



Terrestrial Biodiversity Compliance Statement for the proposed Umdoni South BWA project.

Umdoni, KwaZulu-Natal Province, South Africa

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CLIENT



IN ASSOCIATION WITH INKANYEZI YETHU

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

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	Screening Tool Comparison.....	13
4	Impact Management and Mitigation Plan.....	16
5	Conclusion and Impact Statement	23
5.1	Impact Statement	23
5.2	Specialist Recommendations	23
6	References	24
7	Appendix Items.....	26
7.1	Appendix A: Specialist Declarations	26
7.2	Appendix B: Specialist CVs.....	29

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 types delineated within the project area.....	11
Table 3-3	Summary of the screening tool vs. specialist assigned sensitivities.	13
Table 4-1	Project specific mitigation measures including requirements for timeframes, roles and responsibilities.	17

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 project area (National Environmental Screening Tool, 2023).	14
Figure 3-2	Map depicting the specialist assigned sensitivity ratings of habitats within the project area.	15

1 Introduction

1.1 Background

The Biodiversity Company was appointed by EnviroPro to conduct a terrestrial biodiversity baseline assessment for the proposed Umdoni South Secondary Bulk Water Augmentation project. The project is centred around the Umdoni Command Reservoir which supplies the following settlements on the KwaZulu-Natal South Coast: Sezela, Pennington, Umdoni Village, Kelso, Malangeni, Bazley, Ifafa, and Hilltop. A map of the Project area of Influence (PAOI) relative to the local region is depicted in Figure 1-1, and a detailed map of the PAOI is presented in Figure 1-2.

To determine the baseline ecological state of the area and to present a detailed description of the receiving environment, a desktop assessment and field survey were conducted in tandem during September 2023, with a further follow-up assessment taking place in February 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 area 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 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

UGU Water Service's Masterplan (2020 – 2025) acknowledges that many secondary bulk pipelines and reservoirs were originally designed based on the outdated capacity of 25l/person/day, which has recently been deemed inadequate. Urban secondary bulks and storage were originally designed to service smaller communities, but now require a pragmatic solution to upgrade the pre-existing system to align realistic supply with demand. Moreover, a prioritization model is required to then implement upgrades aligned with the availability and timing of the bulk water supply.

The overarching aim of this project is to upgrade the secondary bulk pipeline from the Umdoni Command Reservoir to settlements like Pennington, Umdoni Village, Kelso, Malangeni, Bazley, Ifafa and Hilltop (refer to Figure 1-1), and to also increase the capacity of the reservoirs in these respective areas.

The proposed pipeline route is ~29km long and covers a large coastal area spanning from Kelso to Elysium, and inland toward Malangeni. Much of the preferred route is expected to run parallel to existing routes, which pass through multiple watercourses and river system (refer to Figure 1-2).

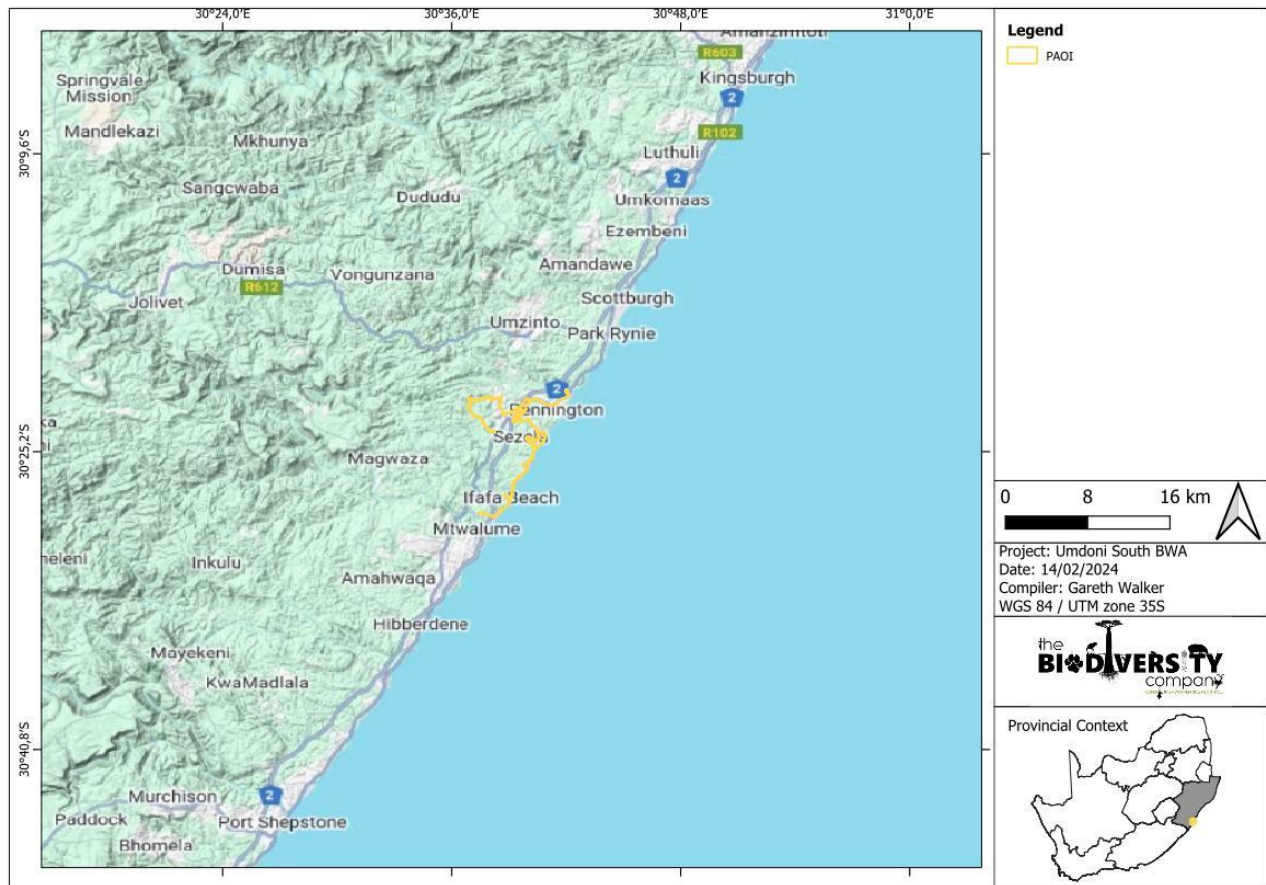


Figure 1-1 Map depicting the regional locality of the Project Area of Influence (PAOI).

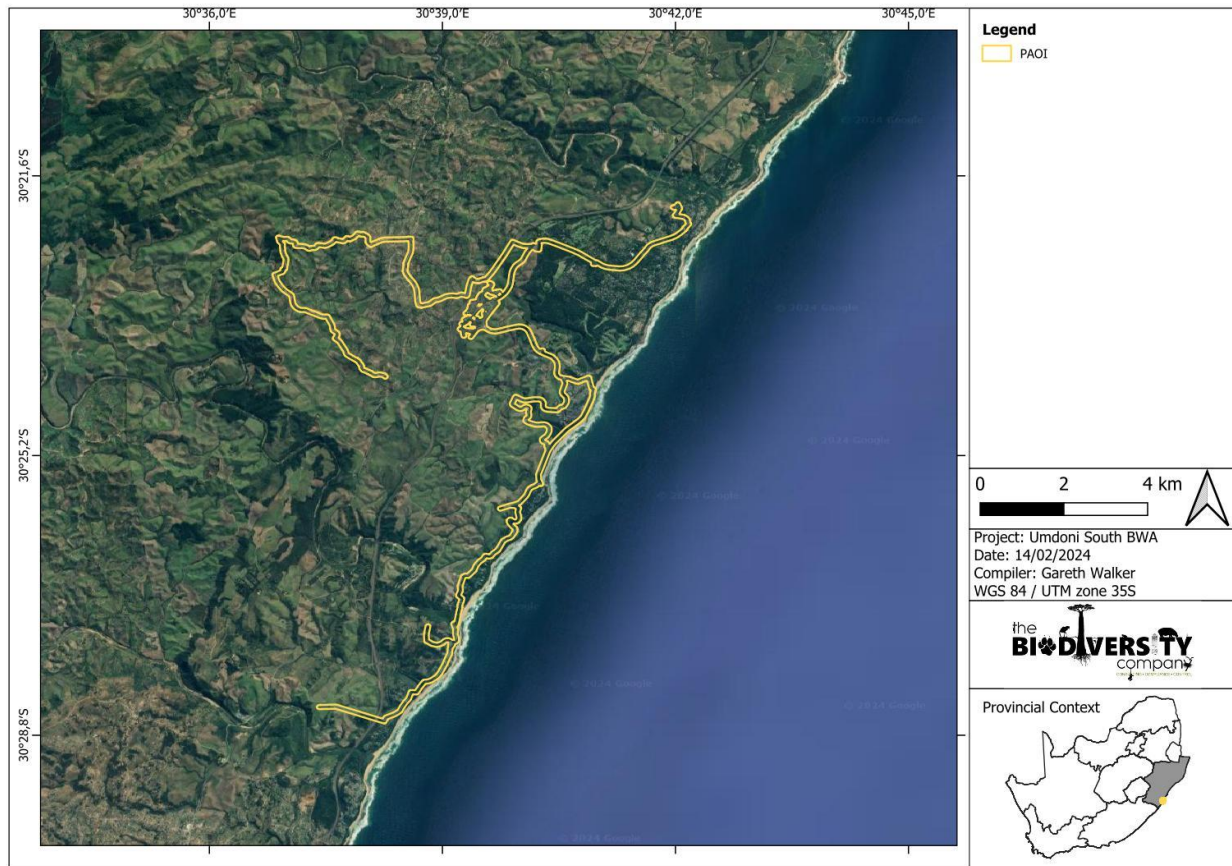


Figure 1-2 Map depicting the layout of the PAOI.

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 it is found to be of a 'Medium/Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from the site sensitivity verification, which involved both a desktop assessment as well as a field survey (conducted between the 27th and the 30th of September 2023, and on the 8th of February 2024), confirmed that most of the proposed footprint area is of a 'Low' sensitivity, thus constituting 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 is accurate at the time of reporting;
- 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;
- Additional areas were added to the layout after the original field survey had been conducted (September 2023). These areas were originally assessed at a desktop level only, with the results either being confirmed or disputed by the specialist conducting the subsequent field assessment in February 2024;
- The area was surveyed during two site visits (i.e., September 2023, and again in February 2024; note that the data collected is considered sufficient to derive a meaningful baseline);
- The first site visit was conducted during the late dry season (i.e., May to September), with the second site visit having been conducted in the middle of the wet season (i.e., October to April). Although multi-seasonal surveys do account for temporal trends in vegetation and fauna heterogeneity, it is possible that certain flora and fauna species may not have been recorded during a particular season. Irrespective, most species were likely recorded during both site surveys;
- This report must be considered in conjunction with the accompanying wetland report (TBC, 2024);
- 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 publication dates 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:

- KwaZulu-Natal Biodiversity Plan (CBAs) (Ezemvelo Wildlife, 2016);
- 2018 National Biodiversity Assessment (NBA, 2018) (Skowno *et al.*, 2019);
- Red List of Ecosystems (RLE) 2021 (Skowno & Monyeki, 2021);
- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018);
- South Africa Protected and Conservation Areas Databases (SAPAD, SACAD), 2022 (DFFE, 2023 & DFFE, 2023a);
- National Protected Areas Expansion Strategy (NPAES), 2016 (DEA, 2016);
- Important Bird and Biodiversity Areas (IBAs), 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 (NFEPA), 2011 (Nel *et al.*, 2011); and
- Strategic Water Source Areas (SWSAs), 2021 (Lötter & Le Maitre, 2021).

2.2 Biodiversity Field Survey

Two field surveys were conducted. The first, which took place from the 27th to the 30th of September 2023 constitutes a late dry season survey. The second, which took place on the 8th of February 2024, constitutes a mid-wet-season survey. Every effort was made to cover all the different habitats within the PAOI, accounting for the limits of time and accessibility. The site visits are 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 surveys, 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 calculated as 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 calculated as 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
Very High	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 ² . 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).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . 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).
Medium	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.
Low	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.
Very Low	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
Very High	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.
High	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.
Medium	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.
Low	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.
Very Low	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 2-3.

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 *Guideline for interpreting Site Ecological Importance in the context of proposed activities.*

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

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

3 Results & Discussion

3.1 Desktop Assessments

3.1.1 Ecologically Important Landscape Features

Table 3-1 below has been produced because of the spatial data collected and analysed (provided for 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. Where a feature is regarded as relevant it is considered an ecologically important landscape feature and is discussed further as part of the sub-sections that follow.

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

Desktop Information Considered	Relevant/Irrelevant	Reasoning
Ecosystem Threat Status	Relevant	Overlaps with Endangered (EN) and Least Concern (LC) habitats.
Ecosystem Protection Level	Relevant	Overlaps with Not Protected (NP) and Well Protected (WP) ecosystems.
National Protected Areas Expansion Strategy (NPAES)	Relevant	Falls within a Priority Focus Area.
Critical Biodiversity Area (CBA)	Relevant	Falls within an Irreplaceable Critical Biodiversity Area (CBA).
Important Bird and Biodiversity Areas (IBA)	Irrelevant	The closest IBA is approximately ~40km south-west of the PAOI.
Protected Areas	Irrelevant	The nearest protected area is the Vernon Crookes Nature Reserve situated approximately ~10km north-east of the PAOI.
Strategic Water Source Areas	Irrelevant	The PAOI does not overlap with any SWSAs.
National Freshwater Priority Area	Relevant	The PAOI overlaps with Unclassified NFEPA wetlands, and NFEPA Rivers.
South African Inventory of Inland Aquatic Ecosystems	Relevant	The PAOI overlaps with EN and VU aquatic ecosystems.

3.2 Biodiversity Field Survey

The following sections discuss the results from the field surveys that were conducted for the proposed PAOI in September 2023 and February 2024. Each habitat unit is described in Table 3-2.

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

Habitat	Description	SEI	Photographs
Indian Ocean Coastal Belt	This habitat unit occurs as the dominant vegetation type throughout the extent of the project area. Comprised predominantly of indigenous KZN Coastal Belt vegetation (e.g., <i>Bridelia micrantha</i>, <i>Albizia adianthifolia</i>, <i>Antidesma venosum</i>) with scattered clusters of Alien Invasive Plants (AIPs) (e.g., <i>Ricinus communis</i>, <i>Lantana camara</i>, <i>Melia azedarach</i>). Although no SCCs were detected, this habitat unit does have the potential to support fauna and flora SCCs. Fairly high anthropogenic impact associated with vehicle traffic prevalent throughout.	Medium	
Forest	Small patches of intact forest vegetation occur within the project area. Intact indigenous forest vegetation with sudatory signals suggestive of a high avifauna diversity (e.g., <i>Camaroptera brachyura</i>, <i>Tauraco porphyreolophus</i>, <i>Pogoniulus bilineatus</i>, <i>Bycanistes buccinator</i>). Like Indian Ocean Coastal Belt, no fauna and/or flora SCCs were detected. However, this habitat unit has the potential to supports SCCs (particularly avifauna).	Medium	

Aquatic*	This habitat unit is comprised of wetlands, rivers, estuaries and seasonal dams. Although no fauna and flora SCC were recorded, this habitat unit does have the potential to support both fauna and flora SCCs. More information on this habitat unit can be found in the accompanying wetland report (TBC, 2023).	Medium	
Modified	This habitat unit is characterised by transformed agricultural land used to farm predominantly sugar cane. The habitat is in a constant state of disturbance and cannot recover to a more natural state owing to continuous disturbances and ecological impacts attributed to agricultural practices, and edge effects from land use and mismanagement. No fauna or flora SCC were recorded or are expected to occur within this habitat unit.	Low	

3.2.1 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 3-3 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 below. The specialist assigned sensitivity ratings are visually depicted in Figure 3-2.

Table 3-3 *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	High	Validated – Fauna (particularly avifauna) diversity was high throughout the Indian Ocean Coastal Belt and Forest habitat units, with a high likelihood of terrestrial fauna species occurring throughout. Although no SCCs were detected, it is possible that fauna SCCs could occur within and in areas surrounding the PAOI.
Plant Theme	High	Medium	Disputed – Although much of the PAOI overlaps with indigenous vegetation habitat units, AIPs were prevalent throughout. Moreover, large sections of the proposed PAOI were modified owing to agriculture and infrastructure development. No SCCs were detected nor expected to occur within the PAOI.
Terrestrial Theme	Very High	Medium/Low	Disputed – Despite overlapping with CBA 1, CBA 2 and EN ecosystems, large sections of the proposed PAOI have been subjected to anthropogenic modification (e.g., agriculture and infrastructure development) and are not representative of CBA and EN ecosystems anymore.

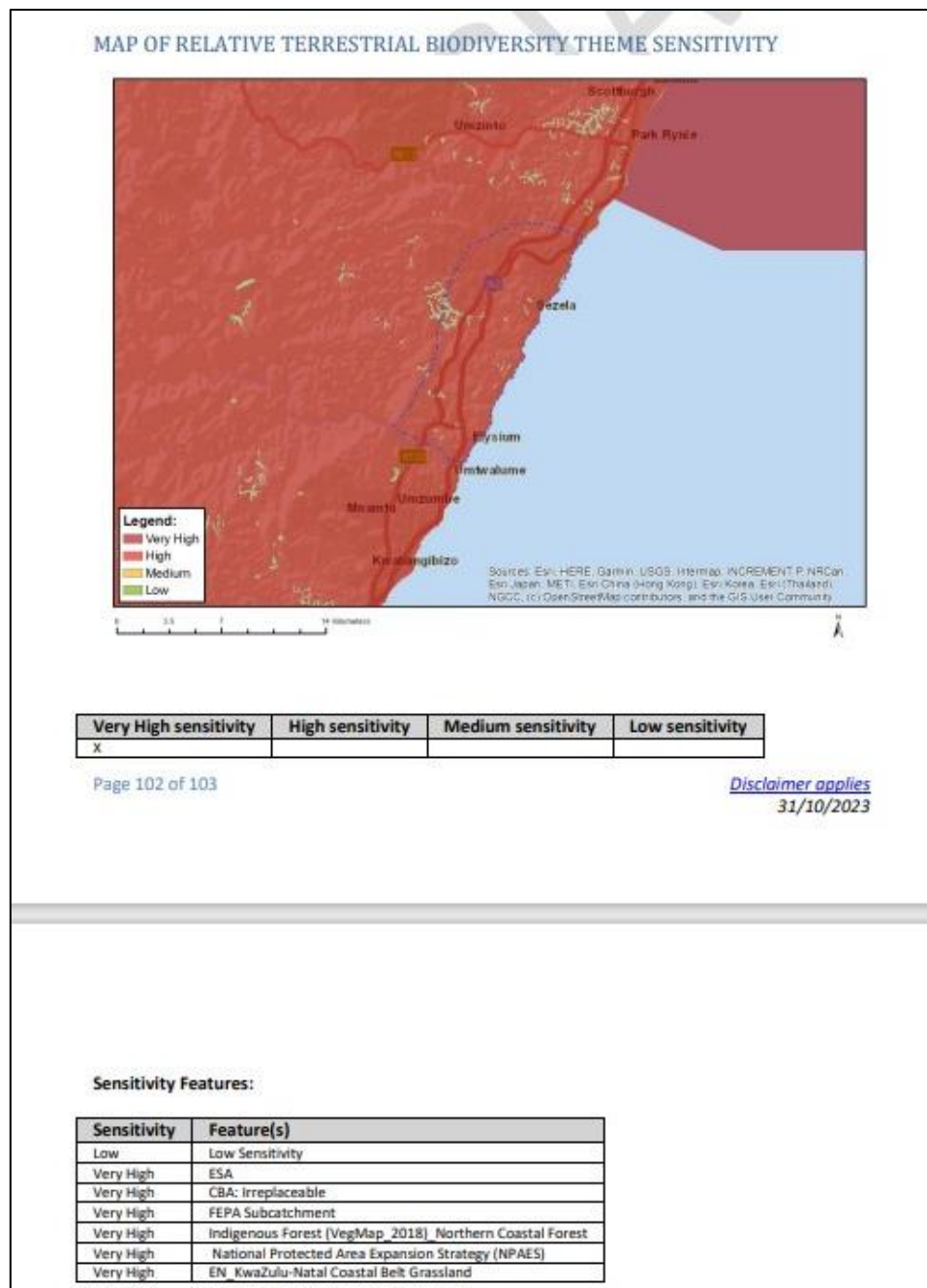


Figure 3-1 *Terrestrial Biodiversity Theme Sensitivity for the PAOI (National Environmental Screening Tool, 2023).*

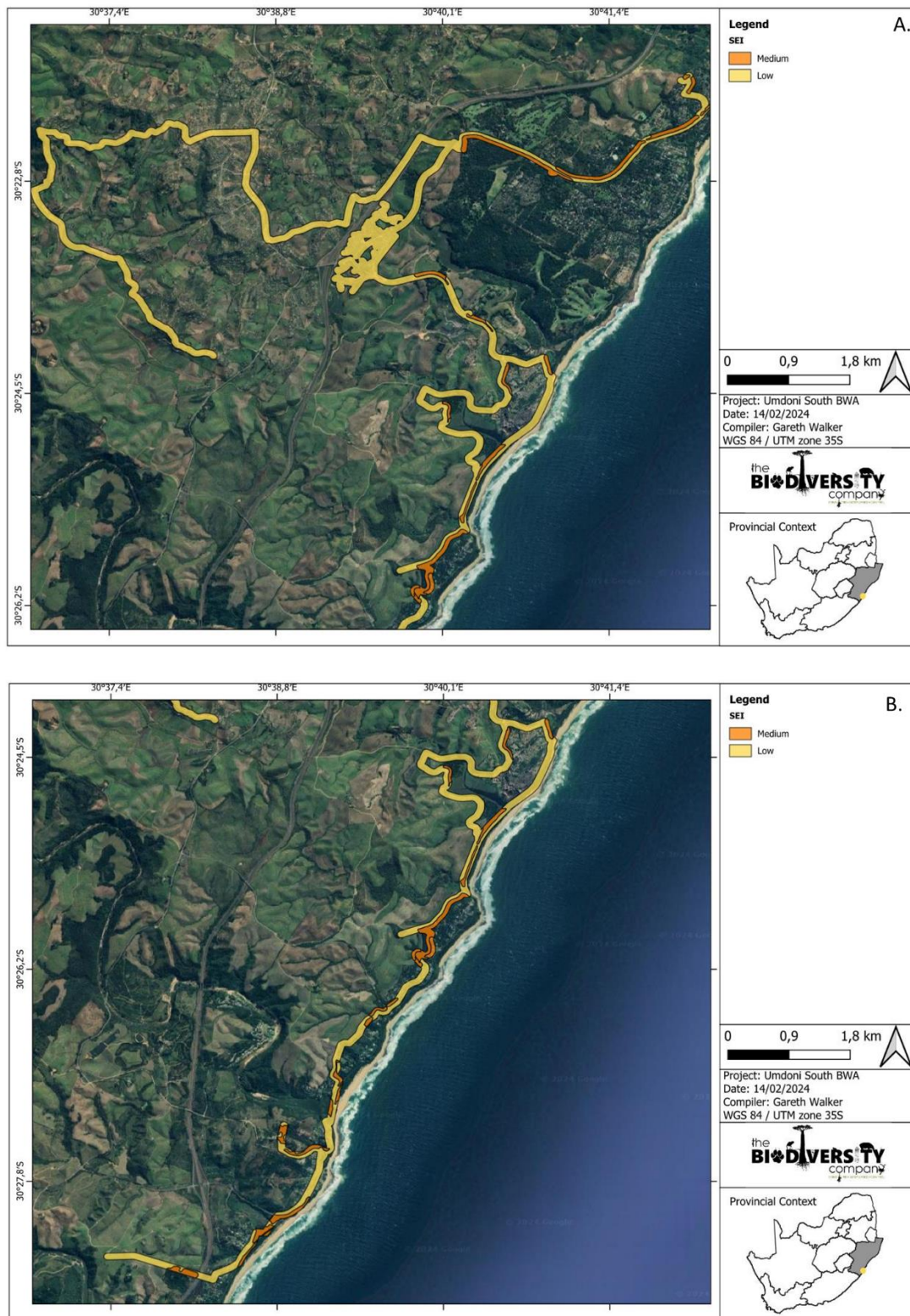


Figure 3-2 Map depicting the specialist assigned sensitivity ratings of habitats within the PAOI. For clarity, the entirety of the PAOI is subdivided into the northern (A) and southern (B) portions.

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 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 indigenous vegetation communities within the CBA and EN 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 Site Ecological Importance (SEI) ratings assigned to the PAOI (see 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. Development must take place along the pre-existing pipeline route.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
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.	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
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.	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure

A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.

- Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.
- No servicing of equipment on site unless necessary.
- All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.
- 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.
- Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.
- 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.

Life of operation

Environmental Officer &
Contractor

Spill events, Vehicles dripping.

Ongoing

It must be made an offence for any staff member to take any indigenous plant species out of any portion of the PAOI, or to bring any alien plant species into any portion of the PAOI. This is to prevent the spread of exotic or invasive species or the illegal collection of plants.

Life of operation

Project manager, Environmental
Officer

Any instances

Ongoing

A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas.

Life of operation

Environmental Officer &
Contractor

Fire Management

During Phase

All construction waste must be removed from site at the closure of the construction phase.

Construction phase

Environmental Officer &
Contractor

Construction waste

During Phase

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 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.

Closure
Phase/Rehabilitation
phaseEnvironmental Officer &
ContractorErosion Management and
Control/ LeaksDuring Phase and Ongoing
Monitoring

Management outcome: Fauna

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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, 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
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
Management outcome: Alien species				
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
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.	Construction phase	Contractor	Dustfall	Dust monitoring program.
Management outcome: Waste management				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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.	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
Litter, spills, fuels, chemical and human waste in and around the Project area must be minimised and controlled according to the waste management plan.	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.	Construction Phase	Environmental Officer & Contractor	Cement mixing and spills	Every occurrence
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.	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
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.	Life of operation	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste	Ongoing
Where a registered disposal facility is not available close to the PAOI, 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.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste	Ongoing

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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.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days
Management outcome: Environmental awareness training				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the Project area to inform contractors and site staff of the 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 EMP. Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.	Pre-construction phase	Health and Safety Officer, Environmental Officer	Compliance to the training	Ongoing
Management outcome: Erosion				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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.	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
Only existing access routes and walking paths may be made use of.	Life of operation	Project manager, Environmental Officer	Routes used within the area	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
A stormwater management plan must be compiled and implemented if applicable.	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

5 Conclusion and Impact Statement

Although sections of the PAOI fall within habitat units comprised of indigenous vegetation, should the proposed development take place along the pre-existing pipeline route (as stipulated by the clients), it is highly unlikely that the development will have any significant ecological impact on the receiving environment. Moreover, large sections of the PAOI are comprised of modified habitat units attributed to agriculture and infrastructure development. Although the PAOI falls within CBA1 & 2, and EN ecosystems, previous construction attributed to the development of the current pipeline in conjunction with the aforementioned activities (i.e., agriculture and infrastructure development), 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 'Medium/Low' sensitivity with the modified habitat units being assigned a similar 'Low' sensitivity rating. The Indian Ocean Coastal Belt and Forest habitat units have been assigned 'Medium' sensitivity ratings owing to the presence of indigenous fauna and flora species. The aquatic habitat unit is similarly assigned a 'Medium' sensitivity rating, however, more information regarding this unit can be found in the accompanying wetland report (TBC, 2024).

5.1 Impact Statement

It is the opinion of the specialists that the project may be favourably considered, provided that the mitigation measures presented in this report and accompanying wetland 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 important to consider that undeveloped portions of land can still contribute to land management objectives and protection targets to some degree. It is recommended that care be taken during construction to adhere to mitigation measures. 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.

This report should be considered in conjunction with the associated wetland report and all management outcomes and put forward by the wetland specialist must be implemented.

6 References

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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

February 2024

info@thebiodiversitycompany.com

DECLARATION

I, Marnus Erasmus, 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.



Marnus Erasmus

Environmental Consultant

The Biodiversity Company

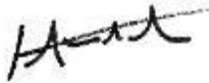
February 2024

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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

February 2024

7.2 Appendix B: Specialist CVs

Gareth Walker

BSc, MSc

Cell: +27 83 572 5371

Email: 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

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

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