
**TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT
FOR THE PROPOSED
PLETTENBERG BAY LAGOON RESIDENTIAL ESTATE**

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Nicole is a Botanical Specialist with over 4 years' experience in South Africa and other African countries. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) from NMU. Nicole has undertaken numerous Ecological Impact Assessments for a range of developments, including Wind Energy Facilities (WEFs), mines, powerlines, housing developments, roads, amongst others, ensuring that these specialist assessments are undertaken and prepared in accordance with the Protocols for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320), Plant Species and Animal Species (GN R. 1150) whilst working closely with developers to ensure a development which is environmentally sustainable as well as financially and technically feasible.

Declaration of Independence

Nicole Dealtry (Botanical Specialist)

- I, Nicole Dealtry, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amended Environmental Impact Assessment Regulations, 2017;
- 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 report are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

.....
SIGNED

.....
DATE

Specialist Check List

The contents of this Terrestrial Biodiversity Compliance Statement complies with the legislated requirements as described in Section 4.3 of the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320 of 2020).

SPECIALIST REPORT REQUIREMENTS ACCORDING TO GN R. 320		SECTION OF REPORT
4.3	In terms of Section 4.3 of the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity, a compliance statement must contain, as a minimum, the following information:	
4.3.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page 2 & 3; Appendix 1 & 2
4.3.2	A signed statement of independence by the specialist;	Page 3
4.3.3	A statement of the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 1.3 & 2.3
4.3.4	A baseline profile description of biodiversity and ecosystems of the site;	Chapter 3 & 4
4.3.5	The methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modelling used, where relevant;	Chapter 2
4.3.6	In the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	N/A
4.3.7	Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	Chapter 5
4.3.8	A description of the assumptions made and any uncertainties or gaps in knowledge or data; and	Section 1.3
4.3.9	Any conditions to which this statement is subjected.	Chapter 5 & 6
4.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	

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Glossary of Terms

Biodiversity is the term that is used to describe the variety of life on Earth and is defined as “*the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems*” (Secretariat of the Convention on Biological Diversity, 2005).

Biome - groupings based on dominant forms of plant life and prevailing climatic factors. Biomes have plants and/or animals living together with some degree of permanence, and one can observe large-size patterns in global plant cover. Biomes broadly correspond with climatic regions as moisture and temperature strongly influence plant establishment and survival, although other environmental controls are sometimes important (SANBI, 2020).

Critical Biodiversity Areas (CBAs) are areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure. These include:

- All areas required to meet biodiversity pattern (e.g. species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity (WCBSP, 2017).

Ecological Support Areas (ESAs) are areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. They support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and Endangered vegetation.

Ecosystem – a dynamic complex of animal, plant and micro-organism communities and their non-living environment interacting as a functional unit (SANBI, 2020).

Ecosystem type – an ecosystem unit, or set of ecosystem units, that has been identified and delineated as part of a hierarchical classification system, based on biotic and/or abiotic factors. Ecosystems of the same type are likely to share broadly similar ecological characteristics and functioning (SANBI, 2020).

Other Natural Areas (ONAs) are areas that have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for meeting biodiversity targets, they are still an important part of the natural ecosystem.

Project Area/site is defined as the erf or farm portion on which the development is proposed and for which this specialist assessment relates to.

Species of Conservation Concern (SCC) includes all species that are assessed according to the IUCN Red List Criteria as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Data Deficient (DD) or Near Threatened (NT), as well as range-restricted species which are not declining and are nationally listed as Rare or Extremely Rare [also referred to in some Red Lists as Critically Rare] (SANBI, 2021).

Vegetation type is defined in terms of dominant, common as well as rare species, as well as association with landscape features such as soil or geology, topography and climate (SANBI).

Acronyms

CBA	Critical Biodiversity Area
CI	Conservation Importance
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and Environment
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
FEPA	Freshwater Ecosystem Priority Area
FI	Functional Integrity
GRBR	Garden Route Biosphere Reserve
GN	Government Notice
LC	Least Concern
MAR	Mean Annual Rainfall
NPAES	National Protected Areas Expansion Strategy
ONA	Other Natural Area
PA	Protected Area
RR	Receptor Resilience
SA	South Africa
SACAD	South African Conservation Areas Database
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
VU	Vulnerable
WCBSA	Western Cape Biodiversity Spatial Plan

1. INTRODUCTION

1.1. Project Description

Biodiversity Africa has been appointed by Cape EAPrac (the Environmental Assessment Practitioner (EAP) for this project) to undertake a Terrestrial Biodiversity Compliance Statement for the Proposed Plettenberg Bay Lagoon Residential Estate located on Erf 6503 within the Bitou Local Municipality, Western Cape Province (Figure 1.1).

The proposed residential estate will consist of the following:

- 9 x single residential (Residential Zone I) erven.
- 28 x group housing (Residential Zone I) erven.
- 40 x apartments (Residential Zone IV): 5 x general residential erven and 8 x apartments per erf.
- Communal open space with a club house and communal recreation space.
- Private Nature Reserve.

The proposed development will therefore consist of ± 77 residential units.

The total area of Erf 6503 is approximately 18.5 ha in extent which has been divided into two portions: the western portion, which is characterised by disturbed vegetation that was historically used for grazing, and the eastern portion, which is characterised by dense intact thicket vegetation that abuts the Keurbooms Lagoon. The proposed development will be restricted to the western portion of Erf 6503 (i.e. the previously disturbed area).

Figure 1.2 illustrates the layout of the proposed development.

1.2. Reporting Requirements

According to the Department of Fisheries, Forestry and Environment (DFFE) Screening Report generated for the proposed site, the relative Terrestrial Biodiversity Theme Sensitivity of the project area is classified as VERY HIGH due to the following sensitivity features:

- Endangered Ecosystem (Garden Route Shale Fynbos)
- Critical Biodiversity Area 1
- Critical Biodiversity Area 2
- Ecological Support Area 1
- Ecological Support Area 2
- Freshwater Ecosystem Priority Area (FEPA) Subcatchments
- Protected Areas Expansion Strategy

In terms of the Protocol for the Specialist Assessment and Minimum Reporting Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320), an Applicant intending to undertake an activity on a site identified by the Screening Tool as being of “very high sensitivity” for terrestrial

biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment. However, in terms of Section 1.3 of GN R. 320, 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 a “low” sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The site sensitivity verification assessment undertaken for the proposed project, determined the western portion of the site (in which the development is located) to have an overall low sensitivity. Based on the low sensitivity and the negligible impacts on the terrestrial biodiversity features associated with the proposed development, a Terrestrial Biodiversity Compliance Statement has been prepared for the proposed project rather than a full specialist assessment.

1.3. Objectives

The objectives of this Terrestrial Biodiversity Compliance Statement are to:

- Undertake a desktop assessment of available literature and spatial data to identify the terrestrial biodiversity sensitivity features of the project area.
- Undertake a field survey, to record the following information:
 - The ecosystem types present.
 - The level of degradation/ecological status of the site (i.e. intact, near natural, transformed).
 - The current impacts and land use.
 - Whether the features contributing to the CBA/ESA classification of the site are present.
- Describe and map the terrestrial biodiversity features, ecosystem types present and no-go areas.
- Assess the sensitivity of the site using the sensitivity analysis outlined in the Species Guideline Document (2021).
- Summarise the findings of the desktop assessment and field survey in a report.
- Where necessary, provide management actions for inclusion in the EMP to reduce the impact of the proposed development on the environment.
- Provide a specialist statement/opinion of the proposed development in relation to the terrestrial biodiversity of the proposed site.

1.4. Limitations and Assumptions

This report is based on current available information and, as a result, the following limitations and assumptions are implicit:

- This report is based on the project description received from the client on the 10th of July 2023 and assumes that the proposed development will be constrained to the previously disturbed western portion of the project area.
- Sampling could only be carried out at one stage in the annual or seasonal cycle. The survey was conducted in June 2023 which falls outside of the optimum survey period for the Fynbos

and Albany Thicket Biome. However, despite the timing of the site visit, the information gathered was sufficient to determine the status of the project area, including the ecosystems/vegetation types present.

- This report includes an assessment of the terrestrial biodiversity features identified in the Screening Report only. A separate report has been prepared for the Terrestrial Plant and the Animal Species Theme.
- Whilst some aquatic features, such as Freshwater Ecosystem Priority Area (FEPA) subcatchments, contribute to the terrestrial biodiversity theme sensitivity of the project area, these features have been dealt with by the Aquatic Specialist and are therefore not assessed in this report.
- The Site Ecological Importance (SEI) assessment is determined by the likelihood of occurrence of Species of Conservation Concern (SCC). As such, the SEI in this report draws on the findings of the Terrestrial Plant Species Assessment Report. More detail on the habitat requirements and distribution of each plant SCC can be found in the Terrestrial Plant Species Assessment Report.
- This assessment has been undertaken to meet the Protocol for the Specialist Assessment and Minimum Report Requirements for Environmental Impacts on Terrestrial Biodiversity (GN. R 320) and the Species Environmental Assessment Guidelines (2021).



Figure 1.1: Locality map of the proposed residential estate.

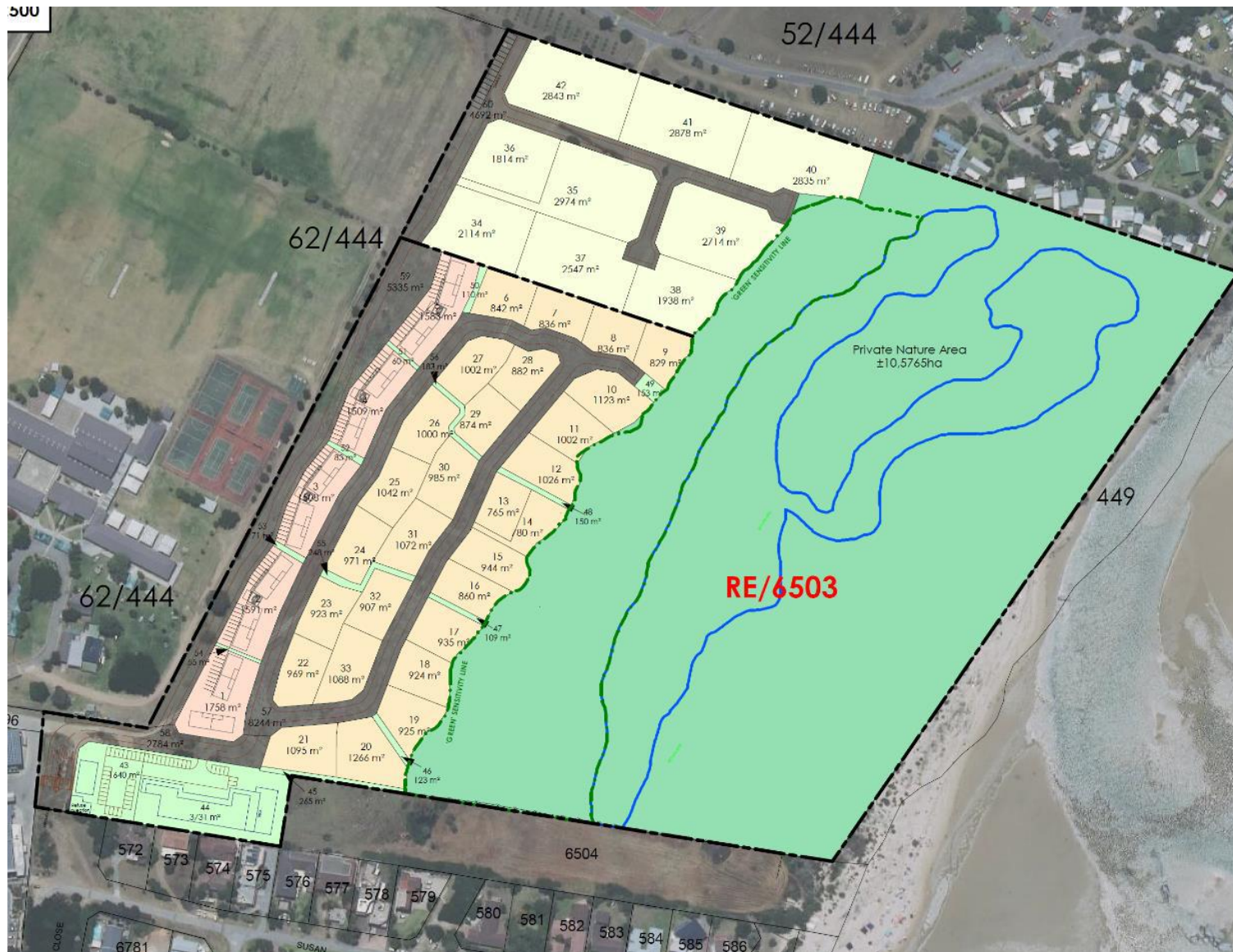


Figure 1.2: Layout of the proposed development on Erf 6503.

2. METHODOLOGY

2.1. DFFE Screening Report

The DFFE Screening Report identifies environmental sensitivities for the project area. This is based on available desktop data and requires that a suitably qualified specialist verify the findings. Of relevance to this report is the terrestrial biodiversity theme (Table 2.1). Comment has been provided in the table below indicating how this theme has been assessed.

Table 2.1: Summary of DFFE screening report theme relevant to this study.

Theme	Sensitivity	Sensitivity Feature	Assessment
Terrestrial Biodiversity Theme	VERY HIGH	Endangered Ecosystem (Garden Route Shale Fynbos)	Prior to undertaking the field survey, a desktop assessment of available literature and the most up to date spatial data was undertaken to verify the findings of the Screening Report. A field survey was then undertaken to identify whether the features contributing to the biodiversity theme sensitivity are present on site.
		Critical Biodiversity Area 1	
		Critical Biodiversity Area 2	
		Ecological Support Area 1	
		Ecological Support Area 2	
		FEPA Subcatchments ¹	
		Protected Areas Expansion Strategy	

2.2. Desktop Assessment

A desktop assessment of available spatial data and satellite imagery was undertaken to verify the findings of the Screening Report and to determine the historical vegetation types/ecosystems, identify biodiversity priority features of the project area, and to determine the historical land use which could have impacted the terrestrial biodiversity of the site.

The following key resources were consulted during the desktop assessment:

- The SA VEGMAP (SANBI, 2018).
- The Revised List of Ecosystems that are Threatened and in need of Protection (DFFE, 2022).
- The Red List of Ecosystems (SANBI, 2021): Remnants spatial dataset.
- The 2017 Western Cape Biodiversity Spatial Plan (WCBSP): Bitou.
- The South African Protected Areas Database (SAPAD, Q1, 2023).
- The South African Conservation Areas Database (SACAD, Q1, 2023).
- The National Protected Area Expansion Strategy (NPAES) (2010).
- The National Protected Area Expansion Strategy (NPAES) Negotiated Focus Areas (2018).

¹ FEPA subcatchments are aquatic features. A separate Aquatic Specialist Study has been undertaken for this project and are therefore not assessed in this report.

2.3. Field Survey

A field survey was undertaken during Winter from the 21st to the 23rd of June 2023. Figure 2.1 indicates the sample sites and tracks recorded during the field survey.

The purpose of the field survey was to verify the findings of the DFFE Screening Report and the desktop assessment by assessing the ecosystem/vegetation types present and determining whether the features contributing to CBA/ESA classification are present on site. The field survey also helped to determine the current land use and ecological status of the project area.

The ecosystem type present is largely determined by the plant species composition. As such, during the field survey, the plant species observed were recorded to determine whether the plant species composition is representative of the expected ecosystem types as per the SA VEGMAP (2018).



Figure 2.1: Map showing sample sites and tracks in relation to the project area.

2.4. Site Sensitivity Assessment

The Species Environmental Assessment Guideline (SANBI, 2020) was applied to assess the Site Ecological Importance (SEI) of the project area. The habitats and the Species of Conservation Concern (SCC) in the project area were assessed based on their conservation importance, functional integrity, and receptor resilience (Table 2.2). The combination of these resulted in a rating of SEI and interpretation of mitigation requirements based on the ratings.

The sensitivity map was developed using available spatial planning tools as well as by applying the SEI sensitivity based on the field survey.

Table 2.2: Criteria for establishing Site Ecological Importance and description of criteria.

Criteria	Description
Conservation Importance (CI)	<i>The importance of a site for supporting biodiversity features of conservation concern present e.g. populations of Threatened and Near-Threatened species (CR, EN, VU & NT), Rare, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.</i>
Functional Integrity (FI)	<i>A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.</i>
Biodiversity Importance (BI) is a function of Conservation Importance (CI) and the Functional Integrity (FI) of a receptor.	
Receptor Resilience (RR)	<i>The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.</i>
Site Ecological Importance (SEI) is a function of Biodiversity Importance (BI) and Receptor Resilience (RR)	

3. BIOPHYSICAL DESCRIPTION OF THE PROJECT AREA

Abiotic and biophysical features such as climate, geology, soil, and landform have a major influence on the distribution and structure of vegetation types occurring within a particular area. The project area occurs along the south coast of South Africa and falls within the eastern portion of the Fynbos Biome, but narrow strips of dune thicket (Albany Thicket Biome) develop within fire-protected dune slacks. This region is characterized by a warm and temperate climate with rainfall occurring throughout the year. This influences the vegetation types present and likely contributes to the ecotone observed between the Fynbos Biome and Thicket Biome. The Mean Annual Rainfall (MAR) for Plettenberg Bay is 663 mm and the average temperature is 16.9°C (Climate-data.org).

The Fynbos Biome occupies most of the Cape Fold Belt (both north-south and east-west mountain chains and wetter valleys) as well as the adjacent lowlands between the mountains and the Atlantic Ocean in the west and south, and between the mountains and the Indian Ocean in the south (Rebello *et al.*, 2006).

The regions supporting the Fynbos Biome, particularly around the Cape Fold Belt, have undergone extensive deformation and metamorphism to produce a mosaic of various geological substrates which has had a major influence on the evolution of the remarkable diversity of taxa and vegetation types within this biome. Sandstone, quartzite, granite, gneiss, shales, and also young limestone sediments are the most prominent rocks of the region (Rebello *et al.*, 2006).

The wide range of environmental conditions such as present and past rainfall, terrain type, and age of the landscape influence the weathering process of the underlying geologies resulting in large variations in soil types and soil associations that are characteristic of the Fynbos Biome. The soils within the project area consist of recently deposited aeolian (windblown) sands which are typically nutrient poor and shallow (Rebello *et al.*, 2006).

At a landscape level, fynbos is generally confined to flatter more extensive areas that are exposed to frequent fires while fire-safe habitats, such as dune slacks, develop small clumps of thicket. The elevation of the western portion of the project area is relatively flat sloping gently towards the east until approximately 150 m from the western boundary when the elevation decreases more considerably forming slacks until it flattens out upon reaching the lagoon (Figure 3.2). This change in elevation corresponds remarkably to the change in vegetation of the project area.

Within the project area, the Secondary Grassy Fynbos is confined to the flatter, higher lying hilltop while the dense dune thicket is confined to the lower lying dune slacks (Figure 3.1). Cape Seashore vegetation has established along the foredune which is exposed to salt spray.

The key ecological drivers maintaining ecosystem function, pattern and structure differ between Fynbos and Thicket. As mentioned above, fire is the main ecological driver determining the distribution of these ecosystems at landscape level. Fire is integral to the persistence of Fynbos ecosystems whereas thicket is resistant to fire. Where these ecosystems occur in a mosaic, fire helps to maintain the boundary between these vegetation types. Other major ecological drivers include edaphic conditions and underlying lithologies. Fynbos typically occurs in shallow, nutrient poor, well-drained soils while thicket tends to occur in deeper soils with higher nutrient content.

4. TERRESTRIAL BIODIVERSITY FEATURES OF THE PROJECT AREA

4.1. Threatened Ecosystems

The DFFE Screening Report identifies that the project area occurs within an Endangered Ecosystem: Garden Route Shale Fynbos. Consultation of the South African Vegetation Map (SA VEGMAP) (SANBI, 2018) indicates that the project area is located within two (2) vegetation types, namely Garden Route Shale Fynbos and Goukamma Dune Thicket (Figure 4.1).

Garden Route Shale Fynbos occurs on undulating hills and moderately undulating plains on coastal forelands in the Western Cape and Eastern Cape Provinces. In wetter areas this vegetation type is characterised by tall, dense proteoid and ericaceous fynbos whilst in drier areas it is characterised by graminoid fynbos or 'shrubby grassland' (Rebelo *et al.*, 2006). Garden Route Shale Fynbos is classified as Endangered due to its narrow distribution and high rates of habitat loss over the past 28 years (DFFE, 2022). Only 44% (~248.5 ha) of the historical extent of this vegetation type remains and is considered poorly protected (SANBI, 2021). The conservation target for this vegetation type is 23%.

Goukamma Dune Thicket occurs along moderately undulating coastal dunes from Victoria Bay near Wilderness to the Knysna Heads, with smaller areas occurring along the coast from Robberg Peninsula near Plettenberg Bay east towards Keurboomstrand in the Western Cape Province. It is characterised by a mosaic of low to tall (1-5 m) dense thicket dominated by small trees and woody shrubs with abundant lianas, in a mosaic of low (1-2 m) asteraceous fynbos. Thicket clumps develop in fire-protected dune slacks which occasionally also supports Coastal Forest dominated by *Celtis africana*, *Ekebergia capensis*, and *Searsia chirindensis*. The fynbos shrubland occurs on upper dune slopes and crests where succulents may be common in more open areas (Grobler *et al.*, 2018). Goukamma Dune Thicket is classified as Least Concern (LC) (SANBI, 2021). The conservation target for this vegetation type is 19%.

Analysis of the SANBI (2021) Red List of Ecosystems: Remnants Spatial Dataset illustrates that both the Garden Route Shale Fynbos and Goukamma Dune Thicket vegetation types are present in the project area (Figure 4.2).

However, analysis of Google Earth Satellite Imagery (Figure 4.3) and the findings from the field survey confirmed that the vegetation on the north-western half of the project area is no longer representative of Garden Route Shale Fynbos but rather of Secondary Grassy Fynbos (Figure 4.4, 4.6 and 4.7). This appears to be due to previous disturbance by prolonged mowing, the exclusion of fire, and historical grazing.

The current plant species assemblages comprising the vegetation of the project area is representative of Secondary Grassy Fynbos, Goukamma Dune Thicket and a small strip of Cape Seashore Vegetation which borders the southeastern boundary of the project area along the coastal dunes. These are discussed in detail below.



Figure 4.1: SA VEGMAP (SANBI, 2018) of the project area.



Figure 4.2: Remaining Extent of ecosystems within the project area (RLE (SANBI, 2021): Remnants spatial dataset).



Figure 4.3: Google Earth Satellite Image of the project area from 2022 illustrating striations in the western portion indicating historical clearance.

Secondary Grassy Fynbos is characterised by an abundance of grass species such as *Digitaria eriantha*, *Eragrostis capensis*, *Heteropogon contortus*, *Imperata cylindrica*, *Melinis repens*, *Panicum maximum*, and *Setaria sphacelata* and fast growing, pioneer plant species mainly of the Asteraceae family including *Arctotheca prostrata*, *Artemisia afra*, *Cirsium vulgare*, *Felicia amoena*, *Helichrysum cymosum*, *H. foetidum*, *H. teretifolium*, *Hypochaeris glabra*, *Nidorella ivifolia*, *Stoebe plumosa*. Other common species included *Carpobrotus deliciosus*, *C. edulis*, *Chenopodium murale*, *Brunsvigia orientalis*, *Arctopus echinatus*, *Centella asiatica*, *Heliophila sp.*, *Aspalathus spinosa*, *Indigofera verrucosa*, *Pelargonium alchemilloides*, *Pelargonium capitatum*, *Hypoxis sp.*, *Hebenstretia integrifolia*, and *Plantago lanceolata* (Figure 4.4).



Figure 4.4: The Secondary Grassy Fynbos of the project area.

Goukamma Dune Thicket was confirmed to occur on site. This vegetation type was characterised by dense, low to tall (2-5 m) thicket dominated by woody trees such as *Searsia chirindensis*, *S. crenata*, *S. glauca*, *S. laevigata*, *Carissa bispinosa*, *C. macrocarpa*, *Tarchonanthus littoralis*, *Gymnosporia nemorosa*, *G. buxifolia*, *Maytenus procumbens*, *Mystroxydon aethiopicum*, *Putterlickia pyracantha*, *Pterocelastrus tricuspidatus*, *Diospyros dichrophylla*, *Euclea racemosa*, *Grewia occidentalis*, *Ekebergia capensis*, *Olea exasperata*, *Sideroxylon inerme*, and *Buddleja saligna* and an abundance of climbers such as *Rhoicissus digitata*, *Rhoicissus tridentata*, *Cynanchum obtusifolium*, *Asparagus spp.* and *Rhynchosia caribaea* (Figure 4.5). Alien invasive plant species, particularly of the Genus *Acacia*, were scattered throughout the project area but abundant in portions of the thicket vegetation. Due to the fragmentation of the remaining portion of Goukamma Dune Thicket caused by frequent access, as well as the presence of alien invasive plant species, this vegetation type within the site is considered near intact.



Figure 4.5: The Goukamma Dune Thicket of the project area.

The ecotone between the Secondary Grassy Fynbos and the Goukamma Dune Thicket was abrupt and corresponds to the change in elevation of the project area (Figure 4.6 & Figure 4.7).

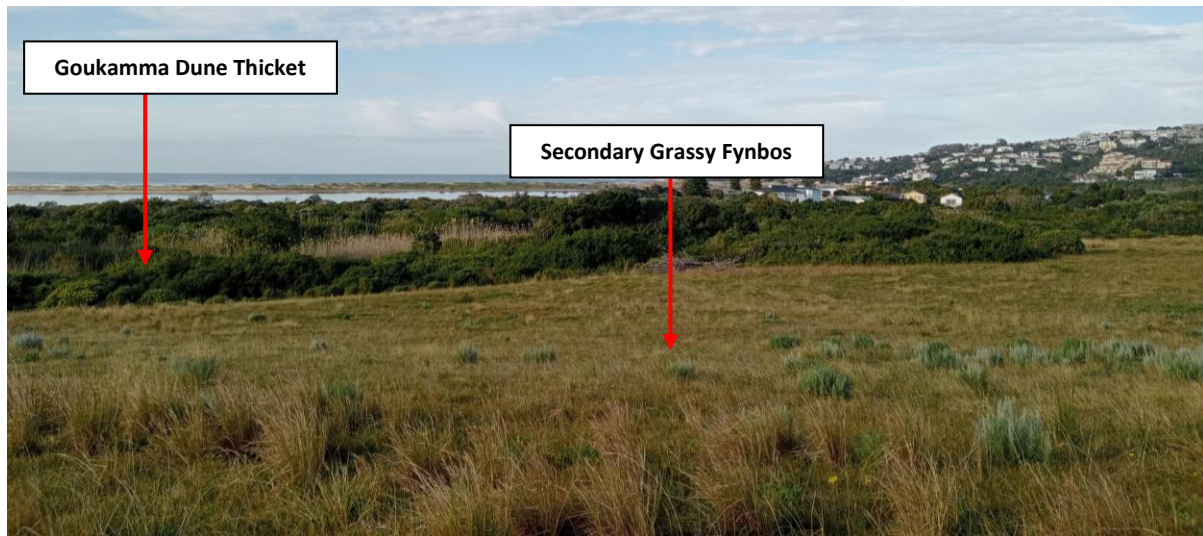


Figure 4.6: The contrast between the Secondary Grassy Fynbos and the Goukamma Dune Thicket of the project area.



Figure 4.7: Photograph illustrating the abrupt ecotone between the Secondary Grassy Fynbos and the Goukamma Dune Thicket of the project area.

Cape Seashore Vegetation: A small strip of Cape Seashore Vegetation bordered the southeastern boundary of the site along the coastal dunes (Figure 4.8). Common species included *Metalasia muricata*, *Ursinia chrysanthemoides*, *U. paleacea*, *Carpobrotus deliciosus*, *Ipomoea pes-caprae*, *Falkia repens*, *Crassula lanceolata*, *Tetragonia decumbens*, *Helichrysum asperum*, *Ficinia nodosa*, *Isolepis cernua*, *Isolepis marginata*, *Pycneus polystachyos*, *Chironia baccifera*, *Ehrharta villosa*, and *Thinopyrum distichum*. Cape Seashore Vegetation is classified as Least Concern (SANBI, 2021).



Figure 4.8: Cape Seashore Vegetation bordering the southeastern boundary of the project area.

It should be noted that no threatened plant Species of Conservation Concern (SCC) were identified during the field survey. However, the Terrestrial Plant Species Assessment Report compiled for this project found that two (2) Vulnerable (VU) plant species have a high likelihood of occurrence within the Goukamma Dune Thicket of the project area, namely *Erica glandulosa* subsp. *Fourcadei* and *Erica glumiflora*.

The vegetation of the project area has been delineated and mapped in Figure 4.9. Based on the observations from the field survey two patches of transformed areas have been included. The transformed portion in the north-western corner consists of a homestead and garden whilst the transformed portion in the south-western corner consists of a gravel driveway and turning circle.

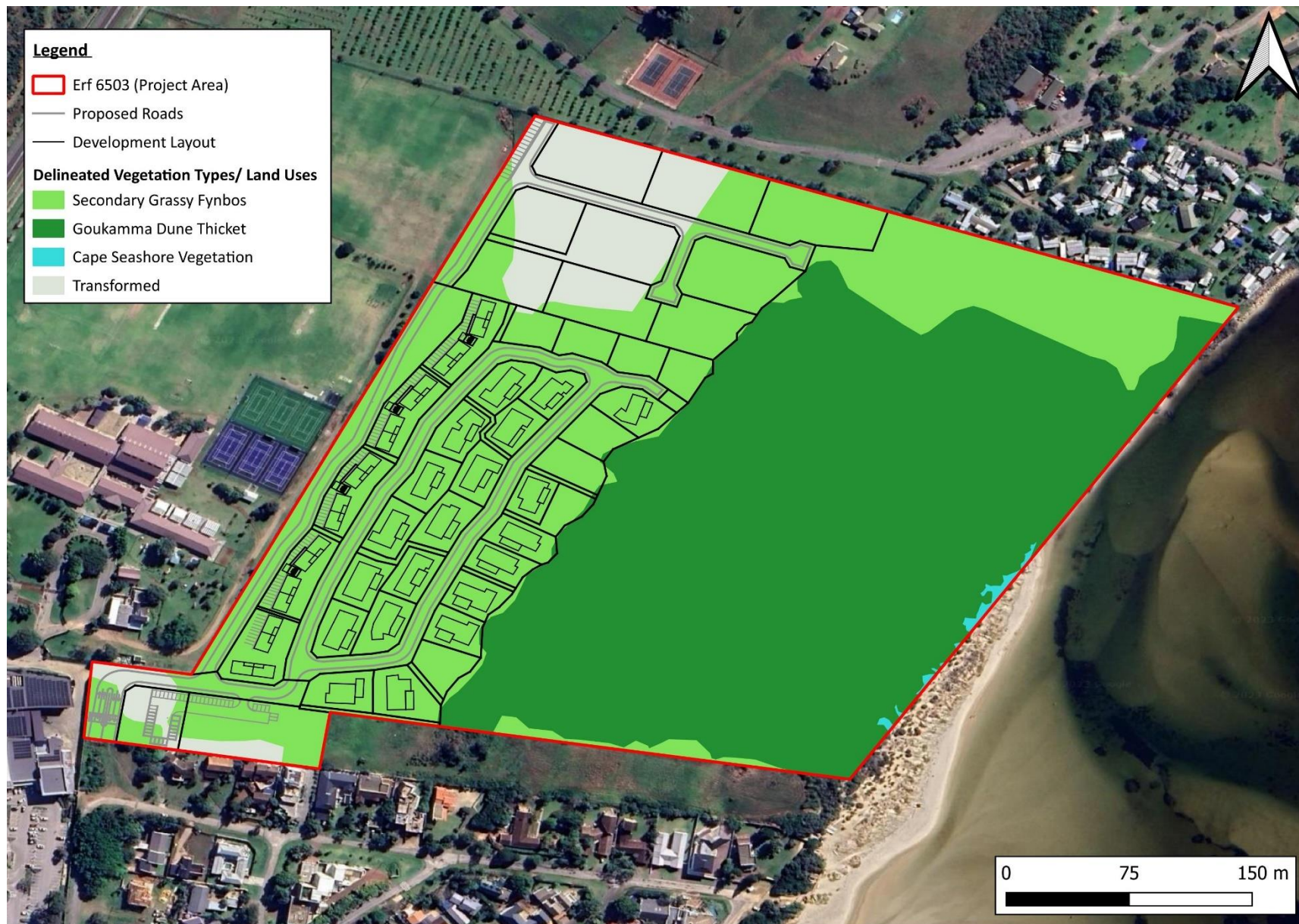


Figure 4.9: Vegetation types delineated and mapped based on field survey findings.

4.2. Critical Biodiversity Areas and Ecological Support Areas

The Western Cape Biodiversity Spatial Plan (WCBS, 2017) is a spatial planning tool that includes a map of biodiversity importance for the Western Cape Province, covering both the terrestrial and freshwater realms, as well as major coastal and estuarine habitats. The WCBS map delineates biodiversity priority features which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem service. The accompanying WCBS handbook also presents a set of land use guidelines that are required to conserve biodiversity.

The WCBS Map shows the following five broad biodiversity priority categories as per SANBI Technical Guidelines for biodiversity maps (2017), including Protected Areas (PA), Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and Other Natural Areas (ONAs) (refer to glossary for definitions of these terms).

According to the WCBS (2017) (Figure 4.10), the south-eastern half of the project area occurs within a CBA 1 whilst the north-western half of the project area occurs within a CBA 2. Two small, isolated portions of ESA 2 occur along the south-eastern boundary of the project area and a small portion of an ESA 1 occurs along the north-western corner of the project area, in the area which is largely transformed.

The features driving the CBA and ESA status have been identified using the provided reason layer and comment has been provided in Table 4.1 on the affect the project could have on each feature.

Table 4.1: Comment on CBA status of the project area.

Triggered	Comment
Climate adaption corridor	Climate adaption corridors are required for long term persistence of biodiversity pattern and process and implementing measures to protect the remaining corridor network (refer to the climate change adaptation corridors – Pence 2009), particularly critical linkages, with biodiversity-compatible land uses. Provided development is restricted to the previously disturbed western half of the project area, and the portion of Goukamma Dune Thicket remains intact, project activities are unlikely to affect this feature particularly if the management measures identified in this report are implemented and adhered to.
Coastal resource protection – Eden	These are areas along the coastline where changes in land use may affect the ecological functioning and/or the resilience of the coast to withstand impacts that may arise as the result of climate change and impact on coastal processes e.g. erosion and deposition, as well as supporting the functioning of PAs or CBAs. The project area is located less than 1 km from the coastline. However, provided development is restricted to the previously disturbed western half of the project area, and the portion of Goukamma Dune Thicket remains intact, project activities are unlikely to affect this feature particularly if the management measures identified in this report are implemented and adhered to.
Garden Route Shale Fynbos (EN)	Based on the findings of the Terrestrial Plant Species Assessment undertaken for this project, this vegetation type is no longer

	present on site and will therefore not be affected by the proposed project activities.
Keurbooms (Core) Estuary	The project is located approximately 270 m from the Keurbooms Estuary. Comment on the impact of the proposed development on water courses and aquatic features would need to be obtained from an aquatic specialist. However, provided development is restricted to the previously disturbed western half of the project area, and the portion of Goukamma Dune Thicket remains intact, project activities are unlikely to directly affect this feature particularly if the mitigation measures identified in this report are implemented and adhered to.
Sedgefield Coastal Grassland (Vlok variant – CR)	According to the SA VEGMAP (2018), the project area occurs within two vegetation types namely Garden Route Shale Fynbos and Goukamma Dune Thicket. Based on the findings of the Terrestrial Plant Species Assessment undertaken for this project, four vegetation types were delineated within the project area namely Goukamma Dune Thicket, Secondary Grassy Fynbos, Cape Seashore Vegetation and Transformed Habitat. As such, Sedgefield Coastal Grassland is not present on site and will not be affected by project activities.
Watercourse protection – Southeastern Coastal Belt	The project is located approximately 270 m from the Keurbooms Estuary. Comment on the impact of the proposed development on water courses and aquatic features would need to be obtained from an aquatic specialist. However, provided the development is restricted to the previously disturbed western half of the project area, and the portion of Goukamma Dune Thicket remains intact, project activities are unlikely to directly affect this feature particularly if the management measures identified in this report are implemented and adhered to.
Cape Estuarine Salt Marsh (LT)	The Terrestrial Plant Species Assessment undertaken for this project identified and delineated four vegetation types within the project area namely Goukamma Dune Thicket, Secondary Grassy Fynbos, Cape Seashore Vegetation and Transformed Habitat. Cape Estuarine Salt Marsh does not occur within or adjacent to the project area. As such, this feature will not be affected.
Coastal Habitat Type	Provided development is restricted to the previously disturbed western half of the project area, and the portion of Goukamma Dune Thicket remains intact, project activities are unlikely to directly affect this feature particularly if the management measures identified in this report are implemented and adhered to.

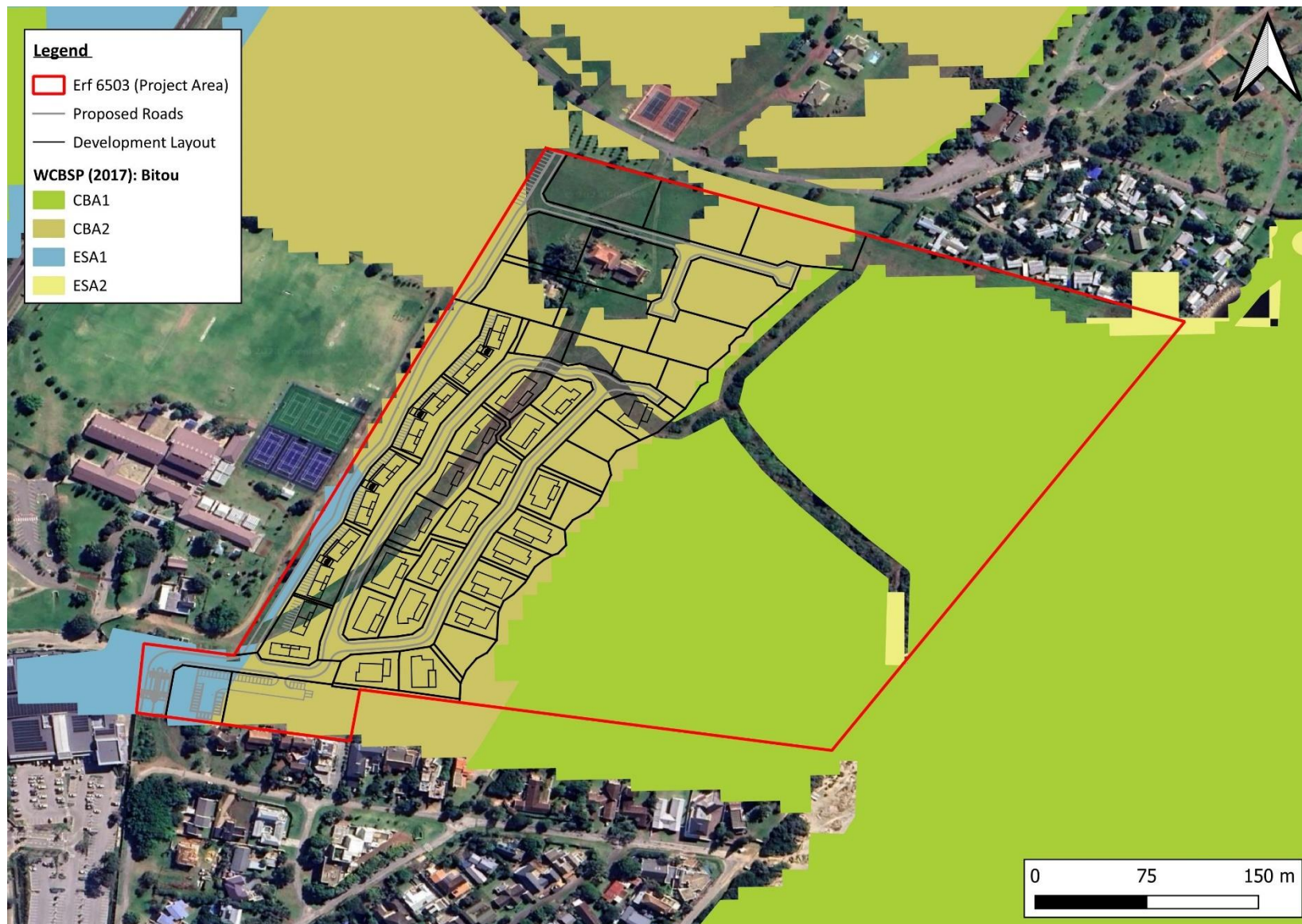


Figure 4.10: CBAs and ESAs within the project area.

4.3. Protected Areas

The South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) is a spatial dataset that includes all the protected areas (PA) and conservation areas (CA) within South Africa. Data on privately owned PAs are also included in the dataset which is maintained and updated on a quarterly basis. This dataset therefore provides the most up to date information on protected areas and conservation areas in South Africa. According to SACAD and SAPAD (2023, Q1), the project area does not occur within a protected area, however, it does occur within the Garden Route Biosphere Reserve.

The Garden Route Biosphere Reserve (GRBR) was recognised by UNESCO as South Africa's 9th Biosphere Reserve in June 2017. The GRBR covers an area of approximately 700,000 ha and extends from the coastline south of George Airport north to Jeffreys Bay. It is located within the Cape Floristic Region along the southern coast of the country, and includes the Tsitsikamma, Goukamma and Robberg Marine Protected Areas, Wilderness Lake RAMSAR site, Garden Route National Park, the Nelson Bay Cave and the Langkloof Valley. The Garden Route National Park, the primary core area of the Garden Route Biosphere Reserve, also forms part of the Cape Floral Region Protected Areas World Heritage Site, inscribed by UNESCO in 2004. The GRBR is divided into areas of biodiversity significance for incorporation into development planning. The core areas cover 31% of the GRBR, with 26% being terrestrial and 5% marine. The buffer zone accounts for 41% and the transition area 28%. There are three Marine Protected Areas and a Ramsar Wetland site found within the reserve (gardenroutebiosphere.org.za).

Although the proposed development is located within the GRBR, considering the previously disturbed nature of the site as well as the surrounding urban land use, the proposed development is unlikely to have a significant impact on the GRBR.

4.4. NPAES Focus Areas

The National Protected Areas Expansion Strategy (NPAES, 2010) was developed to “achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change.” The NPAES originated as Government recognised the importance of protected areas in maintaining biodiversity and critical ecological processes. The NPAES sets targets for expanding South Africa's protected area network, placing emphasis on those ecosystems that are least protected. According to the NPAES (2018), the eastern half of the project area, which correlates with the Goukamma Dune Thicket, occurs within a negotiated focus area identified in 2018 but not yet formalised. This supports the findings of the Screening Report.

The development avoids the Goukamma Dune Thicket within the project area and will not impact the NPAES Negotiated Focus Area (2018).

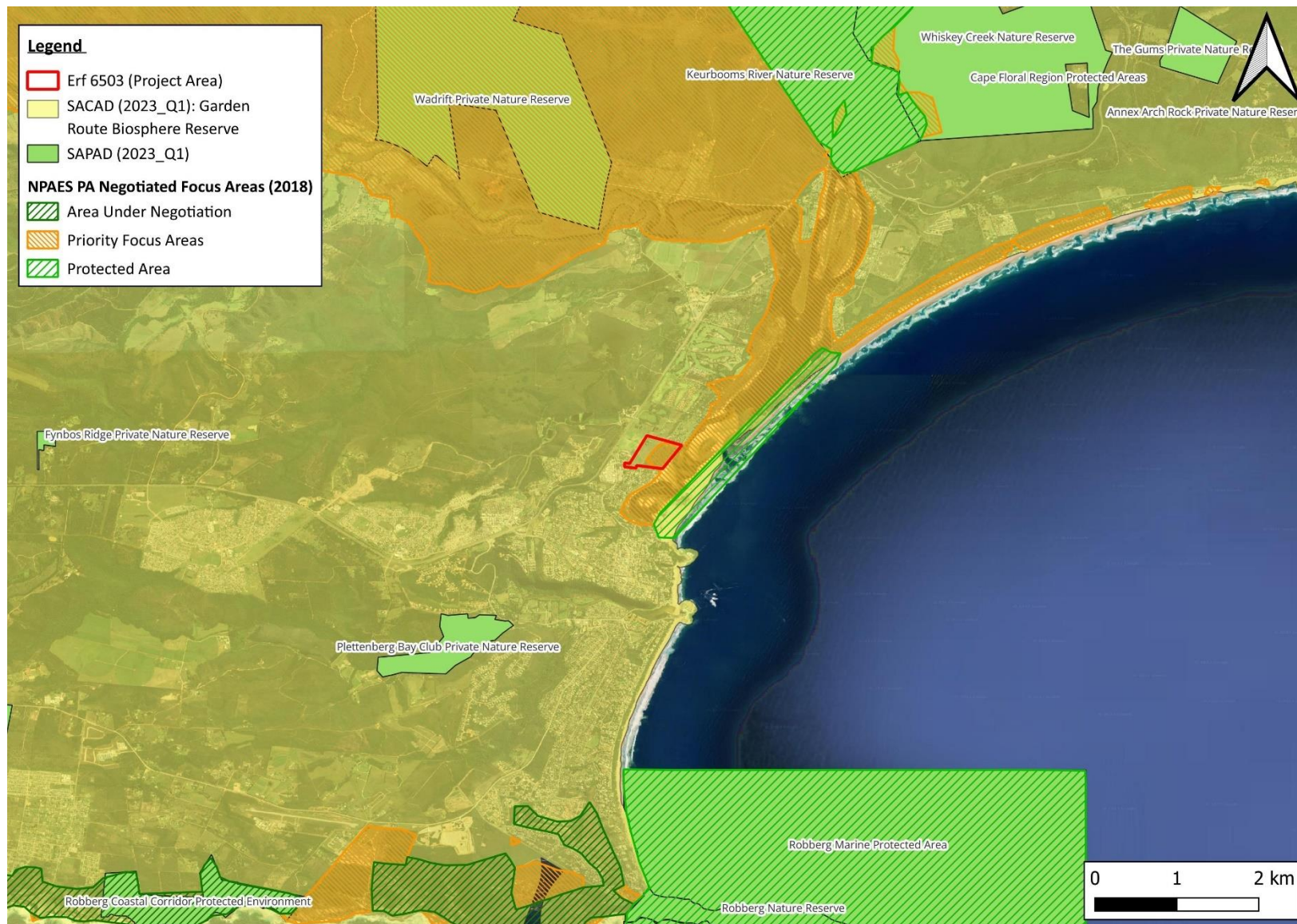


Figure 4.11: Protected Areas and NPAES Focus Areas within and surrounding the project area.

4.5. Site Ecological importance

There is no criteria for the sensitivity assessment of biodiversity features. The assessment of Site Ecological Importance (SEI) as per the Species Environmental Assessment Guideline (SANBI, 2020) considers each ecosystem as a whole and takes into consideration the threat status of the vegetation type present and the presence or likely presence of SCC (i.e., conservation importance), the functional integrity of the ecosystem, and the receptor resilience. As such, to determine the SEI of the project area, the findings of the Plant Species Specialist Assessment undertaken for this project is applicable.

In terms of the Plant Species Specialist Assessment (Biodiversity Africa, 2023), the SEI of the Goukamma Dune Thicket was determined to be HIGH. The SEI of the Secondary Grassy Fynbos was determined to be LOW and the SEI of both the Cape Seashore Vegetation and the transformed portions of the project area were determined to be VERY LOW (Figure 4.12).

In terms of the Guidelines for interpreting SEI in the context of the proposed development activities the following applies:

For areas of **HIGH SEI**: *“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”*. In the context of this project, the developer should avoid locating infrastructure within this vegetation type. Low impact walkways through the Thicket, using existing paths, would be acceptable but houses and associated infrastructure is not acceptable.

For areas of **LOW SEI**: *“Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities”*. In the context of this project, development within this area is permissible.

For areas of **VERY LOW SEI**: *“Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required”*. In the context of this project, development within this area is permissible.

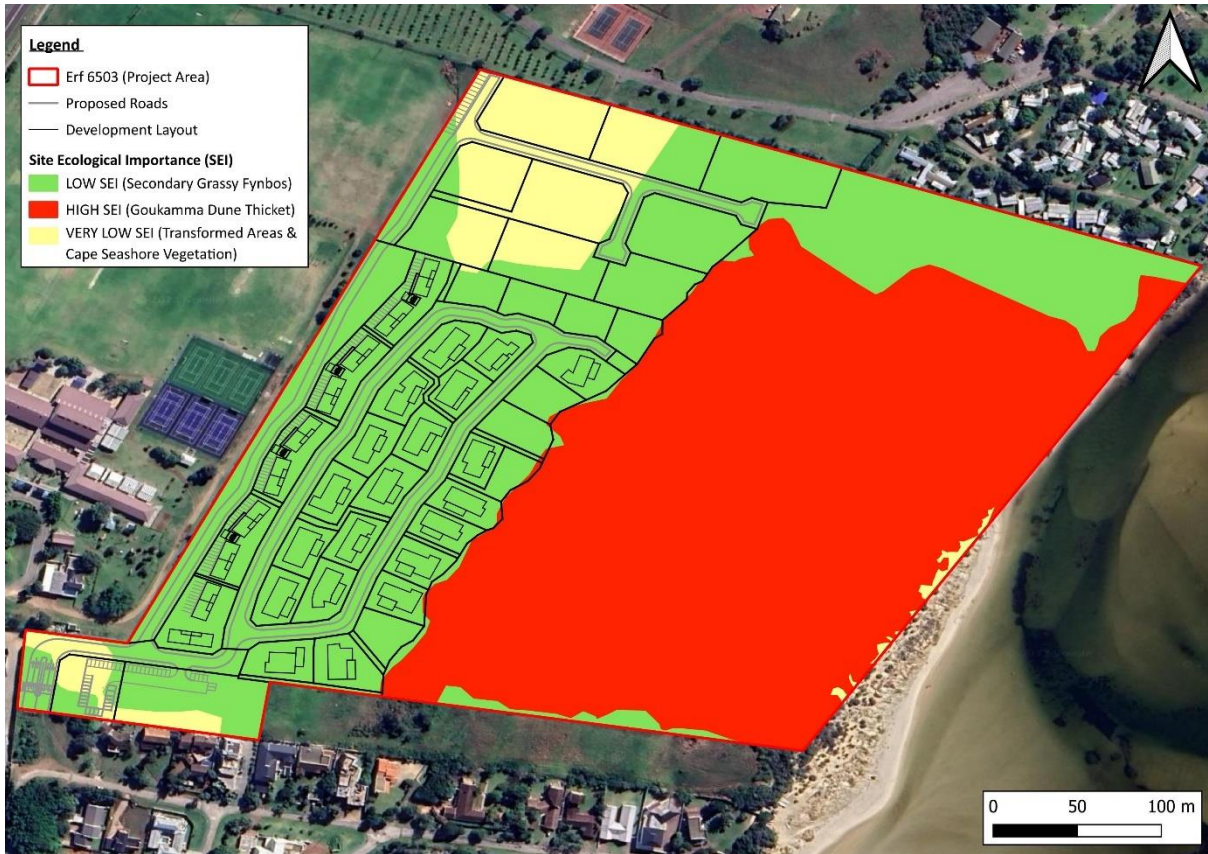


Figure 4.12: Botanical and Terrestrial Biodiversity SEI of the project area based on data gathered from the field survey and the desktop assessment.

5. PROPOSED MANAGEMENT ACTIONS

The following management actions and mitigation measures should be incorporated into the Environmental Management Programme (EMPr) for this project:

Construction Phase

- The proposed residential development must be constrained to the previously disturbed western portion of the site.
- Delineate the construction footprint to prevent encroachment of construction activities into intact Goukamma Dune Thicket and declare a No-go area.
- Vegetation clearance must be strictly limited to that which is necessary for the construction of the proposed residential estate and associated infrastructure.
- Maintain vegetation cover where possible to reduce the possibility of soil erosion.
- If boardwalks/walkways are required, these must follow existing pathways through the thicket vegetation. These pathways cannot be made wider, and no thicket vegetation must be cleared to accommodate the construction or erection of boardwalks/walkways.
- Design and implement a Stormwater Management Plan.
- Design and implement an Erosion Management Plan.
- Erect signs and/or notice boards informing construction staff of no-go areas or areas of high sensitivity.
- Regular toolbox talks should be presented to inform construction staff of no-go areas or areas of high sensitivity.
- The site must be checked regularly for the presence of alien invasive species.
- All alien invasive species that establish as a result of the project must be removed and disposed of as per the Working for Water Guidelines.
- An Alien Invasive Management Plan/Method Statement must be compiled and implemented for all phases of the proposed development.
- Disturbed areas should be rehabilitated as soon as possible to avoid erosion and stormwater runoff.

Operational Phase

- Residents should be made aware of the sensitivity of the Goukamma Dune Thicket and the foredune which supports Cape Seashore Vegetation through the erection of notice boards.
- Access should be restricted to existing pathways and the most direct paths used. Pathways must be demarcated using environmentally friendly markers and paths off the main path, that should not be used by residents, should be cordoned off to prevent people accidentally using these.
- Access by residents should be restricted to existing pathways.
- No pruning of the Goukamma Dune Thicket unless the relevant permits have been obtained.

6. CONCLUSIONS

The DFFE Screening Report classified the terrestrial biodiversity theme of the proposed project area as VERY HIGH due to the following sensitivity features:

- Endangered Ecosystem (Garden Route Shale Fynbos)
- Critical Biodiversity Area 1
- Critical Biodiversity Area 2
- Ecological Support Area 1
- Ecological Support Area 2
- FEPA Subcatchments (Refer to Aquatic Specialist report)
- Protected Areas Expansion Strategy

Based on the desktop assessment and findings from the field survey the following conclusions have been drawn:

Endangered Ecosystem

The western portion of the project area in which the Garden Route Shale Fynbos (EN) historically occurred, has been previously disturbed by the prolonged exclusion of fire, mowing and historical grazing. The plant species composition present within this portion of the site is no longer representative of Garden Route Shale Fynbos. As such, this feature contributing to the terrestrial biodiversity theme sensitivity is no longer present on site and will therefore not be affected by the proposed development.

CBAs/ESAs

According to the WCBS (2017), the south-eastern half of the project area occurs within a CBA 1 whilst the north-western half of the project area occurs within a CBA 2. Two small, isolated portions of ESA 2 occur along the south-eastern boundary of the project area and a small portion of an ESA 1 occurs along the north-western corner of the project area, in the area which is largely transformed. Analysis of the features contributing to the classification of the CBAs/ESAs within the proposed project area revealed that provided the proposed development is constrained to the previously disturbed western half of the site, and the portion of Goukamma Dune Thicket is conserved, these features will not be impacted by the proposed development. Comment will need to be obtained from an Aquatic Specialist regarding the aquatic features contributing to the CBA/ESA classification.

Protected Areas Expansion Strategy

According to the NPAES (2018), the eastern half of the project area, which correlates with the Goukamma Dune Thicket, occurs within a negotiated focus area for protected area expansion identified in 2018 but not yet formalised. This supports the findings of the DFFE Screening Report. However, provided the development is constrained to the previously cleared western portion of the site, and the portion of Goukamma Dune Thicket is conserved, the NPAES Focus Area will not be impacted by the proposed development.

Specialist Opinion

The SEI of the Goukamma Dune Thicket was determined to be HIGH. The SEI of the Secondary Grassy Fynbos was determined to be LOW and the SEI of both the Cape Seashore Vegetation and the transformed portions of the project area were determined to be VERY LOW.


Since project activities will be limited to the Secondary Grassy Fynbos (low SEI), the findings from this report indicate that the proposed development will have a negligible impact on the biodiversity theme features (i.e. CBA, ESA, Endangered Ecosystem, NPAES) of the site, as identified by the DFFE Screening Report.

The specialist is of the opinion that areas of HIGH SEI should be avoided but that development within areas of LOW and VERY LOW SEI is permissible, provided the management measures identified in Chapter 5 are implemented and adhered to.

7. REFERENCES

- DFFE. 2022. The Revised National List of Ecosystems that are Threatened and in need of Protection.
- Grobler, A., Vlok, J., Cowling, R, van der Merwe, S., Skowno, A.L., Dayaram, A. 2018. Technical Report: Integration of the Subtropical Thicket Ecosystem Project (STEP) vegetation types into the VEGMAP national vegetation map 2018.
- Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. 2017. The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.
- Rebelo, AG., Boucher, C., Helme, N., Mucina, L., Rutherford, MC. Fynbos Biome. *Strelitzia* 19.
- SANBI. 2021. Red List of terrestrial Ecosystems of South Africa.
- South African National Biodiversity Institute (SANBI). 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa*. South African National Biodiversity Institute, Pretoria. Version 2.1 2021.

APPENDIX 1: PROOF OF SACNASP REGISTRATION AND HIGHEST QUALIFICATION



SACNASP
South African Council for Natural Scientific Professions


herewith certifies that
Nicole Nadine Wienand
Registration Number: 130289
is a registered scientist

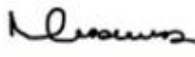
in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)


Environmental Science (Certificated Natural Scientist)
Botanical Science (Professional Natural Scientist)

Effective **3 March 2021** Expires **31 March 2024**




Chairperson


Chief Executive Officer



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NELSON MANDELA
UNIVERSITY

This is to certify that, all the requirements
having been met, the degree

**Bachelor of Science Honours in
Botany**

with all the associated rights and privileges,
was conferred upon

Nicole Nadine Wienand

ID no.: 9501170150088

at a congregation of the Nelson Mandela University on
13 December 2018

Certificate no.: 20185249



Vice-Chancellor



Registrar



00008632

APPENDIX 2: CV

CONTACT DETAILS

Name	Nicole Dealtry (née Wienand)
Name of Company	Biodiversity Africa
Designation	Senior Botanist
Professional Affiliations	SACNASP Pri. Sci. Nat. Botany Reg No. 130289 IAIAsa Membership No. 6176 SAAB: Member of the South African Association of Botanists
E-mail	nicole@biodiversityafrica.com
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Education	April 2018: Bachelor of Science (BSc) Botany and Geology December 2018: Bachelor of Science (BSc) Honours (Hons) Botany
Nationality	South African
Key areas of expertise	<ul style="list-style-type: none">➤ Ecological Impact Assessments➤ Botanical Micro-siting➤ GIS Mapping

PROFILE

Nicole (SACNASP Pri. Sci. Nat. Botany Reg No. 130289) is a Botanical Specialist with over 4 years' experience. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) from NMU. Nicole has undertaken numerous Ecological Impact Assessments for a range of developments, including Wind Energy Facilities (WEFs), mines, powerlines, housing developments, roads, amongst others, ensuring that these specialist assessments are undertaken and prepared in accordance with the Protocols for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320), Plant Species and Animal Species (GN R. 1150) whilst working closely with developers to ensure a development which is environmentally sustainable as well as financially and technically feasible. Nicole also has experience with conducting specialist assessments in other African countries, including Sierra Leone and Mozambique.

**EMPLOYMENT
EXPERIENCE**

Botanical Specialist, Biodiversity Africa

March 2023 – present

- Botanical and Ecological Impact Assessments
- Alien Management Plans
- GIS Mapping

Environmental Consultant and Botanical Specialist, Coastal and Environmental Services (CES)

07 January 2019 – February 2023

- Ecological Impact Assessments
- Botanical Micro-siting
- GIS Mapping
- Basic Assessments
- Public Participation
- Environmental Auditing/Compliance Monitoring
- Environmental Management Programmes (EMPr)

**ACADEMIC
QUALIFICATIONS**

Nelson Mandela University, Port Elizabeth

BSc Honours Botany (Environmental Management)
2018

Nelson Mandela Metropolitan University, Port Elizabeth

BSc Environmental Sciences
2015-2017

**CONSULTING
EXPERIENCE**

Basic Assessments

- Basic Assessment Report (BAR) for the proposed Duyker Island Prospecting Right, North West Province (Role: Assistant Report Writer).
- Basic Assessment Report (BAR) for the proposed Fairview Sand Mine near Port Alfred, Eastern Cape Province (Role: Report Writer).
- Basic Assessment Report (BAR) for the proposed Kareekrans Boerdery Agricultural Development near Kirkwood, Eastern Cape Province (Role: Report Writer).
- Basic Assessment Report (BAR) for the proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province (Role: Report Writer).
- Basic Assessment Report (BAR) for the Proposed Private Jetty in Bushman's Estuary near Kenton-On-Sea, within the Eastern Cape Province (Role: Report Writer).

Ecological Impact Assessments and Related Work

- ZMY Steel Traders (Pty) Ltd., Steel Recycling Plant, Zone 5 of the Coega SEZ, Eastern Cape Province (Role: Ecological Specialist and Ecological Chapter Writer).
- Ecological Impact Assessment for the proposed Kareekrans Boerdery Agricultural Development near Kirkwood Eastern Cape Province (Role: Botanical specialist and Lead Report Writer).
- Ecological Impact Assessment for the proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing (Role: Botanical Specialist and Lead Report Writer).

- Ecological Impact Assessment for the proposed Uitsig Boerdery Trust Citrus Development near Kirkwood, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ground Truthing Survey for Aloe bowiea on Portion 2 of Farm 683 for the proposed Uitsig Boerdery Trust Citrus Development near Kirkwood, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Mosselbankfontein Coastal Dune and Ecological Impact Assessment near Witsand, Western Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Mangrove Forest Survey for the Kenmare Biodiversity Management Plan, Topuito, Mozambique (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment for the proposed Refele Village Sports Facility, Mount Fletcher, Elundini Local Municipality, Eastern Cape Province of South Africa (Role: Lead Report Writer).
- Ecological Impact Assessment for the proposed Hamburg Quarry Expansion, R72, Ngqushwa Local Municipality (Role: Lead Report Writer).
- Ecological Opinion and Site Sensitivity Report for the proposed Woodlands Dairy 22kV Overhead Line near Humandsdorp, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment Report for the proposed Edendale Quarry, R56, Matatiele Local Municipality, Eastern Cape Province (Role: Report Writer).
- Ecological Impact Assessment for the proposed TWFT Piggery near Tsitsikamma, Koukama Local Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment for the proposed Oudtshoorn Cemetery Expansion, Oudtshoorn Local Municipality, Western Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Tyolomnqa River Estuary Situation Assessment (Role: Assistant Report Writer).
- Ecological Opinion Letter for the Proposed Umsobomvu Infrastructure Development, Eastern and Northern Cape Provinces (DEFF Reference Number: 14/12/16/3/3/1/2040) (Role: Report Writer).
- Ecological Opinion Letter for the Proposed Coleskop Infrastructure Development, Eastern and Northern Cape Provinces (DEFF Reference Number: 14/12/16/3/3/1/2039) (Role: Report Writer).
- Quinera Estuary Draft Situation Assessment Report (Role: Report Writer).
- Ecological Impact Assessment for the Proposed Umoyilanga 132 kV Overhead Line in the Sundays River Valley Local Municipality and the Nelson Mandela Bay Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment for the Proposed Umoyilanga Ancillary Infrastructure near Uitenhage, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment Report for the proposed Marine Servitude Project, Zone 10, Coega SEZ, Eastern Cape Province, South Africa (Role: Botanical Specialist and Lead Report Writer).
- Botanical Micro-siting Report for the proposed Umoyilanga 132 kV Overhead Line in the Sundays River Valley Local Municipality and the Nelson Mandela Bay Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Botanical Micrositing Report for the Proposed Dassiesridge (Umoyilanga) Wind Energy Facility near Uitenhage, Nelson Mandela Bay Municipality and Sundays River Valley Local Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).

- Ecological Screening Report for the Proposed Hlaziya 400-132 kV Powerline Project (the MTS Integration Project) from close to Jeffrey's Bay to Grassridge, near the Coega Sez, Eastern Cape Province (Role: Lead Report Writer).
- Ecological Impact Assessment for the proposed Umsobomvu Substation, Concrete Tower Manufacturing Facilities and Temporary Laydown Area, situated in the Umsobomvu Local Municipality (Northern Cape Province) and the Inxuba Yethemba Local Municipality (Eastern Cape Province) (Role: Botanical Specialist and Lead Report Writer).
- Botanical Micro-siting Report for the Eskom Infrastructure MTS situated in the Umsobomvu Local Municipality (Northern Cape Province) (Role: Botanical Specialist and Lead Report Writer).
- Botanical Micro-siting Report for the Proposed Coleskop Wind Energy Facility situated in the Umsobomvu Local Municipality (Northern Cape Province) and the Inxuba Yethemba Local Municipality (Eastern Cape Province) (Role: Botanical Specialist and Lead Report Writer).
- Botanical Micro-siting Report for the Proposed Umsobomvu Wind Energy Facility situated in the Umsobomvu Local Municipality (Northern Cape Province) and the Inxuba Yethemba Local Municipality (Eastern Cape Province) (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment for the Proposed Ganspan Pering 132 kV Overhead Line near Pampierstand, North West and Northern Cape Provinces (Role: Botanical Specialist and Lead Report Writer).
- Botanical Micro-Siting Investigation for the R342 Road Upgrade Between Paterson And Addo, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Terrestrial Biodiversity Compliance Statement for the proposed Stedin College, Walmer, Nelson Mandela Bay Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment Report for a proposed Hippo Enclosure on Glen Boyd Farm, Makana Local Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Ecological Impact Assessment for the Proposed Senqu Rural Water Supply Scheme, Joe Gqabi District Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Environmental Management Site Specification for the Rehabilitation of Land within the Coastal Dune System Impacted by the Zone 10 Services Project, Coega SEZ, Eastern Cape Province (Role: Site Visit and Assistant Report Writer).
- Botanical Assessment Report for the proposed Agricultural Development on the Remainder of Erf 60845, Zone 1, East London Industrial Development Zone, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Botanical Impact Assessment for the proposed FG Gold Limited Baomahun Gold Project, Sierra Leone (Role: Botanical Specialist and Lead Report Writer).
- Biodiversity Management Plan for the proposed FG Gold Limited Baomahun Gold Project, Sierra Leone (Role: Lead Report Writer).
- Ecological Baseline Assessment for the proposed Jeffreys Bay Eco-Estate, Eastern Cape Province (Role: Botanical Specialist and Co-Author).
- Ecological Impact Assessment for the proposed Mulilo Newcastle Wind Energy Facility, KwaZulu-Natal Province (Role: Botanical Specialist and Assistant Report Writer).
- Ecological Impact Assessment for the proposed Ngxwabangu Wind Energy Facility and Grid Connection near Cofimvaba, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).

- Ecological Impact Assessment for the proposed Umoyilanga Buffer Yard, Site Camp and Site Camp Access Road near Uitenhage, Nelson Mandela Bay Municipality and Sundays River Valley Local Municipality, Eastern Cape Province (Role: Botanical Specialist and Lead Report Writer).
- Terrestrial Biodiversity Compliance Statement for the proposed Reverse Osmosis Plant for the Matla Power Station near Kriel, Mpumalanga Province (Role: Lead Report Writer).
- Ecological Impact Assessment for the proposed Great Kei Ancillary Infrastructure located near Komga, Eastern Cape Province.

Environmental Auditing

- Khayamnandi Extension on Erven 114, 609, 590 and 24337, Bethelsdorp, within the Nelson Mandela Bay Municipality;
- Aberdeen Bulk Water Supply Phase 2, Dr Beyers Naude Local Municipality, Eastern Cape Province, South Africa;
- The Milkwoods Integrated Residential Development, Remainder Erf 1953, Victoria Drive, Walmer, Nelson Mandela Bay Municipality, Eastern Cape Province;
- Fishwater Flats Wastewater Treatment Works Refurbishment, Nelson Mandela Bay Municipality, Eastern Cape Province;
- The Refurbishment of the Kwanobuhle Wastewater Treatment Plant, Nelson Mandela Bay Municipality, Eastern Cape Province, South Africa; and
- Driftsands Sewer Collector Augmentation (Phase II), Within the Nelson Mandela Bay Municipality, Eastern Cape Province.

Geographical Information Systems (GIS) Mapping

- ZMY Steel Traders – Basic Assessment Report and Biophysical Mapping.
- Duyker Island – Prospecting Area Mapping & Biophysical Mapping.
- Fairview Sand Mine near Port Alfred, Eastern Cape Province – Biophysical and Layout Mapping.
- St Francis Coastal Protection Scheme – Kromme Estuary Functional Zone Mapping; Biophysical Mapping; and Sand Source Area Mapping.
- Kareekrans Boerdery Agricultural Development – Biophysical and Layout Mapping.
- Sitrusrand Dwarsleegte Farm Citrus Development – Biophysical and Layout Mapping.
- Marine Intake and Outfall Infrastructure Servitude Project, Zone 10, Coega SEZ, Eastern Cape Province, South Africa – Biophysical and Layout Mapping.
- Proposed Private Jetty in Bushman's Estuary near Kenton-On-Sea, within the Eastern Cape Province – Biophysical and Layout Mapping.
- Proposed Woodlands Dairy 22kV Overhead Line near Humansdorp, Eastern Cape Province – Biophysical and Layout Mapping.
- Tyolomnqa River Estuary Situation Assessment – Biophysical and Layout Mapping.
- Hamburg Quarry Expansion, R72, Ngqushwa Local Municipality – Biophysical and Layout Mapping.
- Refele Village Sports Facility, Mount Fletcher, Elundini Local Municipality, Eastern Cape Province of South Africa – Biophysical and Layout Mapping.
- The proposed Woodlands Dairy 22kV Overhead Line near Humansdorp, Eastern Cape Province – Biophysical and Layout Mapping.
- Ecological Impact Assessment Report for the proposed Edendale Quarry, R56, Matatiele Local Municipality, Eastern Cape Province – Biophysical and Layout Mapping.
- The proposed TWFT Piggery near Tsitsikamma, Koukama Local Municipality, Eastern Cape Province – Biophysical and Layout Mapping.

- Tyolomnqa River Estuary Situation Assessment – Biophysical and Layout Mapping.
- Quinera Estuary Draft Situation Assessment Report – Biophysical and Layout Mapping.
- The Proposed Umoyilanga 132 kV Overhead Line in the Sundays River Valley Local Municipality and the Nelson Mandela Bay Municipality, Eastern Cape Province – Biophysical and Layout Mapping.
- The Proposed Umoyilanga Ancillary Infrastructure near Uitenhage, Eastern Cape Province – Biophysical and Layout Mapping.
- Proposed Hlaziya 400-132 kV Powerline Project (the MTS Integration Project) from close to Jeffrey’s Bay to Grassridge, near the Coega Sez, Eastern Cape Province - Biophysical and Layout Mapping.
- Proposed Umsobomvu Substation, Concrete Tower Manufacturing Facilities and Temporary Laydown Area, situated in the Umsobomvu Local Municipality (Northern Cape Province) and the Inxuba Yethemba Local Municipality (Eastern Cape Province) - Biophysical and Layout Mapping.
- Eskom Infrastructure MTS situated in the Umsobomvu Local Municipality (Northern Cape Province) - Biophysical and Layout Mapping.
- Botanical Micro-siting Investigation for the Proposed Umsobomvu Wind Energy Facility situated in the Umsobomvu Local Municipality (Northern Cape Province) and the Inxuba Yethemba Local Municipality (Eastern Cape Province) - Biophysical and Layout Mapping.
- Proposed Ganspan Pering 132 kV Overhead Line near Pampierstand, North West and Northern Cape Provinces - Biophysical and Layout Mapping.
- The proposed Agricultural Development on the Remainder of Erf 60845, Zone 1, East London Industrial Development Zone, Eastern Cape Province - Biophysical and Layout Mapping.
- The proposed Reverse Osmosis Plant for the Matla Power Station near Kriel, Mpumalanga Province - Biophysical and Layout Mapping.

Public Participation process

- Duyker Island Prospecting Right, North West Province St Francis Coastal Protection Scheme.
- Fairview Sand Mine near Port Alfred, Eastern Cape Province.
- Kareekrans Boerdery Agricultural Development near Kirkwood Eastern Cape Province,
- Proposed Coastal Protection Scheme, St Francis Bay, Kouga Local Municipality, Eastern Cape Province; and
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.
- Marine Intake and Outfall Infrastructure Servitude Project, Zone 10, Coega SEZ, Eastern Cape Province, South Africa.
- Proposed Hlaziya 400-132 kV Powerline Project (the MTS Integration Project) from close to Jeffrey’s Bay to Grassridge, near the Coega Sez, Eastern Cape Province.

Social Auditing

- Malawi Millennium Development Trust – Resettlement Action Plan Implementation Auditing.