Erf 998, Tergniet and Portion 5 of the Farm Zandhoogte no, 139, Mossel Bay:

Terrestrial Biodiversity Impact Assessment

and

Plant and Animal species Compliance Statement

chepri (Pty) Ltd
Scientific Services

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1 Introduction

The construction of a business development on Erf 998, Tergniet and the Farm Zandhoogte no. 139 (henceforth the proposed site), has been proposed. Three alternative layouts were produced for the proposed development which include the construction of roads (all alternatives), a service station (alternatives A & B), fast foods and takeaway area (alternative B), mixed use industrial zones (all alternatives), business zones (all alternatives), residential zones (all alternatives) and it currently includes an already existing nursery (Figures 1, 2 & 3). This study serves as a Terrestrial Biodiversity Impact Assessment and Plant and Animal Species Compliance Statements. Almost the entire extent of the site falls under an Ecological Support Area (ESA1), and Endangered ecosystem type namely Groot Brak Dune Standveld and is thus, according to National and Local Biodiversity Planning and LandUse guidelines considered as an area of critical importance for the maintenance of biodiversity (see Table 1).

Table 1: Biodiversity features present on the site triggered by the screening tool.

Sensitivity	**Feature(s)**
Very High	*Ecological support area 1*
Very High	*Endangered ecosystem*

In general, vegetation or habitat types stand as proxies of biodiversity patterns and generally change with geographic features over a given landscape. The scale at which a vegetation type is delineated determines its description, and therefore different vegetation types are very likely to emerge from a classification of the same area (even by the same classifier), depending on the scale it is observed, described and mapped. It consequently also determines the classification's accuracy - in terms of compositional homogeneity - as even small landscape changes over an area may drastically affect species composition in the mega-diverse Cape Floristic Region (CFR) within which the study area is located. The National Biodiversity Assessments (2011 and 2018) for example, is based on a scale of 1:1 000 000, while other vegetation maps of an area, such as the Western Cape Biodiversity Spatial Plan (2017) and the Garden Route Vegetation Map (2008) classify, map and describe vegetation units at a much finer scale (1:10 000 – 1:50 000). The finer classification units

generally reflect the local reality better in terms of the relevant scale of the study area. Ecosystem status is a variable that changes over time and, within a mega-biodiverse region such as the Cape Floristic Region, it is still changing very fast, despite the already large degree of transformation within the region due to agriculture and urban development.

The purpose of this Terrestrial Biodiversity Impact assessment and Plant and Animal Species Assessments is to describe and provide evidence of the situation on the ground derived from most recently available remote sensing data and a field investigation of the study area. Based on a field investigation of the proposed site and its surrounding landscape, and with the aid of satellite imagery (Google Earth, 2020), different areas of land cover categories are identified and delineated on a landscape scale (1:10 000 - 1:15 000). These categories reflect homogeneous vegetation units and may differentiate between either intact vegetation, various states resulting from natural or anthropogenic disturbance patterns within natural vegetation and transformed areas. In this way a general view of the current state of ecosystem functioning, together with remaining biodiversity is considered in the context of the potential (or already established) development of the proposed site.

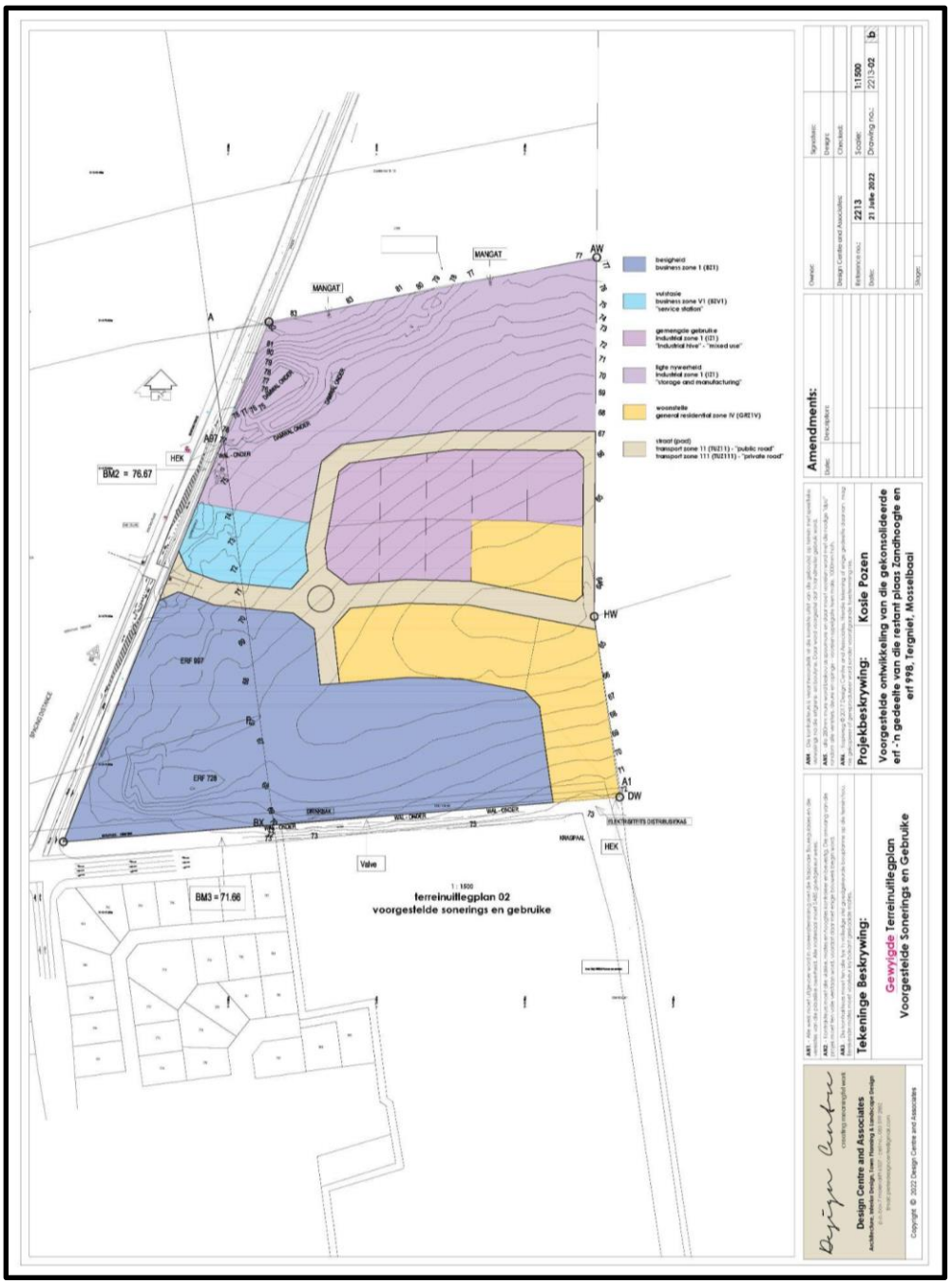


Figure 1. Proposed site development plan (SDP), alternative A, for Erf 998, Tergniet and the Farm Zandhoogte no. 139.

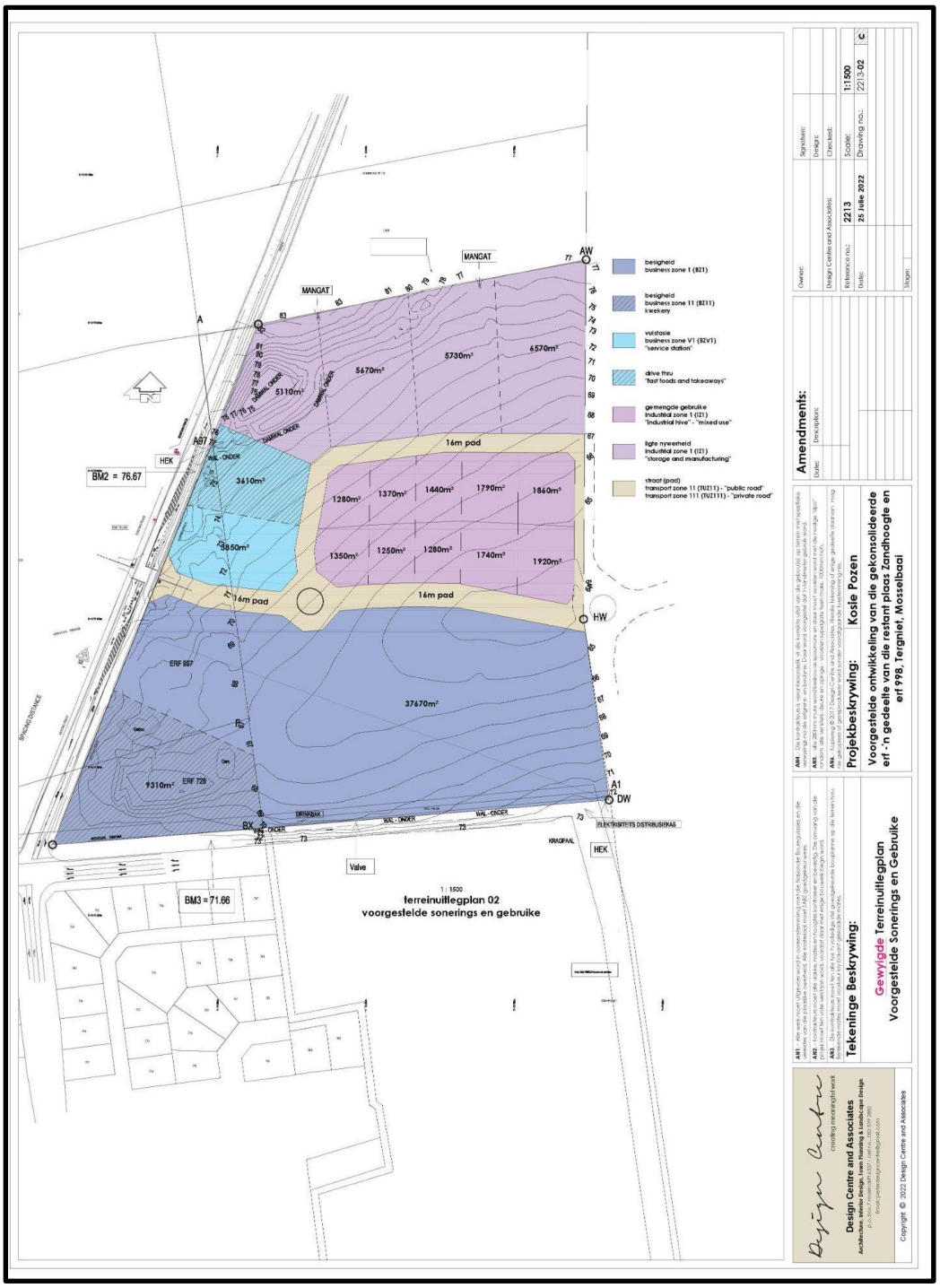


Figure 2. Proposed site development plan (SDP), alternative B, for Erf 998, Tergniet and the Farm Zandhoogte no. 139.

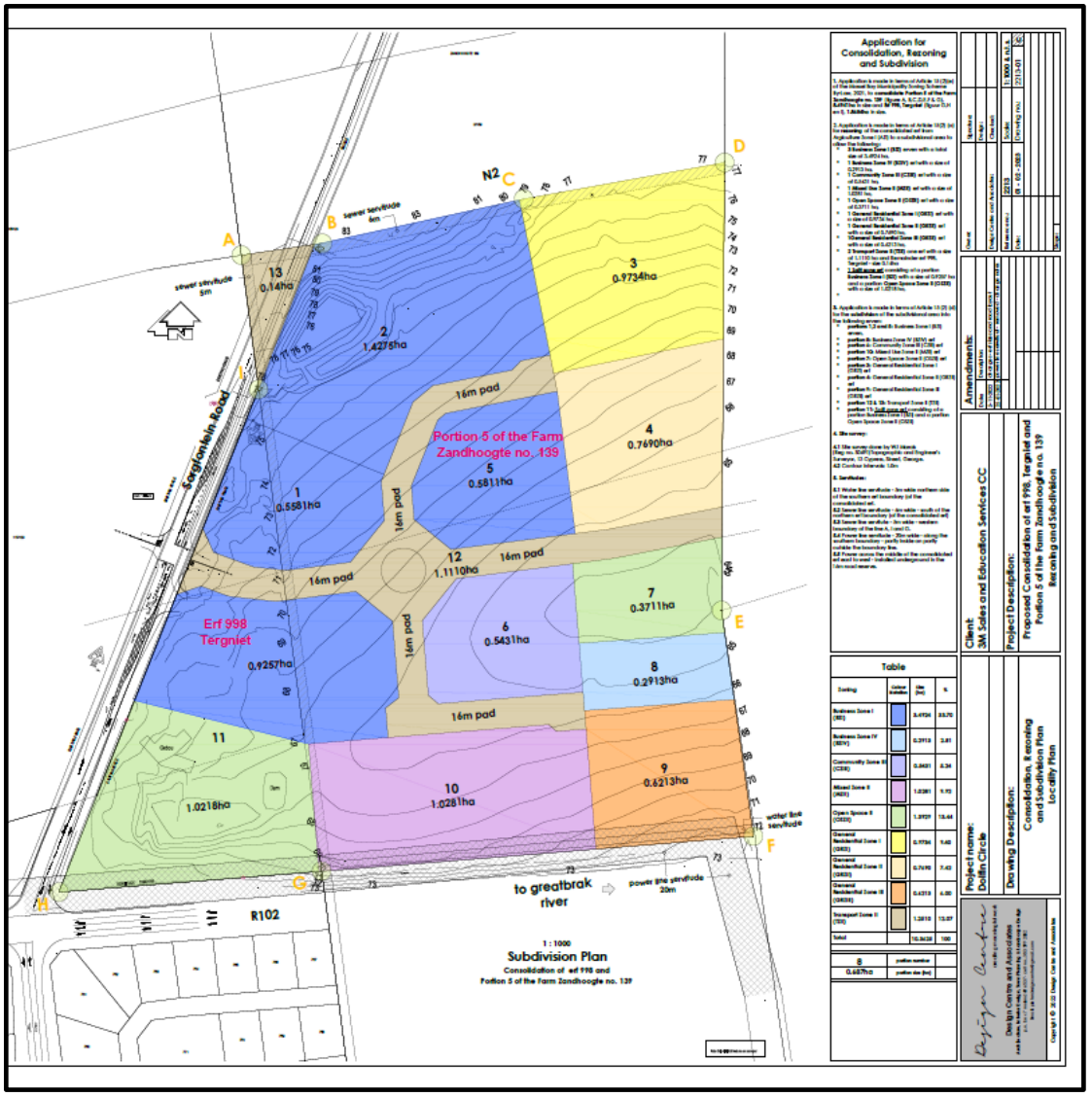


Figure 3. Proposed site development plan (SDP), alternative C, for Erf 998, Tergniet and the Farm Zandhoogte no. 139.

1.1 Study area

1.1.1 Location

Erf 998, Tergniet and the Farm Zandhoogte no. 139, is situated between the town of Groot Brakrivier and coastal village, Tergniet, and is bordered by the provincial road R102, the N2 National Highway and a municipal road, Old Mossel Bay Road (Figure 4). The R102, which immediately borders and runs parallel to the site's southern fenceline, is a major regional road connecting various coastal towns. Old Mossel Bay Road runs immediately adjacent and parallel to the site's eastern border and is one of the major access roads between Groot Brakrivier and Tergniet and connects the rural communities further inland, to the town and coastal villages. The N2 runs adjacent and parallel to the site's northern border. The site's western fence line borders a residential property in the southernmost part and undeveloped land on the northern part.

The surrounding landscape region combines coastal and estuarine ecosystems with rolling hills and dense vegetation. The undulating terrain of this region encompasses coastal plains, rolling hills, and rugged cliffs, providing a unique topographic mosaic that fosters a rich tapestry of habitats. The interplay of these slopes and habitat types sustains a range of ecosystems, including fynbos, renosterveld, subtropical thicket, wetlands, estuaries, and coastal forests.

The landscape north of the site consists of a multitude of farming practices and diverse farm types including crop cultivation, livestock farming, horticulture, and specific practices such as vineyards and wineries. The landscape south of the site mainly consists of a densely developed residential area.

Figure 4: Location of Portions 0 of Erf 998 and Portions 0 of Farm 139 (Zandhoogte), Tergniet, and surrounds.

1.1.2 Vegetation types and Ecosystem Threat Status

The Western Cape Biodiversity Spatial Plan (WCBSP), 2017 (Pool-Stanvliet *et al*. 2017) and the National Vegetation Map (Dayaram *et al*. 2019) identifies the vegetation types present on the site Groot Brak Dune Strandveld and Canca Limestone Fynbos. In the 2018 beta Vegetation Map, however, the vegetation on the entire site has been mapped as Hartenbos Dune Thicket.

1.1.2.1 Groot Brak Dune Strandveld (VU - NBA 2018; EN - WCBSP 2017; EN - NBA 2011)

Groot Brak Dune Strandveld (Figure 5), a unique and ecologically important vegetation type found in the coastal areas of South Africa, is delineated by the WCBSP (Pool-Stanvliet *et al*. 2017) and the “NEMBA 2011 list” (DEA 2011) as Endangered, however, was reassessed as

Vulnerable by the National Biodiversity Assessment (NBA), 2018 (Skowno *et al*. 2019). It is approximately 200 km^2 in extent. In terms of the 2011 national listing, or as per CapeNature's 2016 assessment of threat status, this ecosystems' habitat loss is currently considered irreversible (Pool-Stanvliet *et al*. 2017). For these endangered vegetation types, the major threats and causes of transformation are crop agriculture, conversion to pasture, and intensive herbivory (horses, goats, sheep and donkeys) and residential developments associated with the rapid expansion of coastal towns.

This vegetation type is characterized by its sandy substrate, low nutrient availability, and exposure to salt spray from the nearby ocean. The dominant plant species in the Groot Brak Dune Strandveld are well adapted to these challenging conditions. These include various fynbos species such as *Protea cynaroides* (King Protea), Leucadendron spp. (Conebushes), and Erica spp. (Heaths), as well as coastal dune specialists like *Carpobrotus edulis* (Sour fig) and Gazania spp. (Treasure flowers) (Mucina *et al*. 2006).

The diverse assemblage of plant species of the Groot Brak Dune Strandveld has adapted to the harsh and dynamic conditions of the coastal dune systems. The plant community in Groot Brak Dune Strandveld is primarily composed of low-growing shrubs, grasses, and succulents, including several specialized species, which play a crucial role in stabilizing the dunes and maintaining the integrity of the coastal ecosystem (Cowling *et al*. 2005).

Some of the key dominant succulent plant species in the Groot Brak Dune Strandveld such as *Carpobrotus edulis*, *C. dimidiatus* and *Arthrocnemum macrostachyum*, grow dense matts or grow extensive root systems that help to stabilize the sand and prevent erosion (Cowling *et al*. 1997, 2018; Humphries 2002; Rouget *et al*. 2006).

The dominant shrub *Elytropappus rhinocerotis* (Van der Merwe 2017) also plays a role in stabilizing the dunes and preventing erosion due to its extensive root system (Foden *et al*. 2019). Other important shrub species in this vegetation type are *Euclea racemosa*, *Metalasia muricata* and *Searsia crenata* (Humphries 2002; Holmes *et al*. 2014; Coetzee 2017).

Dominant or important grass, restio or sedge species include *Ehrharta villosa*, *Ficinia nodosa*, *Elegia capensis* and *Hyparrhenia hirta*, adapted to sandy soils and play a role as pioneer

species in the dune succession process (Mucina & Rutherford 2006; Rebelo *et al*. 2006).

Species such as the matt-forming herb, *Arctotheca populifolia*, and groundcover, *Gazania krebsiana*, also occur in this vegetation type (Higgins 2016; Cowling *et al*. 2018).

1.1.2.2 Canca Limestone Fynbos (LC - NBA 2018; LT - WCBSP 2017; LC - NBA 2011)

Canca Limestone Fynbos (Figure 5) is delineated by the WCBSP (Pool-Stanvliet *et al*. 2017) as Least Threatened and by the 2011 and 2018 NBAs (DEA 2011; Skowno *et al*. 2019) as Least Concern. It is approximately 1120 km^2 in extent. Canca Limestone Fynbos is dominated by Rutaceae with abundant succulents and geophytes which grade into succulent thicket on the coast (Mucina & Rutherford 2006).

This fynbos ecosystem is characterized by its distinct composition of dominant plant species, which have adapted to the specific environmental conditions of the limestone substrate. Some of the key or dominant plant species in this vegetation type are *Leucadendron linifolium, Protea cynaroides*, *Erica cerinthoides*, *L. argenteum* and *Restio multiflorus* (Rebelo *et al*. 2006; Smith *et al*. 2018).

1.1.2.2 Hartenbos Dune Thicket (EN – SANBI & DFFE 2021)

Hartenbos Dune Thicket was first assessed as Least Concern (Skowno *et al*. 2019), however more recently assessed as Endangered (EN) by the Red List of Ecosystems (RLE) for terrestrial realm for South Africa (SANBI & DFFE, 2021) and the entire site falls within this ecosystem type (Figure 6). It consists mostly of thickets or bushclumps scattered across vegetation dominated by fynbos elements on relatively deep sands. It is thus considered a mosaic vegetation type. A large number of succulents are included, and fire does not seem to be the major important disturbance factor causing renewal, as much as large herbivores. Several important species reach their easternmost distribution limit in this vegetation type (*Euchaetis burchelli*, *Jordaaniella dubia*, *Orphium frutescens* and *Thamnochortus insignis*) (Vlok & de Villiers 2007). An endemic or near endemic species to this unit is *Delosperma virens*. A large number of endangered plant species occurs within the unit. The thicket component extends into some of the river valleys, where it becomes denser and more

continuous, with species such as *Sideroxylon inerme* (Milkwood) present.

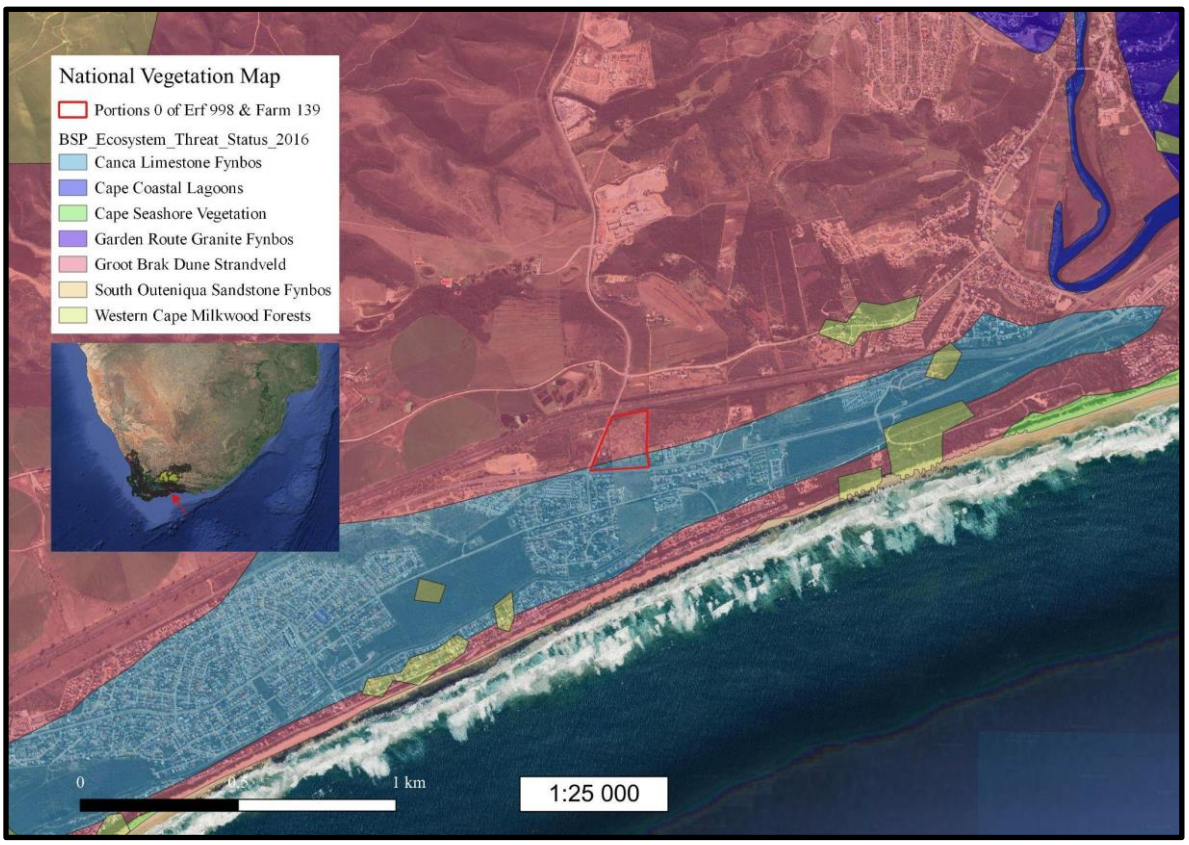


Figure 5: National Vegetation Map (Dayaram *et al*. 2019) delineation of Erf 998, Tergniet and Farm Zandhoogte no. 139, and surroundings.

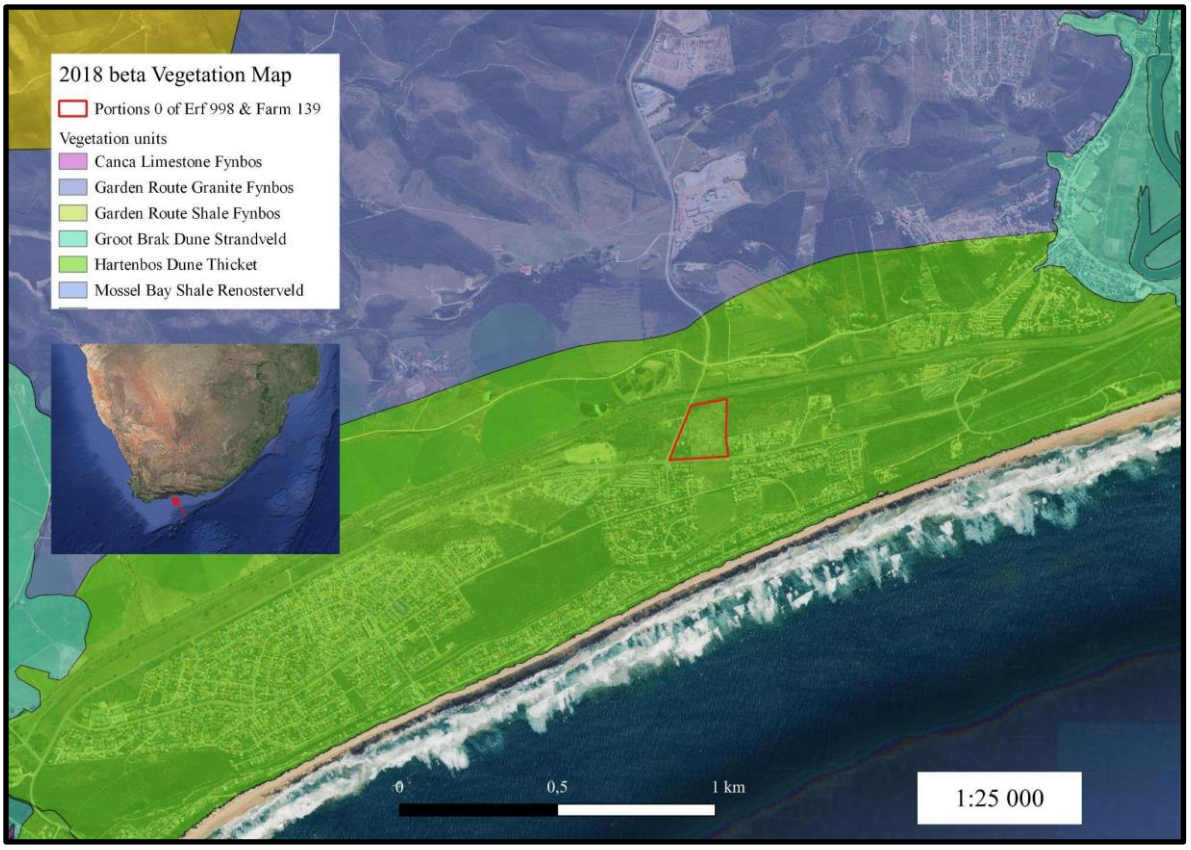


Figure 6: The 2018 beta Vegetation Map and Red List of Ecosystems (RLE) for terrestrial realm for South Africa (SANBI & DFFE, 2021) delineation of Erf 998, Tergniet and Farm Zandhoogte no. 139, and surroundings.

1.1.3 Biodiversity Spatial Planning: Critical Biodiversity Areas and Ecological Support Areas

The WCBSP (Pool-Stanvliet *et al*. 2017) designates about 75% of the site as a ESA1 (Ecological Support Area 1) and about 15% as an ONA (Other Natural Area) (Figure 7 & 8).

The ESA areas are described as not essential for meeting biodiversity targets but play an important role in supporting the functioning of PAs (Protected Areas) or CBAs (Critical Biodiversity Areas) and are often vital for delivering ecosystem services. ESAs support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as corridors, wetlands and water source areas. An ESA1 is still likely to be functional

(i.e., in natural, near-natural or moderately degraded state, while an ESA2 is severely degraded or has no natural cover remaining and therefore requires restoration.

The management objectives of ESA1 areas are to maintain the ecosystem in a functional, near natural state. Some limited habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised. The WCBSP (Pool-Stanvliet *et al*. 2017) guidelines for land use of ESA1 areas require that these areas should ideally be avoided for any activity resulting in the loss of underlying biodiversity and ecological functioning, by considering cumulative impacts. If it cannot be avoided, it must be shown that the mitigation hierarchy set out in the WCBSP.

The ONA areas are described by the WCBSP as ". . . areas that have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritized for meeting biodiversity targets, they are still an important part of the natural ecosystem. ONAs should be managed or utilized in a manner that minimises habitat and species loss and ensures ecosystem functionality through strategic landscape planning. These 'other natural areas' offer considerable flexibility in terms of management objectives and permissible land-uses, but some authorisation may still be required for high impact land-uses."

Figure 7: The WCBSP delineation of Erf 998, Tergniet and Farm Zandhoogte no. 139 and immediate surroundings.

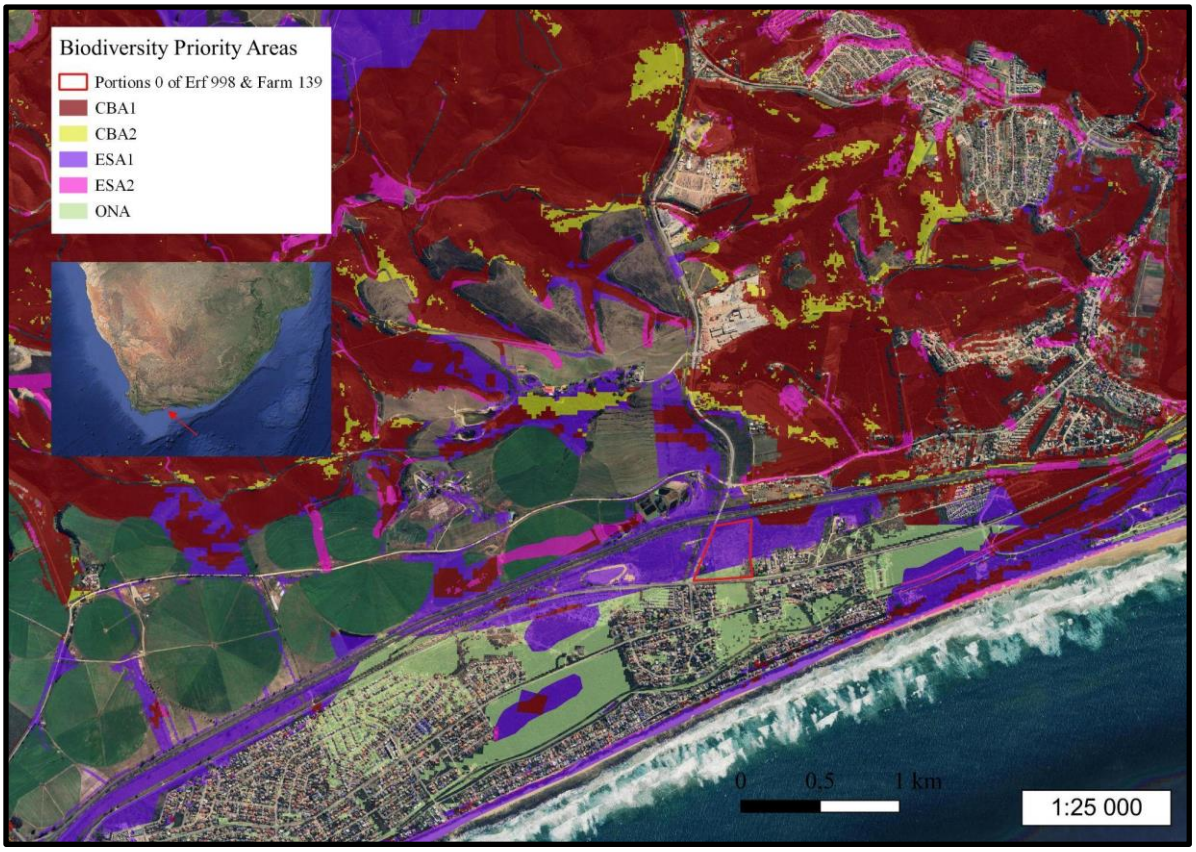


Figure 8: The WCBSP delineation of Erf 998, Tergniet and Farm Zandhoogte no. 139, and larger landscape.

1.1.4 Sensitive Plant Species

The Site Environmental Sensitivity screening tool (Ref_16/3/3/6/7/1/D6/35/0113/21), identified 20 sensitive plant species that potentially occur on the site (Table 2). Of these, six species were assigned codes, with its identity hidden for protection, as these are species that are prone to illegal harvesting. All sensitive plant species' level of sensitivity was "Medium".

Table 2: Potential sensitive plant species potentially present on site (Source: Screening Tool)

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

1.1.5 Sensitive Animal Species

The Site Environmental Sensitivity screening tool (Ref_16/3/3/6/7/1/D6/35/0113/21), identified eight sensitive animal species that potentially occur on the site (Table 3). Of these, two species were assigned codes, with its identity hidden for protection, as these are species that are prone to illegal harvesting. Three sensitive species were bird species, all three assigned a “High” level of sensitivity, two butterfly species, both assigned a “Medium” sensitivity level, two sensitive mammal species (hidden identity) both of “Medium” sensitivity, and one grasshopper species with “Medium” sensitivity.

Table 3: Potential sensitive animal species potentially present on site (Source: Screening Tool)

Sensitivity	**Species**
High	*Circus ranivorus*
High	*Neotis denhami*
High	*Bradypterus sylvaticus*
Medium	*Aloeides thyra orientis*
Medium	*Lepidochrysops littoralis*
Medium	*Sensitive species 5*
Medium	*Sensitive species 8*
Medium	*Aneuryphymus montanus*

2 Methods

The result of this report is derived from the findings of a desktop study and two four-hour visits of the proposed site by a Botanical and Terrestrial Biodiversity Specialist, Dr. Marius van der Vyver (SACNASP: Ecological Science, 118303). The site inspections were conducted on 24 May and 4 June 2023 when ideal weather conditions allowed for appropriate surveying of avian and invertebrate animal species.

Recent Google Earth™ images were used to delineate the plant communities found on site and identify species of conservation concern (SOCC). The WCBSP (Pool-Stanvliet *et al*. 2017) as well as the 2018 NBA (Skowno *et al*. 2019) and associated National Vegetation Map (Dayaram *et al*. 2019) were extensively consulted. Field guides (Brown 1960; Van Oudtshoorn 1992; Moriarty & Snijman 1997; Smith *et al*. 1998; Manning *et al*. 2002, 2010; Bromilow *et al*. 2003; Els 2012; Van Wyk 2013; Manning 2018) were used to identify species encountered. An extensive targeted search of the site for the presence of potential red list category plant and animal species was conducted. The positions of all relevant plant and

animal species (if found) were recorded.

Vegetation units of relatively homogeneous pattern were identified from the Google Earth images and possible ecological corridors identified within the proposed site and its nearby surrounding landscape. All identified features were then ground-truthed during the site inspection. The proposed site area was investigated by driving and walking alternately within each of the delineated units and established roads and identifying all dominant plant species and noting all other observed disturbances that impact on the site. Care was taken to search for species identified as of conservation concern likely to occur on the proposed site in the habitats they are likely to be found, and around impact footprint sites. Therefore, there is a high likelihood of species of conservation concern present outside the impacted areas not searched during the survey nor directly impacted by the disturbance.

The identification of sensitive areas was primarily based on consideration of the current state of the proposed site and location of encountered sensitive species. This state includes the extent to which the area can currently be considered to function as it is designated in terms of reigning conservation plans (WCBSP in this case). Highly fragmented, degraded and transformed areas are considered in terms of the capacity, cost and urgency for active restoration action to be applied to regain that biodiversity function. This methodology considers the mitigation hierarchy (Pool-Stanvliet *et al*. 2017) as a guideline (see Figure 9).

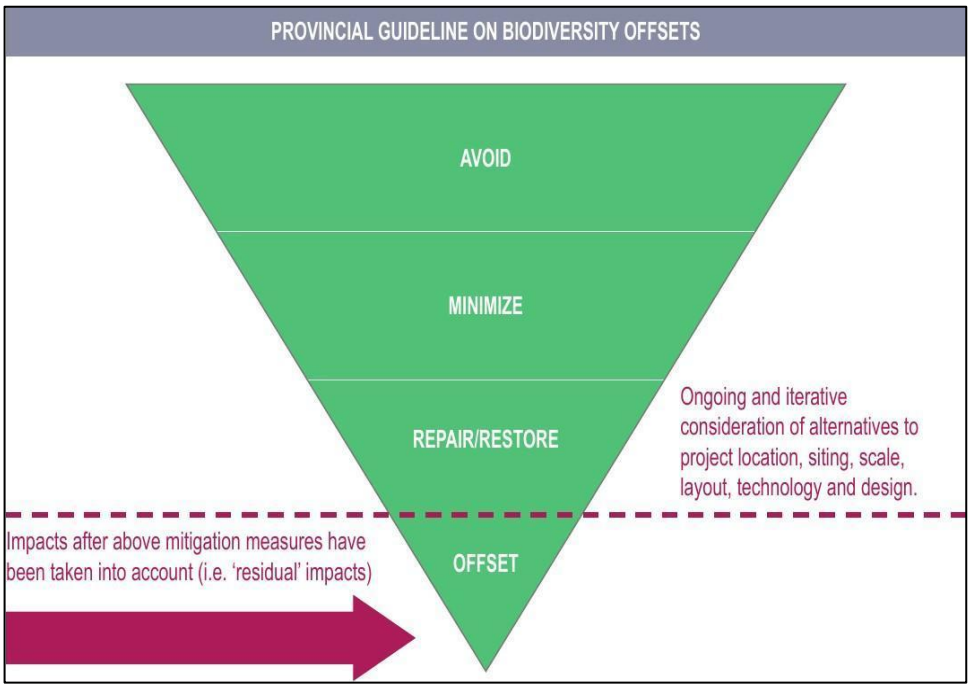


Figure 9: The Mitigation Hierarchy from WCBSP, 2017.

2.1 Impact Assessment

The Impact Assessment (IA) was adapted and performed according to the Department of Environmental Affairs and Tourism (DEAT 2002, 2002b, 2004) guidelines, and takes into account:

1. Impact nature (direct, indirect and cumulative);
2. Impact status (positive, negative or neutral);
3. Impact spatial extent (Table 4);
4. Impact duration (Table 6);
5. Potential impact intensity (Table 5)
6. Impact reversibility (high, moderate, low or irreversible);
7. Irreplaceability of the impacted resource (high, moderate, low or replaceable);
8. Impact probability (Table 7);
9. Confidence in the ratings (high, moderate or low);

Overall impact significance (IS) is calculated as:

IS = IM × IP

where IM and IP are Impact magnitude and Impact probability respectively.

Impact magnitude (IM) is calculated as:

IM = II + ID + IE

where II is impact intensity, ID is impact duration, and IE is impact extent.

The overall impact significance categories are explained in Table 8.

Table 4: Impact extent categories

Extent description	**Score**
Site specific	1
Local (< 2 km from site)	2
Regional (within 30 km of site)	3
National	4
Global	5

Table 5: Impact intensity categories

Description	Effect rating score
Potential to severely impact human health, or lead to loss of species	Negative Fatal flaw 16
Potential to reduce fauna/flora population or to lead to severe reduction/alteration of natural process, loss of livelihoods, quality of life and economic loss	Negative High 8
Potential to reduce environmental quality - air, soil, water. Potential loss of habitat, loss of heritage, reduced amenity	Negative Medium 4
Nuisance	Negative Medium-Low 2
Negative change - no other consequence.	Negative Low 1
Potential net improvement	Positive High 8
Potential to improve environmental quality - air, soil, water, improved livelihoods, improved ecosystem function and connectivity	Positive Medium 4
Potential to lead to economic development	Positive Medium-Low 2
Potential positive change - with no other consequence	Positive Low 1

Table 6: Impact duration categories

Duration	**Score**
Temporary (< 2 yrs) or duration of construction period. This impact is reversible	1
Short term (2-5 yrs). Impact is reversible	2
Medium term (5-15 yrs) The impact is reversible with appropriate mitigation and management	3
Long term (> 15 yrs but where the impact will cease with the operational life of the activity). The impact is reversible with the implementation of appropriate mitigation and management action	4
Permanent (i.e., mitigation will not occur in such a way or in such a timespan that the impact can be considered transient). The impact is irreversible.	5

Table 7: Impact probability categories

Duration	**Score**
Improbably (little to no chance of occurring)	0.10
Low probability (10-25% chance of occurring)	0.25
Probable (25-50% chance of occurring)	0.50
Highly probable (50-90% chance of occurring)	0.75
Definite (> 90% chance of occurring)	1.00

Table 8: Impact significance categories

Score	Rating	Description
18-26	Fatally flawed	The project cannot be authorised unless major changes to the design is carried out to reduce the significance rating
10-17	High	The impacts will result in major alteration to the environment even with the implementation of the appropriate mitigation measures and will have an influence on decision-making
5-9	Medium	The impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an impact on decision-making if not mitigated
<5	Low	The impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making

Cumulative Impact Assessment

Potential impacts of the development were cumulatively assessed using the guidelines provided by DEAT (2002, 2002b, 2004) and these guidelines provide a list of generic questions to ask in order to assess a potential cumulative impact on a particular study area. These questions are:

1. Is the proposed action one of several similar past, present or future actions in the same geographic area?
2. Do other activities (whether state or private) in the region have environmental effects similar to those of the proposed action?
3. Will the proposed action (in combination with other planned activities) affect any ecosystems of local, regional or national concern?
4. Have any recent environmental studies of similar actions identified important adverse or beneficial cumulative effects issues?
5. Has the impact been historically significant, such that the importance of the resource is defined by past loss, gain or investments to restore resources?
6. Does the proposed action involve any of the following?
    i. Long range transport of air pollution;
    ii. Air emissions resulting in the degradation of regional air quality;

iii. Loading large water bodies with discharges of sediment, thermal or toxic pollutants;
iv. Contamination of ground water supplies;
v. Changes in hydrological regimes of major rivers and estuaries;
vi. Long-term disposal of hazardous wastes;
vii. Mobilisation of persistent bioaccumulated substances through the food chain;
viii. Decreases in quantity and quality of soils;
ix. Loss of natural habitats
x. Loss of biological diversity.

3 Results

3.1 Site descriptions and sensitivity

The proposed site is entirely fenced and is about 10.3 ha (hectares) in size of which 8.3 ha (81%) is undeveloped and 2 ha (19%) developed (Figures 10). The developed area, situated on the south-western corner of the site, is fenced off from the undeveloped area and is currently used as a nursery and restaurant which include a parking lot, a building and footpaths. The property is situated next to very busy roads, including a national highway, a provincial road and a municipal road on its northern, western and southern borders (Figure 10 & 12), densely populated residential area next to its south and south-eastern border and developed agricultural farmlands to its north (Figures 10, 11 & 12). A man-made dam, which was constructed before 2004 (Figure 10), is situated on the north-western corner of the property (Figure 13). The south-eastern side of the site is bordered by residential buildings, on a property that extends along the site's eastern fence as open lands (Figure 10).

The ESA1 area delineated on the site, is aligned with the occurrence of the endangered Groot Brak Dune Strandveld ecosystem type (Figure 14). Groot Brak Dune Strandveld is 200 km^2 in extent (Figure 14), of which 0.069 km^2 (0.035%) lies within the borders of the proposed development (excluding the area currently already developed and where the nursery is situated). A very rough and large-scale delineation of obviously transformed Groot Grak Dune

Strandveld (Figure 15), which include areas that are intensely farmed and infrastructure (e.g., residential areas, towns etc), show that a minimum of 62 km^2 (31 %) is transformed. This figure is an under-estimation, as areas that were visibly cleared, but where it was not obvious if it was currently being farmed, i.e., still hold some restoration potential, were excluded. Infrastructure such as roads were also not delineated and included in the calculation of transformed Groot Brak Dune Strandveld.

Figure 10: Satellite image showing the proposed development site (red border), pointing out the existing developed area (pink shaded) and undeveloped area within the site.

Figure 11: Satellite image showing the proposed development site (red border) and its surrounds in the larger landscape.

Figure 12: Photograph showing traffic on the provincial road and residential area bordering the site to the south.

Figure 13: Photograph showing the man-made dam located in the north-western corner of the site.

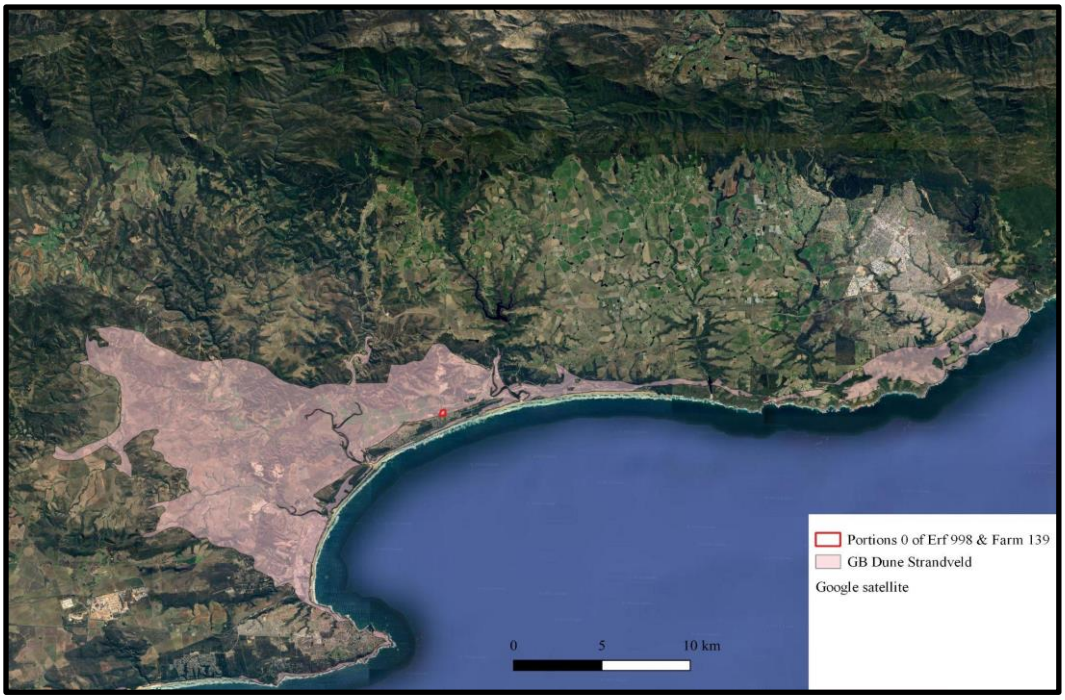


Figure 14: Satellite image showing the extent of Groot Brak Dune Strandveld ecosystem type.

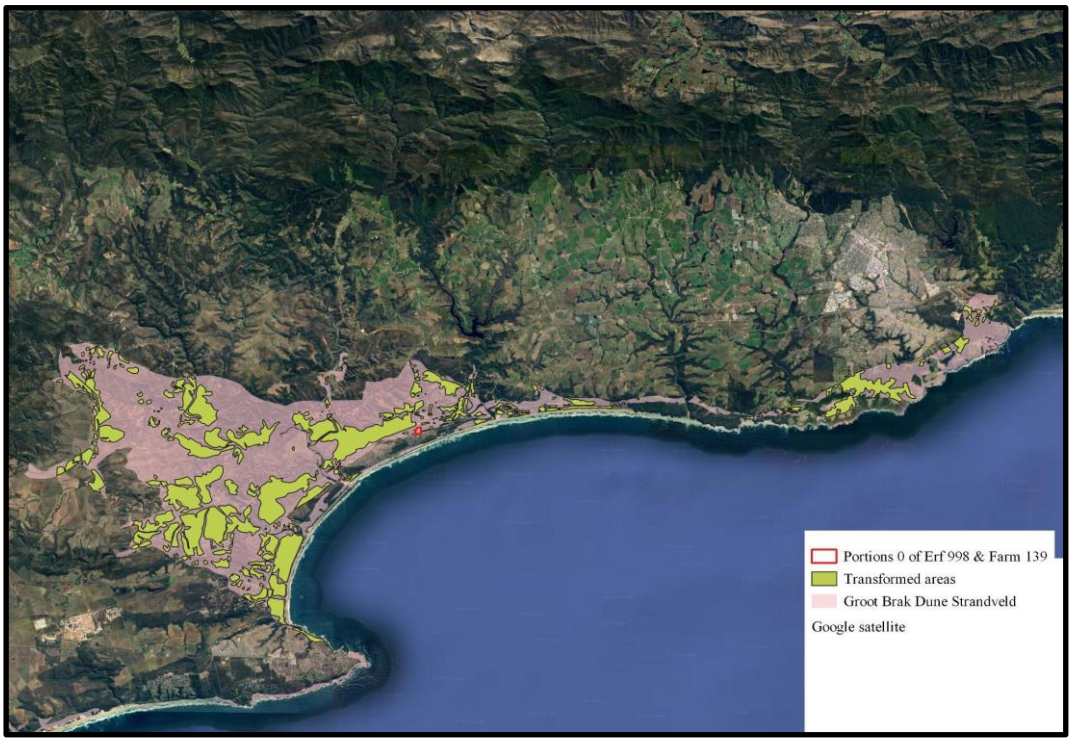


Figure 15: Satellite image showing the radically transformed Groot Brak Dune Strandveld, where restoration potential is very low to null.

3.2 Vegetation

The natural vegetation on the proposed development site (undeveloped section) was transformed from radical clearing practices that took place before 2004 (20 years ago) (Figure 16) to a predominantly grassland phase. Although there is evidence of limited clearing taking place recently (Figure 18), the vegetation is currently in a recovery phase with some, however, fairly limited elements of Groot Brak Dune Strandveld reappearing. Although the vegetation seems to be recovering, cover and structure is still visibly different as compared to the vegetation on the property to the north-east of the site where vegetation clearing practices did not take place (Figure 16 & 17). Apart from the north-western corner of the site, around the dam, where some thicket species such as *Rhus glauca* and *Chrysanthemoides monilifera* (Bietou) are denser, the rest of the site is dominated by the grass species *Melinis repens* (Figure 19A), interrupted across the entire site by matts of *Carpobrotus edulis* (Figure 19B). One smaller area is occupied by *C. acinaciformis*. The native shrub element was mostly composed of *Rhus glauca* and *Chrysanthemoides monilifera*, with a limited amount of Erica and *Dicerothamnus rhinocerotis* shrubs scattered across the site. No Protea or Leucadendron species were found as would have been expected if the site was in a more natural state. A patch of *Elegia tectorum* (Cape thatching reed) about 30 x 30 meters in size, was found next to the fence that separates the developed and undeveloped areas of the site. A few *Pittosporum viridiflorum* trees, listed as protected under the National Forests Act (Act 84 of 1998), were present in the undeveloped and the developed area (Figure 20). No plant species of conservation concern listed by the screening tool were found on the site. The category 2 invasive alien trees *Acacia melanoxylon*, *A. mearnsii* and especially *A. saligna* were present across the site. Inkberry (*Cestrum laevigatum*) trees were also found on site - a species classified as a Category 1b invader.

Figure 16: Historic satellite imagery from the year 2004 of the proposed development site (red border), showing that even prior to 2004, active clearance of natural vegetation was undertaken on the site, in the area outside of the plant nursery (pink shaded area). Vegetation clearance is evident from the marked difference of the vegetation structure and cover between the proposed site and surrounding properties, especially the property bordering the site to the east.

Figure 17: Current satellite imagery of the proposed development site (red border), showing how the vegetation cover between the proposed site and neighbouring properties (especially the eastern neighbouring property) differ in terms of cover, which indicates that the vegetation was slow to recover after active clearance since at least 2004 (Figure 9) and/or that vegetation clearance is still taking place. The pink shaded area is the location of the plant nursery.

Figure 18: Photograph showing current and active clearing practices on the site.

(A)  **(B)** 

Figure 19: Photograph showing the site (undeveloped area), from the northern fence, looking towards a southerly direction, dominated by the grass M. repens (A), and patches of C. edulis (B).

Figure 20: Map showing the location of *P. viridiflorum* trees on the proposed development site.

3.2 Animals

3.2.1 Mammals

Two mammal Species of Conservation Concern were identified by the Screening Tool (Table 3). Because these species are sensitive to illegal harvesting, its identity will be obscured, and its SANBI code, Species 5 and 8, will be used here. Species 8 occurs only in protected areas and its potential for occurrence on site therefore null. Species 5 does occur in the larger landscape around Groot Brakrivier, however, no signs were observed on the site and the site's habitat was unfavourable for these species and its likelihood of occurrence on site is therefore considered to be Very Low to Null.

Bushbuck (*Tragelaphus sylvaticus*) tracks were sighted on the northern half of the undeveloped area (Figure 20A), with most of the tracks close to the northern fence and

seemingly from bushbuck visiting the dam. There was a high density of mole-rat mounds (likely Cape Dune Mole Rat - Bathyergus suillis) across the entire undeveloped site area (Figure 21B). Domestic dog tracks were witnessed across the entire site and one domestic cat track was found (Figure 21C & D).

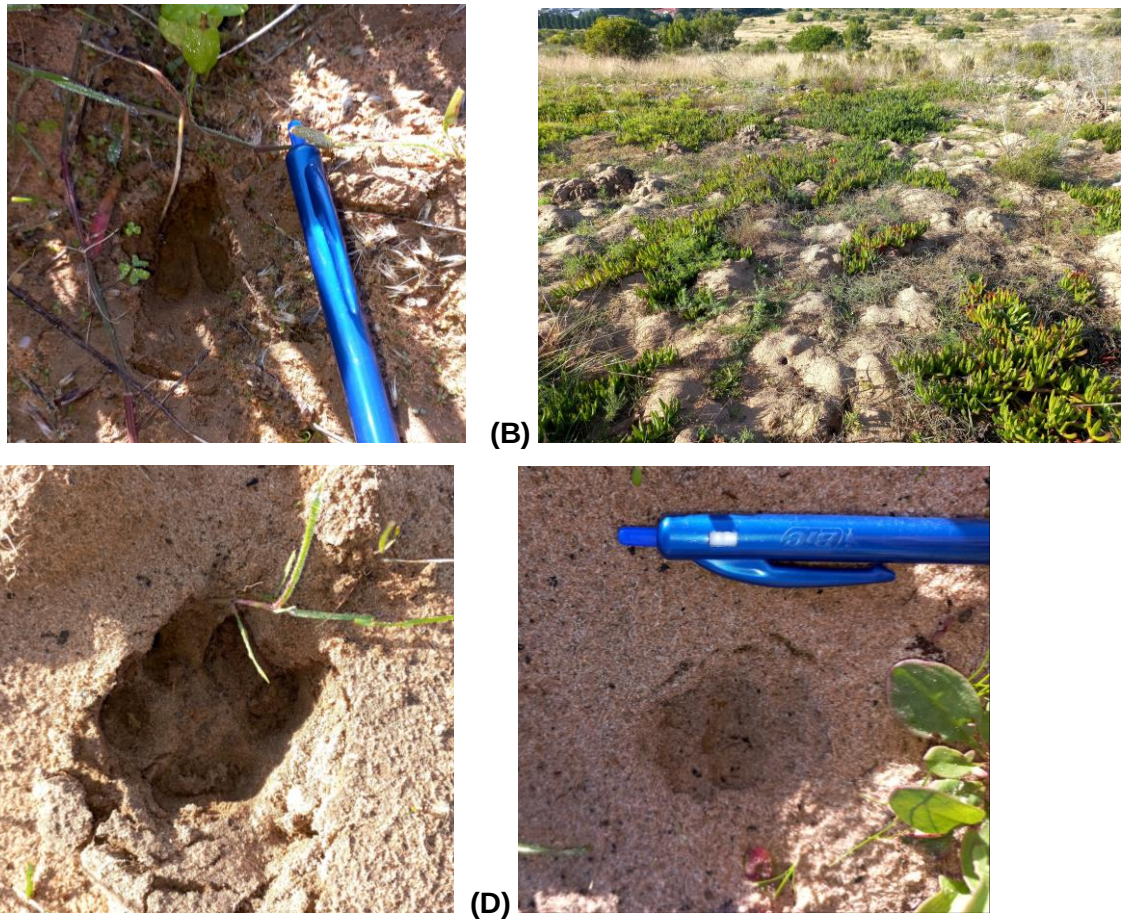


Figure 21: Photos showing signs of mammals, including Bushbuck tracks (A), mole-rat mounds (B), domestic dog tracks (C) and domestic cat tracks (D).

3.2.2 Birds

3.2.2.1 Circus ranivorus | African Marsh Harrier

The species *C. ranivorus* was not sighted on or in surrounding areas to the site, during site visits.

The African Marsh Harrier is found in association with pans, wetlands and wet grasslands. It nests in grasslands and pans in thick vegetation near a wetland or marsh - hence the name. With some floodplains, pans and valleys in the larger area surrounding the site, especially towards the north-western landscape, the landscape does provide some suitable habitat for this species. However, the human activity and infrastructure in and immediately surrounding the site, render the site suboptimal or marginal habitat for the species. Additionally, the SABAP2 observation rate of *C. ranivorus* was very low (0.1 - 2.5%) in the pentad within which the site falls (http://sabap2.birdmap.africa/coverage/pentad/3400_2210). The likelihood of this species' occurrence on the site is therefore considered Low.

3.2.2.2 Neotis denhami | Denham's bustard

The species *N. denhami* was not sighted on or in surrounding areas during site visits.

Denham's bustard is usually associated with grassland habitats but can be found in a considerable range of secondary habitats including dense shrubland, light woodland, farmland, dried marsh and arid plains. From a habitat perspective, it is likely that this bird would utilize the site, although the anthropogenic disturbance around the site is likely to have a strong limiting influence. The SABAP2 observation rate of *N. denhami* was fairly low (10.01-20%) in the pentad within which the site falls (http://sabap2.birdmap.africa/coverage/pentad/3400_2210). Denham's bustard generally requires large swathes of grassland with minimal human disturbance. The reason is the large size of the bird, it needs some space and time to get off into flight and thus is vulnerable in a habitat that does not provide open plains and additionally experiences human disturbances. The likelihood that it occurs on the proposed site is therefore fairly Low, given the human and domestic dog activity on and around the site.

3.2.2.3 Bradypterus sylvaticus | Knysna Warbler

The species *B. sylvaticus* was not sighted on the site during site visits.
The habitat of the Knysna Warbler is dense tangled scrub of forest edges, on or relatively near the coast. It has adapted to non-native bramble thickets and colonised suburban riparian

woodland, though without any marked range expansion. Most breeding territories are established in dense vegetation along streams, and nests are placed very close to the ground.

Although the SABAP2 observation rate was medium (30.01-50%) in the pentad within which the site falls (http://sabap2.birdmap.africa/coverage/pentad/3400_2210), its likelihood of occurrence on the site is considered Low as the habitat on site is unfavourable.

3.2.3 Invertebrates – grasshoppers

3.2.3.1 Aneurphymus montanus | Yellow-winged Agile Grasshopper

The description provided by Brown (1960) provided the best means of identification in the field. "This stout bodied insect is found locally common amongst partly burnt stands of evergreen Sclerophyll in the rocky foothills. It is an active geophilous insect which readily flies off when disturbed and is easily distinguished in flight by the pale lemon base of the hind wing. . . When captured and handled both sexes have the objectionable habit of regurgitating a dark brown fluid which readily stains the fingers."

Note the habitat is given as evergreen Sclerophyll-covered rocky foothills, and thus the habitat on the site is not ideal for this grasshopper to occur as the site is situated on a predominantly sandy slope. No individuals were found on site and its likelihood of occurrence on the proposed site is considered Low.

3.2.4 Invertebrates – butterflies

3.2.4.1 Aloeides thyra orientis | Brenton Copper

The Brenton copper is endemic to the Western Cape of South Africa, and its IUCN risk category is classified as Endangered (EN). Its habitat is defined as coastal fynbos or flat sandy ground (natural or anthropogenically disturbed) between 40-240 m above sea level. Anthropogenic encroachment through roads, houses and infrastructure as well as agricultural activities and the spread of invasive alien plants and disrupted fire frequencies (fire suppression mostly) and associated fire intensities when associated with unnatural biomass

build-up due to fire suppression are the major threats to this species. Adults are on wing from July to April with peaks in October and February (Smith *et al*. 1998). The larvae feed on *Aspalathus acuminata*, *A. laricifolia* and *A. cymbiformis*. The larvae are attended to by *Lepisiota capensis* ants.

Although some of the habitat requirements of the Brenton copper coincide with the conditions found on the site, none of the host plant species were found and no individuals of this species were captured. Due to the clearing practices and unavailability of host plants, the occurrence of the species on this site is therefore considered Low.

3.2.4.2 Lepidochrysops littoralis | Coastal Blue

This species is considered not sensitive according to the SANBI National Sensitive Species List (http:
//nssl.sanbi.org.za/species/lepidochrysops-littoralis) but indicated as Endangered (EN) as per the IUCN risk category. Adults are on wing from late August to December. Its habitat preference is coastal sand dunes and flatlands covered with fynbos. Males have territories around large clumps of dense shrubs, dune peaks and clearings in dense vegetation (Smith *et al*. 1998). There is no data on its larval food source (Smith *et al*. 1998).

The habitat on the site is sub-optimal for this species, due to the clearing practices and therefore limited fynbos component and no individuals were observed on the site and their potential occurrence therefore considered as Low. Their presence cannot be totally discounted, however, as sampling was undertaken outside of the species' flight period.

3.3 Biodiversity status quo

The following features that contribute to biodiversity were present on the proposed development site:

- Intensive clearing seems to have ceased since 2004, and some Groot Brak Dune Strandveld plant species were present, and the ecosystem is in a process of recovery, especially evident by the dominance of the pioneer species *Carpobrotus edulis* and the re-emergence of some Erica shrubs, and other characteristic fynbos elements.

- *Pterocelastrus viridiflorum* (cheesewood), a protected tree species, was present on the site.
- Bushbuck spoor was fairly abundant in the northern section of the undeveloped site area, the area delineated as an ESA1. The spoor directions showed that mostly, bushbuck moved from the open property to the east of the site (where the ESA1 continues and a CBA1 is delineated) and moved in an east-west direction and back., This area therefore does seem to still play a role in terms of providing a corridor area that links the CBA 1 area in a neighbouring property to the east of the site and ESA1 areas on the west of the site.

The following features that negatively impacts biodiversity on the site, were present:

- Radical past vegetation clearance on the entire area of the undeveloped section of the site, has degraded the vegetation and transformed the Groot Brak Dune Strandvels to a predominantly grassland phase.
- Dog spoor was present across the entire site.
- The busy National, Provincial and municipality roads and residential areas to the north, west and south of the site, limit the functionality of the corridor functioning on and just outside of the site.
- Category 2 invasive alien Acacia species were the largest and most dominant trees/ Shrubs on the site.
- No Animal or Plant Sensitive Species of Conservation Concern were sighted on the site.

3.4 Impact Assessment

The impact assessment is carried out according to the above methodology. The mitigation strategies that we suggest and which we considered in scoring the Impact Assessment are to:

1. Designate a mitigation area on the northernmost section of the undeveloped section of the site (Figure 22). This area coincides with the ESA1 area, the areas delineated as high sensitivity for animals by the Screening Tool and with the occurrence of bushbuck spoor, which indicates that this section of the site plays a role in ecological connectivity.
2. Plant indigenous (Groot Brak Dune Strandveld) species in gardens that may be located within the proposed development and encourage indigenous plant recovery in the mitigation area.
3. Undertake active alien invasive plant clearing in the mitigation area and garden areas of the proposed development.

Without mitigation, the significance of the impact is considered Medium, for all the assessed impacted categories (Table 9), except for the category “Loss of ecosystem function, pattern and process”. With the suggested mitigation actions, as set-out above, the significance of impact for all the impacted categories are considered to be Low (Table 10).

Figure 22: Map showing the location of the proposed mitigation area on the proposed development site.

Table 9: Impact tables of the proposed development without mitigation

Impacted category	Extent	Duration	Intensity	Probability	Score	Significance
Loss of an endangered ecosystem type	1	5	4	0,75	7.5	Medium
Loss of ecosystem services	1	5	4	0.75	7.5	Medium
Loss of ecosystem function, pattern and process	2	5	8	0.75	11.3	High
Loss of distinct biodiversity features	2	5	4	0.50	5.5	Medium

Table 10: Impact tables of the proposed development with recommended mitigation

Impacted category	Mitigation	Extent	Duration	Intensity	Probability	Score	Significance
Loss of an endangered ecosystem type	Mitigation area; Active indigenous plant species planting in gardens; Alien clearing.	1	2	1	0,50	2	Low
Loss of ecosystem services	Mitigation area; Active indigenous plant species planting in gardens; Alien clearing.	1	1	2	0,50	2	Low
Loss of ecosystem function, pattern and process	Mitigation area; Active indigenous plant species planting in gardens; Alien clearing.	2	1	2	0,50	2.5	Low
Loss of distinct biodiversity features	Mitigation area; Active indigenous plant species planting in gardens; Alien clearing.	1	1	2	0,50	2	Low

4 Summary and recommendations

Due to almost the entire site falling under an Ecological Support Area (ESA1), and the Endangered ecosystem types, Groot Brak Dune Standveld as delineated by the WCBSP and as Hartenbos Dune Thicket by the Red List of Ecosystems (RLE) for terrestrial realm for South Africa, the proposed development site is considered an area of importance for the maintenance of biodiversity, according to National and Local Biodiversity Planning and Land Use guidelines. We found that, although the vegetation on the entire site is in a degraded state, due to intensive vegetation clearing actions since, at least, 2004, there were some species that are characteristic of Groot Brak Dune Strandveld regenerating on the site. Therefore, the loss of the site's vegetation during construction of the development on the site, will lead to the loss of Groot Brak Dune Strandveld rehabilitation potential on site, which was considered when we assessed and scored impacts. These impacts, however, are considered low if suggested mitigation actions were to be taken, which most importantly, include the demarcation of a mitigation area on the northernmost section of the site where no development is recommended. It is also recommended that care be taken to leave the vegetation in this mitigation area undisturbed during construction on the rest of the site. Additionally, it is recommended that rehabilitation of natural species be encouraged in the mitigation area and that alien invasive species be controlled.

In terms of the ESA1 area, the occurrence of remnant Groot Brak Dune Strandveld plant species and the occurrence of antelope spoor in especially the northern half of the site, indicates that it still holds a function as an ESA1 area, especially in terms of ecological connectivity. The suggested mitigation area, however, will offset the loss of the ESA1 area to some extent and lower the impact on biodiversity from Medium to Low.

None of the Sensitive plant or animal Species of Special Concern, as identified by the screening toll were present on site. However, eight individuals of the protected tree species, *P. viridiflorum*, was found on the site, and mapped. It is recommended that where individuals of this species fall within a development area, that where possible, a 2-meter buffer be

demarcated around the tree. Where a tree can not be kept at its location, it is recommended that an application be made at the nearest Forestry office of DFFE, for a license to replant the tree in an area on the site where development will not take place, otherwise, a valid license to destroy the tree.

References

Bromilow, C. *et al*. Problem Plants of South Africa. Briza Publications, 2003.

Brown, H.D. New grasshoppers (Acridoidea) from the Great Karroo and the South Eastern Cape Province. Journal of the entomological Society of Southern Africa, 23(1), pp.126-143, 1960.

Coetzee, J. Vegetation and habitat diversity in the Groot Brak Dune Strandveld, Garden Route National Park. Unpublished Master's thesis, Nelson Mandela University, 2017.

Cowling, R.M., Holmes, P.M., & Rebelo, A. G. Plant diversity and endemism. In The Vegetation of South Africa, Lesotho, and Swaziland (pp. 52-93). Cambridge University Press, 1997.

Cowling, R.M., Holmes, P.M., & Rebelo, A.G. Plant diversity and endemism. In The Vegetation of South Africa, Lesotho and Swaziland (pp. 77-110). Springer, 2018.

Cowling, R.M., Proches, S., & Partridge, T.C. Explaining the uniqueness of the Cape flora: incorporating geomorphic evolution as a factor for explaining its diversification. Molecular phylogenetics and evolution, 33(1), 1-20, 2005.

Dayaram, A., Harris, L.R., Grobler, B.A., Van der Merwe, S., Rebelo, A.G., Powrie, L.W., Vlok, J.H.J., Desmet, P.G., Qabaqaba, M., Hlahane, K.M. *et al*. Vegetation map of South Africa, Lesotho and Swaziland 2018: a description of changes since 2006. *bothalia*, 49 (1), a2452, 1–11, 2019.

DEA. National List of Ecosystems that are threatened and in need of protection. Government Gazette No. 34809, Government Notice No. 1002. National Printer, Pretoria, 2011.

DEAT. Ecological Risk Assessment, Integrated Environmental Management, Information. Series 6, Department of Environmental. Affairs and Tourism (DEAT), Pretoria, 2002.

DEAT. Environmental Impact Reporting, Integrated Environmental Management, Information Series 15, Department of Environmental Affairs and Tourism (DEAT), Pretoria, 2004.

DEAT. Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria, 2002b.

Els, D. Restios of the fynbos. Penguin Random House South Africa, 2012.

Higgins, S.I. Fynbos (Fine Bush) Biome. In Reference Module in Earth Systems and Environmental Sciences (pp. 1-12). Elsevier, 2016.

Holmes, P.M., Rebelo, A.G. & Forshaw, C. Cape Plants: A conspectus of the Cape Flora of South Africa. Strelitzia 35. South African National Biodiversity Institute, Pretoria, 2014.

Humphries, M. Vegetation types of the Cape Floral Region: a computer-based vegetation classification. Strelitzia, 9, 1-128, 2002.

Manning, J.C., Goldblatt, P., Duncan, G.D., Forest, F., Kaiser, R., Tatarenko, I. *et al*. Botany and horticulture of the genus Freesia (Iridaceae). South African National Biodiversity Institute, 2010.

Manning, J. Field guide to fynbos. Penguin Random House South Africa, 2018.

Manning, J., Goldblatt, P., Snijman, D. *et al*. The color encyclopedia of Cape bulbs. Timber Press, 2002.

Moriarty, A. & Snijman, D.A. Outeniqua, Tsitsikamma & Eastern Little Karoo. Botanical Society of South Africa, 1997.

Mucina, L. & Rutherford, M.C. (eds). The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria, 2006.

Pool-Stanvliet, R., Duffell-Canham, A., Pence, G & Smart, R. The western cape biodiversity spatial plan handbook. Stellenbosch: CapeNature, 2017.

Rebelo, A.G., Siegfried, W.R., Holmes, P.M., *et al*. Coastal vegetation of South Africa. In: Allsopp N, Foden W, O'Connor T, et al., editors. Protecting South Africa's estuaries and associated aquatic resources: a review of the ecological aspects. South African National Biodiversity Institute, Pretoria, 2006.

Rouget, M., Richardson, D.M., Nel, J.L., *et al*.. Mapping the potential ranges of major plant invaders in South Africa, Lesotho, and Swaziland using climatic suitability. Diversity and Distributions, 12(6), 629-643, 2006.

South African National Biodiversity Institute & Department of Forestry, Fisheries and the Environment (2021) Red List of Terrestrial Ecosystems of South Africa June 2021 – version for public comments. South African National Biodiversity Institute. Pretoria, South Africa.

Smith, G.F., Burgoyne, P., Chesselet, P., Hammer, S., Hartmann, H., Klak, C., Kurzweil, H., Van Jaarsveld, E.J. & Van Wyk, B. Mesembs of the world. Briza Pretoria,South Africa, 1998.

Smith, G.F., Van Wyk, B.E., & Burrows, J.E. Leucadendron linifolium. In: Fynbos, Ecology, Evolution, and Conservation of a Megadiverse Region (pp. 319-322). Oxford University Press, 2018.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. South african national biodiversity assessment 2018 technical report volume 1: Terrestrial realm. south african national biodiversity institute, 2019.

Van der Merwe, J.H. The South African field of dune vegetation classification (SFDC) system: history, principles and application. Bothalia, 47(2), a2173, 2017.

Van Oudtshoorn, F. Guide to grasses in South Africa. Briza Publications, 1992.

Van Wyk, B. Field guide to trees of southern Africa. Penguin Random House South Africa, 2013.

Vlok, J.H.J. & de Villiers, M.E. Vegetation map for the Riversdale domain. Unpublished 1:50 000 maps and report supported by CAPE FSP task team and CapeNature, 2007.

Declaration of Independence

I, Dr. Marius L van der Vyver, hereby declare that I

- Act as the independent specialist in this application;
- Will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant and that there are no circumstances that may compromise my objectivity in performing such work;
- Have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- Will comply with the Act, regulations and all other applicable legislation;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority.

I further declare that all the particulars furnished by me in this form are true and correct; and acknowledge that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

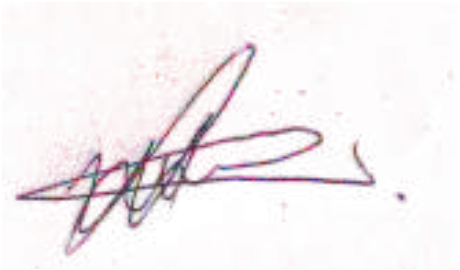
Name of Company

chepri (Pty) Ltd scientific services

Name of Specialist Consultant

Dr. ML van der Vyver

Signature of Specialist Consultant



Date

July 18, 2023

Specialist details

Dr. Marius L. van der Vyver holds a PhD in Botany from Nelson Mandela University and has more than 15 years' experience as an ecologist and botanist. He is registered with the South African Council of Natural Scientific Professions (SACNASP) as an ecological scientist (reg.no. 118303) and a member of the South African Association of Botanists (SAAB).