Specialist Impact Assessment for the Proposed Housing Development on Portion 38 of Farm 136, Tergniet, Mossel Bay.

Terrestrial Biodiversity and Plant Species Themes

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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;
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- All the particulars furnished by me in this document are true and correct.

Bianke Fouche (MSc Conservation Biology)

May 2026

BIANKE FOUCHE ABRIDGED CV

Qualifications

- B.Sc. Environmental Sciences (Nelson Mandela University),
- B.Sc. Honours in Botany (Nelson Mandela University),
- M.Sc. Conservation Biology (University of Cape Town)

SACNASP Registration No: 141757 (Professional Botanical; Candidate Ecological)

Skills and Core Competencies

- My MSc research will add to our understanding of plant community niche construction and Alternative Stable State (ASS) theory. The knowledge gained will be used to advise landscape stewardship practices, especially regarding reforestation initiatives in the Overstrand.
- I have worked closely with the conservation team of the Grootbos Foundation, where I assisted with vegetation surveys, mounting voucher specimens in the Grootbos herbarium, and taken part in controlled fynbos fires in the Overberg.
- Postgraduate studies of mine included assessing the allelopathic effects of *Eucalyptus* leaves on garden peas and leeks and assessing the accuracy of the climate leaf analysis multivariate programme (CLAMP) in predicting the climate of fynbos vegetation.
- In Cape Town I regularly took part in alien clearing activities and helped to identify relevant listed invasive plants.
- I am currently a member of SACNASP, the International Association for Impact Assessment (IAIA) in South Africa, Botanical Society of South Africa, and the custodians for rare and endangered wildflowers (CREW-Outramps) in George.

References

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ABBREVIATIONS

BPA	Biodiversity Priority Area
BSP	Biodiversity Spatial Plan
CARA	Conservation of Agricultural Resources Act (Act no. 43 of 1983)
CBA	Critical Biodiversity Area
CD:NGI	Chief Directorate: National Geo-spatial Information
DFFE	Department of Forestry, Fisheries, and the Environment
EA	Environmental Authorization
LULC	Land-use land-cover
NEM:BA	National Environmental Management: Biodiversity Act
ONA	Other Natural Areas
PAOI	Project Area of Influence
SACNASP	South African Council for Natural Science Professionals
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SDP	Site Development Plan
SEI	Site Ecological Importance
VAST	Vegetation Assets, States, and Transitions

1. INTRODUCTION

1.1 Background

Confluent Environmental was requested by Digital Soils Africa to undertake a specialist assessment for botanical and terrestrial sensitivity of Farm portion 38 of 136 in Tergniet (Fig. 1). According to the Department of Forestry, Fisheries, and the Environment (DFFE) Screening Tool, this 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.

Figure 1: The general location of Farm 38 / 136, Tergniet.

1.2 Site Development Plan

Alternative site development plans (SDPs) have been considered for the development of Portion 38 of Farm 136. Figure 2 indicates SDP Alternative 1 (156 units), the first SDP presented. Figure 3 indicates SDP Alternative 2 (149 units), which was reconfigured following the initial site sensitivity assessments. Figure 4 indicates SDP Alternative 3 (144 units), prepared following a meeting with the Department of Forestry, Fisheries and the Environment, with the primary focus on the retention and removal of protected trees within the site layout. The preferred site development plan (SDP) from an environmental perspective is presented in Figure 5 (133 units), which was produced in November 2025 following recommendations from the terrestrial, botanical, and faunal specialist studies. SDP Alternative 1 was the first

layout prepared, comprising 156 units with no specific regard for protected trees or ecological sensitivity.

Figure 2: SDP Alternative 1 for Portion 38/136, representing the first layout proposed, with 156 residential units

The four SDPs cover the same total site area of approximately 5.96 ha (excluding Robertson Road and the surrounding road reserve), divided into a western section (ca. 2.83 ha) and an eastern section (ca. 3.13 ha). While all layouts propose residential development with associated infrastructure and services, they differ in overall design, unit types, unit numbers, and disturbance footprints.

Figure 3: Alternative 2, which was reconfigured following initial site sensitivity assessments, including 149 residential units.

SDP Alternative 2 reduced the total to 149 units following the initial site sensitivity assessments. SDP Alternative 3 (144 units) incorporated the positions of protected trees identified during field surveys and was the version provided to all specialists for use in the assessment reports. The preferred SDP (133 units) reduces the total unit count by a further

11 relative to Alternative 3, creating pockets of natural open space adjacent to the 14m pipeline servitude along the southern boundary. These areas are intended to remain in a natural condition, providing habitat for remaining wildlife such as birds, small mammals, and invertebrates, as well as receptor sites for plants rescued during construction.

Figure 4: SDP Alternative 3 which was prepared following a meeting with DFFE, with 144 units and protected trees indicated for retention or removal.

Note that while protected and indigenous trees within the remaining open spaces between dwellings are retained, these areas do not necessarily constitute natural habitats within a landscaped development context. This is especially true for SDP Alternatives 1 through 3. The preferred development option (Figure 5), however, preserves additional natural habitat along the servitude. In all options, landscaped open areas are incorporated to provide soft landscapes that support stormwater management by capturing and retaining water, contributing to the ecological functioning of the site despite the overall transformation.

Figure 5: The preferred SDP for Portion 38/136, comprising 133 units and including natural open space pockets along the 14m pipeline servitude along the southern boundary.

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 (Cape Nature, 2023; CapeNature, 2017, 2024; 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 in the eastern section, and a Low sensitivity in the western section**, and the **terrestrial biodiversity theme as having a Very High sensitivity** (Fig. 6). Note that the Screening Tool plant species theme does not take Near Threatened plant populations into account.

Figure 6: The screening tool generated site sensitivities for the proposed development area of Farm 38 / 136.

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. Those triggered for the site are in Table 1.

Table 1: Sources of BPA data for the Terrestrial Biodiversity Theme sensitivity (Stewart et al., 2021). *Only BPAs that have been triggered for Farm 38 / 136 by the screening tool are listed.*

Sensitivity layer	Data included and source
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). In this case the trigger is Hartenbos Dune Thicket, which is listed as an endangered (EN) ecosystem type.

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.
- Specialist insight into the species likely present in the area.

Ecosystem/ vegetation type data was sourced from:

- The 2024 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 (Cape Nature, 2023; CapeNature, 2017, 2024; 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 08th of April 2024. A follow up walkthrough of the site with the faunal specialist was undertaken 20th of June 2025. 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 found more easily during a site survey than others, depending on their abundance, size, and distribution. This survey method is an attempt to account for the short, 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 a Canon EOS 1200D camera, and Nikon Coolpix camera. A provisional species list and plant species accumulation curve is provided in Appendix 13.1.

3.3 Assumptions & Limitations

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

- Only one survey took place during autumn during April 2024. Seasonal and time constraints always somewhat limit the findings of any ecological report.
- The species list and SCC reported are not exhaustive, and more species would likely be added to the list should more sampling effort, and sampling in different seasons occur (Perret et al., 2023).
- 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, many plant species flower seasonally and are therefore difficult / not likely to be identified outside of their flowering season.
- Environmental factors such as the prevailing fire regime, successional stage of the vegetation present, previous cultivation of the land, and the level of alien infestation at the site affects the species visible at the time of assessment (Cowling et al., 2010; Privett et al., 2001).
- Dense and tall thicket clump vegetation on the site made it hard to gain access to some sections of the site. It is possible that focus on “bundu bashing” and getting access to some parts of the site may have caused a lapse in concentration so that an SCC could have been missed on the site.

4. RESULTS: DESKTOP ASSESSMENT

4.1 Terrestrial Biodiversity

4.1.1 Climate, geology, and soil

The climate of the area is mild temperate, with seasonal peaks in rainfall. Soils are generally well formed with a well-defined B horizon where there is marked clay accumulation below the eluviated horizon. The erodibility for the soils here is mapped as high (with an erodibility factor of 0.61).

4.1.2 Vegetation Type(s)

The updated national vegetation mapping of the site (2024) confirms that Portion 38 of Farm 136 remains **Hartenbos Dune Thicket (Endangered, EN)**. This vegetation type is endemic to the Western Cape and occurs primarily on flat to moderately undulating coastal dunes. It is characterized by a mosaic of low thicket (1–3 m) forming small bush clumps dominated by small trees and woody shrubs, interspersed with low asteraceous fynbos (1–2 m) on upper dune slopes and crests. Succulent karroid elements, such as *Aloe ferox*, *Aloe arborescens*, and *Eriocephalus africanus*, occur on bands of mudstone and shale. Thicket clumps are best developed in fire-protected areas, such as interdunal depressions, while the asteraceous fynbos component remains poorly recovered on the site, with few important fynbos taxa observed during the field assessment.

Changes between 2018 and 2024:

Adjacent to the seashore, outside the boundary of the Portion, the updated mapping now identifies a newly described vegetation type, Southeastern Strandveld, which has not yet been assigned a Red List Threat status (Figure 7). This new vegetation type stops just south of the Portion, meaning that the site itself remains fully mapped as Hartenbos Dune Thicket.

Local Vegetation Context – Vlok Map:

The Vlok vegetation map(Vlok et al., 2008) provides a detailed local interpretation of vegetation types in the area. According to the Vlok map, the site corresponds to Hartenbos Strandveld, with a small section along the southern property boundary mapped as Hartenbos Primary Dune. While this local layer is a useful reference for understanding spatial patterns and historical vegetation distributions, it is not legally defensible under current protocols, as it lacks Red List status derived from IUCN criteria. Therefore, while it can be used to provide context or support general discussion, it does not determine the legally recognized conservation status of the site.

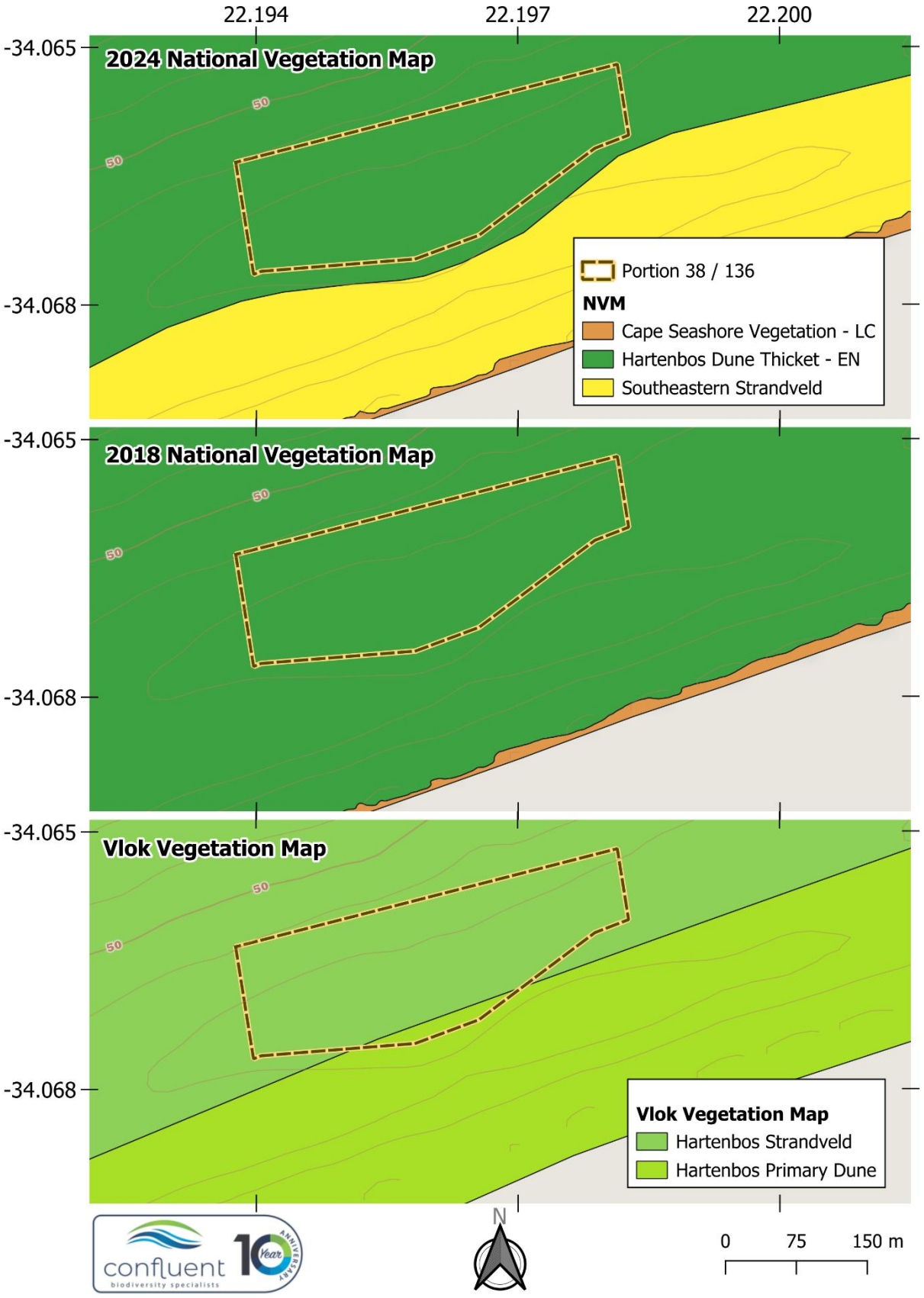


Figure 7: The vegetation maps for Portion 38 / 136, with the National Vegetation Map of 2024 illustrated above the 2018 version, and the Vlok vegetation types represented at the bottom..

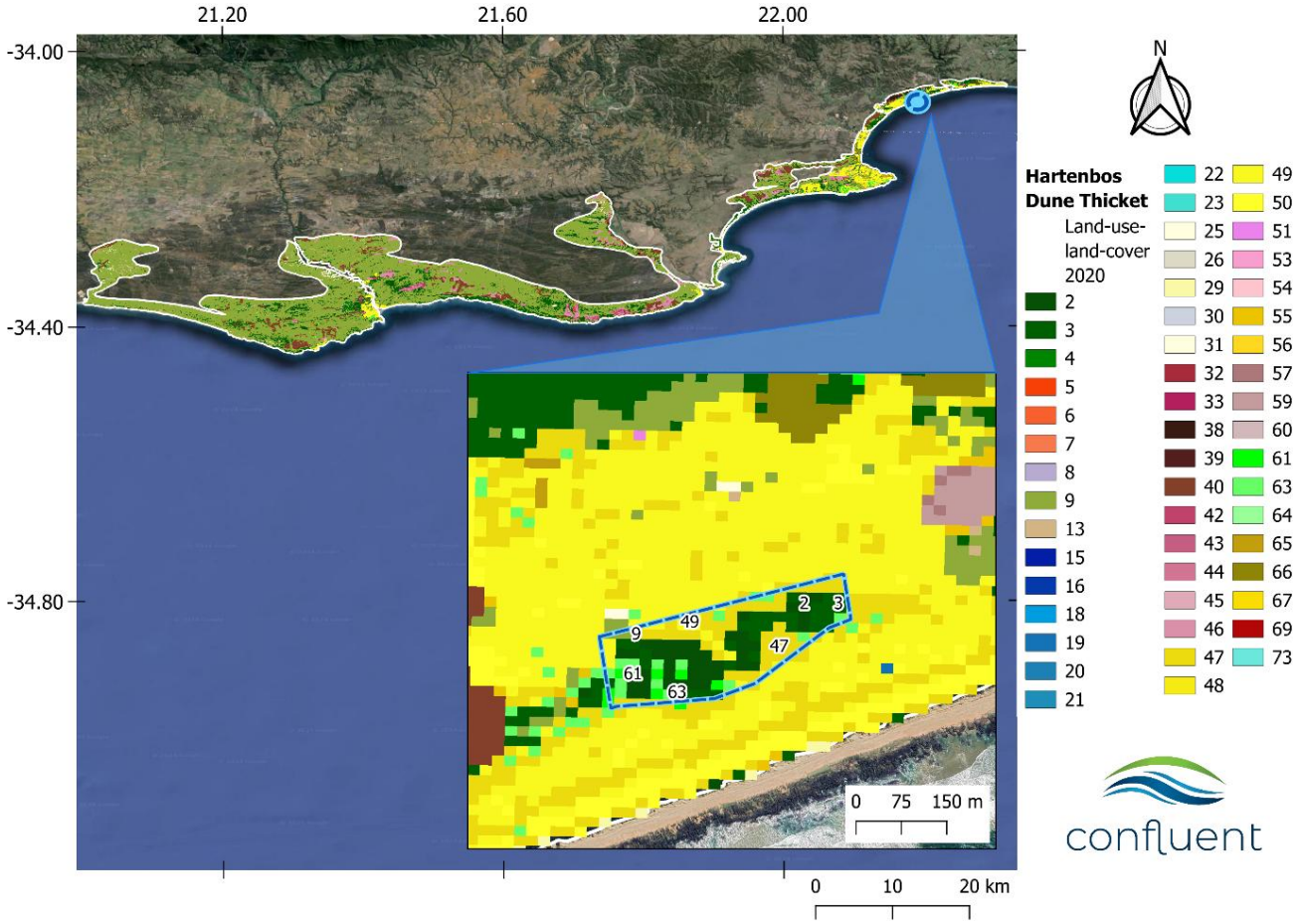
Some of the most important taxa for Hartenbos Dune Thicket are presented below in Table 2. Interestingly, the thicket species have recovered relatively well on the site, but the asteraceous fynbos matrix has recovered very poorly, as almost none of the important fynbos taxa were observed on the site. The current conservation target for Hartenbos Dune Thicket is 19%, and it is a poorly protected ecosystem. This vegetation type is also part of the Subtropical Thicket Ecosystem Project (STEP) and has recently been integrated into the National Vegetation map (Grobler et al., 2018; Pierce & Mader, 2006; Vlok & Euston-Brown, 2002). Approximately 16.54% of this vegetation type has already been transformed. This ecosystem is listed according to criteria B1(iii), which means that the Red List criteria is related to the National Land Cover and the calculated remaining natural area. Sub-criterion B1 (i) and (iii) refer to the extent of a minimum convex polygon (km^2) enclosing all extent of occurrences (EOO) & an observed or inferred continuing decline in spatial extent. Fore EN ecosystems this EOO is ≤20,000 km^2 with ongoing decline.

Table 2: The important species for Hartenbos Dune Thicket. Species that are highlighted in green were confirmed present during the site assessment.

Growth form	Species
Small tree	*Pterocelastrus tricuspidatus* (d), *Sideroxylon inerme* (d)
Succulent tree	*Aloe ferox*
Succulent shrub	*Aloe arborescens*, *Carpobrotus acinaciformis* (d), *Carpobrotus edulis*, *Conicosia pugioniformis*, *Cotyledon orbiculata*, *Crassula nudicaulis*, *Cleretum bellidiforme*, *Euphorbia burmannii*, *Euphorbia caput-medusae*, *Jordaaniella dubia*, *Roepera morgsana* (d)
Succulent herb	*Carpobrotus muirii*, *Haworthia mirabilis var. paradoxa*, *Euphorbia bayeri*
Geophytic herb	*Brunsvigia orientalis*, *Chasmanthe aethiopica*, *Freesia leichtlinii*, *Haemanthus coccineus*, *Ixia orientalis*
Low shrub	*Eriocephalus africanus*, *Eriocephalus africanus* var. *paniculatus*, *Felicia echinata*, *Helichrysum patulum*, *Muraltia spinosa*, *Salvia africana-lutea* (d), *Agathosma apiculata* (d), *Agathosma muirii*, *Athanasia cochlearifolia*, *Athanasia quinquedentata subsp. rigens*, *Diosma aristata*, *Euchaetis albertiniana*, *Hermannia muirii*, *Muraltia barkerae*, *Muraltia depressa*
Graminoid	*Restio eleocharis* (d), *Sporobolus fimbriatus*, *Stenotaphrum secundatum* (d), *Thamnochortus insignis* (d), *Themeda triandra* (d)
Tall shrub	*Azima tetracantha*, *Carissa bispinosa*, *Cassine peragua*, *Cussonia thyrsiflora*, *Euclea racemosa* (d), *Grewia occidentalis*, *Lauridia tetragona*, *Maytenus procumbens* (d), *Metalasia muricata* (d), *Morella cordifolia*, *Mystroxylon aethiopicum*, *Olea exasperata* (d), *Osteospermum moniliferum* (d), *Passerina rigida* (d), *Putterlickia pyracantha*, *Robsonodendron maritimum*, *Scutia myrtina*, *Searsia crenata* (d), *Searsia glauca*, *Searsia lucida*, *Searsia pterota*, *Leucospermum praecox*
Herbaceous climber	*Cynanchum ellipticum*, *Rhoicissus digitata*, *Solanum africanum*

*(d=dominant)

The land-use land-cover (LULC) dataset for 2020 is shown overlaying the total mapped extent of Hartenbos Dune Thicket in Fig. 8 below. The LULC layer for the site clearly illustrates that the site currently faces several negative edge effects as a result of being surrounded by residential developments. Despite the negative ecological effects and numerous up and coming invasive plants on the site, the LULC layer also illustrates that woody vegetation remains in the core of the Farm portion. Land cover class numbers for Portion 38/136 are highlighted and can be traced back to the table below Fig. 8.



No.	Legend Colour	2018 NLC Class Name
2	#065106	Contiguous Low Forest & Thicket (combined classes)
3	#005F00	Dense Forest & Woodland (35 - 75% cc)
9	#8FAB39	Low Shrubland (Fynbos)
47	#ECDB0F	Residential Formal (Tree)
49	#F9F81F	Residential Formal (low veg / grass)
61	#BFFF00	Urban Recreational Fields (Tree)
63	#66FF66	Urban Recreational Fields (Grass)

Figure 8: The land-use land-cover for the full mapped extent of Farm 38 / 136. Additional legend land cover categories outside of the property can be viewed here: SANLC (dffe.gov.za).

4.1.3 Western Cape Biodiversity Spatial Plan

The Biodiversity Spatial Plan for the Western Cape (WC BSP) for Portion 38/136 is presented in Fig. 9. Explanations of the BSP categories on the site are in Box 1 and the proposed appropriate land use categories for the different BSP categories are in Appendix 13.2. The reasons for the older 2017 BSP layers mapped here are (trigger reasons for the 2023 layer are not yet available):

- **Coastal resource protection -Eden** – The site is close to the coastline, being ca. 100m away from the shoreline. There are existing houses closer to the shoreline south of the proposed development area, however these houses were built historically under different legislation.
- **Groot Brak Dune Strandveld (EN)** – This is not mapped here, rather another EN ecosystem, Hartenbos Dune Thicket applies to the site and is present. The vegetation on the site is still busy recovering following past disturbances, and invasive alien plants are becoming an increasingly urgent problem on the site as it exists today.
- **Bontebok extended Distribution Range** – This reason falls outside of the scope of this study. Refer to an animal specialist report for more comment and detail.
- **Foredune** – The site is on sand, but it is not on a foredune. This trigger applies to areas slightly closer to the shoreline.
- **Canca Limestone Fynbos (LT)** – This vegetation type is not present on the site.

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.

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.

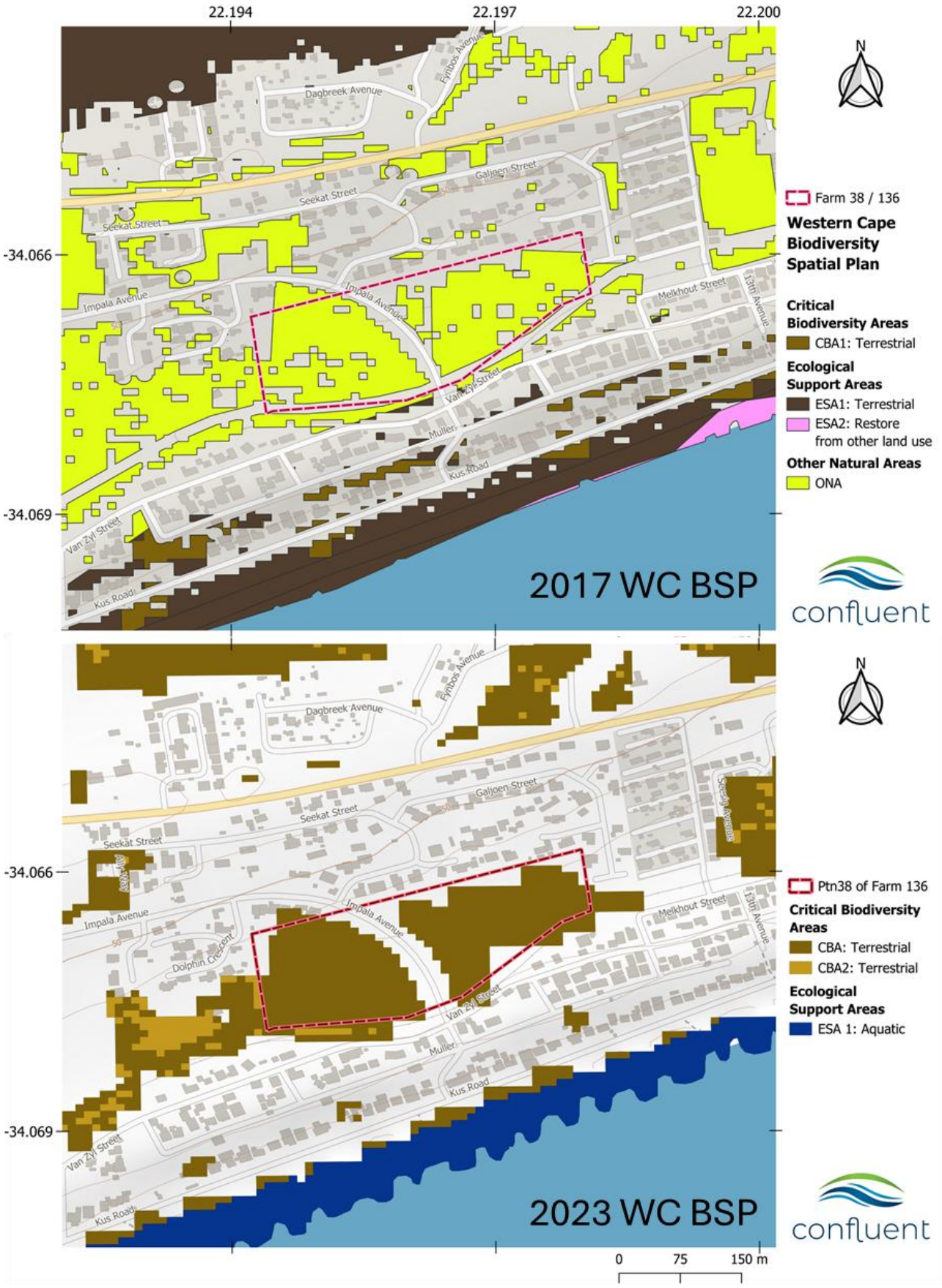


Figure 9: The mapped Western Cape Biodiversity Spatial Plan (WC BSP) categories that have been mapped for Farm 38 / 136 in Tergniet.

The management objectives listed for Critical Biodiversity Area 1 are not aligned with the proposal to transform the majority of the site for a residential housing estate.

4.1.4 Historical Aerial Imagery

High resolution historical imagery (Fig. 10) can be sourced upon request from the CD: NGI Geospatial portal, or from their offices in Mowbray, Cape Town. Google Earth provides a repository of more recent historical images.

1939 to 1974: The earliest imagery for the site was from 1939. By the end of 1939, the farm portion was cleared and used for agricultural purposes. By 1957 the site had been more thoroughly transformed into an agricultural field. Some natural vegetation remained around the Farm portion, and some houses had started to appear to the south between the site and the coastline. By December of 1963 the site was still fully transformed as an agricultural field, and no natural vegetation remained in the landscape surrounding Farm 38 / 136. By December of 1974, the majority of the natural woody vegetation had been entirely removed, and the Farm portion as well as the surrounding landscape was still an agricultural area. Farm 38 / 136 was therefore transformed and kept clear of natural vegetation for 35 years since 1939 by 1974.

1989 to 2004: Another 15 years passed until 1989, and Farm 38 / 136 had been abandoned as an agricultural field at some point during that time. Woody vegetation was visible returning to the site in the June 1989 imagery; however, it is not possible to know if this was predominantly indigenous or invasive woody plant species. Given the site assessment observations in 2024, it is assumed that the returning woody vegetation was a mixture of indigenous and invasive species. The woody vegetation on Farm 38 / 136 densified for a period of time, as shown in the imagery from 1998 and 2004 in Fig. 10. During this period, the agricultural fields in the surrounding landscape were also being abandoned and were slowly being replaced by low density residential houses (apart from the section south of the site which had become higher density residential).

2013 to present day: In October of 2013 there seems to have been some alien clearing activity that took place on Farm 38 / 136, after which no clearing was seen again to the present day. The imagery from 2013 to the present day indicate that residential developments around the Farm portion densified, and essentially the only open corridor remaining by 2019 was a piece of open land with one building along the western boundary of the site. Even though this piece of open land still exists today, the property further west is now also being developed (see the April 2024 imagery in Fig. 10), further reducing connectivity to a wider open space network and isolating Farm 38 / 136.

By 2024 (the time of completion of this report), the site underwent passive recovery (apart from the one likely alien clearing event in 2013) since at least 1989, which amounts to at least 35 years. This means that the vegetation on the site is considered natural vegetation, despite the long history of disturbance on the property prior to this. Indigenous vegetation in South Africa is defined in the National Environmental Management Act (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment Regulations, 2014, which states that :

*"Indigenous vegetation refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the **preceding ten years**."*

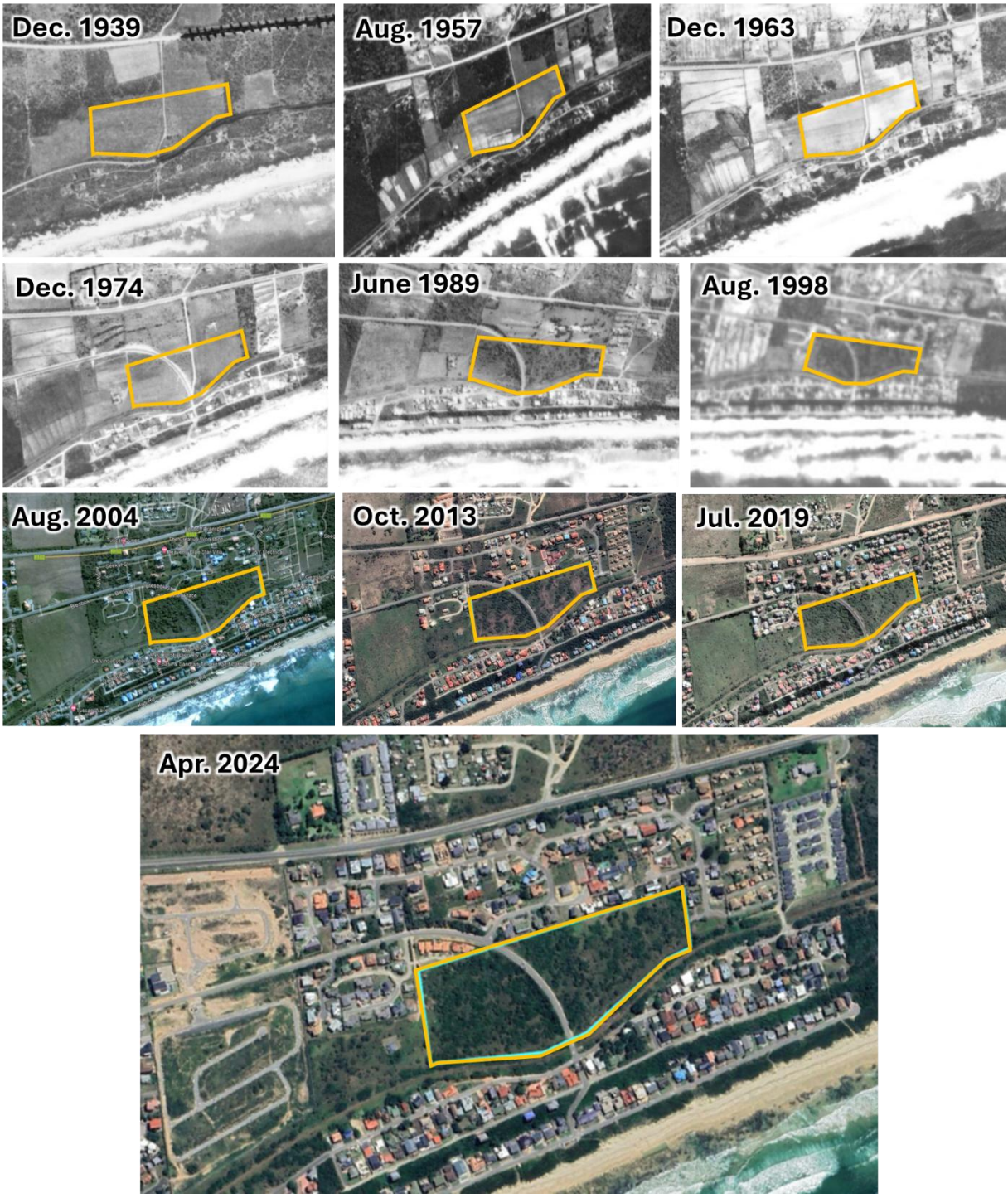


Figure 10: A series of historical images sourced from the CD: NGI geospatial portal (top two rows) and Google Earth (bottom two rows).

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. Several SCC have the potential to occur on the site and include the following:

Agathosma microcarpa	*Lebeckia gracilis*
Agathosma muirii	*Leucospermum praecox*
Asparagus lignosus	*Muraltia knysnaensis*
Cullumia carlinoides	*Nanobubon hypogaeum*
Duvalia immaculata	*Selago burchellii*
Erica glandulosa subsp. *fourcadei*	*Selago villicaulis*
Erica unicolor subsp. *mutica*	Sensitive species 153
Euchaetis albertiniana	Sensitive species 268
Freesia caryophyllaceae	Sensitive species 500
Gnidia chrysophylla	Sensitive species 516
Hermannia lavandulifolia	Sensitive species 654
Lampranthus fergusoniae	Sensitive species 800
Lampranthus pauciflorus	*Wahlenbergia polyantha*

5. RESULTS: FIELD ASSESSMENT

5.1 Refined Vegetation Map.

The current state of the vegetation on portion 38/136 is clearly indicative of a landscape that had previously been disturbed, but is slowly recovering passively. This is because many open degraded patches of vegetation remains between recovering thicket clumps on the site. There are also sections of the site that are badly invaded with rooikrans (*Acacia cyclops*) and *Lantana camara*. Several up-and-coming invasive species are also problematic on the site, such as the castor beans (*Ricinus communis*) that were common on the western section, and the mignotte vine (*Anredera cordifolia*) and *Chenopodium sp.* (goosefoot) that had become dominant species along the periphery of the site in some sections. Images of the general landscape of Portion 38/136 is illustrated in Fig. 11 below.

Figure 11: Images of the vegetation / ecosystems observed on the site and the GPS track walked during the site assessment.

The vegetation on the site represented a mosaic, which is how Hartenbos Dune Thicket is described. However, it seems that following the long-term prior disturbance of the site, the thicket clumps were able to recover relatively well, while the associated asteraceous fynbos matrix was unable to recover, leaving open degraded areas between more intact thicket on the site. This makes for a very unusual landscape; however, this mosaic covered the entire site and therefore the vegetation map following the site assessment only distinguishes between the existing road verge, and the rest of the site vegetation (Fig. 12).

Figure 12: The site assessment based vegetation map for Portion 38/136.

5.2 Species Observations

The site was quite diverse, with the majority of the indigenous vegetation belonging to thicket vegetation types / communities. Milkwood trees (*Sideroxylon inerme inerme*; protected tree number 579) were very common on the site, and in some patches cheesewood trees (*Pittosporum viridiflorum* protected tree no. 139) were also common. In order to cut, disturb, or remove the protected trees on the site, an application for a licence regarding disturbance of protected trees must be obtained from the Department of Forestry, Fisheries, and the Environment (DFFE). The National Forests Act , 1998 (Act No. 84 of 1998) states that:

"*Any person who contravenes the prohibition on (i) the cutting, disturbance, damage, destruction or removal of protected trees referred to in section 15(1)(a); or (ii) the prohibition on the collection, removal, transport, export, purchase or sale or protected trees referred to in section 15(1)(b), is guilty of a first category offence. In terms of section 58(1), a person who is guilty of a first category offence referred to in section 62 and 63 may be sentenced to a fine or imprisonment for a period of up to three years, or to a fine and such imprisonment*."

One SCC was observed on the site near the edge of the road, namely VU *Hermannia lavandulifolia*.

Several invasive and naturalised exotic species were also observed on the site (see Appendix 13.1 for the full list), and some of the most prominent invasive plants are illustrated in Fig. 13. The most dominant invasive species on the site was rooikrans (*Acacia cyclops*), which is an aggressive invasive in coastal areas. Box 2 describes the meaning of the various NEMBA

invasive species categories. The category of the invasive species found on the site are presented in Appendix 13.1.

Figure 13: A summary of some of the species observed on the site. Six invasives on the site are illustrated (red text). The only SCC observed, Hermannia lavandulifolia, is also shown and annotated with green writing. The two protected tree species on the site are also shown, with six additional LC species that were common or dominant on the site.

BOX 2: NEMBA categories for listed invasive alien plants.

Category 1a

Species which must be combatted or eradicated.

- Immediate steps must be taken to eradicate and combat or eradicate.
- Authorised officials must be permitted to enter properties to monitor, assist with or implement the combatting or eradication.
- If an Invasive Species Management Programme has been developed, a person must combat or eradicate the listed invasive species in accordance with such programme.

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 2

Any species listed under Category 2 requires a permit issued by the Department of Forestry, Fisheries and the Environment (DFFE) to carry out a restricted activity (See Permit Applications.)

- A permit is required to carry out any restricted activity.
- No person may carry out a restricted activity in respect of a Category 2 listed invasive species without a permit.
- A person in control of a Category 2 listed species must take all necessary measures to ensure that specimens of the species do not spread outside of the land or area, such as an aviary) specified in the permit.

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.

5.3 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 observations nearby, and the POSA database (Table 3).

Table 3: All plant SCC and protected species flagged for the site and nearby surroundings, and their probability of occurrence on the site.

Species	Common name	Family	Growth form	Status	Probability of occurrence
Hermannia lavandulifolia	Lavender-leaved dollrose	MALVACEAE	Herbaceous perennial	Vulnerable A2c	**Confirmed** Found along the existing road verge.
Pittosporum viridiflorum	Cheesewood	PITTOSPORACEAE	Tree	Protected tree no. 139	**Confirmed** Numerous cheesewood trees were observed.
Sideroxylon inerme inerme	Milkwood tree	SAPOTACEAE	Tree	Protected tree no. 579	**Confirmed** Numerous milkwood trees were observed
Lebeckia gracilis	Slender ganna	FABACEAE	Shrub	Endangered A2bc; B1ab(ii,iii,iv,v)	**High** Although this species was not observed on the site, there is a high likelihood that this species might be present on the site.
Selago burchellii	Bitterbushes	SCROPHULARIACEAE	Herbaceous perennial	Vulnerable B1ab(ii,iii,iv,v)	**High** Although this species was not observed on the site, there is a high likelihood that this species might be present on the site.
Selago villicaulis	Dune bitterbush	SCROPHULARIACEAE	Herbaceous perennial	Vulnerable B1ab(ii,iii,iv,v)	**High** Although this species was not observed on the site, there is a high likelihood that this species might be present on the site.
Agathosma microcarpa	Buchu species	RUTACEAE	Shrub	Vulnerable B1ab(i,ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Agathosma muirii	Heart buchu	RUTACEAE	Shrub	Vulnerable A4abc	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Aparagus lignosus	Fire asparagus	ASPARAGACEAE	Climbing perennial	Near Threatened A2c	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Duvalia immaculata	Succulent species	APOCYNACEAE	Succulent	Endangered B1ab(ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Erica glandulosa subsp. *fourcadei*	Ridges glandular heath	ERICACEAE	Shrub	Vulnerable B1ab(ii,iii,iv,v)	**Moderate**

					It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Gnidia chrysophylla	Gold capesaffron	THYMELAEACEAE	Perennial	Near Threatened B1ab(i,ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Lampranthus fergusoniae	Limestone brightfig	AIZOACEAE	Succulent	Rare	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Lampranthus pauciflorus	Beach brightfig	AIZOACEAE	Succulent	Endangered B1ab(ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Muraltia knysnaensis	Garden Route purplegorse	POLYGALACEAE	Perennial	Endangered B1ab(ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Nanobubon hypogaeum	Rubber-root firecarrot	APIACEAE	Herbaceous Annual	Endangered B1ab(i,ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Wahlenbergia polyantha	Capebells	CAMPANULACEAE	Herbaceous perennial	Vulnerable B1ab(ii,iii,iv,v)	**Moderate** It is conceivable that this species might be present following the precautionary principle. However, it was not observed during the site assessment.
Cullumia carlinoides	Limestone snakethistle	ASTERACEAE	Perennial	Near Threatened B1ab(ii,iii,iv,v)	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Erica unicolor subsp. *mutica*	Two-onecolor heath	ERICACEAE	Shrub	Endangered B1ab(ii,iii,v)	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Euchaetis albertiniana	Albertina beardbuchu	RUTACEAE	Shrub	Endangered A2c	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.

Freesia caryophyllacea	Fragrant kammetjie	IRIDACEAE	Geophyte	Near Threatened B1ab(i,ii,iii,iv,v)	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Leucospermum praecox	Mossel Bay pincushion	PROTEACEAE	Shrub	Vulnerable A2c+3c+4c	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Sensitive species 153	-	RUSCACEAE	-	Endangered B1ab(ii,iii,v)+2ab(ii,iii,v)	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Sensitive species 500	-	ORCHIDACEAE	-	Endangered C2a(i)	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Sensitive species 516	-	ASPHODELACEAE	-	Endangered A2cd+4cd; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)	**Low** This species was not observed, and past disturbances and the habitat on the site lead to an assessment that this species is unlikely to be present on Farm 38 / 136.
Sensitive species 268	-	ASPHODELACEAE	-	Endangered B1ab(iii,iv,v)	**Very Low** Habitat requirements are not met, and past disturbance and current edge effects on the site also reduces the likelihood of occurrence on this species.
Sensitive species 654	-	ORCHIDACEAE	-	Vulnerable C2a(i)	**Very Low** Habitat requirements are not met, and past disturbance and current edge effects on the site also reduces the likelihood of occurrence on this species.
Sensitive species 800	-	IRIDACEAE	-	Vulnerable B1ab(iii)	**Very Low** Habitat requirements are not met, and past disturbance and current edge effects on the site also reduces the likelihood of occurrence on this species.

6. SITE SENSITIVITY VERIFICATION

6.1 Terrestrial Biodiversity

The terrestrial biodiversity theme sensitivity is confirmed as **Very High** (see the next section on the site ecological importance for a more detailed assessment if the ecology of the site). This is because the BPA trigger for the site was accurate (Table 4).

Table 4: The original triggers for the terrestrial biodiversity theme sensitivity. Grey entries represent reasons that do not apply to the site, and green entries do apply to the site.

Sensitivity layer	Reasoning
Red listed ecosystems	The Screening Tool cites that the site is EN Hartenbos Dune Thicket, and this vegetation type had been confirmed as the vegetation type on the site. The vegetation was greatly disturbed in the past, but there has been no soil disturbance on the site for at least the past 35 years.

6.2 Botanical Diversity, Protected Species, & Species of Conservation Concern

The plant species theme sensitivity of the site is confirmed to be **High** due to the presence of *Hermannia lavandulifolia* (VU) and the likely occurrence, or high habitat suitability of the site for several other SCC. The site also contains a high density of Milkwood trees, and patches where Cheesewood trees are also common.

7. SITE ECOLOGICAL IMPORTANCE

The site ecological importance map (Fig. 14) is intended to provide a more refined overview of the sensitivity of the various habitats that have been identified on the site. 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 5 below. The SEI mitigation recommendations for the various ecological importance categories are in in Table 6, and SEI calculation reasons are given in Table 7. The method that was used to calculate the SEI map provided is given in Appendix 13.3.

Table 5: Vegetation Assets, States, and Transitions (VAST) framework with columns representing states and shifts between them defined as transitions, as laid out in (Lesslie et al., 2010; Thackway & Lesslie, 2006).

Increasing modification

		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		
Vegetation cover classes		**Class 0: RESIDUAL BARE**	**Class I: RESIDUAL**	**Class II: MODIFIED**	**Class III: TRANSFORMED**	**Class IV: REPLACED -ADVENTIVE**	**Class V: REPLACED -MANAGED**	**Class VI: REMOVED**
		Areas where native vegetation does not naturally persist	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	Native vegetation community structure, composition and regenerative capacity intact—perturbed by land use or land management practice	Native vegetation community structure, composition and regenerative capacity significantly altered by land use or land management practice	Native vegetation replacement—species alien to the locality and spontaneous in occurrence	Native vegetation replacement with cultivated vegetation	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 14: The SEI map for the terrestrial and botanical themes on Farm 38 of 136.

The Site Ecological Importance (SEI) for most of the property is Medium due to the possible occurrence of SCC, the confirmed presence of *Hermannia lavandulifolia*, and the confirmed EN vegetation type Hartenbos Dune Thicket on the site. Hartenbos Dune Thicket persists on the site, despite obvious signs of past disturbances on the site (reasons are provided in Table 6). The site may seem to have a low ecological importance due to the past disturbance and numerous invasives taking over in some places but recovering patches of thicket are doing very well without any intervention so far.

Table 6: 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 7: The evaluation of the SEI for the vegetation / habitats present within and surrounding the proposed development.

Land use / Land cover	Conservation Importance (CI)	Functional Integrity (FI)	Receptor Resilience (RR)	Site Ecological Importance (SEI)
Hartenbos Dune Thicket & grassy open vegetation mosaic	**Medium** Highly likely occurrence of NT species and VU plant species listed under criteria A only where more than 10 000 mature individuals still persist in nature. An area of invaded, but slowly passively recovering section of an EN ecosystem.	**Medium** Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.	**Medium** VAST Class II This habitat has already been disturbed, and recovery is being hindered by invasive species, especially *Acacia cyclops* and *Lantana camara*. Up and coming invasives are also likely to become a larger problem, such as *Anredera cordifolia*. The habitat therefore recovers slowly (over 10 years) to recover > 75% of the original species composition and receptor functionality. However, the housing development will lead to a permanent loss of vegetation & habitat.	**Medium** BI: Medium RR: Medium
Road verge vegetation	**Medium** Confirmed occurrence of a VU plant species (*Hermannia lavandulifolia*) listed under criteria A only where more than 10 000 mature individuals still persist in nature.	**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. Low rehabilitation potential.	**High** VAST Class III The grassy road verge is likely going to remain very similar due to ongoing maintenance.	**Very Low** BI: Low RR: High
Road	**Very Low** No natural remaining	**Very Low** No habitat connectivity except for flying species or flora with wind-dispersed seeds.	**Very High** VAST Class VI The road will remain a road.	**Very Low** BI: Very Low RR: Very High

8. PROJECT AREA OF INFLUENCE

The project area of influence (PAOI) within the context of this report, can be defined as the spatial extent that surrounds the proposed development or activity which has direct, indirect, and cumulative impacts on natural stands of plant communities, vegetation types, and associated ecological processes. From a botanical point of view, the PAOI includes the immediate and permanent footprint of the site development plan (SDP), as well as adjacent areas where the flora and ecosystem will be affected by the development, such as through changes in hydrology, microclimate, soil composition, or edge effects. The PAOI boundary is

determined based on the sensitivity of local ecosystems, species dispersal ranges, ecological connectivity, and potential pathways of impact.

Given the location of this site in the middle of the residential and built-up area in Tergniet, and the fact that the whole property will be transformed under current plans, and because it is already fragmented by Robertson Avenue, houses, and the railway along the south, the entire property is considered as falling inside of the Primary PAOI. There are some open neighbouring properties to the west and east of the site, however the vegetation there is largely separated from this portion via fences, and disturbances on various properties follow different timelines. This strips of adjacent vegetation (e.g., along the railway and neighbouring properties) are within the Secondary PAOI, as the development will affect ecosystem resilience in these areas.

While other nearby open spaces in the Tergniet area might also be considered within the Tertiary PAOI of the project, these are not affected directly, and a rough indication of these areas are provided in Table 8. These Tertiary PAOI areas are affected more indirectly through concepts like general landscape fragmentation, corridor loss, and ecosystem bottlenecks created by increasing development and loss of open spaces. For this reason, the PAOI is split into three sections (Verburgt et al., 2020), as illustrated in Table 8.

Table 8: The Area Calculations for the PAOI (Verburgt et al., 2020) as it relates to the botanical and terrestrial biodiversity themes.

PAOI	Area (ha)	Description	Probability
			
Primary (SDP, with gardens)	6.21	Areas that will be transformed or form part of gardens – The entire Portion 38/136	Definite direct impacts
Secondary (see above)	ca. 5.48	The small and already disturbed natural areas that remain in a fragmented state around Portion 38/136	Some direct and mostly indirect impacts
Total	**ca. 11.69**		
Tertiary (see above)	Over 22	General open space adjacent to the Portion that will be affected by the further fragmentation & loss of corridor habitat & plant populations.	Indirect impacts

9. CONTEXT OF CRITICAL BIODIVERSITY AREAS AND SCALE MISMATCH

When considering the potential impacts of the proposed development on biodiversity, natural habitats, and CBAs, it is important to contextualize the scale of the project relative to the remaining extent of Hartenbos Dune Thicket (AT40). According to mapping layers (Figure 15):

- In the 2018 layer, AT40 covered approximately 65 066 ha.
- SANBI 2021: The remaining natural ecosystem remnant layer was estimated at 51 579 ha (79% of the 2018 mapped area). This differs slightly from the vegetation type description, which reports 16.5% transformation; the 2021 SANBI layer indicates closer to 21% transformation. This has likely increased since 2021.
- In the 2024 NVM, AT40's mapped extent on the National Vegetation Map (NVM) has shifted to ca. 59 632 ha, with roughly 657 ha specifically (blue areas near Mossel Bay in Figure 14) replaced by the newly described Southeastern Strandveld vegetation type.

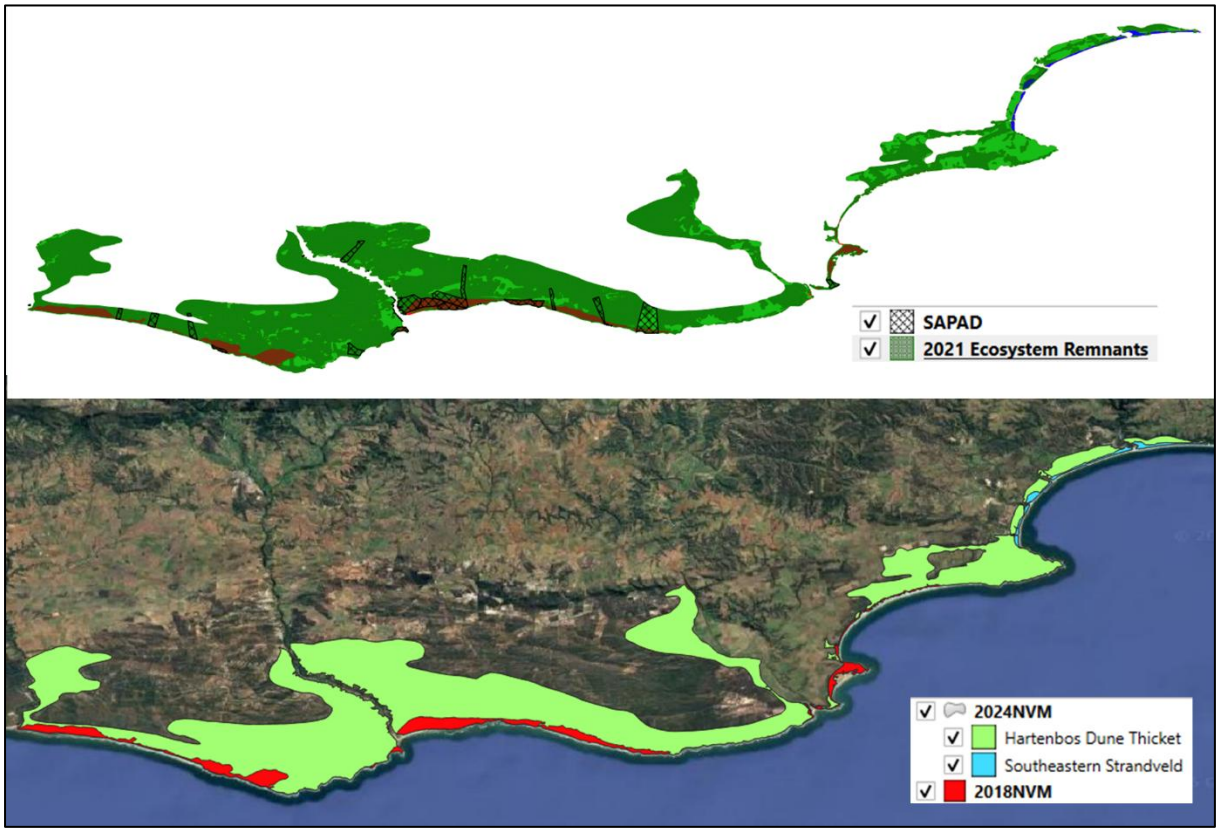


Figure 15: A figure indicating the majority of the 2018 and reduced 2024 mapped area of Hartenbos Dune Thicket. The top map indicates darker areas where vegetation is still intact with SAPAD indicating the South African Protected Areas.

Of the original 2018 mapping, approximately 3 254 ha are included in formal Nature Reserves (see Fig. 15), meaning that only around 5% of the original HDT occurs within protected areas. The conservation target for this vegetation type is 19%, indicating that much of the ecosystem remains outside formal protection.

Against this regional context, the proposed development footprint on Portion 38 of Farm 136 is extremely small. The total site area is 5.96 ha. This means the site represents approximately 0.01% of AT40. This comparison demonstrates a scale mismatch (Falco et al., 2022; Satake et al., 2008): while the site-specific development represents a permanent transformation of the majority of the property, the regional Hartenbos Dune Thicket ecosystem extends over tens of thousands of hectares. Consequently, the impact of the development, when evaluated within the broader ecological landscape, is highly localized and does not register on a habitat at the regional scale.

9.1 Refined CBA Context (2023 re-classification)

The above does not imply that site-level impacts are insignificant; rather, it highlights that CBAs and site vegetation must be interpreted within the local landscape context of Tergniet, as opposed to being assessed solely at the scale of the vegetation type. The site was reclassified in 2023 from Other Natural Area (ONA) to Critical Biodiversity Area 1 (CBA1) for terrestrial biodiversity under the Western Cape Biodiversity Spatial Plan (WCBSP), as described earlier in this report. While the CBA1 designation, if considered in isolation, suggests a “no further loss” objective, this must be interpreted within the broader spatial planning context.

Given the extreme scale mismatch with the regional extent of AT40 (0.01%), the proposed development does not compromise the achievement of provincial or national biodiversity targets for this vegetation type. Furthermore, the WCBSP is a strategic biodiversity planning tool, developed at a regional scale to inform land-use planning and environmental decision-making. It is not a prescriptive or regulatory zoning instrument and cannot, on its own, preclude development on privately owned land. Rather, it serves to:

- identify areas of higher biodiversity importance,
- guide proactive conservation efforts, and
- inform the level of assessment and mitigation required in environmental authorisation processes.

CBAs are delineated through systematic biodiversity planning to efficiently meet targets for ecosystem representation, species persistence, and ecological infrastructure. As such, they function as decision-support tools, highlighting ecological sensitivity and triggering appropriate levels of scrutiny (e.g. specialist studies and, where applicable, more rigorous EIA processes). While CBA1 areas prioritise the maintenance of natural or near-natural habitat and avoidance of further loss where feasible, they do not constitute an automatic prohibition of development. Development within such areas may be considered where supported by detailed, site-specific assessments, and the appropriate application of the mitigation hierarchy. Although the CBA1 status necessitates a rigorous and precautionary assessment approach, it cannot be applied as an absolute constraint. In this case, the combination of:

- the extreme scale mismatch between the site and the regional vegetation extent;
- the site-specific assessment of ecological condition and sensitivity; and
- design refinements (particularly for the preferred SDP),

supports the consideration of the proposed development within the EIA process, subject to the implementation of appropriate mitigation and management measures.

10. IMPACT ASSESSMENT

An impact assessment is required because the vegetation in the site has been left to recover for longer than a decade and can be considered natural Hartenbos Dune Thicket, which is listed as an endangered (EN) vegetation type. Furthermore, although not abundant on the site, the vulnerable (VU) *Hermannia lavandulifolia* was also confirmed on the site, and several Red listed species of conservation concern (SCC) could be supported by the habitat, despite not being found at the time of the survey.

The assessment provided below follows the mitigation hierarchy (Fig. 16). The mitigation hierarchy (Brownlie et al., 2023; Ekstrom et al., 2015) states that the next step should only be followed once the previous step of the hierarchy is no longer viable with valid reason. The impact assessment methodology is presented in Appendix 13.4. Part of assessing the impacts in the site is also considering the "no-go" option.

The "no-go" option refers to the current "status quo" of the site, i.e., where the naturally returning thicket vegetation is allowed to persist on the site with no planned housing development. This is an important step, as the no-go scenario can be compared to the residual impacts associated with the proposed development.

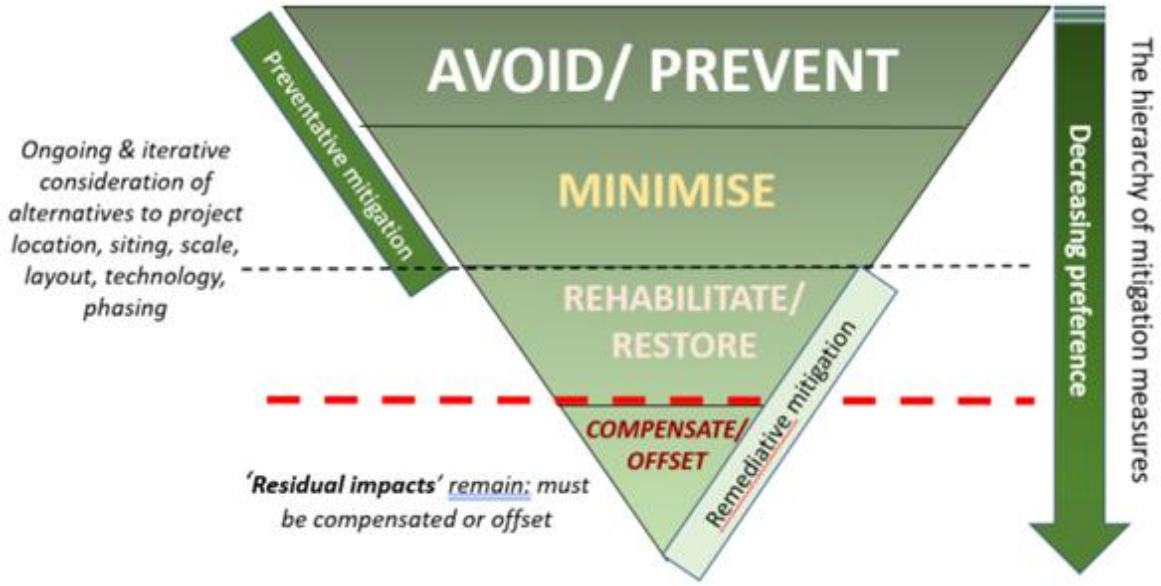


Figure 16: The mitigation hierarchy as presented in (Brownlie et al., 2023). Mitigation steps are illustrated in a hierarchy. The lower steps in the diagram should only be considered once the steps above have been duly considered.

10.1 No-Go Option

The No-Go option is the scenario where the development does not proceed, and the site is left in the current state. The likely trajectory of this scenario must be incorporated into the impact assessment process, as this will serve as an important comparison to the proposed development alternatives. While halting development may appear to preserve ecological value, the site is already experiencing multiple anthropogenic disturbances and fragmentation, as is evident from some existing impacts occurring on the site. These current impacts are discussed below.

10.1.1 Current Impacts

An assessment of existing environmental impacts is essential to understand the current condition and ecological resilience of Portion 38 of Farm 136, Hartenbos. Although portions of the site remain vegetated and support remnant patches of Endangered Hartenbos Dune Thicket, historical and ongoing human activities have already altered the natural environment. This section outlines the existing disturbances and pressures that may affect the receiving environment's ability to absorb additional impacts. Some of the main current negative impacts on the site includes:

- The site is already small and now further split by Robertson Avenue. This reduces ecological connectivity and resilience. This is especially critical for small mammals, reptiles, pollinators, and dispersal-limited plant species.
- As noted, urban edge effects and garden escapees (e.g., *Acacia cyclops, Cestrum laevigatum, Opuntia ficus-indica, Ricinus communis, Cenchrus clandestinus*, and *Lantana camara*) can establish aggressively in disturbed areas. Invasive and emerging invasive plants displace native Hartenbos Dune Thicket species and alters the habitat reducing ecosystem resilience.
- Ongoing human disturbance such as pedestrian shortcuts, paths through the vegetation, litter & dumping of garden waste along the edges, noise & light pollution. These cause localised degradation which has a greater impact on small, isolated and fragmented patches of remaining natural vegetation.
- Altered soil and degradation from historical use of the site for agriculture, and the fact that the vegetation on the site is visibly in a secondary growth state means that the thicket here is more vulnerable to disturbance.

10.2 Layout and Design Phase

The layout and design phase of the proposed development has undergone refinement since the original Site Sensitivity Verification (SSV) for the botanical and terrestrial themes, which was completed in May 2024. At the time of the initial SSV, a Site Development Plan (SDP) was available for assessment which is referred to as **Alternatrives 1, and 2** (see Section 1.2). Following feedback provided in the SSV, the SDP was revised again to indicate protected trees that are to be retained / removed and is considered the **Alternative 3**. Despite consideration of protected trees, all layouts have a very similar footprint.

10.2.1 LAYOUT AND DESIGN 1: Impact of Planning for the Inclusion of a Habitat Corridor Along the Southern Boundary of the Property in the SDP

Description & Mitigation: A corridor of vegetation aims to provide habitat for wildlife movement and dispersal but also creates opportunities for replanting rescued plants during the construction phase. It is recommended that the ecological corridor be incorporated as recommended in **the Preferred SDP**, which was produced in November 2025 and is presented in Section 1.2 of this report. While not the same overall extent as the original recommendation to increase the servitude uniformly by 11m, the habitat pockets indicated along the servitude provide opportunities for the persistence of natural vegetation on the site, as well as receptor sites for rescued vegetation. The aim is to maintain these areas as natural open space with no landscaping.

The Preferred SDP results in a total of 133 units, representing a reduction compared to the earlier alternatives: 144 units in Alternative 3, 149 units in Alternative 2, and 156 units in Alternative 1.

This measure contributes to maintaining a degree of ecological function in an increasingly fragmented landscape and is considered a mitigation feature of the layout phase for the Terrestrial Biodiversity theme as it reduces habitat loss and promotes some corridor connectivity to remain.

10.3 Construction Phase

The construction phase will involve site clearance, bulk earthworks, construction of buildings and infrastructure, and building activities associated with the proposed development. This phase presents a high rate of environmental disturbance, particularly to remaining natural vegetation and soil stability. To ensure that mitigation measures are effectively implemented and to monitor compliance, an independent Environmental Control Officer (ECO) must be appointed for the full duration of the construction phase.

10.3.1 CONSTRUCTION 1: Permanent loss of Secondary Hartenbos Dune Thicket (EN) Habitat due to Earthworks and Other Construction Related Activities.

Description: The proposed development on Portion 38 of 136 will result in the permanent loss of over 50% of the remaining vegetation on the site, and the transformation of ca. 70% of the site (which includes gardens and non-permanent areas in the footprint), based on the site development plans provided. This area currently supports secondary Hartenbos Dune Thicket, an Endangered vegetation type that has started the process of natural recovery following historical agricultural disturbance. Although the current condition is not pristine, the vegetation contributes meaningfully to the local ecological network and the broader conservation objectives for this ecosystem. Development-related activities will lead to the permanent loss and increased fragmentation of thicket vegetation within the defined development footprint, resulting in the direct removal of habitat.

While the area to be transformed represents a very small fraction of the remaining extent of this vegetation type at a regional scale, the loss is still important in cumulative terms, especially given ongoing development pressure in the greater Tergniet-Mossel Bay coastal corridor. Construction-phase environmental control will be crucial to minimise unintended edge damage, as illustrated by the secondary and tertiary PAOI for the site. Mitigation is presented in Table 9.

Table 9: Mitigation for a Permanent loss of Secondary Hartenbos Dune Thicket (EN) Habitat due to Earthworks and Other Construction Related Activities.

Outcomes and Actions	Responsibility
Clearly demarcate the construction footprint	
Make use of fencing such as shade cloth or netting, before site clearing begins. See the pictures below for some examples.  	Contractor & construction staff
Demarcate the 11m buffer along the southern boundary with temporary fencing prior to commencement of construction. This area must be indicated as a No-Go area with clear signage. No vehicles, stored materials, or unnecessary access are permitted for the duration of construction. It is the site for relocating rescued plants and should not be disturbed.	Onsite surveyor, contractor and ECO.
Ensure that all construction staff are aware that areas outside of the demarcated footprint are off limits. This also means ensuring appropriate facilities are available, e.g., ablution facilities.	Contractor and ECO to hold weekly meetings with staff.
Prevent vehicle and personnel movement outside demarcated areas by installing appropriate signage, having designated parking areas in cleared and disturbed areas only.	Contractor and ECO
Ensure that construction and delivery vehicles have clearly defined turning circles. These should preferably be in areas of existing transformation or in areas that fall within the permanent disturbance footprint of this project. No delivery vehicles are allowed on adjacent erven or in naturally recovering thicket vegetation beyond the disturbance footprint, as defined in the SDP for the project.	Contractor and ECO
Weather reports must be checked daily to avoid heavy machinery and activities on the site during rainy weather. Following a significant rainfall event (excluding short periods of gentle, light rain), all construction on the site must cease temporarily. Following such an event, a survey of damage must first be conducted and appropriate mitigation put in place before the continuation of construction	Contractor, ECO, and ECO
Where vegetation will be cleared to make way for construction, erosion control, such as filled sandbags must be used to reduce the intensity of water runoff and flow over the site. Sandbags must be placed perpendicular to the flow of water in areas where runoff might be anticipated.	Contractor with guidance from the ECO or an aquatic specialist.

Outcomes and Actions	Responsibility
 	
Management of invasive and exotic plant species	
Alien clearing must be undertaken during the construction phase to prevent invasive plants from becoming large stands during this time. No newly planted kikuyu grass is allowed anywhere on the site (this is a listed invasive species).	ECO to communicate the list of invasive species to the project contractor.
Recommendations for clearing of invasive plant species should follow the recommendations in the Garden Route District Municipality Invasive Species Monitoring, Control, and Eradication Plan (Rose & Dyantyi, 2019)	ECO to point out areas and oversee constriction staff.
Soil management on the construction site	
Topsoil within new excavation areas must be stripped to a depth of ca. 30cm and kept in designated piles. Topsoil piles must be suitably covered with a geotextile. The topsoil piles must be clearly labelled so that it does not mix with subsoils excavated or any other construction material for the site.	Contractor overseeing constriction staff. ECO to check on stockpile placement.
Should there not be space for storage and protection of topsoil on site, then an alternative temporary stockpile area that is already transformed and where soils can easily be retrieved for post-construction rehabilitation must be identified and used	Contractor with guidance from the ECO.
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. This mitigation measure should take place based on adaptive management on site.	ECO to report to the contractor where cleanup or dust suppression is required

10.3.2 CONSTRUCTION 2: A loss of protected tree species (Sidoxylon inerme inerme & Pittosporum viridiflorum), and the VU SCC Hermannia lavandulifolia due to earthworks and other construction related activities.

Description: The proposed development footprint is within Hartenbos Dune Thicket which includes two protected tree species, *Sideroxylon inerme* (Milkwood) and *Pittosporum viridiflorum* (Cheesewood). These trees are protected under the National Forests Act (No. 84 of 1998), and their removal, damage, or disturbance requires prior authorisation. A permit for these tree species will need to be obtained prior to the commencement of construction. In addition, field verification and botanical surveys have indicated the likely presence of SCC associated with the Hartenbos Dune Thicket vegetation type. Only *Hermannia lavandulifolia* (VU) was confirmed on the site, and it is highly likely that this species will not persist on the site in the long-term.

H. lavandulifolia is a widespread species and is very abundant in the Tergniet and Great Brak areas. Because only one or two plants were observed during the site survey on Portion 38 of 136, this development will have a negligible effect on the populations of this species. For this reason, a search and rescue of the *H. lavandulifolia* is not recommended.

Unlike broader vegetation clearing, the loss of these individual, often mature trees represents a more targeted ecological impact: the removal of important seed sources, and the loss of microhabitats (e.g., “nurse” trees allowing other thicket species to regenerate, as well as nesting or foraging sites) that cannot be quickly replaced through rehabilitation. Milkwood trees, in particular, can serve as structural keystone species in thicket environments, influencing soil stability, shading, and biodiversity.

Given the legal and ecological significance of these species, a tree-specific mitigation strategy is required prior to construction. This includes avoidance and protection measures where possible, obtaining the necessary permits for any removal, and incorporating suitable rescue, and propagation and tree relocation actions as part of the pre- and post-construction phases. Mitigation is presented in Table 10.

Table 10: Mitigation for a loss of protected tree species (Sidoxylon inerme inerme & Pittosporum viridiflorum), and the VU SCC Hermannia lavandulifolia due to earthworks and other construction related activities.

Actions	Responsibility
Protect remaining large indigenous trees (especially *Sideroxylon inerme* and *Pittosporum viridiflorum*)	
Trees outside of the SDP footprint, but still within the PAOI must be protected and may not be damaged. Do this by marking and numbering individual trees. Trees to be moved within the SDP footprint can be marked with danger tape, and those to be retained should be demarcated with protective wooden boxing or fencing, as illustrated below	ECO to guide the contractor.
 	
The Search and Rescue of Protected Trees: It is recommended that this take place in the cooler, wetter months of late autumn to early spring, from May through August. This period allows plants to be relocated when soil moisture is more stable, reducing transplant shock and giving plants a better chance to establish roots before the hotter, drier months. Additionally, it aligns with the growing season for many thicket species. Although plant search and rescue does not compensate for all negative impacts from development, it can serve as a meaningful supplementary mitigation measure. While it cannot fully replace the ecological value lost from habitat transformation, search and rescue contributes by salvaging individual plants, particularly the protected trees which enhances the biodiversity resilience of the area slightly. As such, search and rescue does not substitute the lost ecosystem function entirely but offers a valuable contribution to conserving individual plants. Note that *Hermannia lavandulifolia* (VU) is not included in the search and rescue – only one or two plants were found, and this species has a wide root system which makes it harder to rescue without significant root shock (pers. obs.).	

Actions	Responsibility
Obtain permits from the Department of Forestry, Fisheries and the Environment (DFFE) for any rescue and relocation of protected trees under the National Forests Act. Document the entire process outlined below (before, during, and after) as part of the ECO's monitoring file.	Property owner with inputs from the ECO
Plan a rescue of selected trees within the SDP footprint prior to construction within a given section of the site. It might be useful to break the construction plan into sections, so that a rescue in one area can occur, while construction is ongoing in areas that have already been cleared. Trees that can be rescued are typically: • Seedlings and saplings (up to 1.5–2 m tall). • Small-medium trees with a DBH (diameter at breast height) up to 25 cm, and no signs of stress.	Contractor, and ECO
Excavation Procedure: Water the root zone a day before extraction to soften the soil. Then dig a wide root ball (with a radius of at least 3 times the stem diameter). Carefully lift with soil intact to protect fine feeder roots. Under careful supervision, a construction digger / excavator may be used to help lift the trees	ECO to guide an excavator operator.
Rescued Trees Handling: Wrap root ball with soil in moist hessian or burlap (ensure these are biodegradable). Keep the trees shaded and cool while in transit and in the designated nursery area. Do not allow roots to dry out, i.e., regularly water the trees.	ECO to guide construction workers helping
The rescued plants may be planted within future open spaces of the development site but would preferably be planted along the proposed corridor along the southern boundary. This area will be least disturbed during construction and is close enough for a quick replanting and monitoring.	Planning with Contractor and ECO. If necessary, obtain input from a botanical specialist.
Transplanting: Dig a hole twice as wide as the root ball, carefully remove the burlap / hessian, and then backfill with topsoil (which has also been preserved on the site, as mentioned already), and firm down gently.	Contractor with guidance from the ECO.
Aftercare and Monitoring: Water trees regularly (weekly or as needed) during first 6–12 months following transplanting. Apply mulch to retain soil moisture. Monitor for signs of dieback, fungal infection, or pest damage.	Contractor with construction workers, overseen by ECO.

10.4 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.

10.5 Operational Phase

The operational phase of the project is the final phase of this proposed development, during which the residential development will be fully occupied and functional. Given that the nature of this development is permanent housing, there is no anticipated decommissioning phase for this proposed development. Long-term environmental impacts during this phase are assessed, and options for ongoing management are discussed

10.5.1 OPERATIONAL 1: A slow loss of thicket habitat, protected tree species, and plant species biodiversity due to landscaping and maintenance activities required.

Description: During the operational phase, the site will undergo long-term transformation through landscaping, gardening vegetation trimming, invasive species control, garden planting, and the upkeep of paths, driveways, and stormwater infrastructure. While much of the direct impact occurs during construction, subtle but cumulative ecological degradation often continues over time as a result of how the land is used, maintained, and modified post-construction. For example, important taxa to the ecosystem, or protected trees like *Sideroxylon inerme* (Milkwood) and *Pittosporum viridiflorum* (Cheesewood) may be subject to inappropriate management practices (e.g., excessive pruning, soil compaction around root zones, or competition with alien/exotic species).

The most significant concern is the progressive degradation of remaining Hartenbos Dune Thicket fragments, which are already fragmented, secondary in structure, and under pressure.

The introduction of non-local or alien plant species into gardens, even when labelled “indigenous” can introduce exotic plants into the environment as garden escapees which, even if initially controlled, can easily colonise thicket edges, especially in areas disturbed by footpaths or informal activity. In highly fragmented habitats like Hartenbos Dune Thicket, this can lead to genetic pollution, cryptic hybridisation, and eventual loss of local plant genotypes and floristic integrity. The site already hosts invasive alien plants, including Castor bean (*Ricinus communis*) and Rooikrans (*Acacia cyclops*), which are likely to spread further if not actively managed. In more intact or extensive ecosystems this might be manageable, but in the context where every remaining fragment of natural habitat holds some conservation value, such a spread could lead to complete loss of Hartenbos Dune Thicket fragments on this property, leading to further changes in ecosystem dynamics. Mitigation measures to address this impact are presented in Table 11.

Table 11: Mitigation for a slow loss of thicket habitat, protected tree species, and plant species biodiversity due to landscaping and maintenance activities required (e.g., ongoing management of invasive plants, vegetation trimming, path and road maintenance, etc.).

Actions	Responsibility
Management of Invasive Alien Plants	
Compile a gardening guideline for homeowners which should be written into the constitution for the homeowner's association. This should include the recommendations in this section.	HOA
Landowners, garden services, and contractors must be informed that trimming, cutting or removal of protected tree species is an offence without the necessary permits.	HOA
Implement and maintain an alien clearing and monitoring programme as required in terms of NEM:BA. A lot of guidance is available on invasive plant management, as mentioned the guidelines in the "Garden Route District Municipality Invasive Species Monitoring, Control, and Eradication plan (Rose & Dyantyi, 2019) should be the primary document of reference. Some other guideline documents that may also be used as a control plan include the George Municipality Invasive alien plant monitoring control & eradication plan (Buchholz, 2021), and the "A practical guide to managing invasive alien plants: A concise handbook for land-users in the Cape Floral Region" (Martens et al., 2021).	Landowners / HOA (Homeowners association) / ECO
Do not plant kikuyu grass or any other invasive grasses in gardens, and maintain gardens so that invasive or exotic plants do not spread into natural areas. Rather plant *Cynodon dactylon* (kweek) or *Stenotaphrum secondatum* (Buffalo grass).	Landowners
Remove existing invasive species between houses, such as castor bean (*Ricinus communis*) and Rooikrans (*Acacia cyclops*).	Landowners / HOA
Dispose of garden waste responsibly; no dumping in natural areas or the corridor. This includes no disposal of greywater into the environment.	Landowners / Garden services
Landscaping and Gardening	
Prioritise thicket rehabilitation over ornamental gardening. Avoid burning thicket vegetation, or fires in remaining thicket vegetation.	HOA and Landscape architect/s
Avoid fertilisers and pesticides; if used, apply sparingly and not as routine practice.	Landowners and their appointed Gardeners
Encourage soft landscaping over hard landscaping, using local plants that support biodiversity.	HOA and Landscape architect
Additional sustainable garden design principles from FynbosLife nursery in Cape Town has been adjusted to illustrate some good land-use practices: 1. Consider rainfall, slope/aspect, wind direction and microclimates of your garden before choosing plants. Shape the ground to capture rainfall and slow water loss. Install a rainwater tank if possible. 2. Select locally indigenous plants according to vegetation type (Hartenbos Dune Thicket) and prioritise local plant sources. Avoid hybrid plants and cultivars. Plant in the rainy season only and add a 10cm-thick surface layer of wood chips to lock in soil moisture and keep roots cool. Examples of species suitable for this vegetation type are provided below, although not all these plants are readily available in nurseries.	Provided by the HOA as a guide to homeowners.

Actions	Responsibility
Aloe ferox, *A. arborescens*, *Pterocelastrus tricuspidatus* (Candlewood trees), *Sideroxylon inerme* (Milkwood trees), *Pittosporum viridiflorum* (Cheesewood trees), *Carpobrotus acinaciformis*, *C. edulis, Cotyledon orbiculata, Crassula nudicaulis, Euphorbia burmannii, E. bayeri, Roepera morgsana, Brunsvigia orientalis, Chasmanthe aethiopica, Freesia leichtlinii, Haemanthus coccineus, Ixia orientalis, Eriocephalus africanus, Felicia echinata, Helichrysum patulum, Muraltia spinosa, Salvia africana-lutea, Agathosma apiculata, A. muirii, Athanasia cochlearifolia, A. quinquedentata, Restio eleocharis, Themeda triandra, Azima tetracantha, Carissa bispinosa, Cassine peragua, Cussonia thyrsiflora, Euclea racemosa*, *Grewia occidentalis, Lauridia tetragona, Maytenus procumbens , Metalasia muricata, Morella cordifolia, Mystroxylon aethiopicum, Olea exasperata, Osteospermum moniliferum, Passerina rigida, Putterlickia pyracantha, Robsonodendron maritimum, Scutia myrtina, Searsia crenata, Searsia glauca, Searsia lucida, Searsia pterota, Leucospermum praecox, Rhoicissus digitata*, and *Solanum africanum* 3. Choose a variety of flower shapes, sizes, colours, scents and fruit types to sustain a diversity of bird and insect pollinators and dispersers. How about building an insect hotel? Plants with fluffy seedheads provide nesting material for birds. 4. Replace or substantially reduce lawn areas by planting water-wise groundcovers or enlarging existing shrub beds. 5. Add local edible and aromatic plants to supplement or replace thirsty exotic veggie/herb gardens. E.g., *Eriocephalus africanus*, *Chironia baccifera*, and *Carissa bispinosa*. 6. Install nesting boxes for bats and owls to provide breeding sites for these natural pest control agents. Never use rat poisons with secondary poisoning effects. 7. Choose permeable fencing or create holes in perimeter walls to allow the free passage of wildlife between gardens. 8. Turn an unused corner into a dead hedge (unturned heap of garden waste) to provide suitable habitat for decomposers.	
Visitors & Homeowners Conduct	
Have information boards to inform guests about restricted areas and prohibited activities, as well as to illustrate the biodiversity of the area to incentivise care for the remaining vegetation.	Landowners & HOA
Restrict movement to designated roads, boardwalks and paths only	Enforced by HOA

10.6 Impact Assessment Tables and Residual Impacts

The impact assessments presented in Table 12 can be interpreted and ranked according to the rating system provided in the appendix 13.4. These assessments illustrate both the significance of potential impacts prior to mitigation and the anticipated effectiveness of the mitigation measures proposed. This enables a clear understanding of the residual impacts that remain once mitigation is applied.

The difference in residual impacts between Alternatives 1, 2, and even 3 are marginal, with minor benefits associated with retention of some protected trees in Alternative 3. The further mitigation measure to retain a corridor of thicket vegetation in addition to the servitude area along the southern boundary was assessed as the Preferred development option, and had a more significant reduction on the impacts of loss of Hartenbos Dune Thicket, especially in the

construction phase clearance of vegetation where the Preferred option has a lower percentage clearance associated with it.

The no-go alternative, while avoiding direct habitat loss, maintains existing pressures on the site and contributes little to long-term conservation of Hartenbos Dune Thicket or land-use certainty. Its residual impact is therefore assessed as negligible, though the current status quo not necessarily preferable in terms of broader planning outcomes, given the invasion on the site and no clear plan for future management.

Furthermore, Residual impacts refer to the level of impact significance remaining after the mitigation measures have been implemented and do not imply that all ecological effects of development are eliminated.

Table 12: Impact assessment ratings and associated residual impacts.

Alternatives	All Alternatives (1, 2, and 3)		The Preferred development option		No-go Option	
Mitigation	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
LAYOUT AND DESIGN 1: Impact of Planning for the Inclusion of a Habitat Corridor Along the Southern Boundary of the Property in the SDP						
Duration	Permanent	**NA** (the corridor is the "with mitigation" scenario in the Layout and Design Phase	Permanent	**NA** (the corridor is the "with mitigation" scenario in the Layout and Design Phase	Immediate	**NA**
Extent	Very limited		Very limited		Very limited	
Intensity	Low		Very low		Negligible	
Probability	Certain		Certain		Highly unlikely	
SCORE	Moderate negative: -77		Minor negative: -70		Negligible negative: -3	
Confidence	**High** (the inclusion of this corridor will improve habitat connectivity)					
Reversibility	**Low** (planned structures in the corridor will be difficult to reverse if implemented)					
Resource irreplaceability	**High** (corridor connections in Tergniet are scarce)					
CONSTRUCTION 1: A Permanent loss of Secondary Hartenbos Dune Thicket (EN) habitat due to earthworks and other construction related activities.						
Duration	Permanent	Permanent	Permanent	Permanent	Immediate	Immediate
Extent	Limited	Very limited	Very limited	Very limited	Very limited	Very limited
Intensity	Moderate	Low	Low	Very low	Negligible	Negligible
Probability	Certain	Certain	Certain	Certain	Highly unlikely	Highly unlikely
SCORE	Moderate negative: -91	Moderate negative: -77	Moderate negative: -77	Minor negative: -70	Negligible negative: -3	Negligible negative: -3
Confidence	**High** (Habitat will be lost to make way for the development, no-go will result in the status quo)					
Reversibility	**Low** (The houses and streets constructed are a permanent feature)					
Resource irreplaceability	**Moderate** (The loss will result in less natural open spaces remaining in Tergniet; more thicket is still available beyond the urban edge)					
CONSTRUCTION 2: A loss of protected tree species (*Sidoxylon inerme inerme* & *Pittosporum viridiflorum*), and the VU SCC *Hermannia lavandulifolia* due to earthworks and other construction related activities.						
Duration	Permanent	Long term	Permanent	Long term	Immediate	Immediate
Extent	Limited	Very limited	Very limited	Very limited	Very limited	Very limited
Intensity	Moderate	Low	Moderate	Low	Negligible	Negligible
Probability	Certain	Almost certain	Certain	Likely	Highly unlikely	Highly unlikely
SCORE	Moderate negative: -91	Minor negative: -54	Moderate negative: -84	Minor negative: -45	Negligible negative: -3	Negligible negative: -3
Confidence	**High** (The loss of some plants will occur and is inevitable)					
Reversibility	**Moderate** (replanting some Milkwood & Cheesewood trees so the original impact is reduced)					
Resource irreplaceability	**Low** (Milkwood, Cheesewood, and VU *Hermannia lavandulifolia* are all widespread species)					

Alternatives	All Alternatives (1, 2, and 3)		The Preferred development option		No-go Option	
Mitigation	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
OPERATIONAL 1: A slow loss of thicket habitat, protected tree species, and plant species biodiversity due to landscaping and maintenance activities required (e.g., ongoing management of invasive plants, vegetation trimming, path and road maintenance, etc.)						
Duration	Ongoing	Medium term	Ongoing	Short term	Ongoing	Short term
Extent	Limited	Very limited	Very limited	Very limited	Limited	Very limited
Intensity	Moderate	Low	Moderate	Low	Moderate	Low
Probability	Almost certain	Likely	Almost certain	Likely	Likely	Likely
SCORE	Minor negative: -72	Minor negative: -40	Minor negative: -66	Negligible negative: -35	Minor negative: -60	Negligible negative: -35
Confidence	**Moderate** (Maintenance issues, or lack of maintenance, could occur, however it is likely that invasive and exotic species will remain a problem on the site)					
Reversibility	**Moderate** (The longer the impact persists, the longer & more expensive mitigation can be. Many invasives are hard to eradicate completely)					
Resource irreplaceability	**Moderate** (Small thicket patches may remain in places, though it's hard to anticipate species retained & where clumps will remain intact over decades.					
RESIDUAL IMPACT		**Moderate negative**		**Minor negative**		**Negligible negative**

10.7 Cumulative Impacts

It is confirmed that, following the application of mitigation measures assessed in this report, all residual impacts associated with the proposed development are of Minor significance, with no post-mitigation impact exceeding a minor negative rating. **The Preferred option** is also the best choice from a terrestrial biodiversity perspective due to the presence of the recommended habitat pockets along the servitude. Alternative 3 is considered marginally better than both Alternatives 1 and 2 in terms of terrestrial impacts, but all three Alternatives are assessed together in the impact assessment as there is no material difference between them.

The long-term success of impact mitigation is highly dependent on post-construction management, especially in maintaining ecological buffers, controlling invasive species, and ensuring the responsible use of gardens and open space by future residents. Without these interventions, cumulative effects may still compromise the ecological integrity of remaining habitat on the site over time.

Although the site represents a small fraction of the regional extent of Hartenbos Dune Thicket (less than 0.1%), its contribution to the local network of remaining natural habitat in the Tergniet–Mossel Bay area is meaningful. As this vegetation type is already Endangered, any incremental loss or fragmentation must be approached with care, and management of retained vegetation should be prioritised over ornamental landscaping with exotic plants.

Furthermore, this development does not trigger an offset requirement mainly due to the residual impact being expected to be minor under the Preferred development option. The inclusion of a corridor ensures connectivity for native flora and fauna and represents a significant measure to avoid the loss of habitat in a red listed ecosystem. By maintaining this continuous green link, the development is better aligned with the mitigation hierarchy, prioritizing avoidance as the first step before any consideration of offsets (Department of Forestry Fisheries and the Environment, 2023). While the remainder of the site would be completely transformed with minimal avoidance of natural habitat loss (apart from protected trees) the Medium SEI determined for the site states that development activities of medium impact are acceptable followed by appropriate restoration activities, which have been provided in the mitigation measures. The combination of the biodiversity corridor, unit reduction, and protection of mature trees ensures that residual impacts are minor and manageable within the development footprint, consistent with the National Biodiversity Offset Guideline (NBOG, 2023) principle that offsets are only considered when significant residual impacts remain and cannot be addressed through avoidance, minimization, or rehabilitation measures (Department of Forestry Fisheries and the Environment, 2023).

Persistence of natural vegetation and habitat within the estate would best be secured through formalisation for the use of these areas as follows:

- Zoning of habitat pockets as Open Space III.
- Strict guidelines on planting for homeowners in terms of what they may plant in their gardens. A plant list of indigenous plants to the local area and vegetation type would ideally be provided, and the list should be attached to conditions in the title deed. An appropriate plant list can be provided on request.
- Strict guidelines on pet ownership and designated dog-walking areas outside of natural spaces written into title deeds and enforced by the HOA.

11. CONCLUSION

The protocol sensitivity for the terrestrial biodiversity and plant species themes is confirmed as Very High and High respectively on the site. However, the vegetation on the site is obviously not yet fully recovered since the long period of anthropogenic disturbance in the 1900s. The site is heavily invaded by invasive species, many of which have the potential to become more dominant over time. The property has also recently been isolated in an existing residential development, where most connections to wider open spaces have been significantly compromised.

The plant SCC *Hermannia lavandulifolia* is not a significant population on the site, nor is it an irreplaceable species as it is common elsewhere and seems to thrive in disturbed areas. For all these reasons, the site ecological importance (SEI) is not high, but rather Medium over the majority of the site, despite the protocol sensitivities. This is because the SEI aims to consider the specific conditions of the site, while the protocol sensitivities are more generic and do not take finer details and site context into account.

As outlined earlier in the report, a permit must be obtained for any trimming, removal, or disturbance of protected tree species, including Milkwood and Cheesewood. Invasive alien plants are expected to remain a long-term management concern, and it is the legal responsibility of the landowner to implement ongoing clearing in accordance with national regulations. Gardens may not include any invasive species, and the selection of landscaping plants must align with the ecological characteristics of the site.

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13. APPENDIX

13.1 Provisional Plant Species List

A species accumulation curve for all the species recorded on the site during the assessment are presented in Fig. 17. All species that were observed during the site visit are in Table 13. The site assessment species list is not exhaustive.

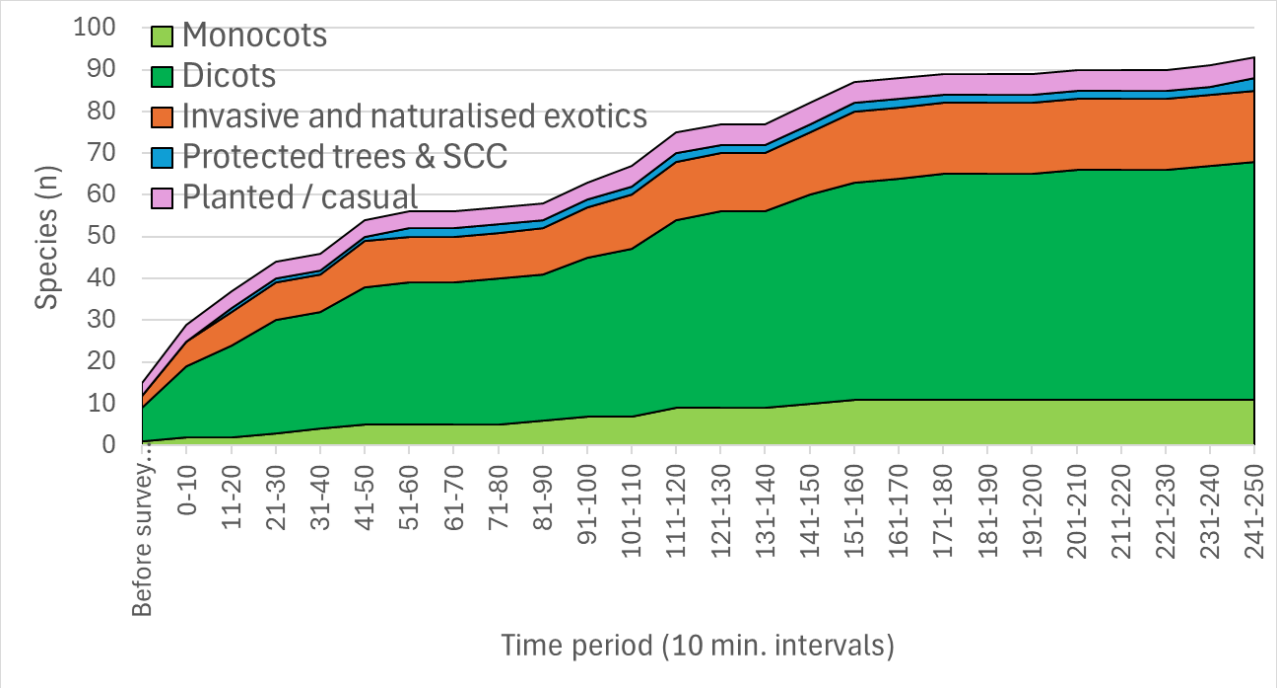

Figure 17: A plant species accumulation curve for the site assessment.

*Table 13: A provisional species list made for plants found during the site assessment on Farm 38 / 136. Protected trees are highlighted in green, listed invasive species in red, and unlisted naturalised exotic species in orange. Species (both invasive & non-invasive) that are planted near the periphery of the site (cultivated) are highlighted in purple. Hermannia lavandulifolia (VU) is highlighted in yellow. A * indicates a dominant species*

Family	Species	Common name	Found in fynbos in Southern half of site? & Information
Liliopsida (Monocots)			
ASPARAGACEAE	*Albuca canadensis*	Soldier-in-a-box	
ASPARAGACEAE	*Asparagus aethiopicus*	African Asparagus	
ASPARAGACEAE	*Asparagus asparagoides*	Cape Smilax	
ASPARAGACEAE	*Yucca sp.*	Yuccas	Planted near the periphery of the site.
ASPHODELACEAE	*Aloe arborescens*	Candelabra Aloe	
COMMELINACEAE	*Commelina africana*	African Yellow Dayflower	
COMMELINACEAE	*Commelina benghalensis*	tropical spiderwort	Naturalised exotic
IRIDACEAE	*Chasmanthe aethiopica**	Cobra Lily	
ORCHIDACEAE	*Bonatea speciosa*	Green Woodorchid	
ORCHIDACEAE	*Eulophia speciosa*	Golden Harlequin	
POACEAE	*Cenchrus clandestinus**	Kikuyu Grass	NEMBA cat. 1b; CARA cat. 1
POACEAE	*Ehrharta erecta*	panic veldtgrass	
POACEAE	*Ehrharta villosa**	Pipe Grass	
POACEAE	*Lagurus ovatus*	Hare's Tail Grass	Naturalised exotic
POACEAE	*Megathyrsus maximus**	guinea grass	
Magnoliopsida (Dicots)			
ACANTHACEAE	*Hypoestes aristata*	ribbon plant	
AIZOACEAE	*Carpobrotus cf. edulis**	sea figs	
AIZOACEAE	*Delosperma inconspicuum*	White Gardenroute Sheepfig	
AIZOACEAE	*Mesembryanthemum canaliculatum*	Beach Dropfig	
AIZOACEAE	*Tetragonia fruticosa*	Sprawling Seacoral	
AMARANTHACEAE	*Atriplex semibaccata*	berry saltbush	
AMARANTHACEAE	*Chenopodium berlandieri**	pitseed goosefoot	Naturalised exotic
ANACARDIACEAE	*Searsia crenata*	Crowberry	
ANACARDIACEAE	*Searsia glauca**	Blue Kunibush	
ANACARDIACEAE	*Searsia pterota**	Wing Currantrhus	
APOCYNACEAE	*Cynanchum obtusifolium*	Roundleaf Buckhorn	
APOCYNACEAE	*Cynanchum viminale*	Caustic Vine	
ARALIACEAE	*Cussonia spicata*	Cabbage tree	Planted near the periphery of the site.

Family	Species	Common name	Found in fynbos in Southern half of site? & Information
ASTERACEAE	*Chrysocoma ciliata*	Bitterbush	
ASTERACEAE	*Curio ficoides*	Blue Chalkstick	Planted near the periphery of the site.
ASTERACEAE	*Erigeron sumatrensis*	tropical horseweed	
ASTERACEAE	*Helichrysum cymosum**	Fume Everlasting	
ASTERACEAE	*Helichrysum patulum**	Honey Everlasting	
ASTERACEAE	*Oncosiphon pilulifer*	stinknet	
ASTERACEAE	*Osteospermum moniliferum**	Bietou	
ASTERACEAE	*Senecio elegans*	Red-purple Ragwort	
BASELLACEAE	*Anredera cordifolia**	Mignonette vine	NEMBA cat. 1b; CARA cat. 1
BIGNONIACEAE	*Tecomaria capensis*	Cape Honeysuckle	
BORAGINACEAE	*Echium candicans*	Pride of Madeira	Naturalised exotic
CACTACEAE	*Opuntia ficus-indica*	Indian fig opuntia	NEMBA cat. 1b; CARA cat. 1
CAPPARACEAE	*Capparis sepiaria**	indian caper	
CARYOPHYLLACEAE	*Pollichia campestris*	Waxberry Plant	
CELASTRACEAE	*Mystroxylon aethiopicum*	Kooboo-berry	
CELASTRACEAE	*Pterocelastrus tricuspidatus**	Candlewood	
CELASTRACEAE	*Putterlickia pyracantha*	Bastard Spikethorn	
CRASSULACEAE	*Cotyledon orbiculata*	pig's ear	
CRASSULACEAE	*Crassula expansa*	Fine Stonecrop	
CRASSULACEAE	*Kalanchoe delagoensis*	Mother of Thousands	Naturalised exotic
CUCURBITACEAE	*Cucurbita moschata*	Squash	
CUCURBITACEAE	*Kedrostis nana*	Porcupine Potato	
DIDIEREACEAE	*Portulacaria afra*	Elephant bush	Planted near the periphery of the site.
EBENACEAE	*Diospyros dichrophylla**	Poison Starapple	
EUPHORBIACEAE	*Euphorbia burmannii*	Sweet Milkbush	
EUPHORBIACEAE	*Ricinus communis**	castor bean	NEMBA cat. 2; CARA cat. 2
FABACEAE	*Acacia cyclops**	western coastal wattle	NEMBA cat. 1b; CARA cat. 2
FABACEAE	*Rhynchosia caribaea*	Caribbean snoutbean	
FABACEAE	*Schotia afra*	Karoo Boerbean	
FABACEAE	*Virgilia divaricata*	Gardenroute Keurboom	
GENTIANACEAE	*Chironia baccifera*	Christmas Berry	
GERANIACEAE	*Pelargonium capitatum*	rose-scented geranium	
GERANIACEAE	*Pelargonium inquinans*	Scented Storksbill	

Family	Species	Common name	Found in fynbos in Southern half of site? & Information
GERANIACEAE	*Pelargonium odoratissimum*	apple-scented pelargonium	
LAMIACEAE	*Leonotis leonurus*	Common Lionspaw	
LAMIACEAE	*Leonotis ocymifolia*	Rock Lionspaw	
LAMIACEAE	*Salvia aurea*	Brown Sage	
MALVACEAE	*Abutilon sonneratianum*	Butter and cheese	Naturalised exotic
MALVACEAE	*Grewia occidentalis*	Crossberry	
MALVACEAE	*Hermannia lavandulifolia*	Lavender Dollsrose	Vulnerable A2c
MORACEAE	*Ficus burkei*	Common Wild Fig	Planted near the periphery of the site.
OLEACEAE	*Olea europaea* *	Olive	
OXALIDACEAE	*Oxalis caprina*	Goat's-foot	
OXALIDACEAE	*Oxalis ciliaris*	Fringe Sorrel	
OXALIDACEAE	*Oxalis pes-caprae*	Bermuda buttercup	
PITTOSPORACEAE	*Pittosporum viridiflorum* *	Cape Cheesewood	Protected tree no. 139
PLANTAGINACEAE	*Plantago lanceolata*	ribwort plantain	Naturalised exotic
RHAMNACEAE	*Phylica ericoides*	Heath Hardleaf	
ROSACEAE	*Rubus rigidus*	White Bramble	Species becomes invasive in disturbed areas.
RUTACEAE	*Clausena anisata*	samandua	Naturalised exotic
SALVADORACEAE	*Azima tetracantha* *	Needle bush	
SANTALACEAE	*Colpoon compressum*	Cape Sumach	
SAPOTACEAE	*Sideroxylon inerme inerme* *	Southern White Milkwood	Protected tree no. 579
SCROPHULARIACEAE	*Buddleja saligna*	False Olive	
SCROPHULARIACEAE	*Chaenostoma caeruleum*	Blue Skunkbush	
SOLANACEAE	*Cestrum laevigatum* *	inkberry	NEMBA cat. 1b; CARA cat. 1
SOLANACEAE	*Datura stramonium*	jimsonweed	NEMBA cat. 1b; CARA cat. 1
SOLANACEAE	*Lycium ferocissimum*	African boxthorn	
SOLANACEAE	*Solanum africanum*	drunken berry	
SOLANACEAE	*Solanum rubetorum*		
VERBENACEAE	*Lantana camara* *	common lantana	NEMBA cat. 1b; CARA cat. 1
VITACEAE	*Rhoicissus digitata*	Baboon Grape	
ZYGOPHYLLACEAE	*Roepera morgsana*	Salad Twinleaf	

13.2 Land use recommendations according to the WC BSP

Recommended acceptable land-uses for each BSP layer is outlined and summarised in Table 14 below.

Table 14: The land-use planning proposed by the Western Cape Biodiversity Spatial Plan. IUCN Red Listing Criteria for species

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

13.3 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 15 below.

Table 15: The matrix that defines the biodiversity importance (BI) of a given habitat type, as identified from a desktop and field assessment.

Biodiversity Importance		**Conservation Importance**				
		Very High	High	Medium	Low	Very Low
Functional Integrity	Very High	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

SEI can then be derived from a second matrix, as depicted in Table 16. 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 16: 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		**Biodiversity 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

13.4 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 17.

Table 17: 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 18.

Table 18: 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 19).

Table 19: 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