Specialist report for Portion 4735, called Seebederfie, located close to the Great Brak River in the George local municipality.

Terrestrial Biodiversity & Terrestrial Plant Species Report

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EXECUTIVE SUMMARY

Portion 4735, called Seebederfie, is located near Great Brak. The site has recently been developed, which has led to vegetation clearance of more than 300m^2, and over more than 50% of the total area of the site. The mapped vegetation type, Hartenbos Dune Thicket has also recently been added to the list of Red Listed ecosystems of South Africa, and the site potentially used to be habitat for some plant species of conservation concern (SCC) which means that the development on the site is now part of a section 24G application. This report discusses the vegetation and plant species that surrounds the development of Seebederfie, and the vegetation that likely covered the site prior to any anthropogenic substrate disturbance and removal of vegetation. The report also includes an impact assessment of what has previously been done on the property (i.e., retrospective) and an impact assessment of what is still being proposed (i.e., two additional guestrooms and the rehabilitation of the remainder of the property). The surrounding vegetation is highly invaded by Rooikrans (*Acacia cyclops*); however, the invasion can still be controlled on Portion 4735, and this is required by law. Protected tree species, namely milkwood trees (*Sideroxylon inerme inerme*) and cheesewood trees (*Pittosporum viridiflorum*) were also likely present in the development footprint prior to vegetation clearance.

DECLARATION OF SPECIALIST INDEPENDENCE

- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);
- At the time of conducting the study and compiling this report I did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;
- Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;
- I do not have any influence over decisions made by the governing authorities;
- I undertake to disclose 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 a competent authority to such a relevant authority and the applicant;
- I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity;
- This document and all information contained herein is and will remain the intellectual property of Confluent Environmental. This document, in its entirety or any portion thereof, may not be altered in any manner or form, for any purpose without the specific and written consent of the specialist investigators.
- All the particulars furnished by me in this document are true and correct.

Bianke Fouche (MSc)

March 2025

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ABBREVIATIONS

Term	Full spelling / definition
BPA	Biodiversity Priority Area
BSP	Biodiversity Spatial Plan
CBA	Critical Biodiversity Area
CD:NGI	Chief Directorate: National Geo-spatial Information
DFFE	Department of Forestry, Fisheries, and the Environment
EMP	Ecological Management Plan
ESA	Ecological Support Area
NEM:BA	National Environmental Management: Biodiversity Act
ONA	Other Natural Areas
PAOI	Project Area of Influence
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SDP	Site Development Plan
SEI	Site Ecological Importance
SSVR	Site Sensitivity Verification

1. INTRODUCTION

1.1 Background

Confluent Environmental was contracted by the Applicant on the recommendation of Cape EAPrac to undertake a Site Sensitivity Verification Report (SSVR) and Impact Assessment for botanical and terrestrial sensitivity of Portion 4735 (called Seebederfie) near Great Brak in the Mossel Bay local Municipality. This erf covers a total area of 9373 m^2. According to the Department of Forestry, Fisheries, and the Environment (DFFE) Screening Tool, the SSVR is required because the terrestrial plant species theme has been highlighted as having a **Medium** sensitivity, and the terrestrial biodiversity has a **Very High** sensitivity (Fig 1).

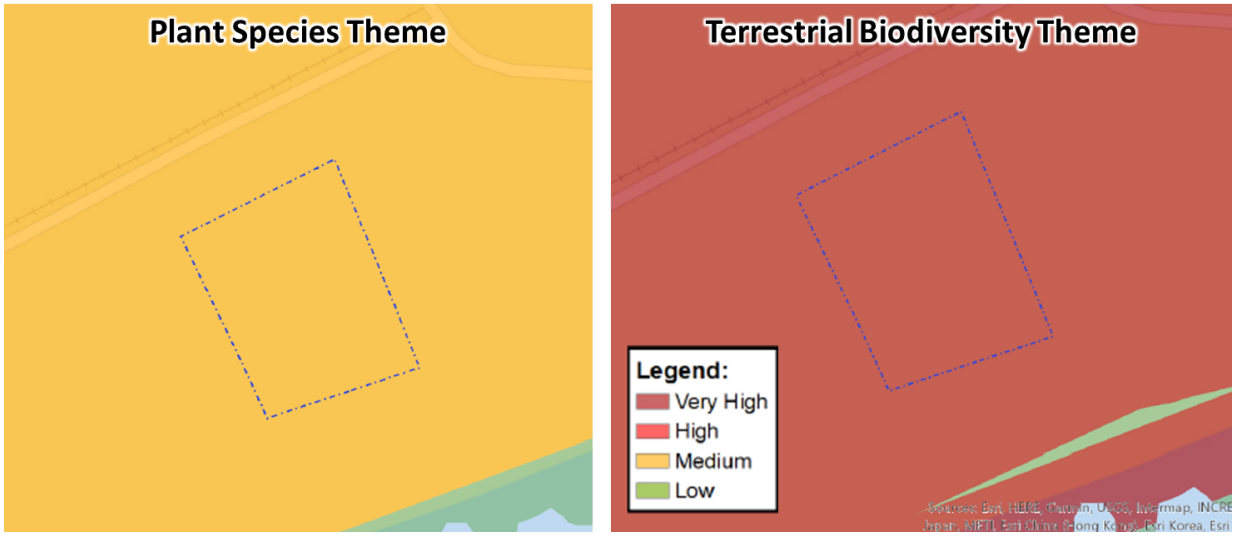

Figure 1: The screening tool generated sensitivity maps for Portion 4735, called Seebederfie.

The plant species theme is triggered due to several species of conservation concern (SCC) that are potentially present in the area (these are listed later in this report). The terrestrial biodiversity theme sensitivity is due to the Farm being mapped as covering several biodiversity priority areas (BPAs).

1.2 General Site Location

Portion 4735 is on sandy soil, and is located adjacent to the coastline (Fig. 2). The site can be accessed from the N2 and R102 highways, which run north of the property. East of Seebederfie is Great Brak's "De Vette Mossel" restaurant. Residential developments surround the erf to the east, west, and north, however Seebederfie sits within a remaining relatively undeveloped section of the coastline.

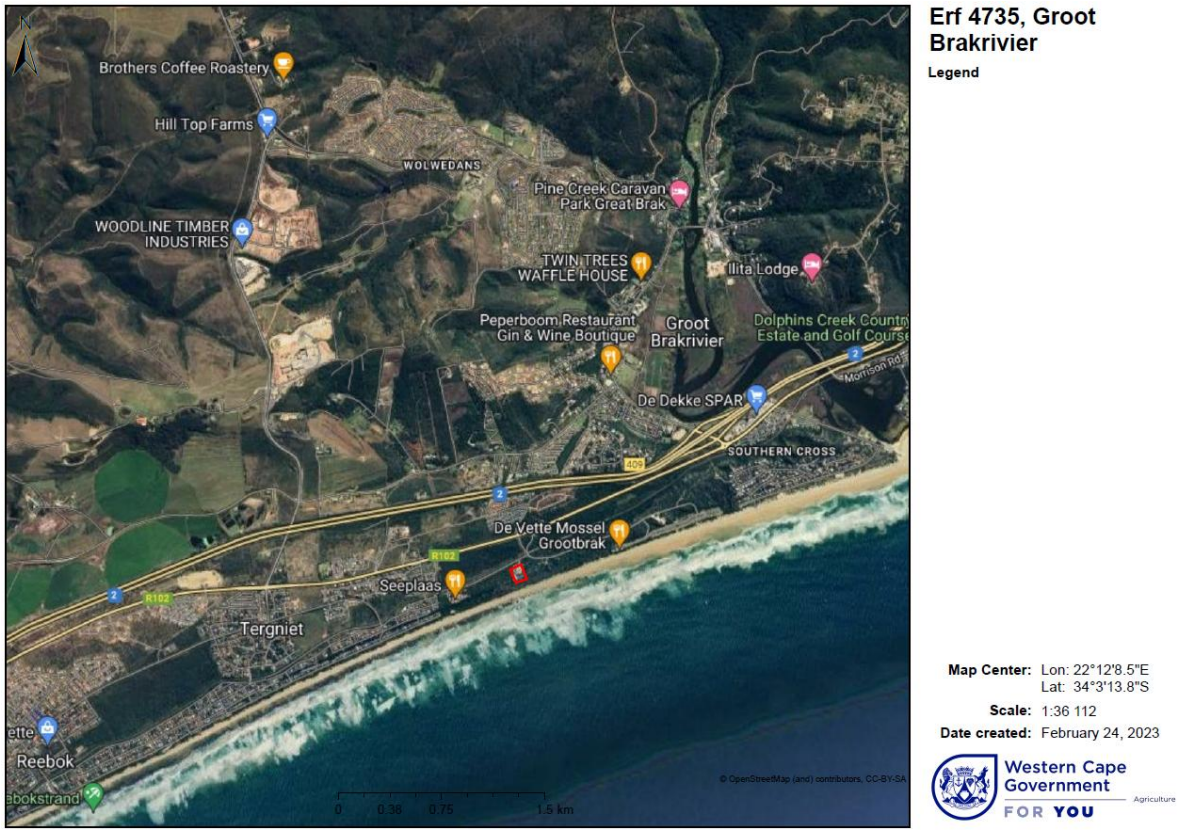

Figure 2: The general location of Portion 4735 (red polygon) near Great Brak.

1.3 Site Development Plan

Seebederfie is part of a Section 24G application, due to the unlawful clearance of endangered indigenous vegetation. This report therefore is an assessment of what likely was present on the site before earthworks and construction related activities including an assessment of what is proposed. The proposed additional 2 guestrooms was communicated early in 2025, and the site development plan (SDP) was provided on the 27th of January 2025 (Fig. 3).

The zoning by-law further determines that 1 parking bay must be provided per guest room and 2 parking bays for the owner/manager. The double garage of the primary dwelling provides the required parking for the owner/manager. A further 6 parking bays should therefore be provided for the 6 guest rooms. The SDP in Fig. 3 shows the parking provision for guests in close proximity to the primary dwelling. The new SDP can be considered for the two new guestrooms on the ground level on the western side of the existing guest house. After consideration of several factors (including engineering regulations regarding the foundations of the existing structures), a second alternative with two new guest rooms as a second storey is no longer a feasible consideration.

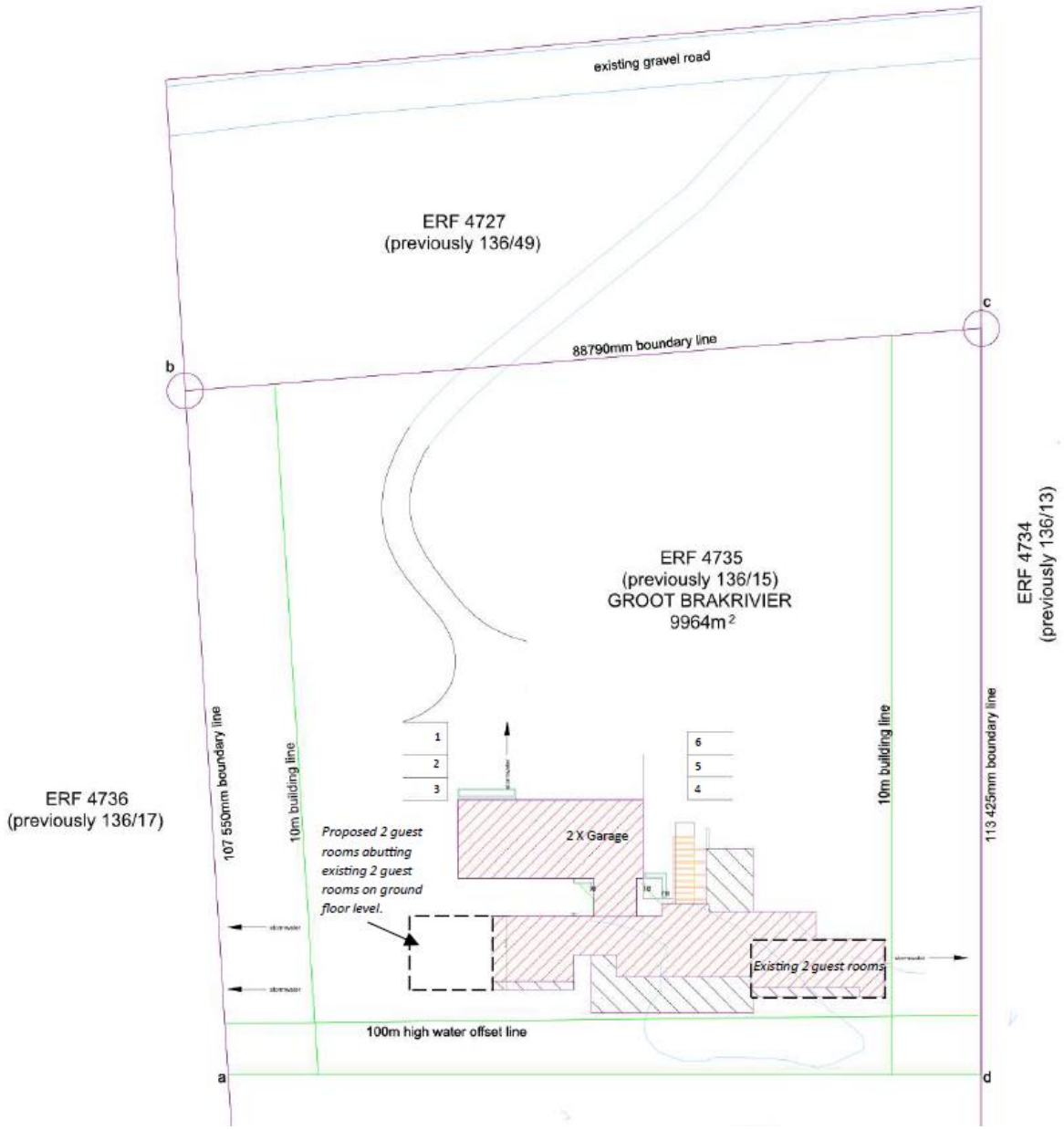

Figure 3: The site development plan (SDP) showing the proposed location of the 2 new guestrooms in relation to the existing structures on the property.

2. TERMS OF REFERENCE

This screening tool sensitivity verification report provides information on Terrestrial and Botanical diversity and sensitivity of the proposed development. The results presented are based on a desktop and field assessment, which includes a consideration of historical photographic records of the site. The assessment presented in this report follows the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity, and Terrestrial Plant Species themes. This site sensitivity assessment follows the requirements of:

- The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), which includes:
    - The protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant species (28 July 2023).
    - The protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity (20 March 2020).
- Additional guidelines for the terrestrial biodiversity theme:
    - Ecosystem Guidelines for Environmental Assessment in the Western Cape (de Villiers et al., 2016).
    - The Western Cape Biodiversity Spatial Plan Handbook and summary booklet (CapeNature, 2017; Pool-Sandvliet et al., 2017).
    - The Subtropical Thicket Ecosystem Programme Handbook: Integrating the natural environment into land-use decisions at the municipal level: towards sustainable development (Pierce & Mader, 2006).
- Additional guidelines for the terrestrial plant species theme:
    - Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa (Verburgt et al., 2020).

The assessment was undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with relevant expertise in the field of Botanical and/or Ecological science.

2.1 Online Screening Tool

The Department of Forestry, Fisheries, and the Environment (DFFE) screening tool report for the development footprint has identified the **terrestrial plant species theme as having a Medium sensitivity**, and the **terrestrial biodiversity theme as having a Very High sensitivity**. The reasons for the terrestrial plant sensitivity theme are the possible occurrence of species of conservation concern (SCC) on the site. A Medium screening tool sensitivity for plants indicates that:

"Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide

a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75% for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level." ~ (Verburgt et al., 2020)

A Very High sensitivity rating for terrestrial biodiversity according to the screening tool is triggered for all Biodiversity Priority Areas (BPAs) and other sensitive features (Stewart et al., 2021). BPAs include the various management layers of the Western Cape Biodiversity Spatial Plan (WC BSP), as well as the other sensitive features in Table 1 below. The highlighted rows of Table 1 were triggered for the proposed development on Portion 4735, called Seebederfie.

Table 1: Sources of BPA data for the Terrestrial Biodiversity Theme sensitivity (Stewart et al., 2021). *Red rows indicate BPAs that have been triggered for Portion 4735, and these form the basis for the Very High sensitivity assigned by the screening tool.*

Sensitivity layer	Data included and source
Critical Biodiversity Areas (CBAs)	Most recent terrestrial CBA spatial footprint for metros, provinces, or bioregional plans, combined to create a national data set.
Ecological Support Areas (ESAs)	Most recent ESA spatial footprint for metros, provinces, or bioregional plans, combined to create a national data set.
Protected Areas (PAs)	Most recent update from the DFFE's "South African Protected Area Database".
National Priority Areas for Protected Areas Expansion	The latest priority expansion areas for each province, as well as the expansion footprint for national parks as per the approved management plan for national parks.
SAN Parks Buffer Areas	A buffer area for a National Park is defined in the February 2012 schedule on Biodiversity Policy and Strategy for South Africa's Strategy on Buffer Zones of National Parks.
Strategic Water Source Areas (SWSAs) (terrestrial)	Surface strategic water source areas, delineated by Mervyn Lotter in October 2020 with substantial input from the SWSA spatial task team as part of the SWSA spatial task team. Note that the protocol only applies to the terrestrial parts of the SWSAs.
Freshwater Ecosystem Catchments (terrestrial)	Freshwater ecosystem catchments, determined through the National Freshwater Ecosystem Priority Area (NFEPA) process.
Lakes	National Lake Areas area also part of the trigger for terrestrial site sensitivity.
Indigenous Forests	Indigenous forests or forest patches are mapped in detail by the Forestry section in the DFFE. The Forest biome makes up less than 1% of South Africa's land area and is protected in terms of the NFA. Consequently, because of their legal status and small spatial footprint, they are the only terrestrial biome that is included in the Screening Tool in its entirety. The latest available data set

	from the national forest inventory (NFI) is used to represent forests in the Screening Tool.
Red Listed Ecosystems	Any ecosystem that is listed as Vulnerable, Endangered, or Critically Endangered according to the "Revised National List of Ecosystems that are Threatened and in Need of Protection (NEM:BA Act no.10 of 2004, as amended in November 2022)

3. METHODOLOGY

3.1 Desktop Assessment

The desktop assessment was performed using Cape Farm Mapper and QGIS version 3.28.3 "Firenze". Plant species data was sourced from the following sources:

- The DFFE screening tool listed SCC.
- Information on plant occurrence prior to the site visit was sourced from SANBIs Botanical Research and Herbarium Management System (BRAHMS) for the Plants of Southern Africa (POSA) database.
- iNaturalist observations of the property and surrounding areas.

Ecosystem/ vegetation type data was sourced from:

- The 2018 updated South African National Vegetation Map from SANBIs Biodiversity GIS (BGIS) database, and the National Biodiversity Assessment report of 2018 (Skowno et al., 2018).
- Shapefiles for the Western Cape Biodiversity Spatial Plan (WC-BSP) i.e., information on PAs, CBAs, ESAs, and ONAs were downloaded from BGIS database (CapeNature, 2017; Pool-Sandvliet et al., 2017).
- Cape Farm Mapper for additional spatial information required for the site.
- Chief Directorate: National Geo-spatial Information (CD: NGI) Geospatial Portal and Google Earth for the acquisition of historical aerial imagery of the site.
- The conservation status of ecosystems was found in the Revised National List of Ecosystems that are Threatened and in need of protection, published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004, as revised in Nov. 2022), and also using the Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006).

3.2 Field Assessment

Field work was undertaken on the 06th of November 2023. The method for identifying species was similar to a BioBlitz, also described as a "timed meander", where the specialist especially keeps an eye out for rarer and threatened species. Some Red Listed Plant species are more easily spotted and found during a site survey than other species. This survey method is an

attempt to account for the short and single survey period, where detection probability of some rare and threatened species (e.g., geophytes, small succulents, small perennials etc.) are low (Garrard et al., 2008; Wintle et al., 2012). Observations of individual species and environmental characteristics were documented using an android app “Spot Lens”. A provisional species list and plant species accumulation curve is provided in Appendix 12.1.

3.3 Assumptions & Limitations

This assessment is subject to a few assumptions, uncertainties, and limitations, as listed below:

- The development and vegetation clearing on Seebederfie has already taken place, making it impossible to know exactly what occurred on the site prior to the development. This report is based on observations made in the area surrounding the developed area on Seebederfie.
- Only one survey took place during winter on the 06th of November 2023. The species list for the area is therefore limited to the findings of the one field assessment, as well as past records on iNaturalist and the Plants of Southern Africa (POSA) database for the proposed development site and its surrounding areas. The species list and SCC reported are not exhaustive, and more species will be added to the list should more sampling effort occur (Perret et al., 2023).
- Seasonal and time constraints always play a role in limiting the findings of a terrestrial specialist report. Many plant species flower seasonally and are therefore difficult to identify outside of their flowering season.
- Some rare and threatened plant species are difficult to locate and easily overlooked in the field (e.g., geophytes, small succulents, small shrubs, and cryptic spp.). Furthermore, some species may not have been visible at all during the time of the site assessment (e.g., some geophytes, annuals, and parasitic plants).
- Environmental factors such as the prevailing fire regime and the observed high level of rooikrans (*Acacia cyclops*) invasion influence the successional stage of the vegetation present at the site, and therefore the species visible at the time of assessment (Cowling et al., 2010; Privett et al., 2001).
- The dense thicket sections on the site and in the surrounding environment made it hard to gain access to some sections of the site.

4. RESULTS: DESKTOP ASSESSMENT

4.1 Terrestrial Biodiversity

4.1.1 Climate

The climate of Portion 4735 is similar to that of Great Brak, which is described as warm and temperate. The rainfall pattern is a-seasonal, although two rainfall peaks typically occur during Autumn and Spring (see Fig. 3). The temperature throughout the year remains moderate, with

sub-zero temperatures rarely occurring. The location of the erf next to the ocean also means that temperature extremes are rare, due to the effect of the ocean on moderating the climate.

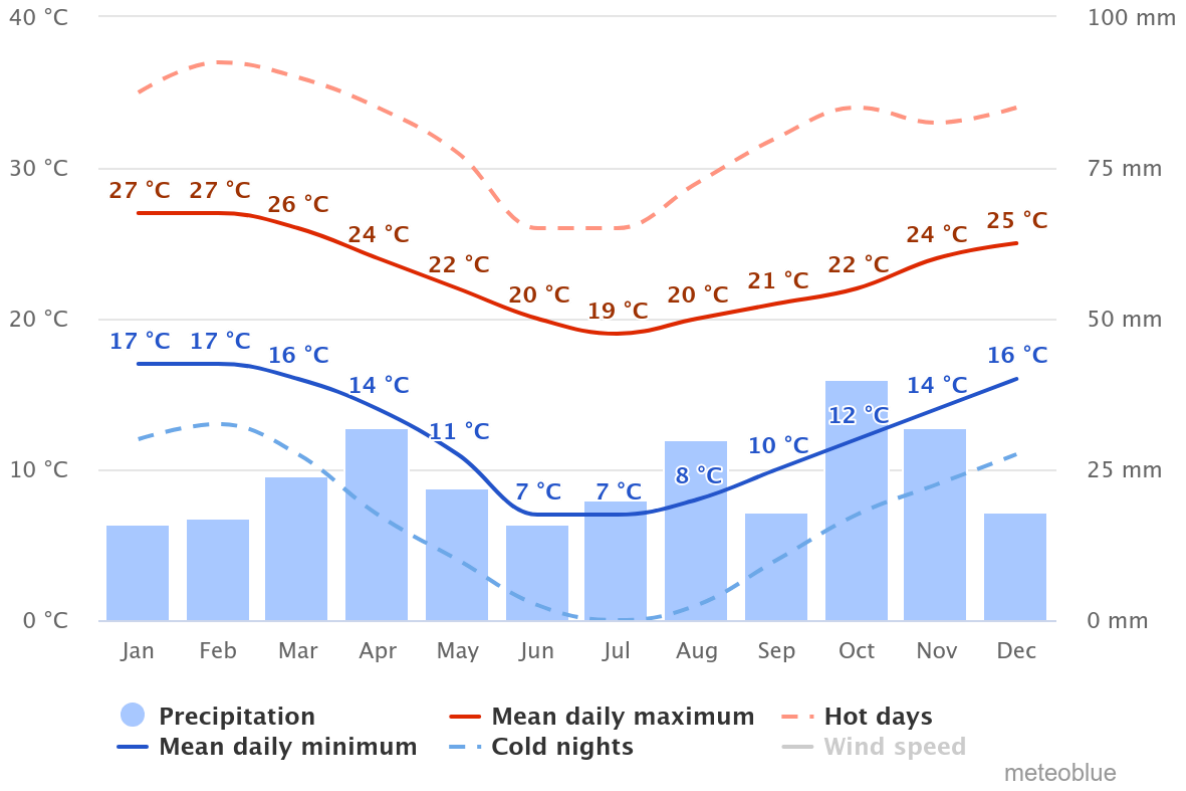

Figure 4: A summary graphic of the weather in Great Brak (year round rainfall and temperature), as sourced from meteoblue.

4.1.2 Geology and soil

The soil on the site is sandy (i.e., derived from coastal dunes), with a high erodibility factor (0.61 on Cape Farm Mapper). These sandy substrates are very well drained and are typically quite deep, but with limited pedological development and a very low to negligible clay content. The geology on the site is sedimentary and dune rock formed from aeolian sands.

4.1.3 Vegetation type(s)

Seebederfie was mapped as forming part of the **endangered (EN) Hartenbos Dune Thicket (AT40)** prior to the 2024 National Vegetation Map (NVM) update (Fig. 4; Dayaram et al., 2019; Mucina & Rutherford, 2006). Since the release of the Beta 2024 NVM update, the Portion now falls within least threatened (LT) Southeastern Strandveld (FS 12). The southern section of the site along the coastline is mapped as Cape Seashore Vegetation, and this has remained consistent after the 2024 update. The Vlok vegetation map is also available to this area and is also presented in Fig. 4. The Vlok vegetation map indicates that Seebederfie is still part of the Hartenbos Primary Dune system, just south of the mapped Hartenbos Strandveld.

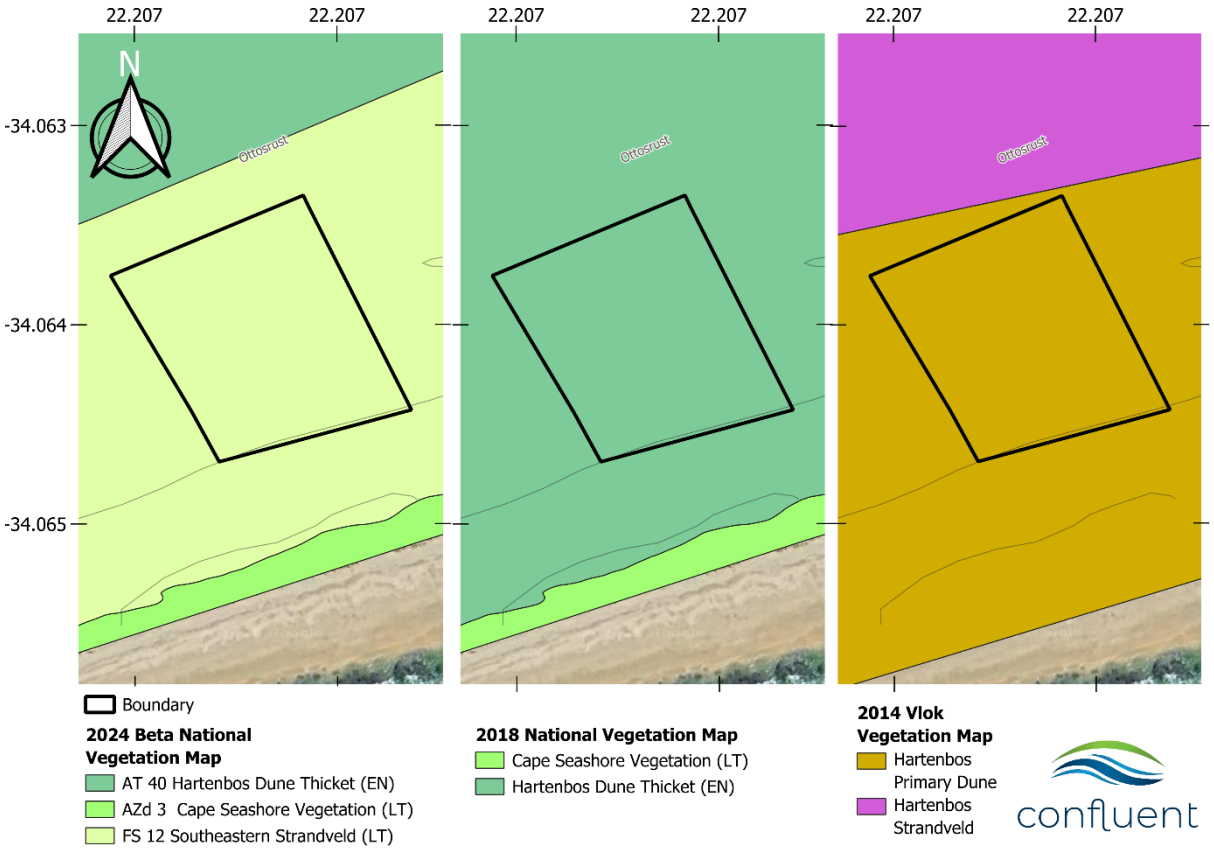

Figure 5: The mapped vegetation type according to the National Vegetation Map (NVM) 2024 Beta and 2018 versions (Dayaram et al., 2019; Mucina & Rutherford, 2006) and the Vlok vegetation map categories.

Hartenbos Dune thicket (AT 40) occurs only in the Western Cape province in coastal areas between Glentana and the Great Brak River (Vlok & Euston-Brown, 2002). This vegetation type is associated with moderately undulating coastal dunes and is composed of a mosaic of low thicket clumps (1-3m height) in a matrix of low (1-2m) asteraceous fynbos. Often this vegetation type is characterised by a thicket-fynbos mosaic where the thicket component occurs in fire-refugia over the landscape. Some of the important taxa that are associated with Hartenbos Dune Thicket includes (green entries were observed during the site assessment):

Small trees: *Pterocelastrus tricuspidatus*, and *Sideroxylon inerme*.

Shrubs: *Azima tetracantha*, *Carissa bispinosa*, *Cassine peragua*, *Cussonia thyrsiflora*, *Eriocephalus africanus*, *Euclea racemosa*, *Felicia echinata*, *Grewia occidentalis*, *Helichrysum patulum*, *Lauridia tetragona*, *Maytenus procumbens*, *Metalasia muricata*, *Morella cordifolia*, *Muraltia spinosa*, Mystroxylon aethiopicum, *Salvia africana-lutea*, *Agathosma apiculata*, *Agathosma muirii*, *Athanasia cochlearifolia*, *Athanasia quinquedentata* subsp. *rigens*, *Diosma aristata*, *Euchaetis albertiniana*, *Hermannia muirii*, *Muraltia barkerae*, *Muraltia depressa*, *Olea exasperata*, *Osteospermum moniliferum*, *Passerina rigida*, *Putterlickia pyracantha*, *Robsonodendron maritimum*, *Scutia myrtina*, *Searsia crenata*, *Searsia glauca*, *Searsia lucida*, *Searsia pterota*, and *Leucospermum praecox*.

Succulents: *Aloe ferox*, *Aloe arborescens*, *Carpobrotus acinaciformis* , *Carpobrotus edulis*, *Conicosia pugioniformis*, *Cotyledon orbiculata*, *Crassula nudicaulis*, *Cleretum bellidiforme*,

Euphorbia bayeri, *Euphorbia burmannii*, *Euphorbia caput-medusae*, *Jordaaniella dubia*, *Roepera morgsana*, *Carpobrotus muirii*, and *Haworthia mirabilis* var. *paradoxa*.

Geophytes: *Brunsvigia orientalis*, *Chasmanthe aethiopica*, *Freesia leichtlinii*, *Haemanthus coccineus*, and *Ixia orientalis*

Graminoids: *Restio eleocharis*, *Sporobolus fimbriatus*, *Stenotaphrum secundatum*, Thamnochortus *insignis*, and *Themeda triandra*

Climbers: *Cynanchum ellipticum*, *Cynanchum viminale*, *Rhoicissus digitata*, and *Solanum africanum*.

The conservation status of Hartenbos Dune Thicket (AT 40) is endangered (EN), while that of Southeastern Strandveld is least threatened (LT). Although the mapping has changed here, several species on the site is shared with Hartenbos Dune Thicket, and the Southeastern Strandveld is still adjacent to a mapped section of Hartenbos Dune Thicket.

4.1.4 Western Cape Biodiversity Spatial Plan

The Biodiversity Spatial Plan for the Western Cape (WC BSP) contains several conservation planning layers that are used to set priority areas for conserving biodiversity. The definition and objectives of the WC BSP layer mapped on Portion 4735 is given in Box 1. Appendix 12.2 illustrates the recommended land-uses associated with the various BSP layers. The majority of Seebederfie was mapped as an ecological support area (ESA 1) under the 2018 version of the BSP. Some small sections of the erf is mapped as critical biodiversity areas (CBA 1 for terrestrial & forest; Fig. 5) and other natural area (ONA). The 2023 BSP was released in early 2025, and includes the entire Portion as a terrestrial Critical Biodiversity Area 1 (CBA 1). Reasons for the 2023 version of the BSP have not yet been released.

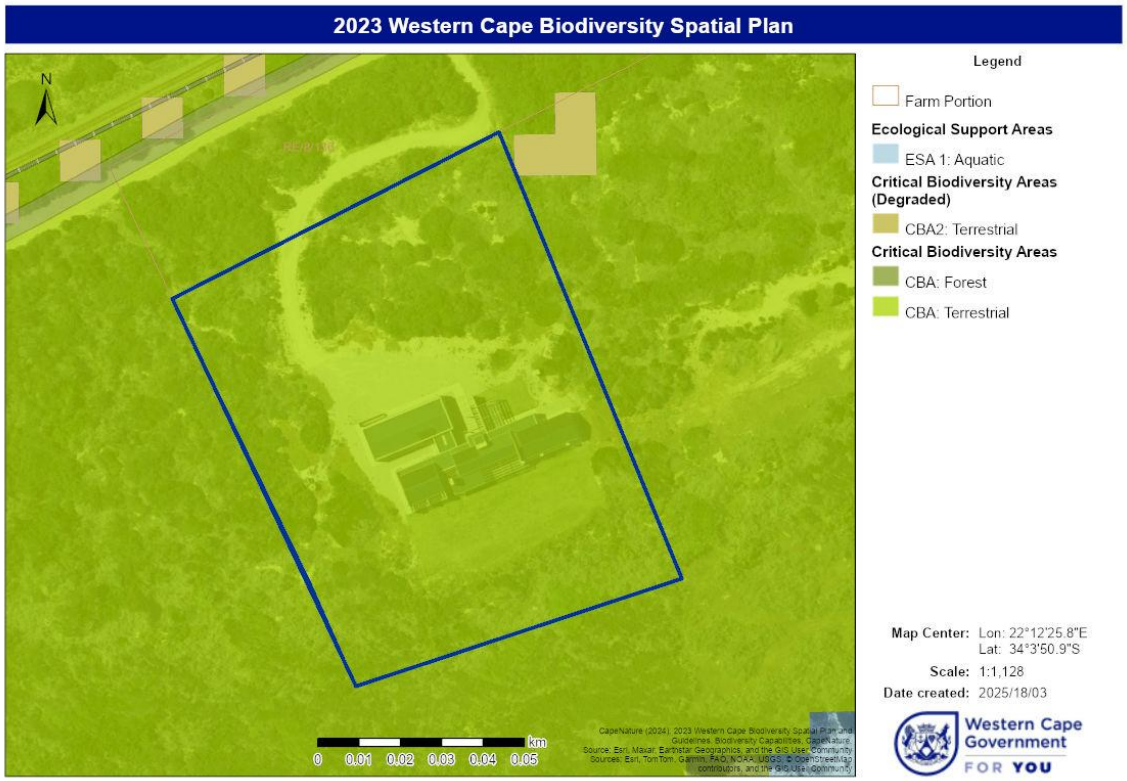

Figure 6: The mapped Western Cape Biodiversity Spatial Plan (WC BSP) categories. The top map indicates the map made for the 2018 BSP version, and the bottom map represents the updated 2023 BSP, as sourced from Cape Farm Mapper

BOX 1: The Biodiversity Spatial Plan

Critical Biodiversity Area 1

Definition: Areas in a natural condition. Required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

Critical Biodiversity Area 2

Definition: Areas in a degraded or secondary condition. Required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a functional, natural, or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

Ecological Support Area 1

Definition: Not essential for meeting biodiversity targets. An important role in supporting the functioning of PAs or CBAs. Often vital for ecosystem services.

Objective: Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided underlying biodiversity objectives/ecological functioning are not compromised.

Ecological Support Area 2

Definition: Not essential for meeting biodiversity targets. Important in supporting functioning of PAs or CBAs. Often vital for ecosystem services.

Objective: Restore/minimise impact on ecological infrastructure functioning, especially soil and water-related services.

Other Natural Areas

Definition: These areas retain most of their natural character and perform biodiversity and ecological infrastructure functions but have not been prioritised in the current Western Cape Biodiversity Spatial Plan.

Objective: Minimise habitat and species loss to ensure ecosystem functionality through strategic landscape planning. Some flexibility in permissible land uses, but authorisation may still be required for high-impact uses.

4.1.5 Historical Aerial Imagery

High resolution historical imagery (Fig. 6) can be sourced upon request from the CD: NGI Geospatial portal, or from their offices in Mowbray, Cape Town. Google Earth is also a repository of more recent historical images.

1939

The earliest imagery available for Seebederfie is from 1939. At this time the majority of the Erf was a dune, with a small section being vegetated in the north of the site. Note that rooikrans (*Acacia cyclops*) had been introduced in South Africa for the first time in 1835, primarily for the stabilisation of dunes in the Western Cape. It is uncertain when rooikrans first started invading this section of the coastline. The black line with vertical marks on the imagery in Fig. 6 is not a real feature, it is a drawing that has been made on the aerial imagery to indicate the position of the gravel road.

1957

By 1957 existing vegetation patches that were present in 1939 had densified. However, the majority of the site is still unvegetated. It is possible that invasive rooikrans may be present on the site between natural vegetation at this time already.

1998 to 2017

By this time the entire Seebederfie erf has been vegetated by a thicket. In 2017 Seebederfie and the erf east of it is still fully vegetated and has not been cleared. Disturbance that involved vegetation clearing and substrate disturbance is not visible in the period 1998 to 2017. The site has remained vegetated, and sis not become a bare dune again.

2018 to 2020

Seebederfie remained undisturbed and fully vegetated. It is between September 2018 and May 2019 that a large section of Seebederfie was cleared to make room for development on the site. The cleared area on Seebederfie linked with the cleared area east of the erf. The cleared area made during 2019 was ca. 3500 m^2, which is over 35% of the entire erf surface. In 2022 the completed development on Portion 4735 is visible.

2023

After the initial clearing and construction on Seebederfie, another large vegetation clearing activity is visible between July 2022 and October 2023. The additional area cleared is ca. 1500 m^2, which is about 15% of the erf. In total, over half of the erf has been cleared of vegetation without prior environmental authorisation to do so. Hartenbos Dune thicket was a new addition to the National Vegetation Map of South Africa in the 2011 revision of ecosystem threat status. In 2018 Hartenbos Dune Thicket was assessed as being least threatened (LT), with some sections being under threat. However, the November 2022 revised assessment of vegetation types now lists Hartenbos Dune Thicket as an Endangered ecosystem due the fact that it is "*narrowly distributed with evidence of ongoing biotic disruption from invasive species*."

Figure 7: A series of historical imagery sourced from the CD: NGI geospatial portal (top two rows) and Google Earth (bottom row). The yellow polygons highlight the position of Portion 4735.

4.2 Plant Species

The plant species theme sensitivity of Medium is dependent on the presence, or likely presence, of several plant species of conservation concern (SCC). The Red List categories are discussed later in the report.

4.2.1 Species of conservation concern (SCC) listed in the screening tool.

Several SCC have the potential to occur on the site. The SCC listed in the screening tool report are shown in Fig. 7 below.

Lampranthus fergusoniae	Agathosma muirii
Lampranthus pauciflorus	Euchaetis albertiniana
Lebeckia gracilis	Muraltia knysnaensis
Leucospermum praecox	Nanobubon hypogaeum
Wahlenbergia polyantha	Sensitive species 516
Selago villicaulis	Sensitive species 800
Erica unicolor subsp. mutica	Sensitive species 500
Erica glandulosa subsp. fourcadei	Sensitive species 654
Hermannia lavandulifolia	Agathosma microcarpa
Sensitive species 153	
Sensitive species 268	
Duvalia immaculata	
Agathosma eriantha	

Figure 8: The potential species of conservation concern (SCC) with a regional Red List status of Vulnerable or higher according to the Screening Tool Report generated for the site. Sensitive species on the site may not be named in this report.

Additional SCC that have been observed nearby on iNaturalist and / or POSA are:

- *Asparagus lignosus*
- *Cullumia carlinoides*
- Sensitive species (unknown number #1)
- *Freesia caryophyllaceae*
- *Freesia leichtlinii*
- *Gnidia chrysophylla*
- *Protea obtusifolia*
- *Selago burchellii*

4.2.2 Results: Field Assessment

4.3 Refined vegetation map

The vegetation on the majority of the Portion was likely consistent with an invaded Hartenbos Dune Thicket (Fig. 8), which grew on a foredune system. The vegetation, although it contained milkwood trees, is not consistent with a coastal milkwood forest, as the majority of the vegetation was impenetrable and not taller than 3m. This is more consistent with Hartenbos Dune Thicket than a coastal milkwood Forest. Some of the important taxa for Hartenbos Dune Thicket occurred on Seebederfie, such as milkwood trees (*Sideroxylon inerme inerme*), the needle bush (*Azima tetracantha*), crossberry (*Grewia occidentalis*), and the climber baboon grape (*Rhoicissus digitata*).

Despite the Portion now being mapped & consequently classified as Southerstaern Strandveld, the observed Milkwood and Cheesewood thicket on the site as well as to the east and west of the structures on the site indicates that the most accurate vegetation type description is likely still Hartenbos Dune Thicket. The strandveld vegetation type is typically characterized by low shrubland with a mixture of succulent and screlophyllous (tough, leathery leaves, suited to dry & nutrient poor conditions) plants. Hartenbos Dune Thicket on the other hand, is more dense structurally, and is characterised by a semi-closed canopy of taller, woody shrubs and small trees, and this is the case on this site.

The remaining vegetation around Seebederfie is heavily invaded by rooikrans (*Acacia cyclops*). No fynbos sections were noted on the site or in the surrounding vegetation. No SCC were observed in the vegetation surrounding the existing development apart from protected trees, however previously cleared areas support a greater number of invasive and naturalised exotic plant species, most notably rooikrans (see Appendix 12.1).

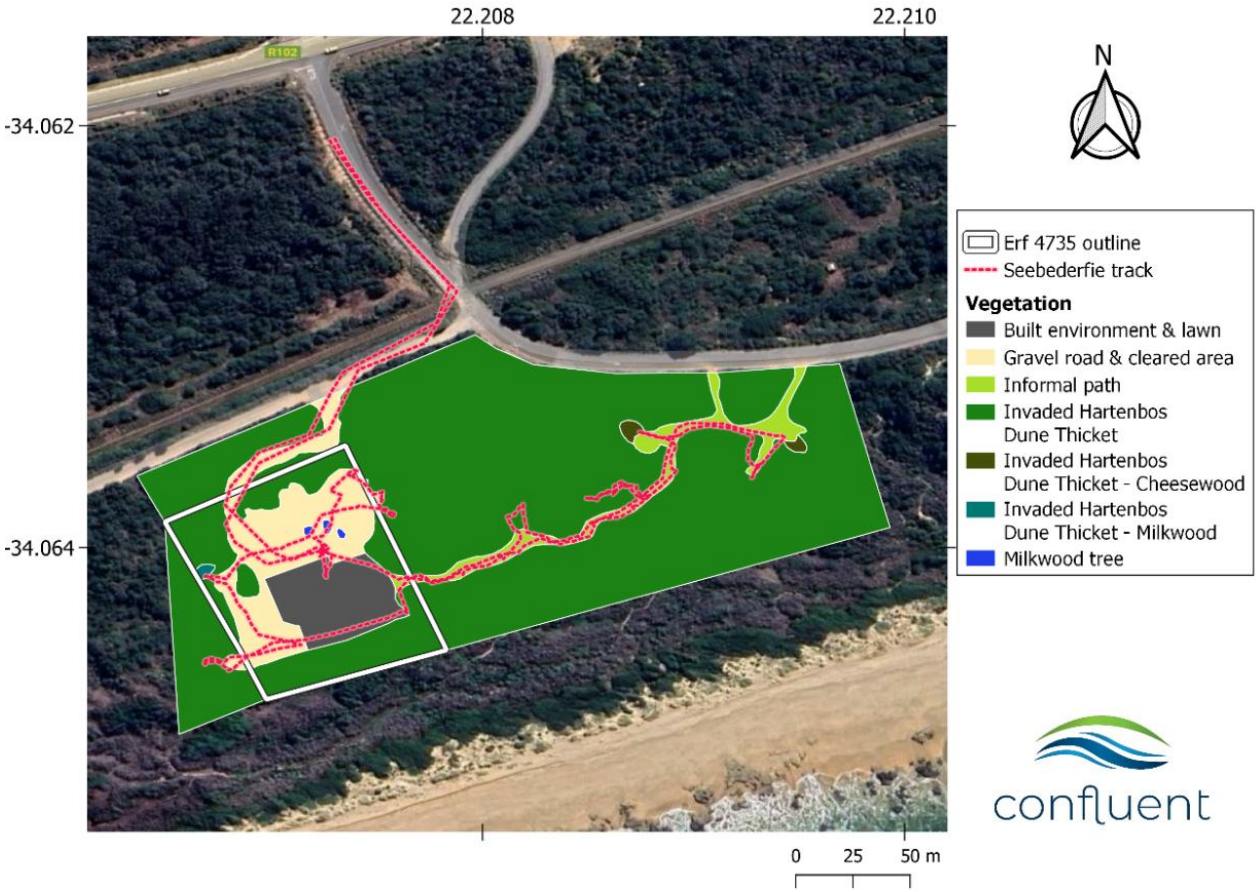

Figure 9: A revised vegetation map for the entire Portion 4735 (Seebederfie). The vegetation to the east is included as it is still natural and was included in the track walked to better understand the vegetation type on the site.

4.4 Plant species on the site

Individual Milkwood trees have been left on the cleared area on Seebederfie (Fig. 9). It is likely that the section of thicket that had been cleared towards the end of 2022 contained protected Milkwood trees (*Sideroxylon inerme inerme*, protected tree 579). To the east of Seebederfie some Cheesewood trees (*Pittosporum viridiflorum*) were also noted, which is also a protected tree (no. 139). Rooikrans (*Acacia cyclops*) was the dominant species in the thicket around Seebederfie. Some additional invasive species were also observed in this thicket around Portion 4735 (Fig. 9). No Red Listed plant species were observed during the site assessment. Categories for the invasive species found are discussed in Box 2.

Figure 10: An image illustrating the two protected trees and exotic plant species that were found on the site.

BOX 2: NEMBA categories for listed invasive alien plants.

Category 1b

- Species which must be controlled.
- Property owners and organs of state must control the listed invasive species within their properties.
- If an Invasive Species Management Programme has been developed, a person must control the listed invasive species in accordance with such programme.
- Authorised officials must be permitted to enter properties to monitor, assist with or implement the control of listed species.
- Any Category 2 listed species (where permits are applicable) which fall outside of containment and control, revert to Category 1b and must be controlled.
- Any Category 3 listed species which occur within a Protected Area or Riparian (wetland) revert to Category 1b and must be controlled.
- The Minister may require any person to develop a Category 1b Control Plan for one or more Category 1b species occurring on a property.

Category 3

- Category 3 listed invasive species are subject to certain exemptions in terms of section 70(1)(a) of the NEMBA Act, which applies to the listing of alien invasive species.
- Any category 3 listed plant species that occurs in riparian areas must be considered as category 1b and the appropriate control measures instituted.

4.5 Additional SCC that may be found

All SCC that may be present on the site have been identified using the screening tool report for the site, iNaturalist nearby observations, and the POSA database (Table 2). The current state of vegetation on the erf made it likely that numerous species were missed during the site assessment. All SCC that have been observed nearby on iNaturalist and POSA have been captured by the DFFE screening tool. The probability of occurrence that is stated in this section is a subjective assessment of SCC likelihood on the site.

Table 2: Plant SCC flagged for the site and nearby surroundings, but that were not observed during site assessment.

Species	Common name	Family	Growth form	Source	South African Red List Status	Probability of occurrence
Hermannia lavandulifolia	Lavender-leaved dollsrose	Malvaceae	Herbaceous perennial	DFFE Screening tool	Vulnerable A2c	High
Gnidia chrysophylla	Gold capesaffron	Thymelaceae	Perennial	iNaturalist	Near Threatened B1ab(i,ii,iii,iv,v)	Medium
Lampranthus fergusoniae	Limestone brightfig	Aizoaceae	Succulent	DFFE Screening tool	Rare	Medium
Lampranthus pauciflorus	Beach brightfig	Aizoaceae	Succulent	DFFE Screening tool	Endangered B1ab(ii,iii,iv,v)	Medium
Wahlenbergia polyantha	Capebells	Campanulaceae	Herbaceous perennial	DFFE Screening tool	Vulnerable B1ab(ii,iii,iv,v)	Medium
Erica glandulosa subsp. fourcadei	Ridges glandular heath	Ericaceae	Shrub	DFFE Screening tool	Vulnerable B1ab(ii,iii,iv,v)	Medium
Lebeckia gracilis	Slender ganna	Fabaceae	Shrub	DFFE Screening tool	Endangered A2bc; B1ab(ii,iii,iv,v)	Medium
Selago villicaulis	Dune bitterbush	Scrophulariaceae	Herbaceous perennial	DFFE Screening tool	Vulnerable B1ab(ii,iii,iv,v)	Medium
Sensitive species (unknown number #001)	-	-	Climbing tuberous geophyte	iNaturalist	Vulnerable A2cd	Medium
Asparagus lignosus	Fire asparagus	Asparagaceae	Climbing perennial	iNaturalist	Near Threatened A2c	Low
Cullumia carlinnoides	Limestone snakethistle	Asteracaea	Perennial	iNaturalist	Near Threatened B1ab(ii,iii,iv,v)	Low
Erica unicolor mutica	Two-onecolor heath	Ericaceae	Shrub	DFFE Screening tool	Endangered B1ab(ii,iii,v)	Low
Muraltia knysnaensis	Garden Route purplegorse	Polygalaceae	Perennial	DFFE Screening tool	Endangered B1ab(ii,iii,iv,v)	Low
Agathosma eriantha	Ridged buchu	Rutaceae	Shrub	DFFE Screening tool	Vulnerable B1ab(ii,iii,iv,v)	Low
Agathosma microcarpa	Buchu	Rutaceae	Dwarf shrub	DFFE Screening tool	Vulnerable B1ab(i,ii,iii,iv,v)	Low

Agathosma muirii	Heart buchu	Rutaceae	Shrub	DFFE Screening tool	Vulnerable A4abc	Low
Duvalia immaculata	Succulent	Apocynaceae	Succulent	DFFE Screening tool	Endangered B1ab(ii,iii,iv,v)	Low
Sensitive species 268	-	-	Succulent	DFFE Screening tool	Endangered B1ab(iii,iv,v)	Low
Sensitive species 516	-	-	Succulent	DFFE Screening tool	Endangered A2cd+4cd; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)	Low
Sensitive species 633	-	-	Succulent	DFFE Screening tool	Critically Endangered A2acd	Low
Freesia caryophyllaceae	Fragrant kammetjie	Iridaceae	Geophyte	iNaturalist	Near Threatened B1ab(i,ii,iii,iv,v)	Low
Freesia leichtlinii	Dune kammetjie	Iridaceae	Geophyte	iNaturalist	Near Threatened B1ab(ii,iii,iv,v)	Low
Sensitive species 800	-	-	Geophyte	DFFE Screening tool	Vulnerable B1ab(iii)	Low
Sensitive species 500	-	-	Tuberous geophyte	DFFE Screening tool	Endangered C2a(i)	Low
Sensitive species 654	-	-	Tuberous geophyte	DFFE Screening tool	Vulnerable C2a(i)	Low
Leucospermum praecox	Mossel Bay pincushion	Proteaceae	Shrub	DFFE Screening tool	Vulnerable A2c+3c+4c	Low
Sensitive species 153	-	-	Tuberous perennial	DFFE Screening tool	Endangered B1ab(ii,iii,v)+2ab(ii,iii,v)	Low
Euchaetis albertiana	Albertina beardbuchu	Rutaceae	Shrub	DFFE Screening tool	Endangered A2c	Low
Protea obtusifolia	Limestone sugarbush	Proteaceae	Shrub	iNaturalist	Near Threatened A2c+3c+4c	Low
Selago burchellii	Garden route bitterbush	Scrophulariaceae	Herbaceous perennial	iNaturalist	Vulnerable B1ab(ii,iii,iv,v)	Low

5. SITE SENSITIVITY VERIFICATION

5.1 Terrestrial Biodiversity

Most of the property also falls into a ESA 1 (terrestrial) area. The CBA 1 areas are along the boundaries of the Erf. The vegetation here is a thicket which is consistent with Hartenbos Dune Thicket. Although Milkwood trees are present in some places, the vegetation here is not consistent with a coastal forest. Rooikrans (*Acacia cyclops*) is the dominant species in the thicket outside of the cleared area of Seebederfie, and it has taken over completely in some places. Despite the invasion, the potential for rehabilitation to natural habitat is good if alien clearing is undertaken on a long-term basis. The **historical and surrounding terrestrial biodiversity sensitivity as per the protocol definitions** for the site is therefore confirmed as **Very High**, despite the historical disturbance and long-term occupation of some areas on the site by IAPs.

5.2 Botanical diversity

No SCC were observed on, or in the vegetation surrounding Portion 4735. Only protected tree species were observed on the erf, and in the surrounding vegetation. Individual milkwood trees (*Sideroxylon inerme inerme*) were present within the latest cleared area on the erf, as well as in the surrounding thicket. Cheesewood trees (*Pittosporum viridiflorum*) were observed east of the erf, and there is a very high likelihood that they were also present on Seebederfie prior to the construction and vegetation clearance activities on the erf. A forestry license is required to remove or alter any protected tree species. However, because these two protected tree species are considered least concern, and because no SCC listed have a high probability of occurrence on the site (apart from the abundant and widespread *Hermannia lavandulifolia*), the likely **historical botanical sensitivity as per the protocol definitions** for the site is conformed as **Low**.

6. SITE ECOLOGICAL IMPORTANCE

The site ecological importance map (Fig. 10) is intended to provide a more refined overview of the sensitivity of the various habitats that have been identified on the site. The SEI reflects the current state of the site, however, prior to any vegetation disturbance since 2018/19 the entire Portion 4735 would have had a SEI rating of Medium. The benchmark for "fully natural" vegetation is defined according to the Vegetation Assets, States, and Transitions (VAST) framework, which considers natural vegetation to be the state pre-European conditions (i.e., period prior to the 1700s or 1600s). The VAST framework works as an aid for the SEI calculation as it helps to (Thackway & Lesslie, 2006):

- Describe and accounts for changes in the condition and status of vegetation.
- Make explicit links between land management (current) and vegetation modification.
- Provide a mechanism for describing the consequences of certain land management on vegetation.
- Contribute to the analysis of terrestrial ecosystem services that are provided by vegetation, including comparison between various land-use.

The VAST framework is summarised in Table 3 below. The SEI mitigation recommendations for the various ecological importance categories are in in Table 4, and SEI calculation reasons are given in Table 5. The method that was used to calculate the SEI map provided is given in Appendix 12.3.

Table 3: Vegetation Assets, States, and Transitions (VAST) framework with columns representing vegetation states and shifts (Lesslie et al., 2010; Thackway & Lesslie, 2006).

Increasing modification

Vegetation cover classes		**Native vegetation cover** Dominant plant species indigenous to the locality and spontaneous in occurrence, i.e. a vegetation community described using definitive vegetation types relative to estimated pre 1750 types				**Non-native vegetation cover** Dominant structuring plant species indigenous to the locality but cultivated; alien to the locality and cultivated; or alien to the locality and spontaneous		
		Class 0: RESIDUAL BARE Areas where native vegetation does not naturally persist	**Class I: RESIDUAL** Native vegetation community structure, composition, and regenerative capacity intact—no significant perturbation from land use or land management practice. Class I forms the benchmark for classes II to VI	**Class II: MODIFIED** Native vegetation community structure, composition and regenerative capacity intact—perturbed by land use or land management practice	**Class III: TRANSFORMED** Native vegetation community structure, composition and regenerative capacity significantly altered by land use or land management practice	**Class IV: REPLACED -ADVENTIVE** Native vegetation replacement—species alien to the locality and spontaneous in occurrence	**Class V: REPLACED -MANAGED** Native vegetation replacement with cultivated vegetation	**Class VI: REMOVED** Vegetation removed
Diagnostic criteria	Current regenerative capacity	Natural regenerative capacity unmodified—ephemerals and lower plants	Natural regenerative capacity unmodified	Natural regeneration tolerates or endures under past and or current land management practices	Natural regenerative capacity limited or at risk under past and or current land use or land management practices. Rehabilitation and restoration possible through modified land management practice	Regeneration of native vegetation community has been suppressed by ongoing disturbances of the natural regenerative capacity; limited potential for restoration	Regeneration of native vegetation community lost or suppressed by intensive land management; limited potential for restoration	Nil or minimal
	Vegetation structure	Nil or minimal	Structural integrity of native vegetation community is very high	Structure is predominantly altered but intact, e.g. a layer or strata and or growth forms and or age classes removed	Dominant structuring species of native vegetation community significantly altered, e.g. a layer or strata frequently removed	Dominant structuring species of native vegetation community removed or predominantly cleared or extremely degraded	Dominant structuring species of native vegetation community removed	Vegetation absent or ornamental
	Vegetation composition	Nil or minimal	Compositional integrity of native vegetation community is very high	Composition of native vegetation community is altered but intact	Dominant structuring species present—species dominance significantly altered	Dominant structuring species of native vegetation community removed	Dominant structuring species of native vegetation community removed	Vegetation absent or ornamental

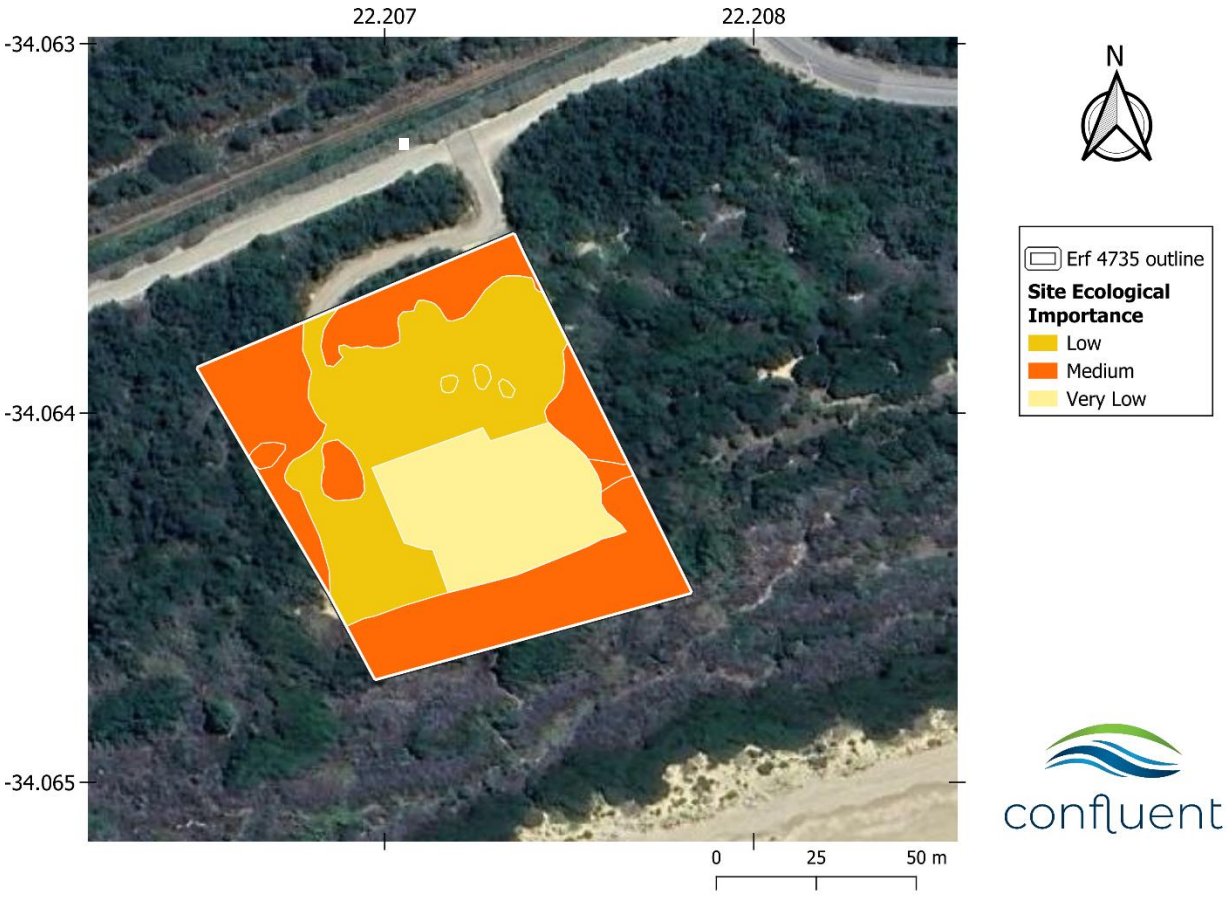

Figure 11: The SEI map for Portion 4735.

Table 4: The mitigation guidelines for interpreting the various SEI categories for the proposed development activities.

Site Ecological Importance	Recommendation for activities based on the mitigation hierarchy
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.

Table 5: The evaluation of the SEI for the vegetation / habitats present within and surrounding the proposed development.

Vegetation	Conservation Importance (CI)	Functional Integrity (FI)	Receptor Resilience (RR)	Site Ecological Importance (SEI)
Built Envionment & lawn	**Very Low** No natural habitat remaining.	**Very Low** No habitat connectivity except for flora with wind-dispersed seeds.	**High** VAST category VI: Removed. The built environment will remain, and the lawn has a high likelihood of remaining even if care and irrigation is removed.	**Very Low** BI: Very Low RR: High
Gravel road & cleared area	**Low** < 50% of receptor contains natural habitat with limited potential to support SCC.	**Low** Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat. Several minor & major current negative ecological impacts.	**Medium** VAST category VI: Removed. Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor if the use / maintenance of the road is discontinued	**Low** BI: Low RR: Medium
Informal Path	**High** Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem.	**Medium** Mostly minor current negative ecological impacts with some major impacts (i.e., established population of Rooikrans & household pollution) and a few signs of minor past disturbance. Moderate rehabilitation potential.	**Medium** VAST category II: Modified. Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor, provided active ongoing alien clearing is in place.	**Medium** BI: Medium RR: Medium
Invaded Hartenbos Thicket (with Cheesewood	**High** Small area (> 0.01% but <	**Medium** Mostly minor current negative ecological	**Medium** VAST category II: Modified. Will recover	**Medium** BI: Medium

trees and Milkwood trees)	0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem.	impacts with some major impacts (i.e., established population of Rooikrans & household pollution) and a few signs of minor past disturbance. Moderate rehabilitation potential.	slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor, provided active ongoing alien clearing is in place.	RR: Medium
Milkwood trees (Isolated)	**Low** < 50% of receptor contains natural habitat with limited potential to support SCC.	**Low** 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.	**Medium** VAST category III: Transformed. Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor, provided active ongoing alien clearing is in place.	**Low** BI: Low RR: Medium

7. RETROSPECTIVE IMPACT ASSESSMENT

For any impact assessment, the mitigation hierarchy must be kept in mind (Fig. 11; Ekstrom et al., 2015) in mind. If mitigation measures are unlikely to be effective at minimising large impacts, then avoidance mitigation must be implemented. If an impact cannot be prevented, then minimisation mitigation is preferred. The methods used for this impact assessment is provided in Appendix 12.4. This impact assessment includes a retrospective impact assessment, as the clearance of vegetation has already taken place on Seebederfie. The purpose of this impact assessment is to better understand what the impacts were historically, prior to any construction on the site, as well as the impacts associated with the proposed building of two guest rooms. Operational Phase impacts can also be assessed based on the current state of the site, and additional impacts expected from the proposed guest rooms.

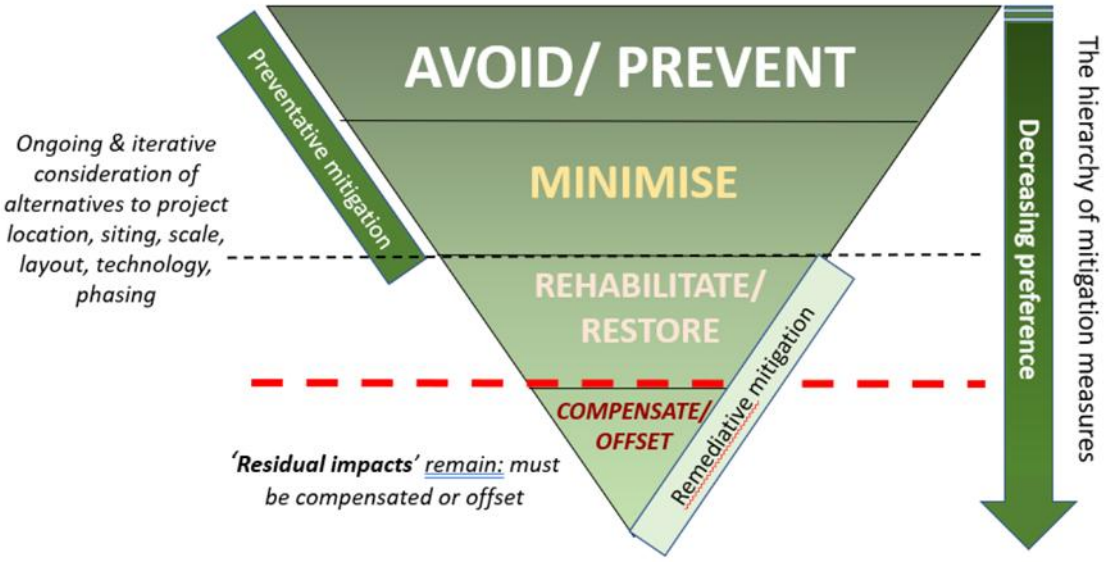

Figure 12: The mitigation hierarchy as presented in (Brownlie et al., 2023). Mitigation steps are illustrated in a hierarchy. The lower steps in the diagram should only be considered once the steps above have been duly considered.

7.1 Construction Phase

The construction phase is an essential part of a project as every chosen construction action impacts the surrounding environment. Different materials, technology, and management choices affect the environment differently. In this section, a construction phase impact assessment is presented for the habitats and terrestrial biodiversity on the site.

7.1.1 A loss of Hartenbos Dune Thicket (EN) and protected tree species (Sidoxylon inerme inerme & possibly Pittosporrum viridiflorum) due to earthworks and other construction related activities for Seebederfie guesthouse on Portion 4735.

Description: It is inevitable that earthworks and construction related activities on the site led to the loss of habitat and, likely, protected tree species. The loss of vegetation on the site to date is permanent. This is because the built structures have caused significant change to the substrate, and thicket habitat takes long to recover after novel disturbances, making the rehabilitation of the current built environment impractical. The impact that took place on the site is not easily reversible. The impact alternatives are assessed in Table 6.

Impact consequences:

1. A general loss of a threatened habitat (i.e., Endangered Hartenbos Dune Thicket).
2. Fragmentation of a threatened habitat.
3. A shift towards a negative change in the conservation status of Hartenbos Dune Thicket and the loss of part of an ESA 1 area.

Retrospective mitigation measures that could have been implemented:

1) Protected trees could only be trimmed, transplanted or altered if the appropriate forestry license was applied for and obtained for the site.

2) The disturbance footprint of proposed developments should be clearly defined and demarcated to prevent unnecessary damage to the surrounding environment.

   a) Protected trees, and other large trees on the site could have been protected and marked on the site to be left undisturbed during construction using wooden boxes around the trees (see Fig. 12).

Figure 13: An example of a construction site with protected and other indigenous trees marked and sectioned off from the rest of the construction site. Each tree and box was marked, and interesting facts about the species and its ecology was provided on the construction site.

   b) Construction netting and fencing could have been used to clearly indicate construction areas. Shade cloth used as fencing should be hammered into the ground using wooden pegs.

   c) Clear signs for “no-go” areas for vehicles and personnel should be placed strategically on the site. No-go areas are anywhere outside of the direct area of influence of the construction phase.

   d) Turning and parking area for construction and delivery vehicles should have taken place in areas that were already cleared, and this delivery area must have been indicated on the roads nearby the site development to guide truck drivers to the construction site, thus avoiding drivers getting lost and causing unnecessary disturbance.

3) Weather reports had to be checked daily to avoid heavy machinery and activities on the site during rainy weather. Following rainfall events (excluding short periods of gentle, light rain), all construction on the site should have ceased temporarily.

4) Where vegetation was cleared to make way for construction, filled sandbags should have been used to reduce the intensity of water runoff and flow over the site (Fig. 13).

Figure 14: Examples of silt socks placed perpendicular to the flow of water. These reduce the force of water flow, erosion, and can prevent unwanted sedimentation on the site.

5) Protection and re-use of topsoil

   a) The topsoil is vital for the successful rehabilitation and re-establishment of thicket following construction. Any areas within the permanent disturbance footprint where the site was not heavily invaded with rooikrans (*Acacia cyclops*), topsoil should have been stripped to a depth of ca. 30cm and kept in designated piles. Topsoil piles could have been suitably covered to prevent any additional invasive species seeds from falling in and establishing in the soil.

   b) The topsoil piles were to be clearly labelled so that it would not mix with subsoils excavated or any other construction material for the site.

6) Dust suppression mechanisms e.g., materials and regular site maintenance (e.g., cleaning surfaces and "rounding off" a workday) is essential to reduce dust, and general pollution.

Table 6: Construction phase impact 1 - A loss of Hartenbos Dune Thicket (EN) and protected tree species (Sidoxylon inerme inerme & possibly also Pittosporrum viridiflorum) due to earthworks and other construction related activities for Seebederfie guesthouse on Portion 4735.

CONSTRUCTION	**Retrospective impact assessment**		**Preferred: guest rooms on ground floor**		**No-go option**
Impact 9.1.1	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	No construction
Duration	Permanent	Permanent	Permanent	Permanent	Immediate
Extent	Limited	Very limited	Very limited	Very limited	None
Intensity	Moderate	Very low	Low	Very low	Negligible
Probability	Certain	Certain	Almost certain	Likely	Highly unlikely
SCORE	Moderate negative: -91	Minor negative: -70	Minor negative: -66	Minor negative: -50	No construction impact: 0

7.1.2 the thicket habitat and protected trees are negatively affected by the management of the construction site (i.e., staff, stockpiles, and equipment).

Description: In addition to the large and obvious construction impacts, the management of materials and staff on the site is also an important impact on the site. If managed properly, many accidents and unanticipated negative losses to the expense of the environment, and plant populations could have been avoided. This impact is assessed in Table 7.

The following consequences may occur due to this impact:

1. Unanticipated losses of vegetation outside of designated areas.
2. Increased duration of negative construction impacts.
3. Increased vulnerability to impacts of remaining habitat portions elsewhere due to a negative disturbance to the processes that are necessary to maintain biodiversity and ecosystem goods and services.
4. Potential health and safety hazards on the site and in the surrounding environment.
5. The creation of novel habitat that indigenous species cannot survive in, but where exotics and invasive plants thrive in. This results from
    a. disorganised materials ending up in wrong places and
    b. the creation of gardens or bare substrate where they are inappropriate.

Mitigation measures:

1. All new staff had to be briefed about the layout of the construction site and made aware of no-go areas and the fact that the surrounding environment is sensitive and must not be disturbed.
2. Construction vehicles should have been checked daily at the start of the day for leaks and other faults.
    a. Sandbags or sawdust on the site would have ensured that accidental oil or toxic material spills can be contained and stopped quickly.
    b. Any contaminated soil could have been removed by a registered hazardous waste service provider (Spill Tech, Interwaste, EnviroServ etc.).
    c. Vehicles with leaks and other problems could have been stopped from operating on the site until they have been repaired.
3. Ongoing monitoring and clearing of invasive plants on the site could have occurred. This is a requirement by law.
4. Materials used during construction must have been sourced responsibly to minimise the risk of further introductions of invasive plants.
5. No waste dumping or burning should have occurred on the site or in the surrounding environment. Material waste had to be collected in designated bins and must be transported to a registered waste disposal facility.
6. Adequate ablution facilities had to be provided for every construction project.
    a. Portable toilets had to be be placed on a level platform before construction and they had to be placed away from any potential fynbos habitat on the site.
    b. Ablution facilities should have been regularly maintained and cleaned.

c. At least one toilet per ten to fifteen construction staff should have been available.

7. Concrete, cement, plastering, and painting:
    a. Mixing areas had to be properly defined and should have been bunded or surrounded by an impermeable material to prevent any runoff into the surrounding environment.
    b. The designated mixing areas should have been limited to areas that became hard surfaces on the site, or that were already transformed and likely to remain transformed.
    c. No concrete and cement mixing allowed in areas outside of the site development plans (SDPs) that will be provided by the architects. The 2m disturbance envelope should have preferably also been avoided for this activity on the site.
    d. Cleaning of cement, plastering & paint equipment must have been done into a designated, bunded & lined slurry sump or container to avoid contaminating the environment.
8. Stockpiles of materials management:
    a. Stockpiles and soil should have been covered by a geotextile or plastic covering, which had to be bunded (e.g., sandbags) when the piles were not in use on the site (Fig 14). This prevents the material from washing away and contaminating the substrate in natural veld, which likely still contains useful seeds and soil organisms.

Figure 15: An example of a protected stockpile (image from stormwaterhawaii.com).

Table 7: Construction phase impact 2 - The thicket habitat and protected trees are negatively affected by the management of the construction site (i.e., staff, stockpiles, and equipment).

CONSTRUCTION	Retrospective impact assessment		Preferred: guest rooms on ground floor		No-go option
Impact 9.1.2	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	No construction
Duration	Medium term	Immediate	Short term	Immediate	Immediate
Extent	Limited	Very limited	Limited	Very limited	None
Intensity	Low	Negligible	Low	Negligible	Negligible
Probability	Certain	Almost certain	Almost certain	Probably	Highly unlikely
SCORE	Minor negative: -63	Negligible negative: -24	Minor negative: -48	Negligible negative: -12	No construction impact: 0

7.2 The Conclusion of the Construction Phase

The conclusion of any project is an essential but often overlooked aspect of projects. This relates primarily to the cleaning up of the site once construction has concluded.

1. All of the mitigation measures proposed above are only meaningful if construction was properly concluded.
2. Construction sites should have been cleared of all waste material, rubble, and debris associated with the construction phase at regular intervals during, and at the conclusion of the construction phase.
3. Revegetation of bare soil following construction is an essential part of concluding the construction phase of the project.
4. Drainage structures had to be checked to ensure that there are no blockages or pollution that is blocking the free flow of water over the site; these checks will prevent erosion during and after the construction phase that could have potentially far-reaching implications beyond the PAOI for the proposed development.

7.3 Operational Phase

The operational phase of the project refers to the state of the site after the construction phase has been concluded, when the proposed developments are ready for, or are in use. This is the current phase of the project, and therefore these mitigation measures can still be implemented on the site. Again, alternatives can't be assessed as the development has already taken place, so the operational phase impacts can only work for the development currently on the site.

7.3.1 A loss of thicket habitat and protected tree species due to maintenance activities required to maintain and protect the Seebederfie (e.g., vegetation trimming, path and road maintenance, ongoing management of invasive plants, etc.).

Description: The guesthouse is located close to protected tree species and is located in a EN ecosystem, Hartenbos Dune Thicket. Despite this, the remaining natural vegetation on the site is rather severely invaded with rooikrans (*Acacia cyclops*). The development has resulted in an altered disturbance regime on the site. Management of the remaining thicket of the site in an ecologically conscious manner in the long-term will result in positive outcomes for the vegetation and protected tree populations of the site. Without the appropriate consideration for the environment, management activities will impact the flora and habitat they grow in negatively. The owner of Seebederfie will need to have an alien invasive management and eradication plan to implement an appropriate alien clearing strategy on the site. He also needs a forestry licence for maintaining and trimming indigenous protected trees near the lodge. The impact is assessed in Table 8.

The following consequences may occur due to this impact:

1. A general loss of habitat for plants, pollinators, and other important taxa.
2. Altered soil characteristics which causes unnecessary harm to thicket vegetation dynamics.
3. Pollution of the environment.
4. Loss of habitat to invasive plants species and increasingly depauperate thicket.

Mitigation measures:

1. It is a requirement of the law that alien clearing and monitoring according to an alien eradication plan be followed.
2. Emergency & cleaning supplies for incidents of waste spillage, or fires accidentally spreading should be kept on the site (e.g., keep lime, spades, first aid etc. handy). Fire extinguishers etc. must be kept as per fire safety regulations.
3. Staff on the site must be properly trained and guests must be well aware of activities that are not allowed on the site.
    a. No staff member is allowed to dispose of grey water in the environment. Treated grey water may be used for irrigation, however irrigated areas must be kept to a minimum.
    b. No member of staff or guest are allowed to walk where a path is not clearly labelled or outside of roads and boardwalks.

c. Instructions for the proper use of chemical toilets must be provided and must be clearly visible in all restrooms.

4. No plants may be brought to the site from elsewhere. Gardens must be planted responsibly, and additional kikuyu (*Cenchrus clndestinus*) grass must be avoided on the site.
    a. Plants of the same species as those naturally found nearby in Hartenbos Dune Thicket may be used in gardening / reestablishing natural thicket vegetation following alien clearing efforts.
    b. Information plaques could be made for some of the tree species on the site with interesting information about each species.
    c. The extra cleared area north of the existing dwelling could be revegetated with thicket species, and monitored to prevent the return of invasive rooikrans.

Table 8: Operational phase impact 1 - The loss of thicket habitat and protected tree species due to maintenance activities required to maintain and protect the Seebederfie (e.g., vegetation trimming, path and road maintenance, ongoing management of invasive plants, etc.).

OPERATION	Retrospective impact assessment		Preferred: guest rooms on ground floor		No-go option
Impact 9.3.1	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	The entire site is rehabilitated
Duration	Ongoing	Short term	Ongoing	Short term	Short term
Extent	Limited	Limited	Limited	Very limited	Limited
Intensity	High	Low	Moderate	Very low	Low
Probability	Certain	Certain	Certain	Certain	Certain
SCORE	Moderate negative: -91	Minor negative: -56	Moderate negative: -84	Minor negative: -42	Minor negative: -56

7.3.2 The thicket and protected trees on the site is negatively affected by inappropriate landscaping resulting in water attenuation problems, genetic pollution, and potential long-term biodiversity loss from the cultivation of species that are not indigenous to the vegetation type and surrounding landscape.

Description: Most landowners plant gardens with plants that are not native and indigenous to the area where they live, as briefly mentioned in the previous impact. The creation of Frankenflora means that genetic pollution could result in cryptic hybridisation and eventual species loss. By allowing the planting of gardens in sensitive natural habitat (even with species advertised as being locally sourced), a loss of plant species diversity could result on the site. Furthermore, there is a problem with an increasing density of invasive rooikrans. This might not be a big problem in areas where there are large relatively natural areas of an ecosystem remaining, but in this case Hartenbos Dune Thicket habitat is already severely fragmented and under pressure. “Hard landscaping” must be avoided where possible (Box 3). Some sustainable and ecologically friendly principles for gardens are presented in Fig. 15. The impact is assessed in Table 9.

BOX 3: Landscaping

Soft landscaping

Soft landscaping refers to natural spaces around constructed buildings that contain plants. The plants used are often trees, shrubs, and herbs that perform valuable ecosystem functions and services at different levels. Soft landscapes support biodiversity if local indigenous species are planted, or better yet, of the natural vegetation is left to recover and grow with minimal to no planting of man-made gardens. Grasses and shrubs are as effective at converting Carbon dioxide as are trees. Keeping vegetation allows groundwater attenuation and minimisation of erosion risk, so that the consequences of groundwater and rainfall risks are far more manageable and are less likely to have far reaching and / or catastrophic impacts.

Hard landscaping

Hard landscaping refers to spaces around constructed buildings that have been transformed into impermeable surfaces, such as pavements, and concrete driveways. Hard landscapes have negative impacts on the natural environment and are less ideal than soft landscaping. Hard landscaping results in the absorption and reflection of heat, which makes them hotter than the surrounding natural areas. Furthermore, they speed up the flow of rainwater which means that water disposal systems need to be adequate to prevent erosion. No plants can really grow on these surfaces making groundwater attenuation problematic.

The following consequences may occur due to this impact:

1. A gradual increase in the number of negative edge effects that result from exotic garden plants outcompeting natural species in the environment.
2. Biodiversity loss from introduction & establishment of invasive plants in natural fynbos vegetation

3. A general loss of habitat.
4. Eventual loss of any remaining native vegetation remaining due to the gradual naturalisation of exotic garden plant varieties.
5. A loss of natural genetic variation (e.g., due to introgression; Mitchell & Holsinger, 2018) between populations and species of plants.
6. Loss of specific adaptations that make plant species resilient.
7. Altered soil characteristics, including soil microbes, & seed bank changes.

Mitigation measures:

1. Rehabilitation of thicket should be prioritised above gardening. Lawns, apart from the existing lawn on the site, may not be planted.
2. Ongoing effort to remove all invasive plants species is a requirement by law. As mentioned before, no more planting of kikuyu grass will be allowed.
3. Landowners are responsible to maintain their gardens, so that plants do not overgrow. No garden waste may be dumped in any remaining natural area and must be disposed of in a responsible manner.
4. Fertilisers and pesticides must be avoided, and when used it must be done with caution and may not become routine practice.
5. If gardens need to be considered, or existing gardens re-designed, they can be designed to be water wise (avoid erosion) and friendly to wildlife and the greater natural habitat. Fynbos Life in Cape Town is an inspirational indigenous landscaping project (Fig. 15). All these tips from Fynbos Life form part of the mitigation on the impact of landscaping. Although the poster is geared towards Fynbos gardens, the general gardening principles can also apply to thickets.

Table 9: Operational phase impact 2 - The thicket and protected trees on the site is negatively affected by inappropriate landscaping resulting in water attenuation problems, genetic pollution, and potential long-term biodiversity loss from the cultivation of species that are not indigenous to the vegetation type and surrounding landscape.

OPERATION	Retrospective impact assessment		Preferred: Guest rooms on ground floor		No-go option
Impact 9.3.2	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	No stormwater management infrastructure
Duration	Permanent	Medium term	Ongoing	Immediate	Short term
Extent	Limited	Very limited	Very limited	Very limited	Very limited
Intensity	Moderate	Low	Very low	Negligible	Low
Probability	Certain	Certain	Almost certain	Almost certain	Likely
SCORE	Moderate Negative:-91	Minor Negative: -56	Minor negative: -54	Negligible negative: -18	Negligible Negative: -35

Figure 16: A illustration that can help guide future gardening decision making, as provided by the https://www.fynboslife.com/life-garden/ website.

7.4 Cumulative Impacts

The greatest cumulative impacts that extend beyond the boundary of Seebederfie is the serious invasion of the area by Rooikrans and the litter and dumping of waste that was visible during the site assessment. Alien clearing on Seebederfie will require long-term commitment, as the surrounding landscape is likely to remain heavily invaded. The implementation of the operational phase mitigation will hopefully lead to reduced pressure from invasive plants, and hopefully a reduction in litter in the landscape. Information on trees of Hartenbos Dune Thicket may inspire others to take better care of their properties too. The cumulative impacts are difficult to mitigate, as they fall outside of Portion 4735.

8. CONCLUSION

The terrestrial biodiversity theme for Portion 4735 has a **Very High** sensitivity due to the presence of an endangered (EN) ecosystem, and the fact that the site is included largely as an ESA 1 area in the planning of the Western Cape BSP. The development also occurred on a foredune, which is considered to contain sensitive terrestrial vegetation. However, despite the terrestrial sensitivity, the botanical sensitivity is **Low** as no SCC were found on the site, or in the surrounding vegetation. It was difficult to access the surrounding vegetation where there were no pre-existing paths due to the impenetrable nature of the natural thicket. Two protected tree species were found on the site, namely milkwood trees (*Sideroxylon inerme inerme*) and cheesewood trees (*Pittosporum viridiflorum*).

The appropriate forestry license is required to trim, remove, or cut any part of these protected tree species. The erf also needs to undertake alien clearing in accordance with an alien clearing and monitoring plan, as this is a requirement by law. Kikuyu grass (*Cenchrus clandestinus*) is also a listed invasive species, and no more lawns may be planted with this species. If no alien clearing and monitoring plan is set up to include Portion 4735, one must be compiled. The impact assessment has revealed that the existing development would result in a minor impact to the surrounding vegetation, provided the mitigation outlined in the operational phase is implemented on Seebederfie. If effort is made to implement the mitigation measures, then there is no need for rehabilitation of the site.

8.1 Rehabilitation recommendations

The existing built guest house, as well as the proposed two guest rooms and their associated six parking areas represent the extent of permanent disturbance on the site. The remainder of the historically disturbed area, namely the large, cleared parking area north of the existing dwelling, and any additional open spaces will be rehabilitated. The following general recommendations are made from a botanical point of view in order to rehabilitate these areas effectively:

8.1.1 Alien Vegetation Control

- Systematic removal of invasive alien plant species, prioritizing *Acacia cyclops* (Rooikrans). Start in least invaded areas and slowly clear aliens in more invaded areas to prevent a loss of dune cover.
- Cut-stump treatment for woody invasives and manual removal of seedlings to prevent re-establishment.

- Follow-up clearing should be conducted at least twice per year for three years to suppress alien regrowth.

8.1.2 *Soil Stabilization and Erosion Control*

- Use brush-packing from cleared alien vegetation to protect bare soil and retain moisture.
- Apply a layer of locally sourced mulch to prevent erosion and improve soil conditions for thicket establishment.

8.1.3 *Indigenous Vegetation Restoration*

- The site will be restored using species typical of Hartenbos Dune Thicket.
- Graminoids for soil stability and wind resistance (these can be planted / sowed first):
    - *Restio eleocharis, Thamnochortus insignis* (Cape Reed species)
    - *Sporobolus fimbriatus*
    - *Stenotaphrum secundatum* (Buffalo Grass)
    - *Themeda triandra* (Red Grass)
- Thicket-forming species for shelter and structure include:
    - *Pterocelastrus tricuspidatus* (Candlewood)
    - *Sideroxylon inerme* (Milkwood)
    - *Euclea racemosa* (Dune Guarri)
    - *Maytenus procumbens* (Dune Koko Tree)
    - *Searsia crenata, Searsia glauca, Searsia lucida, Searsia pterota* (Kuni-bush species)
    - *Passerina rigida* (Gonna-bush)
    - *Metalasia muricata* (Blombos)
- Fynbos shrubland elements for floristic diversity (for inclusion of a strandveld element):
    - *Felicia echinata* (Daisy Shrub)
    - *Salvia africana-lutea* (Brown Sage)
    - *Agathosma apiculata* (Buchu species)
    - *Athanasia cochlearifolia* (Golden Daisy)
    - *Diosma aristata*
    - *Eriocephalus africanus* (Wild Rosemary)
- Succulents and geophytes for resilience:
    - *Aloe arborescens, Aloe ferox*
    - *Carpobrotus acinaciformis, Carpobrotus edulis* (Sour Fig)
    - *Crassula nudicaulis, Cotyledon orbiculata*
    - *Haemanthus coccineus* (April Fool)
    - *Freesia leichtlinii* (Wild Freesia)
    - *Brunsvigia orientalis* (Candelabra Lily)
- Climbing species for habitat complexity:
    - *Rhoicissus digitata* (Baboon Grape)
    - *Cynanchum ellipticum, Cynanchum viminale*
    - *Solanum africanum*
- All plants should be sourced from local seed stock or reputable nurseries to maintain genetic integrity and ecological appropriateness.

8.1.4 Monitoring and Maintenance

- Establish a three-year monitoring program to track vegetation recovery, alien regrowth, and soil stability.
- Conduct follow-up plantings if less than 75% of introduced species survive after the first year.
- Remove any emerging invasive species manually on an ongoing basis.
- Annual photographic monitoring points should be established to document rehabilitation success.
- This approach ensures that the rehabilitation effort aligns with the ecological characteristics of Hartenbos Dune Thicket, contributing to long-term ecosystem recovery.

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10. APPENDIX

10.1 Provisional plant species list

A species accumulation curve for all the species recorded on the site during the assessment are presented in Fig. 16. All species that were observed during the site visit are in Table 10. The site assessment species list is not exhaustive.

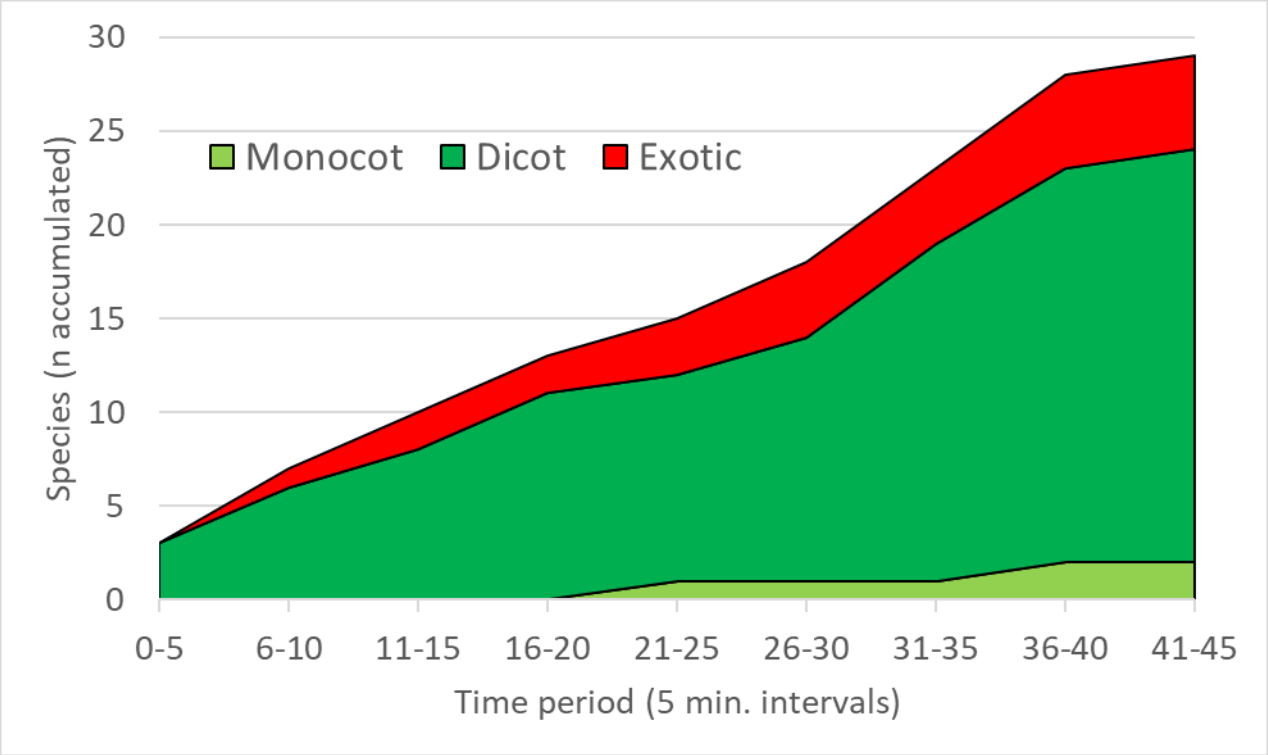

Figure 17: A plant species accumulation curve for the site assessment.

Table 10: A provisional species list made for the site assessment on Portion 4735. The orange species are naturalised exotic and invasive species, in blue are all the species of conservation concern on the site (ranging from NT to EN) and in green is the protected tree species on the site.

Family	Species	Common name	Information
Liliopsida (Monocots)			
Asparagaceae	*Yucca aloifolia*	Aloe Yucca	Naturalised exotic
Cyperaceae	*Fuirena hirsuta*	Hairy Hippo-Sedge	
Iridaceae	*Chasmanthe aethiopica*	Cobra Lily	
Poaceae	*Pennisetum (Cenchrus) clandestinus*	Kikuyu Grass	Invasive. NEMBA category 1b & not listed on CARA
Poaceae	*Lagurus ovatus*	Hare's Tail Grass	Naturalised exotic
Magnoliopsida (Dicots)			
Aizoaceae	*Drosanthemum intermedium*	Dewfig species	
Aizoaceae	*Mesembryanthemum aitonis*	Coast Solfig	
Aizoaceae	*Tetragonia decumbens*	Coast Seacoral	
Anacardiaceae	*Searsia crenata*	Crowberry	
Anacardiaceae	*Searsia glauca*	Blue Kunibush	
Apocynaceae	*Cynanchum obtusifolium*	Roundleaf Buckhorn	
Asteraceae	*Arctotheca prostrata*	Prostrate Capeweed	
Asteraceae	*Osteospermum moniliferum*	Bietou	
Asteraceae	*Senecio burchellii*	Kill Ragwort	
Asteraceae	*Senecio elegans*	Red-purple Ragwort	
Cucurbitaceae	*Zehneria scabra*	Wild Cucumber	
Fabaceae	*Acacia cyclops*	western coastal wattle	Invasive. NEMBA category 1b & CARA category 2
Geraniaceae	*Pelargonium capitatum*	rose-scented geranium	
Lamiaceae	*Tetradenia fruticosa*	Gingerbush species	
Malvaceae	*Grewia occidentalis*	Crossberry	
Pittosporaceae	*Pittosporum viridiflorum*	Cape Cheesewood	
Salvadoraceae	*Azima tetracantha*	Needle Bush	
Sapotaceae	*Sideroxylon inerme inerme*	Southern White Milkwood	
Scrophulariaceae	*Myoporum laetum*	Ngaio	Invasive. NEMBA category 3 & not listed on CARA
Solanaceae	*Solanum africanum*	drunken berry	
Solanaceae	*Solanum linnaeanum*	Yellow Bitter-apple	
Thymelaeaceae	*Passerina rigida*	Beach Gonna	
Vitaceae	*Rhoicissus digitata*	Baboon Grape	
Zygophyllaceae	*Roepera morgsana*	Salad Twinleaf	

10.2 Land use recommendations according to the WC BSP

Recommended acceptable land-uses for each BSP layer is outlined and summarised in Table 11 below.

Table 11: The land-use planning proposed by the Western Cape Biodiversity Spatial Plan

LAND USE CATEGORIES		Conservation		Agriculture		Tourism and Recreational Facilities		Rural Accomodation		Urban			Business & Industrial				Infrastructure Installations			
LAND USE SUB-CATEGORIES (Refer to table 4.7 for descriptions)		Proclaimed Protected Areas	Other Nature Areas	Intensive Agriculture	Extensive Agriculture	Low Impact Facilities	High Impact Facilities	Agri-worker Accommodation	Small holdings	Urban Development & Expansion	Community Facilities & Institutions	New Settlements	Rural Business	Non-place-bound Industry (low-moderate impact)	Non-place-bound Industry (high impact)	Extractive Industry (incl. Prospecting)	Linear - roads & rail	Linear - pipelines & canals	Linear - powerlines	Other Utilities
MAP CATEGORY	DESIRED MANAGEMENT OBJECTIVE	Y = Yes: Permissible land uses that are not likely to compromise the biodiversity objective						R = Restricted: Land uses that may compromise the biodiversity objective are only permissible under certain conditions (refer to Table 4.7 for conditions)					N = No: Land uses that will compromise the biodiversity objective and are not permissible							
Protected Area	Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity.	Land use within proclaimed protected areas are subject to management plan drawn up for that specific protected area.																		
Critical Biodiversity Area 1	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.	Y	Y	N	R	N	N	N	N	N	N	N	N	N	N	N	N	N	R	N
Critical Biodiversity Area 2	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 1: Terrestrial	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	R	R	N	N	R	R	R	R
Ecological Support Area 1: Aquatic	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 2	Restore and/or manage to minimise impact on ecological infrastructure functioning; especially soil and water-related services.	Y	Y	N	R	R	N	N	R	N	N	N	N	N	N	N	R	R	R	R
ONA: Natural to Near-Natural	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high impact land uses.	Y	Y	R	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ONA: Degraded	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high impact land uses.	R	R	R	Y	Y	R	R	Y	R	R	R	R	R	R	R	Y	Y	Y	Y
No Natural Remaining	These areas are suitable for development but may still provide limited biodiversity and ecological infrastructure functions and should be managed in a way that minimises impacts on biodiversity and ecological infrastructure.	R	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

10.3 Site Ecological Importance methods

The site ecological importance (SEI) assessment is a function of biodiversity importance (BI) and receptor resilience (RR), which is defined as:

"The intrinsic capacity of the receptor (i.e., habitat type in question) to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention."

The function is as follows: SEI = BI + RR. BI is a function of conservation importance (CI) and habitat functional integrity (FI), so that BI = CI + FI. The definition of CI given by the Species Environmental Assessment Guideline of 2022 is:

"The importance of a site for supporting biodiversity features of conservation concern present, e.g., populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes."

Most features included in CI are provided by the screening tool but needs to be evaluated at a finer scale from the field work assessment. FI is defined as:

"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."

The criteria for defining RR, CI and FI are provided in the Species Environmental Assessment Guidelines of 2022. BI can be derived from a simple matrix of CI and FI, as illustrated in Table 12 below.

Table 12: The matrix that defines the biodiversity importance (BI) of a given habitat type, as identified from a desktop and field assessment.

Biodiversity 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

SEI can then be derived from a second matrix, as depicted in Table 13. SEI is specific to the proposed development and can therefore only be compared between alternative layouts for the same proposed development, but not between developments.

Table 13: The matrix that defines the site ecological importance (SEI) of a given habitat type, as identified from a desktop and field assessment.

Site Ecological Importance		Very High	High	Medium	Low	Very Low
Receptor Resilience	Very High	Very High	Very High	High	Medium	Low
	High	Very High	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very Low
	Low	High	Medium	Low	Very Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

10.4 Impact assessment methods

Individual impacts for the construction and operational phase were identified and rated according to criteria which include their intensity, duration, and extent. The ratings were then used to calculate the consequence of the impact which can be either negative or positive as follows:

Consequence *= type x (intensity + duration + extent)*

Where type is either negative (i.e., -1) or positive (i.e., 1). The significance of the impact was then calculated by applying the probability of occurrence to the consequence as follows:

Significance *= consequence x probability*

The criteria and their associated ratings are shown in Table 14.

Table 14: Categorical descriptions for impacts and their associated ratings.

Rating	Intensity	Duration	Extent	Probability
1	Negligible	Immediate	Very limited	Highly unlikely
2	Very low	Brief	Limited	Rare
3	Low	Short term	Local	Unlikely
4	Moderate	Medium term	Municipal area	Probably
5	High	Long term	Regional	Likely
6	Very high	Ongoing	National	Almost certain
7	Extremely high	Permanent	International	Certain

Categories assigned to the calculated significance ratings are presented in Table 15.

Table 15: Value ranges for significance ratings, where (-) indicates a negative impact and (+) indicates a positive impact

Significance Rating	Range	
Major (-)	-147	-109
Moderate (-)	-108	-73
Minor (-)	-72	-36
Negligible (-)	-35	-1
Neutral	0	0
Negligible (+)	1	35
Minor (+)	36	72
Moderate (+)	73	108
Major (+)	109	147

Each impact was considered from the perspective of whether losses or gains would be irreversible or result in the irreplaceable loss of biodiversity of ecosystem services. The level of confidence was also determined and rated as low, medium, or high (Table 16).

Table 16: Definition of reversibility, irreplaceability, and confidence ratings.

Rating	Reversibility	Irreplaceability	Confidence
Low	Permanent modification, no recovery possible.	No irreparable damage and the resource isn't scarce.	Judgement based on intuition.
Medium	Recovery possible with significant intervention.	Irreparable damage but is represented elsewhere.	Based on common sense and general knowledge
High	Recovery likely.	Irreparable damage and is not represented elsewhere.	Substantial data supports the assessment