



# **The Terrestrial Biodiversity Compliance Statement for the proposed Glencore Lydenburg Solar Photovoltaic (PV) Facility**

**Lydenburg, Ehlanzeni District Municipality,  
Thaba Chweu Local Municipality,  
Mpumalanga**

January 2024

**CLIENT**



**Prepared by:**

**The Biodiversity Company**

Cell: +27 81 319 1225

Fax: +27 86 527 1965

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

[www.thebiodiversitycompany.com](http://www.thebiodiversitycompany.com)



Report Name	<b>The Terrestrial Biodiversity Compliance Statement for the proposed Glencore Lydenburg Solar Photovoltaic (PV) Facility</b>
Reference	<b>Glencore Lydenburg PV Project</b>
Submitted to	
Report Writer	<p><b>Gareth Walker</b> </p> <p>Gareth completed his Masters in Natural Science degree at Stellenbosch University in 2015 and currently has a PhD under examination through Rhodes University. He is a specialist in botany, zoology, and ecology with experience in field work and report writing.</p>
Report Reviewer	<p><b>Sarah Newman</b> </p> <p>Sarah obtained her Master of Science degree in Entomology from the University of Pretoria in 2018. Sarah is a terrestrial ecologist (Cand. Sci. Nat. 158474) who conducts floral and faunal surveys. She has experience working in the fields of ecology, conservation, and biodiversity</p>
Report Writer / Reviewer	<p><b>Andrew Husted</b> </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 16 years' experience in the environmental consulting field.</p>
Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>

**Table of Contents**

1 Introduction..... 1

1.1 Background ..... 1

1.2 Project Description ..... 1

1.3 Report Legislative Framework ..... 4

1.4 Assumptions and Limitations ..... 5

2 Methods..... 6

2.1 Desktop Assessments..... 6

2.2 Biodiversity Field Survey ..... 6

2.3 Terrestrial Site Ecological Importance ..... 6

3 Results & Discussion ..... 10

3.1 Desktop Assessments..... 10

3.1.1 Ecologically Important Landscape Features ..... 10

3.2 Biodiversity Field Survey..... 10

3.2.1 Ecological Sensitivity..... 13

3.2.2 Screening Tool Comparison..... 16

4 Impact Management and Mitigation Plan..... 18

5 Conclusion and Impact Statement ..... 25

5.1 Impact Statement ..... 25

5.2 Specialist Recommendations ..... 25

6 References ..... 26

7 Appendix Items..... 28

7.1 Appendix A: Specialist Declarations ..... 28

7.2 Appendix B: Specialist CVs..... 31

**List of Tables**

Table 1-1	Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report. ....	4
Table 2-1	Summary of Conservation Importance (CI) criteria.....	7
Table 2-2	Summary of Functional Integrity (FI) criteria.....	7
Table 2-3	Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI). ....	8
Table 2-4	Summary of Receptor Resilience (RR) criteria. ....	8
Table 2-5	Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI). ....	8
Table 2-6	Guideline for interpreting Site Ecological Importance in the context of proposed activities. ....	9
Table 3-1	Summary of the spatial relevance of the project area to local ecologically important landscape features. ....	10
Table 3-2	Sensitivity summary of the habitat unit delineated within the PAOI. ....	11
Table 3-3	Summary of the proposed PAOI habitat types and corresponding Site Ecological Importance (SEI). ....	14
Table 3-4	Summary of the screening tool vs. specialist assigned sensitivities. ....	16
Table 4-1	Project specific mitigation measures including requirements for timeframes, roles, and responsibilities.....	19

**List of Figures**

Figure 1-1	Map depicting the regional locality of the Project Area of Influence (PAOI). ....	2
Figure 1-2	Map depicting the PAOI. ....	3
Figure 3-1	Terrestrial Biodiversity Theme Sensitivity for the PAOI (National Environmental Screening Tool, 2024). ....	16
Figure 3-2	Map depicting the specialist assigned sensitivity ratings of habitats within the PAOI. .	17

## 1 Introduction

### 1.1 Background

The Biodiversity Company was appointed to undertake a terrestrial biodiversity baseline assessment for the proposed Glencore Lydenburg Solar Photovoltaic (PV) project. The proposed Project Area of Influence (PAOI) is located adjacent to the northeastern portion of Lydenburg (renamed Mashishing in 2006) in the Mpumalanga Province of South Africa. A map of the PAOI relative to the local region is depicted in [Figure 1-1](#)~~Figure 1-4~~, and a detailed map of the PAOI is presented in [Figure 1-2](#)~~Figure 1-2~~.

Glencore is one of the world's largest globally diversified natural resource companies and one of its largest traders. Glencore Lydenburg CMI Smelter, an operation by Glencore South Africa (Pty) Ltd (hereinafter the applicant), wishes to develop a Solar PV Energy Generation Facility at the Lydenburg CMI Smelter. The generation capacity will be up to ~~~200-300~~ megawatts (MW). All power generated from the facility will be used at the on-site smelter or will be wheeled to other Glencore operations. Other possible infrastructure will include an on-site substation/switching station, access roads, ~~battery~~ energy storage system and an ~~13288~~ kV powerline (EIMS, 2023).

To determine the baseline ecological state of the PAOI and to present a detailed description of the receiving environment, a desktop assessment and field survey were conducted in tandem during January 2024. The desktop assessment and field survey focused on the detection, identification and description of any locally relevant sensitive receptors and habitats, and the way in which these may be affected by the proposed development.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 30 October 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation." The National Web based Environmental Screening Tool has characterised the Terrestrial Biodiversity Theme for the PAOI as 'Very High' sensitivity (National Environmental Screening Tool, 2023).

The purpose of conducting the specialist study is to provide relevant input into the Environmental Authorisation application process, with a focus on the proposed activities and their associated impacts. This report, after taking into consideration the findings and recommendations provided by the specialist stipulated herein, should inform and guide the Registered Environmental Assessment Practitioner and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

### 1.2 Project Description

The applicant proposes the development of a Solar PV Energy Generation Facility at the Lydenburg CMI Smelter. The generation capacity will be up to ~200 MW. All power generated from the facility will be used at the smelter on-site. The proposed PV facility will include the following infrastructure:

- PV Panels;
- Power line connection (~~13288~~-kV);
- Access roads;
- On-site substation; and
- Possible on-site ~~battery-energy~~ storage facility.



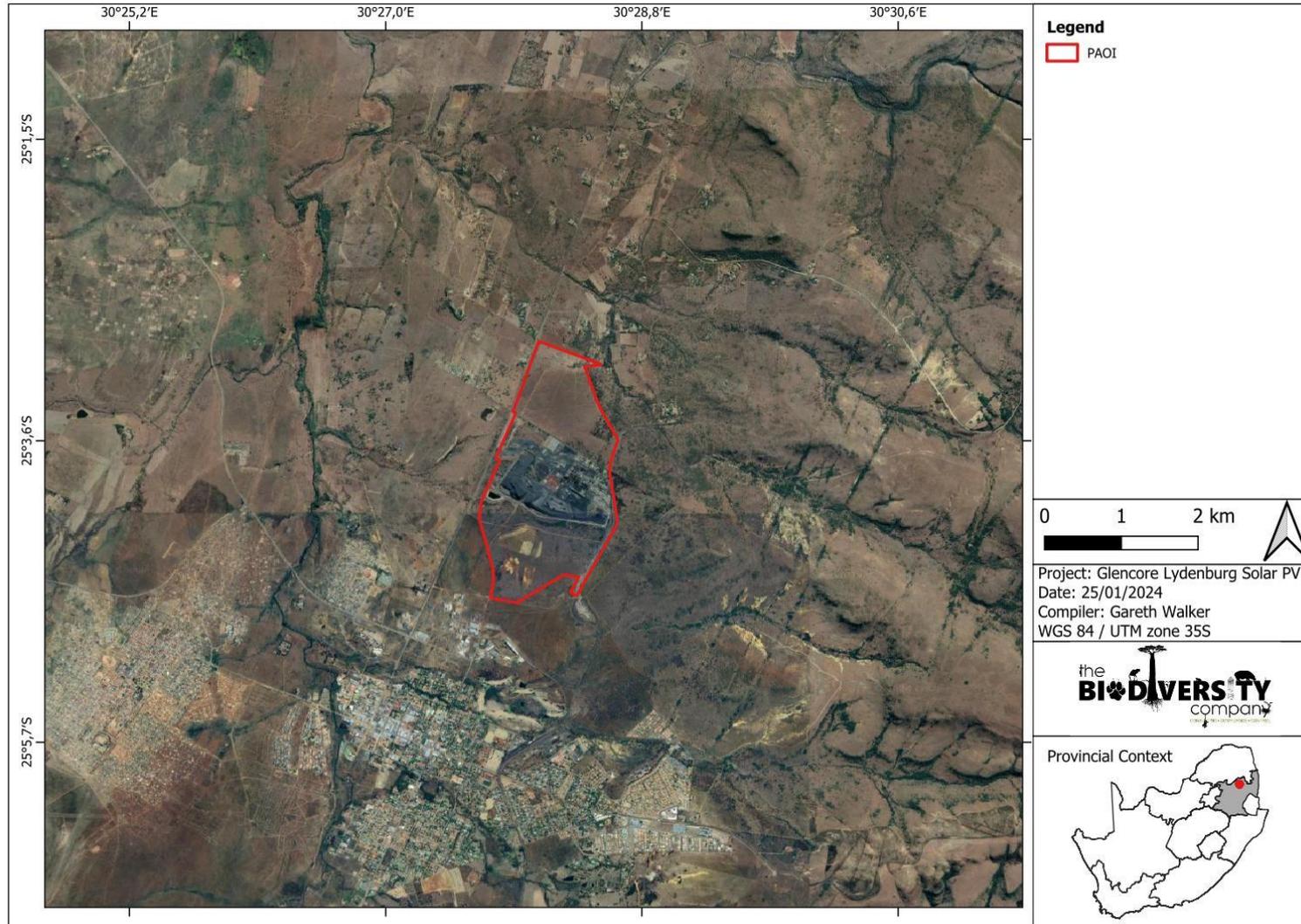


Figure 1-2 Map depicting the PAOI.

### 1.3 Report Legislative Framework

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

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

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey, confirmed that the proposed footprint PAOI is of a 'Low' sensitivity. Therefore, this report constitutes a Terrestrial Biodiversity Compliance Statement.

As per sections 2 and 3 of the protocol discussed above, a Terrestrial Biodiversity Compliance Statement must contain the information as presented in [Table 1-1](#) below.

**Table 1-1** *Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report.*

Information to be Included (as per GN 320, 20 March 2020)	Report Section
Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used	2
Description of the assumptions and any uncertainties or gaps in knowledge or data	1.3
A baseline profile description of biodiversity and ecosystems of the site	3.1.1
Site sensitivity verification: Desktop Analysis using satellite imagery and available information	3.2.1
A statement on the duration, date, and season of the site inspection	3.1
Site sensitivity verification: Onsite inspection, include a description of current land use and vegetation found on-site	3.2
Site sensitivity verification: Photographs/evidence of environmental sensitivity	3.2
Screening tool confirmation/dispute: The assessment must verify the “low” sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes	3.2.1
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	4
Indicate whether the proposed development will have any impact on the terrestrial environment, animals and/or plants	5
A signed statement of independence by the specialist	7.1
Specialist details, including a CV	7.2

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

#### 1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client and landowner is accurate;
- 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) was based on the footprint areas as provided for 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;
- The PAOI was surveyed during a single site visit (22<sup>nd</sup> January 2024), therefore, this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline);
- The single site visit was conducted during the mid-wet season, meaning that most flora species would have been present and observable. By contrast, given the increased vegetation density, it is possible that certain fauna species (particularly smaller species) may have remained undetected during the site visit. Irrespective, it is probably that most species have been recorded;
- Whilst every effort was made to cover as much of the PAOI as possible, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations; 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.

## 2 Methods

### 2.1 Desktop Assessments

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to determine if any are applicable to the site. These datasets and their respective dates of publishing are provided below.

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

- Mpumalanga Biodiversity Sector Plan (MBSP) (MTPA, 2014);
- 2018 National Biodiversity Assessment (NBA, 2018) (Skowno *et al.*, 2019);
- Red List of Ecosystems (RLE) 2021 (Skowno & Monyeke, 2021);
- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018);
- South Africa Protected and Conservation Areas Databases, 2023 (DFFE, 2023 & DFFE, 2023a);
- National Protected Areas Expansion Strategy (NPAES), 2016 (DEA, 2018);
- Important Bird and Biodiversity Areas (IBA), 2015 (Marnewick *et al.*, 2015);
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Awuah, 2018 & Van Deventer *et al.*, 2019);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel *et al.*, 2011);
- Mpumalanga Highveld Wetlands, 2014 (SANBI, 2014);
- Strategic Water Source Areas, 2021 (Lötter & Le Maitre, 2021);
- Strategic Transmission Corridors (EGI);
- Renewable Energy Development Zones (REDZ); and
- Renewable Energy EIA Application Database (REEA).

### 2.2 Biodiversity Field Survey

A single season field survey was undertaken on the 22<sup>nd</sup> of January 2024 – constituting a mid-wet season survey – to determine the presence of any local Species of Conservation Concern (SCC) and to achieve the delineation of local habitat types and their associated sensitivities. Effort was made to cover all the different habitat types within the PAOI, within the limits of time and accessibility. This site visit is considered sufficient for the project.

### 2.3 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 project area) 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 2-1](#) and [Table 2-2](#) respectively.

**Table 2-1 Summary of Conservation Importance (CI) criteria.**

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

**Table 2-2 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 below.

**Table 2-3 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 2-4](#).

**Table 2-4 Summary of Receptor Resilience (RR) criteria.**

Resilience	Fulfilling Criteria
Very High	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.
High	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.
Medium	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.
Low	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.
Very Low	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 2-5](#).

**Table 2-5 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 2-6](#)~~Table 2-6~~.

**Table 2-6** *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 assessed PAOI. 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.

### 3 Results & Discussion

#### 3.1 Desktop Assessments

##### 3.1.1 Ecologically Important Landscape Features

[Table 3-1](#) ~~Table 3-4~~ below has been produced because of the spatial data collected and analysed (as provided by various sources such as the national and provincial environmental authorities and SANBI). It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or PAOI.

**Table 3-1 Summary of the spatial relevance of the project area to local ecologically important landscape features.**

Desktop Information Considered	Relevant/Irrelevant	Reasoning
Mpumalanga Provincial Conservation Plan	Relevant	PAOI overlaps with terrestrial ESA.
Ecosystem Threat Status	Relevant	PAOI overlaps with a 'Least Concern' (LC) ecosystem.
Ecosystem Protection Level	Relevant	PAOI situated within a 'Poorly Protected' (PP) ecosystem.
Red List of Ecosystems	Relevant	PAOI situated within a 'Least Concern' (LC) ecosystem.
Protected and Conservation Areas (SAPAD & SACAD)	Relevant	Portions of the PAOI overlap with the Lydenburg Nature Reserve.
National Protected Areas Expansion Strategy (NPAES)	Relevant	Portions of PAOI overlap with 'Priority Focus Areas.'
Important Bird and Biodiversity Areas (IBA)	Irrelevant	Nearest IBA is Blyde River Canyon approximately ~20 km east of the PAOI.
Strategic Water Source Areas (SWSA)	Irrelevant	PAOI does not overlap with a SWSA.
National Freshwater Ecosystem Priority Areas (NFEPA)	Relevant	PAOI overlaps with a non-priority FEPA wetland.
Mpumalanga Highveld Wetlands	Irrelevant	PAOI does not overlap with any categorised Mpumalanga Highveld Wetlands.
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Irrelevant	PAOI does not overlap with any SAIIAE's.
Renewable Energy Development Zones (REDZ)	Irrelevant	PAOI does not overlap with any REDZ
Powerline Corridor	Irrelevant	Nearest powerline corridor is located approximately ~25km west of PAOI (i.e., International Corridor)
Renewable Energy EIA Application Database (REEA)	Irrelevant	Nearest REEA project is located ~24km east of the PAOI.

#### 3.2 Biodiversity Field Survey

The following sections discuss the results from the field survey that was conducted for the proposed PAOI undertaken on the 22<sup>nd</sup> of January 2024. Each habitat unit is described in [Table 3-2](#) ~~Table 3-2~~.

**Table 3-2 Sensitivity summary of the habitat unit delineated within the PAOI.**

Habitat	Description	SEI	Photographs
<p><b>Mining</b></p>	<p>This habitat unit includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified the area's primary ecological functions and species composition. This habitat unit no longer maintains its functional ecological integrity and does not contribute to ecosystem services. This habitat unit is characterised by areas used for mining related activities.</p> <p>No fauna or flora SCC were recorded or are expected to occur in this habitat unit.</p>	<p><b>Very Low</b></p>	 <p>(* Detailed pictures of the mine were not taken owing to site inaccessibility)</p>
<p><b>Transformed Grassland</b></p>	<p>This habitat unit comprises transformed, recovering grasslands that have previously been exposed to anthropogenic disturbances attributed to agricultural practices (particularly livestock farming). Although some portions were dominated by Invasive Alien Species (IAPs) such as <i>Ricinus communis</i>, <i>Melia azerdach</i>, and <i>Solanum mauritianum</i>, most of the area was dominated by indigenous grass species (e.g., <i>Panicum maximum</i>, <i>Themeda triandra</i>, and <i>Urochloa mosambicensis</i>). Further, there were numerous termite mounds occurring throughout this habitat unit which are important vectors of nutrient cycling, contributing to improved ecosystem functionality.</p> <p>No flora SCCs were recorded or are expected to occur within this habitat unit. Although no fauna SCCs were recorded, it is possible that certain sensitive species (specifically avifauna and cryptic herpetofauna species) do have the potential to occur within this habitat unit but remained undetected at the time of the field survey.</p>	<p><b>Medium</b></p>	

<p><b>Degraded Grassland</b></p>	<p>This habitat unit is characterised by degraded grassland vegetation exposed to high levels of anthropogenic impact attributed to the mining activities occurring adjacent to the area. Although small portions of this habitat unit include indigenous plant species, large areas are dominated by IAPs. Further, numerous settlings ponds are located throughout this habitat unit.</p> <p>No fauna or flora SCCs were detected or are expected to occur within this habitat unit.</p>	<p><b>Low</b></p>	
----------------------------------	--	-------------------	---

### 3.2.1 Ecological Sensitivity

Based on the criteria provided for in Section 2.3 of this report, all habitats within the PAOI were assigned sensitivity categories (i.e., SEI categories). The PAOI possesses habitats that range from 'Very Low' to 'High' SEI (see [Table 3-2](#) ~~Table 3-2~~ & Table 3-3). This suggests that the findings of this report contradict the Screening Tool with respect to the combined Terrestrial, Plant and Animal Species Theme Sensitivity.

**Table 3-3 Summary of the proposed PAOI habitat types and corresponding Site Ecological Importance (SEI).**

Habitat Type	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Mitigation	Receptor Resilience (RR)	Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities
<b>Degraded Grassland</b>	<b>Low</b> <50% of receptor contains natural habitat with the potential to support SCC.	<b>Low</b> Several minor and major current negative ecological impacts.	<b>Low</b>	N/A	<b>Medium</b> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	<b>Low</b> Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
	<b>Very Low</b> No natural habitat remaining.	<b>Very Low</b> Several minor and major current negative ecological impacts.			<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	<b>Very Low</b> Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
<b>Transformed Grassland</b>	<b>Medium</b> > 50% of receptor contains natural habitat with potential to support SCC.	<b>Medium</b> Only narrow corridors of good habitat connectivity. Mostly minor current negative ecological impacts, with some major impacts and a	<b>Medium</b>	N/A	<b>Medium</b> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	<b>Medium</b> Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
					<b>High</b> Vegetation beneath PV	<b>Low</b>

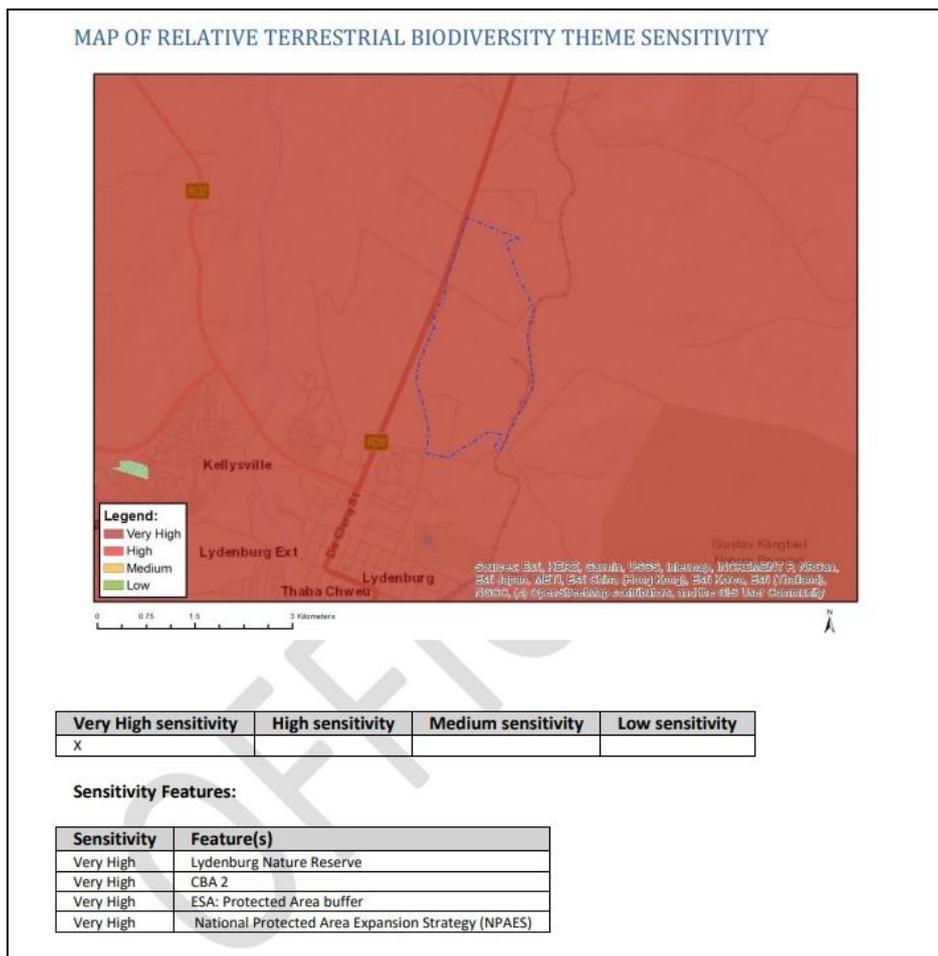
<p>few signs of minor historical disturbance.</p>		<p>panels retained and results of ecological site walkdown suggest the absence of SCCs.</p>	<p>Habitat that can recover relatively quickly (~ 5–10 years) to restore &gt; 75% of the original species composition and functionality of the receptor functionality</p>	<p>Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.</p>
---	---	---	---	---

### 3.2.2 Screening Tool Comparison

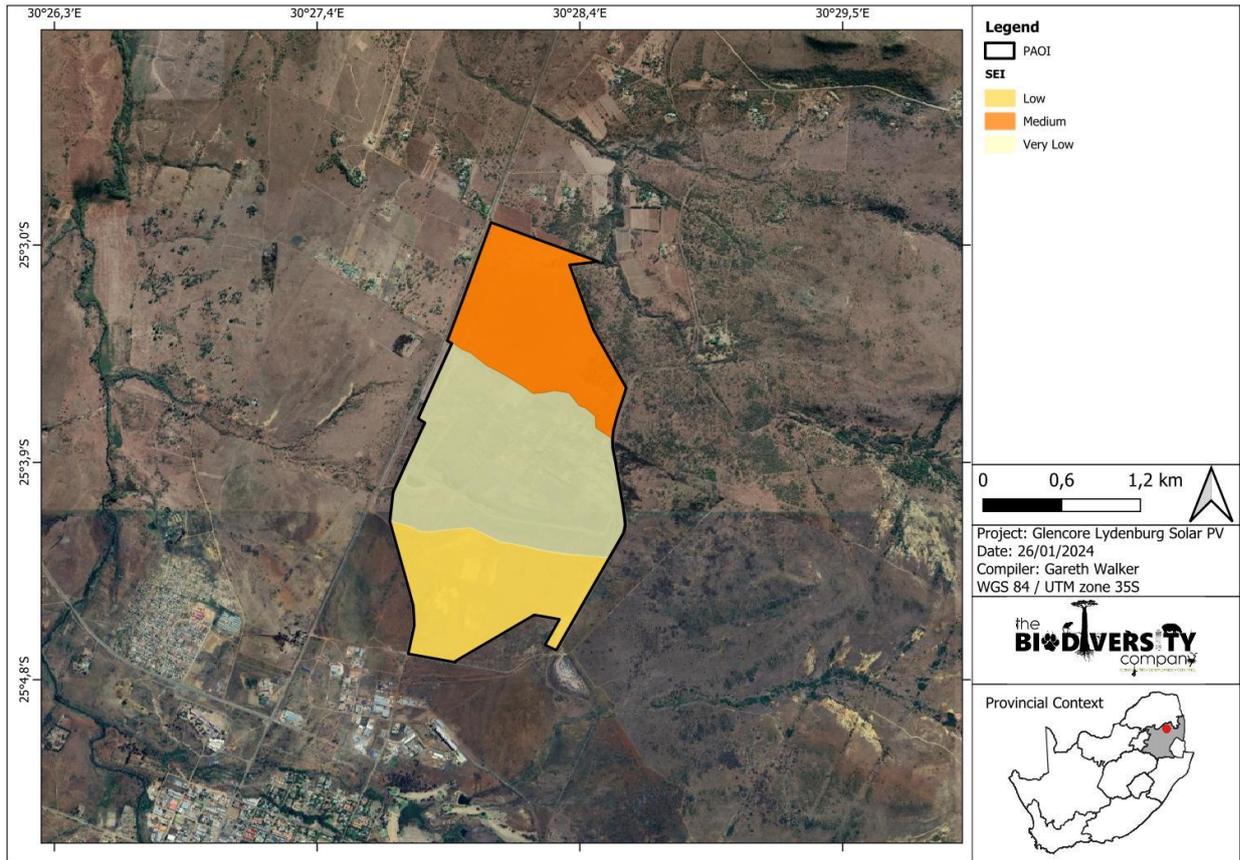
The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 3-4 below. A summative explanation for each result is provided. The specialist-assigned sensitivity ratings are based largely on the SEI process (as previously explained), and consideration is given to any observed or likely presence of SCC or protected species. The screening tool terrestrial theme sensitivity can be seen in [Figure 3-1](#) [Figure 3-4](#) below. The specialist assigned sensitivity ratings are visually depicted in [Figure 3-2](#) [Figure 3-2](#).

**Table 3-4 Summary of the screening tool vs. specialist assigned sensitivities.**

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	High	Medium	Disputed – Most of the receiving habitat is degraded, and most of the PAOI has been modified. Although no flora and fauna SCC were recorded, it is possible that fauna (specifically avifauna and herpetofauna) SCC may occur within the transformed grassland habitat unit.
Plant Theme	Medium	Low	Disputed – Large portions of the receiving habitat are severely degraded, and most of the PAOI has been modified. AIP species are dominant throughout the PAOI. No flora SCC were recorded, nor expected.
Terrestrial Theme	Very High	Low	Disputed – Despite overlapping with ESA ecosystems, the receiving habitat has been modified and is consequently degraded and does not represent ESA ecosystems anymore.



**Figure 3-1 Terrestrial Biodiversity Theme Sensitivity for the PAOI (National Environmental Screening Tool, 2024).**



**Figure 3-2** Map depicting the specialist assigned sensitivity ratings of habitats within the PAOI.

#### 4 Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. [Table 4-1](#)~~Table 4-1~~ presents the recommended mitigation measures and the respective time frames, targets, and performance indicators relative to the terrestrial assessment.

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

- Prevent the further loss and fragmentation of vegetation communities within ESA ecosystems within and around the PAOI;
- Reduce the negative fragmentation effects of the development and facilitate the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities; and
- Adequately follow the guidelines for interpreting the SEI ratings assigned to the PAOI (see [Table 2-6](#)~~Table 2-6~~).

**Table 4-1** Project specific mitigation measures including requirements for timeframes, roles, and responsibilities.

Management outcome: Vegetation and Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas and should take up the smallest footprint possible.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
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.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
An ecological walkdown should be performed on site to locate potential fauna and flora SCCs occurring within the PAOI.	Pre-construction phase	Biodiversity Specialist, Project Manager, Environmental Officer	Development footprint	During Phase
All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas. Vegetation beneath PV panels should be retained.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
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.	Construction and Operational Phase	Environmental Officer, Design Engineer, and Contractor	Laydown areas	Ongoing

<p>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 alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.</p>	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
<p>A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.</p> <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 Project area.</li> </ul>	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing
<p>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. This is to prevent the spread of exotic or invasive species or the illegal collection of plants.</p>	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
<p>A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas.</p>	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
<p>All construction waste must be removed from site at the closure of the construction phase.</p>	Construction phase	Environmental Officer & Contractor	Construction waste	During Phase
<p>Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks. This involves the installation of leak warning and detection systems, as well as the planting of dense</p>	Closure Phase/Rehabilitation phase	Environmental Officer & Contractor	Erosion Management and Control/ Leaks	During Phase and Ongoing Monitoring

indigenous pioneer grass seeds across all bare earth areas. Monitoring of the pipeline must be undertaken to detect leaks and monitoring should be undertaken at least once a week.				
<b>Management outcome: Fauna</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A qualified environmental control officer must be on site when activities begin. A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.	Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal SCC	During phase
Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the Project area and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.	Construction Phase	Environmental Officer & Contractor	Progressive land clearing operations and the movement of fauna	Ongoing
The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing
The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.	Construction	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed and Signs must be put up to enforce this. Monitoring must take place in this regard.	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing

Glencore Lydenburg PV Project

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.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Light pollution and period of light	Ongoing
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training	Ongoing
Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day	Ongoing
Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling.	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
If fencing is required: 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.	Planning and construction	Environmental Officer & Contractor, Engineer	Fauna movement corridor	Ongoing
Use environmentally friendly cleaning and dust suppressant products.	Construction and operation	Environmental Officer & Contractor, Engineer	Presence of chemicals in and around the Project area	Ongoing
<b>Management outcome: Alien species</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
An Alien Invasive Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.	Life of operation	Project manager, Environmental Officer & Contractor	Manage and assess presence and encroachment of alien vegetation	Twice a year
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths.	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation

**A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.**

Life of operation	Environmental Officer & Health and Safety Officer	Evidence or presence of pests	Life of operation
-------------------	---	-------------------------------	-------------------

**Management outcome: Dust**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<b>Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.</b>	Construction phase	Contractor	Dustfall	Dust monitoring program.

**Management outcome: Waste management**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<b>Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible.</b>	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
<b>Litter, spills, fuels, chemical and human waste in and around the Project area must be minimised and controlled according to the waste management plan.</b>	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
<b>Toilets at the recommended Health and Safety standards must be provided. Portable toilets must be emptied regularly to prevent overflow. Once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site.</b>	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
<b>The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.</b>	Life of operation	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste	Ongoing
<b>Where a registered disposal facility is not available close to the Project area, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried on open pits.</b>	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste	Ongoing

<b>Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.</b>	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days
<b>Management outcome: Environmental awareness training</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.</p> <p>Discussions are required on sensitive environmental receptors within the Project area to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr.</p> <p>Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.</p>	Pre-construction phase	Health and Safety Officer, Environmental Officer	Compliance to the training	Ongoing
<b>Management outcome: Erosion</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<b>Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds.</b>	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
<b>Only existing access routes and walking paths may be made use of.</b>	Life of operation	Project manager, Environmental Officer	Routes used within the area	Ongoing
<b>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.</b>	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
<b>A stormwater management plan must be compiled and implemented if applicable.</b>	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

## **5 Conclusion and Impact Statement**

The PAOI is predominantly made up of modified, degraded habitat units attributed to the ongoing mining activities recorded. Although the PAOI falls within ESA ecosystems, ongoing disturbances and impacts associated with the aforementioned activity will impede on the long-term recovery of the site to a more natural state.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall 'Low' sensitivity with the degraded grassland habitat unit being assigned the same 'Low' sensitivity rating, and the habitat unit wherein mining activities are recorded being assigned a 'Very Low' sensitivity rating. The transformed grassland habitat unit that has previously been exposed to anthropogenic pressures attributed to livestock farming was originally assigned a 'Medium' sensitivity rating owing to the presence of indigenous flora species that were previously listed. However, if indigenous vegetation beneath the PV panels is retained, and pending the completion of an ecological site walkdown to located potential flora and fauna SCCs that may occur within the PAOI, this sensitivity will be reduced to 'Low.'

### **5.1 Impact Statement**

It is the opinion of the specialist included herein that the project may be favourably considered, provided that the mitigation measures presented in this report be implemented correctly, along with the recommendations below. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

### **5.2 Specialist Recommendations**

It is recommended that care be taken during construction to adhere to mitigation measures. Specifically, it is imperative that indigenous vegetation beneath the PV panels be retained. Without these mitigations, the habitat (specifically the transformed grassland habitat unit) will retain its 'Medium' sensitivity rating. Lastly, an AIP management plan must be implemented as a priority to prevent the further spread and proliferation of AIP species to the surrounding natural areas.

## 6 References

Auwah, A. 2018. NBA 2018 Rivers and NBA 2018 National Wetland Map 5. South African National Biodiversity Institute (SANBI), Newlands, Cape Town.

Department of Environmental Affairs (DEA). 2016. National Protected Areas Expansion Strategy for South Africa 2016. Department of Environmental Affairs, Pretoria, South Africa.

Department of Forestry, Fisheries and the Environment (DFFE). 2023. South Africa Protected Areas Database (SAPAD\_OR\_2023\_Q1). Published 2022/06/30. Available at: <http://egis.environment.gov.za>.

Department of Forestry, Fisheries and the Environment (DFFE). 2023a. South Africa Conservation Areas Database (SACAD\_OR\_2023\_Q1). Published 2022/06/30. Available at: <http://egis.environment.gov.za>.

Goff, F., Dawson, G., & Rochow, J. 1982. Site examination for threatened and endangered plant species. *Environmental Management*, 6(4), 307-316.

IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-3. <https://www.iucnredlist.org>. The International Union for Conservation of Nature. Accessed: May 2023.

Lötter, M.C. & Le Maitre, D. 2021. Fine-scale delineation of Strategic Water Source Areas for surface water in South Africa using Empirical Bayesian Kriging Regression Prediction: Technical report. Prepared for the South African National Biodiversity Institute (SANBI), Pretoria. 33 pages.

Marnewick MD, Retief EF, Theron NT, Wright DR, Anderson TA. 2015. Important Bird and Biodiversity Areas of South Africa. Johannesburg: BirdLife South Africa.

Mucina, L. & Rutherford, M.C. (Eds.). 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria, South African.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). 2007. Vegetation map of South Africa, Lesotho and Swaziland. 1:1 000 000 scale sheet maps. 2nd ed. South African National Biodiversity Institute, Pretoria.

National Environmental Screening Tool. 2022. National Environmental Screening Tool, 2022. Available from the Department of Forestry, Fisheries and the Environment website: <https://screening.environment.gov.za/screeningtool/index.html#/pages/welcome>.

NBA. 2018. Terrestrial Ecosystem Threat Status and Protection Level 2018. <http://bgis.sanbi.org/>. (Accessed: Mar 2022).

Nel, J.L., Murray, K.M., Maherry, A.M., Petersen, C.P., Roux, D.J., Driver, A., Hill, L., Van Deventer, H., Funke, N., Swartz, E.R., Smith-Adao, L.B., Mbona, N., Downsborough, L. and Nienaber, S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801. Water Research Commission, Pretoria.

POSA. 2019. South African National Biodiversity Institute. Botanical Database of Southern Africa (BODATSA) [dataset]. <http://posa.sanbi.org/>. (Accessed: May 2023).

SADAP (South Africa Protected Areas Database) and SACAD (South Africa Conservation Areas Database) (2022). <http://egis.environment.gov.za>

SANBI (South African National Biodiversity Institute). 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning. A., Holness, S. & Daniels, F. (Eds). 1st Edition. South African National Biodiversity Institute, Pretoria.

SANBI (South African National Biodiversity Institute). 2018. Terrestrial ecosystem threat status and protection level layer [Vector] 2018. Available from the Biodiversity GIS website: <http://bgis.sanbi.org/SpatialDataset/Detail/2675>. downloaded: March 2022.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

Van Deventer, H., Smith-Adao, L., Collins, N.B., Grenfell, M., Grundling, A., Grundling, P-L., Impson, D., Job, N., Lötter, M., Ollis, D., Petersen, C., Scherman, P., Sieben, E., Snaddon, K., Tererai, F. and Van der Colff D. 2019. *South African National Biodiversity Assessment 2018: Technical Report*. Volume 2b: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20.500.12143/6230>.

## 7 Appendix Items

### 7.1 Appendix A: Specialist Declarations

#### DECLARATION

I, Gareth Walker, 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.



Gareth Walker

Environmental Consultant

The Biodiversity Company

January 2024

## DECLARATION

I, Sarah Newman, 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.



Sarah Newman

Environmental Consultant

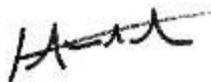
The Biodiversity Company

January 2024

## DECLARATION

I, Andrew Husted, declare that:

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



Andrew Husted

Terrestrial Ecologist

The Biodiversity Company

January 2024

## 7.2 Appendix B: Specialist CVs

# Gareth Walker

BSC, MSc

Cell: +27 83 572 5371

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

Identity Number: 9111095050080

Date of birth: 09 November 1991



### Profile Summary

Work experience throughout South Africa.

Extensive experience working in Limpopo and Mpumalanga assessing the various ecological drivers of terrestrial ungulates.

Experience with wildlife management and ecological monitoring in the Kruger National Park.

### Areas of Interest

Zoology, Ecology, Biodiversity, Conservation and Invasion Ecology.

### Key Experience

- Terrestrial Ecological Assessments
- Monitoring programmes
- Field work and research
- Species distribution modelling

### Country Experience

South Africa

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Conversational

Zulu – Basic

### Qualifications

- PhD Zoology (Currently under examination), Rhodes University
- MSc Botany – Invasion Ecology, Stellenbosch University
- BSc (Hons) Conservation Ecology, Stellenbosch University

## **OVERVIEW**

An overview of the specialist technical expertise includes the following:

- Terrestrial Ecological Assessments
- Faunal surveys which include mammals, birds, amphibians and reptiles
- Management plan compilation (antelope relocation and introduction management plan)

## **EMPLOYMENT EXPERIENCE**

### **Environmental Consultant at The Biodiversity Company (August 2023 - Present)**

Terrestrial biodiversity surveys and assessments.

### **Postgraduate Student Supervisor at the University of Mpumalanga (February 2023 – Present)**

Supervision of a postgraduate honours student project

### **Environmental Consultant (contract) for Riverland Estate (January 2021 – July 2021)**

Compilation of an Environmental Management Plan (EMPr) to facilitate the relocation and introduction of medium-sized antelope on a private estate in northern KZN.

### **Game Ranger at Mala Mala Game Reserve (January 2017 – January 2019)**

Multifaceted position that included tourism, ecological, reserve and wildlife management

## **ACADEMIC QUALIFICATIONS**

### **Rhodes University, Grahamstown (2023):** Doctor of Science (PhD) in Zoology (under examination)

Title: The influence of bottom-up and top-down factors regulating herbivores in the northern Kruger National Park

### **Stellenbosch University, Stellenbosch (2017):** Master of Science (MSc) in Botany – Invasion Ecology

Title: Spatial distribution of *Ailanthus altissima* (tree of heaven)

### **Stellenbosch University, Stellenbosch (2016):** Bachelor of Science Honours (BSc (Hons)) in Conservation Ecology and Entomology

---

## 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

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality
- Aquatic Ecological Assessments
- Aquaculture

### Country Experience

Botswana, Cameroon  
Democratic Republic of Congo  
Ghana, Ivory Coast, Lesotho  
Liberia, Mali, 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

**EMPLOYMENT EXPERIENCE**

**The Biodiversity Company (January 2015 – Present)**

Director / Ecologist.

**Digby Wells Environmental (August 2008 – December 2014)**

Freshwater & Terrestrial Ecologist

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

Freshwater Ecologist

**ACADEMIC QUALIFICATIONS**

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

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

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

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

**PUBLICATIONS**

Desai M., Husted A., Fry C., Downs C.T., & O'Brien G.C. 2019. Spatial shifts and habitat partitioning of ichthyofauna within the middle–lower region of the Pungwe Basin, Mozambique. *Journal of Freshwater Ecology*, 34(1), 685–702. doi: 10.1080/02705060.2019.1673221

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

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

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

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

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

---