ATKV

TERRESTRIAL BIODIVERSITY, PLANT AND ANIMAL COMPLIANCE STATEMENTS FOR THE PROPOSED DUNE STABILISATION AT THE ATKV, HARTENBOS, WESTERN CAPE PROVINCE

UPDATED FINAL REPORT

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TERRESTRIAL BIODIVERSITY, PLANT AND ANIMAL COMPLIANCE STATEMENTS FOR THE PROPOSED DUNE STABILISATION AT THE ATKV, HARTENBOS, WESTERN CAPE PROVINCE.
FINAL REPORT.
2026

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DOCUMENT GUIDE

Terrestrial Biodiversity, Plant and Animal Compliance Statements are being prepared for the proposed dune stabilisation project along the Hartenbos coastline. A Terrestrial Biodiversity Compliance Statement must be conducted and the report prepared in accordance with the "*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity*" as set out in Government Notice (GN) 320 of Government Gazette (GG) 43110 (30 March 2020, as amended). Plant and Animal Species Compliance Statement must be conducted and the reports prepared in accordance with the "*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species"* and "*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species",* respectively, as set out in GN 1150 of GG 43855 (30 October 2020, as amended).

These protocols have been published in terms of Section 24(5)(a) and (h) of the National Environmental Management Act (NEMA; Act 107 of 2008), and the Environmental Impact Assessment (EIA) Regulations of 2014 with the purpose of providing minimum information requirements for biodiversity, plant and animal compliance statements within EIAs.

The gazetted requirements have been tabulated below and indicates the Section or Appendix number in which the specific content has been included. This "checklist" is intended to provide readers both with an easy directory to navigate their way through this document, while also indicating this report's compliance with the protocols.

Table 1. Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as set out in GN 320 of GG 43110 (2020, as amended).

No.	Protocols for Terrestrial Biodiversity	Section of the reports/ Notes
4.1	The compliance statement must be prepared by a specialist registered with the SACNASP and having expertise in the field of ecological sciences.	**APPENDIX B**
4.2	The compliance statement must:	
4.2.1	be applicable to the preferred site and proposed development footprint;	**Section 1.1**
4.2.2	confirm that the site is of "low" sensitivity for terrestrial biodiversity; and	**Section 1.2.2**
4.2.3	indicate whether or not the proposed development will have any impact on the biodiversity feature.	**Section 6**
4.3	**The compliance statement must contain, as a minimum, the following information:**	
4.3.1	the contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	**APPENDIX B**
4.3.2	a signed statement of independence by the specialist;	**Page ix**
4.3.3	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 3.2**
4.3.4	a baseline profile description of biodiversity and ecosystems of the site;	**Section 4**
4.3.5	the methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modelling used, where relevant;	**Section 3**
4.3.6	in the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	**Not Applicable**

No.	Protocols for Terrestrial Biodiversity	Section of the reports/ Notes
4.3.7	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	**Section 5**
4.3.8	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	**Section 1.4**
4.3.9	any conditions to which this statement is subjected	**Section 6**
4.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report	**Noted**

Table 2. Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species as set out in GN 1150 of GG of GG 43855 (2020, as amended).

No.	Protocols for Terrestrial Plant Species	Section of the reports/ Notes
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science)	**APPENDIX B**
5.2	The compliance statement must:	
5.2.1	be applicable within the study area;	**Section 1.1**
5.2.2	confirm that the study area is of "low" sensitivity for terrestrial plant species; and	**Section 1.2.2**
5.2.3	indicate whether or not the proposed development will have any impact on SCC.	**Section 6**
5.3	**The compliance statement must contain, as a minimum, the following information**	
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	**APPENDIX B**
5.3.2	a signed statement of independence by the specialist;	**Page ix**
5.3.3	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 3.2**
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	**Section 3**
5.3.5	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	**Section 5**
5.3.6	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	**Section 1.4**
5.3.7	the mean density of observations/ number of samples sites per unit area; and	**Section 4**
5.3.8	any conditions to which the compliance statement is subjected	**Section 6**
	A signed copy of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	**Noted**

Table 3. Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as set out in GN 1150 of GG of GG 43855 (2020, as amended).

No.	Protocols for Terrestrial Animal Species	Section of the reports/ Notes
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Zoological Science or Ecological Science).	**APPENDIX B**
5.2	**The compliance statement must:**	
5.2.1	**be applicable to the study area;**	**Section 1.1**
5.2.2	**confirm that the study area, is of "low" sensitivity for terrestrial animal species; and**	**Section 1.2.2**
5.2.3	**indicate whether or not the proposed development will have any impact on SCC.**	**Section 6**
5.3	**The compliance statement14 must contain, as a minimum, the following information:**	
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	**APPENDIX B**
5.3.2	a signed statement of independence by the specialist;	**Page ix**
5.3.3	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 3.2**
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	**Section 3**
5.3.5	the mean density of observations/ number of samples sites per unit area	**Section 5**
5.3.6	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	**Section 1.4**
5.3.7	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	**Section 4**
5.3.8	any conditions to which the compliance statement is subjected.	**Section 6**
6	A signed copy of the Terrestrial Animal Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	**Noted**

EXECUTIVE SUMMARY

Introduction

Anchor Environmental Consultants (Pty) Ltd (Anchor) was commissioned by ATKV Hartenbos (ATKV) to prepare Terrestrial Biodiversity, Animal and Plant Compliance Statements as part of the Basic Assessment process for the proposed dune stabilisation project along the Hartenbos coastline, Western Cape. The project aims to replace damaged gabion structures, previously installed to mitigate severe coastal erosion, with stabilisation structures across three implementation phases (Phases 2, 4, and 6). Three revetment upgrade alternatives were considered to address the deterioration of the existing rock-filled wire basket revetment. The preferred option is Alternative 1, which involves upgrading the revetment using sand-filled geotextile containers. Alternative 2 involves replacing or upgrading the revetment using conventional rock-filled wire baskets (gabions). The No-Go Alternative (Alternative 3) assumes that no maintenance or upgrade of the existing revetment would be undertaken. The intervention is necessary due to escalating dune erosion caused by frequent high-energy wave events, which threaten the integrity of the dune system and adjacent infrastructure.

The objective of the assessment was to evaluate the current condition of terrestrial biodiversity, including vegetation, animal species, and habitat integrity, within and around the proposed stabilisation footprint. The study sought to confirm or revise the sensitivity ratings assigned by the Department of Forestry, Fisheries and the Environment (DFFE) National Screening Tool and to determine whether the project triggers any significant ecological risks requiring detailed specialist assessment.

According to the Screening Tool, the site was initially rated as follows:

- Terrestrial Biodiversity: Very High
- Animal Species: Medium to High
- Plant Species: Low

Field-based Site Sensitivity Verification (SSV), undertaken in September 2025, confirmed that these ratings were largely overestimated due to the coarse resolution of national datasets and the degraded nature of the site. The on-site assessment found that:

- The study area comprises Cape Seashore Vegetation, which is classified as Least Concern in the 2018 National Biodiversity Assessment (NBA).
- The vegetation is highly degraded, with dominance of disturbance-tolerant species and extensive invasion by Acacia cyclops (Rooikrans).
- Faunal diversity is low, restricted to generalist species tolerant of human disturbance.
- The site does not intersect with any Terrestrial Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) and contributes minimally to the broader Gouritz Cluster–Mossel Bay Key Biodiversity Area (KBA).
- Although the site overlaps marginally with an Aquatic ESA and a Freshwater Ecosystem Priority Area (FEPA) sub-catchment, these aquatic sensitivities are addressed under a separate Aquatic Biodiversity assessment.

Following field verification, all sensitivity themes were reclassified to “Low”:

- Terrestrial Biodiversity: Very High → Low
- Animal Species: Medium/High → Low
- Plant Species: Low → Low

Based on the confirmed ecological condition and absence of conservation-significant habitats or species, the proposed dune stabilisation project is not anticipated to result in significant adverse impacts on terrestrial biodiversity. In fact, the project is intended to reduce any further degradation of the environment beyond the dunes. The development can therefore be appropriately managed under a Compliance Statement, with standard mitigation and management measures integrated into the project's Environmental Management Programme (EMPr).

In summary, the site's low ecological value, lack of sensitive or threatened vegetation types, and isolation within a disturbed urban–coastal matrix confirm that the proposed intervention poses low biodiversity risk and aligns with the intent of Section 24 of NEMA and the GN 320 (2020) and GN 1150 Protocols.

Regulatory Framework

The proposed development is governed by a comprehensive legal and policy framework that ensures environmental protection and sustainable land use. The Constitution of the Republic of South Africa (1996) protects the right to an environment that is not harmful to health or well-being and mandates intergenerational environmental protection. It underpins all subsequent environmental legislation.

The National Environmental Management Act (NEMA; Act 107 of 1998) provides the overarching framework for cooperative governance and sets out the duty of care to prevent environmental harm. The EIA Regulations promulgated under NEMA establish the procedural requirements for authorising listed activities that may impact the environment. These regulations include provisions for specialist studies, such as the present terrestrial plant, animal and biodiversity assessments, and require the identification of environmental sensitivities prior to project implementation.

The National Environmental Management: Protected Areas Act (NEMPAA; Act 57 of 2003) supports the conservation of biodiversity by enabling the declaration and management of protected areas, including national parks and private reserves.

The National Environmental Management: Biodiversity Act (NEMBA; Act 10 of 2004) provides for the protection of ecosystems and Species of Conservation Concern (SCC). It also regulates alien and invasive species, with landowners required to manage invasive species under the Alien and Invasive Species Regulations (2020). Under NEMBA, the Threatened or Protected Species (ToPS) Regulations (2015) require permits for activities involving specific listed species.

Internationally, South Africa is a signatory to the Convention on Biological Diversity (CBD), committing to the conservation of biological diversity and equitable resource use. National efforts, such as biodiversity stewardship programmes and expansion of protected area networks, are aligned with international targets.

At the provincial level, the Western Cape Biodiversity Act (Act 6 of 2021) provides a tailored framework for biodiversity management within the province. This includes provisions related to protected areas, catchment management, and the provincial Biodiversity Spatial Plan (BSP),

which serves as a critical decision-support tool for spatial planning and conservation prioritisation.

The Spatial Planning and Land Use Management Act (SPLUMA; Act 16 of 2013) provides a national framework for spatial development and land use regulation, ensuring consistency and integration across sectors and tiers of government. In the Western Cape, SPLUMA is operationalised through the Western Cape Land Use Planning Act (2015), which guides municipal spatial frameworks and mandates the inclusion of ecologically sensitive areas, biodiversity corridors, and climate change adaptation strategies in planning instruments.

Collectively, these legislative instruments establish the legal mandate and responsibilities relevant to the environmental assessment of the proposed development. The project must therefore demonstrate full compliance with these national and provincial requirements, including the protection of SCC, proper land use planning, and the management of ecological sensitivities within the study area.

Methodology

A combined desktop and field-based assessment was undertaken to evaluate the terrestrial biodiversity and ecological condition of the proposed dune stabilisation areas at ATKV Hartenbos, Western Cape. The assessment aimed to identify potential SCC and sensitive habitats that may be affected by the project, in accordance with national biodiversity and environmental legislation.

The desktop component involved a comprehensive review of existing biodiversity and spatial datasets to establish the baseline ecological context of the study area. This included the identification of vegetation types, ecologically significant features, such as for example Critical Biodiversity Areas (CBAs), and the potential distribution ranges of plant and animal SCC. Databases and sources consulted included:

- GBIF and iNaturalist for species occurrence records;
- SANBI Red List for conservation status verification;
- National Biodiversity Assessment (NBA, 2018);
- Vegetation Map of South Africa (SANBI, 2018);
- Western Cape Biodiversity Spatial Plan (CapeNature, 2024);
- Key Biodiversity Areas (NCG, 2024);
- National Freshwater Ecosystem Priority Areas (Nel et al., 2011); and
- Strategic Water Source Areas (Le Maitre et al., 2018).

Species-specific habitat requirements were evaluated using national taxonomic and ecological references, including Child et al. (2017) for mammals, Taylor et al. (2015) for birds, Tolley et al. (2023) for reptiles, Minter et al. (2004) for amphibians, and Henning et al. (2009); Samways & Simaika (2016) and Picker et al. (2019) for invertebrates. These data were spatially analysed in a GIS environment to map the study site's position relative to sensitive ecological features and habitat zones.

A field survey was conducted from 24 to 26 September 2025, applying multiple complementary sampling methods to document faunal and floral diversity and to ground-truth desktop findings. Methods included:

- Active searching (meander transects) to record flora and mobile fauna;
- Stationary bird counts (150 m apart, 50 m radius) to assess avifaunal presence; and

- Sweep-netting for insect collection across 20 m transects adjacent to bird count points.

All species encountered were photographed using a Nikon Coolpix L340, with faunal evidence such as spoor, scat, or burrows recorded. Insect specimens were preserved in acetone kill jars, frozen, and later processed and photographed in the Anchor Environmental Laboratory using a stereo zoom trinocular dissecting microscope with a 4K Dewinter camera. All records were uploaded to iNaturalist for verification.

Habitat types were delineated and mapped in situ using GPS Gland Measure 3.22.2, by walking the perimeters of distinct habitat polygons. Survey coverage included all three dune stabilisation phases (Phases 2, 4, and 6), each mapped with meander transects and bird count locations.

This integrated methodological approach ensured a robust assessment of site-specific biodiversity, enabling accurate evaluation of the project's potential ecological implications and verification of national screening tool sensitivities.

Results from the Desktop Assessment and Field Survey

The proposed dune stabilisation project at ATKV Hartenbos is situated within a dynamic coastal landscape dominated by Cape Seashore Vegetation, a vegetation type classified as Least Concern under the 2018 NBA. Despite this favourable conservation status, the site has undergone significant anthropogenic modification due to urban and recreational development, resulting in fragmented and degraded natural habitats interspersed with alien vegetation.

The Cape Seashore Vegetation occupies sandy beaches, dunes, dune slacks, and coastal cliffs, forming open grassy and herbaceous communities typically dominated by pioneer species. Environmental gradients—such as proximity to the high-water mark, substrate age, and exposure to marine influences—drive spatial variation in vegetation composition. Approximately 20% of this vegetation type is formally protected, while 1.7% has been transformed, largely from coastal urbanisation.

Analysis of the 2024 Western Cape Biodiversity Spatial Plan (WCBSP) revealed that most of the dune stabilisation footprint does not overlap with CBAs or Protected Areas (PAs). However, several portions intersect with zones classified as Ecological Support Areas (ESA 1: Aquatic), indicating ecological sensitivity related to hydrological and sediment processes.

The project area also falls within the Gouritz Cluster – Mossel Bay Key Biodiversity Area (KBA), a landscape-scale conservation unit of global significance. However, the proposed works are not expected to compromise the KBA's ecological integrity if mitigation measures are implemented.

The National Freshwater Ecosystem Priority Areas (NFEPA) dataset indicates that the site lies within a Freshwater Ecosystem Priority Area (FEPA) sub-catchment, with a small overlap between Phase 7 and a natural wetland associated with the Hartenbos River estuary. The area does not fall within or near any Strategic Water Source Areas (SWSA), indicating limited relevance to national water supply priorities.

The DFFE Screening Tool identified two SCC (one bird, the Caspian Tern *Hydroprogne caspia* and one insect, the yellow-winged agile grasshopper *Aneuryphymus montanus*), while desktop analyses of GBIF and iNaturalist records yielded an additional 32 SCC potentially occurring in the broader region. Field surveys documented 68 faunal species in the area surrounding the study area (48 invertebrates and 20 vertebrates, most of which were birds), with only one of these being

a SCC, the Cape Cormorant (*Phalacrocorax capensis*). However, this bird was not observed directly within the study area, but fly past on the ocean side of the study site. No SCC were recorded within the study area itself. Species richness varied between phases, with Phase 4 hosting the highest absolute diversity (51 species) and Phase 2 exhibiting the greatest species density per unit area (0.009 species/m^2).

No plant SCC were flagged by the DFFE screening tool, though 42 potential SCC were identified during the desktop review. Fieldwork recorded 27 plant species, seven of which are alien or invasive alien species listed under NEMBA (2020), including dense stands of *Acacia cyclops* (rooikrans) and *Myoporum tenuifolium* (manatoka). None of the SCC identified during desktop analysis were observed during the field survey.

Four habitat types were mapped across the study area:

- Dune Vegetation — representing remnant natural habitat dominated by grasses, succulents, and pioneer shrubs, but heavily disturbed and invaded by alien species;
- Grass Habitat — an artificial, sown lawn with low ecological value, confined to Phase 4;
- Coastal Habitat — the beach and nearshore zone adjacent to the dune base, forming the terrestrial–marine interface; and
- Recreational Walkway — a constructed pedestrian path contributing to habitat fragmentation and isolation.

Overall, the study site reflects a highly transformed coastal environment with limited natural vegetation cover and moderate ecological sensitivity, primarily associated with dune vegetation remnants and the adjacent aquatic ESA. The findings highlight the importance of implementing site-specific mitigation and rehabilitation measures to preserve remaining ecological function and prevent further degradation within this coastal ecosystem.

EMPr Mitigation Recommendations

This section outlines the mitigation measures to be implemented for the proposed dune stabilisation project at Hartenbos, Western Cape, to address potential ecological impacts on terrestrial biodiversity. The measures are guided by the mitigation hierarchy, a structured, stepwise framework that prioritises: (1) avoidance/prevention, (2) minimisation, (3) rehabilitation/restoration, (4) offsetting, and (5) the no-go option.

While complete avoidance of habitat loss is not feasible due to the project's spatial and technical constraints, all reasonable steps will be taken to minimise environmental disturbance. The proposed development involves clearing approximately 0.9 hectares of degraded and isolated dune vegetation, which currently supports mostly common and disturbance-tolerant species. No significant habitat for SCC is expected to be affected.

During the construction phase, which presents the highest risk of ecological disturbance, mitigation will focus on reducing direct and indirect impacts. Key measures include:

- Restricting all activities to the approved project footprint and previously disturbed areas.
- Providing environmental awareness training for all personnel.

- Establishing clearly demarcated “no-go” areas and minimising the overall development footprint.
- Implementing strict waste management protocols to prevent wildlife attraction and contamination.
- Ensuring all vehicles and equipment are free of leaks and properly maintained.
- Conducting pre-construction walk-throughs to safely relocate fauna and installing temporary barriers around excavations.
- Limiting construction to daylight hours and minimising light and noise pollution.
- Developing and enforcing an Alien and Invasive Plant Management Plan (AIPMP) to prevent the spread of invasive species.
- All construction-related incidents must be recorded in an environmental incident register, and only trained personnel may handle fauna encountered on site.

The operational phase of the project is not expected to result in significant ecological impacts due to the small scale, localised footprint, and the stabilised nature of the post-construction environment. Accordingly, no specific operational-phase mitigation measures are required beyond routine maintenance and alien plant control.

Overall, the mitigation measures proposed aim to ensure that the project proceeds in an environmentally responsible and sustainable manner, consistent with the principles of ecological conservation and the NEMA.

Discussion and Conclusions

The proposed dune stabilisation project is situated along the seaward foot of the dune system at Hartenbos, Western Cape Province, within the Cape Seashore Vegetation type, classified as Least Concern in the 2018 NBA. Approximately 20% of this vegetation type is formally protected, and only 1.7% has been transformed, largely due to urban expansion.

Field investigations identified four distinct habitat types within the study area: dune vegetation, grass, coastal, and recreational walkway habitats. Spatial analysis confirmed that the project footprint does not overlap with any formally protected areas or CBAs, though it does intersect with ESA 1: Aquatic. The potential impacts on these aquatic ESAs will be addressed in a separate aquatic biodiversity assessment. Terrestrial CBAs and estuarine CBAs occur nearby but will not be directly affected, and these areas have already undergone substantial transformation due to adjacent urban and recreational development.

The site is highly degraded and anthropogenically influenced, with extensive trampling, vegetation loss, and fragmentation caused by informal beach access. Dense stands of invasive alien plants (IAPs), notably *A. cyclops* (rooikrans) and *M. tenuifolium* (manatoka), further compromise habitat integrity by outcompeting indigenous vegetation and forming monotypic stands.

A total of 68 animal species were recorded, of which 71% were invertebrates and 29% vertebrates (mostly birds), mostly common, disturbance-tolerant species. Only one SCC were recorded in the area surrounding the study site (i.e., the Cape Cormorant (*Phalacrocorax capensis*)), although none were recorded within the study area itself. An additional 12 SCCs (primarily birds) are considered potentially present in the broader area but unlikely to depend on the site for essential ecological functions.

The botanical assessment recorded 27 plant species, none of which are SCCs. Seven were identified as alien or invasive. The low floristic diversity aligns with what is expected for Cape Seashore Vegetation but also reflects habitat degradation from trampling, erosion, and invasion. Of the 42 plant SCCs identified in the desktop review, none were detected during fieldwork, and only *Freesia leichtlinii* var. *alba* is considered known to occur within Cape Seashore Vegetation, though unlikely within the disturbed footprint.

Overall, the site's isolation, disturbance level, and small size limit its ecological value. Given the absence of sensitive or range-restricted species, the proposed dune stabilisation project is not expected to result in significant adverse impacts on terrestrial biodiversity. On the contrary, the intervention is anticipated to provide positive ecological outcomes by stabilising the dune system, reducing erosion, and promoting the recovery of indigenous vegetation over time.

Three revetment upgrade alternatives were assessed from a terrestrial biodiversity perspective. Alternative 1, which utilises sand-filled geotextile containers, was identified as the preferred option as it is expected to provide the greatest long-term benefit to terrestrial biodiversity. Compared to the gabion revetment proposed under Alternative 2, Alternative 1 offers improved long-term structural stability and eliminates the risk of wire mesh corrosion and deterioration, which could lead to renewed erosion and pose hazards to wildlife through entanglement or injury. Consequently, Alternative 1 represents the most environmentally suitable solution, providing effective long-term bank stabilisation while minimising risks to both plant and animal species.

In conclusion, from a terrestrial biodiversity, plant and animal species perspective, the project is considered environmentally acceptable, with no significant ecological constraints preventing its implementation, provided that the recommended mitigation and management measures are fully incorporated into the EMPr.

DECLARATION OF INDEPENDENCE

Box 1: Declaration of Independence of Specialist

I, Francois André de Villiers hereby declare that I have no conflicts of interest related to the work of this assessment. Specifically, I declare that I have no personal financial interests in the property and/or development being assessed in this assessment, and that I have no personal or financial connections to the relevant property owners, developers, planners, financiers, or consultants of the development.

February 2026

Box 2: Declaration of Independence of Reviewer

I, Cheruscha Swart hereby declare that I have no conflicts of interest related to the work of this assessment.

Specifically, I declare that I have no personal financial interests in the property and/or development being assessed in this assessment, and that I have no personal or financial connections to the relevant property owners, developers, planners, financiers, or consultants of the development.

February 2026

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ABBREVIATIONS AND ACRONYMS

Anchor	Anchor Environmental Consultants (Pty) Ltd
ATKV	Afrikaanse Taal- en Kultuur Vereniging Hartenbos
BMP	Biodiversity Management Plan
BSP	Biodiversity Spatial Plan
CBAs	Critical Biodiversity Areas
CBD	Convention on Biological Diversity, 1992
DFFE	Department of Forestry, Fisheries and the Environment
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESAs	Ecological Support Areas
GBIF	Global Biodiversity Information Facility
IAS	Invasive Alien Species
IUCN	International Union for Conservation of Nature
KBAs	Key Biodiversity Areas
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMBA	Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEMPAA:	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NFEPA	National Freshwater Ecosystem Priority Areas
ONAs	Other Natural Areas
PAs	Protected Areas
PES	Present Ecological State
SANBI	South African National Biodiversity Institute
SCC	Species of conservation concern
SPLUMA	Spatial Planning and Land Use Management Act (Act 16 of 2013)
STR	Screening Tool Report
SWSA	Strategic Water Source Area
ToPS	Threatened or Protected Species

1 INTRODUCTION

1.1 BRIEF PROJECT OVERVIEW

Anchor Environmental Consultants (Pty) Ltd (Anchor) was appointed by ATKV Hartenbos (ATKV) to undertake Terrestrial Biodiversity, Plant and Animal Species Compliance Statements for the proposed dune stabilisation of the coastal dune system located in front of ATKV properties along the Hartenbos coastline, Western Cape Province, South Africa (hereafter referred to as the study site) (Figure 1.1).

The Southern Cape coastline has experienced an increased frequency of high-energy wave events resulting in progressive erosion of the dune system, with significant volumes of sand being removed from the seaward face of the dunes. This poses an elevated risk to infrastructure that relies on the dune system for physical buffering, stabilisation, and coastal protection. Historically, gabion cages were installed to mitigate further erosion. However, scouring of the underlying sand resulted in the destabilisation and collapse of the gabions (Figure 1.2). It is now proposed that the damaged gabions be replaced to reduce further marine encroachment onto the dunes. The replacement and stabilisation activities will be implemented in three phases, namely Phases two, four, and six (Figure 1.1). Three revetment upgrade alternatives have been identified and are discussed below. Alternative 1 has been identified as the preferred option, with a combination of Alternatives 1a and 1b to be implemented depending on the structural condition of the existing rock-filled wire baskets.

- Alternative 1: Sandbag Revetment (Preferred Alternative)
    - Alternative 1a: Installation of sand-filled geotextile containers (single or double row, as required) over the existing rock-filled wire basket revetment where the existing baskets remain structurally stable and suitable as a foundation.
    - Alternative 1b: Removal of the existing rock-filled wire baskets where they are structurally compromised, followed by the installation of a new revetment comprising single or double rows of sand-filled geotextile containers.
- Alternative 2: Gabion Revetment
    - Alternative 2a: Installation of a new rock-filled wire basket (gabion) revetment over the existing rock-filled wire baskets where the existing structures remain stable.
    - Alternative 2b: Removal of the existing rock-filled wire baskets and replacement with a new rock-filled wire basket (gabion) revetment.
- Alternative 3: No-Go Alternative
    - No upgrade or maintenance of the existing revetment structures would be undertaken, and the current situation would remain unchanged (status quo).

The purpose of this report is to assess the current terrestrial biodiversity, animal and plant species condition of the study site, including both the broader landscape context and fine-scale site conditions. The assessment identifies and evaluates sensitive ecological receptors, including remnant indigenous vegetation and habitat patches, and considers their potential vulnerability to the proposed intervention. Key ecological, botanical and faunal features within the study area are described, and any conservation-significant habitats in proximity to the site are noted where relevant. Appropriate mitigation and management measures are provided to avoid or minimise potential impacts on terrestrial habitats and biodiversity, with the outcomes to be integrated into the project's Environmental Management Programme (EMPr).

Figure 1.1 The location of the proposed dune stabilisation in Hartenbos, Western Cape Province, South Africa. The stabilisation will take place in three phases namely phase two, four and six.

Figure 1.2. The gabion cages which were damaged by the high energy wave events.

1.2 TERMS OF REFERENCE

1.2.1 ONLINE SCREENING TOOL

The scope of this assessment was informed by the legislative framework established under the National Environmental Management Act (NEMA; Act 107 of 1998). Prior to initiating a specialist assessment, the legislated National Web-Based Environmental Screening Tool provided by the Department of Forestry, Fisheries and the Environment (DFFE) must be used to screen the proposed development area for environmental sensitivities. It generates a report that outlines key environmental themes (such as terrestrial biodiversity, etc.) and assigns to it a sensitivity rating based on the development footprint/ type, the status of the vegetation type and the overlap with any habitat of known species or provincial spatial plan layers. These ratings are categorised as "Very High", "High", "Medium" or "Low" and determines whether the specialist must assess the potential impacts of the development in the form of a Compliance Statement (Low sensitivity), or detailed Specialist Assessment Report (High or Very High). As the Screening Tool relies on numerous broad national datasets, its sensitivity ratings must be confirmed by undertaking a site sensitivity verification (SSV), which entails a site visit and desktop analysis by a qualified specialist.

The Screening Tool Report generated for this project is attached as APPENDIX A. According to the Screening Tool, the terrestrial biodiversity theme for the proposed development area has been classified as having a "Very High" sensitivity rating (Figure 1.3), the animal species theme has been classified as "High" (Figure 1.4), and the plant species theme has been classified as "Low" (Figure 1.5).

Figure 1.3. The proposed dune stabilisation has been assessed by the Screening Tool as having a "Very High" sensitivity in terms of terrestrial biodiversity.

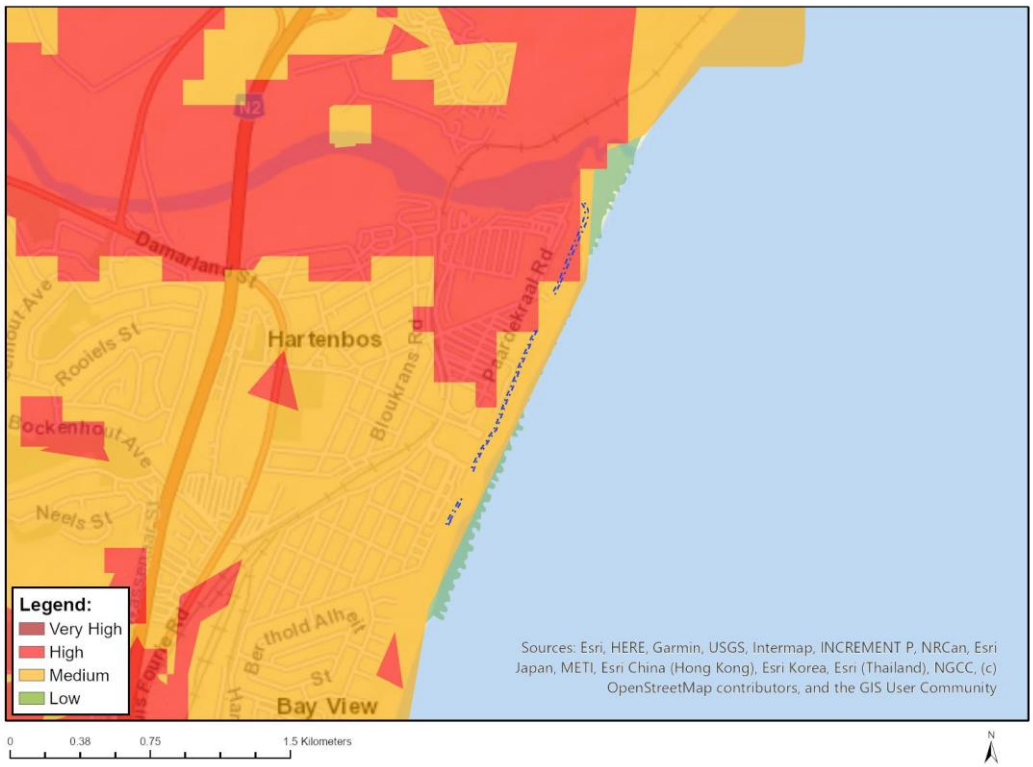

Figure 1.4. The proposed dune stabilisation has been assessed by the Screening Tool as having a "High" sensitivity in terms of animal species.

Figure 1.5. The proposed dune stabilisation has been assessed by the Screening Tool as having a "Low" sensitivity in terms of plant species.

1.2.2 Confirmation of Theme Sensitivity—Site Sensitivity Verification Results

The SSV process followed a multi-step approach to confirm environmental sensitivities within the proposed development footprint. Results from the STR were reviewed, along with relevant spatial datasets, to identify potential environmental sensitivities within the proposed development footprint. This was followed by a desktop review of recent satellite imagery and spatial data to identify additional sensitivities and assess current land cover, existing infrastructure and landscape features. Finally, a site inspection was undertaken on 24–26 September 2025 to ground-truth the STR findings and involved assessing the actual on-site conditions and confirming the presence or absence of identified environmental features and sensitivities.

ANIMAL SPECIES THEME

The Screening Tool assigned "High" animal species sensitivity ratings to the site. The sensitivity is likely attributed to the potential occurrence of *A. montanus* (Yellow-winged Agile Grasshopper) in the areas marked as "Medium" sensitivity, while the "High" rating is likely due to an increased possible presence of both *A. montanus* and *H. caspia* (Caspian Tern) in those areas marked as High. These species triggers are based on historical distribution records, and their current occupancy of the site is uncertain.

The habitat requirements of *A. montanus* indicate an association with fynbos vegetation on rocky slopes (Brown, 1960). However, the study area comprises dune vegetation and lacks such habitat features, making the presence of this species unlikely. *H. caspia* may occur in proximity to the site given its association with the Hartenbos Estuary. However, the species is not expected to be impacted by the proposed dune stabilisation activity as it does not feed, breed, or roost in close vicinity to the site.

The remaining natural habitat within the site is limited, highly isolated between the marine environment and the surrounding residential/recreational matrix and is ecologically degraded. The site visit confirmed low faunal diversity, with observations limited primarily to disturbance-tolerant species.

Based on the field verification and the current ecological condition of the site, the initial "High" animal species sensitivity ratings are considered inaccurate and should be revised to "Low." Accordingly, the Animal Species Theme for this site will be addressed in the form of a Compliance Statement rather than a Specialist Assessment.

PLANT SPECIES THEME

The Screening Tool assigned a "Low" plant species sensitivity rating to the site. This rating is likely attributed to the overlap of the proposed dune stabilisation footprint with Cape Seashore Vegetation, which is not currently classified as a vegetation type of conservation concern. Due to the relatively coarse spatial resolution of national screening datasets, ecological sensitivity may be under- or overestimated, particularly within urbanised or highly transformed landscapes. For this reason, on-site verification by a suitably qualified specialist is required to ground-truth the screening outputs and accurately determine plant species sensitivity.

Field verification confirmed the "Low" sensitivity rating. The site supported low indigenous plant species diversity, with several areas heavily invaded by *A. cyclops*

(Rooikrans). The flora observed was predominantly composed of disturbance-tolerant species.

Based on the current ecological condition and the results of the site assessment, the initial "Low" plant species sensitivity rating is considered accurate and should remain "Low." Consequently, the Plant Species Theme for this site will be addressed in the form of a Compliance Statement.

TERRESTRIAL BIODIVERSITY THEME

The Screening Tool assigned a "Very High" Terrestrial Biodiversity sensitivity rating to the site. This rating is likely due to the overlap of the proposed dune stabilisation footprint with an Aquatic Ecological Support Areas (ESA) 1 and with a Freshwater Ecosystem Priority Areas (FEPA) sub-catchment. It is important to note that these sensitivity ratings are derived from national-scale spatial datasets. Due to their relatively coarse resolution, such datasets may under- or overestimate ecological sensitivity, particularly within urbanised or heavily transformed landscapes. Accordingly, on-site verification by a suitably qualified specialist is essential to ground-truth the screening results and provide an accurate assessment of actual site sensitivity.

Specialist Site Verification confirmed that the proposed development is located within Cape Seashore Vegetation, which is not currently of conservation concern. This Vegetation exhibits a high degree of ecological degradation, primarily due to ongoing anthropogenic disturbance. The residual natural extent of this vegetation type is small, highly isolated between the marine environment and the residential/recreational matrix and is ecologically compromised. This was evidenced by low plant and animal diversity, dominance of disturbance-tolerant species, and the widespread occurrence of the invasive *A. cyclops* (Rooikrans). While the site lies adjacent to the endangered Hartenbos Dune Thicket, the portion of this vegetation adjoining the proposed dune stabilisation footprint has been almost entirely transformed for residential and recreational purposes.

Furthermore, the site does not intersect with any designated terrestrial Critical Biodiversity Areas (CBAs) or ESAs. Although it falls within the broader Gouritz Cluster – Mossel Bay Key Biodiversity Areas (KBA), the degraded ecological condition of the site means it contributes minimally to the terrestrial biodiversity value of the KBA.

The site is not located within a Strategic Water Source Area (SWSA). However, it does overlap with an Aquatic ESA (ESA 1: Aquatic) and a FEPA sub-catchment. These aquatic features are addressed in greater detail under the Aquatic Biodiversity theme below.

Based on the field verification and ecological condition of the site, the initial "Very High" sensitivity rating for Terrestrial Biodiversity is considered inaccurate and should be revised to "Low." Consequently, the Terrestrial Biodiversity theme for this site will be assessed in the form of a Compliance Statement.

1.3 SCOPE OF WORK

This compliance statement focused on terrestrial biodiversity, animal and plant species, with an emphasis on habitat condition and connectivity, areas of conservation concern (i.e., Protected Areas (PAs), CBAs and EESAs, species of conservation concern (SCC), and ecosystems which has been classified as threatened according to the 2018 National

Biodiversity Assessment (NBA; SANBI, 2019). The statement was conducted in accordance with the *Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes* in Terms of Sections 24(5)(a) and (h) and 44 of the NEMA, with specific reference to the *Protocol for the Specialist Assessment and Minimum Content Requirements for Environmental Impacts on Terrestrial Biodiversity* (GN 320 of GG 43110, as amended), *"Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant species"* (GN1150 of GG43855, as amended), and *"Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species"* (GN1150 of GG43855, as amended). Additionally, this statement was conducted in line with the "*Species Environmental Assessment Guidelines*" (SANBI 2020). The primary scope of the study included the following components:

- Compilation and review of existing data and literature on terrestrial biodiversity, animal and plant species of the study area and its surrounding landscape;
- Implementation of a field survey to identify the various habitat types, the animal and plant species present within the study area; and
- Formulation of mitigation and management recommendations for inclusion in the project's EMPr.

In alignment with this scope, the objectives of the report are to:

- Provide a baseline overview of the terrestrial biodiversity present within the study area;
- Determine the animal and plant SCC likely to occur in proximity of the study area;
- Determination of areas of conservation concern and threatened ecosystems;
- Confirm that the site is of "low" sensitivity for the three themes;
- Indicate whether or not the proposed development will have any impact on the biodiversity of the area; and
- Recommend appropriate mitigation and biodiversity management measures.

1.4 Assumptions and Limitations

The following assumptions and limitation are applicable to this report:

- The compliance statement was restricted to the defined boundaries of the proposed study area and did not extend to adjacent or neighbouring properties. However, the broader landscape, including the immediate surroundings, was incorporated into the desktop analysis, the outcomes of which are presented in Section 3.
- Due to the inherent limitations of ecological sampling, wherein not all individuals or species are encountered or identified, some species occurring within the project footprint may have gone undetected during the assessment.

- Fieldwork was conducted in September 2025, during the spring season. Spring is considered to be the better sampling period as the majority of the animals are active and a large amount of the flowering plants bloom making identification easier. While a more exhaustive assessment would ideally include surveys across all seasons to capture seasonal variation in species presence and activity, the integration of field observations, desktop data, and regional expert knowledge is considered adequate for the current assessment objectives.

2 REGULATORY FRAMEWORK

2.1 RELEVANT NATIONAL LEGISLATION, POLICY, AND GUIDELINES

2.1.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

Numerous regulations govern environmental protection in South Africa. The Constitution of the Republic of South Africa, 1996 (Constitution), serves as the highest legal authority and upholds the right of all South Africans to an environment free from harm to health and well-being. It obligates the protection of this right for the well-being of both present and future generations, achieved through appropriate legislative and other actions. As such, the Constitution forms the fundamental legal basis for environmental management in South Africa, with various laws at the national, provincial, and local levels aligning with its legal principles.

2.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA, ACT 107 OF 1998)

The NEMA establishes principles for decision making on matters that affect the environment, to provide for cooperative environmental governance. It establishes statutory environmental duty of care obligations, imposing responsibilities to prevent and address pollution or environmental degradation. Activities that have the potential to impact on the environment, socio-economic conditions and the cultural heritage, need to be identified and assessed prior to their implementation. These activities should be reported to the organ of state, known as the Competent Authority, and receive Environmental Authorisation prior to their commencement. An application for Environmental Authorisation is conducted by means of an Environmental Impact Assessment (EIA) process.

ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS 2014

The EIA regulations have been promulgated in terms of Chapter 5 of NEMA, which provides the legislative framework for the authorisation of activities that may significantly affect the environment. Under the EIA Regulations, a range of legal instruments are published to guide the environmental authorisation process. These include the Listing Notices (1, 2, and 3), which detail activities that require Environmental Authorisation and trigger the need for an EIA. In addition, the regulations include provisions on minimum content requirements for specialist reports and EMPrs.

2.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (NEMPAA, ACT 57 OF 2003)

The NEMPAA and its amendments primarily focus on the protection and conservation of ecologically sensitive areas and those which are representative of South Africa's rich biological diversity. NEMPAA identifies various categories of Protected Areas, including Nature Reserves, Special Nature Reserves, National Parks and Protected Environments. It acknowledges the designation of World Heritage Sites (WHS) under the World Heritage Convention Act (WHCA; Act 49 of 1999), Marine Protected Areas (MPAs) under the Marine Living Resources Act (MLRA; Act 18 of 1998) and/or NEMPAA, specially protected Forest Areas in accordance with the National Forest Act (NFA; Act 84 of 1998) , and Mountain

Catchment Areas declared by the Mountain Catchment Areas Act (MCAA; Act 63 of 1970). Furthermore, this Act empowers the designation of National Parks, Special Parks, and Heritage Sites, entrusting their management and oversight to South African National Parks (SANParks). The Act further requires management plans for all protected areas to guide conservation and land-use decisions.

2.1.4 The National Environmental Management: Biodiversity Act (NEMBA, Act 10 of 2004).

The NEMBA provides legal protection and management of South Africa's biodiversity within the framework of NEMA. The Act seeks to protect species and ecosystems that require national-level safeguarding, promote the sustainable utilisation of indigenous biological resources and ensure the fair and equitable sharing of benefits derived from activities involving such resources. It supports biodiversity planning tools such as bioregional and Biodiversity Management Plans and provides for biodiversity assessments, including the NBA, which evaluates ecosystem condition and sensitivity using International Union for Conservation of Nature (IUCN) Red List frameworks to inform conservation, spatial planning and policy. The legislation also establishes the South African National Biodiversity Institute (SANBI), defining its roles and functions.

Alien and Invasive Species

The NEMBA also regulates all alien and invasive organisms in South Africa, aiming to prevent unauthorised introduction and spread, and to manage and control alien and invasive species to minimise harm to the environment and biodiversity. The Act outlines a 'Duty of care relating to listed invasive species', specifying that landowners with listed invasive species must notify the Competent Authority, control and eradicate the species, and prevent its spread while minimising harm to biodiversity. An Alien and Invasive Species Management Plan is required as part of the project approval conditions. It serves to guide the removal of existing invasive species, prevent their establishment, and monitor their presence and management success. The Alien and Invasive Species Regulations, 2020 (GN R1020 of GG 43735), published under this Act, set out requirements for preventing the unauthorised introduction and spread of alien and invasive species and must be read with NEMBA.

Threatened and Protected Species Regulations of 2015

The Act also establishes regulations for listing and protecting threatened species and prohibits certain activities involving listed species without permits. The Threatened or Protected Species Regulations, 2015 (ToPS; GN 255 in GG 38600), established under NEMBA, aim to safeguard and preserve threatened and protected species. They outline the prohibition of specific restricted activities involving particular listed threatened or protected species. According to these regulations, obtaining a permit may be necessary for activities that involve the disturbance or removal of certain species.

CONVENTION ON BIOLOGICAL DIVERSITY 1992

The Convention on Biological Diversity (CBD) is an international legal framework aimed at safeguarding biological diversity, promoting the sustainable utilisation of its components, and ensuring the just and equitable sharing of benefits derived from genetic resources. The Convention addresses biodiversity across various levels, including ecosystems, species, and genetic resources.

South Africa became a signatory to the CBD on 4 June 1993 and has been a member state of the Convention since 2 November 1995. South Africa has adopted several management categories for protected areas that align with the established classifications of the IUCN. One of South Africa's key conservation objectives is to increase the extent of protected areas to meet the international benchmark of 10% of the nation's total land area. The DFFE collaborates closely with landowners to encourage their active participation in the Stewardship Programme. This initiative permits landowners to utilise their properties for biodiversity and conservation purposes, contributing significantly to the expansion of the country's conservation estate.

2.1.5 Sea Birds and Seals Protection Act (Act 46 of 1973)

This Act prohibits the harassment, disturbance, killing, or capture of seabirds and seals. It is supported by a national policy (South African Policy on the Management of Seals, Seabirds, and Shorebirds (2007)) aimed at reducing incidental mortality caused by fishing operations.

2.1.6 Spatial Planning And Land Use Management Act (SPLUMA; Act 16 Of 2013)

The purpose of the SPLUMA is to establish a new framework for managing planning permissions and approvals, setting guidelines for new developments, and defining legal land uses in South Africa. It functions as a foundational law, outlining general principles for provincial laws that will manage planning. Additionally, SPLUMA clarifies how planning law interacts with other legal regulations and policies.

2.2 Relevant Provincial Law, Guidelines, and Policies

2.2.1 Western Cape Biodiversity Act (Act 6 of 2021)

This Western Cape Biodiversity Act aims to provide for the framework and institutions for nature conservation and the protection, management and sustainable use of biodiversity and ecosystems in the province; and for matters incidental thereto. It recognises and mandates the use of the Biodiversity Spatial Plan (BSP) as a key tool in planning and regulatory processes and integrates biodiversity considerations into land-use planning and decision-making. It also discusses and includes requirements in terms of Protected Areas, Mountain Catchment Areas, Biodiversity Stewardship and Biosphere Reserves.

This Act was signed into law on 14 December 2021 and will come into effect in a phased manner. Certain sections of the Act have come into effect on 15 November 2022. Once in fully force, the Act will repeal a number of laws applicable in the province including The Sea Shore Act (1935) The Mountain Catchment Areas Act (1970), the Nature Conservation Ordinance (1974), The Western Cape Biosphere Reserves Act (2011), and others.

BIODIVERSITY SPATIAL PLAN BY CAPENATURE

The Western Cape BSP is integral to various aspects, including guiding the Provincial Protected Area Expansion Strategy, informing biodiversity stewardship, identifying ecosystems and species listing, influencing land use planning and decision-making, shaping policies and guidelines under environmental legislation, contributing to decision-support systems and strategic environmental assessments, influencing decisions by state organs impacting biodiversity, and playing a role in biodiversity offset considerations.

2.2.2 WESTERN CAPE LAND USE PLANNING ACT, 2015

The Western Cape Land Use Planning Act consolidates legislation in the province related to planning, development, and regulation. It establishes provisions for spatial development frameworks, minimum standards for municipal development management, and regulations for provincial development management. The Act guides municipal spatial development frameworks, emphasising compliance with legislation, predictability in land use, addressing development priorities, and alignment with provincial plans. Municipal frameworks must include essential elements, such as road networks, public transport, health and education facilities, heritage sites, agricultural and tourism resources, and areas of ecological importance, incorporating nature conservation, biodiversity, soil conservation, pollution control, and climate change adaptation strategies.

3 METHODS

3.1 DESKTOP ASSESSMENT

During the desktop assessment, the potential ecological condition of the study site was evaluated by investigating the recorded habitat types and vegetation classifications present in the area, the ecologically significant features interacting with the study site, and identifying the range overlaps of SCC with the study area (i.e., determining which SCC could potentially occur within the site boundaries).

The likelihood of occurrence of animal and plant SCC at the study site was assessed through a desktop review of various online biodiversity databases, including the Global Biodiversity Information Facility (GBIF) (GBIF.org-a) and iNaturalist (*iNaturalist*). The conservation status of each identified SCC was verified using the SANBI Red List of animal and plant species. To further refine the assessment, the specific habitat requirements for each SCC were reviewed to evaluate their probability of occurrence within the study area. The habitat information for all flora was sourced from (*National Assessment: Red List of South African Plants*), and the habitat information for mammals was sourced from Child et al. (2017), for birds (Aves) from (Taylor et al., 2015), for reptiles from (Tolley et al., 2023), for frogs from (Minter et al., 2004), and for invertebrates from (Henning et al. 2009, Samways & Simaika 2016, Picker et al. 2019).

The ecological important features and the vegetation type was sourced as data layers and imposed on a map to visually indicate the physical location of the study site in relation to the mentioned features. The following spatial datasets were used:

- 2022 National Red List of Terrestrial Ecosystems (RLEs) (Skowno & Monyeki, 2021);
- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI (2006- 2018), 2018);
- Western Cape Biodiversity Spatial Plan 2023(CapeNature, 2024);
- Key Biodiversity Areas of South Africa (NCG., 2024);
- National Freshwater Ecosystem Priority Area (NFEPA) (Nel et al., 2011); and
- Strategic Water Source Areas, 2021 (Le Maitre et al., 2018)

All spatial analyses and mapping were conducted using QGIS v3.42.3 (QGIS Development Team, 2025).

3.2 FIELD ASSESSMENT

A single field survey was conducted from 24 to 26 September 2025. Three complementary sampling methods were applied to document faunal diversity within the study area, namely active searching, sweep-netting, and stationary bird counts. Sweep-netting was used to sample insect fauna, stationary point counts were conducted to sample avifaunal diversity, and active searching was employed to sample all remaining faunal groups.

Active searching involved systematically traversing the proposed project footprint areas using meander transects (phase 2 is depicted in Figure 3.1; phase 4 in Figure 3.2; and phase 6 in Figure 3.3). All floral and faunal species encountered were recorded and photographed using a Nikon Coolpix L340 digital camera, and indirect evidence of fauna

(e.g. spoor, scat, burrows) was also documented. Stationary bird counts were conducted at least 150 m apart, with all birds observed or heard within a 50 m radius of each point identified and counted (phase 2 — Figure 3.1; phase 4 — Figure 3.2; phase 6 — Figure 3.3). Sweep-netting involved sweeping a handheld sweep net across the vegetation over 20 m transect sections following each bird count location, during the active searching process. All insects captured were euthanised using a kill jar containing acetone-drenched cotton wool, stored in sealed plastic bags, and subsequently frozen for sorting and photography in the Anchor Laboratory using an unbranded stereo zoom trinocular dissecting microscope fitted with a 4K Dewinter multimedia camera (Dewinter Optical). All photographs of plant and animal species recorded in the field or processed in the laboratory were uploaded to iNaturalist for species identification confirmation.

Habitat types and their condition within the study area were identified. Each of the various habitats were mapped using the GPS application Gland Measure 3.22.2 (Toptoshirou, 2025) by walking the outline of each habitat type creating a polygon on the application.

Figure 3.1. Phase 2 active searching meander transect and bird count survey location. The bird count position is delineated by a yellow circle, and the meander transect route is illustrated by a red line.

Figure 3.2. Phase 4 active searching meander transect and bird count survey location. The bird count position is delineated by a yellow circle, and the meander transect route is illustrated by a red line.

Figure 3.3. Phase 6 active searching meander transect and bird count survey location. The bird count position is delineated by a yellow circle, and the meander transect route is illustrated by a red line.

4 RESULTS

4.1 VEGETATION TYPE AND ECOSYSTEM THREAT STATUS

Typical terrestrial coastal vegetation comprises plant communities that do not exhibit adaptations to prolonged flooding and generally occur outside the influence of tidal inundation. However, these systems remain influenced by the marine environment through salt spray and the deposition of fine sediments (Mucina et al., 2006). Terrestrial coastal vegetation occurs on a range of substrates which are broadly classified into sandy beaches and dunes, the dominant coastal landform along approximately 70% of South Africa's shoreline (Tinley, 1985), and rocky shores, including coastal cliffs and headlands. These vegetation units are collectively classified as seashore vegetation, of which four types are recognised in South Africa: Namib Seashore Vegetation, Namaqualand Seashore Vegetation, Cape Seashore Vegetation and Subtropical Seashore Vegetation (Mucina et al., 2006). The study area is situated within the Cape Seashore Vegetation type (Figure 4.1)(SANBI, 2018). Surrounding areas include Hartenbos Dune Thicket and Mossel Bay Shale Renosterveld. The prosed development is situated south of the Estuarine Functional Zone, which supports estuarine and salt marsh vegetation (SANBI (2006- 2018), 2018).

Cape Seashore Vegetation occurs on beaches, coastal dunes, dune slacks, and coastal cliffs (Mucina et al., 2006). It is typically characterised by an open grassy, herbaceous, and in parts dwarf-shrub-dominated structure, frequently dominated by one or a few pioneer species. Spatial variation in plant community structure and composition reflects environmental gradients, including substrate age and disturbance regime, proximity to the high-water mark, and whether the dune slope is oriented leeward or seaward (Mucina et al., 2006).

Approximately 20% of the Cape Seashore Vegetation remains under formal protection, while only 1.7% has been transformed, primarily due to urban development. The ecosystem is currently classified as Least Concern (Mucina & Rutherford, 2006)(SANBI, 2019))(Figure 4.2). This status is based on the 2022 National Red List of Terrestrial Ecosystems developed by SANBI, aligned with IUCN Red List of Species and Red List of Ecosystems. The assessment considers biodiversity richness and uniqueness, spatial extent, exposure to natural or human-induced disturbances, and the degree of ecosystem intactness or degradation(SANBI, 2019).

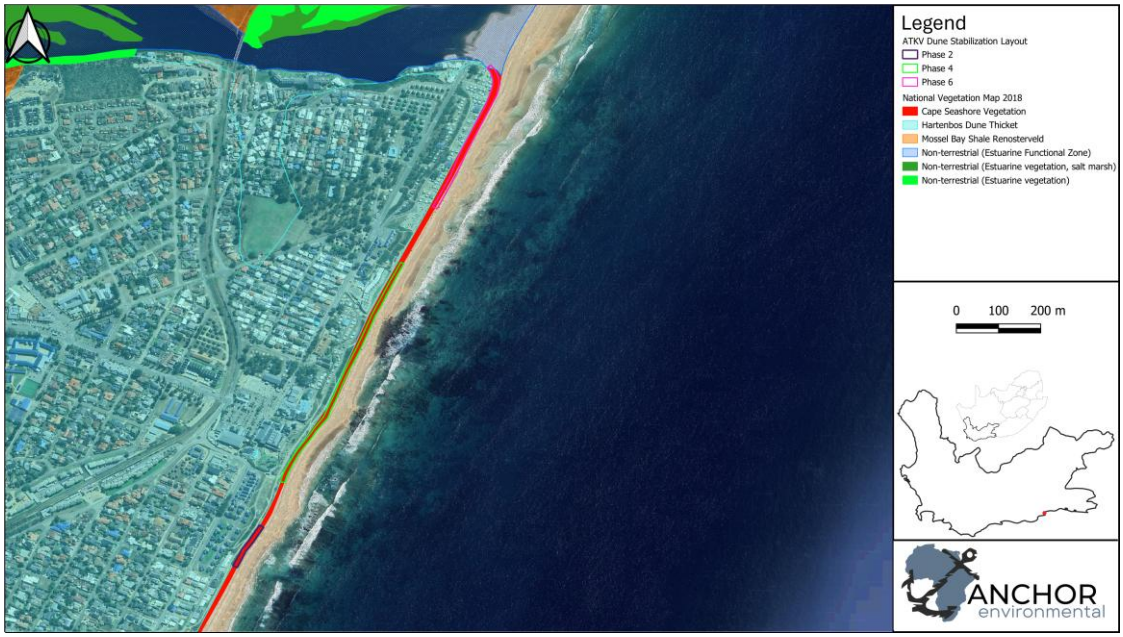

Figure 4.1. Vegetation types associated with and surrounding the ATKV dune stabilisation project. The proposed footprint falls within the Cape Seashore Vegetation (indicated by red shading). Surrounding areas include Hartenbos Dune Thicket (light blue) and Mossel Bay Shale Renosterveld (orange). To the north lies the Estuarine Functional Zone (blue) with estuarine (lime green) and salt marsh vegetation (green) (SANBI (2006- 2018), 2018).

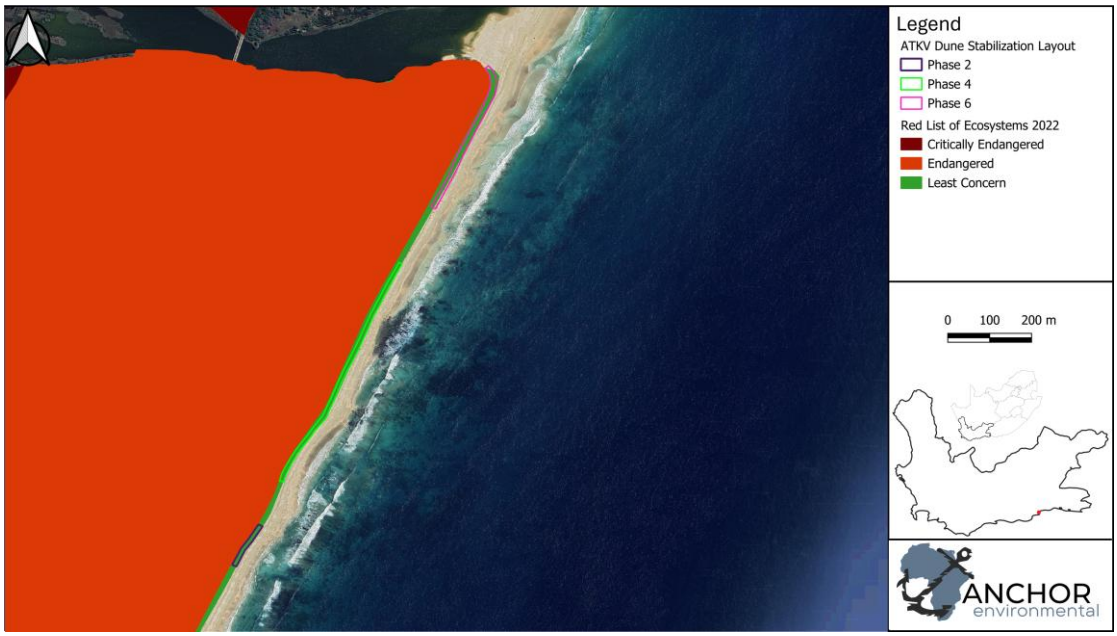

Figure 4.2. Terrestrial Threat Status of the area as per the 2022 National Red List of Terrestrial Ecosystems (Skowno & Monyeki, 2021). The study site is classified as Least Concerned. Green areas are areas of least Concern, red areas are areas that are Endangered and maroon areas are areas that are Critically Endangered.

4.2 WESTERN CAPE BIODIVERSITY SPATIAL PLAN

The Western Cape BSP identifies priority terrestrial areas essential for biodiversity conservation, encompassing diverse ecosystems, species, and ecological processes. It also includes aquatic features such as rivers. It classifies areas into several categories, including CBAs, ESAs, PAs and Other Natural Areas (ONAs). These are all important for maintaining representative ecosystems, species persistence, ecological functioning, and landscape connectivity (Pool-Stanvliet et al., 2017). These classifications are spatially represented in CBA maps, which guide planning and decision-making to support sustainable development. While municipalities may adapt the naming conventions of these categories in local spatial plans, they must retain alignment with the BSPs underlying principles and national policy frameworks.

For this assessment, spatial data layers from the 2024 Western Cape Biodiversity Spatial Plan (CapeNature, 2024) were incorporated to evaluate the ecological sensitivity of the site. This included the identification and assessment of CBAs, ESAs, PAs and ONAs, as summarised in Table 4.1. The majority of the proposed dune stabilisation footprint does not intersect with any designated biodiversity priority areas (i.e., CBA or PA; Figure 4.3). However, large sections of the proposed dune stabilisation overlap with areas classified as ESA 1: Aquatic (Figure 4.3).

Table 4.1. Summary of the Western Cape Biodiversity Spatial Plan priority categories as listed in (CapeNature, 2024).

Category	Definition
PAs	Areas that are legally protected and recognized under the National Environmental Management: Protected Areas Act (Act 57 of 2023), including formally gazetted Contract Nature Reserves and Protected Environments.
CBAs	CBAs are essential for conserving biodiversity, supporting ecosystem processes, and maintaining ecological infrastructure. They include areas needed to meet conservation targets, protect Critically Endangered ecosystems, and maintain landscape connectivity. CBAs must remain in a natural or near-natural state, with CBA 1 areas generally intact and CBA 2 areas potentially degraded or containing secondary vegetation.
ESAs	ESAs are not essential for achieving biodiversity targets but are crucial for supporting the ecological functioning of Protected Areas and Critical Biodiversity Areas, and for sustaining ecosystem services. They include key features such as climate adaptation corridors, water recharge zones, riparian habitats, and threatened vegetation types, and should be maintained in at least a functional condition. ESAs are classified as ESA 1 (functional areas in natural to moderately degraded condition) and ESA 2 (severely degraded areas requiring restoration), with land uses permitted only if they do not compromise ecological integrity or long-term biodiversity goals.
ONAs	ONAs are not designated as priorities in the current biodiversity spatial plan but still retain much of their natural character and contribute to biodiversity and ecological infrastructure. While they allow greater flexibility in management and land use, activities should aim to minimise habitat and species loss and maintain ecosystem functionality. High-impact land uses may be permitted but require appropriate environmental authorisation.

Figure 4.3. Spatial representation of designated biodiversity priority areas in relation to the proposed dune stabilisation footprint. Critical Biodiversity Area 1 (CBA 1) is shown in red; Critical Biodiversity Area 2 (CBA 2) in orange; and Ecological Support Area 1 (ESA 1) in yellow, respectively (CapeNature, 2024).

4.3 Key Biodiversity Areas

Key Biodiversity Areas (KBAs) are internationally recognised sites contributing significantly to the global persistence of biodiversity, identified according to established international criteria (SANBI, 2024). However, KBA boundaries often cover large areas and reflect broader landscape-level ecological significance, rather than the specific ecological value of any one site within them. Therefore, the inclusion of a development site within a KBA does not automatically preclude development.

The entire project site falls within the Gouritz Cluster – Mossel Bay KBA (Figure 4.4). This KBA designation reflects the ecological importance of the broader Gouritz area rather than site-specific sensitivities within the proposed development footprint. The proposed development is unlikely to compromise the broader ecological integrity or conservation objectives of the Gouritz Cluster – Mossel Bay KBA, provided that all recommended mitigation measures identified through this assessment are fully implemented.

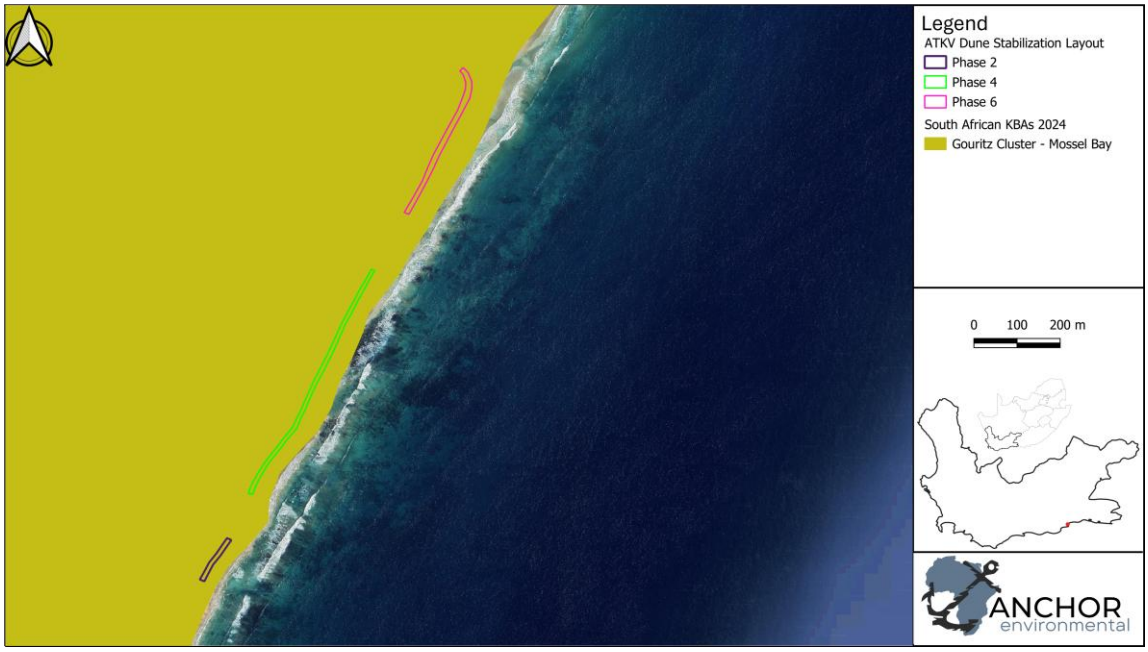

Figure 4.4. Delineated Key Biodiversity Areas within the area (NCG., 2024).

4.4 National Freshwater Ecosystem Priority Areas

National Freshwater Ecosystem Priority Areas (NFEPA) identify and prioritise strategic freshwater ecosystems that are important for conserving biodiversity and supporting the sustainable use of South Africa's water resources (Nel et al., 2011). NFEPA provides guidance on which rivers, wetlands, and estuaries should be maintained in a natural or near-natural state. According to the NFEPA dataset, the dune stabilisation footprint falls within a FEPA sub-catchment, while a small part of the northern section of Phase 7 overlaps with the natural wetland associated with Hartenbos river estuary (Figure 4.5).

Figure 4.5. Location of the proposed development in relation to the National Freshwater Ecosystem Priority Area (NFEPA) rivers and wetlands (Nel et al., 2011).

4.5 STRATEGIC WATER SOURCE AREA

There are two types of SWSA, namely surface water SWSA and ground water SWSA. Surface water SWSAs are defined as land areas that contribute a disproportionately high volume of mean annual surface water runoff relative to their size, while groundwater SWSAs are areas with both high groundwater availability and national-level importance. The site does not fall within and not near any of the listed SWSA (Figure 4.6).

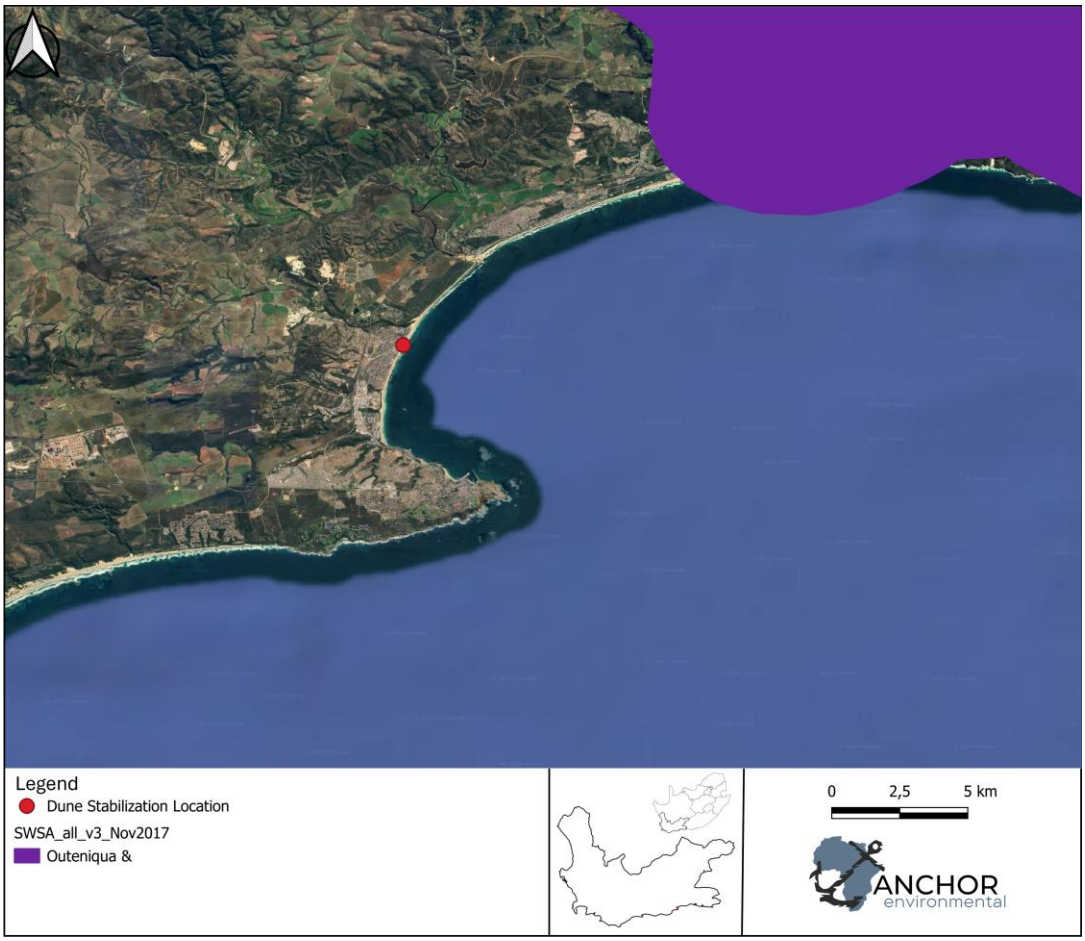

Figure 4.6. Strategic Water Source Areas in the area. The site does not overlap with any SWSA (Le Maitre et al., 2018).

4.6 FAUNA

Two SCC (one insect, the yellow-winged agile grasshopper *Aneuryphymus montanus* and one bird species, the Caspian Tern *Hydroprogne caspia*) were identified by the DFFE screening tool. In addition, a further 32 SCC were identified through a desktop review of online biodiversity databases, which included the GBIF (GBIF.org,.b) and iNaturalist(iNaturalist). These species, along with their global conservation status, national Red List classification (*Red List of South African Species* produced by SANBI), and habitat requirements, are presented in Table 4.2.

Table 4.2. Faunal SCC potentially occurring within the proposed dune stabilisation area. Species highlighted by the DFFE screening tool is shown in bold. The table includes scientific and common names, national Red List status, IUCN Red List status and associated habitat requirements for each species. Habitat information for mammals was sourced from Child et al. (2017), for birds (Aves) from (Taylor et al., 2015), for herpetofauna from (Tolley et al., 2023), and for invertebrates from (Henning et al. 2009, Samways & Simaika 2016, Picker et al. 2019).

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Anthropoides paradiseus	Blue crane	NT	VU	In the Western Cape of South Africa, it breeds in lowland agricultural areas such as pastures, cereal fields, and even coastal dunes. During the non-breeding season, it moves to lower altitudes and prefers short, dry grasslands, the Karoo, and cultivated areas in the fynbos. It avoids overgrazed or frequently burned grasslands and relies on agricultural lands like croplands and fallow fields for foraging.
Ardenna grisea	Sooty Shearwater	NT	NT	These birds are pelagic, spending the majority of their lives at sea. They come ashore only to breed on small islands in the southern oceans.
Arenaria interpres	Ruddy Turnstones	NT	NT	Ruddy Turnstones reside almost exclusively in coastal habitats in the region during the non-breeding season and are usually found on stony, rocky, and kelp-covered shores, estuarine mud- and sand flats, especially those covered in eelgrass, although they can be occasionally seen on sandy beaches too (Turpie 2005). It can be gregarious, being found in small flocks, and often associated in groups with other waders. They forage primarily by day and have a diverse diet.

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Bradypterus sylvaticus	Knysna Warbler	VU	VU	The Knysna Warbler occurs along the edges of Afro-temperate forests and in thick, tangled vegetation along the banks of watercourses or drainage lines in forest patches in the Fynbos Biome. It has adapted to thickets of introduced Rubus brambles, where it can be locally common, particularly in Western Cape. Birds have recently started to abandon natural, protected forests in favour of narrow belts of suburban riverine woodland with a dense, tangled understorey. This was attributed to the availability of nesting substrate as opposed to prey availability. In parts of the range, such around George, the species is also regularly recorded in overgrown suburban gardens with dense understorey vegetation.
Buteo trizonatus	Forest Buzzard	LC	NT	It generally favours Afromontane Forest and plantations of alien trees, such as *Eucalyptus* and pines (*Pinus*).
Calidris canutus	Red Knot	LC	NT	Regionally the species prefers sheltered bays and coastal lagoons, favouring extensive mud and sand flats. Habitat preference is linked to their specialised diet of molluscs, especially bivalves. In South Africa the species occurs mainly on the west coast from Langebaan to the Orange River and sporadically along the southern and eastern coasts.
Calidris ferruginea	Curlew sandpiper	LC	VU	This species is found across wetlands throughout southern Africa, though it primarily occupies coastal areas and highveld pans in the Free State and Transvaal. Inland wetlands used by the species typically feature muddy margins and receding waterlines, providing suitable foraging conditions. Compared to more uniformly distributed species like the Greenshank, its occurrence in the interior is notably more scattered.
Certhilauda brevirostris	Agulhas Long-billed Lark	NT	NE	The Agulhas Long-billed Lark is endemic to South Africa's Western Cape Province and is largely restricted to the Agulhas Plain and Overberg wheatbelt, east of the Hottentots Holland Mountains. In contrast to vegetation type, vegetation structure is an important predictor of occupancy and presence at sites show a preference for open habitats with scattered bush cover and low (<30 cm), structurally diverse, species-rich vegetation. It was found that Agulhas Long-billed Lark occupancy was positively related to the presence of renosterveld hedgerows at sites. They are less common in Coastal Fynbos and Sand Plains Fynbos, favouring sandy areas.

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Charadrius pallidus	Chestnut-banded Plover	NT	LC	*C. pallidus* exhibits a strong ecological association with saline and alkaline water bodies, breeding predominantly in natural and artificial alkaline wetlands, such as inland salt pans and large alkaline lakes in East Africa. It favours sparsely vegetated habitats near water, typically remaining within 50 meters during breeding and within 1 kilometer during the non-breeding season, particularly along coastal environments like lagoons, estuarine salt marshes, and intertidal mudflats. Although rarely found in freshwater habitats, the species demonstrates adaptability by occupying anthropogenic environments such as man-made salt ponds.
Charadrius mongolus	Lesser sand plover	EN	EN	It is a vagrant to coastal Western Cape and Namibia. It generally prefers intertidal and estuarine mudflats, sandy beaches and shores with sand dunes.
Circus ranivorus	African Marsh Harrier	EN	LC	This species is dependent on permanent wetlands, both inland and coastal, for breeding, feeding and roosting. 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.
Circus maurus	Black harrier	EN	EN	*C. maurus* is a species primarily associated with cool, dry environments, frequenting coastal and montane fynbos, highland grasslands, Karoo subdesert scrub, open plains with low shrubs, and croplands In the Western Cape of South Africa, it is most abundant in coastal and montane fynbos This species prefers open ground with low vegetation for hunting, primarily feeding on small mammals such as *Otomys* and *Rhabdomys* species
Falco biarmicus	Lanner Falcon	VU	LC	Lanner Falcons favour open environments, ranging from forest edges to deserts. They are most commonly found in open savannahs and sour grasslands. In South Africa, they are prevalent in the eastern grasslands and migrate to various habitats such as Fynbos, Nama Karoo, and Southern Kalahari outside the breeding season.
Falco peregrinus minor	African Peregrine Falcon	NT	LC	Most of the sub-Saharan Africa population is resident, absent from the equatorial lowland forest of West Africa. In southern Africa it is generally uncommon and localised in Namibia, northern and eastern Botswana, Zimbabwe, western Mozambique and South Africa. It generally favours riverine, mountainous or coastal environments, especially with high cliffs, used for roosting and hunting. Dam walls, quarries and the tall buildings of city centres can also fulfil this purpose.

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Hydroprogne caspia	**Caspian Tern**	VU	LC	In Southern Africa the Caspian Tern is largely confined to the coastline, estuaries and to large river systems and inland water bodies. Caspian Tern occurs mostly in sheltered bays and estuaries along the coast while inland occur both at natural and man-made waterbodies, showing preference for saline pans and large impoundments. At inland sites, it breeds on small low islets, while along the coast, primarily on offshore islands, but with increasing use of sandy beaches and islands at saltworks.
Limosa lapponica	Bar-tailed godwit	LC	NT	While more scare further inland. It generally prefers estuaries, coastal lagoons and sheltered embayments, occasionally moving to sandy beaches, coastal sewage works and commercial salt pans.
Morus capensis	Cape Gannet	VU	EN	Ranges widely over the continental shelf while foraging for small pelagic fish (mainly sardine *Sardinops sagax* and anchovy *Engraulis encrasicolus*); can travel 130 km from colony, covering over 400 km in a single foraging trip. Out of the breeding season, they can travel widely but usually stay within 500-600 km of their breeding colony; in winter, many follow sardine shoals into KwaZulu-Natal waters. Immatures are more mobile and many travel up the West Coast as far as Angola.
Neotis denhami	Denham's Bustard	VU	NT	It inhabits grasslands, grassy *Acacia*-studded dunes, fairly dense shrubland, light woodland, farmland, crops, dried marsh and arid scrub plains, also grass-covered ironstone pans and burnt savanna woodland in Sierra Leone and high rainfall sour grassveld, planted pastures and cereal croplands in fynbos in South Africa.
Numenius arquata	Eurasian Curlew	NT	NT	Within the region the species is concentrated along the west coast between Langebaan Lagoon to the Berg River mouth and then along the southern coast extending into the Eastern Cape Province. In the region most of the population is concentrated at coastal lagoon and on muddy flats, but they also inhabit open sandy beaches, rocky shores that have many rock pools and mangrove swamps.
Oxyura maccoa	Maccoa duck	NT	EN	Prefers permanent wetlands that have rich concentrations of bottom-dwelling (benthic) invertebrates.
Phalacrocorax capensis	Cape Cormorant	EN	EN	The Cape Cormorant is found on the coast and at sea mainly in inshore waters, but also offshore (<50 km from the coast). It breeds mainly on islands and islets, but also on rocky outcrops of the mainland, including cliffs or boulders. Cape Cormorants forage at sea on small pelagic fish, mainly Cape Anchovy *E. encrasicolis*, South African Sardine *S. sagax* and Horse Mackerel *Trachurus trachurus*.

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Phoeniconaias minor	Lesser Flamingo	NT	NT	Primarily inhabits shallow aquatic environments such as lagoons, saline or alkaline lakes, estuaries, and mudflats. These habitats are typically characterized by high salinity or extreme alkalinity, with recorded pH levels reaching up to 11
Phoenicopterus roseus	Greater Flamingo	NT	LC	Primarily inhabits shallow aquatic environments such as lagoons, saline or alkaline lakes, estuaries, and mudflats. These habitats are typically characterized by high salinity or extreme alkalinity, with recorded pH levels reaching up to 11
Polemaetus bellicosus	Martial eagle	EN	EN	Occupies a range of habitats, including open woodlands, wooded savannas, bushy grasslands, thornbush areas, and, in southern Africa, more open landscapes and even semi-desert regions evidence indicating a strong preference for habitats that are less disturbed by human activity
Procellaria aequinoctialis	White-chinned Petrel	VU	VU	The White-chinned Petrel is a colonial nesting species that breeds on an annual basis with the breeding season extending from October to May. It forages day and night, feeding mainly by surface-seizing, but is also capable of diving to depths of approximately 16 m. The diet in South African continental waters comprises mainly of offal from trawlers, small fish, mantis shrimps Squilla armata, cuttlefish Sepia spp. and other cephalopods. The species is attracted to fishing activity.
Spheniscus demersus	African Penguin	EN	EN	African Penguins forage for small pelagic fish (predominantly sardine and anchovy) in inshore waters, usually within 15 km of the coast and can travel up to 50 km from colonies while breeding. Outside of the breeding season, they can move further offshore, especially when foraging on the Agulhas Bank off the south coast of South Africa. Juveniles are typically far-ranging and can move up to 1800 km from their natal colony, although they tend to recruit to natal colonies.
Stercorarius antarcticus	Brown Skua	EN	LC	Skuas are present throughout the year on the trawling grounds off the Western Cape although the species is more abundant during the winter months (Sinclair 1980, Crawford et al. 1991).

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Sterna dougallii	Roseate Tern	EN	LC	The species nests in various habitats including sand dunes, sand spits, shingle beaches, reefs, saltmarshes, and rocky, sandy, or coral islands. It prefers densely vegetated sites in temperate regions but opts for sparsely vegetated sites in tropical areas. Additionally, it favours nest sites near clear, shallow, sandy fishing grounds, particularly in tidal bays and sheltered inshore waters. Low rocky headlands, and less often beaches and sandbanks, are preferred as roosting sites.
Turnix hottentottus	Fynbos Buttonquail	EN	EN	The species has specific habitat requirements, favouring early-successional Fynbos 2 – 5 years post-fire, characterized by sparse vegetation and low grass cover. It avoids dense, overgrown habitats and transformed landscapes. The Fynbos Buttonquail is generally solitary but may be seen in pairs during the early to mid-summer breeding season. It is cryptic and difficult to detect due to its unobtrusive behaviour and camouflage. Recent research highlights its preference for early-successional Fynbos, typically two to five years post-fire, avoiding both recently burnt and moribund veld. The species is associated with habitats that have low vegetation cover and gentle slopes, primarily in mountain and coastal Fynbos.
Aonyx capensis	Cape clawless otter	NT	NT	Cape Clawless Otters are predominantly aquatic and seldom found far from permanent water. Fresh water is an essential habitat requirement, not only for drinking but also for rinsing their fur. As otters do not have a subcutaneous layer of fat like most other aquatic mammals, they rely on their dense fur for thermoregulation. Thus, rinsing their fur in freshwater followed by rolling in sand, grass or reeds helps them cleanse their fur and restore the thermoregulatory properties. Generally, they will only occur in marine habitats provided there is access to fresh water (coastal rivers or estuaries) and rocky shores are preferred for foraging, and otter activity is often found near thick vegetation, abundant food supply and fresh water.

Scientific name	Common Name	National Red List Status	IUCN Status	Habitat Preferences
Chlorotalpa duthieae	Duthie's Golden Mole	VU	VU	Occurs on alluvial sands and sandy loams in Southern Cape Afrotemperate forests (especially coastal platform and scarp forest patches) in the Fynbos and Moist Savanna biomes. Coexists with *Amblysomus corriae* in parts of their range, but trapping data suggest that *A. c. corriae* prefers fynbos and forest fringes, and *C. duthieae* deeper forest. Thrives in cultivated areas and gardens.
Pelea capreolus	Grey Rhebok	NT	NT	Grey Rhebok are associated with rocky hills, grassy mountain slopes, and plateau grasslands in the eastern extent of their distribution. In the south and southwest, their distribution is associated with the rocky hills of mountain fynbos and the little Karoo.
Philantomba monticola	Blue Duiker	VU	LC	Across the continent, Blue Duikers exist in a wide range of forested and wooded habitats, including primary and secondary forests, gallery forests, dry forest patches, coastal scrub farmland and regenerating forest. Within the assessment region, they occur mainly within scarp and coastal forests, thickets or dense coastal bush, although they can occupy modified habitats. They frequent forest glades and open areas but need dense underbrush to rest or take cover
Aneuryphymus montanus	**yellow-winged agile grasshopper**	VU	VU	A. montanus is associated with fynbos vegetation, typically found in rocky foothills among partly burnt stands of evergreen sclerophyllous plants. It shows a preference for south-facing slopes, which offer cooler microclimatic conditions. These habitat preferences indicate adaptation to fire-influenced, temperate environments with specific topographical exposures.

A total of 68 animal species, comprising 371 individual organisms, were recorded during the field assessment. Of these, 48 species were invertebrates, including 46 insect species and two arachnid species (Table 4.3), while 20 species were vertebrates, consisting of three reptile species, 15 bird species, and two mammal species (Table 4.4). Each vertebrate species was assigned a conservation status based on the SANBI National Red List of South African Species. Invertebrate taxa were identified to Order level, and therefore no conservation status was assigned. Where applicable, alien species were identified according to their classification under the NEMBA Alien and Invasive Species List.

Only one of these SCC identified during the desktop study, the Cape Cormorant (*Phalacrocorax capensis*), were observed during the field survey, although not directly within the study area, but flying past on the seaward side of the study site during a stationary bird count. Among the surveyed areas, Phase 4 supported the highest overall species richness with 51 species, followed by Phase6 (43 species), and Phase 2 (14 species) (Table 4.5). When standardised by area, Phase 2 exhibited the highest species density with 0.009 species/m^2, followed by both Phase 4, and Phase 6 (0.008 species/m^2) (Table 4.5). Phase 6 recorded the highest number of animal encounters per unit area

(0.033 animals/m^2), followed by Phase 2 (0.025 animals/m^2), and Phase 4 (0.023 animals/m^2) (Table 4.5).

Table 4.3. The invertebrates recorded on-site during the field assessment, including the order name, number of species encountered within each order and number of individuals encounter for each order

Order	No of species	Number of individuals
Coleoptera	11	51
Hemiptera	10	54
Trichoptera	1	3
Hymenoptera	7	34
Diptera	11	62
Lepidoptera	4	9
Psocodea	1	1
Aranea	2	4

Table 4.4. Vertebrate species recorded on-site during the field assessment, including the scientific name, common name and number of individuals encountered, along with each species' conservation status (as per the national Red List category by SANBI (2020)), or invasion status (under NEMBA), where applicable. Red list categories are as follows: EN = Endangered; NT=Near Threatened; LC = Least Concern. No conservation status was given if an animal could not be identified to species level).

Species	Common Name	National Red List Status	IUCN Status	Number of individuals encountered
Agama atra	Southern Rock Agama	LC	LC	9
Apus affinis	Little Swift	LC	LC	10
Ardea brachyrhyncha	Yellow-billed egret	NT	LC	1
Bitis arietans	Puff adder	LC	LC	1
Cinnyris chalybeus	Southern double-collared sunbird	LC	LC	1
Columba guinea	Speckled Pigeon	LC	LC	2
Corvus albus	Pied Crow	LC	LC	1
Falco rupicolus	Rock kestral	LC	LC	2
Haematopus moquini	African oystercatcher	LC	LC	16
Lanius collaris	Southern Fiscal	LC	LC	2
Larus dominicanus	Kelp gull	LC	LC	46
Motacilla capensis	Cape Wagtail	LC	LC	10
Otomys irroratus	Southern African Vlei Rat	LC	LC	4
Passer melanurus	Cape Sparrow	LC	LC	14
Phalacrocorax capensis	Cape Cormorant	EN	EN	1
Phalacrocorax lucidus	White-breasted cormorant	LC	LC	1
Rhabdomys pumilio	Cape Striped field Mouse	LC	LC	11
Spilopelia senegalensis	Laughing Dove	LC	LC	6
Sturnus vulgaris	Common starling	LC	LC	6
Trachylepis capensis	Cape Skink	LC	LC	6

Table 4.5. The animal and species encounter rate for the three phases. The size, total number of species, number of animals, species per m^2, and animals per m^2 is given for each of the four phases

Phases	Size (m^2)	Total number of species	Total number of animals	Species per m^2	Animals per m^2
Phase 2	1474	14	37	0,009	0,025
Phase 4	6347	51	146	0,008	0,023
Phase 6	5622	43	188	0,008	0,033

4.7 FLORA

No plant SCC were flagged by the DFFE screening tool. However, 42 SCC were identified through a desktop review of online biodiversity databases, which included the GBIF (GBIF.org,c) and iNaturalist (*iNaturalist*). These species, along with their, national Red List classification (*Red List of South African Plants* produced by SANBI), and habitat requirements, are presented in Table 4.6.

Table 4.6. Flora SCC potentially occurring within the proposed dune stabilization area. The table includes scientific and common names, national Red List status, and associated habitat requirements for each species. Some species have been indicated only as "Sensitive Species" due to their protection status. Habitat information and red list status for all flora was sourced from (*National Assessment: Red List of South African Plants*).

Species	Common Name	National Red list Status	Habitat
Agathosma eriantha	Rigid Buchu	VU	The species occurs within Blombos Strandveld, Overberg Dune Strandveld, Central Ruens Shale Renosterveld, Ruens Silcrete Renosterveld, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Albertinia Sand Fynbos, and Hartenbos Dune Thicket. It inhabits coastal flats at or near sea level, where it grows in dry, fine-textured clay soils interspersed with limestone fragments. These environments are typically characterized by low nutrient availability, periodic drought, and exposure to coastal winds, supporting a mosaic of strandveld and limestone fynbos vegetation influenced by edaphic variation and fire disturbance regimes.
Agathosma muirii	Heart Buchu	VU	*A. muirii* occurs within Canca Limestone Fynbos, Albertinia Sand Fynbos, Hartenbos Dune Thicket, and Goukamma Dune Thicket. It is typically found on deep, well-drained sandy soils of coastal dune systems associated with underlying limestone formations. These habitats are characterized by nutrient-poor, calcareous substrates, exposure to maritime climatic influences, and vegetation mosaics shaped by fire and aeolian activity. The species is adapted to the coastal foreland environment of the southern Cape, where it contributes to the structural diversity of dune fynbos and thicket communities.

Species	Common Name	National Red list Status	Habitat
Aspalathus obtusifolia		VU	*A. obtusifolia* occurs within Albertinia Sand Fynbos and Hartenbos Dune Thicket. It inhabits lowland fynbos environments on fine-grained, dark (black) soils, typically derived from coastal or alluvial deposits, at elevations up to approximately 130 m above sea level. These habitats are characterised by nutrient-poor substrates, moderate drainage, and vegetation structure influenced by fire and edaphic gradients within the southern Cape coastal landscape.
Asparagus lignosus	Fire Asparagus	NT	*A. lignosus* exhibits a broad ecological range, occurring across numerous vegetation types including Saldanha Flats Strandveld, Cape Flats Sand Fynbos, Cape Flats Dune Strandveld, Langebaan Dune Strandveld, Swartland Shale Renosterveld, Swartland Silcrete Renosterveld, Overberg Sandstone Fynbos, Kogelberg Sandstone Fynbos, De Hoop Limestone Fynbos, Swartland Granite Renosterveld, Hangklip Sand Fynbos, Peninsula Sandstone Fynbos, Atlantis Sand Fynbos, Hopefield Sand Fynbos, Leipoldtville Sand Fynbos, Peninsula Granite Fynbos, Saldanha Granite Strandveld, Eastern Ruens Shale Renosterveld, Saldanha Limestone Strandveld, Hartenbos Dune Thicket, Cape Lowland Alluvial Vegetation, Western Coastal Shale Band Vegetation, Swellendam Silcrete Fynbos, Klawer Sandy Shrubland, Namaqualand Spinescent Grassland, Vanrhynsdorp Gannabosveld, Overberg Dune Strandveld, Agulhas Sand Fynbos, Albertinia Sand Fynbos, Potberg Sandstone Fynbos, Potberg Ferricrete Fynbos, Peninsula Shale Renosterveld, Peninsula Shale Fynbos, Agulhas Limestone Fynbos, Lambert's Bay Strandveld, Canca Limestone Fynbos, Mossel Bay Shale Renosterveld, Gamka Valley Thicket, Namaqualand Strandveld, Swartland Alluvium Renosterveld, Western Ruens Shale Renosterveld, Ruens Silcrete Renosterveld, and Elim Ferricrete Fynbos. The species typically inhabits coastal flats and rocky lower slopes, favouring well-drained sandy or gravelly soils derived from a range of geological substrates including sandstone, shale, limestone, granite, and ferricrete. *A. lignosus* is well adapted to the semi-arid to Mediterranean-type climates of the southwestern and southern Cape, occupying habitats influenced by periodic fire, coastal winds, and edaphic variability across both fynbos and strandveld vegetation mosaics.
Carpobrotus muirii	Lime Sourfig	NT	*C. muirii* occurs within Canca Limestone Fynbos, De Hoop Limestone Fynbos, Albertinia Sand Fynbos, and Hartenbos Dune Thicket. It is typically found in lowland coastal habitats, primarily within 10 km of the shoreline. The species favours calcareous and sandy soils derived from limestone formations and coastal dune systems. These environments are characterised by high light intensity, exposure to salt-laden winds, and well-drained substrates,

Species	Common Name	National Red list Status	Habitat
			supporting a mosaic of dune thicket and limestone fynbos vegetation.
Cullumia carlinoides	Limestone Snakethistle	NT	*C. carlinoides* occurs within Groot Brak Dune Strandveld, Blombos Strandveld, North Swartberg Sandstone Fynbos, Canca Limestone Fynbos, Garden Route Granite Fynbos, Albertinia Sand Fynbos, Knysna Sand Fynbos, Hartenbos Dune Thicket, and Goukamma Dune Thicket. It is primarily associated with coastal limestone fynbos, typically occupying well-drained calcareous soils on low-lying coastal slopes and dunes. These habitats are characterised by nutrient-poor substrates, exposure to maritime climatic influences, and vegetation communities shaped by periodic fire and aeolian processes.
Diosma aristata	Fine Bitterbuchu	CR	*D. aristata* is restricted to Hartenbos Dune Thicket, where it typically occurs in coastal fynbos habitats. It grows in deep, well-drained sandy soils or among rocky outcrops within the coastal forelands. These environments are characterised by nutrient-poor, aeolian-derived substrates and are subject to maritime climatic influences and periodic fire events that maintain the open fynbos–thicket mosaic.
Disa hallackii	Bluetongue Disa	EN	*D. hallackii* occurs across a range of coastal and lowland habitats, including Overberg Dune Strandveld, Agulhas Limestone Fynbos, Garden Route Granite Fynbos, Hangklip Sand Fynbos, Cape Flats Sand Fynbos, Atlantis Sand Fynbos, Knysna Sand Fynbos, St Francis Dune Thicket, Hartenbos Dune Thicket, and Goukamma Dune Thicket. It inhabits lowland sandy flats, stabilised coastal dunes, and rocky promontories, typically within close proximity to the shoreline. The species favours well-drained, nutrient-poor soils derived from calcareous or siliceous sands and occurs in vegetation shaped by maritime climatic influences, periodic disturbance, and fire dynamics.
Disa lugens lugens	Blue Bonnet Disa	VU	*D. lugens lugens* are associated with Amathole Montane Grassland, Cape Flats Dune Strandveld, Algoa Sandstone Fynbos, Kouga Grassy Sandstone Fynbos, Kouga Sandstone Fynbos, South Kammanassie Sandstone Fynbos, Tsitsikamma Sandstone Fynbos, South Langeberg Sandstone Fynbos, North Langeberg Sandstone Fynbos, Overberg Sandstone Fynbos, Suurberg Quartzite Fynbos, Albertinia Sand Fynbos, Cape Flats Sand Fynbos, Atlantis Sand Fynbos, Hartenbos Dune Thicket It is localised on coastal sand flats and dry mountain sides and can be found in fynbos and grassland at an altitude ranging from near sea level to 1500m.

Species	Common Name	National Red list Status	Habitat
Drosanthemum lavisii	Scarlet Dewfig	EN	*D. lavisii* occurs within Western Little Karoo, Montagu Shale Renosterveld, Eastern Ruens Shale Renosterveld, Western Ruens Shale Renosterveld, Potberg Sandstone Fynbos, South Langeberg Sandstone Fynbos, North Langeberg Sandstone Fynbos, Canca Limestone Fynbos, Potberg Ferricrete Fynbos, Cape Lowland Alluvial Vegetation, and Hartenbos Dune Thicket. It typically inhabits ecotonal zones between fynbos and renosterveld vegetation at elevations of approximately 150–200 m above sea level. The species favours well-drained, fine-textured soils derived from shale, sandstone, or limestone substrates, within semi-arid to sub-Mediterranean climates were fire and soil composition influence vegetation structure and species composition.
Erica dispar	Stillbay Minor Heath	NT	The primary vegetation types supporting *E. dispar* include Blombos Strandveld (coastal dune vegetation with sandy soils and succulent elements), Overberg Dune Strandveld (similar dune systems with fynbos-shrubland transitions), Canca Limestone Fynbos (limestone-derived soils supporting diverse ericoid shrubs), De Hoop Limestone Fynbos (calcareous substrates with high endemism), Albertinia Sand Fynbos (quartzitic sandy plains with proteoid and restioid components), and Hartenbos Dune Thicket (dense thicket formations on stabilized dunes). These habitats are part of the greater Cape Floristic Region, a global biodiversity hotspot, where E. dispar typically occurs at elevations below 200 m above sea level. The species is adapted to periodic fire regimes, regenerating from seed banks in post-fire environments, but faces ongoing threats from habitat fragmentation due to urban expansion, agriculture, and invasive alien species.
Erica unicolor mutica	Two Onecolour Heath	EN	*E. unicolor mutica* exhibits a preference for lowland elevations and lower-slope positions, occurring on both south-facing and north-facing slopes. This distribution across opposing aspects suggests the species possesses broad ecological tolerance for solar radiation and moisture regimes. The taxon colonizes areas transitional between true fynbos communities and dune thicket formations, indicating adaptation to variable substrate conditions and moisture availability. This subspecies inhabits multiple distinct edaphic and topographic fynbos communities across the southern Cape region of South Africa. The species occupies the following phytosociological units: South Outeniqua Sandstone Fynbos, South Langeberg Sandstone Fynbos, Garden Route Shale Fynbos, Garden Route Granite Fynbos, Swellendam Silcrete Fynbos, and Hartenbos Dune Thicket.

Species	Common Name	National Red list Status	Habitat
Eriospermum vermiforme		EN	*E. vermiforme* an endemic tuberous monocotyledon in the Ruscaceae family native to the Western Cape province of South Africa, inhabits a narrow coastal range from the Gourits River to the Great Brak River, occurring on lower slopes or flats in sandy, well-drained soils amidst low bushes under a Mediterranean climate with winter rainfall. This endangered species is primarily associated with Garden Route Shale Fynbos and Hartenbos Dune Thicket vegetation types within the biodiverse Cape Floristic Region, at low elevations in the Mossel Bay area where nutrient-poor substrates and periodic disturbances shape the ecosystem. Facing ongoing threats from habitat loss due to agriculture, coastal development, quarrying, and invasive alien species, *E. vermiforme* exhibits a decreasing population trend across its four known locations, with an extent of occurrence less than 2,500 km^2.
Euchaetis albertiniana	Albertinia Beardbuchu	EN	*E. albertiniana* occurs within Canca Limestone Fynbos, Garden Route Granite Fynbos, Albertinia Sand Fynbos, Hartenbos Dune Thicket It grows in coastal sands and limestones.
Freesia leichtlinii alba	White Kammetjie	NT	*F. leichtlinii* subsp. *alba*, a cormous geophyte in the Iridaceae family endemic to the southern Cape Provinces of South Africa, occupies a limited coastal distribution from Still Bay to Plettenberg Bay, spanning sandy coastal dunes, flats, and limestone fynbos ecosystems, often in rocky microhabitats under a Mediterranean climate with winter rainfall and dry summers. This near-threatened species is associated with specific vegetation types including Groot Brak Dune Strandveld, Blombos Strandveld, Canca Limestone Fynbos, Knysna Sand Fynbos, Cape Seashore Vegetation, Hartenbos Dune Thicket, and Goukamma Dune Thicket, all within the biodiversity-rich Cape Floristic Region where well-drained, nutrient-poor soils prevail. Adapted to periodic disturbances, *F. leichtlinii* subsp. *alba* faces ongoing threats from habitat fragmentation due to coastal development, agriculture, and invasive species, contributing to its declining populations.

Species	Common Name	National Red list Status	Habitat
Gladiolus vaginatus	White Afrikaner	VU	*G. vaginatus,* a cormous geophyte in the Iridaceae family endemic to the southwestern and south-southwestern Cape Provinces of South Africa, inhabits coastal lowlands from the Agulhas Plain to the Garden Route, thriving on limestone and clay loam soils within fynbos and renosterveld vegetation under a Mediterranean climate characterized by winter rainfall and dry summers. This vulnerable species is associated with diverse vegetation types including Mossel Bay Shale Renosterveld, Central Ruens Shale Renosterveld, Western Ruens Shale Renosterveld, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, Garden Route Granite Fynbos, Elim Ferricrete Fynbos, Albertinia Sand Fynbos, Agulhas Sand Fynbos, Hangklip Sand Fynbos, Knysna Sand Fynbos, Hartenbos Dune Thicket, and Goukamma Dune Thicket, all part of the Cape Floristic Region's nutrient-poor, fire-prone ecosystems. Once common but now reduced to isolated subpopulations due to extensive habitat loss, *G. vaginatus* faces ongoing threats from agricultural expansion, urban development, and invasive species, leading to its declining status.
Gnidia chrysophylla	Gold Capesaffron	NT	*G. chrysophylla*, a shrubby perennial in the Thymelaeaceae family endemic to the Cape Provinces of South Africa, inhabits coastal flats from Kleinmond to Knysna, thriving in sandy, well-drained soils within fynbos and related ecosystems under a Mediterranean climate with winter rainfall and dry summers. This near-threatened species is associated with diverse vegetation types including Overberg Sandstone Fynbos, Hartenbos Dune Thicket, Knysna Sand Fynbos, Hangklip Sand Fynbos, Albertinia Sand Fynbos, Garden Route Granite Fynbos, De Hoop Limestone Fynbos, Goukamma Dune Thicket, Kogelberg Sandstone Fynbos, Groot Brak Dune Strandveld, North Langeberg Sandstone Fynbos, Potberg Sandstone Fynbos, South Outeniqua Sandstone Fynbos, North Hex Sandstone Fynbos, Central Ruens Shale Renosterveld, Overberg Dune Strandveld, and Canca Limestone Fynbos, all within the fire-prone Cape Floristic Region. Adapted to periodic disturbances, *G. chrysophylla* faces population declines due to habitat degradation from urban expansion, agriculture, and invasive species.

Species	Common Name	National Red list Status	Habitat
Heliophila linearis reticulata	Hairy Needle Sunspurge	VU	*H. linearis* var. *reticulata*, a perennial herb in the Brassicaceae family endemic to the Western Cape province of South Africa, inhabits sandy coastal flats from Hawston to Stillbay, thriving in well-drained, nutrient-poor substrates under a Mediterranean climate with winter rainfall and dry summers. This vulnerable species is primarily associated with vegetation types including Blombos Strandveld, Overberg Dune Strandveld, and Hartenbos Dune Thicket within the Cape Floristic Region's fire-adapted ecosystems, where it occurs in open, lowland areas. Adapted to periodic disturbances, *H. linearis* var. *reticulata* faces ongoing threats from habitat loss due to coastal development, agriculture, and invasive species, leading to population declines.
Hermannia lavandulifolia	Lavender Dollsrose	VU	*H. lavandulifolia* occur within the following vegetation types: Groot Brak Dune Strandveld, Overberg Dune Strandveld, Breede Shale Renosterveld, Montagu Shale Renosterveld, Mossel Bay Shale Renosterveld, Eastern Ruens Shale Renosterveld, Central Ruens Shale Renosterveld, Western Ruens Shale Renosterveld, Hartenbos Dune Thicket, Gouritz Valley Thicket, Goukamma Dune Thicket, Gamka Valley Thicket It occurs on clay slopes in renosterveld and valley thicket.
Hypodiscus procurrens	running pineapplereed	NT	*H. lavandulifolia*, a shrubby perennial in the Malvaceae family endemic to the Western Cape province of South Africa, occupies coastal lowlands from the Overberg region eastward to Mossel Bay and beyond, thriving on clay slopes, sandy substrates, and rocky areas within renosterveld, fynbos, and thicket ecosystems under a Mediterranean climate featuring winter rainfall and dry summers. This vulnerable species is primarily associated with vegetation types including Overberg Dune Strandveld, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, Agulhas Sand Fynbos, and Hartenbos Dune Thicket, all part of the biodiverse Cape Floristic Region where nutrient-poor soils and periodic fire regimes prevail. Adapted to such disturbance-prone habitats, *H. lavandulifolia* faces significant threats from historical and ongoing habitat loss due to crop cultivation, coastal development, and competition from invasive alien plants, resulting in a decreasing population trend across its range.

Species	Common Name	National Red list Status	Habitat
Jamesbrittenia calciphila	Lime Jaybee	NT	*J. calciphila*, a shrubby perennial in the Scrophulariaceae family endemic to the Western Cape province of South Africa, inhabits limestone outcrops, steep rocky slopes, ridges, and cliffs, often in rocky crevices at elevations never exceeding 200 m above sea level, under a Mediterranean climate with winter rainfall and dry summers. This near-threatened species is primarily associated with vegetation types including Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, and Hartenbos Dune Thicket within the biodiverse Cape Floristic Region, where nutrient-poor, calcareous substrates and periodic fire regimes prevail. Adapted to such specialized, disturbance-prone habitats, *J. calciphila* faces ongoing threats from habitat degradation due to agricultural activities, urban development, and invasive species, contributing to its declining populations.
Lachenalia sessiliflora	Limestone Viooltjie	VU	*L. sessiliflora*, an endemic bulbous geophyte in the Hyacinthaceae family from the Western Cape, South Africa, inhabits a restricted coastal lowland range from Bredasdorp to Stillbay, occurring on limestone hills and flats in well-drained, nutrient-poor soils under a Mediterranean climate with winter rainfall and dry summers. This species is associated with specific vegetation types including Overberg Dune Strandveld, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, and Hartenbos Dune Thicket, all within the fire-prone Cape Floristic Region. With unknown pollinators and local seed dispersal through splitting mature fruits, *L. sessiliflora* faces threats from invasive alien species and coastal development, contributing to its vulnerable conservation status and declining population trend.
Lampranthus ceriseus	Cerise Brightfig	VU	*L. ceriseus*, a succulent subshrub in the Aizoaceae family endemic to the Western Cape province of South Africa, inhabits coastal lowlands from the Agulhas Plain to Riversdale, thriving in coastal limestone fynbos on nutrient-poor, calcareous substrates under a Mediterranean climate with winter rainfall and dry summers. This vulnerable species is associated with vegetation types including Overberg Dune Strandveld, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, Albertinia Sand Fynbos, Agulhas Sand Fynbos, and Hartenbos Dune Thicket, all within the fire-prone Cape Floristic Region. Adapted to periodic disturbances, *L. ceriseus* faces severe ongoing threats from agriculture, coastal development, and invasive alien species, leading to a decreasing population trend across fewer than 10 locations and an extent of occurrence under 8000 km^2.

Species	Common Name	National Red list Status	Habitat
Lampranthus diutinus		EN	*L. diutinus*, a succulent subshrub in the Aizoaceae family endemic to the Western Cape province of South Africa, inhabits coastal sands from Mossel Bay to Riversdale, thriving in terrestrial coastal sands under a Mediterranean climate with winter rainfall and dry summers. This endangered species is associated with vegetation types including Albertinia Sand Fynbos and Hartenbos Dune Thicket within the fire-prone Cape Floristic Region, where nutrient-poor soils prevail. With an extent of occurrence of 3200 km^2 and five to seven severely fragmented subpopulations, *L. diutinus* faces ongoing threats from coastal development, alien plant invasion, and crop cultivation, leading to a decreasing population trend.
Lampranthus fergusoniae	Limestone Brightfig	VU	*L. fergusoniae*, a succulent subshrub in the Aizoaceae family endemic to the Western Cape province of South Africa, inhabits calcareous soils often associated with limestone dunes in coastal areas from Pearly Beach to Knysna, thriving under a Mediterranean climate with winter rainfall and dry summers. This vulnerable species is associated with vegetation types including Overberg Dune Strandveld, Agulhas Limestone Fynbos, and Hartenbos Dune Thicket within the fire-prone Cape Floristic Region, where nutrient-poor substrates and periodic disturbances prevail. Facing ongoing threats from coastal development, invasive alien species such as *Acacia cyclops*, crop cultivation, and lack of fire due to habitat fragmentation, *L. fergusoniae* exhibits a decreasing population trend.
Lampranthus pauciflorus	Beach Brightfig	EN	*L. pauciflorus* occurs predominantly in coastal dune strandveld and fynbos vegetation types, including Groot Brak, Blombos, Overberg, and Garden Route Granite Fynbos, as well as in southern Afrotemperate Forest and dune thicket communities such as Hartenbos and Goukamma. It is typically found on rocky coastal slopes and clay-rich hills, indicating a preference for well-drained, heterogeneous substrates in coastal environments. This distribution highlights the species' adaptability to diverse edaphic conditions within a coastal to subcoastal ecological gradient.
Leucadendron galpinii	Hairless Conebush	EN	*L. galpinii* occurs within a mosaic of Canca Limestone Fynbos, De Hoop Limestone Fynbos, Albertinia Sand Fynbos, Agulhas Sand Fynbos, Swellendam Silcrete Fynbos, and Hartenbos Dune Thicket. It inhabits low-lying areas situated between limestone ridges, predominantly on deeper, moderately neutral soils.

Species	Common Name	National Red list Status	Habitat
Leucadendron meridianum		NT	*L. meridianum* is primarily found on limestone flats near the coast at elevations ranging from 0 to 200 meters, within diverse vegetation types including Blombos Strandveld, Overberg Dune Strandveld, Potberg Sandstone Fynbos, and several limestone and sand fynbos units, as well as Hartenbos Dune Thicket. The species is fire-adapted, with mature plants being killed by fire while seeds survive, stored in fire-resistant inflorescences and dispersed by wind following fires. It is dioecious, having separate male and female plants with insect-pollinated flowers.
Leucospermum praecox	Mossel Bay Pincushion	VU	*L. praecox* is restricted to Canca Limestone Fynbos, Albertinia Sand Fynbos, and Hartenbos Dune Thicket. It occurs on tertiary acid sands derived from limestone formations within the coastal forelands. The species grows in nutrient-poor, well-drained soils typically associated with lowland fynbos habitats.
Metalasia erectifolia		NT	*M. erectifolia* occurs across a range of lowland habitat types, including Overberg Dune Strandveld, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, Garden Route Granite Fynbos, Agulhas Sand Fynbos, Hartenbos Dune Thicket, and Goukamma Dune Thicket. It typically occupies limestone- and shale-derived hills within transitional ecotones between calcareous and siliceous substrates, generally below 500 m above sea level. The species is associated with nutrient-poor, well-drained soils characteristic of coastal foreland systems, and often occurs in structurally diverse shrubland mosaics influenced by edaphic variation and fire regimes.
Moraea australis	Southern Glasstulp	NT	*M. australis* is associated with coastal dune ecosystems, occurring within Groot Brak Dune Strandveld, Southern Cape Dune Fynbos, St Francis Dune Thicket, and Hartenbos Dune Thicket. It inhabits sandy, well-drained calcareous or acidic dune soils along the coastal forelands. These habitats are typically characterized by dynamic aeolian processes, exposure to salt-laden winds, and vegetation mosaics shaped by disturbance, particularly wind and fire.

Species	Common Name	National Red list Status	Habitat
Muraltia knysnaensis	Knysna Butterflybush	EN	*M. knysnaensis* occurs across a diverse range of lowland and montane vegetation types, including Southern Afrotemperate Forest, South Outeniqua Sandstone Fynbos, North Langeberg Sandstone Fynbos, Garden Route Shale Fynbos, Albertinia Sand Fynbos, Southern Cape Dune Fynbos, Knysna Sand Fynbos, Hartenbos Dune Thicket, and Goukamma Dune Thicket. It typically occupies fynbos vegetation on dry, well-drained flats and gently undulating hills. The species is adapted to nutrient-poor, acidic sandy or shale-derived soils, often occurring along ecotonal transitions between fynbos and dune thicket or forest margins. Its distribution spans both coastal and lower montane landscapes within the southern Cape, where fire plays a key role in shaping vegetation structure and dynamics.
Nanobubon hypogaeum	Rubber-Root Firecarrot	EN	*N. hypogaeum* occurs within Knysna Sand Fynbos, Hartenbos Dune Thicket, and Goukamma Dune Thicket. It is restricted to sandy coastal fynbos habitats, typically on deep, well-drained aeolian sands along the southern Cape coastal forelands. These environments are characterized by nutrient-poor soils, exposure to maritime climatic influences, and vegetation dynamics strongly governed by fire and dune-driven ecological processes.
Polygala pubiflora	Hairyflower Falsepea	VU	*P. pubiflora* occurs within Mossel Bay Shale Renosterveld, Eastern Ruens Shale Renosterveld, North Langeberg Sandstone Fynbos, Garden Route Granite Fynbos, Swellendam Silcrete Fynbos, and Hartenbos Dune Thicket. It is typically found on rocky outcrops and exposed slopes derived from shale, limestone, sandstone or silcrete substrates. The species favours shallow, well-drained soils on rugged, rocky terrain within lowland to lower montane fynbos–renosterveld ecotones. These habitats are characterised by high levels of microhabitat heterogeneity, edaphic variability, and fire-driven vegetation dynamics.
Protea susannae	Stinkleaf Sugarbush	NT	*P. susannae* inhabits a variety of fynbos and strandveld vegetation types in the Cape Floristic Region, including Blombos Strandveld, Overberg Dune Strandveld, Potberg Sandstone Fynbos, North Langeberg Sandstone Fynbos, Overberg Sandstone Fynbos, Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, Elim Ferricrete Fynbos, Albertinia Sand Fynbos, Agulhas Sand Fynbos, and Hartenbos Dune Thicket. This species is adapted to bottomland environments between limestone hills, thriving on deeper calcareous and neutral sandy soils at elevations of 20–200 meters.

Species	Common Name	National Red list Status	Habitat
Ruschia leptocalyx		EN	*R. leptocalyx* is found in habitats characterized by gravelly quartzitic and shale outcrops, occurring within Mossel Bay Shale Renosterveld, Potberg Ferricrete Fynbos, and Hartenbos Dune Thicket vegetation types. These substrates provide well-drained, nutrient-poor conditions suited to the species' adaptation. The species is typically associated with rocky outcrops that influence local microhabitats within these South African floristic regions.
Selago glandulosa		VU	*S. glandulosa* occurs primarily in coastal dune systems and on limestone hills and outcrops within Canca Limestone Fynbos, De Hoop Limestone Fynbos, and Hartenbos Dune Thicket vegetation types. It is adapted to these calcareous and sandy environments, where soil drainage and substrate composition influence its distribution. The species occupies niches characterized by exposed, rocky terrain and dynamic coastal processes.
Selago villicaulis	Dune Bitterbush	VU	This species is primarily found in Hartenbos Dune Thicket and Goukamma Dune Thicket habitats, which consist of fixed dune systems reaching elevations of up to 150 meters. These stable dune environments provide sandy, well-drained substrates that support dense thicket vegetation. The species is adapted to coastal dune ecology within these specific floristic regions.
Thamnochortus muirii		VU	*T. muirii* occurs in deep sandy habitats associated with limestone substrates, typically at elevations between 30 and 200 meters. Its distribution includes Canca Limestone Fynbos, De Hoop Limestone Fynbos, Agulhas Limestone Fynbos, and Hartenbos Dune Thicket. The species is adapted to these well-drained, calcareous soils within a coastal to subcoastal ecological gradient.
Tulista kingiana		EN	*T. kingiana* inhabits diverse vegetation types including Mossel Bay Shale Renosterveld, North Langeberg Sandstone Fynbos, Garden Route Granite Fynbos, and Hartenbos Dune Thicket. It is typically found in renosterveld and sparse grassland environments within valley bushveld ecosystems. These habitats provide open, well-drained conditions suited to the species' growth and survival.

A total of 27 plant species were recorded during the field assessment (Table 4.7). Seven of these species were classified as Alien or Invasive Alien Species (IAS), as listed in the Alien and Invasive Species List, 2020 (GN R1003 of GG 43726), published under the NEMBA. All recorded species, along with their conservation status (as per SANBI (2020)) or invasion status under NEMBA, are summarised in Table 4.7. None of the species identified in the desktop assessment were observed during the field survey.

Table 4.7. Floral species recorded on-site during the field assessment, including each species' scientific name, common name and conservation status (as per the national Red List category by SANBI (2020)), or invasion status (under NEMBA), where applicable.

species	Common Name	Conservation status under the National Red List Classification (SANBI (2020)) or Invasion Status under NEMBA
Carpobrotus edulis	Edible Sourfig	LC
Arctotheca calendula	Capeweed	LC
Myoporum insulare	Australian Manatoka	Category 3 Invasive
Helichrysum teretifolium	Needle Everlasting	LC
Trifolium repens	White Clover	Alien
Myoporum laetum	New Zealand Manatoka	Category 3 Invasive
Arctotheca prostrata	Prostrate Capeweed	LC
Cotyledon orbiculata	Varkoor	LC
Dimorphotheca fruticosa	Rankbitou	LC
Ipomoea cairica	Mile-a-minute Vine	LC
Malva arborea	Tree Mallow	Alien
Pelargonium capitatum	Kusmalva	LC
Senecio elegans	Red-purple Ragwort	LC
Disphyma crassifolium	Purple Dewplant	LC
Carpobrotus acinaciformis	Elandsvy	LC
Lycium ferocissimum	Snakeberry Honeythorn	LC
Chenopodiastrum murale	Nettle-leaved Goosefoot	Alien
Dasispermum suffruticosum	Dune Celery	LC
Tetragonia decumbens	Kinkelbossie	LC
Mesembryanthemum aitonis	Sea Spinach	LC
Chenolea diffusa	Beach Soutbos	LC
Cynanchum obtusifolium	Roundleaf Buckhorn	LC
Senecio arenarius	Sandveld Ragwort	LC
Thinopyrum distichum	Sea Wheat	LC
Gazania rigens	Trailing Gazania	LC
Lysimachia loeflingii	Blue Scarlet Pimpernel	Alien
Acacia cyclops	Rooikrans	Category 2 Invasive

4.8 Habitat Types

A total of four distinct habitat types were identified within the boundaries of the study site. These include dune vegetation, grass, coastal, and recreational walkway habitats. The spatial distribution of these habitat types in relation to the four proposed project phases is illustrated in Figure 4.7 (Phase 2), Figure 4.8 (Phase 4), and Figure 4.9 (Phase 6).

Figure 4.7. The habitat types associated with phase 2. Yellow represents the coastal habitat, green the dune vegetation and black the recreational walkway.

Figure 4.8. The habitat types associated with phase 4. Yellow represents the coastal habitat, green the dune vegetation, lime green the grass and black the recreational walkway.

Figure 4.9. The habitat types associated with phase 6. Yellow represents the coastal habitat, green the dune vegetation and black the recreational walkway.

The majority of the study site has been transformed for residential and recreational purposes, resulting in substantial alteration of the original natural environment. Consequently, the remaining natural areas are highly fragmented and exhibit varying degrees of ecological degradation. A detailed description of the current condition and ecological characteristics of each identified habitat type is provided below.

- Dune Vegetation: The dune vegetation observed within the study site is characteristic of Cape Seashore Vegetation, consisting primarily of grasses and succulent shrub species, with one or two pioneer species dominating the assemblage. Evidence of anthropogenic disturbance was widespread, as indicated by frequent trampling of vegetation and the presence of invasive alien plant species (Figure 4.10).

Figure 4.10. Dune vegetation present on the study site. The ecological degradation and presence of IAPs is evident.

- Grass: The grass habitat, occurring exclusively within Phase 4, consists predominantly of a sown grass lawn established for recreational purposes. This habitat provides minimal ecological value, as it lacks structural and floristic diversity. Portions of the natural dune vegetation have been removed and replaced with this grass cover, which is also exhibiting encroachment into adjacent dune vegetation (Figure 4.11).

Figure 4.11. Grass found on the study site. The grass was planted for the recreational purposes and is currently cutting into the natural dune vegetation

- Coastal: The coastal habitat refers to the beach and nearshore marine zone bordering the dune vegetation on the ocean-facing side. The high-water mark occurs close to the base of the dunes, delineating the transition between the terrestrial and marine environments (Figure 4.12)

Figure 4.12. The coastal habitat found on site. The coastal habitat is adjacent to the dune vegetation with the high-water mark visible close to the edge of the dune.

- Recreational Walkway: The recreational walkway refers to a constructed pathway designed for use by residents and visitors (Figure 4.13). This structure offers no ecological value and contributes to the fragmentation and isolation of the bordering dune vegetation.

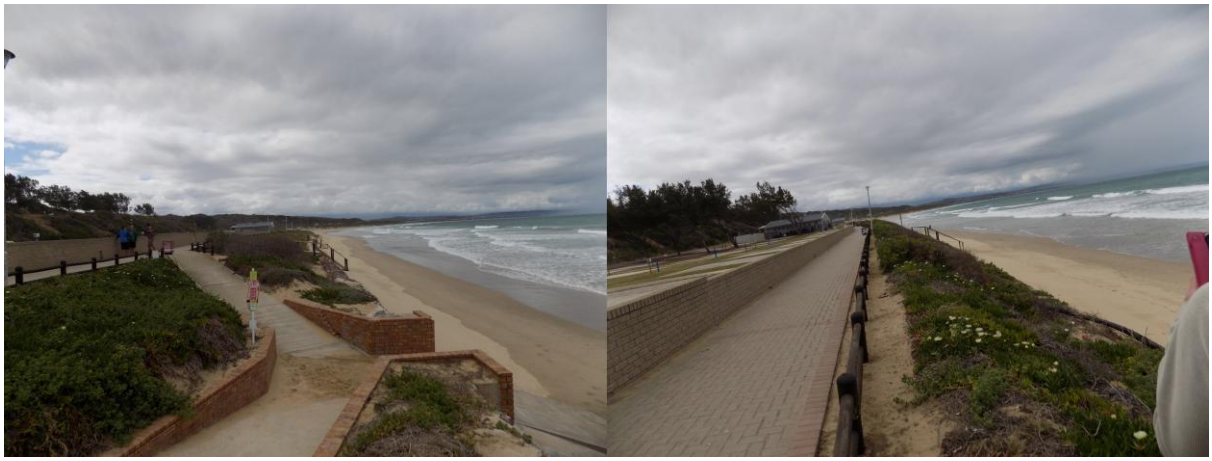

Figure 4.13. The recreational walkways which are present throughout the entire study site. Isolation of the dune vegetation by the recreational walkway and the coastal habitat is evident.

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5 EMPr MITIGATION RECOMMENDATIONS

The mitigation measures that need to be implemented by a development to address potential ecological impacts are guided by the mitigation hierarchy. This is a structured, stepwise approach used in environmental management that consists of five sequential levels: (1) avoidance/prevention, (2) minimisation, (3) rehabilitation/restoration, (4) offsetting, and (5) the no-go option. The preferred approach is to avoid or prevent adverse impacts entirely. However, this is not always feasible due to technical, economic, or spatial constraints. Where avoidance is not practicable, efforts must be made to minimise impacts as far as possible. For example, by reducing the spatial footprint of the development, adjusting the layout to avoid sensitive features, timing activities to avoid critical life stages of species, or implementing low-impact construction methods, among others. If certain impacts remain unavoidable or cannot be sufficiently minimised, the next step in the hierarchy is to rehabilitate or restore the affected areas to their pre-project condition following construction. However, where rehabilitation is not sufficient to fully address significant residual impacts, biodiversity offsetting measures are considered. Offsetting involves implementing conservation actions elsewhere to provide measurable, equivalent ecological gains to compensate for the loss at the development site—such as protecting or restoring similar habitats in a different location. Should all previous mitigation levels fail to adequately address highly significant residual impacts, such as irreversible destruction/ loss of critical ecosystems, the final step, known as the no-go option, is invoked. This entails re-evaluating or relocating the proposed activity to an alternative site to avoid unacceptable environmental degradation.

The proposed project involves the clearing of approximately 1.34 hectares of dune vegetation to facilitate the installation of dune stabilisation interventions. Given the nature and location of the proposed development, complete avoidance of habitat loss is not feasible. However, the existing habitat to be cleared is already degraded, isolated, and heavily influenced by anthropogenic activities. Consequently, it is unlikely to provide suitable ecological conditions for any SCC that may potentially occur in the broader area. The study site primarily supports common species adapted to disturbed or anthropogenically modified environments. Although the habitat is degraded and no SCC were observed, mitigation measures to minimise potential impacts on terrestrial biodiversity are still recommended. Accordingly, mitigation measures recommended for inclusion in the EMPr are provided below to.

5.1 Construction Phase

The construction phase is anticipated to have the greatest direct and indirect impacts on terrestrial biodiversity. Recommended mitigation measures include:

- All new staff must receive environmental awareness training, especially in terms of areas to be avoided as well as No-Go areas (if applicable and have been established).
- Minimise the development footprint to the absolute area necessary for construction and operational activities.
- Limit vegetation clearance and disturbance strictly to the approved project footprint; no clearance or disturbance should occur outside these boundaries.
- Confine temporary construction facilities to previously disturbed areas.

- No equipment or machinery may be stored on the beach.
- Clearly demarcate and enforce "no-go" zones for vehicles and personnel, including all areas outside the direct construction influence zone.
- Equip construction vehicles and machinery with noise-suppression systems to minimise acoustic disturbances.
- Ensure that emergency response equipment, including fire suppression and spill containment supplies, is readily available at each proposed development location on the property.
- All construction materials, equipment, and any foreign objects introduced to the area by contractors must be removed immediately upon completion of construction activities.
- Maintain general waste storage areas in a manner that does not attract nuisance or opportunistic wildlife. Dispose of all food waste (e.g., leftovers, bones, fruit cores) in sealed, designated waste bins; under no circumstances should food waste be discarded into the surrounding environment.
- Use tamper-proof lids on all waste bins to prevent access by wildlife.
- Construction vehicles must be inspected before being brought onto site and every day while on site for leaks and other faults.
- No leaking construction vehicle will be allowed on site.
- Protection against accidental leaks must be present on site.
- Erect temporary barriers around open trenches and excavations to prevent fauna from becoming trapped within development area.
- Prior to the commencement of any new earthworks, a walk-through must be conducted of all demarcated construction areas and access roads to identify and safely relocate fauna with limited mobility.
- During construction activities, any observation of immobile or slow-moving fauna must be reported. Construction in that area must be temporarily halted until all fauna have been removed from harm's way.
- Maintain an incident register throughout all project phases, documenting any incidents that occur on site.
- Only individuals with appropriate training are permitted to handle fauna encountered on-site.
- Limit construction activities to daylight hours to allow for effective monitoring of fauna presence and movement.
- If night lighting is essential, all lights must be directed downward and shielded to prevent light spill into the surrounding natural environment.
- An alien and invasive plant management plan must be developed and implemented, to ensure that the ongoing control of invasive plant species throughout the construction phase.
- Invasive plant species removed during development activities must be disposed of at a licensed landfill site in a manner that prevents the spread of seeds, both during transport and at the point of disposal.

5.2 Operational Phase Impact

The operational phase of the proposed project is not expected to result in any significant negative impacts on the surrounding environment. Therefore, no specific mitigation measures are deemed necessary for this phase.

6 DISCUSSION AND CONCLUSIONS

The proposed dune stabilisation project is located at the seaward foot of the dune system along the Hartenbos coastline in the Western Cape Province. The intervention area falls within the Cape Seashore Vegetation type, which is currently classified as Least Concern according to the 2018 NBA. This classification reflects the fact that approximately 20% of this vegetation type is formally protected, while only 1.7% has been transformed, primarily due to urban expansion (Mucina et al., 2006).

Based on ecological conditions observed during the site inspection, the study area was divided into four distinct habitat types: dune vegetation, grass, coastal, and recreational walkway habitats. Spatial data from the WCBSP indicate that the majority of the proposed development footprint does not intersect with any formally Protected Areas or CBAs. However, all project phases overlap with ESA 1: Aquatic. The potential impact on these aquatic ESAs will be evaluated in detail in a separate aquatic biodiversity assessment. CBAs (Terrestrial 1 and 2) and CBA 1: Estuary occur in close proximity to Phase 6 of the proposed dune stabilisation works (Figure 4.3) (CapeNature, 2024), although the current development footprint will not directly impact these areas. Furthermore, the terrestrial CBAs in the vicinity have been largely transformed due to residential and recreational development. Consequently, the proposed dune stabilisation is not expected to negatively affect the ecological integrity or conservation objectives of the WCBSP.

The study site exhibits clear signs of anthropogenic disturbance, including frequent trampling, vegetation removal, and fragmentation due to informal beach access paths. The remaining dune vegetation is highly isolated and confined to a narrow linear section bordered by the marine environment and surrounding urban infrastructure. Additionally, dense stands of IAPs, notably *Acacia cyclops* (rooikrans) and *Myoporum tenuifolium* (Australian and New Zealand manatoka), have further degraded the habitat by forming monotypic stands and outcompeting indigenous plant species.

A total of 68 animal species were recorded during the field survey, of which 71% were invertebrates and 29% vertebrates. Of the vertebrates 75% were bird species, and the remaining 25% comprised mammals (10%) and reptiles (15%). Only one SCC was recorded in the area surrounding the study site (i.e., the Cape Cormorant (*Phalacrocorax capensis*)), although none were recorded within the study area itself. Although this level of faunal richness might suggest a moderately intact ecosystem, the dominance of generalist and disturbance-tolerant species indicates a degraded ecological condition. Invertebrate diversity is a poor indicator of habitat quality in this context, as many insect taxa readily adapt to anthropogenically altered environments due to their rapid evolutionary responses (Garnas, 2020; Sruthi & Deepthy, 2024; van Baaren & Ulrika, 2018). Most vertebrates recorded were avifaunal species that were recorded mostly in the area surrounding the study site and that do not depend exclusively on dune vegetation for foraging, roosting, or nesting. The small number of mammals and reptiles detected (comprising only 7% of all species recorded) provides a more accurate reflection of the site's ecological degradation. These included species such as the Cape Striped Field Mouse, Southern Vlei Rat, Cape Skink, Southern Rock Agama, and Puff Adder, all commonly found in urban or peri-urban environments, suggesting a high tolerance for disturbance.

Of the 33 animal SCCs identified during the desktop study, only one (Cape Cormorant) was confirmed on site, and 12 additional SCCs (11 bird and one mammal species) are considered potentially present within the broader study area. None of these SCCs, however, are likely to depend on the habitats within the proposed development footprint for essential ecological functions such as breeding, roosting, or foraging.

A total of 27 plant species were recorded during the botanical assessment. None are classified as SCCs, while seven species are listed as alien or invasive. The remaining species are categorised as Least Concern. The low floristic diversity observed is typical of Cape Seashore Vegetation, which is generally dominated by a few hardy pioneer species (Mucina et al., 2006). However, considering the apparent age of the dune system, a greater diversity of native flora would be expected under natural conditions. Extensive areas of the site were either dominated by single IAP species or sparsely vegetated due to trampling and sand displacement by strong wave action. These patterns further indicate a degraded ecological state.

Of the 42 plant SCCs identified through the desktop study, none were encountered on site. Only one species, *Freesia leichtlinii* var. *alba*, associated with Cape Seashore Vegetation, is considered likely to occur within the broader area (von Staden & Patel, 2021). Given the site's isolation and degraded condition, the probability of this species being present within the development footprint is considered low.

Considering the Least Concern threat status of the vegetation type, the highly disturbed and isolated nature of the study site, and the absence of sensitive or range-restricted species, the proposed dune stabilisation project is not expected to result in significant impacts on terrestrial biodiversity, plant or animal species. Although SCCs are known to occur in the broader region, their presence is more probable in less disturbed habitats to the north, where large tracts of intact natural vegetation persist. The limited size, isolation, and altered condition of the site are therefore likely to discourage SCC utilisation. Furthermore, the stabilisation of the dune system is expected to yield positive ecological outcomes by reducing erosion and vegetation loss caused by wave action, thereby promoting greater habitat stability and resilience over time.

Of the three revetment upgrade alternatives proposed, Alternative 1 is considered the preferred option from a terrestrial biodiversity perspective, as it is expected to provide the greatest long-term benefit to both plant and animal species. In contrast, the wire mesh used in the gabion structures proposed under Alternative 2 is likely to corrode and deteriorate over time. As the wire baskets degrade, they may lose their structural integrity, potentially leading to renewed erosion and a reduction in the long-term effectiveness of the revetment. In addition, exposed and broken wire ends may pose a hazard to wildlife, increasing the risk of injury through entanglement or laceration. Alternative 1 provides a more durable and environmentally suitable solution, with a lower risk of long-term structural degradation and associated impacts on terrestrial biodiversity. . Consequently, Alternative 1 is considered the preferred option from a terrestrial biodiversity perspective, as it offers the greatest potential for long-term bank stabilisation while minimising risks to both plant and animal species.

Given the site conditions, existing levels of disturbance, the expected spatial extent of the dune stabilisation footprint, and the limited potential for ecological impact, it is the specialist's opinion that the proposed development represents an acceptable and appropriate land use. There are no ecological constraints preventing the project from

proceeding, provided that all recommended mitigation and management measures are fully implemented.

7 REFERENCES

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APPENDIX A — SCREENING TOOL REPORT

APPENDIX B — DETAILS AND EXPERTISE OF THE SPECIALISTS

CURRICULUM VITAE

FRANCOIS ANDRÉ DE VILLIERS

ACADEMIC QUALIFICATIONS:

MSc Zoology, 2016, Stellenbosch University
BSc (Hons) Biodiversity & Ecology, 2013, Stellenbosch University
BSc Biodiversity & Ecology, 2012, Stellenbosch University

OTHER TRAINING:

First aid (Level 1)

COUNTRY EXPERIENCE: South Africa
LANGUAGE PROFICIENCY: English (Good), Afrikaans (Excellent)

POSTAL ADDRESS: 8 Steenberg House, Silverwood Close, Tokai 7945
PHONE: +27-21-7013420 **E-MAIL:** andre@anchorenvironmental.co.za

EMPLOYMENT HISTORY:

2025-Present: Consultant (Anchor Environmental Consultants)
2024-2025: ECO and Consultant (Anchor Environmental Consultants)
2022-2024: Conservation Officer (Affirmative Portfolios)
2020-2021: Director (Amet Environmental Services)
2018-2020: Environmental Officer (Proxa Water)
2017: Environmental Officer (Opti Power Projects)
2016-2017: Environmental Officer (CSV Construction)

SUMMARY PROFILE

André de Villiers holds an MSc degree in Zoology and a BSc (Hons) in Biodiversity and Ecology from the University of Stellenbosch. With nine years of research and consulting experience across various disciplines, he is currently a Consultant for Environmental Compliance and Consulting at Anchor Environmental. His research has focused on freshwater amphibians (anurans), specifically examining species interactions, performance, and population and age structures. Additionally, he has experience in invasion biology, contributing to the control of the African clawed frog in Europe as part of the INVAXEN initiative. André has also supported the City of Cape Town's efforts to mitigate the spread of the invasive Polyphagous Shot Hole Borer. He has overseen the rehabilitation of two projects and was responsible for the rehabilitation of two others. He has published 13 articles in Class A scientific journals, including one in Science. With over seven years of comprehensive experience in environmental management, he has worked on diverse projects throughout both the construction and operational phases. These projects range from wind turbine initiatives to desalination projects. He also has external auditor experience, having audited various water treatment plants. His responsibilities include environmental research, impact assessment, and monitoring project development.

SKILLS: MARK, R, Statistica, QGIS, MS Suite.

SELECT PROJECT EXPERIENCE

Period	Country	Clients	Project, Tasks
2025	**South Africa**	**Enviro-EAP**	**Peer Review of terrestrial animal species compliance statement:** Peer Review of terrestrial animal species compliance statement for the proposed new Grootfontein dam on portion 24 on Misgiunt farm 499, Clanwilliam district, Western Cape
2025	**South Africa**	**Enviro-EAP**	**Peer Review of terrestrial animal species compliance statement:** Peer Review of terrestrial animal species compliance statement for the proposed development on erven 3677, 3680 and 3617, Citrusdal, Western Cape
2025	**South Africa**	**Enviro-EAP**	**Peer Review of terrestrial animal species specialist assessment:** Peer Review of terrestrial animal species specialist assessment for the proposed development on a erf 474, St Helena Bay, Western Cape
2025	**South Africa**	**Enviro-EAP**	**Peer Review of terrestrial animal species specialist assessment:** Peer Review of terrestrial animal species specialist assessment for the mixed used development on a portion of portion 4 of farm 560, Yzerfontein, Western Cape
2025	**South Africa**	**Enviro-EAP**	**Terrestrial biodiversity and terrestrial animal species specialist assessment:** Terrestrial biodiversity and terrestrial animal species assessment for the proposed housing development on erf 2732, Yzerfontein, Western Cape
2025	**South Africa**	**Overstrand Municipality**	**Invasive Alien Plant Species Management, Control and Eradication plan:** Developing an invasive alien plant species management, control and eradication plan for the Onrus river Catchment
2025	**South Africa**	**Private Client**	**Terrestrial and Animal Specialist** Site Sensitivity Verification (SSV) and Report for the Proposed Solar-Power Desalination Plant Jacobsbaai & Saldanha Area, Western Cape.
2025	**South Africa**	**Breed Valley Municipality**	**Site sensitivity verification and terrestrial biodiversity compliance statement:** The site sensitivity verification and terrestrial biodiversity compliance statement as part of the environmental authorization for the proposed residential development at Touwsrivier, Western Cape

Period	Country	Clients	Project, Tasks
2025	**South Africa**	**Breed Valley Municipality**	**Terrestrial animal species specialist assessment:** Terrestrial animal species assessment as part of the environmental authorization for the proposed residential development at Touwsrivier, Western Cape
2025	**South Africa**	**Casidra**	**Freshwater Rehabilitation Monitoring** Reporting on the progress and condition of the rehabilitation and the extent of invasive species at the Holsloot River
2024	**South Africa**	**MW & S Project Services (Pty) Ltd**	**Terrestrial fauna and flora compliance statement** Compiling the terrestrial fauna and flora compliance statement for the Proposed Tiger Brands Wheat Mill.
2024	**South Africa**	**Private**	**Section 30A ECO** Onrus Estuary Section 30A directive, provision Environmental Control Officer (ECO) services and environmental monitoring.
2024	**South Africa**	**Transnet Port Authority**	**Port of East London Desalination EMPr** Compiling the Environmental Management Programme (EMPr) for the construction and Operational phase of the Port of East London Desalination Project.
2024	**South Africa**	**MC Ranching**	**Environmental Risk Assessment for abalone ranching pilot project** Assisting in drafting an environmental risk assessment for abalone pilot ranching project for MC Ranching.
2024	**South Africa**	**V&A Waterfront**	**V&A Waterfront Desalination OEMPr** Compiling the Operational Environmental Management Programme (OEMPr) for the V&A Waterfront Desalination Project
2024-Present	**South Africa**	**Department of Forestry, Fisheries and the Environment**	**ADZ ECO** Investigating and reporting on the aquaculture farms within the ADZ's compliance towards the approved Environmental Authorization (EA) and Environmental Management Programme (EMPr).
2023	**Global**	**IUCN**	**Technical note on invasive alien *Xenopus laevis*** Reviewing and providing input into the Technical note on invasive alien *Xenopus laevis*
2022-2024	**South Africa**	**City of Cape Town**	**Invasive Species Management** Invasive species awareness; Invasive species control; Invasive species control plans
2022-2024	**South Africa**	**City of Cape Town**	**Invasive species awareness** Held public talks to spread awareness of the polyphagous shot hole borer beetle
2022-2024	**South Africa**	**City of Cape Town**	**Invasive species management training** Provided training to various stakeholders on how to prevent the spread of the polyphagous shot hole borer and how to deal with infested trees and waste
2022-2024	**South Africa**	**City of Cape Town**	**Invasive alien species monitoring, control and eradication plans** Drafting Invasive alien species monitoring, control and eradication plans for various nature reserves

Period	Country	Clients	Project, Tasks
2022-2024	**South Africa**	**City of Cape Town**	**Species control plan** Drafting species control plan for the guttural toad within the boundaries of the City of Cape Town
2022-2024	**South Africa**	**City of Cape Town**	**Invasive species management protocols** Drafting Invasive species management protocols for polyphagous shot hole borer
2021	**South Africa**	**Proxa**	**Dune Rehabilitation** Reinstatement and rehabilitation of the dunes on the footprint of the Monwabisi Salt Water Reverse Osmosis plant.
2021	**South Africa**	**Proxa**	**Rehabilitation Supervisor (Independent)** Oversaw and reported on the rehabilitation progress following the decommissioning of the Strandfontein Salt Water Reverse Osmosis plant**.**
2019-2020	**South Africa**	**Tronox**	**S30A and WREMPr Compliance Monitoring** Ensuring Proxa's compliance towards the issued Section 30 A (S30A), Water Resilience Environmental Management Programme (WREMPr) during the construction phase, operational and decommissioning phase of the Tronox Desalination Project
2019-2020	**South Africa**	**Proxa**	**EA and OEMPr internal compliance auditing** Auditing the conditions set out in the approved Environmental Authorization (EA) and Operational Environmental Management Programme (OEMPr) during the operational phase of the Central Basin Acid Mine Drainage Project.
2019-2020	**South Africa**	**Proxa**	**EA and OEMPr internal compliance auditing** Auditing the conditions set out in the approved Environmental Authorization (EA) and Operational Environmental Management Programme (OEMPr) during the operational phase of the East Basin Acid Mine Drainage Project.
2018-2022	**South Africa**	**Proxa**	**S30A and WREMPr Compliance Monitoring** Ensuring Proxa's compliance towards the issued Section 30 A (S30A), Water Resilience Environmental Management Programme (WREMPr) during the construction phase, operational and decommissioning phase of the Zandvlei Re-Use plant Project
2018-2022	**South Africa**	**Proxa**	**S30A, WREMPr, WUL Compliance Monitoring** Ensuring Proxa's compliance towards the issued Section 30 A (S30A), Water Resilience Environmental Management Programme (WREMPr) during the construction phase, operational and decommissioning phase of the Monwabisi Desalination Project
2018-2022	**South Africa**	**Proxa**	**S30A, WREMPr, WUL Compliance Monitoring** Ensuring Proxa's compliance towards the issued Section 30 A (S30A), Water Resilience Environmental Management Programme (WREMPr) during the construction phase, operational and decommissioning phase of the Strandfontein Desalination Project

Period	Country	Clients	Project, Tasks
2017	**South Africa**	**Opti Power Projects**	**EA and CEMPr Compliance Monitoring** Ensuring Opti Power Projects' compliance towards the approved Environmental Authorization (EA) and Construction Environmental Management Programme (CEMPr) during the construction phase of the 440kV line from Kleinsee to Alexanderbaai Project
2016-2017	**South Africa**	**CSV Construction**	**EA and CEMPr Compliance Monitoring** Ensuring CSV Construction's compliance towards the approved Environmental Authorization (EA) and Construction environmental management programme (CEMPr) during the construction phase of the Longyuan Mulilo De Aaar Wind 2 Project

PUBLICATION RECORD

Reinke, B. A., Cayuela, H., Janzen, F. J., Lemaître, J. F., Gaillard, J. M., Lawing, A. M., Iverson, J. B., Christiansen, D. G., Martínez-Solano, I., Sánchez-Montes, G., Gutiérrez-Rodríguez, J., Rose, F. L., Nelson, N., Keall, S., Crivelli, A. J., Nazirides, T., Grimm-Seyfarth, A., Henle, K., Mori, E., **De Villiers, F. A**., … Miller, D. A. W. 2022. Diverse aging rates in ectothermic tetrapods provide insights for the evolution of aging and longevity. *Science*. 376(6600): 1459-1466.

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Ihlow, F., Courant, J., Secondi, J., Herrel, A., Rebelo, R., Measey, G.J., Lillo, F., **De Villiers, F.A**., Vogt, S., De Busschere, C. and Backeljau, T., 2016. Impacts of climate change on the global invasion potential of the African clawed frog *Xenopus laevis*. *PLoS One*, *11*(6), p.e0154869.

De Villiers, F.A., de Kock, M. and Measey, G.J., 2016. Controlling the African clawed frog Xenopus laevis to conserve the Cape platanna *Xenopus gilli* in South Africa. Conservation Evidence 2016 (13), 17

De Villiers, A., Mouton, P.L.F.N. and Flemming, A., 2015. Generation glands of cordylid lizards: mechanism of secretion transfer to the environment. *Amphibia-Reptilia*, *36*(4), pp.351-360.

Measey, G.J., Vimercati, G., **De Villiers, F.A**., Mokhatla, M.M., Davies, S.J., Edwards, S. and Altwegg, R., 2015. Frog eat frog: exploring variables influencing anurophagy. *PeerJ*, *3*, p.e1204.

THESES

De Villiers, F.A. 2016. The dispersal ability, performance and population dynamics of Cape *Xenopus* frogs. MSc Thesis, Stellenbosch University, 92 pp.

De Villiers, F.A. 2013. Generation glands of cordylid lizards: mechanism of secretion dispersal to the environment. BSc Hons. Thesis, Stellenbosch University, 28 pp.

CONFERENCES

2015 Zoological Society of South Africa (ZSSA). The Age Structure of Cape *Xenopus* (Anura:Pipidae) (Presentation)

2014 Herpetological Association of Africa. The Survival and Dispersal of Cape *Xenopus* (Anura: Pipidae) (Presentation)

CURRICULUM VITAE

CHERUSCHA SWART

DATE OF BIRTH: 3 November 1988

NATIONALITY: South African

ACADEMIC QUALIFICATIONS

- MSc (Cum Laude) Zoology, Stellenbosch University, 2015 – 2017
- BSc (Hons) Biodiversity and Ecology, Stellenbosch University, 2013
- BSc Biodiversity and Ecology, Stellenbosch University, 2010 – 2012

SCIENTIFIC REGISTRATIONS:

- EAPASA – Environmental Assessment Practitioner: Number 2021/3298
- SACNASP – Pr.Sci.Nat. Environmental Science: 155305
- IAIAsa – Member: Membership number 7398

OTHER TRAINING

- Environmental Impact Assessment and Decision-Making Training Course, Cape Town, 2025. Business Succes Solutions in association with Janice Tooley Attorneys. Accredited with SACNASP and EAPASA.
- Practical Implementation of Environmental Auditing and Monitoring Training Course, Cape Town, 2024. Business Success Solutions in association with Umhlaba Environmental Consulting. Accredited with SACNASP and EAPASA.
- Environmental Impact Assessments Training Course, Cape Town, 2024. Business Succes Solutions in association with Janice Tooley Attorneys. Accredited with SACNASP and EAPASA.
- Environmental Legal Compliance, Auditing and Monitoring Training Course, Cape Town, 2023. Business Succes Solutions in association with Janice Tooley Attorneys. Accredited with SACNASP and EAPASA.
- Environmental Impact Assessment Law Event Course, Cape Town, 2020. Business Succes Solutions in association with Janice Tooley Attorneys. Accredited with SACNASP.
- First Aid Level 1.

LANGUAGE PROFICIENCY: English (Excellent), Afrikaans (Excellent)

POSTAL ADDRESS: 8 Steenberg House, Silverwood Close, Tokai 7945

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EMPLOYMENT HISTORY:

2022 – Present — Senior Consultant & Environmental Assessment Practitioner in Environmental Impact Assessment Department: Anchor Environmental
2018 – 2022 — Consultant and Environmental Assessment Practitioner: Anchor Environmental
2018 – 2019 — Taxonomist and Lab Assistant: Anchor Environmental
2014 – 2017 — Assistant Research Consultant: Stellenbosch University
2014 – 2015 — Research Intern: National Research Foundation

SUMMARY PROFILE

Cheruscha attained a Master of Science degree (MSc) in Zoology (Cum Laude) and an Honours (BSc Hons) and Bachelor of Science degree (BSc) in Biodiversity and Ecology from the University of Stellenbosch. She is a Registered Environmental Assessment Practitioner (EAP) with 12 years of research and consulting experience in several disciplinary fields, including conducting Basic and Scoping & Environmental Impact Assessments. Her training and experience have made her highly competent within a variety of disciplines, including environmental monitoring and impact assessments, terrestrial and marine biodiversity and ecology, invasion biology, conservation biology, plant and animal sciences and marine invertebrate taxonomy and biology. Within Anchor Environmental Consultants, her primary role is that of EAP and leading Senior Consultant on several environmental specialist studies spanning the marine, coastal and terrestrial environment. Cheruscha manages a range of projects including applications for prospecting, ranching and other operational rights, environmental licenses and environmental authorisations; specialist impact assessments and baseline studies; environmental monitoring of important conservation and disturbed habitats; and monitoring environmental compliance of various operations. Projects include, amongst others, land-based and offshore prospecting operations; offshore mining operations; greenhouse agricultural projects; land- and sea-based aquaculture facilities; desalination plant projects; and monitoring the health of bays and ports along the South African Coast. Cheruscha is the author of three peer reviewed scientific publications and numerous scientific reports, with several other projects and publications in preparation.

SELECT PROJECT EXPERIENCE

Period	Country	Clients	Project, Tasks
2025	**South Africa**	**Overstrand Local Municipality**	**Specialist and Principal Reviewer** Invasive Alien Plant Species Monitoring, Control and Eradication Plan for the Onrus Catchment, Western Cape Province.
2025	**South Africa**	**ATKV Sake (RF) Pty Ltd** **t/a ATKV Hartenbos**	**Terrestrial and Animal Specialist; Principal Reviewer** Terrestrial Biodiversity, Plant and Animal Compliance Statement for the Proposed Dune Stabilisation at the ATKV, Hartenbos, Western Cape Province.
2025	**South Africa**	**Gansbaai Marine (Pty) Ltd**	**Marine Field Scientist** Marine Rocky Shore Survey to fulfil the requirements of Gansbaai Marine's Coastal Waters Discharge Permit, Western Cape.
2025	**South Africa**	**Enviro-EAP Pty (Ltd) on behalf of the developer**	**Terrestrial and Animal Specialist; Principal Reviewer** Terrestrial Biodiversity, Animal and Plant Species Assessments for the Proposed Residential Housing Development, situated on a portion of Erf 2732, on the Rooipan Salt Pans, Yzerfontein, Western Cape.
2025	**South Africa**	**Enviro-EAP Pty (Ltd) on behalf of the developer**	**Independent Reviewer** Animal Species Impact Assessment for the Mixed-Use Development on a Portion of Portion 4 of Farm No. 560, Yzerfontein, Western Cape.

Period	Country	Clients	Project, Tasks
2025	**South Africa**	**Enviro-EAP Pty (Ltd) on behalf of the developer**	**Independent Reviewer** Animal Species Impact Assessment for the Proposed Residential Development on erf 474, St Helena Bay, Western Cape.
2025	**South Africa**	**Enviro-EAP Pty (Ltd) on behalf of the developer**	**Independent Reviewer** Animal Species Compliance Statement for the Proposed Citrusdal Housing Development on Remainder of Erf 3677, 3680 and RE 3617, Citrusdal, Western Cape.
2025	**South Africa**	**Enviro-EAP Pty (Ltd) on behalf of the developer**	**Independent Reviewer** Animal Species Compliance Statement for the New Grootfontein Dam on Misgunt 499 Portion 24, Clanwilliam District, Western Cape.
2025	**South Africa**	**Breede Valley Municipality (Western Cape)**	**Terrestrial and Animal Specialist; Principal Reviewer** Animal Species Specialist Assessment for the Proposed Integrated Residential Development at Touwsrivier, Western Cape Province
2025	**South Africa**	**Breede Valley Municipality**	**Terrestrial and Animal Specialist; Principal Reviewer** Terrestrial Biodiversity Compliance Statement for the Proposed Integrated Residential Development at Touwsrivier, Western Cape Province
2025	**South Africa**	**Breede Valley Municipality**	**Terrestrial and Animal Specialist; Principal Reviewer** Site Sensitivity Verification (SSV) and Report for Terrestrial Biodiversity and Animal and Plant Species for the Proposed Integrated Residential Development at Touwsrivier, Western Cape Province
2025	**South Africa**	**Private Client**	**Environmental Assessment Practitioner; Terrestrial and Animal Specialist** Site Sensitivity Verification (SSV) and Report for the Proposed Solar-Power Desalination Plant Jacobsbaai & Saldanha Area, Western Cape.
2025	**South Africa**	**V&A Waterfront**	**Environmental Assessment Practitioner; Project Manager** Basic Assessment Process for a Mixed Use Development at the V&A Waterfront, Cape Town, Western Cape
2025	**Namibia**	**Namwaste (Pty) Ltd**	**Animal Specialist** Invertebrate Specialist Study for the Proposed Namwaste Management Facility, Arandis, Namibia
2025	**South Africa**	**De Beers Marine (Pty) Ltd**	**External Environmental Auditor** External Environmental Compliance Audit for prospecting right NC12189 PR in South African Sea Area 6C — Phase 2 Auditing the compliance of prospecting activities, during January 2022, with the conditions and

Period	Country	Clients	Project, Tasks
			management measures stipulated in the associated Environmental Authorisation and Environmental Management Programme.
2024-2025	**South Africa**	**Overstand Local Municipality**	**Environmental Assessment Practitioner** Onrus Catchment to Coast (C2C) Programme Preparing an Estuarine Maintenance Management Plan (MMP) Report for the proposed dredging and future maintenance of the Onrus Estuary
2024/ 2025	**South Africa**	**Sunwater East London**	**Environmental Assessment Practitioner; Project Manager** Scoping & Environmental Impact Assessment (EIA) for the proposed Solar Powered Desalination Plant in the Port of East London for Transnet National Ports Authority
2024/ 2025	**South Africa**	**Department of Forestry, Fisheries and the Environment**	**Project Manager; Stakeholder Engagement Specialist** Development of management plans for the South-East Atlantic and South-West Indian Seamounts Marine Protected Areas
2024	**South Africa**	**Prism Environmental Management Services on behalf of property owner**	**Marine and Terrestrial Specialist** Coastal Impact Assessment for the Proposed Property Development on two Erven in Wilderness, Western Cape.
2024	**South Africa**	**De Beers Marine (Pty) Ltd**	**External Environmental Auditor** External Environmental Compliance Audit for prospecting right NC12189 PR in South African Sea Area 6C — Phase 1 Auditing the compliance of prospecting activities, during the period 15 April 2021 to 31 December 2021, with the conditions and management measures stipulated in the associated Environmental Authorisation and Environmental Management Programme.
2024	**South Africa**	**Port Nolloth Sea Farms Ranching (Pty) Ltd**	**Environmental Assessment Practitioner** Amendment of the Environmental Authorisation for the Port Nolloth Sea Farms ranching abalone holding and processing facility, south of Kleinzee.
2023	**South Africa**	**Gansbaai Marine (Pty) Ltd**	**Marine Field Scientist** Marine Impact Assessment to fulfil the requirements of Gansbaai Marine's Coastal Waters Discharge Permit
2023	**South Africa**	**St Helena Bay Water Quality Trust**	**Report Editor and Reviewer** The State of St Helena Bay: annual environmental monitoring and reporting campaign
2019 – present (ongoing)	**South Africa**	**Saldanha Bay Water Quality Forum Trust**	**Marine Field Scientist; Co-author; Report Editor** The State of Saldanha Bay and Langebaan Lagoon: Annual Monitoring and reporting campaign
2023/24	**South Africa**	**GIZ**	**Co-author; Aquatic and Terrestrial Considerations** Green infrastructure options for improved waterway and catchment management for the City of Cape Town.
2023	**South Africa**	**Impact Water Solutions and GIZ**	**Co-author** GIZ Green Hydrogen Desalination ESIA Scoping Study to provide strategic information on the technoeconomic,

Period	Country	Clients	Project, Tasks
			legal, environmental, and social applicability of desalination plants as water source for green hydrogen projects in South Africa.
2023	**South Africa**	**Doug Jeffrey Environmental Consultants**	**Marine and Coastal Specialist** Marine Specialist Study for the Residential Development in Oude Kraal, Camps Bay: Site Sensitivity and Constraints Report
2023	**South Africa**	**African Tuna**	**Specialist and Lead Author** Feasibility study for the commercial harvesting of periwinkles and limpets on the west coast of South Africa
2023	**Angola**	**SHELTER (on behalf of Eni Angola)**	**Specialist and Co-author** Preparation of a Biodiversity Action Plan (BAP) as part of the Angola Northern Gas Complex Onshore Plant Project
2022/2023	**South Africa**	**Matzikama Kaolin**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Scoping Assessment as part of an application for prospecting rights: Prospecting of kaolin in the Western Cape
2022/2023	**South Africa**	**Xwena Kaolin**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Scoping Assessment as part of an application for prospecting rights: Prospecting of kaolin and silica in the Western Cape
2022 – present (ongoing)	**South Africa**	**I&J Danger Point**	**Environmental Assessment Practitioner; Stakeholder Engagement Specialist** Abalone ranging right application & Risk Assessment
2022 – present (ongoing)	**South Africa**	**Drylands Farms**	**Terrestrial Specialist** Scoping and Pre-Feasibility for a proposed agricultural development on a mine in the Northern Cape of South Africa
2018 – present (ongoing)	**South Africa**	**De Beers Marine Namibia**	**Taxonomist; Environmental Scientist; Co-author** De Beers Marine Namibia Environmental Monitoring Programme in the Atlantic 1 Mining License Area: Annual Benthic Sampling Campaign
2021/2022	**South Africa**	**SANEK Liquidators**	**Environmental Site Officer (ESO)** Stonehurst mountain Estate Phase 4 Development — Compliance Monitoring
2021/2022	**South Africa**	**SRK Consulting**	**Marine Specialist** Marine Impact Assessment for the increase in manganese handling capacity at the Multi-Purpose Terminal, Port of Saldanha, Saldanha Bay, South Africa
2021/2022	**South Africa**	**Trans Atlantic Diamonds**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Basic Assessment Process and application for prospecting rights in an offshore sea concession 10B in the Northern Cape
2021/2022	**South Africa**	**Trans Atlantic Diamonds**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Basic Assessment Process and application for prospecting rights in an offshore sea concession 7C in the Northern Cape

Period	Country	Clients	Project, Tasks
2021/2022	**South Africa**	**Trans Atlantic Diamonds**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Basic Assessment Process and application for prospecting rights in the offshore sea concession area 14C, Western Cape
2021/2022	**South Africa**	**Trans Atlantic Diamonds**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Basic Assessment Process and application for prospecting rights in the offshore sea concession area 11C, Western Cape
2021	**South Africa**	**Trans Atlantic Diamonds**	**Environmental Assessment Practitioner; Project Manager; Stakeholder Engagement Specialist** Basic Assessment Process and application for prospecting rights in the inshore sea concession area 14A, Western Cape
2021	**South Africa**	**Nomalungelo Faku**	**Specialist and Lead Author** Feasibility study for a pearl farm in the greater Nelson Mandela metropolitan area
2021	**South Africa**	**Cliff Path Action Group**	**Marine Specialist** Marine Environmental Impact Assessment for the Proposed Pedestrian Path to Connect the two Parts of the Hermanus Cliff Path via Poole's Bay
2018 – 2021	**South Africa**	**Mhlathuze Water**	**Lab Technician and Scientist** Mhlathuze Water Environmental Monitoring Programme for the Richards Bay Offshore Outfalls Region
2019/2020	**South Africa**	**Planet Capital and Cape Nordic Corporation**	**Environmental Assessment Practitioner Support; Stakeholder Engagement Specialist** Basic Assessment Process for the Proposed Land-based Aquaculture Facility near Elands Bay on the West Coast of South Africa
2020	**South Africa**	**Planet Capital and Cape Nordic Corporation**	**Specialist; Field Scientist** Proposed Land-based Aquaculture Facility near Elands Bay – Bat Specialist Impact Survey and Assessment
2020	**South Africa**	**CSIR Coastal Systems Research Group**	**Taxonomist** CSIR Coastal Systems Research Group: Identification of benthic invertebrate macrofauna.
2020	**South Africa**	**Department of Environmental Affairs and Development Planning**	**Field Scientist; Stakeholder Engagement Specialist** Berg Estuary Valuation Study: Value of The Berg Estuary and Importance of Management Interventions
2019	**South Africa**	**Department of Agriculture, Forestry & Fisheries**	**Environmental Assessment Practitioner Support; Stakeholder Engagement Specialist** Basic Assessment Process for the Proposed Sea-Based Aquaculture Development Zone in Algoa Bay, Eastern Cape
2019	**South Africa**	**Doring Bay Abalone**	**Co-Author** Draft Environmental & Risk Assessment for an Application for a Right to Engage in an Abalone Ranching Pilot Project

Period	Country	Clients	Project, Tasks
2019	**South Africa**	**Mozal Alumium Smelter**	**Taxonomist; Co-Author** Estuarine Specialist Report for the Mozal Matola River Pipeline, Mozambique: Estuarine Impact Assessment

PUBLICATION RECORD

SWART C AND ROBINSON TB (2019) Horizon scanning for alien predatory crabs: insights from South Africa. African Journal of Marine Science 41(2): 125 – 135, DOI: 10.2989/1814232X.2019.1588782

SWART C, VISSER V AND ROBINSON TB (2018) Patterns and traits associated with invasions by predatory marine crabs. NeoBiota 39: 79 – 102. https://doi.org/10.3897/neobiota.39.22002

ROBINSON TB AND **SWART C** (2015) Distribution and impact of the alien anemone *Sagartia ornata* in the West Coast National Park. *Koedoe* 57 (1): DOI: 10.4102/koedoe.v57i1.1246

SEDICK S, CLARK B, GIHWALA K, **SWART C** (In prep.) The description of a new species of Nereis (Annelida, Nereididae) from the shallow waters of southern Namibia.

GIHWALA K, BICCARD A, CLARK B, **SWART C**, MAKHOSONKE A, STEFFANI N, ROOS L (In prep.). Anthropogenic disturbance and subsequent recovery of benthic habitats and associated macrofaunal communities in southern Africa.]

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