Plants, Animals and Terrestrial Biodiversity Assessment

prepared in accordance with the
protocols for the specialist assessment and minimum report content requirements for environmental impacts on plant species, animal species, and terrestrial biodiversity.

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Plant Species, Animal Species, and Terrestrial Biodiversity Assessment Report for Erf 9706 at Robberg, Plettenberg Bay in the Western Cape Province

30 July 2025

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Specialist details and declaration

This report has been prepared in accordance with the protocol for the specialist assessment and minimum report content requirements, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320, for environmental impacts on terrestrial plant and animal species (October 2020), and terrestrical and aquatic biodiversity (March 2020). It has been prepared independently of influence or prejudice by any parties.

The details of the specialist:

Specialist	Qualification and accreditation
Dr David Hoare (Pr.Sci.Nat.)	• PhD Botany • SACNASP Reg. no. 400221/05 (Ecology, Botany)

Declaration of independence:

David Hoare of BioCensus (Pty) Ltd is an independent consultant and hereby declares that he does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by BioCensus (Pty) Ltd is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure:

BioCensus (Pty) Ltd undertakes to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the

competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to BioCensus (Pty) Ltd by the client and in addition to information obtained during the course of this study, BioCensus (Pty) Ltd presents the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practice.

_____ 30 July 2025

Dr David Hoare Date

Terms of reference

This report is prepared in compliance with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial and aquatic biodiversity, terrestrial plant species and terrestrial animal species.

This assessment follows the requirements of The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020 for Terrestrial and Aquatic Biodiversity, and in GN. No. 1150 dated 30 October 2020 for Terrestrial Plant Species and Terrestrial Animal Species. As per these Regulations, the approach for assessing sensitivity with respect to Terrestrial Plant Species and Terrestrial Animal Species is in accordance with guidelines described in the latest version of the "Species Environmental Assessment Guidelines," available at https://bgis.sanbi.org/.

The assessment and minimum reporting requirements of these protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The screening tool can be accessed at:

https://screening.environment.gov.za/screeningtool.

Introduction

Site location

The site is Erf 9706 on Portion 57 of Brakkloof 443 in Robberg, Plettenberg Bay, in the Western Cape Province. The site is adjacent to the Robbe Berg Baai road, via which it is accessed. Refer to **Figure 1** below for the general location.

There was previously a dwelling on the property, which was lost during the fires in 2017. A new construction is currently taking place on the site. The original boardwalk was also lost during the 2017 fires - it was located outside the property on the seaward (eastern) side (Figure 2).

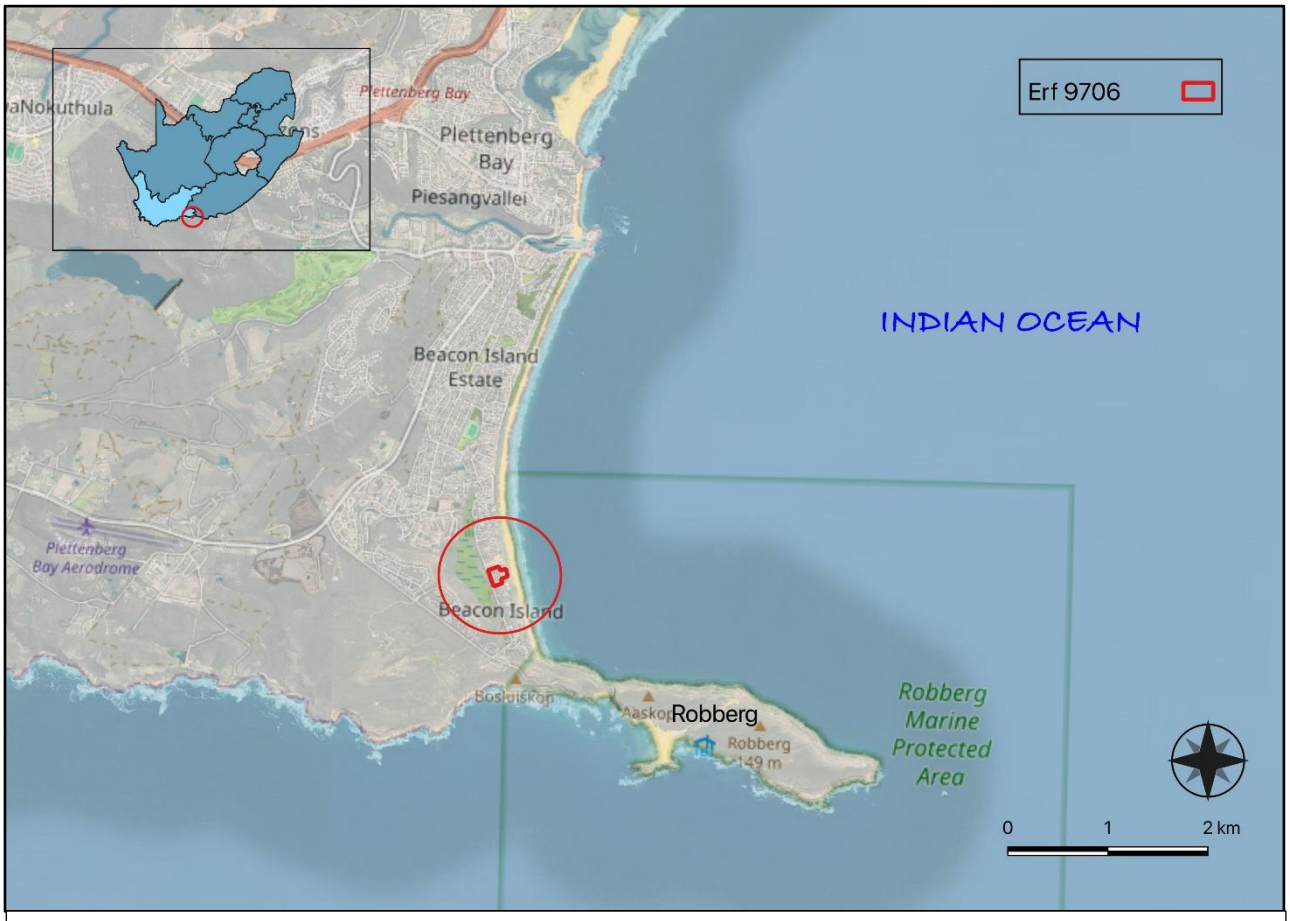

Figure 1: Location of the site (within red circle).

The scope of this report is the location of the proposed replacement boardwalk, as well as proposed new sections of boardwalk, and a new deck section adjacent to the new house.

Figure 2: Aerial image of the property and surrounding areas.

Identified Theme Sensitivities

A sensitivity screening report from the DFFE Online Screening Tool was requested in the application category:

Infrastructure|Localised infrastructure|Infrastructure in the Sea Estuary Littoral Active Zone Development Setback_100M Inland or coastal public property.

The DFFE Screening Tool report for the area, dated 20/06/2025, indicates the following ecological sensitivities:

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species Theme			X	
Animal Species Theme		X		
Terrestrial Biodiversity Theme	X			

Plant Species theme

Areas of different sensitivity are shown in Figure 3. Sensitive species flagged for the site are as follows:

Sensitivity	Feature
Medium	*Lampranthus pauciflorus*
Medium	*Ruschia duthiae*
Medium	*Lebeckia gracilis*
Medium	*Sensitive species 131*
Medium	*Leucospermum glabrum*
Medium	*Selago burchellii*
Medium	*Erica chloroloma*
Medium	*Erica glandulosa subsp. fourcadei*
Medium	*Hermannia lavandulifolia*
Medium	*Sensitive species 657*
Medium	*Sensitive species 1032*
Medium	*Acmadenia alternifolia*
Medium	*Muraltia knysnaensis*
Medium	*Erica glumiflora*
Medium	*Sensitive species 500*
Medium	*Sensitive species 763*

Medium	*Sensitive species 800*
Medium	*Osteosermum pterigoideum*
Medium	*Pterygodium cleistogamum*
Medium	*Pterygodium newdigateae*

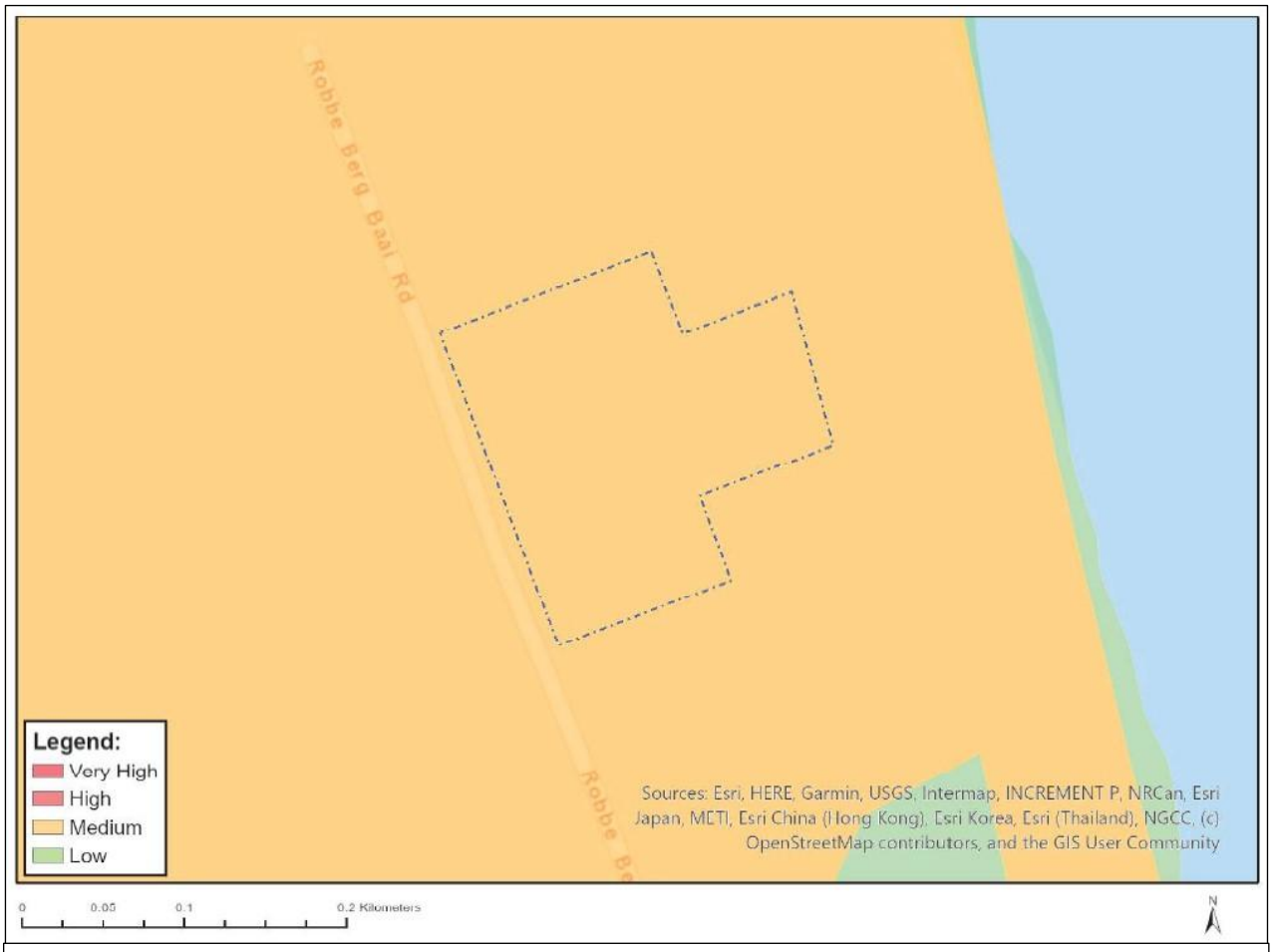

Figure 3: Plant Species theme sensitivity for the site and surrounding areas.

Animal Species theme

Areas of sensitivity are shown in Figure 4 and sensitive features are indicated as follows:

Sensitivity	Feature(s)
High	Aves-Circus ranivorus
Medium	Aves-Stephanoaetus coronatus
High	Aves-Neotis denhami
Medium	Aves-Bradypterus sylvaticus
Medium	Invertebrate-Aneuryphymus montanus

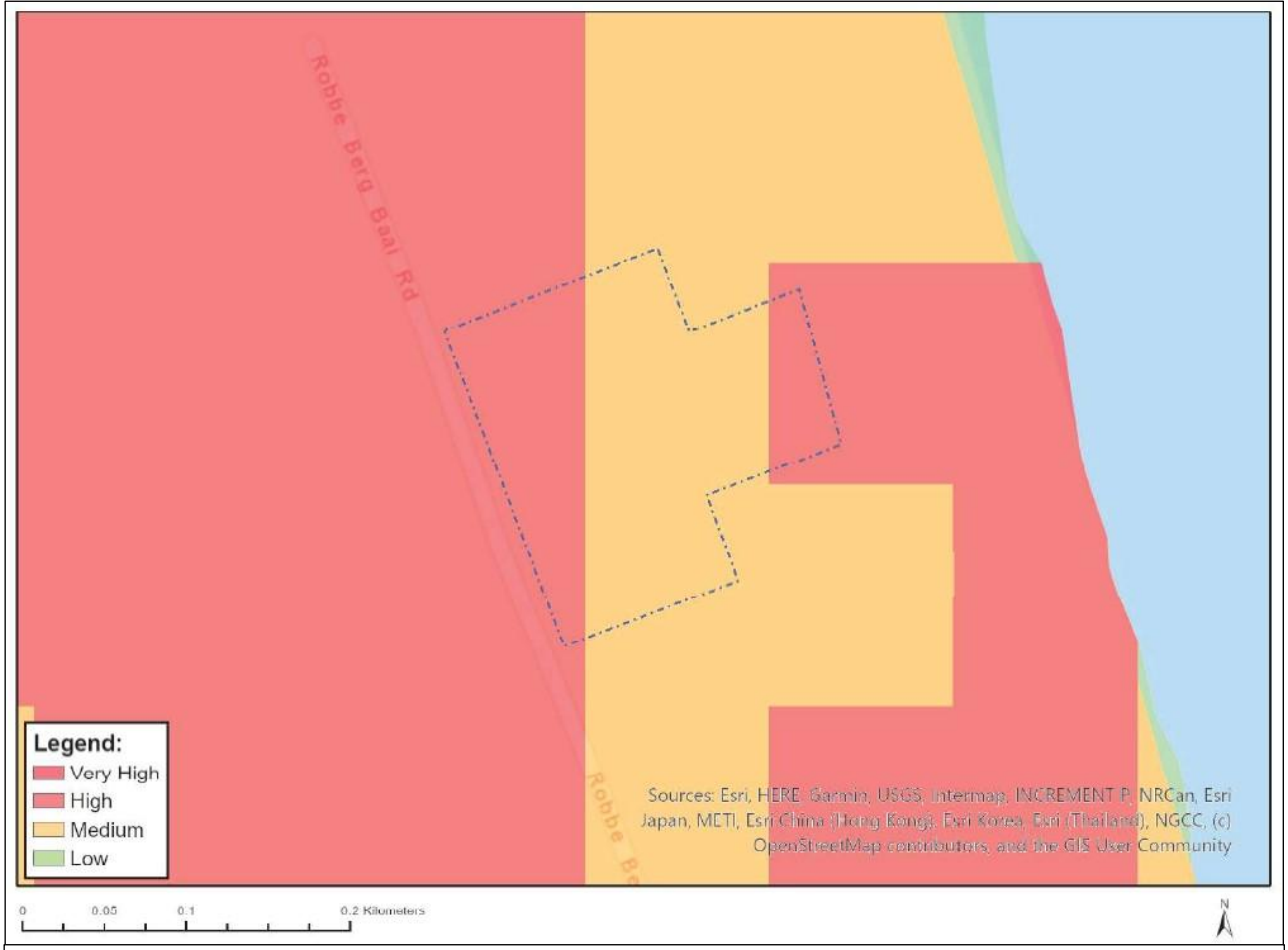

Figure 4: Animal Species theme sensitivity for the site and surrounding areas.

Terrestrial Biodiversity theme

Areas of sensitivity are shown in Figure 5 and sensitive features are indicated as follows:

Sensitivity	Feature(s)
Very High	ESA 1

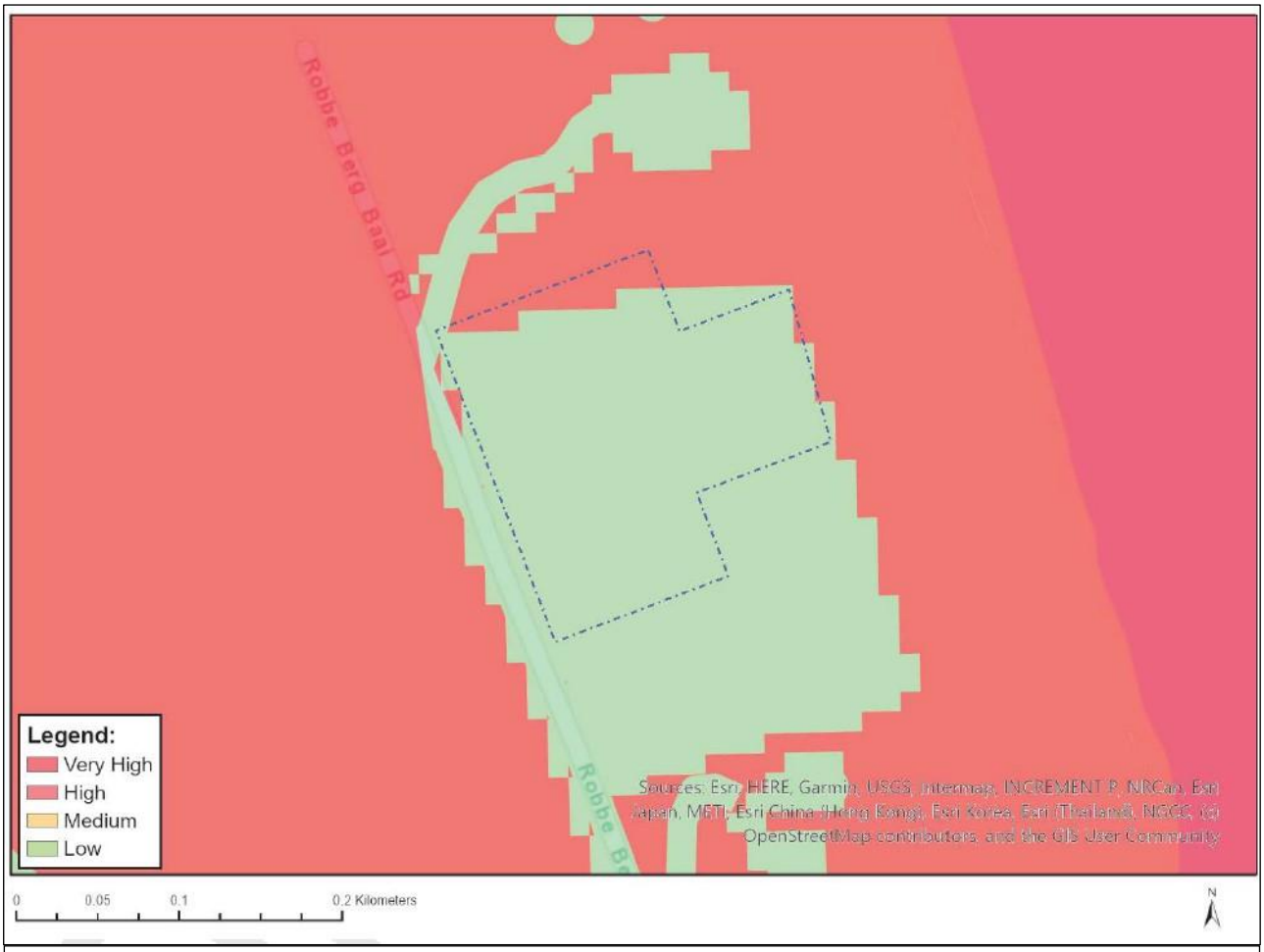

Figure 5: Terrestrial Biodiversity theme sensitivity for the site and surrounding areas.

Assessment methodology

The detailed methodology followed as well as the sources of data and information used as part of this assessment are described below.

Survey timing

The study commenced as a desktop-study followed by site-specific field study on 27 June 2025. The site is within the Fynbos Biome of the southern Cape which has an all-year rainfall season. The timing of the survey in June is therefore optimal in terms of assessing the flora and vegetation of the site. Rainfall seasonality, which drives most ecological processes, is shown in **Figure 6**, which shows that Plettenberg Bay has peak rainfall from August to November. The overall condition of the vegetation was possible to be determined with a high degree of confidence.

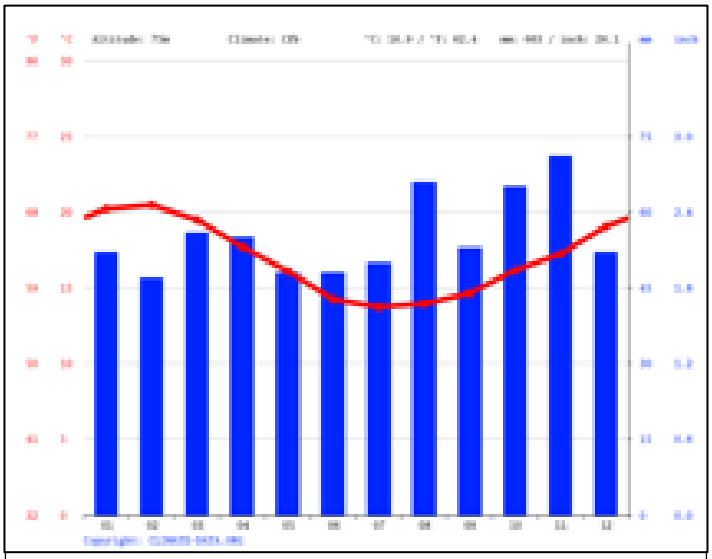

Figure 6: Monthly rainfall for Plettenberg Bay.

Field survey approach

Field surveys of the site included meander searches of the entire area proposed for development, and active searching in surrounding habitats that were considered to be suitable for specific groups or species. A hand-held Garmin GPSMap 64s was used to record a track within which observations were made. Digital photographs were taken of features and habitats on site, as well as of all plant and animal species that were seen. All plant and animal species recorded were uploaded to the iNaturalist website (https://www.inaturalist.org) and are accessible by viewing the observations for the site (use the Explore menu, zoom and pan until the desired study area is within the browser window, click the button "Redo search in map", and all observations for that area will be shown and listed).

Aerial imagery from Google Earth was used to identify and assess habitats on site. This included historical imagery that may show information not visible in any single dated image. Patterns identified from satellite imagery were verified on the ground. Digital photographs were taken at locations where features of interest were observed. During the field survey, particular attention was paid to ensuring that all habitat variability was covered physically on the ground.

Impact assessment methodology

The impact assessment methodology assists in evaluating the overall effect of a proposed activity on the environment. The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). The rating system is applied to the potential impact on the receptor. The impact assessment methodology provided below explicitly takes into account the value and condition of the biodiversity resources affected. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
BIODIVERSITY VALUE / SENSITIVITY CRITERIA					
Irreplaceability (I) The biodiversity value of the affected resource	Resource is widespread and common and /or regenerates itself (LC)	Resource is uncommon, endemic to a restricted area, moderately rare, or is already noticeably affected but still relatively widespread (e.g., NT, ESA)	Resource is naturally rare, restricted to limited localities, ephemeral, or is approaching a threshold of persistence (VU, CBA2)	Resource is highly localised / loss has already exceeded persistence thresholds (EN, CBA1)	Resource is critically rare / loss has already well exceeded persistence thresholds (CR, Protected)
Threshold (T) The scale of the impact relative to the overall distribution of a resource, therefore the degree to which the impact contributes towards exceeding an ecological threshold	Impact affects a negligible proportion of the overall biodiversity resource	Impact affects a proportion of the biodiversity resource that is within 6 orders of magnitude of the total extent / number of the resource (0.001-0.1%)	Impact affects a proportion of the biodiversity resource that is within 4 orders of magnitude of the total extent / number of the resource (0.1-1%)	Impact affects a proportion of the biodiversity resource that is within 2 orders of magnitude of the total extent / number of the resource (1-10%)	Impact affects a proportion of the biodiversity resource that is within 1 order of magnitude or more of the total extent / number of the resource (≧10%)
Condition (C) The integrity of the resource in terms of its intactness and functionality, the coherence of its ecological structure and function	Resource in very poor condition, displaying advanced degradation		Moderately affected resource, functional but displaying obvious signs of minor degradation		Fully functional and in a state expected in a completely natural state, unaffected by human influence.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation	Mostly reversible: requires minor mitigation	Partly reversible: Recoverable with more intense mitigation	Barely reversible: unlikely to be reversed, even with intense mitigation	Irreversible: Not possible despite action
IMPACT MAGNITUDE CRITERIA					
Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Within site boundary only	Site & surroundings: Extends for a limited distance beyond site boundaries	Landscape: Outside activity area	Regional: Affects patterns at a regional or provincial scale	Global: Across borders or boundaries
Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact, 0-1 years	Short term: 1-5 years	Medium term: 5-10 years	Long term: Project life, 10-25 years	Permanent: Indefinite
Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease or continue in a highly modified way	Very High: Permanent cessation of processes
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$\boldsymbol{S = [(E + D + M)/3 \times (R + I + T + C)/4]/5}$ $\boldsymbol{Significance = (Extent + Duration + Magnitude)/3 \times (Reversibility + Irreplaceability + Threshold + Condition)/4}$				
IMPACT SIGNIFICANCE RATING					

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Total Score	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5
Environmental Significance Rating (Negative (-))	Very low	Low	Moderate	High	Very High
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

Sources of information

Regional Vegetation

- South African National Biodiversity Institute (2006-2024). The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, https://bgis.sanbi.org/Projects/Detail/2258, Version 2024.
- The description of each vegetation type includes a list of plant species that may be expected to occur within the particular vegetation type.

Threatened Ecosystems

- The conservation statuses of the vegetation types were obtained from the Revised National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).

Regional plans

- Information from the National Protected Areas Expansion Strategy (NPAES) was consulted for possible inclusion of the site into a protected area in future (available on http://bgis.sanbi.org).
- CapeNature 2024. 2023 Western Cape Biodiversity Spatial Plan and Guidelines Overview V2.0.
- South Africa Protected Areas Database (SAPAD_OR_2024_Q3) retrieved from the Department of Forestry, Fisheries and the Environment website (https://egis.environment.gov.za/data_egis/data_download/current).

Aerial imagery

- Recent satellite imagery (courtesy of Google Earth Pro). Google Earth Pro also provides historical imagery for a period up to 15 years ago, which aided in the determination of certain vegetation types and land use historically and currently present on site.

- Archive of historical aerial photography dating back to the 1930's accessed from the Department of Agriculture, Land Reform and Rural Development's (DALRRD) National Geo-spatial Information (NGI) website (http://www.cdngiportal.co.za/cdngiportal/).

Vegetation and plant species

- Plant species that could potentially occur in the general area were obtained from the South African National Biodiversity Institute (SANBI) available on the Biodiversity Advisor website (https://biodiversityadvisor.sanbi.org/).
- The IUCN Red List category for plant species, as well as supplementary information on habitats and distribution, was obtained from the SANBI Threatened Species Programme (Red List of South African Plants, http://redlist.sanbi.org).
- Lists were compiled specifically for any species at risk of extinction (Red List species) previously recorded in the area. Historical occurrences and habitat information of threatened plant species were obtained from SANBI and various published sources. The probability of finding these species was then assessed by comparing the habitat requirements with those habitats that were found during the field survey of the site.
- Regulations published for the National Forests Act (Act 84 of 1998) (NFA) as amended, provide a list of protected tree species for South Africa. The species on this list were assessed in order to determine which protected tree species have a geographical distribution that coincides with the study area and habitat requirements that may be met by available habitat in the study area. The distribution of species on this list were obtained from distribution information on the SANBI Biodiversity Advisor website (https://biodiversityadvisor.sanbi.org/).

Animal species

- Lists of animal species that have a geographical range that includes the study area were obtained from literature sources (Bates et al., 2014 for reptiles, du Preez & Carruthers 2009 for frogs, Mills & Hes 1997 and Friedmann and Daly, 2004 for mammals). This was supplemented with information from the Animal Demography

Unit website (adu.uct.ac.za) and literature searches for specific animals, where necessary.

Limitations

The following assumptions, limitations, uncertainties are listed regarding the assessment of the site:

- The assessment is based on the site visit as well as a desktop study of the available information. The time spent on site was adequate for understanding general vegetation patterns across the study area.
- Rare and threatened plant and animal species are, by their nature, usually very difficult to locate and can be easily missed. This is partially overcome by undertaking desktop research of possible species of concern. The Screening Tool output contains modelled distributions of all species that could occur on site, based on current knowledge of all SANBI databases.

Results

Desktop description of vegetation

The entire site is mapped as occurring within one regional vegetation type, namely Goukamma Strandveld (**Figure 7**). The coastal strip of vegetation adjacent to the property on the east is Cape Seashore Vegetation, and Garden Route Shale Fynbos is mapped as occurring to the west.

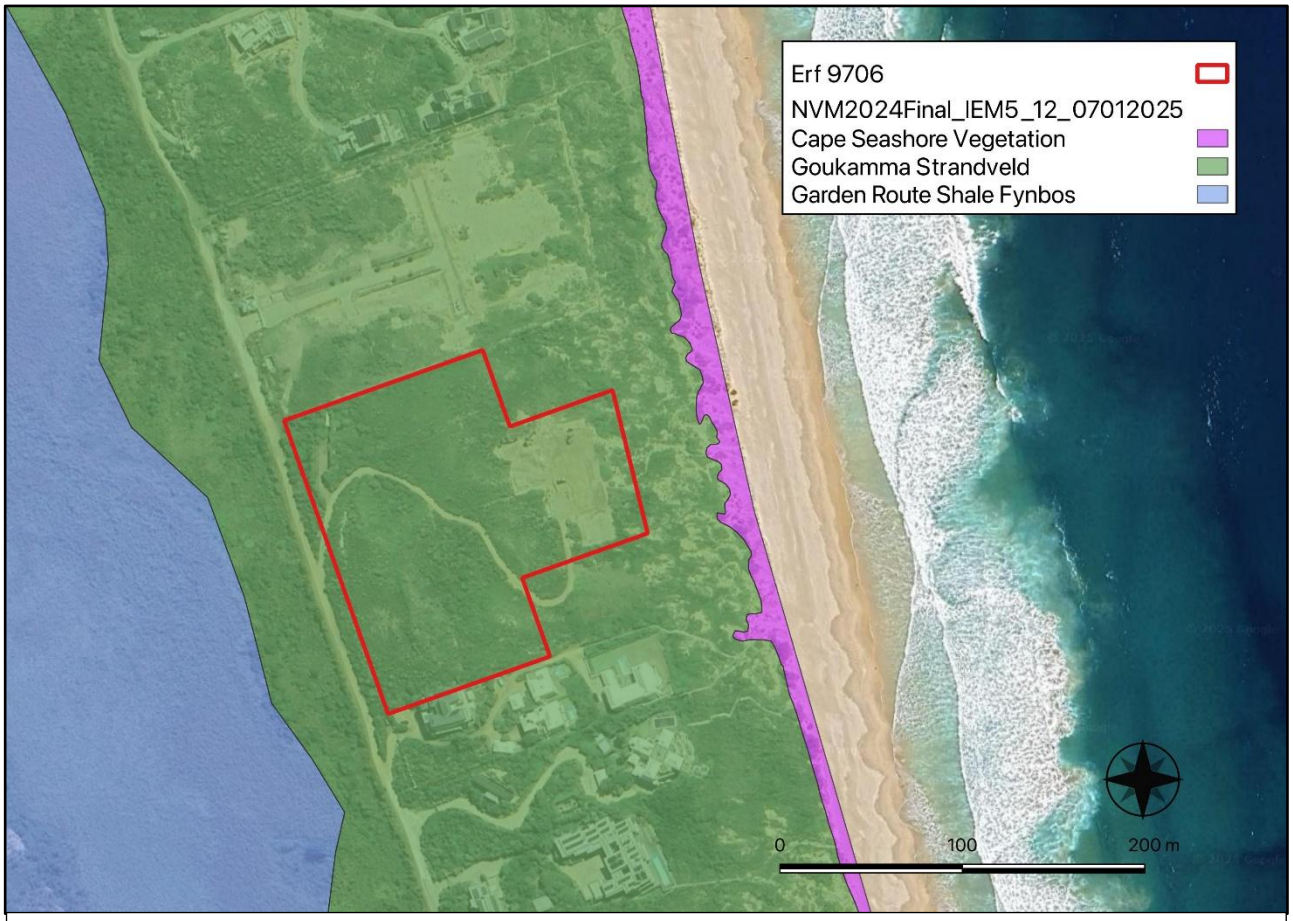

Figure 7: Regional vegetation types of the site and surrounding areas.

Goukamma Strandveld

Distribution

This vegetation type occurs in the Western Cape Province in Sedgefield Bay, wedged between the Knysna Heads to the east and Wilderness to the west covering 39 km^2.

Vegetation & Landscape Features

Parabolic dunes occur along the coastal margin, with inland ridges supporting Knysna Sand Fynbos. Mesic Dune Thicket patches are common in the Goukamma Strandveld, and in fire-protected and locally wet areas, they grow into forests. Altitude ranging between 1 – 196 metres (median 49 m).

Geology & Soils

The vegetation is overlaying the Klein Brak Formation rocks cemented beach deposits, Waenhuiskrans aeolianite sand on oxidised, neutral sands. The Klein Brak Formation rocks, which are primarily quartz-rich, shelly sandstones, border the dune cordon between Arniston and De Hoop Nature Reserve.

Climate

Like that of the St Francis Strandveld but with a lower annual rainfall 500–700 $mmyr^{-1}$. Warm temperate, subhumid to semi-arid and sub-Mediterranean. The temperature regime is equable: mean midsummer temperatures are 20−22 °C, and midwinter temperatures 16−18 °C.

Important Taxa

(d=dominant, e=South African endemic, et=possibly endemic to a vegetation type)

Growth form	Species
Tall Shrub	*Passerina corymbosa* (d), *Erica glumiflora*(d), *Metalasia muricata* (d), *Imperata cylindrica* (d), *Restio eleocharis* (d), *Struthiola argentea* (d), *Cliffortia falcata* (d), *Chironia decumbens*

	(d), *Erica glandulosa* ssp. *fourcadii* (d), *Disparago kraussii* (d), *Cliffortia linearifolia* (d), *Lachnaea diosmoides* (d).
Herb	*Carpobrotus edulis*

Cape Seashore Vegetation

Distribution:

Western Cape and Eastern Cape Provinces: Temperate coasts of the Atlantic Ocean (Olifants River mouth to Cape Agulhas) and Indian Ocean (Cape Agulhas to East London). According to Tinley (1985; see also Lubke et al. 1997), this stretch of coast comprises the South West and South Coasts.

Vegetation & Landscape Features:

Beaches, coastal dunes, dune slacks and coastal cliffs of open grassy, herbaceous and to some extent also dwarf-shrubby (some-times succulent) vegetation, often dominated by a single pioneer species. Various plant communities reflect the age of the substrate and natural disturbance regime (moving dunes), distance from the upper tidal mark and the exposure of dune slopes (leeward versus seaward).

Geology, Soils & Hydrology:

Young coastal sandy sediments forming beaches and dunes (Strandveld Formation), exposed to reworking by relentless winds and frequent sea storms. Some stretches of the West Coast are covered by extensive shell beds.

Climate:

Largely uniform, all-year precipitation pattern, but this pattern must be interpreted with care since the unit encompasses regions of very diverse precipitation regimes. The West Coast (under influence of the Benguela Current) and the portion of the South Coast bordering on the Atlantic Ocean are characterised by cold seawater and frequent upwelling events. The local precipitation is low (as low as 100 mm in places) and typically seasonal (winter-rainfall peak). From Cape Agulhas westwards the coast is influenced by

occasional eddies of the Agulhas Current, but the water stays generally cold. The precipitation becomes transitional, with a considerable increase of summer rainfall eastwards. MAP in Lambert's Bay, Cape Town, Plettenberg Bay and Port Elizabeth is 128 mm, 517 mm, 661 mm and 604 mm, respectively. The temperature varies less than precipitation (17–18°C for both Lambert's Bay and Port Elizabeth).

Important Taxa:

Dunes & beaches:

Growth form	Species
Succulent Shrubs	*Drosanthemum candens (d), Pelargonium capitatum (d), Tetragonia decumbens (d), Didelta carnosa var. tomentosa, Exomis microphylla var. axyrioides, Lycium tetrandrum, Scaevola plumieri.*
Low Shrubs	*Hebenstretia cordata (d), Frankenia repens, Oncosiphon sabulosum.*
Semiparasitic Shrub	*Thesidium fragile.*
Herbaceous Climbers	*Cynanchum ellipticum, C. obtusifolium.*
Herbs	*Gazania rigens (d), Senecio littoreus (d), Amellus asteroides, Dasispermum suffruticosum, Manulea tomentosa, Polygonum maritimum, Senecio elegans.*
Geophytic Herb	*Trachyandra divaricata.*
Succulent Herbs	*Arctotheca populifolia (d), Carpobrotus acinaciformis, C. edulis.*
Graminoids	*Cladoraphis cyperoides (d), Ehrharta villosa var. maxima (d), Sporobolus virginicus (d), Stipagrostis zeyheri subsp. barbata.*

Cliffs:

Growth form	Species
Succulent Shrubs	*Disphyma crassifolium (d), Sarcocornia littorea (d).*
Herb	*Gazania rigens (d).*

Endemic Taxa:

Dunes & beaches:

Growth form	Species
Succulent Shrubs	*Amphibolia laevis (d).*

Low Shrub	*Psoralea repens (d).*
Semiparasitic Shrub	*Thesidium fragile.*
Herbs	*Amellus capensis, Gazania maritima, G. rigens var. leucolaena, Silene crassifolia.*
Succulent Herbs	*Senecio litorosus, S. maritimus.*
Graminoids	*Thinopyrum distichum (d), Eragrostis sabulosa.*

Dune slacks:

Growth form	Species
Herb	*Vellereophyton vellereum.*

Cliffs:

Growth form	Species
Succulent Shrubs	*Drosanthemum marinum (d), D. stokoei, Erepsia steytlerae, Prenia vanrensburgii.*
Low Shrub	*Syncarpha sordescens.*
Herbs	*Limonium sp. nov. (Mucina 6942/1 STEU), Lobelia boivinii.*

Conservation status of broad vegetation types

The conservation status for Goukamma Dune Thicket in accordance with the Revised National List of Ecosystems (Government Notice No 2747 of 18 November 2022) published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), is given below. Note that there is no assessment for Goukamma Strandveld, therefore the status of the vegetation unit (from which Goukamma Strandveld was separated) is provided here.

Vegetation Type	**Conservation status**
	Revised National Ecosystem List (NEM:BA) (2022)
Goukamma Dune Thicket	Not listed - Least concern

It is therefore verified that the site DOES NOT occur within a Listed Ecosystem, as listed in the Revised National List of Ecosystems that are Threatened and need of protection (GN2747 of 2022) and therefore has LOW sensitivity with respect to this attribute.

Ecosystem status in accordance with Section 52(2) of National Environmental Management: Biodiversity Act (Act No. 10 of 2004):

i. **Critically endangered** ecosystems are ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention, and are subject to an extremely high risk of irreversible transformation;
ii. **Endangered** ecosystems are ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, and are subject to a significant risk of irreversible transformation (although to a lower extent than critically endangered ecosystems;
iii. **Vulnerable** ecosystems are ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention; their risk of irreversible transformation is less than for critically endangered or endangered ecosystems; and
iv. **Protected** ecosystems are ecosystems of high conservation value or of high national or provincial importance, although they are not under immediate risk of irreversible transformation, such as critically endangered, endangered or vulnerable ecosystems; and.
v. **Degraded**/sacrificial zones that could be used in support of sustainable development without impacting adversely on the environment.

Biodiversity Conservation Plans

The Western Cape Biodiversity Spatial Plan (WCBSP) classifies the habitats of the province according to conservation value in decreasing value, as follows:

1. Protected Areas (PA);
2. Critical Biodiversity Areas 1 (CBA1);
3. Critical Biodiversity Areas 2 (CBA2);
4. Ecological Support Area 1 (ESA1);
5. Ecological Support Area 2 (ESA2)

The WCBSP map shows that part of the property, as well as the coastal shore to the west of the property, is mapped as an ecological Support Area 1 (**Figure 8**).

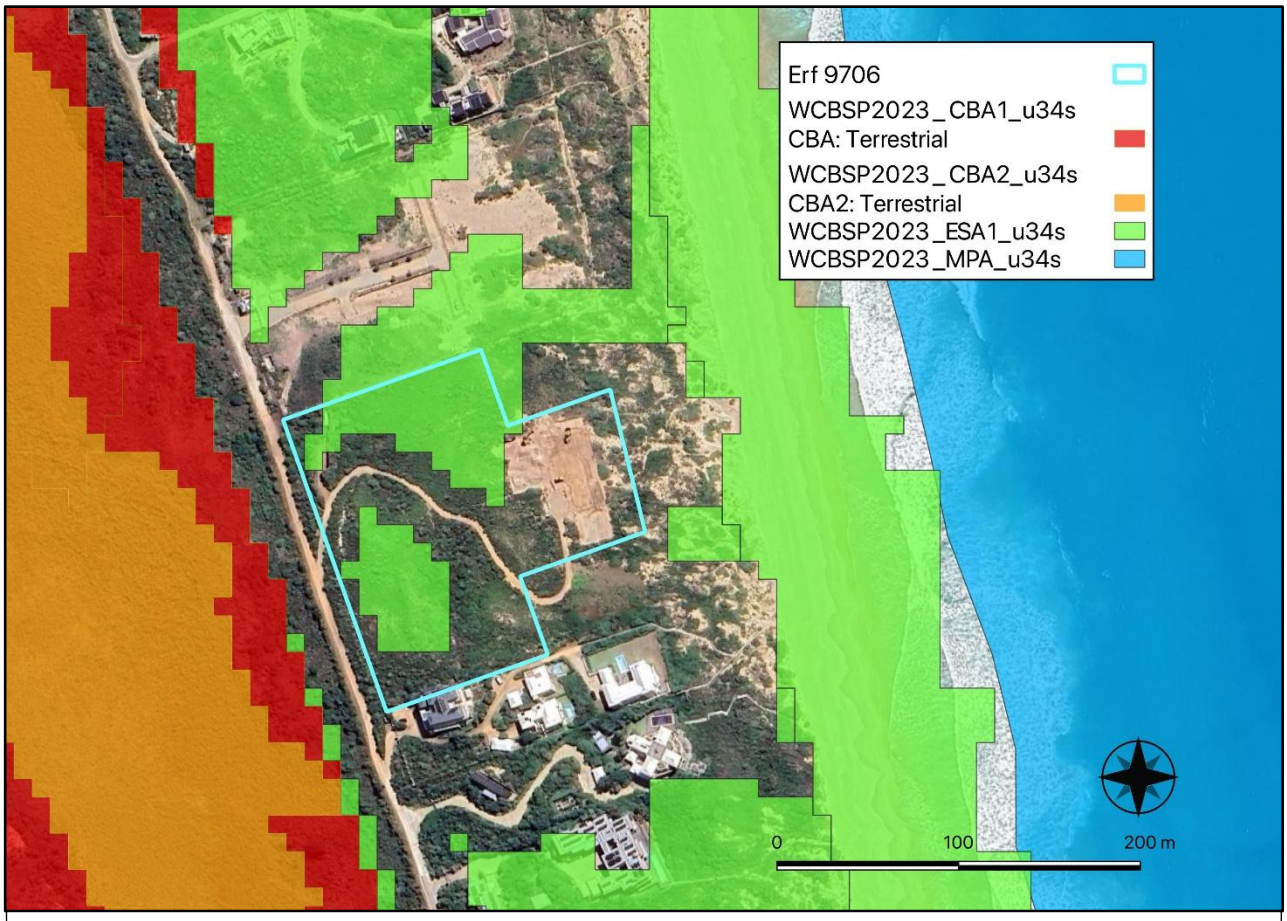

Figure 8: Western Cape Biodiversity Spatial Plan of the site and surrounding areas.

Historical disturbance

The main disturbance on site is the homestead and associated structures, which is currently being replaced after loss of the previous structures during fires in 2mariamariamariamariammmm. The previous boardwalk was also lost at that time, but the original route is still visible as an open area with no vegetation - the original support poles are still visible (Figure 9).

Figure 9: Previous location of boardwalk, lost during fires of 2017 (old support poles still visible).

Ecosystem dynamics in coastal dunes

Coastal dunes are formed where sand is deposited onshore by the sea and at river mouths, or exposed by a dropping sea level from past glacial times (Tinley 1985). They are dynamic, shifting features of a shoreline in which the sedimentary particles are shaped by wind, waves, and tides. Waves and wind generate nearshore surf zone currents. The predominent angle of the swell, and the prevailing wind, generate near-shore surf-zone currents that erode, transport and deposite sediments, the most important of which is sand that is responsible for beach formation (Tinley 1985). These beaches supply sand for the formation of wind-formed dunes.

Frontal dunes form part of the sediment exchange system of the littoral active zone (Tinley 1985). Important physical processes include sand sources and movement, wind, wave and tide action, and stabilisation of sand by vegetation.

Sand supply for dune formation in the study area

Formosa Bay (in which Plettenberg Bay is located) is a typical half-heart bay containing dune ridges that are approximately parallel to the coastline. Offshore sand deposits in Formosa Bay can be divided into two main compartments (Flemming & Martin 2021), the first of which is fed primarily by sediment transported into the study area from the west due to sub-continental scale sediment movement.

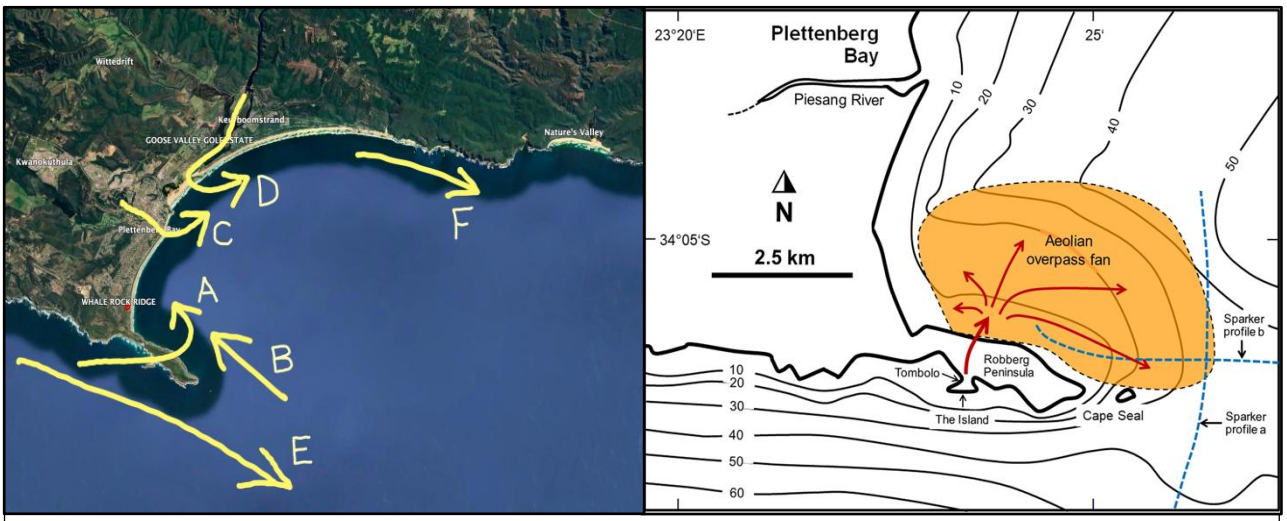

Figure 10: Sediment sources for Plettenberg Bay (adapted from Hellstrom 2011, left, and Flemming & Martin 2021, right).

Sand transport along a coastline in a particular direction is a function of persistent swell direction coupled with the intensity of wave energy. The swell on the South African subcontinent is dominated by a persistent south-west and south swell generated in the Roaring Forties (Tinley 1985). This swell is refracted to approach from between south-south-east and south-east (Tinley 1985), causing a force which creates a conveyor belt of sediment transport equatorwards, i.e. towards the north-east along the southern and south-eastern coastlines (Tinley 1985). At Robberg, this results in net movement of sediments eastwards past Robberg point (E in **Figure 10**).

Sand is directly supplied to the location of the current site partly via a climbing-falling dune system that crosses Robberg (Hellstrom & Lubke 1993, Flemming & Martin 2021) (A in **Figure 10**) and partly from submarine sediments immediately north of Robberg Peninsula (Hellstrom 2011, Flemming & Martin 2021) (Figure 9 right). Since approximately 1936 the encroachment of alien invasive plants into the climbing-falling dune has substantially restricted sand movement over the peninsula into the bay (Hellstrom & Lubke 1993) and this Robberg dune system is currently almost entirely stabilised with vegetation.

Additional sand supply to the beach at the current site is from Holocene age submarine sediments located offshore of the Robberg Peninsula (Flemming & Martin 2021) that . These form part of of a sediment compartment that is fed

Despite possible restrictions to sand supply, available aerial photographic evidence does not indicate any reduction in the beach area at the current location.

Dune erosion and re-formation

Dunes may erode due either to deflation of dunes by wind action or due to water erosion of the seaward-facing toe of the dune by wave action, both of which occur naturally. Deflation can occur when dune vegetation is removed (often by human activities), which allows the sand to become mobile. Wind can then shift sand to new positions, which can destabilise other vegetated areas, or it can cover existing vegetation with wind-blown sand. Active revegetation or stabilisation is usually the only way to re-stabilise these areas.

Winds that are most likely to cause physical changes to the dunes will be strong winds at a time of the year when sand is dry enough to be moved, which is during the hot summer months when the sand is dry. The strongest winds at the site at this time of the year are mostly easterly (**Figure 11**), which would drive sand inland.

Wave erosion is a natural process and occurs during storm conditions or periods of large swells. In Plettenberg Bay the largest swells occur during the winter months (June to August), although high swells coupled with strong winds and spring tides can occur at any time. For example, on 1 September 2008 very high wave conditions occurred on the south coast with wave heights exceeding 8 m (Schumann 2015). These caused considerable damage to coastal areas of the south coast, including erosion of barrier dune systems (Schumann 2015). Wave erosion removes hummosck dunes and can erode the toe of fixed dunes, but these eventually reform during more stable periods.

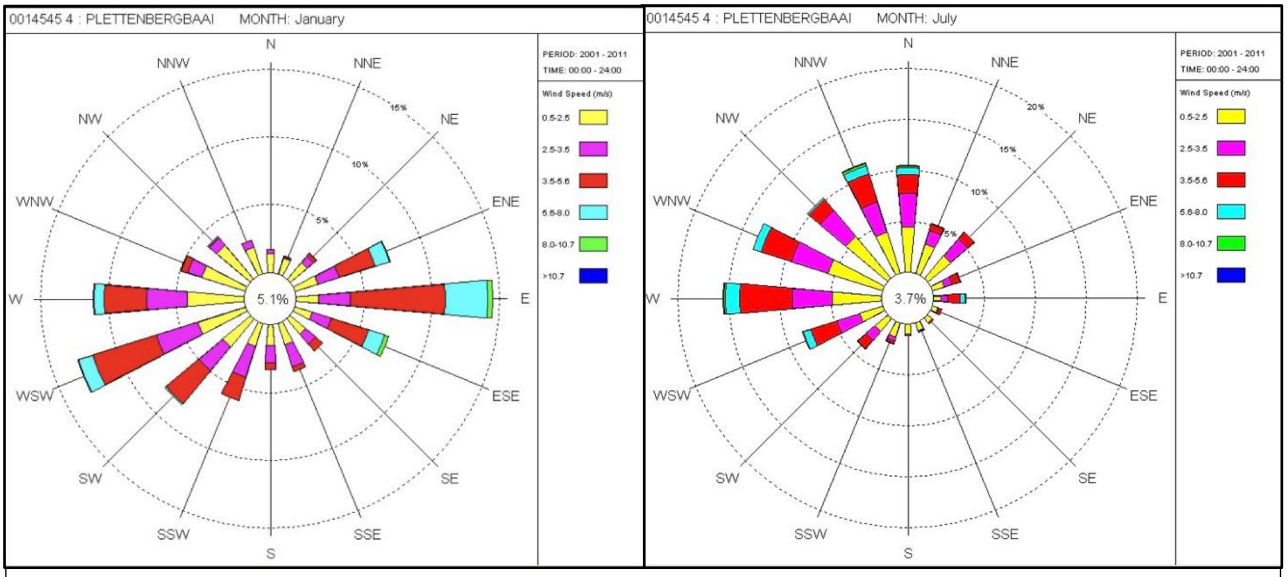

Figure 11: Predominant wind direction and average speed in summer (left) and winter (right) for Plettenberg Bay (CNdV Africa 2013).

Typical vegetation zonation in coastal dunes

Dunes display linear zonation from the surf zone inland (Figure 12). Closest to the sea is a pioneer strand plant community (Zone I) composed of low, creeping grasses and succulent-leaved herbs with rhizomatous, stoloniferous and sympodial growth form. These colonise mobile sands and in growing ahead of accumulating sand are responsible for building up the first embryonic partially stable dunes. Behind the pioneer community is a shrub community (Zone II) composed of an open short cover of clumped bushes with an understorey of herbs and climbers. This is followed by the closed "clipped hedge" canopy of the scrub-thicket community (Zone III). Furthest from the sea is the oldest mature community of tall thicket and/or forest (Zone IV).

The plant communities which distinguish the four zones form part of a single plant succession. The beach between Robberg and Keurboomstrand is a fixed dune system (Tinley 1985) with three main foredune zones, (I) strand plant zone, (II) shrub zone, and (III) scrub-thicket zone), as well as successive ridges with thicket/forest. There are well-developed dune slack wetlands between successive dune ridges, but between Robberg

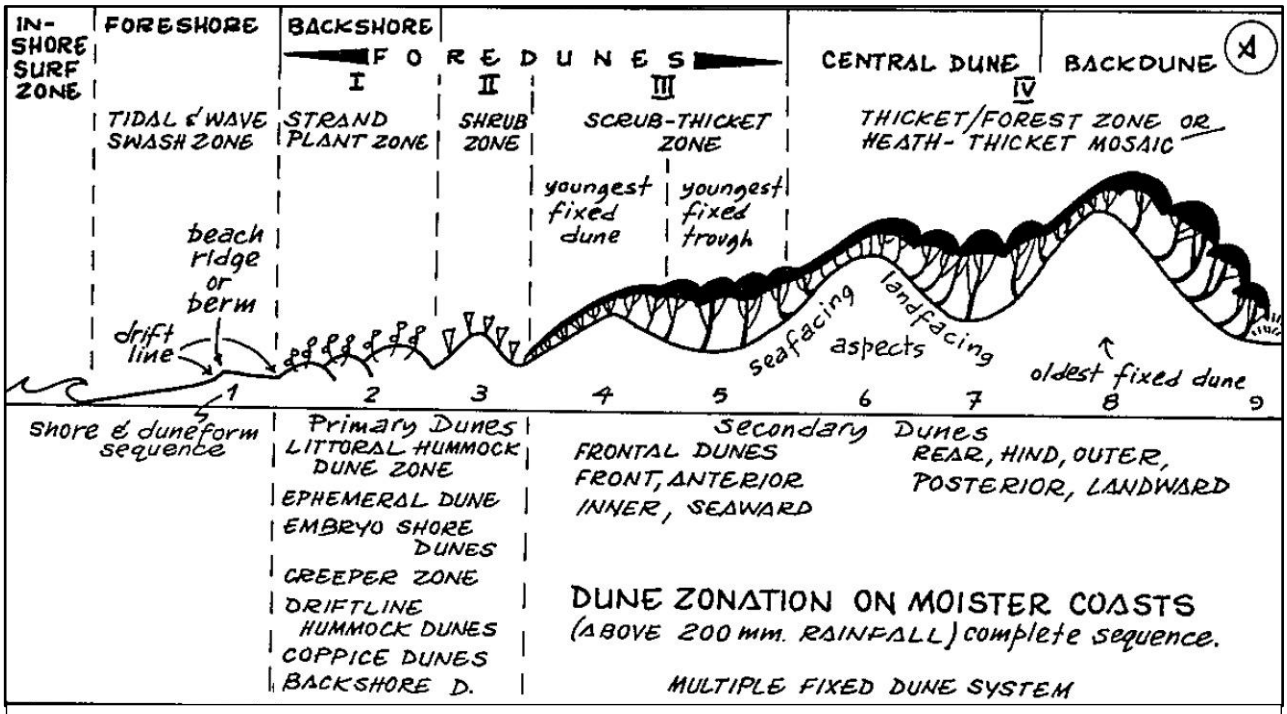

Figure 12: Coastal dune zonation (from Tinley 1985).

and Central Beach, these (along with most of the thicket/forest bands) have been mostly lost to development.

In light of climate change it is predicted that the frequency and intensity of natural hazards such as storm surges will further increase, sea levels will rise, and erosion will be exacerbated beyond the increase observed in the past decades (Department of Environmental Affairs 2017).

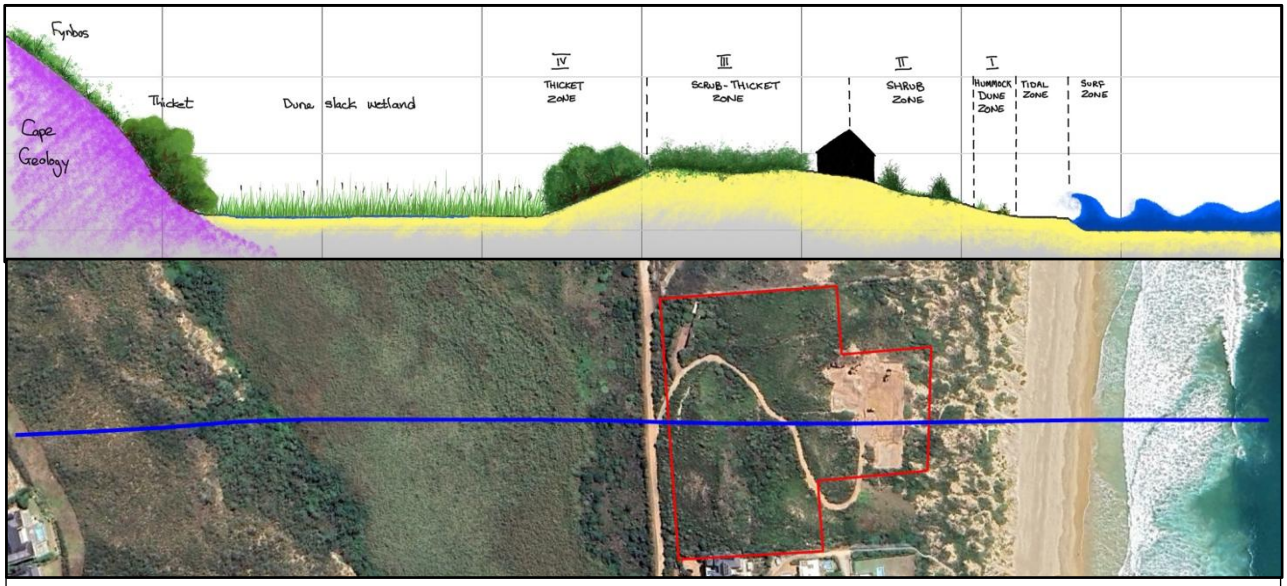

Figure 13: Profile through site showing dune zones.

Observed habitats and landcover on site

There are two main habitats on site (within the proposed boardwalk and deck footprint area), namely hummock dunes (Zone I), and a shrub zone (Zone II) (**Figure 13** and **Figure 14**).

The hummock dunes form above the high-water mark and are colonised by dune pioneer species. In the study area, these areas contained three plant species, all typical of this habitat, namely *Arctotheca populifolia* (sea pumpkin), *Ipomoea pes-caprae* (goatsfoot morning glory) and *Scaevola plumieri* (sea grape). All of these species are highly adapted to mobile sand and typically form hummocks where the sand is stabilised around their

roots. This species composition and environment matches the description for Cape Seashore Vegetation.

On the foredunes, between the house and the shoreline, the vegetation is coastal dune shrubland. It is a low thicket that occurs in patches with low herbaceous vegetation. The dominant species are low shrubs and dwarf trees, including *Brachylaena discolor, Maytenus procumbens, Metalasia muricata, Morella cordifolia, Mystroxylon aethiopicum, Olea exasperata, Osteospermum moniliferum, Passerina rigida, Phylica* sp*, Polygala myrtifolia, Pterocelastrus tricuspidatus, Robsonodendron maritimum, Searsia crenata, Sideroxylon inerme* and *Tarchonanthus littoralis*. Common dwarf shrubs and herbaceous species are *Agathosma apiculata, Chironia baccifera, Felicia amoena, Felicia echinata, Helichrysum asperum, Helichrysum teretifolium, Knowltonia vesicatoria, Roepera maritima, Salvia aurea, Senecio sp, Solanum africanum, Tetragonia decumbens, Thesium fragile* and *Ursinia chrysanthemoides*. Graminoids are present but not dominant, and

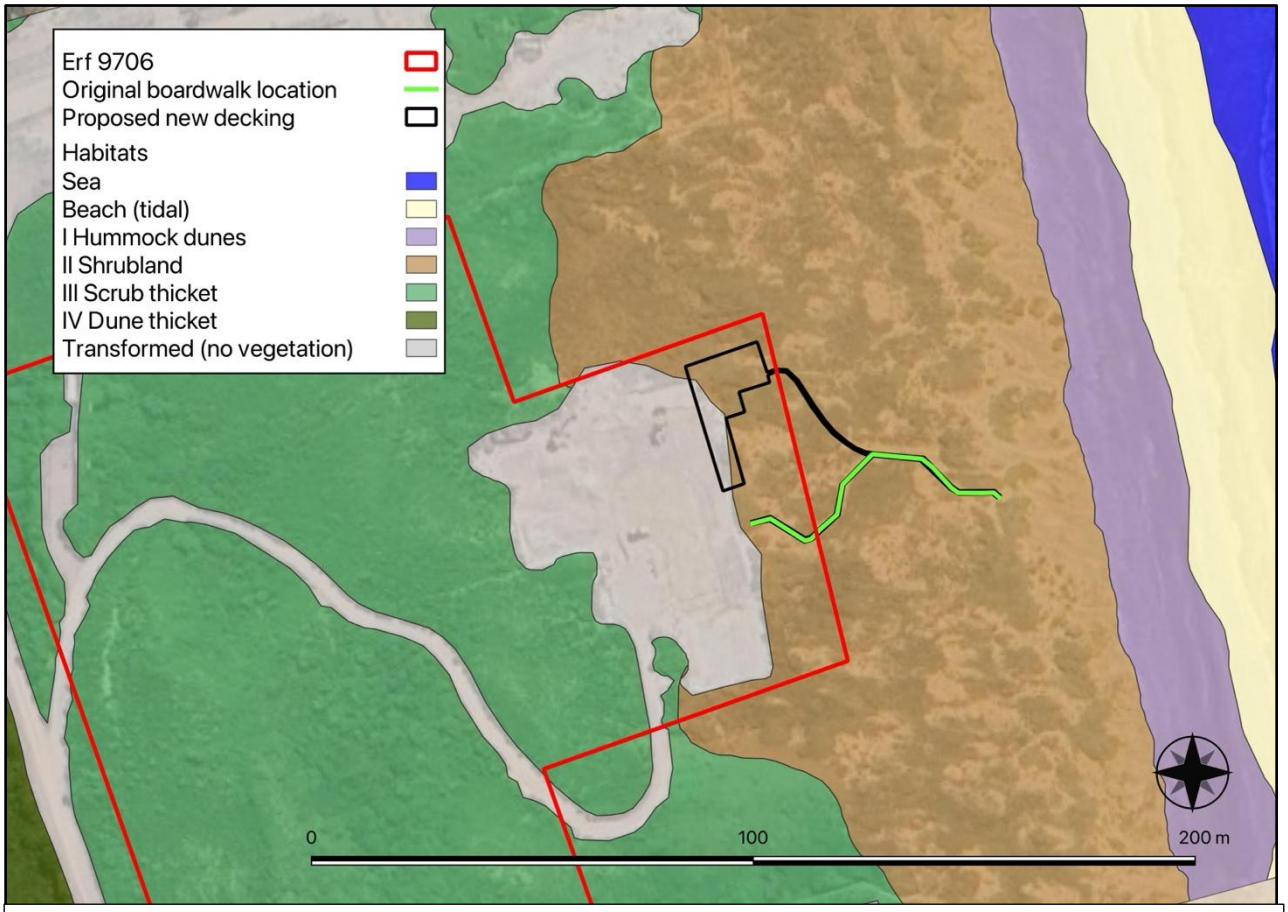

Figure 14: Map of habitats on site.

include *Ficinia lateralis, Ficinia ramosissima, Hellmuthia membranacea* and *Restio eleocharis*. There are several succulent species present in the vegetation, including *Carpobrotus sp, Crassula expansa*, and *Gasteria acinacifolia*.

This species composition is typical of the foredunes of the bay at Plettenberg Bay, as well as eastwards past Keurbooms. They are unusual in the southern Cape, because they are east-facing in a protected bay, a physical situation that occurs nowhere else in the Garden Route. However, the vegetation structure and species composition does NOT match the description for Goukamma Strandveld - it is dominated by woody shrubs that indicate thicket vegetation.

Figure 15: Combination of two photos showing the vegetation between the house (top left) and the beach. The pathway of the original boardwalk is still visible.

Figure 16 shows the location of the photographs taken on site and the GPS track walked during this survey.

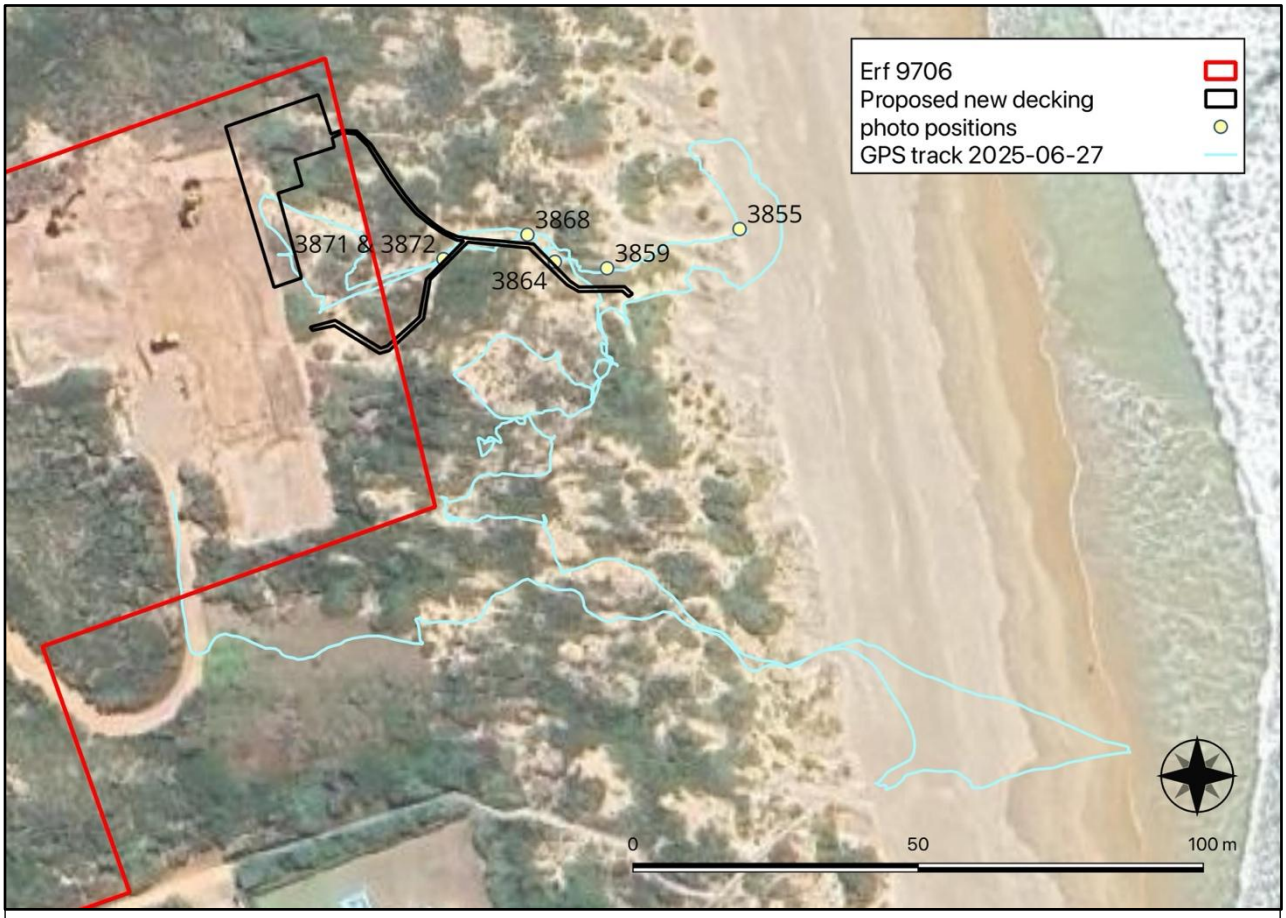

Figure 16: Location of photographs taken on site during the site inspection.

Figure 17: A series of photographs along the proposed boardwalk.

Plant species of the study area

A total of 44 plant species were found on site, listed in the table below.

Scientific name	Common name	Notes
Agathosma apiculata	Garlic Buchu	Protected: Cape Nature and Environmental Conservation Ordinance 19 of 1974
Arctotheca populifolia	Sea Pumpkin	
Brachylaena discolor	Coast Silver-Oak	
Brunsvigia orientalis	Candelabra Lily	Protected: Cape Nature and Environmental Conservation Ordinance 19 of 1974
Carpobrotus sp	Sourfigs	Protected: Cape Nature and Environmental Conservation Ordinance 19 of 1974
Chironia baccifera	Christmas Berry	
Chloris gayana	Rhodes Grass	
Crassula expansa	Fine Stonecrop	
Cynodon dactylon	Quick Grass	
Felicia amoena	Soft Felicia	
Felicia echinata	Dune Felicia	
Ficinia lateralis	Side Clubrush	
Ficinia ramosissima	Branch Clubrush	
Gasteria acinacifolia	Coast Oxtongue	
Helichrysum asperum	Rough Everlasting	
Helichrysum teretifolium	Needle Everlasting	
Hellmuthia membranacea	Helmet Sedge	
Ipomoea pes-caprae	Goatsfoot Morning Glory	
Knowltonia vesicatoria	Common Burnleaf	
Maytenus procumbens	Dune Kokotree	
Metalasia muricata	Strandveld Blombush	
Morella cordifolia	Dune Waxberry	
Mystroxylon aethiopicum	Kooboo-Berry	
Olea exasperata	Dune Olive	
Osteospermum moniliferum	Bietou	
Passerina rigida	Beach Gonna	
Phylica sp	Hardleaves	
Polygala myrtifolia	September Falsepea	
Pterocelastrus tricuspidatus	Candlewood	
Restio eleocharis	Beach Pegreed	
Robsonodendron maritimum	Dune Saffronwood	
Roepera maritima	Beach Twinleaf	

Salvia aurea	Brown Sage	
Scaevola plumieri	Sea Grape	
Searsia crenata	Bluefruit Currantrhus	
Senecio sp	Ragworts	
Sideroxylon inerme	White Milkwood	PROTECTED (National Forests Act)
Solanum africanum	Drunken Berry	
Stipagrostis zeyheri		
Tarchonanthus littoralis	Coastal Camphorbush	
Tetragonia decumbens	Coast Seacoral	
Tetragonia fruticosa	Sprawling Seacoral	
Thesium fragile	Beach Rootthug	
Ursinia chrysanthemoides	Creeping Paraseed	

None of these species are declared weeds and/or alien invader plants, nor naturalised exotic species.

One species, *Sideroxylon inerme*, is protected under the National Environmental Management: Biodiversity Act No 10 of 2004.

The species flagged as potentially occurring in the area were specifically searched for and their habitat assessed for their probability of occurrence. The probability was rated on a scale from NEGLIGIBLE (no probability), LOW (habitat suitable but low quality; and/or conspicuous plant but not found on site during search; or out of known distribution range); MODERATE (habitat suitable but may be overlooked due to inconspicuous); HIGH (habitat suitable and not transformed); to CONFIRMED. The results of the species assessments are recorded in the following table:

Taxon	**IUCN status***	**Distribution**	**Habitat**	**Probability of occurrence**
Acmadenia alternifolia	VU	Plettenberg Bay to Knysna, possibly extending as far as Nature's Valley. A number of observations from inland areas, including the mountain foothills north of Keurbooms, and north of the N2 at Harkerville	Coastal headlands and steep slopes, exposed positions on dry cliffs near the coast from Knysna to Plettenberg Bay.	NEGLIGIBLE

Taxon	IUCN status*	Distribution	Habitat	Probability of occurrence
Erica chloroloma	VU	Wilderness to Fish River Mouth. Most observations are between Cape St Francis and Gqeberha. Nearest population known from Goukamma Nature Reserve (recent) and Buffalo Bay (1921).	Coastal dune fynbos.	LOW
Erica glandulosa subsp. fourcadei	VU	Mossel Bay to Cape St. Francis.	Coastal fynbos. Common in Goukamma Nature Reserve and on coastal cliffs SW of Plettenberg Bay	LOW
Erica glumiflora	VU	Wilderness to East London, extending inland to Grahamstown. Recorded from Robberg peninsula near end.	In fynbos on sandy coastal flats and dunes in low coastal hills. All observations are in sandy substrates.	LOW
Hermannia lavandulifolia	VU	Western Cape, from Worcester to the Overberg, and extending along the southern Cape coastal lowlands to Plettenberg Bay. All observations on iNaturalist are west of Knysna. Only single observation near Plett is on coast near Robberg.	Clay slopes in renosterveld and valley thicket. Collected on western part of Robberg Peninsula in 1960 (Acocks Coll. No. 21141).	NEGLIGIBLE
Lampranthus pauciflorus	EN	Found in the Western Cape from Cape Infanta to Plettenberg Bay. Four known locations remain after most of this species' habitat has been transformed for coastal development. Habitat loss continues, especially around Plettenberg Bay, Mossel Bay and Knysna.	On rocky coastal slopes and clay hills. Major habitats are Groot Brak Dune Strandveld, Blombos Strandveld, Overberg Dune Strandveld, Potberg Sandstone Fynbos, Garden Route Granite Fynbos, Albertinia Sand Fynbos, Knysna Sand Fynbos, Hartenbos Strandveld, Goukamma Dune Thicket.	LOW

Taxon	IUCN status*	Distribution	Habitat	Probability of occurrence
Lebeckia gracilis	EN	Port Elizabeth to Bredasdorp. Two main areas of occurrence are in the Lakes District between Knysna and George, and in the Albertinia area.	Coastal fynbos in deep sandy soils below 300 m.	LOW
Leucospermum glabrum	EN	Outeniqua and Tsitsikamma mountains. Observed multiple times around George in the mountains, as well as north of Plett. and around Keurbooms.	Wet south slopes in Sandstone Fynbos.	LOW
Muraltia knysnaensis	EN	Coastal lowlands between Mossel Bay and Keeurbooms River.	Coastal fynbos on dry flats and hills.	LOW
Osteospermum pterigoideum	EN	George and Humansdorp.	Low sandstone slopes. Tsitsikamma Sandstone Fynbos, South Outeniqua Sandstone Fynbos, North Outeniqua Sandstone Fynbos.	NEGLIGIBLE
Pterygodium cleistogamum	VU	Knysna to Grahamstown.	Fynbos, stony slopes in sandstone derived soils, from sea-level to 340 m.	NEGLIGIBLE
Pterygodium newdigateae	CR PE	Plettenberg Bay	Stony slopes near sea level. South Outeniqua Sandstone Fynbos.	NEGLIGIBLE
Ruschia duthiae	VU	A highly range-restricted but locally common species, known from 10 locations from Sedgefield to Nature's Valley. Quite common in the sandy soils of the Lakes District between Wilderness and Knysna.	Gentle north-facing sandstone or shale slopes with grassy fynbos.	LOW
Selago burchellii	VU	George to Plettenberg Bay, including Robberg coastal corridor, Knysna western heads, Goukamma, inland parts of the lakes area, and in the Outeniqua Mountains.	Coastal slopes and flats. Unverified observation from Robberg. Distribution data shows that it also occurs in the Outeniqua Mountains, which	LOW

Taxon	IUCN status*	Distribution	Habitat	Probability of occurrence
			would be mountain fynbos.	
Sensitive species 131	CR PE	Knysna and Plettenberg Bay.	Sandy flats in South Outeniqua Sandstone Fynbos.	NEGLIGIBLE
Sensitive species 500	EN	Cape Flats to Gqeberha. Previously recorded from near Robberg.	Lowland sandy flats, stabilised dunes and coastal rock promontories. Not on mobile dunes.	NEGLIGIBLE
Sensitive species 763	VU	Riversdale to Port St Johns. Recorded previously from near Keurbooms, as well as Diepwalle.	Dry coastal renosterveld and grassy places in coastal forest.	NEGLIGIBLE
Sensitive species 657	EN	Great Brak River to Port Elizabeth.	Confined to coastal littoral habitat but not mobile dunes.	NEGLIGIBLE
Sensitive species 800	VU	Cape Peninsula to Knysna.	Limestone and clay loam soil, in fynbos and renosterveld on coastal lowlands.	NEGLIGIBLE
Sensitive species 1032	VU	George to Port Alfred.	On stabilised (fixed) dunes close to the shoreline. 0-150m. Confined to coastal habitat.	NEGLIGIBLE

No plant species of conservation concern were found on the site. The highly dynamic habitat on site is suitable for rapidly growing and fast-dispersing pioneers that are inherently more common and the habitat is unlikely to support any of the rare or threatened species flagged in the area.

The site sensitivity for the Plant Species Theme is therefore LOW. The habitat to be affected is localised and unlikely to be critical for the support for any of these species.

Animal species flagged for the study area

According to the screening tool, five animal species are flagged as of concern for the current project. These are described in more detail below, including an assessment of the

likelihood of occurring on site. The probability was rated on a scale from NEGLIGIBLE (no probability), LOW (habitat suitable but low quality and conspicuous but not found on site during search), MODERATE (habitat suitable but may be overlooked due to being inconspicuous or mobile), HIGH (habitat suitable and not transformed, distribution within wandering range) to CONFIRMED.

Taxon	**IUCN Status**	**Habitat**	**Probability of occurrence**
Aves-*Circus ranivorus* (African marsh harrier)	EN	Widespread but sparsely distributed throughout central, eastern and southern Africa. It is dependent on permanent wetlands for breeding, feeding and roosting, and is found in marshes and reedbeds. The main threat to this species is loss and degradation of wetlands. It also hunts over drier floodplains, grasslands, croplands, and Fynbos, where it preys mainly on small rodents, as well as birds, reptiles, frogs and insects.	LOW Large wetland nearby. Could hunt over the site but not likely to be resident there.
Aves-*Stephanoaetus coronatus* (Crowned eagle)	VU	Sub-Saharan Africa and eastern parts of southern Africa, as far west as Gqebehra. West of this there are only incidental records, from as far west as the Overberg. Occurs in riparian wetlands and forests.	LOW Possible in general Plett area but not on site - no forest.
Aves-*Neotis denhami* (Denham's bustard)	VU	Wide but fragmented Afrotropical range and occurs widely but sparsely over much of the mesic eastern half of South Africa. It has been recorded several times in Garden Route between Mossel Bay and Stilbaai. Nests in small open patches on the ground between higher shrubs to hide the breeding birds. In the Western Cape, it can be locally numerous in mosaics of cultivated pastures, agricultural croplands and natural vegetation	NEGLIGIBLE
Aves-*Bradypterus sylvaticus* (Knysna warbler)	VU	Restricted and fragmented distribution in four areas of Eastern and Western Cape. One sub-population occurs in the Garden Route between Tsitsikamma and Stilbaai. It occurs along the edges of Afrotemperate forests and in thick, tangled vegetation along the banks of watercourses or drainage lines in forest patches in the Fynbos Biome. Population decline is attributed to clearance of habitat for developments, agriculture and silviculture, leading to a decrease in the amount of available habitat, as well as the quality.	LOW Possible in nearby (more inland) areas but not on site - no forest or dense thicket on site.
Invertebrate-*Aneuryphymus montanus*	VU	Associated with fynbos vegetation, although extending geographically towards East London, where it has been collected "amongst partly burnt stands of evergreen Sclerophyll in rocky foothills". It prefers south-facing cool slopes. It is a medium-sized, robust, active geophilous insect	NEGLIGIBLE

(Yellow-winged agile grasshopper)		which readily flies off when disturbed and is easily distinguished in flight. When observed, occurs in obvious numbers.	

No animal species of conservation concern were found on the site, and no suitable habitat conditions are present to support the SCC identified for the site. **The site sensitivity for the Animal Species Theme is therefore LOW**. The habitat to be affected is localised and unlikely to be critical for the support for any of these species.

Outcome of the assessment

Site ecological importance

The Species Environmental Assessment Guidelines require that a Site Ecological Importance is calculated for each habitat on site, and provides methodology for making this calculation.

As per the Species Environmental Assessment Guidelines, Site Ecological Importance (SEI) is calculated as a function of the Biodiversity Importance (BI) of the receptor and its resilience to impacts (SEI = BI + RR). The Biodiversity Importance (BI) in turn is a function of Conservation Importance (CI) and Functional Integrity (FI), i.e. BI = CI + FI.

Sensitivity scores provided in the Species Environmental Assessment Guidelines allow evaluation relative to ecosystem status and/or presence of sensitive species.

Habitat	**Conservation importance (CI)**	**Functional integrity (FI)**	**Biodiversity Importance (BI = CI x FI)**	**Receptor resilience (RR)**	**Site Ecological Importance SEI = BI x RR)**
Zone II Shrubland	Low Natural habitat but not in any threatened category.	High Very large (>100 ha) intact area for any conservation status of ecosystem type - dune vegetation on site is evaluated in terms of entire connected extent, both on-site and in surrounding areas, because it acts as a continuous unit. Good habitat connectivity.	Medium	Medium Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact	Medium

		Several major ecological impacts associated with existing development.		has been removed.. Based on the fact that this dune habitat is naturally exposed to some levels of perturbation.	

The calculation of Site Ecological Importance includes an explicit recognition of the ability of each ecosystem to tolerate and recover from disturbance. Guidelines for development activities within different importance levels are given in the table below. This shows that impacts within Forests should be avoided, and impacts within Secondary vegetation should be minimized, followed by restoration activities.

Site ecological importance	Interpretation in relation to proposed development activities
Very high	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/ not possible (i.e. last remaining populations of species, last remaining good condition patches of ecosystems/ unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities
Very low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

Habitat sensitivity

According to the "PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY", there are only two sensitivity classes for the Terrestrial Biodiversity Theme, namely VERY HIGH or LOW. The VERY HIGH category includes any area of natural vegetation that falls within one of the following categories:

1. terrestrial critical biodiversity areas (CBAs).
2. terrestrial ecological support areas (ESAs).
3. protected areas as defined by the National Environmental Management: Protected Areas Act, 2004.
4. priority areas for protected area expansion.
5. strategic water source areas (SWSAs).
6. freshwater ecosystem priority areas (FEPA) subcatchments.
7. indigenous forests.

Any area that is in a natural state and that falls within one of these categories is therefore automatically assigned a sensitivity class of VERY HIGH and requires a Terrestrial Biodiversity Specialist Assessment.

It is important to note that the definition of natural vegetation, according to the National Environmental Management Act, 1998 (Act No. 107 of 1998) is "*vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years*." According to this description, the vegetation on site (including secondary vegetation) is legally in a natural state.

The current projects includes no areas within sensitive categories. There are ESA1 areas closer to the high-tide mark, but these are outside the project footprint area. The project therefore has LOW sensitivity according to the Terrestrial Biodiversity Theme.

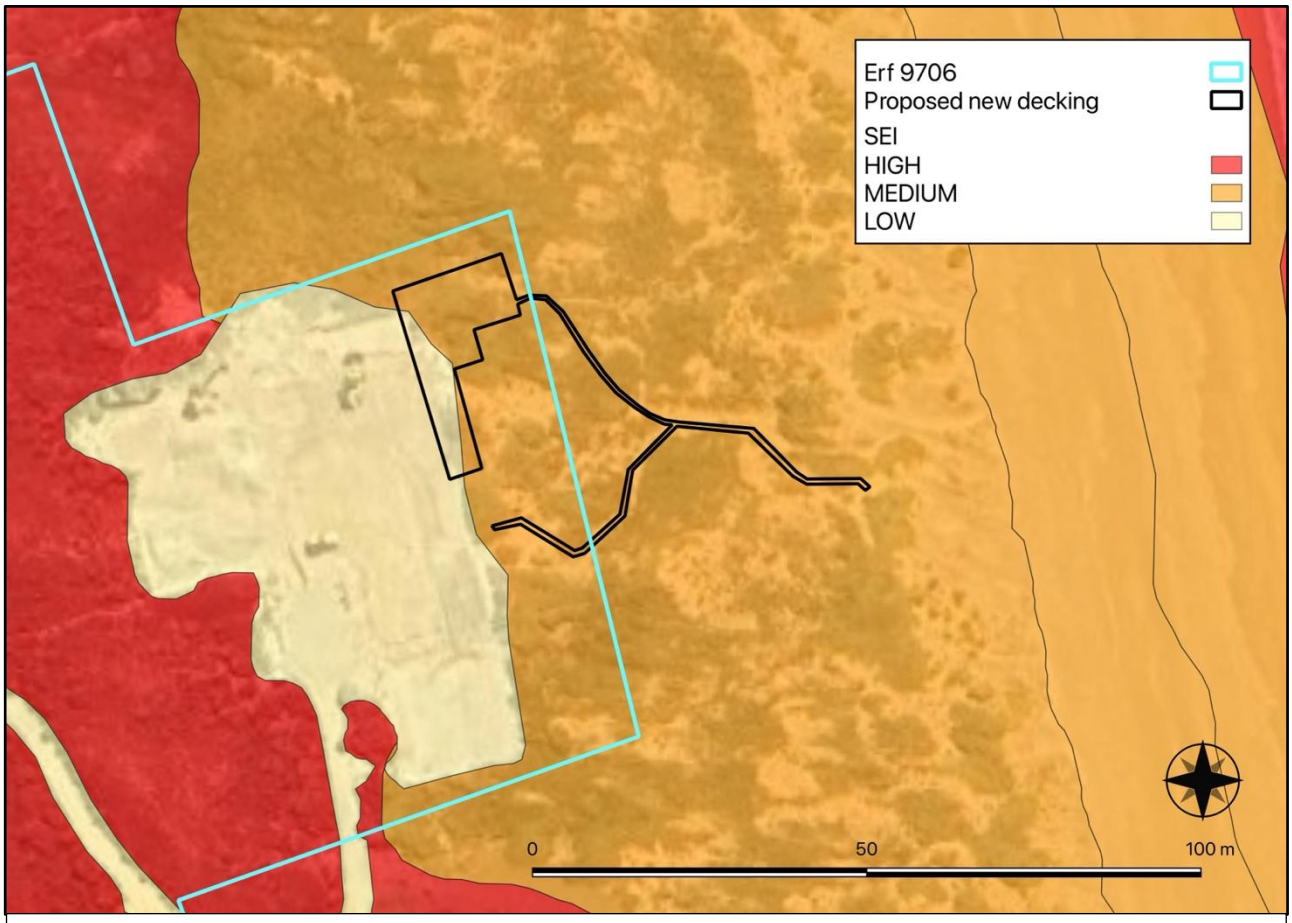

Figure 18: Site Ecological Importance (SEI) for habitats on site.

Impact assessment

Proposed development / Project Area of Influence (PAOI)

Anticipated impacts will mostly occur during the construction and operational phases of the project. These impacts are not expected to extend significantly beyond the boundaries of the footprint area. The PAOI is therefore treated here as the footprint within which direct impacts will occur, as well as a 10 m buffer around the proposed infrastructure.

Construction will require imbedding support posts into the dune at regular intervals along the proposed boardwalk, and constructing the boardwalk above them. Foundations are therefore limited to the post locations. The proposed boardwalk is mostly along the route of the original boardwalk, where no vegetation currently occurs, which means limited vegetation will be lost.

Possible long-term effects will be related to wind erosion of sand under and around the proposed boardwalk, as well as trampling effects on vegetation closer to the high-water mark, where pedestrians leave the boardwalk. This area closer to the water is subject to naturally higher disturbance levels and will "cope" ecologically, but more inland areas may require more dynamic management.

Another high-risk impact is potential invasion by alien invasive plants. This could entirely disrupt the ecologically and physical stability of the dune vegetation.

No plant species of concern were found on site, but one wind-cropped milkwood tree (*Sideroxylon inerme*) was found on site that is protected under the National Forests Act.

The impacts assessed here are therefore as follows:

1. Destabilisation of dunes due to construction and/or operation of boardwalk.
2. Loss of protected milkwood trees.
3. Invasion by alien invasive plant species.

Impact: Destabilization of dunes

The proposal is to replace a boardwalk that previously existed on site, the purpose of which is to limit damage to dunes by pedestrian traffic. The boardwalk is itself therefore a measure to limit impacts on the dune system, a common measure practised at numerous locations where pedestrian traffic crosses coastal dunes.

Resource irreplaceability

The dunes and dune vegetation are sensitive ecosystems that, for several well-described reasons, should be protected. They are irreplaceable in the sense that the original habitat is unlikely to recover in the case of high levels of damage. Score = 5.

Threshold

The potential impact affects a negligible proportion of the vegetation type. Score = 1.

Resource condition

The habitat on site (within the proposed development footprint) is in moderate condition, and has already been affected by historical disturbance. Score = 3.

Reversibility of impact

Loss of habitat on site (within the proposed development footprint) is partly REVERSIBLE - vegetation can be restored to its current state through active rehabilitation in combination with natural succession. Score = 3.

Extent of impact

The impact will occur within the site boundary. It is possible that there may be spillover effects into surrounding areas, due mostly to secondary impacts, such as boundary disturbance, alien invasive species spread, etc., combined with natural processes of disturbance, primarily wind. Score = 2.

Duration of impact

Damage to the habitat on site is assessed as being long-term, if it occurs. Score = 4

Intensity of impact

At a local scale, the impact is of LOW intensity, since it would result in a slight impact on ecological processes. Score = 2.

Probability of occurrence

Based on the proposed development plan and the known location of the habitats found on site, the impact will be POSSIBLE. Score = 3.

Confidence

There is a high understanding in the identity and on-site value of the vegetation, as well as the nature and extent of the proposed activity. The biggest uncertainties relate to possible future climate and weather impacts on site. No measures are therefore required to improve the confidence in the assessed impact.

Significance of impact

The significance is a combination of the value of the biodiversity resource, the magnitude of the expected impact and the probability of the impact occurring.

Biodiversity value score: (5 + 1 + 3 + 3)/4 = 3.00

Impact magnitude: (2 + 4 + 2)/3 = 2.67

The impact is calculated as (3.00 x 2.67 = 8.0)/5 = 1.6 = **LOW** significance

Possible mitigation measures

Possible mitigation measures that can be applied are as follows:

1. Temporary stabilisers can be used to provide a surface cover until more permanent vegetation becomes established. They protect the sand surface and can encourage sand trapping. These include temporary stabilisers such as brushes and mulches, liquid sprays, and cover crops, and the installation of erosion control structures like sand fences and coir logs.

2. Encourage revegetation of bare areas through natural dune successional processes. This can be formalised in a Rehabilitation Plan, which should include details of erosion control methods, a detailed revegetation plan, a monitoring schedule, and performance indicators.

Loss of individuals of protected tree species

Resource irreplaceability

The tree species affected is *Sideroxylon inerme*, protected under the National Forests Act. A total of 2 individuals were seen on site, all of them moderately large but windcropped individuals. The species is widespread but is a key and dominant component of coastal forests in the Garden Route. Neither is required to be removed. Score = 2.

Threshold

The potential impact affects a very small proportion of the overall known population the species. Score = 1.

Resource condition

The trees on site are in good condition. Score = 4.

Reversibility of impact

Loss of individuals on site is possibly PARTLY REVERSIBLE in terms of replacement of individuals due to natural population processes or deliberate planting (milkwoods plant easily and grow well in this type of environment). Score = 2.

Extent of impact

The impact will occur within site boundary (within the development footprint). Score = 1.

Duration of impact

Loss of trees on site is assessed as being long-term on the basis that trees removed can be replaced through planting - the timeframe is to allow planted individuals to achieve a reasonable size, which could take 10 years or more. Score = 5

Intensity of impact

At a local scale, the impact is of LOW intensity, since it would result in the permanent loss of the trees on site, although this is unlikely. Score = 2.

Probability of occurrence

Based on the proposed development plan and the known location of the individuals found on site (intention is to retain trees within the proposed development), the impact has LOW PROBABILITY. Score = 2.

Confidence

There is a high understanding in the identity and distribution of the species on site, as well as the nature and extent of the proposed activity. A high proportion of suitable habitats were checked on site and it is not expected that the on-site population varies much from what was observed. Additional searches will improve the overall count but not the on-site distribution. No additional measures are therefore required to improve the confidence in the assessed impact.

Significance of impact

The significance is a combination of the value of the biodiversity resource, the magnitude of the expected impact and the probability of the impact occurring.

Biodiversity value score: (2 + 1 + 4 + 2)/4 = 2.25

Impact magnitude: (1 + 5 + 2)/3 = 2.67

The impact is calculated as (2.25 x 3.33 = 6.0)/5 = 1.20 = **LOW** significance

Possible mitigation measures

Possible mitigation measures that can be applied are as follows:

1. Retain existing trees within proposed development.
2. If any trees need to be removed or pruned then a permit is required, according to the National Forests Act.

3. If appropriate, plant additional milkwoods in the development as part of the final landscaping. The proportions and composition should reflect habitat that would have occurred naturally at this site.

Impact: Invasion by alien invasive plants

Any disturbance enhances conditions favourable for invasion by alien species. Once established, these are hard to remove and require constant follow-up to eradicate, primarily due to high numbers of seeds produced and the resilience to control. Previously invaded areas are usually biologically damaged, which is difficult to reverse. Even after rehabilitation of cleared areas, aliens re-emerge and take over again, if not controlled.

Resource irreplaceability

The dunes and dune vegetation are sensitive ecosystems that, for several well-described reasons, should be protected. They are irreplaceable in the sense that the original habitat is unlikely to recover in the case of high levels of damage. Score = 5.

Threshold

The potential impact affects a negligible proportion of the vegetation type, but can spread easily and become more problematic over wider areas. Score = 2.

Resource condition

The habitat on site (within the proposed development footprint) is in moderate condition, and has already been affected by historical disturbance. Score = 3.

Reversibility of impact

Reversal of alien invasion is partly REVERSIBLE - vegetation can be restored to its current state through active rehabilitation in combination with natural succession, but requires high input. Score = 3.

Extent of impact

The impact will occur within the site boundary, but it is likely to spillover into surrounding areas. Score = 2.

Duration of impact

Damage to the habitat on site is assessed as being long-term, if it occurs. Score = 4

Intensity of impact

At a local scale, the impact could be of MODERATE to HIGH intensity, since it would result in processes temporarily ceasing or continueing in a highly modified way. Score = 4.

Probability of occurrence

Based on the known patterns of invasion, the impact is LIKELY. Score = 4.

Confidence

There is a high understanding of the species that invade and the impact on natural habitats. No measures are therefore required to improve the confidence in the assessed impact.

Significance of impact

The significance is a combination of the value of the biodiversity resource, the magnitude of the expected impact and the probability of the impact occurring.

Biodiversity value score: (5 + 2 + 3 + 3)/4 = 3.25

Impact magnitude: (2 + 4 + 4)/3 = 3.33

The impact is calculated as (3.25 x 3.33 = 10.83)/5 = 2.17 = **MEDIUM** significance

Possible mitigation measures

Possible mitigation measures that can be applied are as follows:

1. Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.
2. Undertake regular monitoring to detect alien invasions early so that they can be controlled, as per the Alien Management Plan.

Conclusion

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns for various themes:

Terrestrial Biodiversity Theme

1. The proposed infrastructure is within one regional vegetation type, Goukamma Strandveld, which is not listed. in any threat category. However, the foredunes in the Plettenberg Bay area have high value from a biodiversity perspective, a coastal process perspective, and in terms of protecting coastal development from marine natural processes.
2. The proposed infrastructure is not within any CBA or ESA area, although the seaward side of the dunes is within an ESA1 area (outside of footprint area).
3. The vegetation within the proposed infrastructure footprint is natural dune shrubland. There is a bare pathway in the footprint of the previous boardwalk that existed there. This habitat is naturally exposed to long-term natural dune dynamics, but is vegetated and should be maintained in this condition.
4. An impact assessment considered three potential impacts that were relevant to the Terrestrial Biodiversity Theme, namely:

    a. Destabilization of dunes: assessed as having LOW significance.
    b. Possible loss or damage to protected trees (milkwoods): assessed as having LOW significance.
    c. Invasion by alien invasive plants: assessed as having MEDIUM significance.

The main issue that is relevant to the proposed infrastructure is the possible destabilisation of the natural dune system. However, the proposed boardwalk is a measure that would be proposed to protect the dunes, if pedestrian traffic was expected. Nevertheless, it should be constructed and maintained in a way that takes into account the sensitivity of the dune ecosystem, and protects this ecosystem as best as possible.

Terrestrial Biodiversity Statement:

1. Based on the site verficaiton and impact assessment it is confirmed that the site has LOW sensitivity from a Terrestrial Biodiversity perspective.
2. Based on the low risks to surrounding ecosystem function of the proposed project, it is regarded to be an acceptable proposal for the site and can be approved.
3. This statement is subject to any conditions contained in the final approved EMPr.

Plant Species Theme

No flagged, sensitive or listed plant species were found within the proposed development footprint and none are likely to occur on site under current ecological conditions. The footprint area therefore has LOW sensitivity with respect to the Plant Species Theme and a Plant Species Compliance Statement was therefore required. The following is therefore stated:

1. The habitat of the proposed footprint area has low sensitivity with respect to the Plant Species Theme.
2. The proposed development will not have any impacts on any terrestrial plant SCC.
3. Although not threatened, bulbs of Brunsvigia orientalis must be rescued prior to construction, as per requirements of Bitou Municipality.

Animal Species Theme

Of the animal species flagged for the site, there are several bird species and one antelope species that may possibly migrate through the site, or else it forms part of the overall foraging resource of these species. It is possible (but unlikley) that the Knysna Warbler (Vulnerable) migrates trough the site. The Marsh Harrier could occur in the large wetland to the west of the property, but is unlikley to occur on site. The site therefore has LOW sensitivity with respect to the Animal Species Theme. None of these were found during the site inspection. An Animal Species Compliance Statement was therefore required. The following is therefore stated:

1. The habitat of the proposed footprint area has medium sensitivity with respect to the Terrestrial Animal Species Theme.
2. The proposed development may have impacts of Low significance on terrestrial animal SCC.

Recommendations

The following measures were recommended to address specific assessed impacts:

1. Temporary stabilisers can be used to provide a surface cover until more permanent vegetation becomes established. They protect the sand surface and can encourage sand trapping. These include temporary stabilisers such as brushes and mulches, liquid sprays, and cover crops, and the installation of erosion control structures like sand fences and coir logs.
2. Encourage revegetation of bare areas through natural dune successional processes. This can be formalised in a Rehabilitation Plan, which should include details of erosion control methods, a detailed revegetation plan, a monitoring schedule, and performance indicators.
3. Retain existing protected trees within the proposed development.
4. If any trees need to be removed or pruned then a permit is required, according to the National Forests Act.
5. If appropriate, plant additional milkwoods in the development as part of the final landscaping. The proportions and composition should reflect habitat that would have occurred naturally at this site.
6. Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.
7. Undertake regular monitoring to detect alien invasions early so that they can be controlled, as per the Alien Management Plan.

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Western Cape Biodiversity Act, Act No. 6 of 2021.

APPENDICES:

Appendix 1: List of protected tree species (National Forests Act, 1998).

In terms of section 15(1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree; or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister of Agriculture, Forestry and Fisheries. The list of Protected Tree Species under the National Forest Act, 1998 (Act No. 84 of 1998) is attached here as Appendix 1. The most recent version of this list was published in the Government Gazette No. 41887 on 7 September 2018, designated as GN No. 536 of 2018, and contains 47 species distributed across South Africa.

SCHEDULE A

Botanical name	**English common names**	**Other common names** **Afrikaans (A), Sepedi (P), Sesotho (S), Setswana (T), Tshivenda (V), isiXhosa (X), isiZulu (Z), Xitsonga (XT)**	**National tree number**
Acacia erioloba	Camel thorn	Kameeldoring (A)/Mogohlo (NS)/Mogôtlhô (T)/	168
Acacia haematoxylon	Grey camel thorn	Vaalkameeldoring (A)/Mokholo (T))	169
Adansonia digitata	Baobab	Kremetart (A)/Seboi (NS)/Mowana (T)/Ximuwu (XT	467
Afzelia quanzensis	Pod mahogany	Peulmahonie (A)/Mutokota (V)/Inkehli (Z)	207
Balanites subsp. *maughamii*	Torchwood	Groendoring (A)/Ugobandlovu (Z)	251
Barringtonia racemosa	Powder-puff tree	Poeierkwasboom (A)/Iboqo (Z)	524
Boscia albitrunca	Shepherd's tree	Witgat (A)/Mohlôpi (NS)/Motlhôpi (T)/ Muvhombwe (V)/Umgqomogqomo (X)/Umvithi (Z)	122
Brachystegia spiciformis	Msasa	Msasa (A)	198.1
Breonadia salicina	Matumi	Mingerhout (A)/Mohlomê (NS)/Mutu-lume (V)/Umfomfo (Z)	684
Bruguiera gymnorrhiza	Black mangrove	Swartwortelboom (A)/isiKhangati (X)/IsiHlobane (Z)	527
Cassipourea swaziensis	Swazi onionwood	Swazi-uiehout (A)	531.1
Catha edulis	Bushman's tea	Boesmanstee (A)/Mohlatse (NS)/Igqwaka (X)/Umhlwazi (Z)	404
Ceriops tagal	Indian mangrove	Indiese wortelboom (A)/isinkaha (Z)	525
Cleistanthus schlechteri var. *schlechteri*	False tamboti	Bastertambotie (A)/Umzithi (Z)	320

Colubrina nicholsonii	Pondo weeping thorn	Pondo-treurdoring (A)	453.8
Combretum imberbe	Leadwood	Hardekool (A)/Mohwelere-tšhipi (NS)/Motswiri (T)/Impondondlovu (Z)	539
Curtisia dentata	Assegai	Assegaai (A)/Umgxina (X)/Umagunda (Z)	570
Elaeodendron transvaalensis	Bushveld saffron	Bosveld-saffraan (A)/Monomane (T)/Ingwavuma (Z)	416
Erythrophysa transvaalensis	Bushveld red balloon	Bosveld-rooiklapperbos (A)/Mofalatsane (T)	436.2
Euclea pseudebenus	Ebony guarri	Ebbeboom-ghwarrie (A)	598
Ficus trichopoda	Swamp fig	Moerasvy (A)/Umvubu (Z)	54
Leucadendron argenteum	Silver tree	Silwerboom (A)	77
Lumnitzera racemosa var. *racemosa*	Tonga mangrove	Tonga-wortelboom (A)/isiKhaha- esibomvu (Z)	552
Lydenburgia abbottii	Pondo bushman's tea	Pondo-boesmanstee (A)	407
Lydenburgia cassinoides	Sekhukhuni bushman's tea	Sekhukhuni-boesmanstee (A)	406
Mimusops caffra	Coastal red milkwood	Kusrooimelkhout (A)/Umthunzi (X)/Umkhakhayi (Z)	583
Newtonia hildebrandtii var. *hildebrandtii*	Lebombo wattle	Lebombo-wattel (A)/Umfomothi (Z)	191
Ocotea bullata	Stinkwood	Stinkhout (A)/Umhlungulu (X)/Umnukane (Z)	118
Ozoroa namaquensis	Gariep resin tree	Gariep-harpuisboom (A)	373.2
Philenoptera violacea	Apple-leaf	Appelblaar (A)/Mphata (NS)/Mohata (T)/isiHomohomo (Z)	238
Pittosporum viridiflorum	Cheesewood	Kasuur (A)/Kgalagangwe (NS)/Umkhwenkwe (X)/Umfusamvu (Z)	139
Podocarpus elongatus	Breede River yellowwood	Breëriviergeelhout (A)	15
Podocarpus falcatus (Afrocarpus falcatus)	Outeniqua yellowwood	Outniekwageelhout (A)/Mogôbagôba (NS)/Umkhoba (X)/Umsonti (Z)	16
Podocarpus henkelii	Henkel's yellowwood	Henkel se geelhout (A)/Umsonti (X)/Umsonti (Z)	17
Podocarpus latifolius	Real yellowwood	Regte-geelhout (A)/Mogôbagôba (NS)/Umcheya (X)/Umkhoba (Z)	18
Protea comptonii	Saddleback sugarbush	Barberton-suikerbos (A)	88
Protea curvata	Serpentine sugarbush	Serpentynsuikerbos (A)	88.1
Prunus africana	Red stinkwood	Rooistinkhout (A)/Umkhakhase (X)/Umdumezulu (Z)	147
Pterocarpus angolensis	Wild teak	Kiaat (A)/Morôtô (NS)/Mokwa (T)/Mutondo (V)/Umvangazi (Z)	236
Rhizophora mucronata	Red mangrove	Rooiwortelboom (A)/isiKhangathi (X)/Umhlume (Z)	526

Sclerocarya birrea subsp. *caffra*	Marula	Maroela (A)/Morula (NS)/Morula (T)/Umganu (Z) /Nkanyi (XT)	360
Securidaca longepedunculata	Violet tree	Krinkhout (A)/Mmaba (T)	303
Sideroxylon inerme subsp. *inerme*	White milkwood	Witmelkhout (A)/Ximafana (X)/Umakhwelafingqane (Z)	579
Tephrosia pondoensis	Pondo poison pea	Pondo-gifertjie (A)	226.1
Warburgia salutaris	Pepper-bark tree	Peperbasboom (A)/Molaka (NS)/Mulanga (V)/isiBaha (Z)	488
Widdringtonia cedarbergensis	Clanwilliam cedar	Clanwilliamseder (A)	19
Widdringtonia schwarzii	Willowmore cedar	Baviaanskloofseder (A)	21
Berchemia zeyheri *(RHAMNACEAE) LC*	Red ivory Pink ivory	Rooi-ivoor (A) / Rooihout (A) / Monee (S) / umNeyi (SW) / umNini (Z, X) / Xiniyani (TS) / Moye (T) / Munia-niane (V)	450
Diospyros mespiliformis *(EBENACEAE) LC*	Jackal berry	Jakkalsbessie (A) / Musuma (V) / Muntoma (TS) / Mgula (TS)	606
Schinziophyton rautanenii	Manketti / Mongongo	Mankettiboom (A) / Monghongho (T) / Makongwa (T)	337
Umtiza listeriana	Umtiza	Umtiza (X) / Omtisa (A)	205

Appendix 2: Flora protected under the Cape Nature and Environmental Conservation Ordinance 19 of 1974

SCHEDULE 3: Endangered Flora

As per the Cape Nature and Environmental Conservation Ordinance 19 of 1974

Family: APOCYNACEAE	Common name / Additional notes
Pachypodium namaquanum	Halfmens (currently listed as LC)
Family: GESNERIACEAE	
Charadrophila capensis	Cape Gloxinia (currently listed as Rare)
Family: LILIACEAE	
Aloe pillansii	Now called *Aloidendron pillansii*, currently listed as Endangered
Aloe buhrii	Currently listed as Vulnerable
Aloe erinacea	Now called *Aloe melanacantha*, currently listed as Least Concern
Family: PROTEACEAE	
Mimetes capitulates	Currently listed as Endangered
Mimetes hottentoticus	Currently listed as Critically Endangered
Mimetes stokoei	Currently listed as Critically Endangered
Orothamnus zeyheri	Currently listed as Vulnerable
Protea odorata	Currently listed as Critically Endangered
Family: STANGERIACEAE	
Stangeria eriopus	Bobbejaankos (currently listed as Vulnerable)
Family: ZAMIACEAE	
Encephalartos spp.	Cycads, all species

SCHEDULE 4: PROTECTED SPECIES

As per the Cape Nature and Environmental Conservation Ordinance 19 of 1974

Family:AMARYLLIDACEAE	All species
Family: APOCYNACEAE	All species except those listed in Schedule 3
Family: AQUIFOLIACEAE	All species
Ilex mitis	
Family: ARACEAE	
Zantedeschia elliottiana	Yellow arum lily (currently DDT)
Family: ASCLEPIADACEAE (now Apocynaceae)	All species
Family: BORAGINACEAE	
Echiostachys spicatus	

Family: BRUNIACEAE	All species
Family: COMPOSITAE (now Asteraceae)	
Senecio colyphyllous (coleophyllous?)	
Cotula duckitteae	
Family: CRASSULACEAE	
Crassula columnaris	
Crassula perfoliata	
Crassula pyramidalis	
Kalanchoe thyrsiflora	
Rochea coccinea (now Crassula cochinea)	
Family: CUNONIACEAE	
Cunonia capensis	
Platylophus trifoliatus	
Family: DIOSCOREACEAE	
Testudinaria sylvatica (now Dioscorea sylvatica)	
Testudinaria elephantipes (now Dioscorea elephantipes)	
Family: ERICACEAE	All species
Family: EUPHORBIACEAE	
Euphorbia bupleurifolia	
Euphorbia fasciculata	
Euphorbia globosa	
Euphorbia horrida	
Euphorbia meloformis	
Euphorbia obesa	
Euphorbia schoenlandii	
Euphorbia symmetrica	
Euphorbia valida	
Family: GEISSOLOM(AT)ACEAE	All species
Family: GESNERIACEAE	
Streptocarpus	All species
Family: GRAMINAE (now Poaceae)	
Arundinaria tessellata (Thamnocalamus tessellatus)	
Secale africanum (now Secale strictum subsp. africanum)	
Family: GRUBBIACEAE	All species
Family: IRIDACEAE	All species
Family: LEGUMINOSAE (now Fabaceae)	
Erythrina acanthocarpa	
Erythrina humeana	
Liparia comantha	
Liparia sphaerica	
Liparia splendens	
Podalyria calyptrata	
Priestleya vestita	
Priestleya tomentosa	
Family: LILIACEAE (now split into a number of families)	

All species of the genus ALOE except those specified in Schedule 3 and the species *Aloe ferox*	
Gasteria beckeri	
Gloriosa superba	
All species of the genus Haworthia	
All species of the genus Kniphofia	
All species of the genus Lachenalia	
Littonia modesta	
Sandersonia aurantiaca	
All species of the genus Velthemia	
Agapanthus walshii	
Daubenya aurea	
Family: MELIACEAE	
Nymania capensis	
Family: MESEMBRYANTHEMACEAE (now Aizoaceae)	All species
Family: MUSACEAE (now Strelitziaceae)	
Strelitzia	All species
Family: NYMPHAECEAE	
Nymphaea capensis (now N. nouchali)	
Family: ORCHIDACEAE	All species
Family: OXALIDACEAE	
Oxalis nutans (no such species)	
Family: PENAEACEAE	All species
Family: POLYGALACEAE	
Muraltia minuta	
Family: POLYPODIACEAE	
Adiantium (now Family Pteridaceae)	All species
Hemitelia capensis (now Alsophila capensis, Family Cyathaceae)	
Polystichum adiantiforme (now Rumohra adiantiformis, Family Dryopteridaceae)	
Family: PORTULACACEAE	
Anacampseros (now Family Anacampserotaceae)	All species
Family: PROTEACEAE	
All species	
Family: RANUNCULACEAE	
Anemone capensis (now A.tenuifolia)	
Family: RESTIONACEAE	
Chondropetalum	
Acockii pillans (no such species)	
Elegia fenestrata	
Restio acockii	
Restio micans	
Restio sabulosus	
Family: RETZIACEAE (now Stilbaceae)	
Retzia capensis	
Family: RHAMNACEAE	

Phylica pubescens	
Family: RORIDULACEAE	All species
Family: RUTACEAE	All species
Family: SCROPHULARIACEAE	
Diascia	All species
Harveya	All species
Nemesia strumosa	
Halleria	All species
Family: THYMELAEACEAE	
Lachnaea aurea	

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06 February 2026

ATTENTION: Samantha Teeluckdhari

DEA&DP Ref: 16/3/3/6/7/1/D1/15/0299/25 - ACKNOWLEDGMENT OF RECEIPT AND COMMENT ON THE NOTICE OF INTENT TO APPLY (NOI): PROPOSED DEVELOPMENT ERF 9706, PORTION 57 OF 443, PLETTENBERG BAY

The purpose of this letter is to indicate that no aquatic features were found to occur on site within the proposed development zone for the above project.

A combined report was provided that addressed the requirements for the Terrestrial Biodiversity Theme, the Terrestrial Plant Species Theme and the Terrestrial Animal Species Theme, according to the relevant Protocols. No specific assessment of the Aquatic Theme was undertaken but the specialist was requested to confirm whether any aquatic features were seen to occur on site or not.

Although the site is on coastal dunes, no marine species or ecosystems are directly affected - the proposed infrastructure is located well above the high-tide level and falls within the defined (terrestrial) CBA/ESA mapped areas and a mapped terrestrial vegetation type (Goukamma Dune Strandveld). In the specialist report, ecosystem processes were described at length, and it was emphasized that they are driven by coastal sand-movement processes, which is partly a marine process but located in the terrestrial realm.

Coastal dunes are highly permeable to water, therefore surface aquatic features do not form unless an impermeable layer develops, or if the sand forms hollow areas at or below the level of the water-table. In dune ecosystems the most commonly occurring wetland features that occur are often dune-slack wetlands that are found at the foot of dunes where soil moisture is located close to the surface. Depending on the degree of sand movement, these may be transient systems that develop in the lowest parts of the dune systems. No such features occur on site, nor any other aquatic features.

Wetlands are delineated based on three characteristics, discussed below for dune areas:

1. soil mottling or gleying that indicates permanent or temporary waterlogging. In dune sand, this develops as grey to black colouring in the anaerobic parts of the profile, usually found at or below the level of the water-table. Searching for such features would only be required to confirm the boundaries of any wetland features, as per the National Water Act, and was not conducted.
2. The topography of the site indicates that the dunes are high above the marine high-tide mark, and there are no inland topographical features that would suggest that inland freshwater groundwater would back up within the soil profile to the level that it would express within the site (which is between 5 and 20 m above sea level). There were also no significant valleys on site. There is a large wetland system inland of the site that occurs at an elevation just above sea-level. This occurs primarily due to the presence of the dune system upon which the current site occurs, which allows water to fill up behind the dunes, but the elevation of this system is lower than any of the proposed developments on site. A profile is provided in the specialist report, added below for convenience.
3. No aquatic or wetland plants were found on site, not even facultative wetland species.

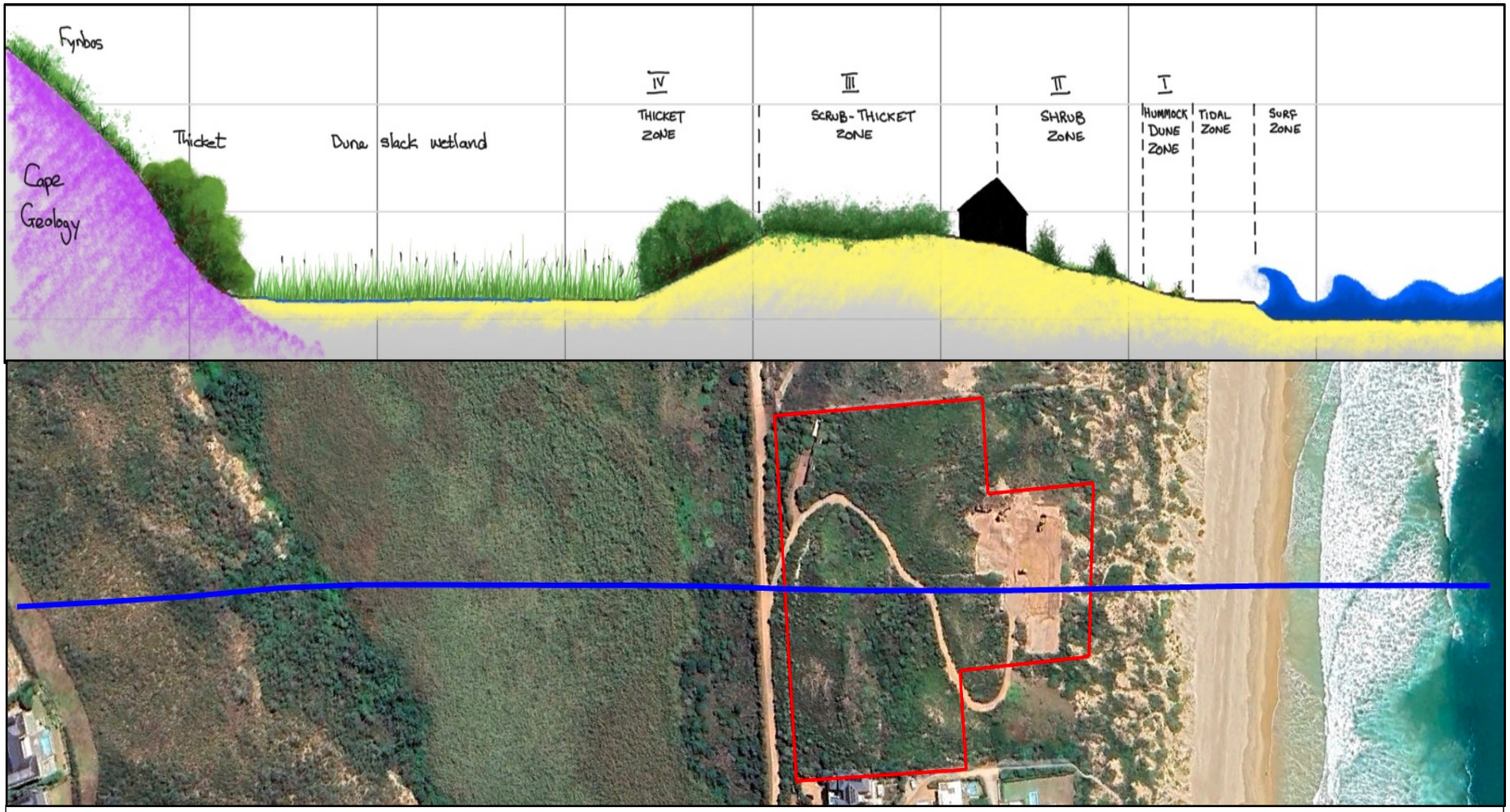

Figure 1: Profile through site showing dune zones.

In my opinion, there are no aquatic ecosystems on site, nor any aquatic species, therefore an Aquatic Biodiversity Assessment is not required. This can be confirmed by getting the opinion of an (recognised) aquatic specialist.

In terms of specific expertise, the Regulations require broad expertise and registration for specific themes but rely on experience and qualifications to determine whether a specialist is qualified for a specific theme. I am qualified, experienced and appropriately registered with SACNASP to undertake Terrestrial Biodiversity, Plant and Animal Theme assessments. I am also qualified and experienced to undertake Aquatic Theme assessments but have not registered to do so due to limited capacity, as well as the existence of several well-qualified specialists that can do these. I worked for several years with Wetland Consulting Services in Pretoria, specifically on wetland ecosystems and can provide a list of consulting reports. Here are three professional reports that I undertook in the past as a recognised expert:

1. Department of Water Affairs and Forestry (DWAF). 2008. Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare. Report no. X. Stream Flow Reduction Activities, Department of Water Affairs and Forestry, Pretoria, South Africa.
2. VLOK, W., COOK, C.L., GREENFIELD, R.G., HOARE, D., VICTOR, J. & VAN VUREN, J.H.J. 2006. A Biophysical Framework for the Sustainable Management of Wetlands in the Limpopo Province with Nylsvley as a reference Model. WRC Report No.: 1258/1/06. Report to the Water Research Commission.
3. HOARE, D.B., VICTOR, J.E. & MARNEWIC, G. 2005. Vegetation and flora of the wetlands of Nylsvley River catchment as component of a project to develop a framework for the sustainable management of wetlands in Limpopo Province.

Additionally, my entire undergraduate and Honours level studies were coastal based (rocky shores, sandy beaches and coastal dune ecosystem based) and I was accepted into a Marine Biology Masters level degree before fate took me on a different path. Prof Roy Lubke, Dr Ted Avis and Prof Christopher McQuaid were my main lecturers and mentors, all recognised coastal and intertidal biologists.

Yours faithfully,

_____

Dr David Hoare
Director

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

David Barry Hoare

Registration Number: 400221/05

is a registered scientist

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

Ecological Science (Professional Natural Scientist)
Botanical Science (Professional Natural Scientist)

Effective **16 August 2005** Expires **31 March 2026**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

CURRICULUM VITAE

Dr. David Barry Hoare

Ph.D., Pr.Sci.Nat. (Ecology, Botany)

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Date of birth: 04 November 1966, Grahamstown, South Africa
Citizenship: Republic of South Africa
ID no.: 661104 5024 088

Education
PhD (Botany) – Nelson Mandela Metropolitan University, Port Elizabeth
M.Sc (Botany) - University of Pretoria, 1995-1997 with distinction
B.Sc (Hons) (Botany) - Rhodes University, 1994 with distinction
B.Sc (majors: Botany, Zoology) - Rhodes University, 1991-1993
Matric - Graeme College, Grahamstown, 1984

Main areas of specialisation
- Plant biodiversity and threatened plant species specialist.
- Flora and fauna surveys.
- Vegetation ecology, survey and mapping.
- Protected plant and tree species surveys, management plans and permits.
- Alien invasive plant identification and control / management plans.
- Remote sensing, analysis and mapping of vegetation.
- Specialist consultant for environmental management projects.

Membership
Professional Natural Scientist, South African Council for Natural Scientific Professions, 16 August 2005 – present. Reg. no. 400221/05 (Ecology, Botany)
Member, International Association of Vegetation Scientists (IAVS)
Member, Ecological Society of America (ESA)
Member, International Association for Impact Assessment (IAIA)
Member, Herpetological Association of Africa (HAA)

Employment history
1 December 2004 – present, Director, David Hoare Consulting (Pty) Ltd. Consultant, specialist consultant.
1January 2009 – 30 June 2009, Lecturer, University of Pretoria, Botany Dept.
1January 2013 – 30 June 2013, Lecturer, University of Pretoria, Botany Dept.
1 February 1998 – 30 November 2004, Researcher, Agricultural Research Council, Range and Forage Institute, Private Bag X05, Lynn East, 0039. Duties: vegetation ecology, remote sensing image processing.

Experience as consultant
Professional consultant since 1995 (28 years of experience). Author of over 800 specialist ecological consulting reports. Wide experience in ecological studies within grassland, savanna, karoo and fynbos, as well as riparian, coastal and wetland vegetation.

Publication record:
Refereed scientific articles (in chronological order):
Journal articles:

HOARE, D.B. & BREDENKAMP, G.J. 1999. Grassland communities of the Amatola / Winterberg mountain region of the Eastern Cape, South Africa. *South African Journal of Botany* 64: 44-61.

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HOARE, D.B., VICTOR, J.E. & LUBKE, R.A. *Description of the coastal fynbos south of George, southern Cape*; Paper presentation, Fynbos Forum, Bienne Donne, July 1994

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niobe) (Trimen)(*Lycaenidea*) at Brenton-on-Sea. Unpublished report for the Endangered Wildlife Trust of Southern Africa, Johannesburg. 38pp.
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Department of Water Affairs and Forestry (DWAF). 2008. Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare. Report no. X. Stream Flow Reduction Activities, Department of Water Affairs and Forestry, Pretoria, South Africa.

Consulting reports:
Total of over 800 specialist consulting reports for various environmental projects from 1995 – present.

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