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# Part 2 Amendment Application for the Proposed Moquini Development on Erf 14796, Mossel Bay, Western Cape

Terrestrial Biodiversity and Botanical Assessment



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**Version:** Draft



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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;
- Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;
- I do not have any influence over decisions made by the governing authorities;
- I undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by a competent authority to such a relevant authority and the applicant;
- I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity;
- This document and all information contained herein is and will remain the intellectual property of Confluent Environmental. This document, in its entirety or any portion thereof, may not be altered in any manner or form, for any purpose without the specific and written consent of the specialist investigators.
- All the particulars furnished by me in this document are true and correct.



Bianke Fouche (MSc Conservation Biology)

May 2024

## BIANKE FOCHE 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 (Candidate Botanical Scientist)

### 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.

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# 1. PROJECT OVERVIEW

## 1.1 Background Project Description

Confluent Environmental was appointed by Cape EAPrac to undertake an assessment of plant species and terrestrial biodiversity for a Part 2 Amendment of the Site Development Plan (SDP) for the proposed Moquini Hotel development on Erf 14796, Mossel Bay, Western Cape. The size of the property is ca. 4.6 ha. and is located along the western boundary of Dana Bay directly north of the coastline (Fig. 1).



Figure 1: The general location of Erf 14796.

## 1.2 Botanical Impacts and Considerations Determined in the EIA

Jan Vlok from Regalis Environmental wrote the original impact assessment report for this proposed development on Erf 14796. His main recommendation was to limit the impact of the proposed development to areas that had already been previously disturbed. The findings by Regalis Environmental on the site were that:

1. The foredune vegetation is the most sensitive on the property. Sadly, this is also the section of the property that is most invaded by rooikrans (*Acacia cyclops*).
2. The Dune Thicket vegetation (mapped as Hartenbos Dune Thicket, which is endangered) is significant for conservation purposes, even though the majority of the site is not mapped as a Critical Biodiversity Area (CBA) or Ecological Support Area (ESA), but rather an Other Natural Area (ONA) according to the Western Cape Biodiversity Spatial Plan (WC BSP). In order to view the National Vegetation Map for the site and to view the WC BSP, visit the Cape Farm Mapper (CFM) website.
3. The undisturbed natural section of vegetation on the property north of the existing cleared area must be retained as a corridor between the Fishermans Village, Erf 14796, and Danabaai as illustrated in Fig. 2 below.



Figure 2: A photo presented in the original report by Regalis Environmental, taken by Jan Vlok, illustrating the view of Erf 14796 (red outline) from Fisherman's Village.

## 2. AMMENDMENT DETAILS & SDP COMPARISON

At the time of writing this report the proposed Moquini Hotel development layout had undergone various amendments to the SDP layouts, each of which had taken botanical recommendations into account (previous botanical reports and recommendations provided by Regalis Environmental Services in 2007 and 2010; see Fig. 3). Environmental Authorisation had been granted for the development layout option (top right in Fig. 3) and the property developers now wish to seek approval for a revised layout (bottom left in Fig. 3) by means an amendment.

The newly proposed SDP intends for construction to occur in 11 phases and consists of 2-story apartment buildings with basements, some central facilities and associated road/parking infrastructure. In total, 144 apartments are planned with 215 parking spaces (open and basement parking for residents and guests). The difference in footprints between the approved SDP and the newly revised SDP is illustrated in Fig. 4 and equates to an approximately 0.6 ha increase in the SDP footprint, which is primarily related to the addition of natural/garden areas beyond the buildings in the north ([inland]-facing) and south (sea-facing).

In the original report by Regalis Environmental, a development footprint of 1.5 ha was recommended, and the report stated that the updated SDP was acceptable as it covered only marginally more area (1.6 ha, as shown in Fig 4).



Figure 3: Iterations of changes to the SDP layouts on Erf 14796. Top left: Initial SDP layout provided by landowner/developer in 2011. Top right: revised layout with environmental authorisation which was produced in 2016. Bottom left: newly proposed SDP from late 2023 to be considered in this report.

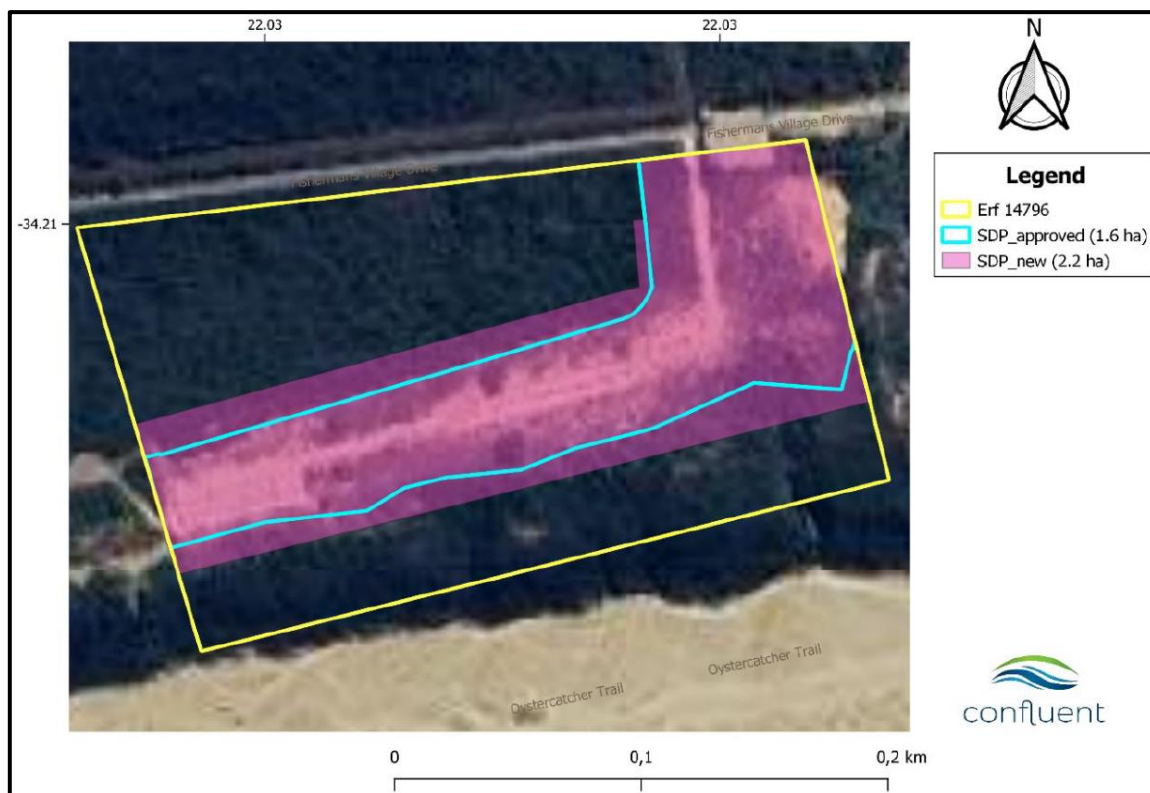


Figure 4: A comparison between the areas covered by the previously approved SDP footprint (blue outline) and the newly proposed SDP footprint (pink shading) on Erf 14796.

### 3. SITE ASSESSMENT 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 SANBI's 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 2018 updated South African National Vegetation Map from SANBI's Biodiversity GIS (BGIS) database, and the National Biodiversity Assessment report of 2018 (Skowno et al., 2018).
- Shapefiles for the Western Cape Biodiversity Spatial Plan (WC-BSP) i.e., information on PAs, CBAs, ESAs, and ONAs were downloaded from BGIS database (CapeNature, 2017; Pool-Sandvliet et al., 2017).
- Cape Farm Mapper for additional spatial information required for the site.

- Chief Directorate: National Geo-spatial Information (CD: NGI) Geospatial Portal and Google Earth for the acquisition of historical aerial imagery of the site.
- The conservation status of ecosystems was found in the Revised National List of Ecosystems that are Threatened and in need of protection, published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004, as revised in Nov. 2022), and also using the Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006).

### 3.2 Field Assessment

Field work was undertaken on the 06<sup>th</sup> of May 2024. 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 other species. This survey method is an attempt to account for the short and single survey period, where detection probability of some rare and threatened species (e.g., geophytes, small succulents, small perennials etc.) are low (Garrard et al., 2008; Wintle et al., 2012). Observations of individual species and environmental characteristics were documented using Nikon Coolpix camera. A provisional species list and plant species accumulation curve is provided in the results section of this report.

### 3.3 Assumptions & Limitations

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

- Only one survey took place during late autumn on the 06<sup>th</sup> of May 2024. Seasonal and time constraints always somewhat limit the findings of any ecological report.
- The species list and SCC reported in the original report by Jan Vlok, as well as species added to his list in this report is not exhaustive, and more species could 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 vegetation on the site made it hard to gain access to some sections of the site. It is possible that focus on “bundu bashing”, getting access to some parts of the site, and marking protected trees may have caused a lapse in concentration so that an SCC could have been missed on the site.
- An inventory of protected trees was attempted on the site, however it is very likely that some trees and seedlings were missed, especially in the sections of the site further than a 10m radius from the track walked during the site assessment.

### 4. RESULTS: ADDITIONAL SITE ASSESSMENT OBSERVATIONS

The site assessment for this report revealed that there are several large and established milkwood trees (*Sideroxylon inerme inerme*) located directly north of the previously cleared disturbed area (Fig. 5). The majority of the milkwood trees on the site are in the area that is now included in the “open” areas indicated on the 2023/4 SDP. The relevant forestry licence from DFFE must be obtained in order to trim, remove, or transplant any of the protected trees on the site. The current plan also extends into sensitive intact Hartenbos Dune Thicket (EN) habitat.

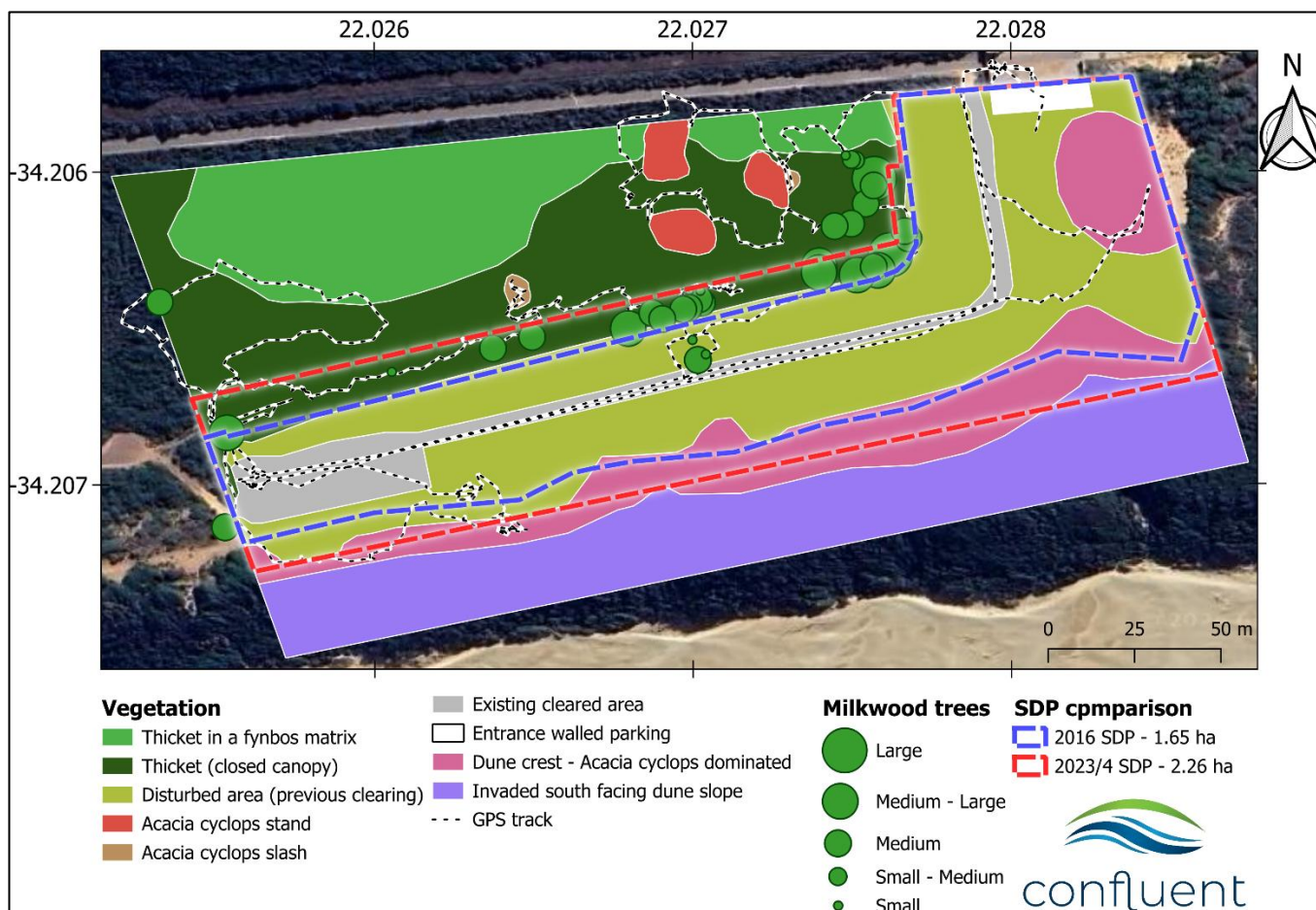


Figure 5: A revised vegetation cover map for the site, including all protected trees observed and the track walked during the site assessment. Protected trees that were recorded are divided into different size classes. Two of the SDPs are also overlaid with the vegetation on the site, together with the total area covered by each in hectares (ha). A composite panorama image of the entire site is printed below the map.

If the development with the new 2023/4 SDP goes ahead, there is a possibility that offset requirements will become relevant to the project, and therefore the developer, owner, and other stakeholders need to carefully reconsider if the enlargement of the footprint is necessary.

Additionally, the new total footprint in the 2023/4 SDP is now ca. 2.26 ha and is 0.56 ha larger than the previous SDP proposed in 2016. This increase in footprint size is significantly larger than the footprint originally recommended. The southern enlarged section of the footprint (Fig. 5) is actually on a steep dune and may not be practical to include in the footprint. The main invasive species on the site is rooikrans (*Acacia cyclops*), as also indicated in Fig. 5.

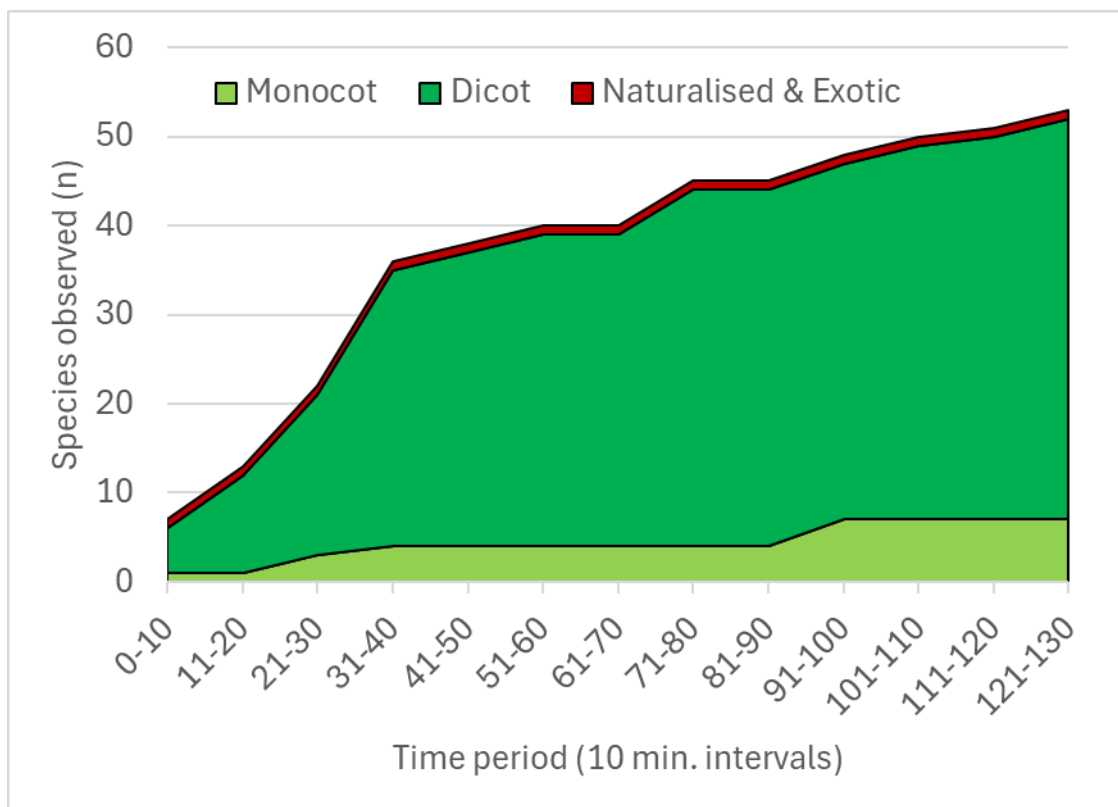


Figure 6: A species accumulation curve for the site assessment on the 06<sup>th</sup> of May 2024.

The species observed on the site are all presented in Table 1, and a species accumulation curve is presented in Fig. 6 above. The accumulation curve indicates that the assessment on the site was not sufficient to represent all of the species present on the site. Subsequent surveys on the site will most likely reveal more species that were not found during this assessment, including SCC that may have been missed on the site (such as the SCC listed in the Screening tool report for the site in Fig. 7 below).

Sensitivity	Feature(s)				
Medium	Lampranthus ceriseus	Medium	Selago glandulosa		
Medium	Lampranthus diutinus	Medium	Selago villicaulis		
Medium	Lampranthus fergusoniae	Medium	Erica unicolor subsp. mutica		
Medium	Lampranthus foliosus	Medium	Hermannia lavandulifolia		
Medium	Lampranthus pauciflorus	Medium	Sensitive species 153		
Medium	Ruschia leptocalyx	Medium	Sensitive species 268	Medium	Polygala pubiflora
Medium	Argyrobium harmsianum	Medium	Thamnohortus muirii	Medium	Nanobubon hypogaeum
Medium	Aspalathus campestris	Medium	Duvalia immaculata	Medium	Sensitive species 516
Medium	Aspalathus obtusifolia	Medium	Athanasia cochlearifolia	Medium	Drosanthemum lavisii
Medium	Lebeckia gracilis	Medium	Agathosma eriantha	Medium	Sensitive species 800
Medium	Leucadendron galpinii	Medium	Agathosma muirii	Medium	Sensitive species 500
Medium	Leucospermum praecox	Medium	Agathosma riversdalensis	Medium	Sensitive species 654
Medium	Wahlenbergia polyantha	Medium	Euchaetis albertiniana	Medium	Agathosma microcarpa
		Medium	Muraltia knysnaensis		

Figure 7: Red Listed plant species (excluding Rare and Near Threatened species) that have been listed in the screening tool report as potentially occurring on the site. While none of these species were found on the site is still likely that one of these species might be present on the site.

Some of the species of conservation concern (SCC) listed by the screening tool report (Fig. 7) for the site have a High likelihood of occurrence in the thicket vegetation on the site. The *Erica versicolor* identified on the site could actually be *Erica unicolor mutica*, which is an endangered (EN) SCC. Fig. 8 below contains images of the *Erica sp.* as well as the abundant protected milkwood tree species found on the site. Note that, apart from the first SDP, the *Erica sp.* was found outside of all subsequent development footprints and is therefore not at risk of any direct negative effects.



Figure 8: Images of a milkwood tree (top) and of the heath currently identified as LC *Erica versicolor*, which could potentially be the EN *Erica unicolor mutica*.

Table 1: A provisional species list made for plants found during the site assessment on Erf 14796 on the 06<sup>th</sup> of May 2024. The light red entry indicates the dominant invasive species on the site and the light blue entry indicates the protected tree species on the site. The light green *Erica versicolor* is cf. *E. unicolor mutica*

Family	Species	Common name	Information
<b>Liliopsida (Monocots)</b>			
AMARYLLIDACEAE	<i>Brunsvigia orientalis</i>	candelabra lily	
ASPARAGACEAE	<i>Asparagus aethiopicus</i>	African Asparagus	
ASPARAGACEAE	<i>Drimia capensis</i>	Maerman Squill	
ASPHODELACEAE	<i>Aloe arborescens</i>	Candelabra Aloe	
CYPERACEAE	<i>Ficinia lateralis</i>	Side Clubrush	
CYPERACEAE	<i>Hellmuthia membranacea</i>	Helmet Sedge	
POACEAE	<i>Ehrharta erecta</i>	panic veldtgrass	
<b>Magnoliopsida (Dicots)</b>			
AIZOACEAE	<i>Carpobrotus mellei</i>	Mountain Sourfig	
AIZOACEAE	<i>Drosanthemum sp.</i>	Dewfigs	
AIZOACEAE	<i>Drosanthemum intermedium</i>		
AIZOACEAE	<i>Jordaaniella dubia</i>	Strandveld Beachfig	
AMARANTHACEAE	<i>Exomis microphylla</i>	Brakbos	
ANACARDIACEAE	<i>Searsia glauca</i>	Blue Kunibush	
ANACARDIACEAE	<i>Searsia pterota</i>	Wing Curranthus	
APOCYNACEAE	<i>Carissa bispinosa</i>	num-num	
APOCYNACEAE	<i>Cynanchum obtusifolium</i>	Roundleaf Buckhorn	
ARALIACEAE	<i>Cussonia thyrsoiflora</i>	Cape Coast Cabbagetree	
ASTERACEAE	<i>Chrysocoma ciliata</i>	Bitterbush	
ASTERACEAE	<i>Eriocephalus africanus</i>	Cape Snow Bush	
ASTERACEAE	<i>Tarchonanthus littoralis</i>	Coastal Camphorbush	
CELASTRACEAE	<i>Lauridia tetragona</i>	Climbing Saffron	
CELASTRACEAE	<i>Mystroxydon aethiopicum</i>	Kooboo-berry	
CELASTRACEAE	<i>Pterocelastrus tricuspidatus</i>	Candlewood	
CELASTRACEAE	<i>Putterlickia pyracantha</i>	Bastard Spikethorn	
CRASSULACEAE	<i>Cotyledon orbiculata</i>	pig's ear	
CRASSULACEAE	<i>Crassula atropurpurea</i>	purple crassula	
CRASSULACEAE	<i>Crassula expansa</i>	Fine Stonecrop	
EBENACEAE	<i>Diospyros dichrophylla</i>	Poison Starapple	
EBENACEAE	<i>Euclea racemosa</i>	Dune Gwarrie	
ERICACEAE	<i>Erica versicolor</i> (cf. <i>E. unicolor mutica</i> )	Twotone Heath	If these ericas are <i>E. unicolor mutica</i> , then they are Red Listed as Endangered B1ab(ii,iii,v)
EUPHORBIACEAE	<i>Euphorbia mauritanica</i>	Yellow Milkbush	
FABACEAE	<i>Acacia cyclops</i>	western coastal wattle	NEMBA category 2; CARA category 2

FABACEAE	<i>Indigofera nigromontana</i>	Swartberg Indigo	
FABACEAE	<i>Indigofera porrecta</i>	Strand Indigo	
FABACEAE	<i>Lotononis pungens</i>		
FABACEAE	<i>Rhynchosia sp.</i>	Snoutbeans	
FABACEAE	<i>Schotia afra</i>	Karoo Boerbean	
FABACEAE	<i>Schotia afra afra</i>	Small Karoo Boerbean	
GERANIACEAE	<i>Pelargonium peltatum</i>	ivy geranium	
MALVACEAE	<i>Grewia occidentalis</i>	Crossberry	
OLEACEAE	<i>Olea exasperata</i>	Dune olive	
POLYGALACEAE	<i>Polygala myrtifolia myrtifolia</i>	Septemberbush	
RHAMNACEAE	<i>Phyllica imberbis</i>	Hairy Hardleaf	
RUTACEAE	<i>Agathosma apiculata</i>	Garlic Buchu	
RUTACEAE	<i>Clausena anisata</i>	samandua	
SALVADORACEAE	<i>Azima tetracantha</i>	Needle Bush	
SANTALACEAE	<i>Colpoon compressum</i>	Cape Sumach	
SAPOTACEAE	<i>Sideroxylon inerme inerme</i>	Southern White Milkwood	Protected tree number 579
SCROPHULARIACEAE	<i>Chaenostoma</i>	Skunkbushes	
SOLANACEAE	<i>Lycium sp.</i>	boxthorns	
SOLANACEAE	<i>Solanum linnaeanum</i>	Yellow Bitter-apple	
THYMELAEACEAE	<i>Passerina rigida</i>	Beach Gonna	
ZYGOPHYLLACEAE	<i>Roepera morgsana</i>	Salad Twinleaf	

## **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. UPDATED IMPACT ASSESSMENT

The impact assessment in the original report by Regalis Environmental follows an older version and reasoning of impact assessment than the method presented in this report. For that reason, the impact assessment in this report was worked out using the methodology provided in Appendix 8.1. For any impact assessment, the mitigation hierarchy must be kept in mind (Fig. 9; Ekstrom et al., 2015) in mind. If mitigation measures are likely to be ineffective at minimising large impacts, then avoidance mitigation must be implemented. If an impact cannot be prevented, then minimisation mitigation is preferred.

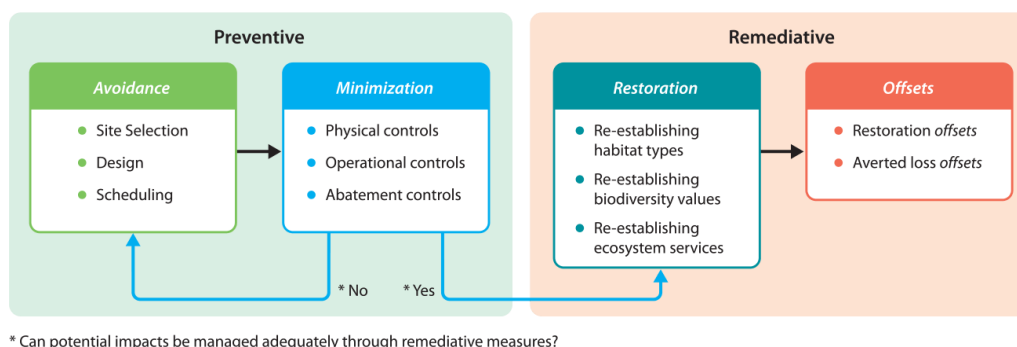


Figure 9: The iterative process of avoiding and minimising the predicted impacts on biodiversity and ecosystem services, as described in (Ekstrom et al., 2015).

### 5.1 Current Impacts

A summary of some of the existing negative impacts on the site are:

- The existing disturbance footprint on the site separates the foredune south of the disturbance from the thicket immediately north of the disturbed area. Refer to the animal theme assessment by Monica Leitner for more information on the effect of fragmentation on wildlife movement.
- Sections of the property are densely invaded by Rooikrans (*Acacia cyclops*), as indicated in the vegetation map in Fig. 5. An alien and invasive plant species management plan must be made for the site, and relevant sections of the plan must be implemented prior to the commencement of construction on the site.
  - The foredune south of the existing disturbance footprint, as well as the dune section along the eastern section of the property is most invaded. However, despite the monoculture of invasion in some sections, near pristine thicket & thicket mosaic persists on Erf 14796.
  - Although some alien clearing was visible on the site, slash material was left in the natural vegetation, and some stumps had not been treated with herbicide (Fig. 10 below).
    - Slash material must be cleared prior to the commencement of the construction phase of the project. This will allow the veld to have better resilience against future disturbance as it will be better able to recover without being smothered and, and this fire averse thicket vegetation will be at a lower risk of fire in the future (which would further compromise the resilience and stability of the ecosystem).

- Herbicide and biological control treatment options for Rooikrans is provided in Table 2. The gall midge is already active on the site and unviable Rooikrans galls were present on the plants instead of viable seed pods.



Figure 10: Photos from two different points on the property where Rooikrans slash had been left within the natural vegetation on the site, with no visible application (dyes) of herbicide.

Table 2: A table indicating the different treatment options for Rooikrans (*Acacia cyclops*).

Herbicide registration status	Size class	Treatment method	Herbicide	Trade name	Recommended product	Dosage (mℓ / g)	Wetter / Dye	a.i. (L / kg)	Mix (L)	% mix	Estimated product (L/ha or kg/ha)	Volume of mix	Cautions	
Registered	All	Aerial application	Clopyralid 90 + Triclopyr (as amine salt) 270 g/L SL	Confront	Clopyralid 90 + Triclopyr (as amine salt) 270 g/L SL	300	2.00%	0.3	10	3	3	100		
	Seedling	Hand pull	No herbicide needed											
			Clopyralid 90 + Triclopyr (as amine salt) 270 g/L SL	Confront, Astra		50	0.50%	0.05	10	0.5	1.5	300		
				Fluroxypyr 200 g/L EC	Tomahawk		25	0.50%	0.025	10	0.25	0.75	300	
				Triclopyr (as butoxy ethyl ester) 480 g/L EC	Garlon 4, Garlon 480 EC, Nuvogon 480EC, Tribel 480 EC, Triclon, Viroaxe, Vulture 480 EC	Clopyralid 90 + Triclopyr (as amine salt) 270 g/L SL	50	0.50%	0.05	10	0.5	1.5	300	
				Triclopyr (as triethyl ammonium) 120 g/L + Aminopyralid 12 g/L	Confront super		75	0.50%	0.075	10	0.75	2.25	300	
				Triclopyr (as butoxy ethyl ester) 240 g/L + Aminopyralid 30 g/L	Garlon max		37.5	0.50%	0.0375	10	0.375	1.125	300	
	Adult	Cut stump / Frill	Cylindrobasidium laeve	Stumpout	Cylindrobasidium laeve	1 sachet / 400ml sunflower oil					200		Stumpout should be preference	
Biological control	All	Biological control	Dasineura dielsii (GALL MIDGE CONFIRMED PRESENCE ON SITE ALREADY)	Dasineura dielsii	Both							Consider biocontrol as priority		
			Melanterius servulus	Melanterius servulus										

## 5.2 Construction Phase

The construction phase for this project is planned for implementation in phases. This means that the construction phase will take a longer time, and some sections of the site will already be in the operational phase while other sections will still be in the construction phase. The animal species report by Monica Leitner already covers a wide range of impacts on the site, and this report serves to add mitigation measures to those proposed in the animal theme report for this property.

### 5.2.1 *A loss of habitat and increased edge effects affecting currently resilient plant populations as a result of construction activities & management, which alters the ecological functioning of the ecosystem on Erf 14796*

**Description:** This impact is the main overarching significant impact for the terrestrial biodiversity and plant themes for the site. The proposed development will result in the permanent loss and fragmentation of recovering (and some sections of near pristine) EN Hartenbos Dune Thicket. Given the Rooikrans alien invasion on the site, an alien management plan needs to be set up and implemented prior to the commencement of the construction phase. Furthermore, Erf 14796 is potentially home to an SCC (*Erica versicolor* identified could also be the EN *E. unicolor mutica*). However, this potential SCC on the site is outside of the proposed development footprints. In addition to the large and obvious construction impacts, the management of materials and staff on the site is also an important impact on the site. If managed properly, many accidents and unanticipated negative losses to the expense of the environment, as well as staff can be avoided. The impact is assessed in Table 3.

#### **Consequences that may occur due to this impact:**

1. A general loss of an EN habitat that is already poorly represented in existing Protected Areas. Some losses may be more indirect and therefore unanticipated.
2. A shift towards a negative change in the conservation status of Hartenbos Dune Thicket.
3. Fragmentation & degradation, and a reduction in the extent of occurrence (EOO) of SCC
4. A loss of genetic variation within remaining SCC stands.
5. A shift towards a negative change in the conservation status of the SCC and other indigenous species affected by the development. The combined effect of this development and the many other developments in the area could potentially lead to an increase in the Red List status of some species.
6. An increased risk of re-invasion of the site, mainly by Rooikrans.
7. The creation of novel habitat that indigenous species cannot survive in, but where exotics and invasive plants thrive in.
8. Increased duration of negative construction impacts.

## Mitigation measures:

1. **Pre-construction:** The disturbance footprint of proposed developments should be clearly defined and demarcated to prevent unnecessary damage to the surrounding environment.
  - a. The current footprint of 2.2 ha will result in an unacceptable loss of vegetation given the recommendations made in the original approval. Clearing/transformation of even open areas beyond the planned built environment must not take place in order to allow the physical footprint of the project to fit within (or a maximum of 0.1 ha over) the original 1.5 ha recommendation. That means that, the open spaces around dwellings are left as untransformed thicket (checkboard regions on Fig. 11).



Figure 11: A map with the current proposed SDP from 2023/4, illustrating areas where no vegetation clearing should be allowed, unless alien plants must be cleared. This will ensure the disturbance footprint remains no more than 1.5 ha.

- b. Construction areas must be clearly defined (refer to the animal specialist report for more specific information relating to the appropriate mitigation of this impact).
2. **Pre-construction:** Protected milkwood trees and potential SCC search & rescue operation.
  - a. Firstly, the relevant forestry licence will need to be applied for. Milkwood trees (*Sideroxylon inerme inerme*; protected tree number 579) were very common on the site. In order to cut, disturb, or remove the protected trees on the site, an application for a licence regarding 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 of 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.”*

- b. Once the relevant permits have been obtained, a plant search and rescue operation must be undertaken on the site in order to salvage as many small milkwood trees as possible on the site. These trees must then be replanted in the open space landscape that will remain after the proposed development has concluded.
  - c. Other plants in the disturbance footprint that are not protected or Red Listed can also be rescued if they could potentially have value as part of rehabilitation or landscaping when the construction phase concludes.
  - d. An excavator may be used to carefully remove the earmarked species to be rescued. This will allow the plants to retain most of the original soil around their roots, reducing the initial plant transplantation shock, increasing their chances of survival.
  - e. A nursery must be set up on the site within an existing disturbed area. All rescued plants must be kept therefore the duration of the construction phase. The nursery area must be clearly indicated and covered with shade-cloth.
1. During construction: Ongoing monitoring and clearing of invasive plants, without soil disturbance outside of the approved development area on the site should occur. This is a requirement by law; refer to the National Environmental Management: Biodiversity Act (NEMBA, Act No. 10 of 2004) and the Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983).

*Table 3: Construction phase impact – A loss of habitat and increased edge effects affecting currently resilient plant populations as a result of construction activities & management, which alters the ecological functioning of the ecosystem on Erf 14796*

CONSTRUCTION	Current (2023/4): Preferred SDP		Adjusted Jan Vlok assessment for Alternative 2: The second site development plan from 2016		Adjusted Jan Vlok assessment for Alternative 3: First site development plan from 2011		No-go scenario	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Duration	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent	Immediate	Immediate
Extent	Limited	Very limited	Limited	Very limited	Limited	Very limited	Very limited	Very limited
Intensity	Very High	High	High	Moderate	Extremely high	Very High	Negligible	Negligible
Probability	Certain	Certain	Certain	Certain	Certain	Certain	Rare	Rare
SCORE	Moderate Negative: -105	Moderate Negative: -91	Moderate Negative: -98	Moderate Negative: -84	High Negative: -112	Moderate Negative: -98	Negligible Negative: -6	Negligible Negative: -6
Confidence	High	High	High	High	High	High	High	High
Reversibility	Low	Low	Low	Low	Low	Low	Moderate	Moderate
Resource irreplaceability	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

### 5.3 The Conclusion of the Construction Phase

The conclusion of any project is an essential, but often overlooked aspect of projects. This relates primarily to the cleaning up of the site once construction has concluded. Refer to the animal specialist report for more detail on mitigation proposed for the conclusion of the construction phase.

### 5.4 Operational Phase

The operational phase of the project refers to the state of the site after the construction phase has been concluded, when the proposed developments are ready for, or are in use.

#### 5.4.1 *Thicket habitat and protected trees negatively affected by landscaping & erven maintenance which results in reduced habitat quality, diversity, and resilience against invasive plants.*

**Description:** Without the appropriate consideration for the environment, management activities will impact the flora and habitat they grow in negatively. Most landowners plant gardens with plants that are not native and indigenous to the area where they live. By allowing the planting of gardens right next to sensitive EN Hartenbos Dune Thicket habitat a loss of SCC will take place from increased edge effects which could lead to more invasive species encroaching on the natural habitat outside of the development area. Open spaces around hard built infrastructure should aim to retain “soft landscaping” designs rather than “hard landscaping” (Box 4). The impact is assessed in Table 4.

## BOX 4: Landscaping

### Soft landscaping

Soft landscaping refers to natural spaces around constructed buildings that contain plants.

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

Soft landscaping is especially important on Bijenbos where the proposed cabins will be constructed atop a hill, where water will flow towards the valley below. Furthermore, the valleys and hillslopes are all heavily invaded, which makes erosion control and groundwater flow important aspects to consider in this vulnerable and invaded landscape.

### Hard landscaping

Hard landscaping refers to spaces around constructed buildings that have been transformed into impermeable surfaces, such as pavements, and concrete driveways. Hard landscapes have negative impacts on the natural environment and are less ideal than soft landscaping. Hard landscaping results in the absorption and reflection of heat, which makes them hotter than the surrounding natural areas. Furthermore, they speed up

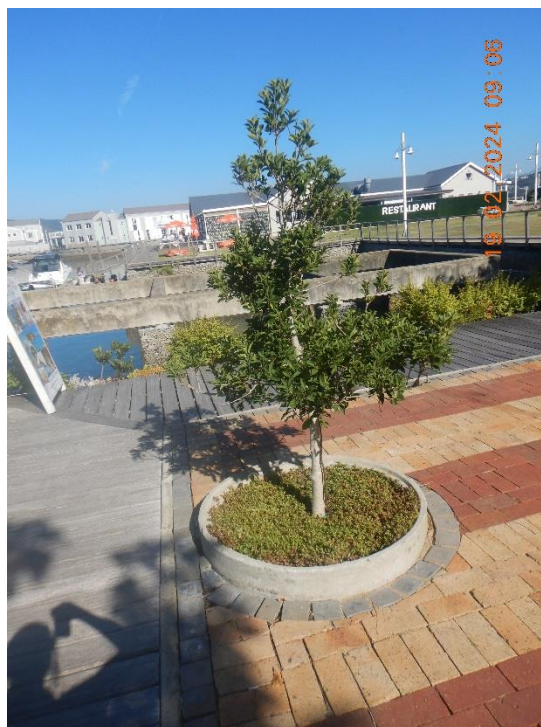
the flow of rainwater which means that water disposal systems need to be adequate to prevent erosion. No plants can really grow on these surfaces making groundwater attenuation problematic.

**The following consequences may occur due to this impact:**

1. A general loss of habitat for plants and other important taxa.
2. Altered soil characteristics (e.g., invasives may release allelopathic chemicals that reduce the ability of native vegetation to recover) and pollution of the environment.
1. A gradual increase in the number of negative edge effects & establishment of invasive plants that result from exotic garden plants outcompeting natural species in the environment.

**Mitigation measures:**

1. It is a requirement of the law that alien clearing and monitoring according to an alien eradication plan must be followed during the operational phase for the entire Erf 14796. Given the future subdivision of the property into multiple erven, alien clearing and monitoring is the responsibility of every future landowner, and progress must be monitored by the homeowners association / relevant management structure that will be in place during the operational phase.
2. Staff & guests must be aware of activities that are not allowed on the site.
  - a. No disposal of waste and grey water in the environment.
  - b. No walk where a path is not clearly labelled.
  - c. Instructions for the proper use of chemical toilets must be provided and must be clearly visible in all restrooms.
3. No exotic plants may be brought to the site.
  - a. Locally indigenous plants that naturally occur in Hartenbos Dune Thicket may be planted on the erven, but the natural conservation space around the erven must not be augmented with species that were not part of the original search and rescue operation on the site.
  - b. Rescued trees must be planted along roadsides and on erven, but no exotic trees that do not occur in the surrounding thicket vegetation type (e.g., fever trees, oaks, pines) may be planted. Trees should also preferably be planted in depressions to encourage water sequestration and reduce erosion risk. See Fig. 13 below for an example of what NOT to do in the urban spaces:



*Figure 12: The image in this figure is an example of an incorrect way to plant a tree. Firstly, the area around the tree is a hard landscape, and secondly the tree is in a raised container which does against the principles of sustainable urban drainage systems (SUDS).*

- c. Ongoing effort to remove all invasive plants species is a requirement by law.
  - d. No planting of kikuyu grass (a listed invasive species) will be allowed. Furthermore, lawns should be limited on the site.
4. If gardens need to be considered, or existing gardens re-designed at some point, they can be designed to be water wise (avoid erosion) and friendly to wildlife and the greater natural habitat. Fynbos Life in Cape Town is an inspirational indigenous landscaping project (Fig. 14). All these tips from “Fynbos Life” form part of the mitigation on the impact of landscaping.

**TEN TIPS TO MAKE YOUR GARDEN COUNT FOR WATER AND WILDLIFE CONSERVATION:**

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. Ensure that your garden is free of NEMBA-listed invasive alien plants.
3. Select locally indigenous plants according to veld type, sourcing only forms of species grown from Cape Town lowland genetic stock. These are the plants that are best adapted to the local environment. Avoid hybrids and cultivars.  
Plant in the rainy season only, i.e. early winter (May/June) in Cape Town and add a 10cm-thick surface layer of wood chips to lock in soil moisture and keep roots cool.
4. 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.
5. Replace or substantially reduce lawn areas by planting water-wise groundcovers or enlarging existing shrub beds.
6. Add local edible and aromatic plants to supplement or replace thirsty exotic veggie/herb gardens.
7. 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.
8. Opt for permeable fencing or create holes in perimeter walls to allow the free passage of frogs and other wildlife between gardens.
9. Create a grey water wetland using plants to filter water and absorb excess nutrients.
10. Turn an unused corner into a dead hedge (unturned heap of garden waste) to provide suitable habitat for decomposers.

An illustration of a lush garden scene. In the foreground, a brown frog sits on a white, curved object, possibly a rainwater tank or a decorative element. To the right, a black butterfly with white spots is perched on a plant. The garden is filled with various colorful plants, including red and orange flowers, yellow and blue blossoms, and green foliage. The background is a soft, light green gradient.

Figure 13: A illustration that can help guide future gardening decision making, as provided by the <https://www.fynboslife.com/life-garden/> website.

Table 4: Operational phase impacts – habitat and protected trees negatively affected by landscaping & erven maintenance which results in reduced habitat quality, diversity, and resilience against invasive plants.

OPERATIONAL Impact aspects	Current (2023/4): Preferred SDP		Adjusted Jan Vlok assessment for Alternative 2: The second site development plan from 2016		Adjusted Jan Vlok assessment for Alternative 3: First site development plan from 2011		No-go scenario	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Duration	Ongoing	Medium Term	Ongoing	Medium Term	Ongoing	Medium Term	Immediate	Immediate
Extent	Limited	Very limited	Limited	Very limited	Local	Limited	Very limited	Very limited
Intensity	Very High	Moderate	High	Moderate	Extremely high	High	Negligible	Negligible
Probability	Almost Certain	Likely	Almost Certain	Likely	Certain	Almost Certain	Highly unlikely	Highly unlikely
SCORE	Moderate Negative: -84	Minor Negative: -45	Moderate Negative: -78	Minor Negative: -45	Major Negative: -90	Moderate Negative: -65	Negligible Negative: -3	Negligible Negative: -3
Confidence	High	High	High	High	High	High	High	High
Reversibility	Low	Low	Low	Low	Low	Low	Low	Low
Resource irreplaceability	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

## 6. CONCLUSION

The thicket habitat on the site is consistent with the mapped EN Hartenbos Dune Thicket. Although the site is mapped as an “other natural area” (ONA), it is part of a thicket type that is poorly represented in conservation areas, and the site is still connected to a larger natural open space. The proposed enlargement of the footprint will result in the disturbance and potential removal of numerous protected milkwood trees (forestry licence will be required). The animal specialist report discusses the change in the plan well:

*“The newly proposed SDP increases the development footprint by adding gardens or green space around the apartment buildings (Figure 3), ultimately resulting in ca. 2.2 ha (48%) of natural habitat being lost on the property compared to the previously approved SDP which had 1.6 ha (35%) habitat loss.*

*While the addition of gardens to the development is likely to make this more attractive for prospective tenants, this advantage from a development perspective needs to be balanced with the need to protect an endangered ecosystem type and fauna SCC likely occurring on site. Previous botanical assessments recommended that development be limited on site to [ca. 1.5] ha (J. Vlock, 2007 and 2010 botanical assessments), which was in line with the previously approved SDP, however this newly proposed SDP exceeds this recommendation.”*

During the construction phase, transformation of the additional thicket vegetation under the revised SDP (e.g. to lawns or landscape gardens) will result in a Moderate Negative impact. While the significance of impact is similar to the mitigated 2016 SDP scenario, the quantitative impact score has increased substantially (from -84 to -105 – see Table 3) and represents a marked increase in impact. Given the increase in erven size, a reduced impact score (similar to the mitigated 2016 SDP scenario) can only be achieved if the thicket vegetation in each erven is not transformed to lawns or landscaped gardens.

For the operational phase, the revised SDP will result in a Moderate Negative Impact, primarily due to the increased likelihood of invasion of remaining natural thicket vegetation by *A. cyclops*. A Minor Negative impact (similar to the mitigated 2016 SDP scenario) can only be achieved subject to the strict implementation of an alien management plan.

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## 8. APPENDIX

### 8.1 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** =  $\text{impact type} \times (\text{intensity} + \text{duration} + \text{extent})$  of the impact which can be either negative or positive. Where type is either negative (i.e., -1) or positive (i.e., 1). The **significance** =  $\text{consequence} \times \text{impact probability}$  of the impact was then calculated by applying the probability of occurrence to the consequence. The criteria and their associated ratings are shown in Table 5. Categories assigned to the calculated significance ratings are presented in Table 6. 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 7).

Table 5: 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

Table 6: 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

Table 7: 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