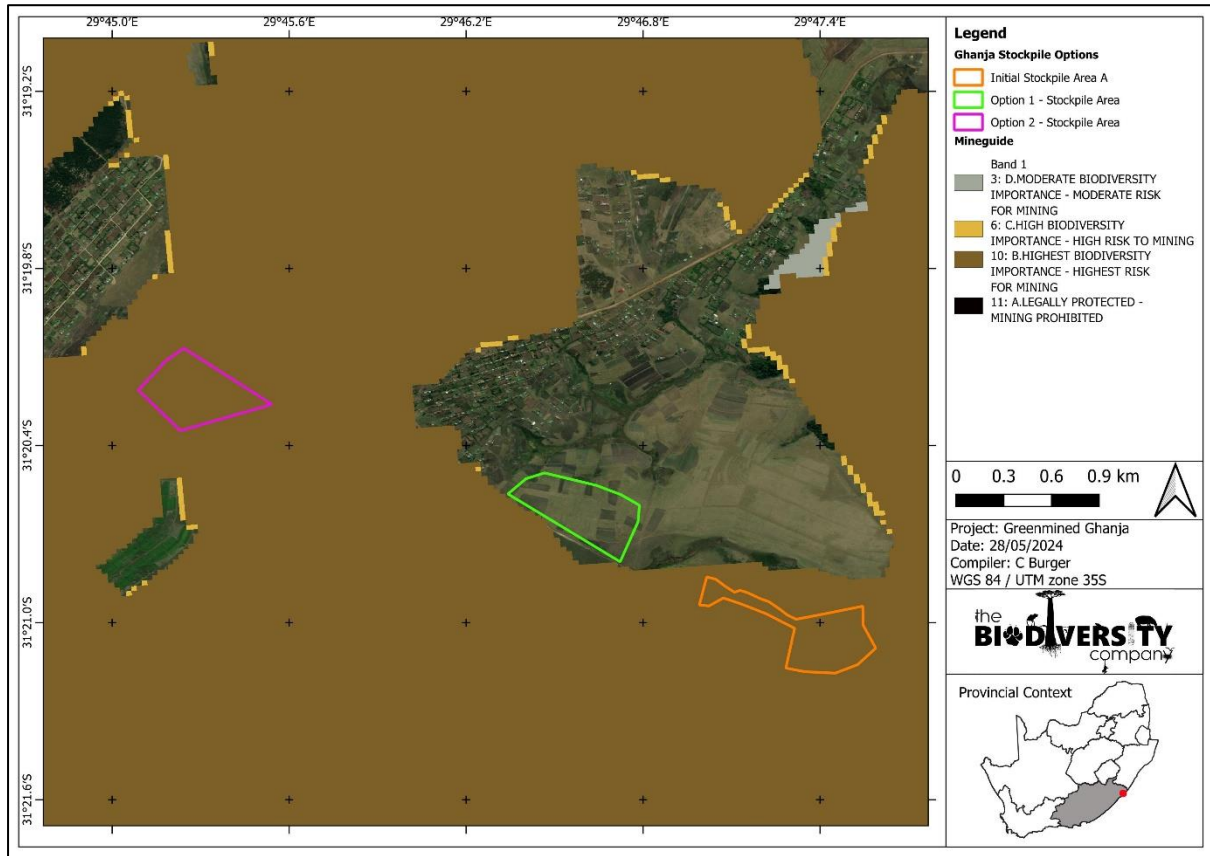
In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et 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). Both stockpile options 500 m Regulated Area does not overlap with any NFEPA wetlands or rivers (Figure 3-7).



**Figure 7-9** Map illustrating the PAOI in relation to the National Freshwater Ecosystem Priority Area dataset.

### 7.7.1.9 Mining and Biodiversity Guidelines

According to the Mining and Biodiversity Guidelines spatial dataset (2013), Stockpile Option 1 does not overlap with areas at risk for mining, while Stockpile Option 2 is of highest BI and there is therefore a correlating highest risk for mining (Figure 3-8).



**Figure 7-10** The PAOI in relation to the Mining and Biodiversity Guidelines

**7.7.1.10** Historical Imagery

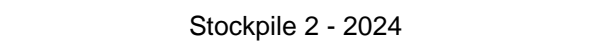
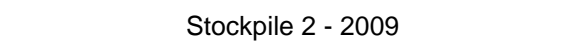
Stockpile 1 - 2009

Stockpile 1 - 2024



Stockpile 2 - 2009

Stockpile 2 - 2024







From the historical imagery (Google Earth) it can be seen that Stockpile Option 1 has been utilised for agricultural purposes since 2009 and is still being used for agriculture in 2024. This has rendered the area in a modified state and no longer representative of the vegetation type or of a CBA1 area (Based on Desktop data only).

From the imagery (Google Earth) it can also be seen that Stockpile Option 2 has been left in a relatively natural state, from 2009, with the only prevalent impacts seen from a desktop perspective being burning. As such the area seems to still be in a relatively natural state in 2024 and could still be representative of the vegetation type as well as CBA 1 areas. This must be confirmed by a site visit.

### 7.7.2 Conclusion

Based on the desktop assessment undertaken it was found that the Stockpile Option 1 area is considered to be the most viable option for the stockpile area from a terrestrial ecological perspective. From google earth imagery it is evident that this area is associated with areas utilised for agricultural purposes, currently and historically, and as such is considered to be in a modified state. This is however based on a desktop data and must be verified by a site inspection.