

TERRESTRIAL BIODIVERSITY AND PLANT SPECIES ASSESSMENT

**PROPOSED DEVELOPMENT FEATEHRBED PORTION
59 OF FARM 216, KNYSNA, KNYSNA MUNICIPALITY,
WESTERN CAPE PROVINCE**



CAPENSIS

GREG NICOLSON

JULY 2024

**REPORT PREPARED FOR
ECO ROUTE ENVIRONMENTAL CONSULTANTS**

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, as amended.

APPOINTMENT OF SPECIALIST

Capensis Ecological Consulting (Pty) Ltd was appointed by Eco Route Environmental Consultants to provide specialist botanical and terrestrial biodiversity consulting services for a proposed development at Portion 59 of Farm 216, Knysna, Western Cape.

CONDITIONS RELATING TO THIS REPORT

The content of this report is based on the authors' best scientific and professional knowledge as well as available information. Capensis Ecological Consulting (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

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Expertise

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- Has experience in Botanical exploration in South Africa and Namibia
- Has conducted over 250 botanical assessments for the EIA process.

THE SPECIALIST

I, Gregory Alexander Nicolson, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
- other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the specialist:



Name of company: Capensis Ecological Consulting (Pty) Ltd
Date: 02 July 2024

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1. INTRODUCTION

Capensis Ecological Consulting has been appointed by Eco Route Environmental Consultants to provide specialist botanical and terrestrial biodiversity consulting services for proposed developments on Featherbed Portion 59 of the Farm 216, Knysna. The proposed developments consist of the following components:

1. Managers cottage
2. Garages
3. Conference Centre
4. Entertainment Facility

The developments, if approved, would result in the loss of indigenous vegetation and therefore requires a Terrestrial Biodiversity and Plant Species Assessment.

2. TERMS OF REFERENCE

2.1. GENERAL

Terrestrial Biodiversity assessments must follow guidelines set out in the following documents:

- Department of Environmental Affairs and Development Planning (DEA&DP) Guidelines for Involving Biodiversity Specialists in the EIA Process (Brownlie, 2005);
- Ecosystem Guidelines for Environmental Assessment in the Western Cape (Cadman et al., 2016);
- The requirements of CapeNature for providing comments on agricultural, environmental, mine planning and water-use related applications (Turner, 2013); and
- Protocol for the assessment and reporting of environmental impacts on terrestrial biodiversity (Government Gazette 2020).

2.2. SPECIFIC

The specific terms of reference provided by EcoRoute are as follows:

1. Approach to include desktop study and site visit(s) to verify site sensitivity and level of study required:
 - a) where the information gathered from the site sensitivity verification differs from the designation of “very high” sensitivity on the screening tool and it is found to be of a “low” sensitivity, then a Compliance Statement must be submitted.

- b) where the information gathered from the site sensitivity verification differs from that identified as having a “low” sensitivity on the screening tool, a Specialist Assessment must be conducted.
2. Advice on the need for additional specialists to investigate specific components and the scope and extent of the information required from such studies.
3. Engage with other specialists whose studies may have bearing on their specific investigation.
4. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring.
5. Appraisal of alternatives (including the No-Go option) by identifying the Best Practicable Environmental Option with suitable justification.
6. Consider time boundaries, including short to long-term implications of impacts for project life- cycle (i.e. pre-construction, construction, operation and decommissioning).
7. Consider spatial boundaries, including the broad context of the proposed project (i.e. beyond the boundaries of the specific site), off-site impacts, and local to regional context.
8. Present findings to the EAP project team, where key discussion points will include the evaluation of alternatives, recommended management measures and monitoring programme.
9. Address issues raised by I&APs and assess all potentially significant impacts.
10. Any additional issues that have not been identified should also be highlighted to the EAP for further investigation.
11. Where a Specialist Assessment is required, the following must be included:
 - a. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.
 - b. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment, which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.
12. Take into account the policy framework and legislation relevant to their particular studies.
13. Specialists must consider and adhere to section 13 (“General requirements for EAPs and specialist”) and section 14 (“Disqualification of EAPs and specialists”) of the EIA Regulations, 2014 (as amended).
14. Specialist must be registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of Terrestrial Biodiversity and Plant Species Specialist.

3. PROTOCOL FOR DETERMINING LEVEL OF REPORTING

The terrestrial biodiversity sensitivity theme was predetermined using the Department of Forestry, Fisheries and the Environment's (DFFE) National Web Based Screening Tool (<https://screening.environment.gov.za/screeningtool/>). The Screening Tool assigns a Very High and High terrestrial biodiversity sensitivity rating to the site (Figure 1). The Very High sensitivity rating, if verified, requires a **Terrestrial Biodiversity Impact Assessment** to be submitted as part of the application for Environmental Authorization (EA). Medium sensitivity areas have been confirmed and identified at the site and an impact assessment is thus provided. This Terrestrial Biodiversity Impact Assessment meets follows the requirements set out in the Protocol for the assessment and reporting of environmental impacts on terrestrial biodiversity (GN 320 of 20 March 2020).

The relative plant species theme sensitivity for the site is rated as High and Medium by the Screening Tool Report. "An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "high or medium sensitivity" for plant species, must submit either a **Plant Species Specialist Assessment Report** or a **Plant Species Compliance Statement**, depending on the outcome of a site inspection undertaken in accordance with paragraph 4" (GN 1150 of 30 October 2020, as amended). Plants listed as Species of Conservation Concern (SCC) have been identified within the study area and therefore a Plant Species Specialist Assessment Report is included in Appendix 3 of this report.

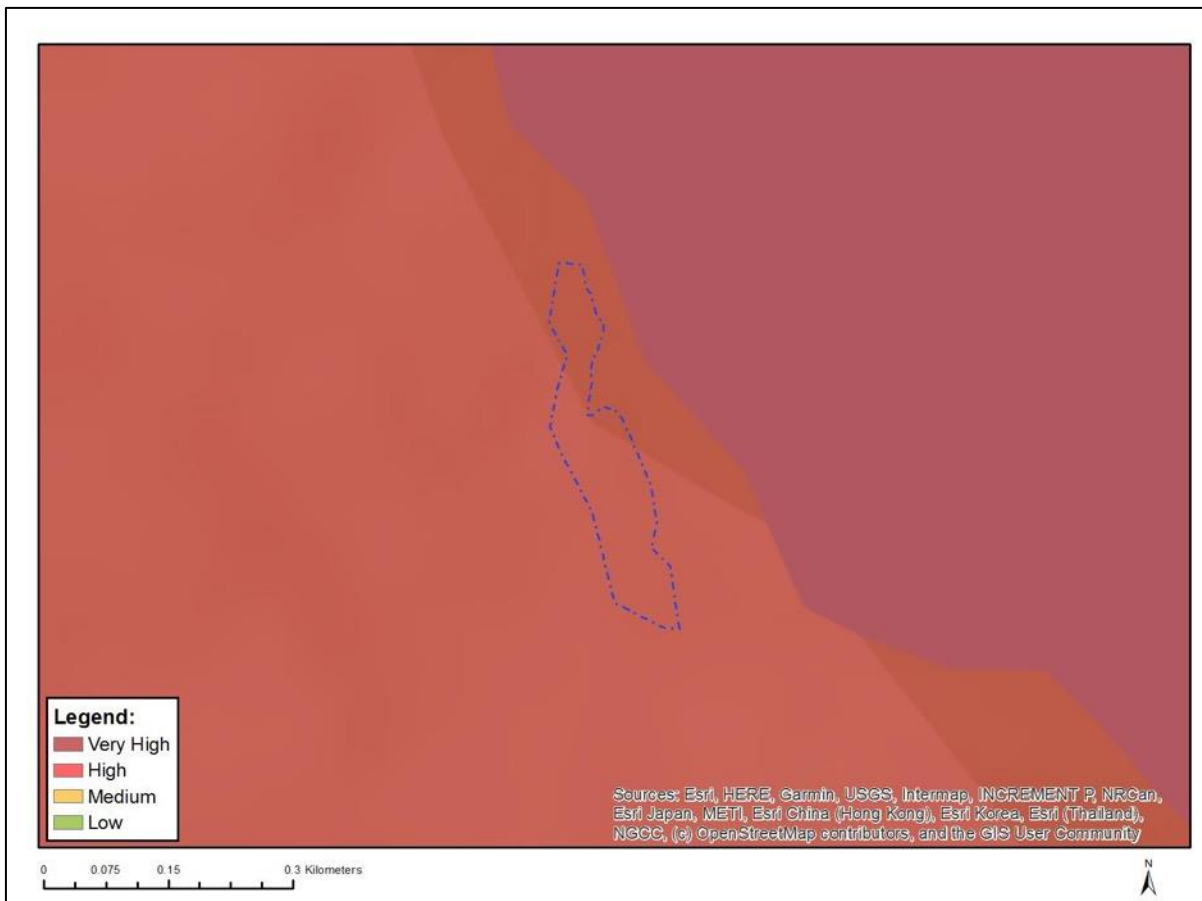


Figure 1. Map of relative terrestrial biodiversity theme sensitivity generated from the DFFE Screening Tool (<https://screening.environment.gov.za>). The study area is marked by the blue dashed line.

4. METHODOLOGY, LIMITATIONS AND ASSUMPTIONS

The study area was visited on the 22nd of May 2024 and surveyed on foot. Sample waypoint positions were obtained using a Garmin GPS map 62. Photographs were taken and georeferenced using an Olympus TG-5 Camera with built-in GPS.

The following sources have been used to inform this study:

- *Site boundaries:* The property boundaries have been downloaded from the Cape Farm Mapper Website (<https://gis.elsenburg.com/apps/cfm/>).
- *Vegetation Types:* Based on *The Vegetation of South Africa, Lesotho and Swaziland* (VEGMAP)(Mucina & Rutherford, 2006). The South African National Biodiversity Institute (SANBI) has updated the mapping for the VEGMAP (2018) and these latest shapefiles have been used. The Fine Scale Vegetation Map for the Garden Route (Vlok, Euston-Brown, & Wolf, 2008) has also been referenced.
- *Ecosystem threat status:* Informed by (1) The Revised National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2022)

- *Biodiversity planning:* The Western Cape Biodiversity Spatial Plan (WCBSPP) for the Knysna Municipality (CapeNature, 2017) is essential to determine the conservation importance of the affected habitats. Ground-truthing is an essential component in terms of determining the habitat condition.
- *Important Plant species:* The presence or absence of threatened (i.e. species of conservation concern) and ecologically important species informs the ecological condition and sensitivity of the site. The latest conservation status of species is checked on the Red List of South African Plants (Raimondo *et al.* 2009) via the website (www.redlist.sanbi.org). A list of sensitive species generated by the National Web-based Screening Tool (screening.environment.gov.za) was used. Certain species cannot be disclosed to the public as per the requirements of the screening tool. Observations from iNaturalist (inaturalist.org) at and in the vicinity of the study area were also noted.

The site visit was carried out during autumn. The timing of the survey is sub-optimal as many geophytic and annual plant species flower during spring. Some bulbs species were visible, either as their leaves were present or their old flowering parts were still visible. It should be noted however that due to the year-round precipitation experienced in the Garden Route region this limitation is not considered to have had a highly significant effect on sampling efforts.

5. STUDY AREA

5.1. LOCALITY

The study area is located on the western side of the Knysna heads close to Brenton-on-Lake within the Knysna Municipality. (Figure 2). The main road in the area is the tar road from the N2 to Brenton-on Sea. The Knysna lagoon is located immediately west of the site (Figure 3). The site is characterized by mostly developed areas consisting of an existing house, restaurant, parking area and shed. Perennial or non-perennial rivers mapped on the site are indicated in figure 4A. Some small pockets of indigenous vegetation occur alongside landscaped areas between the developments. The remainder of the property is part of the Featherbed Nature Reserve and contains a mix of natural vegetation and invasive alien plants. The proposed development components are shown in Figure 4B.



Figure 2. The location of the study area within the context of the Knysna Municipality and closest towns, overlaid on an Google Maps™ Map.



Figure 3. The location of the subject property and study area in relation to the closest roads, perennial rivers and towns, overlaid on a Google Maps™ aerial image.

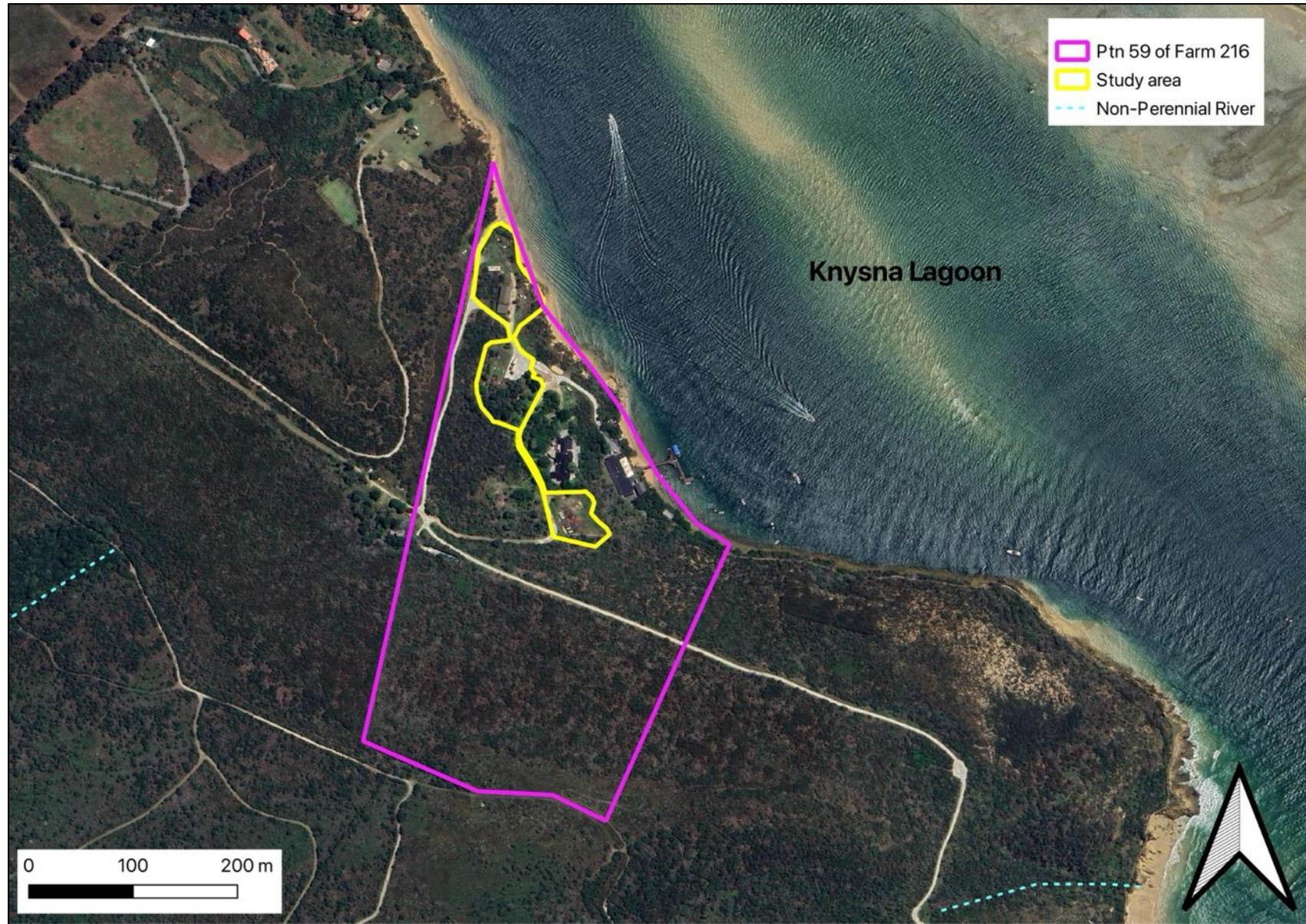


Figure 4A. A Google Maps™ satellite image of the subject property and study area.



Figure 4A. A CDNGI 50cm satellite image of study area showing the proposed development components.

5.2. LANDSCAPE AND GEOLOGY

The topography of the property is characterized by fairly steep slopes that lead down to the estuary. The study focus area where developments have been proposed are already mostly levelled. The higher elevation on the south side of the property (elevation 210 MASL) is fairly steep (Figure 5).

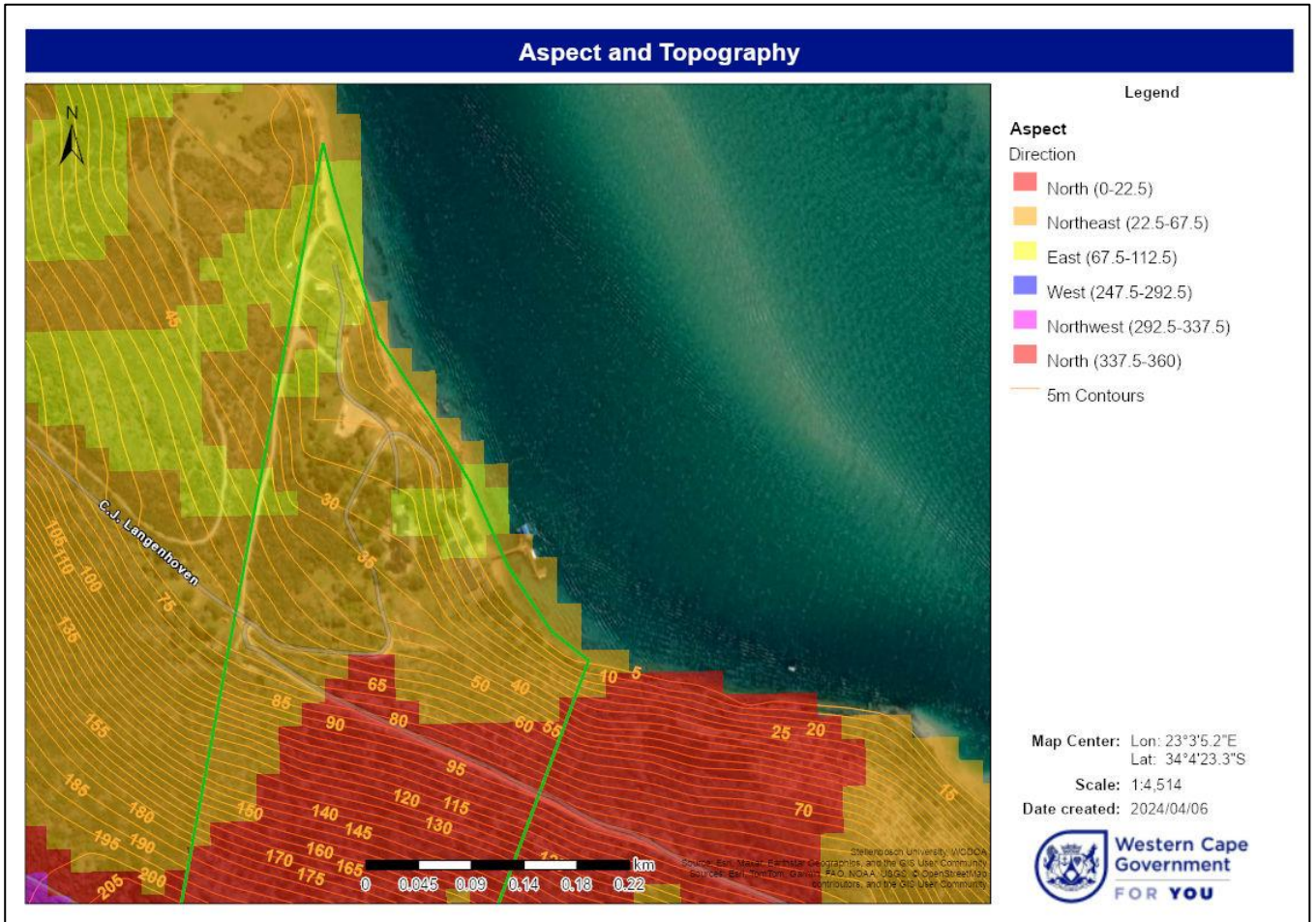


Figure 5. A contour map showing the topography on the site overlaid on a ESRI™ aerial image (CapeFarm Mapper: Western Cape Department of Agriculture, gis.elsenberg.com).

According to the Soils and Geology (ENPAT) layer on CapeFarmMapper (gis.elsenberg.com) the site contains one land type, namely Ga. The soils and geology of this land type is described below:

Land Type: Ga 3

Soil:	Soils with a diagnostic ferrihumic horizon, predominantly deep (Lamotte form)
Geology:	Mainly fixed dunes and dune rock, largely overlying conglomerate, sandstone, siltstone and mudstone of the Enon Formation, as well as quartzitic sandstone of the Table Mountain Group, Cape Supergroup.

The soils observed on the site are light brown to white, fine-grained deep sands.

6. OVERVIEW OF VEGETATION AND CONSERVATION PLANS

6.1. NATIONAL VEGETATION TYPE

The National Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018) (VEGMAP) classifies the expected vegetation types in the study area as Knysna Sand Fynbos, Goukamma Dune Thicket and Non-terrestrial (Estuarine Functional Zone) (Figure 6). The vegetation and landscape features of the assigned vegetation types are described as follows:

Knysna Sand Fynbos

“Garden Route coastal flats from Wilderness, generally to the north of the system of lakes, several patches around the Knysna Lagoon, with more isolated patches eastwards to the Robberg peninsula near Plettenberg Bay. Undulating hills and moderately undulating plains covered with a dense, moderately tall, microphyllous shrubland, dominated by species more typical of sandstone fynbos”.

Goukamma Dune Thicket

“Coastal stretches from Victoria Bay near Wilderness to the Knysna Heads, with smaller areas along the coast from Robberg Peninsula near Plettenberg Bay eastward to Keurboomstrand. A mosaic of low to tall (1-5 m), dense thicket, dominated by small trees and woody shrubs with lianas abundant, in a mosaic of low (1-2 m) asteraceous fynbos. Thicket clumps are best developed in fire-protected dune slacks, which occasionally also support pockets of coastal forest. The fynbos shrubland occurs on upper dune slopes and crests where succulents may be common in more open areas”

Non-terrestrial (Estuarine Functional Zone)

This ecosystem is not described in the VEGMAP book or terrestrial ecosystems website.

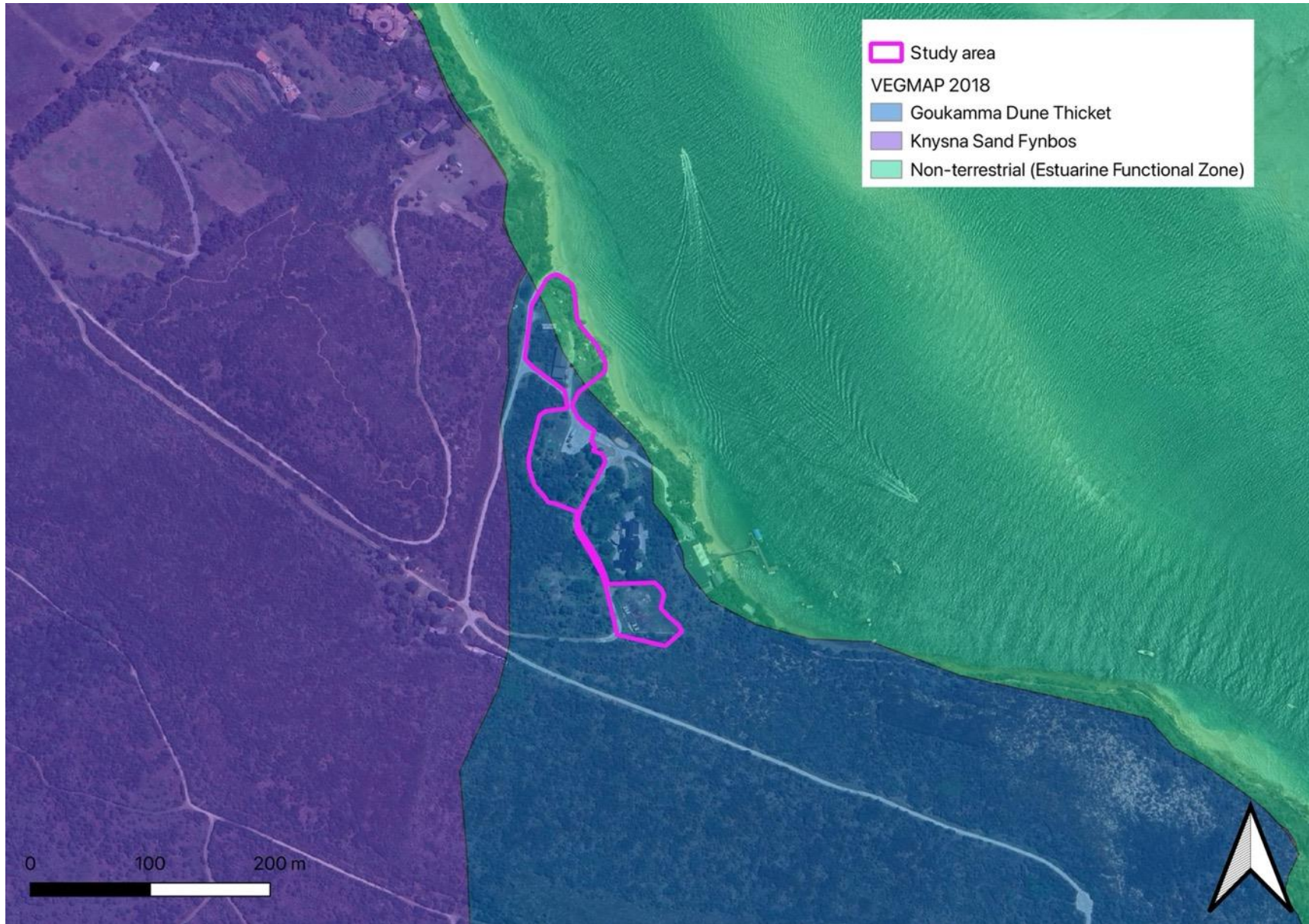


Figure 6. VEGMAP: The study area in relation to the VEGMAP (SANBI, 2018) overlaid on a Google Maps™ aerial image.

6.2 NATIONAL ECOSYSTEM THREAT STATUS

Ecosystem threat status is informed by *The Revised National List of Ecosystems that are Threatened and Need of Protection* (RNLETNP)(Government Gazette, 2022). Species information is not provided in the RNLETNP and is thus taken from The National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2011). Table 1 provides a summary of (a) the ecosystem status and reasons, (b) the remaining percentage of the ecosystem and the original (national) extent, (c) the proportion of ecosystem target protected, and (d) the national conservation target from the two most relevant information sources.

Table 1. Ecosystem threat status derived from available information sources

The Revised National List of Ecosystems that are Threatened and in Need of Protection	
KNYSNA SAND FYNBOS	
Ecosystem threat status	CRITICALLY ENDANGERED
Reason	B (Rate of loss of natural habitat)
Remaining % of ecosystem	21% of 15212 (ha)
Conservation target	23%
Protected area	10.1 %
Species of Concern	3 Red listed plants
Pressures & threats	This ecosystem has experienced a loss in natural habitat of approximately 6.65 km ² in the last 28 years (1990-2018). These spatial declines have been primarily driven by plantations which now cover 89.98 km ² . Agriculture has also been a pressure to Knysna Sand Fynbos with 4.85 km ² covered by cropland and a further 16.96 km ² covered by old fields. The ecosystem is further degraded by erosion and alien invasions of <i>Acacia melanoxylon</i> , <i>A. mearnsii</i> and <i>A. longifolia</i> (Rebelo et al. 2006).
NOTES	Trigger Sub-Criteria: B1(i) - Knysna Sand Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), placing the ecosystem type at risk of collapse. Scope: Global & national status (global extent assessed)
GOUKAMMA DUNE THICKET	
Ecosystem threat status	LEAST CONCERN
Reason	(No Criteria for LC)
Remaining % of ecosystem	71% of 9178 ha
Conservation target	19%
Protected area	50.6%
Species of Concern	Data deficient
Pressures & threats	Data deficient
NOTES	Goukamma Dune Thicket has experienced low rates of natural habitat loss and biotic disruptions, placing this ecosystem at low risk of collapse. Scope: Global & national status (global extent assessed)

Ecological drivers

The key ecological drivers for the relevant ecosystems (Cadman et al., 2016) are listed below:

Lowland fynbos: (1) the natural fire frequency, (2) diversity of habitat and environmental gradients, (3) regional and local natural water drainage patterns and (4) natural grazing and physical soil disturbance.

Albany Thicket: (1) Herbivory, (2) fire, (3) rainfall, (4) climatic variability, (5) ecosystem engineers, (6) seed dispersal by animals (especially birds) and (7) topography, geology and soil type.

6.3 GARDEN ROUTE INITIATIVE VEGETATION MAP (2008)

The vegetation within the study area was mapped at a fine scale by Vlok, Euston-Brown, & Wolf (2008) in the C.A.P.E. Fine-scale Mapping Project. According to this map three vegetation units are found within the study area, namely Garden Route Estuary, Groenvlei Coastal Forest, and Sedgfield Thicket-Fynbos (Figure 7). The terrestrial units are described as follows:

Groenvlei Coastal Forest: “restricted to deep sandy soils in the lowlands. It is best developed next to extensive water bodies, where fires originate and burn upslope. The tall closed canopy is similar to those of the Afromontane Plateau Forest, with tall *Afrocarpus falcatus* often emerging above the canopy. It does, however, differ in its floristic component and in having deciduous trees such as *Celtis africana* often locally abundant. It is most easily recognized as it has trees with a subtropical affiliation such as *Calodendrum capense*, *Ekebergia capensis*, *Strychnos decussata* and even sometimes *Olea europaea* spp. *africana* present. No rare plant species are known from this unit, but it is the habitat of the rare Knysna Woodpecker (*Campethera notata*).” (Vlok, Euston-Brown, Wolf, 2008).”

Sedgfield Thicket-Fynbos: “This habitat type differs from the Sandplain Fynbos habitat only in having some Thicket bush-clumps present. We only recognize one unit in this habitat, the Sedgfield Thicket-Fynbos. The bush-clumps currently present in this unit are probably much more abundant and larger than they used to be as most of this habitat has been protected against fires for many years. In the past browsers probably also contained the extent of these bush-clumps, which consists mostly of Dune thicket species such as *Azima tetraacantha*, *Carissa bispinosa*, *Cussonia thyrsiflora*, *Euclea racemosa*, *Olea exasperata*, *Rhus glauca*, *Sideroxylon inerme* and *Tarchonanthus camphoratus*, which all can grow rapidly in the absence of fire. These bush-clumps easily overgrow the adjacent matrix Fynbos vegetation in the absence of fire. This results in the loss of the rich biodiversity of the matrix Sandplain Fynbos. Geophyte species endemic to the Sandplain Fynbos, such as *Gladiolus vaginatus* and *Satyrium princeps* will first go extinct without the correct fire regimes, but they will soon be followed by endemic shrubs such as *Erica glandulosa* ssp. *fourcadei*”.

Table 2 provides the ecosystem threat status of the vegetation units mapped in the Garden Route Initiative Map derived from the Critical Biodiversity Areas of the Garden Route Conservation Planning Technical Report (Holness et al, A. 2010)

Table 2. Ecosystem threat status for the FSP vegetation units derived from available information sources.

Vegetation type	National Equivalent Ecosystem Status
Groenvlei Coastal Forest	ENDANGERED
Sedgefield Thicket-Fynbos	LEAST THREATENED
Garden Route Estuary	LEAST THREATENED

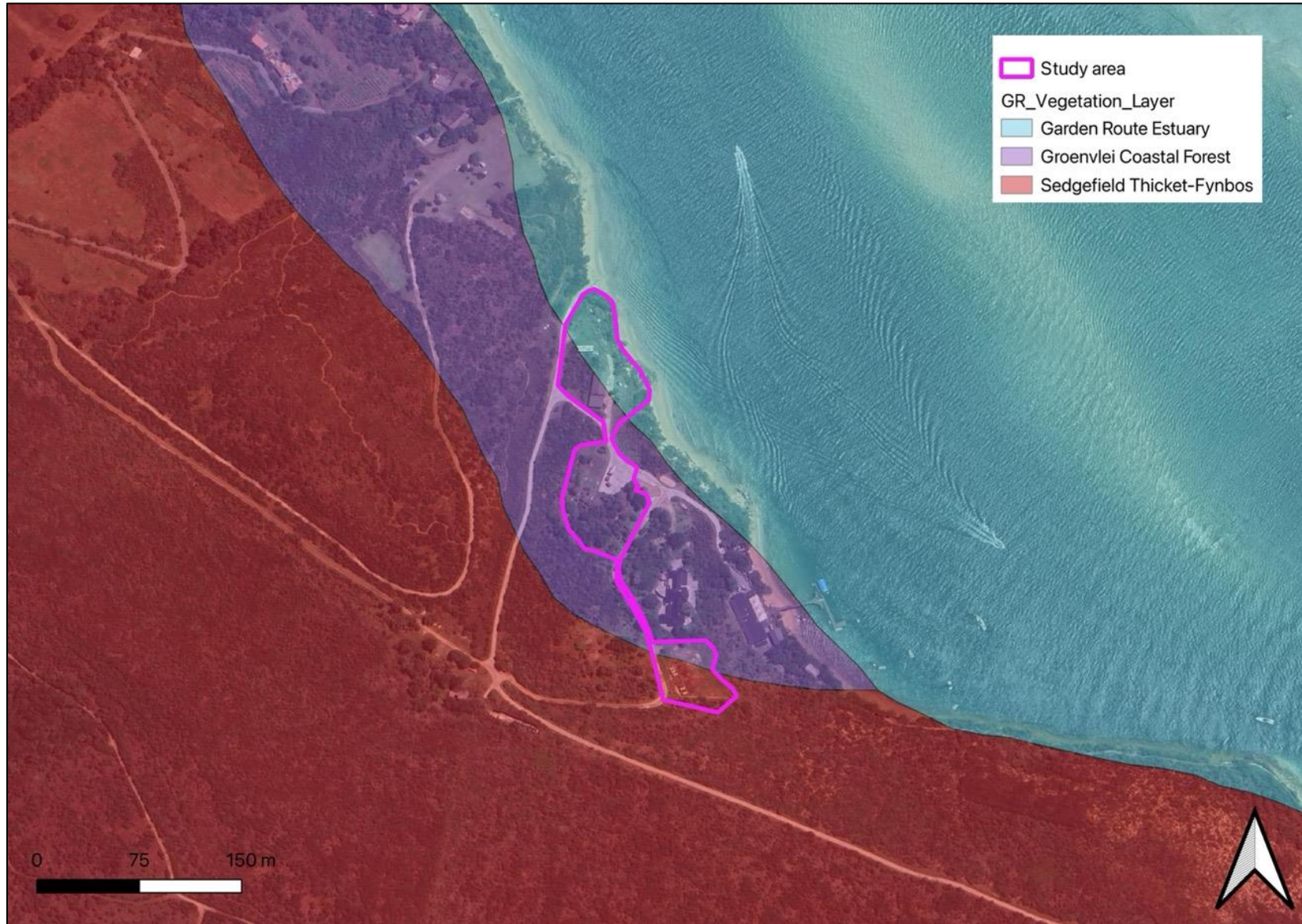


Figure 7. FSP VEGMAP: The study area in relation to the C.A.P.E FSP Vegetation Map for the Garden Route (Vlok, Euston-Brown, & Wolf 2008) overlaid on a Google Maps™ aerial image

6.4 CONSERVATION AND BIODIVERSITY PLANS

The 2017 WCBSP Handbook (Pool-Stanvliet *et al.*, 2017) distinguishes between the various conservation planning categories. Critical Biodiversity Areas are habitats with high biodiversity and ecological value. Such areas include those that are likely to be in a natural condition (CBA 1) and those that are potentially degraded or represent secondary vegetation (CBA 2). Ecological Support Areas are not essential for meeting biodiversity targets. However, they play an important role in supporting the functioning of Protected Areas (PA) or CBAs and are often vital for delivering ecosystem services. A distinction is made between ESAs that are still likely to be functional (i.e. in a natural, near-natural or moderately degraded condition; (ESA 1) and Ecological Support Areas that are severely degraded, or have no natural cover remaining, and therefore require restoration (ESA 2). Other Natural Area (ONA) sites are not currently identified as a priority, but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although not prioritised, they are still an important part of the natural ecosystem. Ground-truthing of the assigned CBA and ESA sites are described in the vegetation and discussion section below.

The study area is classified as Protected Area, the Featherbed Private Nature Reserve (Figure 8A and Table 3).

A number of The South African Protected Areas Database (SAPAD) protected areas occur in the broader landscape surrounding the site, namely (1) Knysna National Lake Area which is extensive and continuous around the region, (2) Brenton Blue Butterfly Nature Reserve found to the west of the site, (3) Skuilte Private Nature Reserve to the north-west of the site and (4) Pledge Nature Reserve to the north of the site. The Goukamma Provincial Nature Reserve and Goukamma Marine Protected Area occur further west. The Goukamma Provincial Nature Reserve accounts for the high proportion of the Goukamma Dune Thicket ecosystem that is formally protected (Figure 8B).

The study area falls within The South African Protected Areas Database (SACAD) protected area, namely the Garden Route Biosphere Reserve, a nationally important conservation area that was recognised by UNESCO as South Africa's ninth Biosphere Reserve (<https://gardenroutebiosphere.org.za/>). This extensive area includes the whole Garden Route Area.

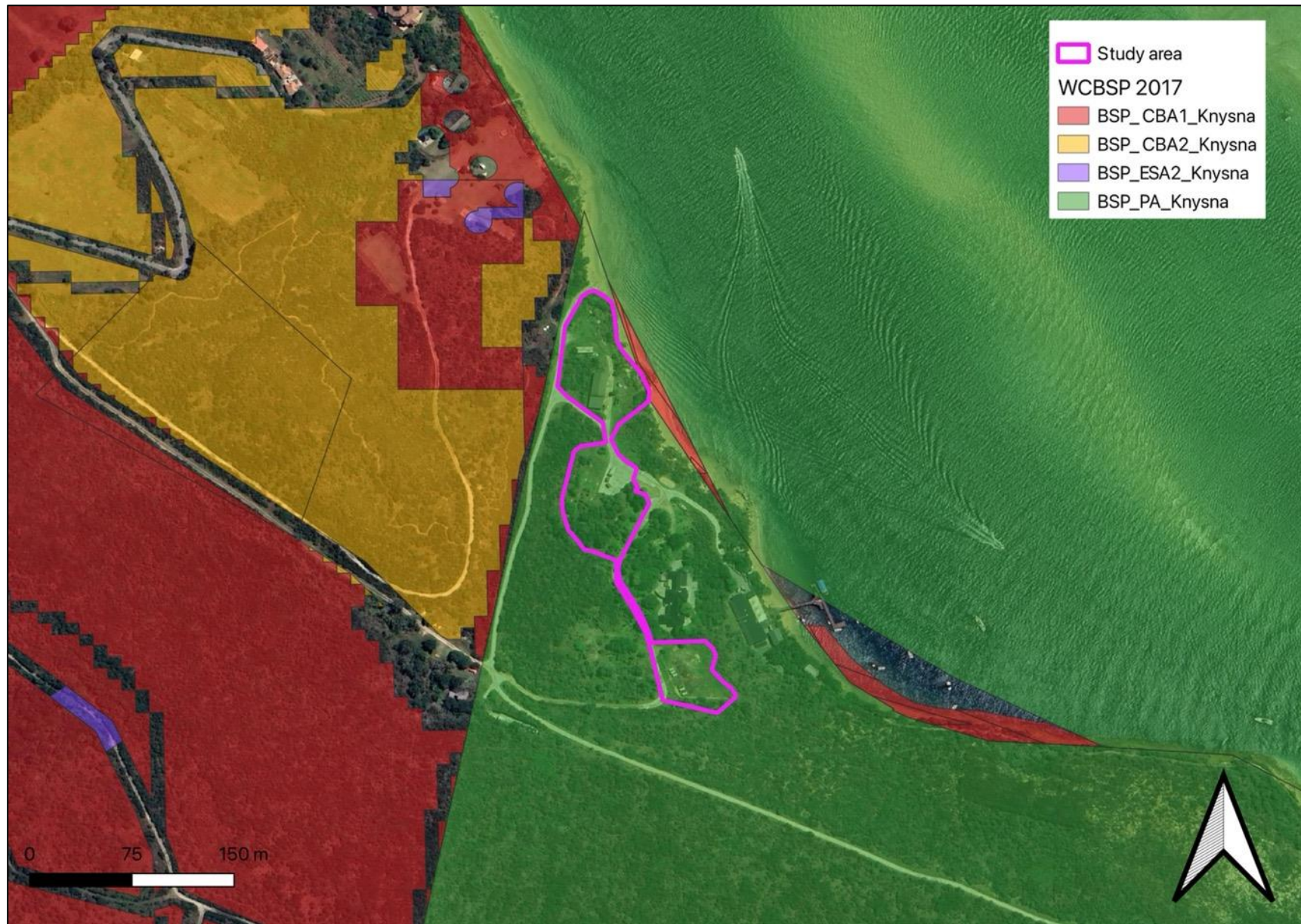


Figure 8A. CONSERVATION PLANNING MAP: The study area in relation to the Western Cape Biodiversity Spatial Plan (CapeNature 2017) overlaid on a ESRI™ aerial image.

Table 3. The CBA categories from the WCBSP (CapeNature 2017) with the associated subcategory, definition and management objectives that are found on the site

Map category	Definition	Management objective	Reasons
Protected Area	Areas that are formally protected by law and recognised in terms of the NEMPAA. This includes gazetted private Nature Reserves and Protected Environments concluded via a stewardship programme.	Must be kept in a natural state with a management plan focussed on maintaining or improving the state of biodiversity	Coastal resource protection- Eden Eastern Fynbos Renosterveld Sand Fynbos Floodplain Wetland Eastern Fynbos Renosterveld Sand Fynbos Seep Wetland Knysna (Core) Estuary Knysna Sand Fynbos (CR) Water source protection- Knysna Watercourse protection- South Eastern Coastal Belt

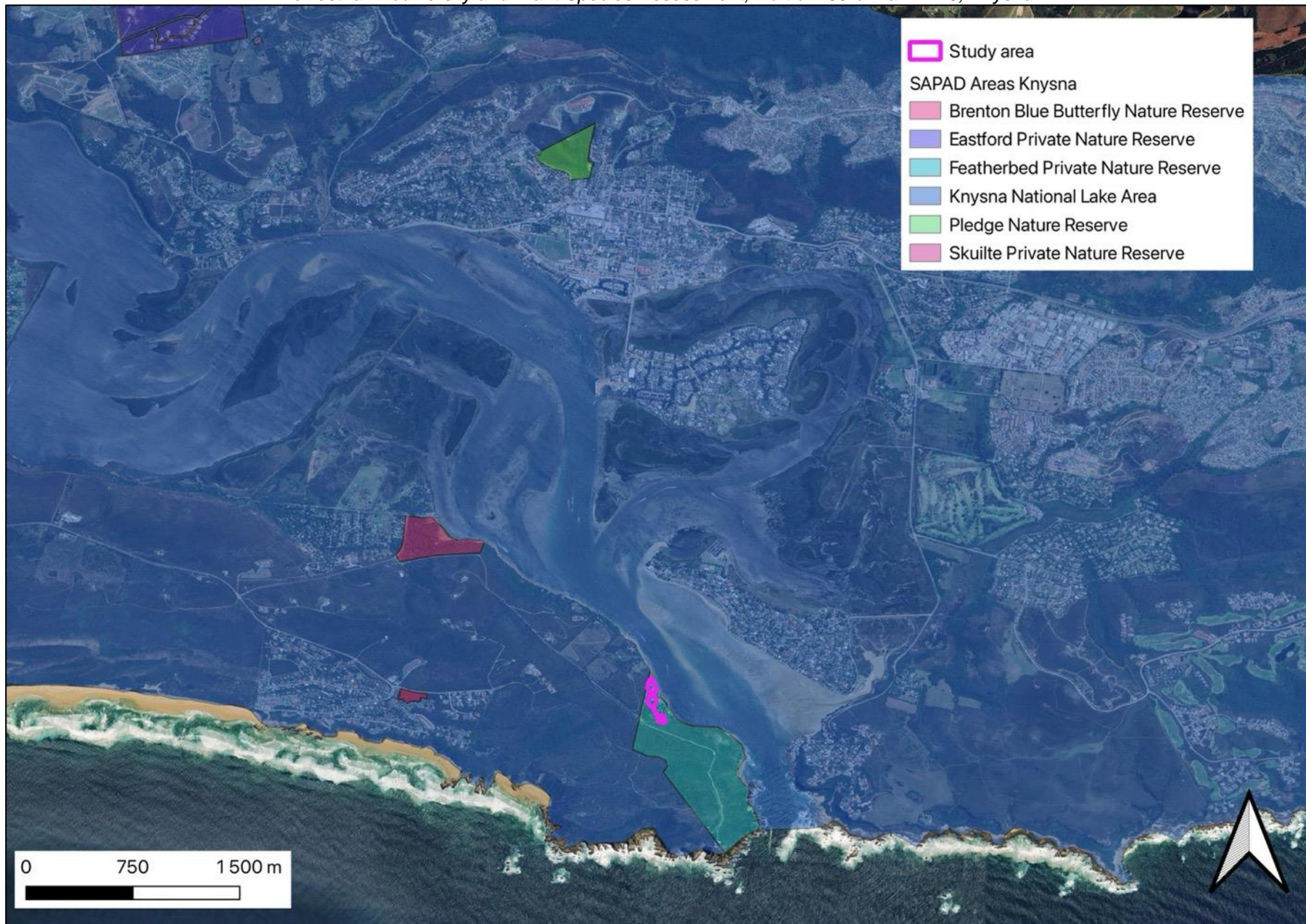


Figure 8B. CONSERVATION AREAS MAP: The study area in relation to the SAPAD Areas overlaid on a Google™ aerial image.

6.5. PROTECTED AREA EXPANSION

The National Protected Area Expansion Strategy for South Africa 2018 (DEA, 2018) is a detailed document that outlines the need for protected area expansion in South Africa, the priority areas and the mechanisms through which it can be achieved. The main motivation for protected area expansion according to the NPAES is that “South Africa’s protected area network currently falls far short of representing all ecosystems and maintaining ecological processes”. The greater part of the site has been included in the NPAES mapping as a Priority Focus area (Figure 9).

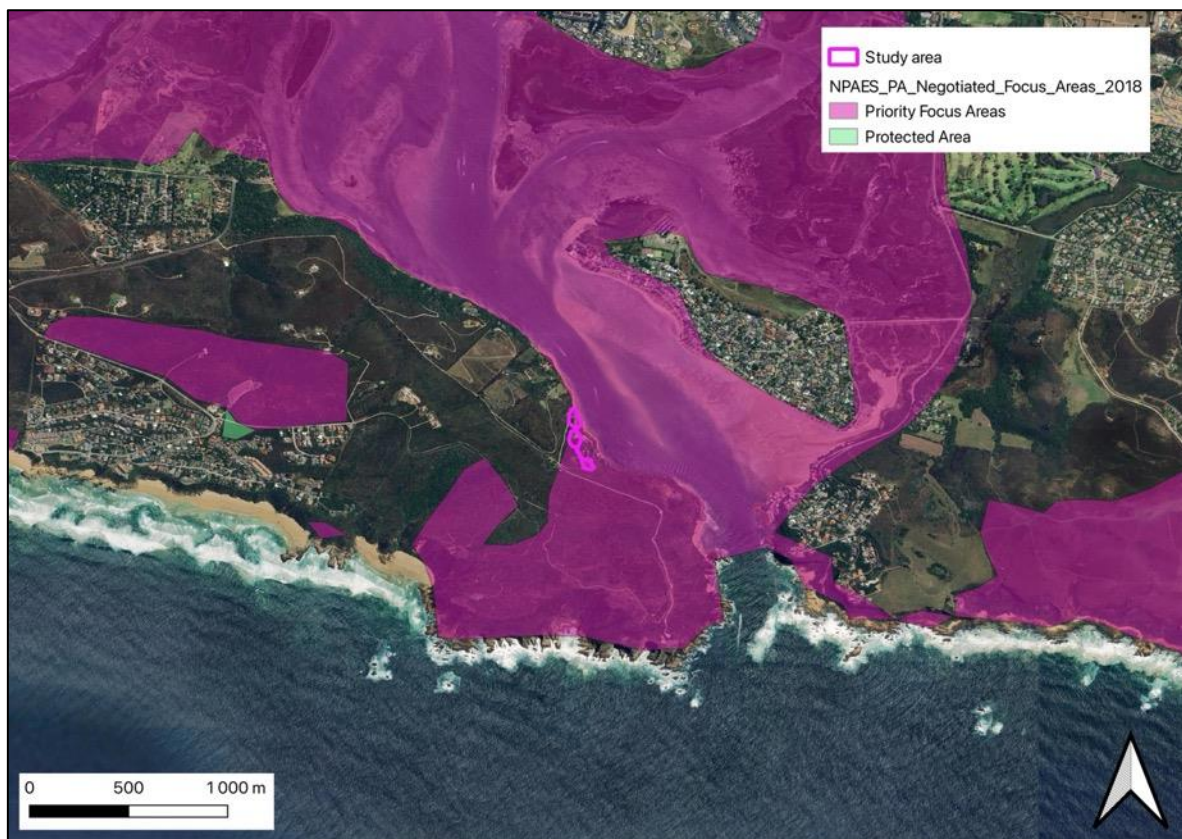


Figure 9. The NPAES map for the region showing the already protected areas as well as the priority focus areas earmarked for development. Note that the already Protected Areas shown in this image include lower-level protected areas that may not be as well conserved as a National Park.

6.6 STRATEGIC WATER SOURCE AREAS (SWSAS)

Surface Water

Strategic Water Source Areas (SWSAs) surface water refer to the 10% of South Africa’s land area that provides a disproportionate 50% of the country’s water runoff. Understanding where these SWSAs are is crucial to planning and management of water resources, including the ecosystems that support water quality and quantity. The 2021 spatial layer for

SWSAs for surface water is a fine-scale delineation of the SWSAs, intended to support the integration of SWSAs in a range of catchment- and local-level planning, management, and regulatory processes. In the case of the study area, it is included within the Outeniqua SWSA (Figure 10).



Figure 10. The study area overlaid onto a Google satellite image showing the SWSAs Surface water layer. The site falls within the Outeniqua SWSA.

Ground Water

This GIS layer shows the outlines of the Strategic Water Source Areas for groundwater (SWSA-gw) that have been delineated as part of a Water Research Commission (WRC) project (K5/2431). Groundwater Strategic Water Source Areas (SWSAs) are areas which combine areas with high groundwater availability as well as where this groundwater forms a nationally important resource. The sub-national Water Source Areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage.

In the case of the study area, it is excluded from this layer.

Wetlands (NFEPA)

This layer shows Wetland Freshwater Priority Areas (FEPAs), wetland ecosystem types and wetland condition on a national scale. The delineations were based largely on satellite imagery and do not include historic wetlands lost through drainage, ploughing and concreting. Irreversible loss of wetlands is expected to be high in some areas, such as urban centres. In addition, there are many gaps in wetlands as remote sensing does not detect all wetlands. In the case of the study area, the Knysna estuary adjacent to the site has been included in this layer (Figure 11).

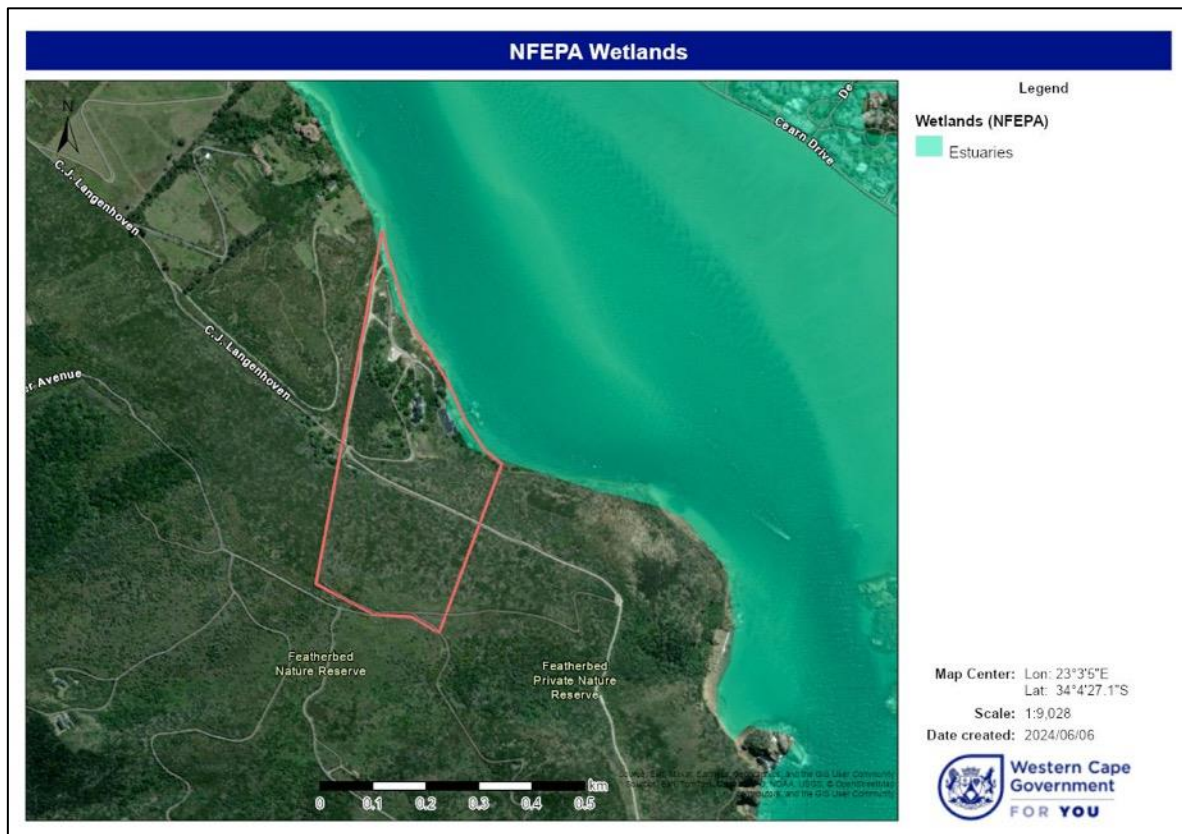


Figure 11. The study area overlaid onto a ESRI hybrid satellite image showing the NFEPA Wetland layer (image produced in Cape Farm Mapper <https://gis.elsenburg.com/apps/cfm/>)

Rivers (FEPA Subcatchments)

FEPAs are identified based on

- 20% biodiversity target for river, wetland and estuarine ecosystem types across the country
 - 20% biodiversity target for significant wetland clusters embedded in natural landscapes, within each wetland vegetation group
- Population targets for threatened freshwater fish species indigenous to South Africa
- alignment with all remaining free-flowing rivers

- alignment with priority estuaries identified in the National Biodiversity Assessment 2010
- alignment with existing protected areas and focus areas for protected area expansion

For rivers and fish, whole sub-catchments were identified as FEPAs. For rivers, FEPAs were identified in rivers that are in a good condition (A or B). Where it was not possible to meet biodiversity targets for river ecosystems in such rivers, Phase 2 FEPAs were identified in moderately modified (C) rivers. D rivers were not considered as they usually cannot be rehabilitated back to an AB state. Different categories are shown on the FEPA maps, each with different management implications.

“River FEPA and associated sub-quaternary catchment: River FEPAs achieve biodiversity targets for river ecosystems and threatened fish species, and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicates that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources. For river FEPAs the whole sub-quaternary catchment is shown in dark green, although FEPA status applies to the actual river reach within such a sub-quaternary catchment. The shading of the whole sub-quaternary catchment indicates that the surrounding land and smaller stream network need to be managed in a way that maintains the good condition (A or B ecological category) of the river reach. It is important to note that river FEPAs currently in an A or B ecological category may still require some rehabilitation effort, e.g. clearing of invasive alien plants and/or rehabilitation of river banks. From a biodiversity point of view, rehabilitation programmes should therefore focus on securing the ecological structure and functioning of FEPAs before embarking on rehabilitation programmes in Phase 2 FEPAs (or other areas)” (Nel et al. 2011).

In the case of the study area, the Knysna River flows into the adjacent Knysna estuary, and this catchment is mapped as a FEPA sub-catchment (Figure 12).



Figure 12. The study area overlaid onto a Google Earth™ satellite image showing the NFEPA Rivers and sub catchment layer.

7. VEGETATION AND TERRESTRIAL BIODIVERSITY OF THE STUDY AREA

The study area is mapped to contain a number of vegetation types in both the national vegetation map VEGMAP (SANBI, 2018) and the FSP (Vlok et al., 2007). Both sources map the estuary within the site, however, this does not overlap with any of the proposed developments. The current vegetation on the site is highly modified, but the remnants that do occur suggest that a mosaic of Dune Thicket (which contains fynbos elements) and Forest patches were originally present.

The habitat map provided in Figure 13 distinguishes between Forest, Dune Thicket and their condition. The habitats categories include (1) Degraded Forest, (2) Highly degraded Forest, (3) Degraded Dune Thicket, (4) Highly degraded, (5) Highly degraded – Landscaped areas and (6) Transformed. The description of habitat condition classes appears in Table 4.

]

Table 4. The habitat condition descriptions used for the vegetation on the site.

Habitat category	Description	Indigenous vegetation
Intact vegetation	A true representation of the original vegetation type in terms of structure and species makeup. Minimal soil disturbance. Unlikely to have ever been ploughed. Disturbance may be evident.	Yes
Semi-intact	Resembles the original vegetation type in terms of structure and species makeup but has lower species diversity than intact vegetation. Dominated by disturbance-resilient species. Soils may have been heavily disturbed in the past. Restoration potential is high.	Yes
Degraded	Only a few species representative of the original vegetation type are present. The vegetation has undergone heavy disturbance. Restoration potential is either low or moderate.	Yes
Highly degraded	The original vegetation is usually absent and has been removed in the past. Only a few remnant or pioneer species are present. Soils usually ploughed in the past. Restoration potential is very low.	*No (not naturally occurring as per the NEMA definition)
Transformed	No remnant species exist anymore. The landscape is altered irreversibly with no restoration potential. Examples include cultivated farmland and the built environment.	*No (not naturally occurring as per the NEMA definition)



Figure 13. HABITAT MAP: The habitats identified in the screened areas, overlaid on a Google™ aerial image.

7.1 DEGRADED FOREST

This habitat occurs just south of the proposed garages, and intersects slightly with the footprint. The habitat is dominated by large shrubs, medium sized trees and climbers which are all indigenous and a fair representation of the original forest patches that likely occurred in this region in fire protected areas. Disturbances are related to the existing developments on the site including the concrete slab, roads and landscaped areas. Species include crossberry *Grewia occidentalis*, bastard currant *Allophyllus decipiens*, small knobwood *Zanthoxylum capense*, coastal camphorbush *Tarchonanthus littoralis*, candlewood *Pterocelastrus tricuspidatus*, bridal asparagus *Asparagus asparagoides*, poison starapple *Diospyros dichrophylla*, pock ironwood *Chionanthus foveolatus*, clausena *Clausena anisata*, common glossy curranthrus *Searsia lucida*, white pear *Apodytes dimidiata*, Cape buckhorn *Cynanchum cf. africanum*, Cape ivy *Delairea odorata*, white ironwood *Vepris lanceolata*, shiny leaf *Rhamnus prinoides*, tree fuschia *Halleria lucida* and white milkwood *Sideroxylon inerme*.

This is a small patch of forest, and most if it will remain undisturbed, but the vegetation adjacent to the proposed garages may be disturbed during construction.

The ecological functioning of the forest habitat is already highly altered in its current state, mainly due to the close proximity of other developments and the landscaped gardens. The ecological functioning in the adjacent areas (the nature reserve beyond the developed areas) is moderate to high, with moderate plant species diversity and therefore suitable habitat for all forms of animal life. However, high densities of Invasive Alien Plants (IAPs) are present in the nature reserve, and this threatens the species diversity and ecological functioning.



Figure 14. The Degraded Forest habitat south of the proposed garages.

7.2 HIGHLY DEGRADED FOREST

This habitat occurs on the site of the proposed garages and to the west. It has been cleared of the original vegetation, with the exception of a few individual indigenous trees found in forest habitats. The rest of the area is open and grassy, scattered with planted trees, some of which are protected yellowwood trees. Indigenous species noted here include white stinkwood *Celtis africana*, pock ironwood *Chionanthus foveolatus*, white ironwood *Vepris lanceolata*, Cape kooboo berry *Mystroxyton aethiopicum* ssp. *aethiopicum*, coastal camphorbush *Tarchonanthus littoralis*, candlewood *Pterocelastrus tricuspidatus* and drunken berry *Solanum africanum*. Planted species include: real yellowwood *Podocarpus latifolius*, Outeniqua yellowwood *Afrocarpus falcatus*, Henkel's yellowwood *Podocarpus henkelii* (all protected trees), African plum *Harpephyllum caffrum* and the invasive common guava *Psidium guajava* (NEMBA category 3).



Figure 15. The Highly Degraded forest is mostly cleared with scattered trees in a grassy area. Some of the trees are naturally occurring, whereas some are planted. The blue lines show the approximate boundary of the proposed garages.

7.3 DEGRADED DUNE THICKET

This habitat occurs on the steep slopes between the current developments and transformed habitat and the lagoon, along with a small patch to the west of the existing shed, in the area proposed for the conference centre. This habitat also occurs to the south of the proposed entertainment facility and is extensive from this area into the greater part of the Featherbed Nature Reserve. The only part of this habitat likely to be impacted by the proposed development is the area to the west of the shed. This small area contains a moderate number of indigenous species, mostly representing fynbos elements, but also with some thicket elements. Species noted here include common storksbill *Pelargonium capitatum*, Cape coast cabbagetree *Cussonia thyrsiflora*, num-num *Carissa bispinosa*, bitou *Osteospermum moniliferum*, Cape boxwood *Myrsine africana*, poison starapple *Diospyros dichrophylla*, Eastern thatchreed *Thamnochortus glaber*, common gonna *Passerina corymbosa*, cobra lily *Chasmanthe aethiopica*, crossberry *Grewia occidentalis*, sour fig *Carpobrotus edulis*, common burbleaf *Knowltonia vesicatoria*, axil hardleaf *Phyllica axillaris*, round leaf buckhorn *Cynanchum obtusifolium*, candlewood *Pterocelastrus tricuspidatus*,

dune olive *Olea exasperata*, coastal camphorbush *Tarchonanthus littoralis*, garlic buchu *Agathosma apiculata*, silver everlasting *Helichrysum petiolare*, Cape moonseed vine *Cissampelos capensis*, pock ironwood *Chionanthus foveolatus* and warty indigo *Indigofera verrucosa*.

One species of conservation concern was found in this patch of Degraded Dune Thicket, the Vulnerable dune bitterbush *Selago villicaulis*, however, only two individuals were found in this area.

The ecological functioning of this habitat is moderate, and most ecological processes will still persist especially in the areas adjacent to the lagoon and to the south of the site. The small patch adjacent the shed is isolated from other remnant vegetation by the existing buildings and the road on the west. A low density of the invasive rooikrans *Acacia cyclops* (NEMBA category 1b) occurs in this habitat within the study area, but the density increases further to the south in other parts of the property.



Figure 16. The Degraded Dune Thicket on the steep eastern edge of the study area. This part of the site will not be disturbed by the proposed developments.



Figure 17. Degraded Dune Thicket close to the existing shed. This area would be removed during construction if the application is authorised.

7.4 TRANSFORMED AND HIGHLY DEGRADED LANDSCAPED AREAS

These habitats contain very few indigenous plants. The Transformed habitat contains open grassy areas, buildings or roads. The Highly degraded landscaped areas have been converted to ornamental gardens using both indigenous and exotic species. Some of the original forest trees have been incorporated into these areas.

The ecological integrity and functioning of these habitats is highly modified. In the case of the Highly degraded habitat, very few indigenous species are present and this limits the ecological functionality. However, the landscaped areas support a moderate diversity of species and this still supports ecological activity. Potential threats are the spread of landscaped extralimital indigenous and exotic plants ('horticultural escapes') into the natural areas of the nature reserve. Examples of this is the dune felicia *Felicia echinata* which occurs extensively outside of its natural range in natural areas. The ecological functioning within the Transformed habitat is very low.



Figure 18. The Transformed area in the proposed Mangers house site.



Figure 19. The Highly degraded landscaped habitat can be seen in the top of the image with an open grassy area and some remnant Highly degraded vegetation at the bottom of the retaining wall. Some Degraded Dune Thicket can be seen in the foreground

8. SENSITIVITY

Sensitivity is defined here as the ‘**conservation value**’ together with the ‘**degree of resilience to disturbance**’. The conservation value relates to the conservation status (including the ecosystem threat status) and other factors including ecological connectivity, habitat condition, persistence of ecological process and the site’s role in supporting biodiversity. The degree of resilience takes into consideration factors such as sensitivity to disturbance and restoration potential. The sensitivity ratings and justification for each rating is provided below:

A **Medium sensitivity** applies to the Degraded Forest and the Degraded Dune Thicket habitats for the following reasons:

1. The vegetation present in the Degraded Dune Thicket habitat is partially representative of Goukamma Dune Thicket, a Least Concern ecosystem.
2. The Degraded Forest habitat is partially representative of Groenvlei Coastal Forest, an Endangered ecosystem according to the Vegetation Map for the Garden Route.
3. This entire site falls within a Protected Area, the Featherbed Private Nature Reserve, and as such, and natural habitat is of medium conservation significance.
4. One SCC was found in the Degraded Dune Thicket habitat, namely the dune bitterbush *Selago villicaulis* (Vulnerable).
5. A number of naturally occurring protected milkwood trees *Sideroxylon inerme* occurs within these habitats.
6. The ecological functioning of these habitats is moderately modified (Degraded habitats) or highly modified (in the case of the isolated patch of Degraded Dune Thicket) and impacted by a medium to low density of IAPs.
7. The areas of these habitats which are likely to be impacted by the proposed development occur within the existing developments on the site and as such are not connected to large natural areas of important vegetation, i.e they are already fragmented.
8. The restoration potential of these areas is low to moderate, but in the context of the overall site.

A **Low to Very low sensitivity** applies to the Highly degraded Forest, Highly degraded landscaped area and the transformed habitats for the following reasons.

1. The vegetation present in these habitats is no longer representative of indigenous vegetation
2. Although classified as within a Protected area, these habitats are already part of the developed part of the nature reserve.

3. No SCC were identified in these habitats, and none are likely to be found here.
4. Although a number of protected trees (yellowwood species) occur within these habitats, they have been planted here and are not part of the original ecosystem. Despite this, permission must be obtained before they are removed.
5. The restoration potential of these habitats is low.

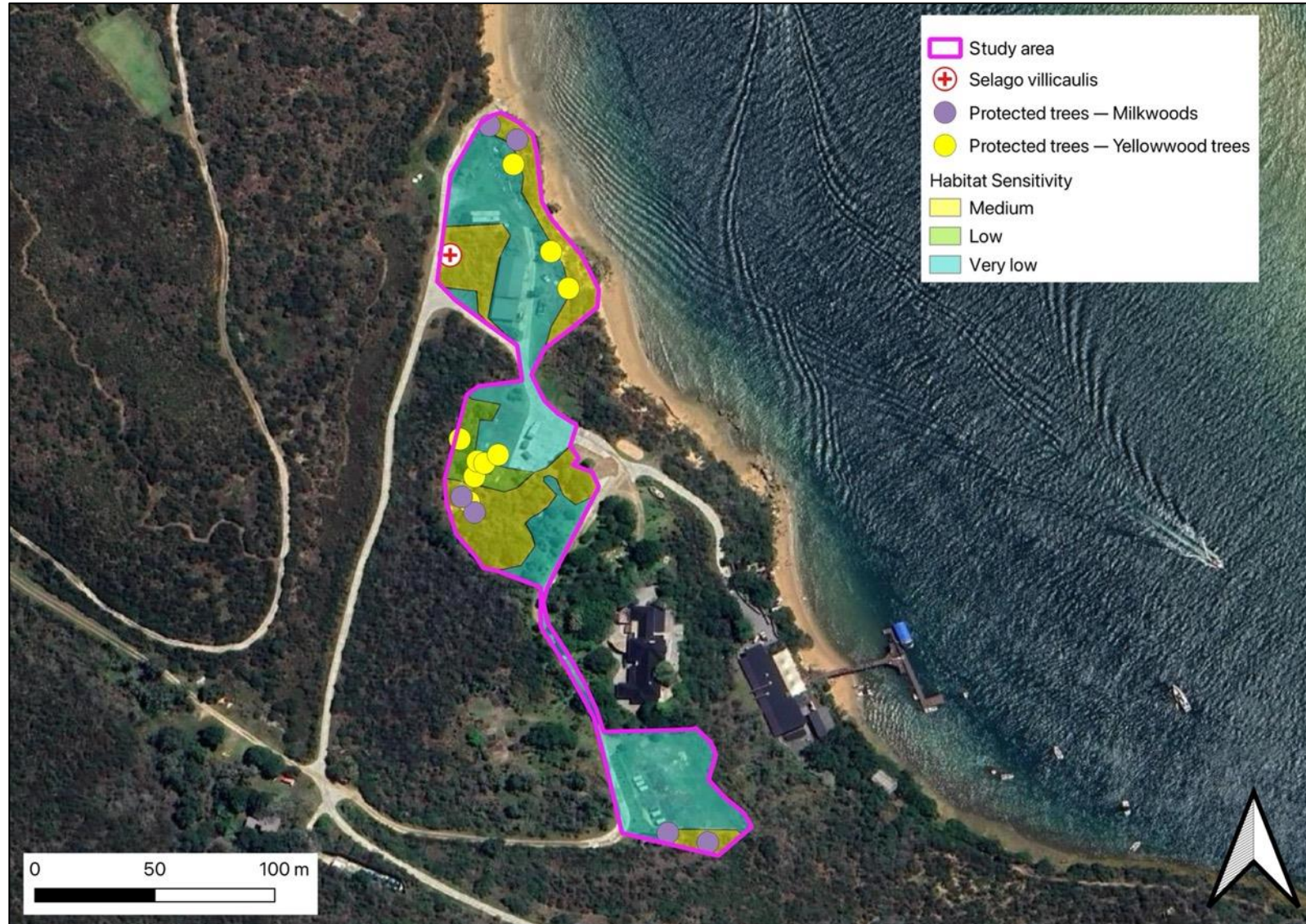


Figure 20. SENSITIVITY MAP: The sensitivities for the study area overlaid on an Google Maps™ image.

9. IMPACT ASSESSMENT

The impact assessment is a measure of the impacts likely to occur on the affected environment, specifically the vegetation, ecological processes, important species and habitats. They are considered for (a) the 'No Go' scenario and (b) the direct, indirect and cumulative impacts of the proposed project. Impacts are assessed for the construction and operational phases.

The impact assessment methodology is explained in detail in Appendix 1.

9.1. 'NO GO' OR NO DEVELOPMENT SCENARIO

The 'No Go' or no development scenario takes into consideration the impacts associated with the no construction option. It is a prediction of the future state of the affected area in the event of no construction activities taking place and is based on the current and/or anticipated future land use. If no construction were to take place and the *status quo* would remain the same, and no significant changes to site condition would be expected. The impact of the No-Go scenario is Negligible.

9.2. DIRECT IMPACTS

Direct impacts are those that would occur as a direct result of the agricultural activities proposed. The vegetation that occurs in the areas proposed for expansion would be removed and permanently lost.

The direct impacts are considered separately for the two following components:

1. Loss of terrestrial habitats including: vegetation type, ecological processes, indigenous vegetation, ecologically important species, terrestrial habitat and ecological connectivity.
2. Loss of species of conservation concern (SCC).

A number of habitats with Medium sensitivity have been identified within the study area. Two of these habitats would be impacted by the proposed developments. They are (1) the Degraded Dune Thicket to the west of the existing shed, which would be partially lost, and probably highly disturbed during the construction of the conference centre (the area affected is estimated at 850 m²), and (2) the Degraded Forest habitat which would be partially lost and disturbed by the proposed garages (the area affected is estimated at 250 m²). The loss

of and disturbance to these areas affects very small areas in the context of the entire property. The impacts are likely to be Low negative without mitigation. Some best practise mitigation is proposed, however, this would not reduce the level of impact significance.

One SCC, the Vulnerable dune bitterbush *Selago villicaulis* occurs in area 1, however, only two individuals were found here. This population occurs on a small and isolated fragment of vegetation and is unlikely to persist in the long-term due to edge effects of the nearby roads and domestic activities. Conservation efforts would be better directed at the expansive protected areas on the property which contain similar habitat, and almost certainly contain more sub-populations of this species (<https://www.inaturalist.org/observations/16227241>). The impact of this loss is rated as Low negative, and no mitigation is proposed. Mitigation is described in detail in section 9.5

Table 7. Impact table for the construction phase of the proposed development.

	Loss of SCC	Loss of Terrestrial Biodiversity	No-Go Alternative
Potential impact and risk:	Loss of two individuals of at least SCC, the VU <i>Selago villicaulis</i>	Loss of approximately 1100m ² of indigenous vegetation, mostly representative of Goukamma Dune Thicket (LC)	Status quo remains
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Site (1) and Long-term (3)	Site (1) and Long-term (3)	Site (1) and Medium term (2)
Magnitude	Medium (2)	Medium (2)	Zero (0)
Consequence of impact or risk:	Slightly detrimental (6)	Slightly detrimental (6)	Negligibly detrimental (3)
Probability of occurrence:	Definite (4)	Definite (4)	Probable (3)
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	Low
Degree to which the impact can be reversed:	Low	Low	Low
Cumulative impact prior to mitigation:	Very Low	Very Low	Very Low
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (24)	Low (24)	Negligible (9)
Degree to which the impact can be avoided:	Low	Low	Low
Degree to which the impact can be managed:	Low	Low	Low
Degree to which the impact can be mitigated:	Low	Low	Low
Proposed mitigation:	None proposed	Mark off the Degraded forest habitat and avoid disturbance in this area as far as possible. If the site allows, adjust the footprint	N/A

		slightly to the north to avoid this habitat.	
Residual impacts:	Low	Low	Low
Cumulative impact post mitigation:	Very Low	Very Low	Very Low
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (24)	Low (24)	Negligible (9)

Operational Phase

The operational phase impacts are related to the use of the site for tourism and as a conference centre. Impacts are unlikely to be insignificant in this phase of the project, as the site is managed as a Nature Reserve and activities will be tourism and conservation oriented. The impacts are rated as Negligible for the loss of SCC, loss of terrestrial biodiversity and for the No Go scenario (Table 8). Fire exclusion in the areas adjacent to the development is likely to be maintained, but this would already have been the status quo for the existing infrastructure on the site. No mitigation is proposed for this phase.

Table 8. Impact table for the operational phase of the proposed development.

	Loss of SCC	Loss of Terrestrial Biodiversity	No-Go Alternative
Potential impact and risk:	No SCC are expected to be lost in this phase.	No loss of terrestrial biodiversity is expected for this phase.	Status quo remains
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Site (1) and Medium term (2)	Site (1) and Medium term (2)	Site (1) and Medium term (2)
Magnitude	Zero (0)	Zero (0)	Zero (0)
Consequence of impact or risk:	Negligibly detrimental (3)	Negligibly detrimental (3)	Negligibly detrimental (3)
Probability of occurrence:	Probable (3)	Probable (3)	Probable (3)
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	Low
Degree to which the impact can be reversed:	Low	Low	Low
Cumulative impact prior to mitigation:	Very Low	Very Low	Very Low
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Negligible (9)	Negligible (9)	Negligible (9)
Degree to which the impact can be avoided:	Low	Low	Low
Degree to which the impact can be managed:	Low	Low	Low
Degree to which the impact can be mitigated:	Low	Low	Low
Proposed mitigation:	N/A	N/A	N/A
Residual impacts:	Low	Low	Low

Cumulative impact post mitigation:	Very Low	Very Low	Very Low
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Negligible (9)	Negligible (9)	Negligible (9)

9.3 INDIRECT IMPACTS

Indirect impacts occur mostly at the operational stage and are less obvious. Examples include loss of diversity due to loss of connectivity between vegetation remnants and associated loss of pollination. Indirect impacts associated with the project is likely to be fire suppression in the developed areas of the property. This would already be the case and the more extensive natural areas on the site will still burn. This indirect impact is therefore not associated with the new development components, and is likely to be Low negative in significance.

9.4 CUMULATIVE IMPACTS

Cumulative impacts are those impacts linked but not limited to (a) increased loss of vegetation type or the ecosystems listed in the Revised National List of Ecosystems that are threatened and in need of protection (Government Gazette, 2022) and (b) other local developments taking place in the region. The area that would be lost within the Goukamma Dune Thicket (Degraded) is estimated at 850m². This represents 0.001% of the remaining natural area of the ecosystem (6 516 ha) (Government Gazette, 2022). Considering the Low percentage lost, the impact rated as **Very Low negative**. The area that would be lost within the Groenvlei Coastal Forest ecosystem (Degraded) is estimated at 250m². This represents 0.001% of the remaining natural area of the ecosystem (1 821 ha) (Holness, 2010). Considering the potential low percentage loss, the impact is rated as **Very Low negative**.

9.5 MITIGATION

Mitigation options are generally considered in terms of the following mitigation hierarchy: (1) avoidance, (2) minimization, (3) restoration and (4) offsets. A distinction is also made between essential mitigation (non-negotiable mitigation measures that lower the impact significance) and non-essential mitigation (best practise measures that do not lower the impact significance).

In this instance, no essential mitigation measures are necessary to reduce the impact of the development. However, the following best practise mitigation is proposed.

1. Mark off the areas that are not going to be developed prior to undertaking any works, and ensure that no unnecessary loss of adjacent vegetation occurs, especially around the Degraded Forest habitat.
2. Mark off all protected trees, ensure permits are obtained prior to removal. Ensure that these are not disturbed where possible.
3. Sites for building material stocks, vehicles, toilets etc must be clearly marked and restricted to the building footprint, exiting roads or existing disturbed areas.

10. CONCLUSIONS AND RECOMMENDATIONS

According to the VEGMAP, the study area contains the Least Concern Goukamma Dune Thicket and the Non-terrestrial (Estuarine Functional Zone), presenting the Knysna Lagoon. The adjacent ecosystem is Knysna Sand Fynbos, which is CRITICALLY ENDANGERED. However, this was not found to be present, and Goukamma Dune Thicket is a good match for the vegetation on the site, with the exception of the small patch of Forest. This is a better match for Groenvlei Coastal Forest (ENDANGERED) as mapped in the Vegetation Map for the Garden Route.

According to the WCBSP 2017 the site is a Protected Area, namely the Featherbed Private Nature Reserve. It also falls within the Garden Route Biosphere Reserve and the Knysna National Lake Area.

The Terrestrial Biodiversity sensitives assigned to the site are Medium, Low and Very low. Some Medium sensitivity areas are confirmed to occur on the site, however, they are relatively small and only 1 100m² of these habitats are likely to be lost or disturbed by the proposed developments. One species of conservation concern was found on the site within the Medium sensitivity Degraded Dune Thicket habitat. The SCC is the Vulnerable Dune bitterbush *Selago villicaulis*, however, only two individuals of this species were found in this area. A number of protected tree species occur on the site. The naturally occurring milkwoods will not be impacted by the proposed development, however, a number of the yellowwood trees would need to be removed. These trees have been planted, and as such the property owners should be allowed to remove them. They will require permission to remove as they are protected according to the National Forest Act (Act 84 of 1998).

The proposed developments all occur within the portion of the property that is currently used for domestic and commercial purposes. No important habitat or ecological corridors would

be lost due to the proposed developments as they all occur in a limited area. The remainder of the property is assumed to be managed for conservation considering that it is a Protected Area. Overall, the proposed developments are likely to have a Low negative impact on terrestrial biodiversity and plant species and can therefore be supported.

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APPENDIX 1: ASSESSMENT METHODOLOGY

For each impact, the **nature** (positive/negative), **extent** (spatial scale), **magnitude/intensity** (intensity scale), **duration** (time scale), **consequence** (calculated numerically) and **probability** of occurrence is ranked and described. These criteria would be used to ascertain the **significance** of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place.

The tables below show the rankings of these variables, and defines each of the rating categories.

Table 2: Assessment criteria for the evaluation of impacts

CRITERIA	RANK	DESCRIPTION
Nature	Positive (+)	The environment will be positively affected.
	Negative (-)	The environment will be negatively affected.
Extent or spatial influence of impact	National (4)	Beyond provincial boundaries, but within national boundaries.
	Regional (3)	Beyond a 10 km radius of the proposed activities, but within provincial boundaries.
	Local (2)	Within a 10 km radius of the proposed activities.
	Site specific (1)	On site or within 100 m of the proposed activities.
	Zero (0)	Zero extent.
Magnitude/ intensity of impact (at the indicated spatial scale)	High (3)	Natural and/ or social functions and/ or processes are <i>severely</i> altered.
	Medium (2)	Natural and/ or social functions and/ or processes are <i>notably</i> altered.
	Low (1)	Natural and/ or social functions and/ or processes are <i>slightly</i> altered.
	Zero (0)	Natural and/ or social functions and/ or processes remain <i>unaltered</i> .
Duration of impact	Long Term (3)	More than 10 years, but impact ceases after the operational phase.
	Medium Term (2)	Between 3 – 10 years.
	Short Term (1)	Construction period (up to 3 years).
	None (0)	Zero duration.
Consequence (Nature x (Extent + Magnitude/ Intensity + Duration))	Extremely beneficial/ detrimental (10 – 11) (+/-)	The impact is <i>extremely</i> beneficial/ detrimental.
	Highly beneficial/ detrimental (8 – 9) (+/-)	The impact is <i>highly</i> beneficial/ detrimental.
	Moderately beneficial/ detrimental (6 – 7) (+/-)	The impact is <i>moderately</i> beneficial/ detrimental.
	Slightly beneficial/ detrimental (4 – 5) (+/-)	The impact is <i>slightly</i> beneficial/ detrimental.
	Negligibly beneficial/ detrimental (1 – 3) (+/-)	The impact is <i>negligibly</i> beneficial/ detrimental.
	Zero consequence (0) (+/-)	The impact has zero consequence.

Probability of occurrence	Definite (4)	Estimated at a greater than 95% chance of the impact occurring.
	Probable (3)	Estimated 50 – 95% chance of the impact occurring.
	Possible (2)	Estimated 6 – 49% chance of the impact occurring.
	Unlikely (1)	Estimated less than 5% chance of the impact occurring.
	None (0)	Estimated no chance of impact occurring.

The **significance** of an impact is derived by taking into account the **consequence** (nature of the impact and its extent, magnitude/intensity and duration) of the impact and the **probability** of this impact occurring through the use of the following formula:

$$\text{Significance Score} = \text{Consequence} \times \text{Probability}$$

The means of arriving at a significance rating is explained in Table 3.

Table 3: Definition of significance ratings

SIGNIFICANCE SCORE	SIGNIFICANCE RATINGS	
32 – 40	High (+)	High (-)
25 – 31	Medium (+)	Medium (-)
19 – 24	Low (+)	Low (-)
10 – 18	Very-Low (+)	Very-Low (-)
1 – 9	Negligible	

Once the significance of an impact has been determined, the **confidence** in the assessment of the impact, as well as the degree of **reversibility** of the impact and **irreplaceable loss of resources** would be determined using the rating systems outlined in Table 4, 5 and 6 respectively. Lastly, the **cumulative impact** is ranked and described as outlined in Table 7.

Table 4: Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
High	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Medium	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Low	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 5: Degree of reversibility

REVERSABILITY OF IMPACT	CRITERIA
High	High potential for reversibility.
Medium	Medium potential for reversibility.
Low	Low potential for reversibility.
Zero	Zero potential for reversibility.

Table 6: Degree of irreplaceability

IRREPLACEABLE LOSS OF RESOURCES	CRITERIA
High	Definite loss of irreplaceable resources.
Medium	Medium potential for loss of irreplaceable resources.
Low	Low potential for loss of irreplaceable resources.
Zero	Zero potential for loss of irreplaceable resources.

Table 7: Cumulative Impact on the environment

CUMULATIVE IMPACTS	CRITERIA
High	The activity is one of <i>several</i> similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the geographical, physical, biological, social, economic and cultural aspects of the environment.
Medium	The activity is one of a <i>few</i> similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the geographical, physical, biological, social, economic and cultural aspects of the environment.
Low	The activity is localised and might have a negligible cumulative impact.
Zero	No cumulative impact on the environment.

APPENDIX 2: ABBREVIATED CURRICULUM VITAE: GREG NICOLSON

Experience

- Expertise in field work in the CFR – vegetation surveys, plant identification, plant collection, ecological monitoring
- Data management and analysis
- Basic skills in GIS programs
- Vegetation and species mapping
- MSc thesis entitled “ *Road reserves as conservation assets: exploring the species of conservation concern and the ecological condition of the N7 road reserve*”. Graduation date: December 2010
- Experience leading teams of field assistants in remote mountainous areas
- Completed over 100 botanical survey/assessment reports

Career History

- 2019 – present: Co-founder and independent botanist at Capensis Ecological Surveys
- March 2013 – Dec 2018: independent botanical specialist and associate of Bergwind Botanical Surveys & Tours CC
- March 2011 – December 2012: conducted a comprehensive post fire survey of the Paardeberg (Paardeberg Sustainability Institute)

Education and qualifications

- Pr. Nat. Sci. (116488)
- MSc (Botany) – University of Cape Town (2010).
- BSc: Hons (Env. Science) – University of Cape Town (2005)
- BSc: Environmental and Geographical Science - University of Cape Town (2002 – 2004)

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- Marital status – Single
- Dependents – 3

APPENDIX 3: PLANT SPECIES SPECIALIST ASSESSMENT REPORT

1. Introduction

The relative plant species theme sensitivity for the site generated by the web-based Screening Tool (<https://screening.environment.gov.za>) is rated as “High” (Figure 1). “An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of “High sensitivity” for plant species, must submit a **Plant Species Specialist Assessment Report**, depending on the outcome of a site inspection undertaken in accordance with paragraph 4” (Government Gazette 2020b).

Plants listed as Species of Conservation Concern (SCC) have been identified at this site, and therefore a Plant Species Specialist Assessment Report is provided. This report has been compiled following the guidelines set out for the **Terrestrial Fauna and Terrestrial Flora Species Protocols for Environmental Impact Assessments in South Africa** (SANBI 2022).¹

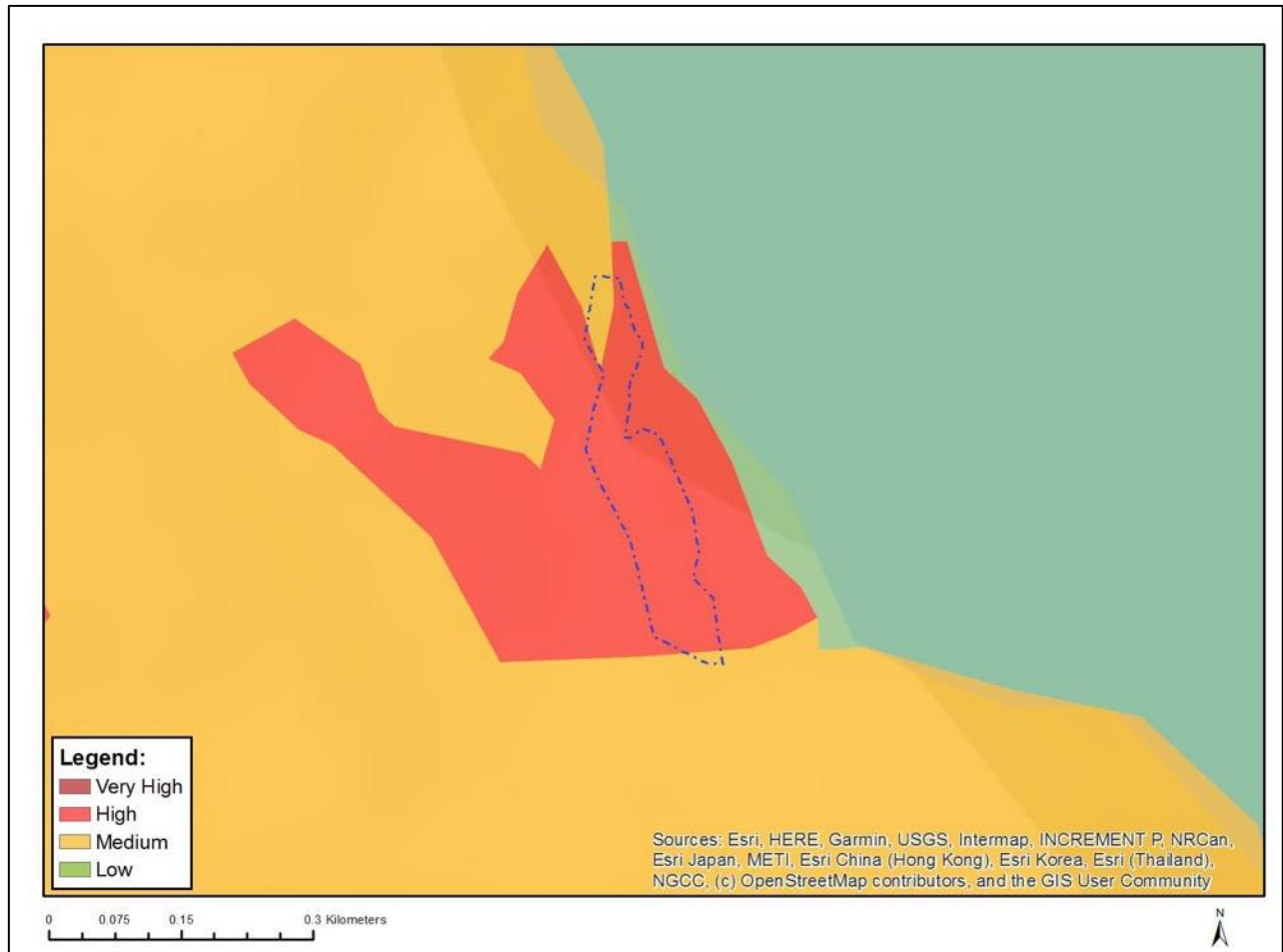


Figure 1. Map of relative plant species theme diversity.

2. Project Area of Influence (PAOI) and Sampling Density

In this case the PAOI is the areas surveyed during the site visit (Figure 2). No impacts are expected to occur outside of this area if the mitigation is successfully applied. 29 Waypoints were recorded in the 1.25 ha site making the sampling density 23.2 waypoints/hectare.

¹ South African National Biodiversity Institute (SANBI). 2022. *Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa.* South African National Biodiversity Institute, Pretoria. Version 3.1.



Figure 2. The map of the study area showing the survey tracks and waypoints recorded.

3. SCC within the study area

One SCC were recorded during the site visits (See Figure 3 and Tables 1 – 4 below). The contents of tables 1 – 4 appears below:

Table 1: The SCC predicted to occur within the study area (based on the screening tool).

Table 2: The SCC confirmed within the study area.

Table 3: Additional details about the SCC confirmed or suspected to occur within the study area.

Table 4: Additional information on the SCC confirmed on the site or likely to be found on the site from The Red List of South African Plants website (www.redlist.sanbi.org)

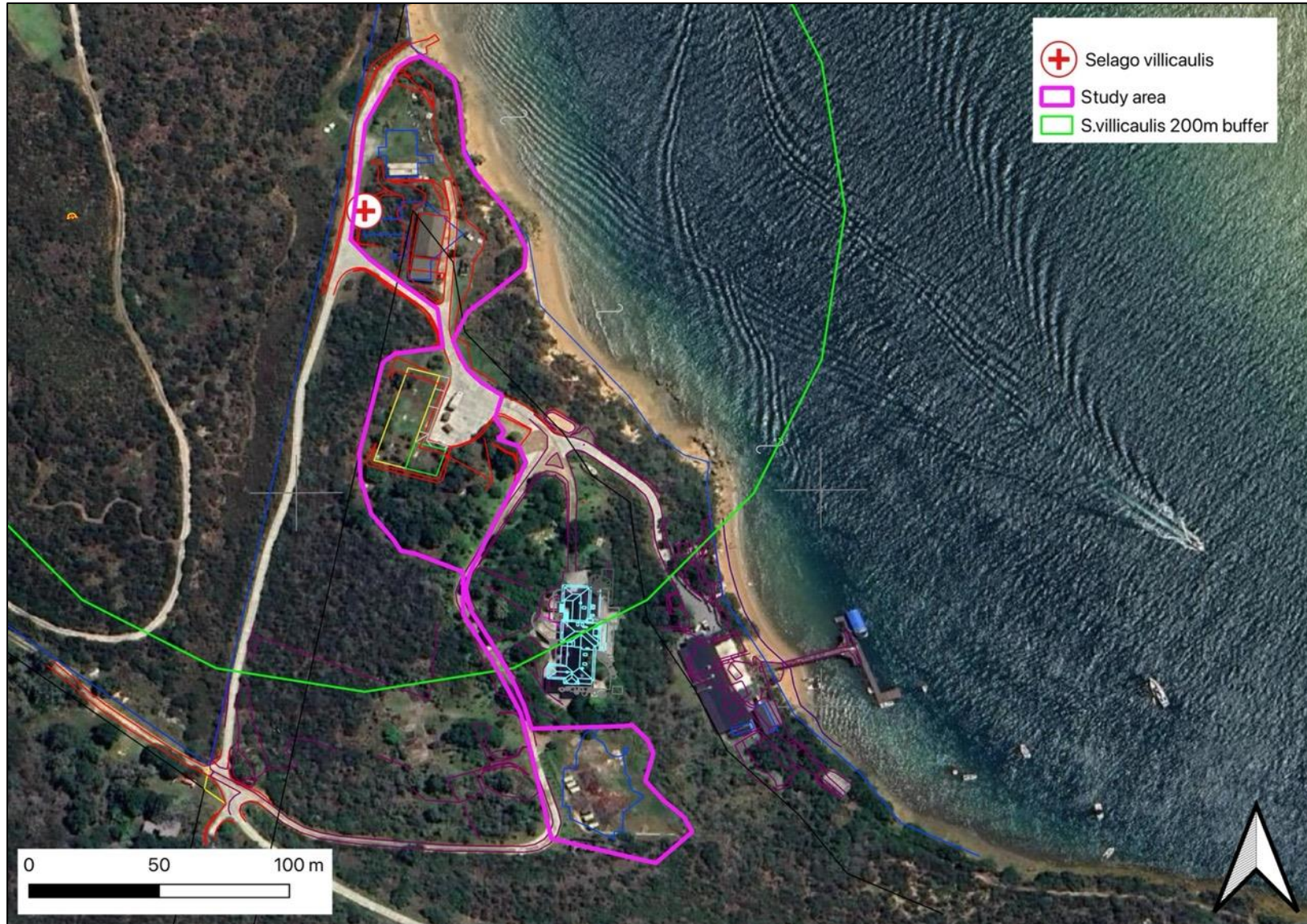


Figure 3. The map of the study area showing the SCC and buffer found in or surrounding the proposed development footprint.

Table1. Species predicted to be in the study area (by the screening tool) AND those not predicted in the screening tool that were found in the adjacent vegetation.

Species	IUCN Status	Observed/Likelihood of	Justification for likelihood of occurrence
Sensitive species 1252			<i>This species was not found on the site and is unlikely to have been missed</i>
Lampranthus fergusoniae	VU	No/Low	<i>No succulents with this growth form were found in the study area</i>
Lampranthus pauciflorus	EN	No/Low	<i>No succulents with this growth form were found in the study area</i>
Ruschia duthiae	VU	No/Low	<i>No succulents with this growth form were found in the study area</i>
Lebeckia gracilis	EN	No/Medium	<i>This species occurs on the adjacent property in close proximity to the study area, but is unlikely to have been overlooked in this site.</i>
Wahlenbergia polyantha	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Selago burchellii	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Selago villicaulis	VU	Confirmed	
Pentameris barbata subsp. orientalis	CR	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Sensitive species 419	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Erica chloroloma	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Erica glandulosa subsp. fourcadei	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Hermannia lavandulifolia	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
Sensitive species 657	VU	No/Low	<i>One species from this genus occurs on the adjacent property but not this species.</i>
Sensitive species 1024	EN	No/Low	<i>This species was not found on the site but was potentially missed due to seasonality of the survey, but this is unlikely as the leaves should have been present and none for this genus were found in the site.</i>
Sensitive species 1032	VU	No/Low	<i>This species was not found on the site but was potentially missed due to seasonality of the survey, but this is unlikely as the leaves should have been present and none for this genus were found in the site.</i>
Cotula myriophylloides	CR	No/Low	<i>Specific habitat does not occur on the site.</i>

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<i>Acmadenia alternifolia</i>	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
<i>Muraltia knysnaensis</i>	EN	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>
<i>Nanobubon hypogaeum</i>	EN	No/Medium	<i>Cryptic and easily overlooked, this is was potentially overlooked but this is unlikely. It has been recorded in the vicinity at Brenton</i>
Sensitive species 500	EN	No/Low	<i>This species was not found on the site but was potentially missed due to seasonality of the survey, but this is unlikely as the leaves should have been present and none for this genus were found in the site.</i>
Sensitive species 800	VU	No/Low	<i>This species was not found on the site but was potentially missed due to seasonality of the survey, but this is unlikely as the leaves should have been present and none for this genus were found in the site.</i>
Sensitive species 53	VU	No/Low	<i>Specific wetland habitat not found on the site</i>
Sensitive species 763	VU	No/Low	<i>This species was not found on the site but was potentially missed due to seasonality of the survey, but this is unlikely as the leaves should have been present and none for this genus were found in the site.</i>
<i>Pterygodium cleistogamum</i>	VU	No/Low	<i>This species was not found on the site but was potentially missed due to seasonality of the survey, but this is unlikely as the leaves should have been present and none for this genus were found in the site.</i>
<i>Zostera capensis</i>	EN	No/Low	<i>Estuarine habitat not present on the site</i>
<i>Erica glumiflora</i>	VU	No/Low	<i>This species was not found on the site and is unlikely to have been missed</i>

Table 2. Plant Species of Conservation Concern found within the study area.

FAMILY	Species	Status	Url link to observation(s)
SCROPHULARIACEAE	<i>Selago villicaulis</i>	Vulnerable B1ab(ii,iii,iv,v)	https://www.inaturalist.org/observations/220205684

Table 3. SCC confirmed on the site or likely to be found on the site

Species	Distribution (Figure 3)	Viability	Population Size	Nature and extent of impact on SCC	Known population size* and AOO (Appendix 8 of Guidelines) and loss	Conservation importance of SCC
<i>Selago villicaulis</i>	Occurs within the Degraded Dune Thicket habitat adjacent to the shed.	Unlikely to persist in the long term.	Only two plants seen but more potentially occur, but confirmed as a very small population.	Likely loss of these individuals during the construction phase, and this area is likely to be disturbed used for access in the operational phase.	AOO not listed in guidelines EOO 3800 km ² listed in Redlist website AOO lost is very low around 850m ²	This species still persists in the Featherbed Nature Reserve as recorded in iNaturalist. The species was recorded on the adjacent property, and occurs more extensively in the suitable habitat on the western Knysna head between Brenton and Belvidere. If these two individuals are lost, the specie will still persist on the property and no change in conservation status will occur.

* Derived from the Red List of South African Plants (www.redlist.org.za)

Table 4. Additional information on the SCC confirmed on the site or likely to be found on the site from The Red List of South African Plants website (www.redlist.sanbi.org)

Name	Justification	Range	Habitat Description	Threats	Population
<i>Selago villicaulis</i>	EOO 3800 km ² , known from less than 10 locations. Threatened by ongoing coastal development on the South Coast as well as by alien plant invasion.	Stilbaai to Knysna.	Fixed dunes up to 150 m.	Coastal development is an ongoing, moderate to severe threat throughout this species range- especially in the George, Wilderness and Knysna areas. Alien plants are an ongoing, moderate threat throughout the species range.	Decreasing

3. Site Ecological Importance (SEI)(Derived from SANBI 2022 Guidelines)

SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience [RR]) as follows:

$$EI = BI + RR$$

BI is a function of conservation importance (CI) and the functional integrity (FI) of the receptor as follows:

$$BI = CI + FI$$

SEI Calculation for Development Footprint

The SEI for each habitat has been calculated according to the Species Guidelines (SANBI, 2022)(Table 5) and the appropriate mitigation suggested for each SEI category is provided in Table 6.

Table 5. Calculation of SEI ratings for each habitat and the relevant fulfilling criteria for the proposed development.

Habitat	Conservation Integrity	Functional Integrity	Receptor Resilience	Site Ecological Importance
Degraded Dune Thicket and Degraded forest	High Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.	Medium Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of minor past disturbance. Moderate rehabilitation potential.	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 has been removed.	Medium
Highly degraded	Low < 50% of receptor contains natural habitat with limited potential to support SCC.	Low Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a	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	Low

		very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.	disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	
Transformed	Very low No natural habitat remaining.	Very low Several major current negative ecological impacts.	Low Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	Very Low

Table 6. Guidelines for interpreting SEI in the context of the proposed development 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.

The habitats within the study area with a Medium, Low or Very Low SEI. The some of the Medium SEI habitat will be lost.

4. Impacts and Mitigation

The loss of species of conservation concern from within the proposed development footprint would be Low negative and cannot be mitigated, however, this is acceptable in this case (refer to section 9 of the Terrestrial Biodiversity Report).

5. Buffers

The SCC buffers appear in Figure 3. The suggested 200m buffer around the Vulnerable species cannot be applied and allow most of the proposed developments. In this instance, considering the

location and size of the habitat lost, and the very small size of the population of the SCC, a buffer and avoidance of this loss would not be required.

6. Conclusion

This plant species specialist assessment report has been compiled according to the relevant legislation using the guidelines provided. The impact on SCC of the proposed development is Low negative and no mitigation is proposed. The Site Ecological Importance is Medium, Low or Very low. No essential mitigation is required, and the proposed developments are considered acceptable from a Plant species theme perspective.

7. Content of report requirement and relevant sections

		Section or page of report
2.1	The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professions (SACNASP), within a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.	Page ii and Appendix 3
2.2	The assessment must be undertaken within the study area.	It was
2.3	The assessment must be undertaken in accordance with the <i>Species Environmental Assessment Guideline</i> ²³ and must:	
2.3.1	Identify the SCC which were found, observed or are likely to occur within the study area;	Tables 1 and 2 in Appendix 4
2.3.2	provide evidence (photographs) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility ²⁴ immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3).	Tables 1 and 2 in Appendix 4
2.3.3	identify the distribution, location, viability ²⁵ and detailed description of population size of the SCC identified within the study area.	Table 2 and 3 in Appendix 4
2.3.4	identify the nature and the extent of the potential impact of the proposed development to the population of the SCC located within the study area.	Section 9
2.3.5	determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases.	Table 3 in Appendix 4
2.3.6	determine the potential impact of the proposed development on the habitat of the SCC located within the study area.	Table 3 in Appendix 4
2.3.7	include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, a motivation for the deviation;	Table 3 in Appendix 4

2.3.8	identify any dynamic ecological processes occurring within the broader landscape, that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems.	N/A
2.3.9	identify any potential impact on ecological connectivity within the broader landscape and resulting impacts on the identified SCC and its long term viability.	N/A
2.3.10	determine buffer distances as per the <i>Species Environmental Assessment Guidelines</i> used for the population of each SCC; and	Section 4 of Appendix 4
2.3.11	discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, <i>Data Deficient or Near Threatened Species, as well as any undescribed species</i> ²⁶ ; and	Table 1 of Appendix 4.
2.3.12	identify any alternative development footprints within the preferred development site which would be of “low” sensitivity” or “medium” sensitivity as identified by the screening tool and verified through the site sensitivity verification.	N/A

APPENDIX 4: MINIMUM CONTENT REQUIREMENTS FOR TERRESTRIAL BIODIVERSITY SPECIALIST REPORTS AS PER PROTOCOL FOR THE SPECIALIST ASSESSMENT OF ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY (GN 320 OF 20 MARCH 2020)

Protocol ref	Terrestrial Biodiversity Specialist Assessment Report Content	Section / Page
3.1.1.	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page ii and Appendix 3
3.1.2.	a signed statement of independence by the specialist;	Page iii
3.1.3.	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 5
3.1.4.	a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Section 5
3.1.5.	a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Section 5
3.1.6.	a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	Section 8
3.1.7.	additional environmental impacts expected from the proposed development;	Section 9
3.1.8.	any direct, indirect and cumulative impacts of the proposed development;	Section 9
3.1.9.	the degree to which impacts and risks can be mitigated;	Section 9
3.1.10.	the degree to which the impacts and risks can be reversed;	Section 9
3.1.11.	the degree to which the impacts and risks can cause loss of irreplaceable resources;	Section 9
3.1.12.	proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 9

3.1.13.	a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	N/A
3.1.14.	a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Section 10
3.1.15.	any conditions to which this statement is subjected.	Section 10