# Impact Assessment for Retrospective and Proposed development of a Municipal Water Depot on the Remainder of Erf 464, George, Western Cape

Terrestrial and Plant Species Theme Specialist Assessment:

Site Sensitivity Verification, Impact Assessment, and 24G Rectification Process


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**Date:** November 2024

**Version:** Draft pending Site Development Plan

## DECLARATION OF SPECIALIST INDEPENDENCE

I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);

At the time of conducting the study and compiling this report I did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;

Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;

I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;

I do not have any influence over decisions made by the governing authorities;

I undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by a competent authority to such a relevant authority and the applicant;

I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity;



All the particulars furnished by me in this document are true and correct.

Kim Daniels (MSc)

November 2024

## SUMMARY OF EXPERIENCE AND ABRIDGED CV - KIM DANIELS

**Core skills**

- MSc. Biodiversity and Conservation Biology (University of Cape Town) and 3 years of work experience (research assistance and education) for research projects aimed at investigating invertebrate diversity, plant diversity, insect ecology, disease ecology, invasive species, plant systematics, herpetology, and climate change impacts on a variety of taxa.
- Ecological and field work experience before, during, and after postgraduate degrees across a range of environments (mesic savanna, arid savanna, fynbos, succulent karoo, and Nama karoo) and taxa (plants, invertebrates, avifauna, amphibians, and small mammals).
- My postgraduate studies have been focused on vegetation change in the fynbos and parasitic plants as thermal refugia for arid savanna birds.

**Work experience**

- Teaching assistant at the Organization of Tropical Studies and Roots & Shoots
- Internships in Entomology, Horticulture, and Plant Conservation
- Research assistant at the Centre for Invasion Biology
- Field assistant at Valuing Orchard and Integrated Crop Ecosystem Services Project

**Qualifications**

- BSc. Biodiversity and Conservation Biology (2018, University of the Western Cape)
- BSc. Hons. Biodiversity and Conservation Biology (2021, University of the Western Cape)
- MSc. Conservation Biology (2023, University of Cape Town)

**References**

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# ABBREVIATIONS AND ACCRONYMS

| | |
|---|---|
| **CBA** | Critical Biodiversity Area |
| **CD:NGI** | Chief Directorate: National Geo-spatial Information |
| **DFFE** | Department of Forestry, Fisheries, and the Environment |
| **ESA** | Ecological Support Area |
| **NEMA** | National Environmental Management Act |
| **SANBI** | South African National Biodiversity Institute |
| **SCC** | Species of Conservation Concern |
| **SDP** | Site Development Plan |
| **SSVR** | Site Sensitivity Verification Report |
| **WCBSP** | Western Cape Biodiversity Spatial Plan |

# 1. INTRODUCTION

## 1.1 Background and Site Location

Confluent Environmental Pty (Ltd.) was appointed by Cape EAPrac to provide Terrestrial and Plant Species Specialist inputs for a retrospective assessment of activities relating to unauthorised vegetation clearing and further proposed development, in terms of the National Environmental Management Act (NEMA, Act 107 of 1998), for the George Municipality Water Depot on Erf 464 in George, Western Cape. The depot is situated in a semi-urban area, surrounded by a mosaic of land uses, including residential developments, commercial zones, and patches of transformed vegetation (Figure. 1).

The municipality initiated activities including the unlawful clearance of vegetation to facilitate the expansion of the George Municipality Water Depot without obtaining the required environmental authorization. To rectify this, the municipality now seeks to apply for environmental authorization through a section 24G application under the National Environmental Management Act (NEMA). This application aims to obtain retrospective authorization for the vegetation clearance and the continued expansion of the water depot, ensuring compliance with environmental regulations.

Furthermore, the municipality has requested a Terrestrial and Plant Species Specialist inputs for future development of the George Municipality Water Depot. This specialized assessment is key to identifying sensitive to endangered ecosystems and species of conservation concern that may occur in and around the site and the nearby non-perennial river.

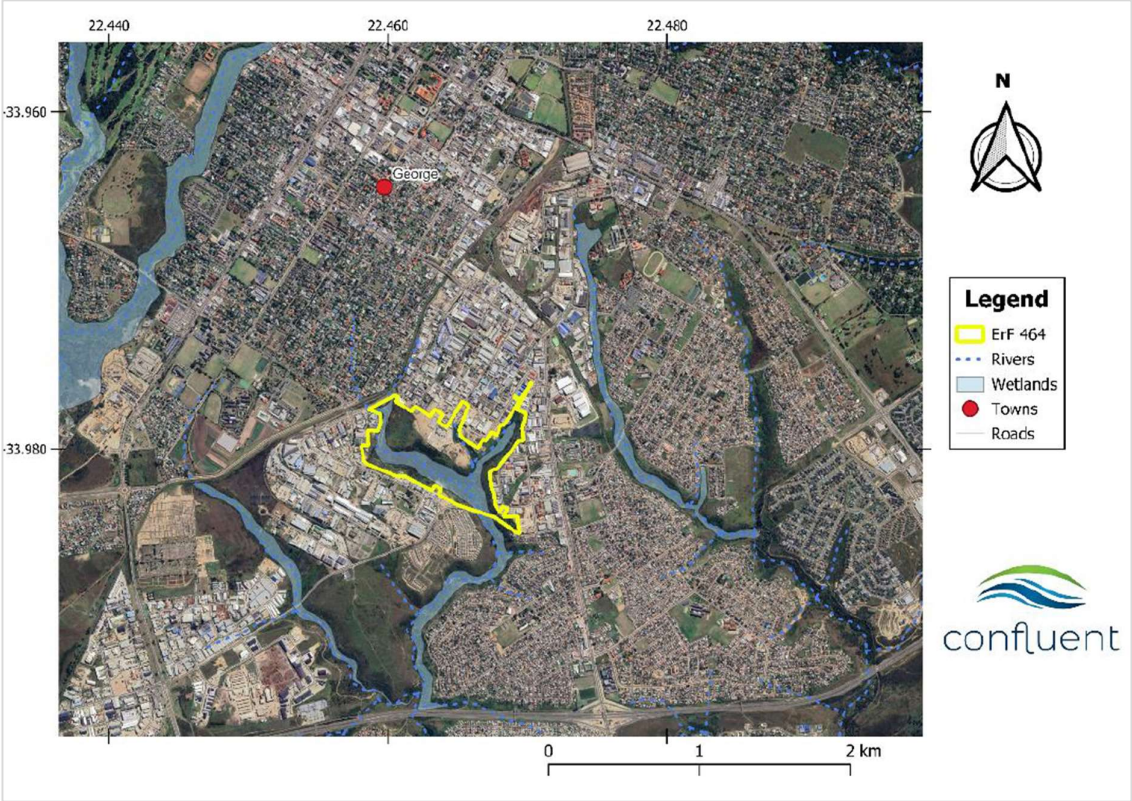


*Figure 1. The general location of Erf 464 (outlined in yellow) George, Western Cape and watercourses found in the landscape.*

## 1.2 Unauthorised Clearing and Proposed Development

### *1.2.1 Unauthorised Clearing*

The unauthorized clearing of vegetation on Erf 464 (Orange outline, Figure 2), intended for the expansion of the George Municipality Water Depot, has potentially caused significant ecological and environmental degradation. Of particular concern is the potential removal of the critically endangered Garden Route Fynbos vegetation which is mapped to occur with the property boundaries. Furthermore, the site is located within a highly sensitive ecological zone that includes an unchanneled valley-bottom wetland and a non-perennial river, all of which provide essential ecosystem services.

The municipality cleared additional indigenous vegetation outside the depot's current fence line, establishing an unauthorised dumping site on the cleared land (outlined in red, Figure. 2). This area is included in the Section 24G application.


*Figure 2. Map showing the unauthorized clearing of indigenous vegetation on Erf 464*

As part of the Section 24G application, the site development plan includes several ongoing developments aimed at enhancing the operational capacity of the George Municipality Water Depot. Key ongoing developments include a new office building and water depot with associated parking lots, a stormwater attenuation pond, and a road (Figure 3).

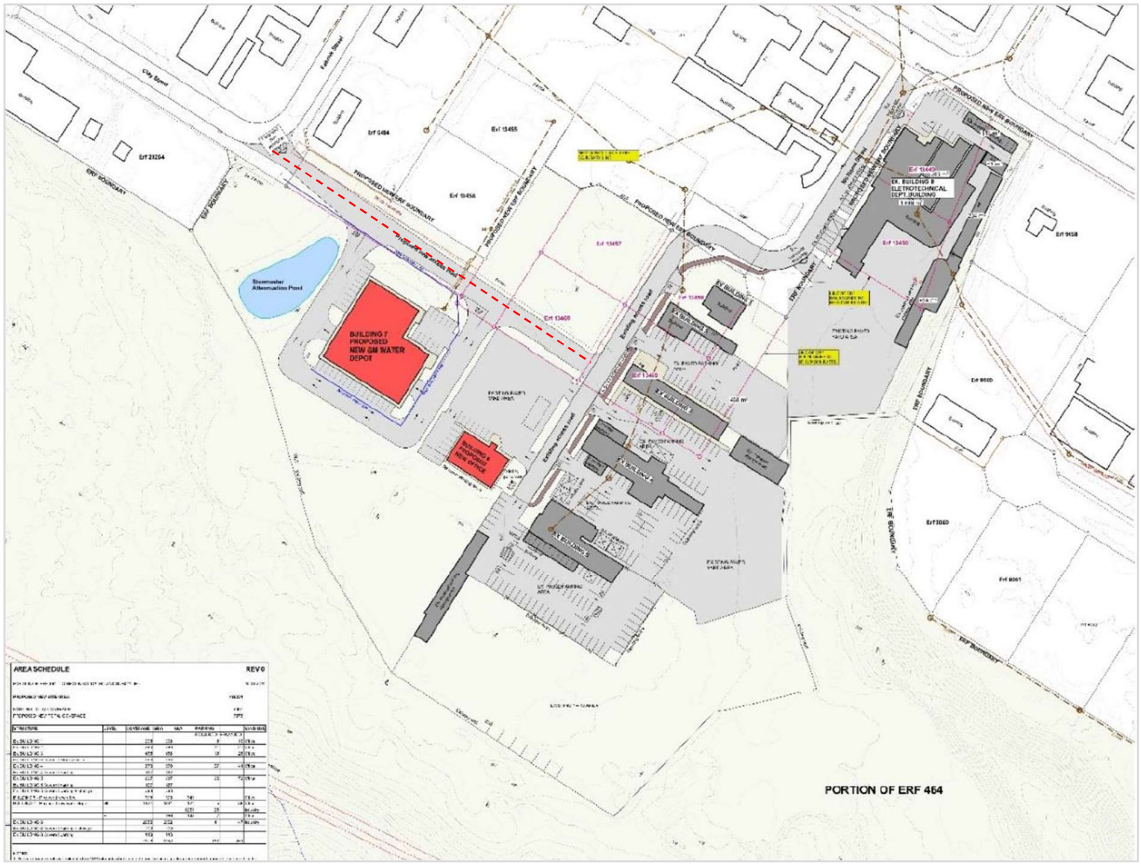


*Figure 3. Site development plan showing the proposed new buildings in red, a proposed new road as indicated by the red dashed line, and a stormwater attenuation pond in blue.*

### *1.2.2 Proposed Development*

The municipality also plans to undertake future developments to expand the water depot, within the area located outside the current fence line of the depot. Figure. 4 outlines the future proposed development site and shows the watercourses present which include a wetland and a non-perennial river.

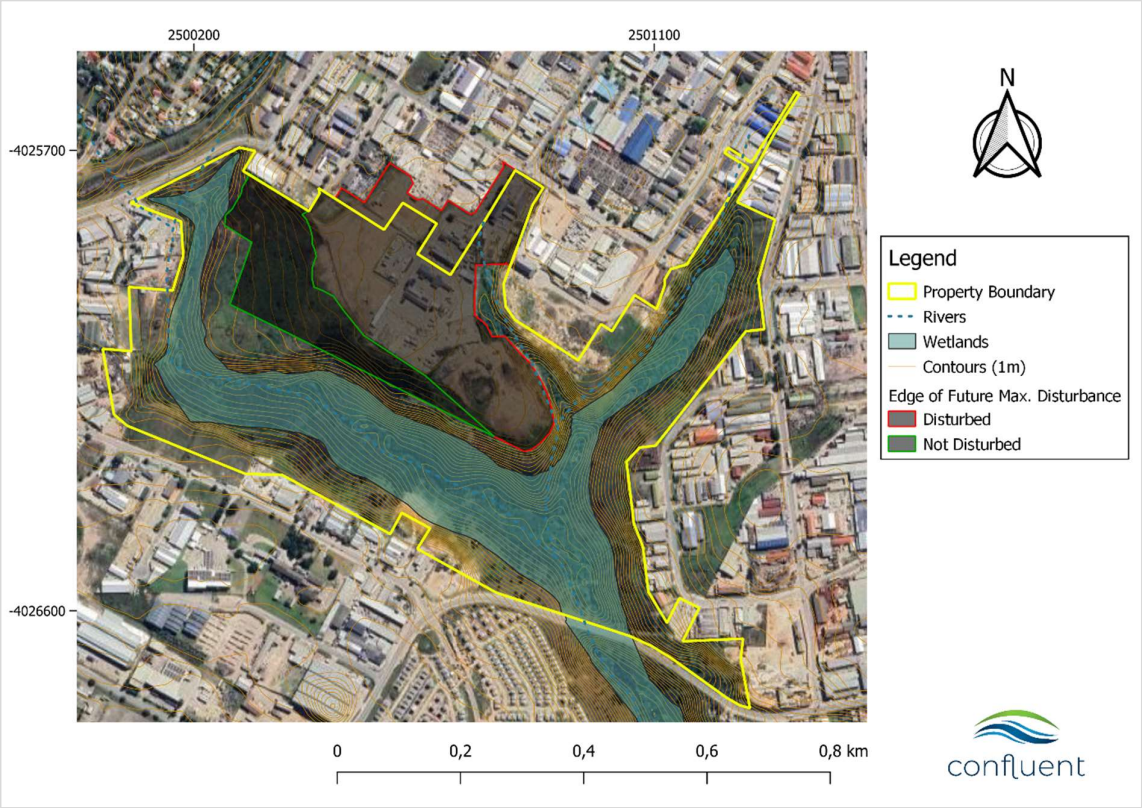


*Figure 4. Map showing the area where potential future developments might take place and the water courses on Erf 464.*

## 2. TERMS OF REFERENCE

This screening tool sensitivity verification report provides information on Terrestrial and Botanical diversity and sensitivity of the proposed development. The results presented are based on a desktop and field assessment, which includes a consideration of historical photographic records of the site. The assessment presented in this report follows the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity, and Terrestrial Plant Species themes.

This site sensitivity assessment follows the requirements of:

The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), which includes:

The protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant species (28 July 2023).

The protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity (20 March 2020).

Additional guidelines for the terrestrial biodiversity theme:

Ecosystem Guidelines for Environmental Assessment in the Western Cape (de Villiers et al., 2016).

The Western Cape Biodiversity Spatial Plan Handbook and summary booklet (CapeNature, 2017; Pool-Sandvliet et al., 2017).

The Subtropical Thicket Ecosystem Programme Handbook: Integrating the natural environment into land-use decisions at the municipal level: towards sustainable development (Pierce & Mader, 2006).

Additional guidelines for the terrestrial plant species theme:

Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa (Verburgt et al., 2020).

The assessment was undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with relevant expertise in the field of Botanical and/or Ecological science.

## 2.1 Online Screening Tool

The Department of Forestry, Fisheries, and the Environment (DFFE) screening tool report for the development footprint has identified the **terrestrial plant species theme as having a Medium sensitivity**. The **terrestrial biodiversity theme is largely considered Very High sensitivity** (Figure. 3). Note that the Screening Tool plant species theme does not take Near Threatened plant populations into account. A Medium screening tool sensitivity for plants indicates that:

> *"Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75% for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level."* ~ (Verburgt et al., 2020)

A Very High sensitivity rating for terrestrial biodiversity according to the screening tool is triggered for all Biodiversity Priority Areas (BPAs) and other sensitive features (Stewart et al., 2021) (Figure. 3). BPAs include the various management layers of the Western Cape Biodiversity Spatial Plan (WCBSP), as well as the other sensitive features. The BPA triggered for the property is that parts of the area are mapped as an Ecological Support Areas and Critical Biodiversity Areas. The property is mapped as containing Garden Route Granite

Fynbos (Critically Endangered), forms part of the SANPARKS buffer for the Garden Route National Park and contains part of the Outeniqua Strategic Water Source Area.

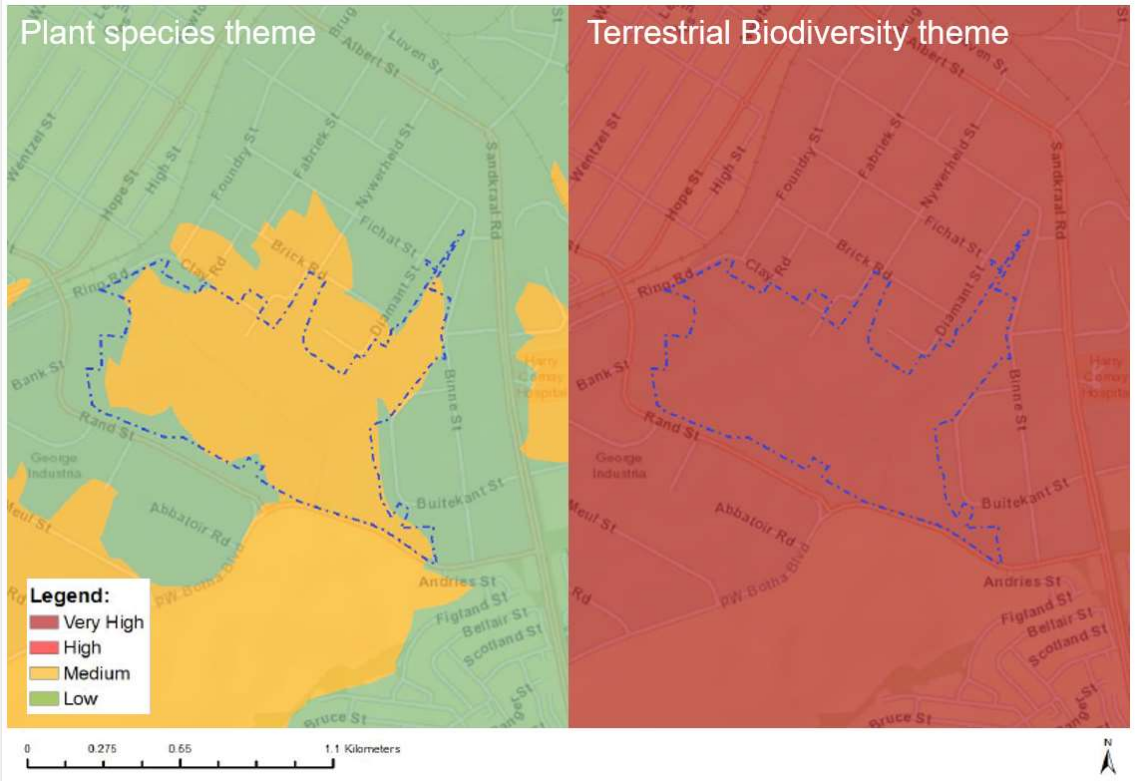


*Figure 5. DFFE Online Screening Tool outcome for the plant species and terrestrial biodiversity themes for Erf 464, George. The property boundary is indicated by the blue dashed line.*

*Table 1. Species of Conservation Concern highlighted by the DFFE Online Screening Tool for Erf 464, George.*

| Sensitivity | Scientific Name | Common name | Red list status* |
|---|---|---|---|
| Medium | *Lampranthus pauciflorus* | Beach brightfig | Endangered |
| Medium | *Leucospermum glabrum* | Outeniqua pincushion | Endangered |
| Medium | Sensitive species 1024 | - | Endangered |
| Medium | Sensitive species 1032 | - | Vulnerable |
| Medium | Sensitive species 800 | - | Vulnerable |
| Medium | Sensitive species 500 | - | Endangered |
| Medium | *Diosma passerinoides* | Silcrete bitterbuchu | Vulnerable |

* Red list status as per SANBI's Red List of South African Plants (http://redlist.sanbi.org/index.php).

## 3. METHODOLOGY

### 3.1 Desktop Assessment

The desktop assessment was performed using Cape Farm Mapper and QGIS version 3.28.3 "Firenze." Plant species data was sourced from the following sources:

- The DFFE screening tool listed SCC.
- Information on plant occurrence prior to the site visit was sourced from SANBIs Botanical Research and Herbarium Management System (BRAHMS) for the Plants of Southern Africa (POSA) database.
- iNaturalist observations of the property and surrounding areas.
- Specialist insight into the species likely present in the area.

Ecosystem/ vegetation type data was sourced from:

- The 2018 updated South African National Vegetation Map from SANBIs Biodiversity GIS (BGIS) database, and the National Biodiversity Assessment report of 2018 (Skowno et al., 2018).
- Shapefiles for the Western Cape Biodiversity Spatial Plan (WC-BSP) i.e., information on PAs, CBAs, ESAs, and ONAs were downloaded from BGIS database (CapeNature, 2017; Pool-Sandvliet et al., 2017).
- Cape Farm Mapper for additional spatial information required for the site.
- Chief Directorate: National Geo-spatial Information (CD: NGI) Geospatial Portal and Google Earth for the acquisition of historical aerial imagery of the site.
- The conservation status of ecosystems was found in the Revised National List of Ecosystems that are Threatened and in need of protection, published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004, as revised in Nov. 2022).

## 3.2 Field Assessment

The field assessment took place on the 4th of October 2024 in sunny weather. The method for identifying species was similar to a BioBlitz, also described as a “timed meander”, where the specialist especially keeps an eye out for rarer and threatened species. Some Red Listed Plant species are found more easily during a site survey than other species. This survey method is an attempt to account for the short and single survey period, where detection probability of some rare and threatened species (e.g., geophytes, small succulents, small perennials, etc.) is low (Garrard et al., 2008; Wintle et al., 2012A). Observations of individual species and environmental characteristics were documented using both a Nikon Coolpix and Canon EOS 1200D cameras. A provisional species list (Table. 8) and plant species accumulation curve (Figure. 19) is provided in Appendix 1.

The cleared Section 24G area (C in Figure. 6), where the construction of a building and associated parking lot is to take place, was clearly visible. The area had been completely cleared of vegetation. Additionally, it was observed that the municipality had already commenced with the construction of a building to be used as an office (D in Figure. 6) and the stormwater attenuation pond has also ready been established along with landscaping (B in Figure. 6). The field visit confirmed the clearing of areas A1 and A2 in Figure 6, not laid out in the site development plan and replanted with planted trees and lawn, respectively, with lawn set to be installed in site A1 as well. The building proposed for the area marked as D in Figure

6 was already under construction and the new road labelled E was already constructed and tarred. Soils were also illegally dumped at F in Figure. 6.

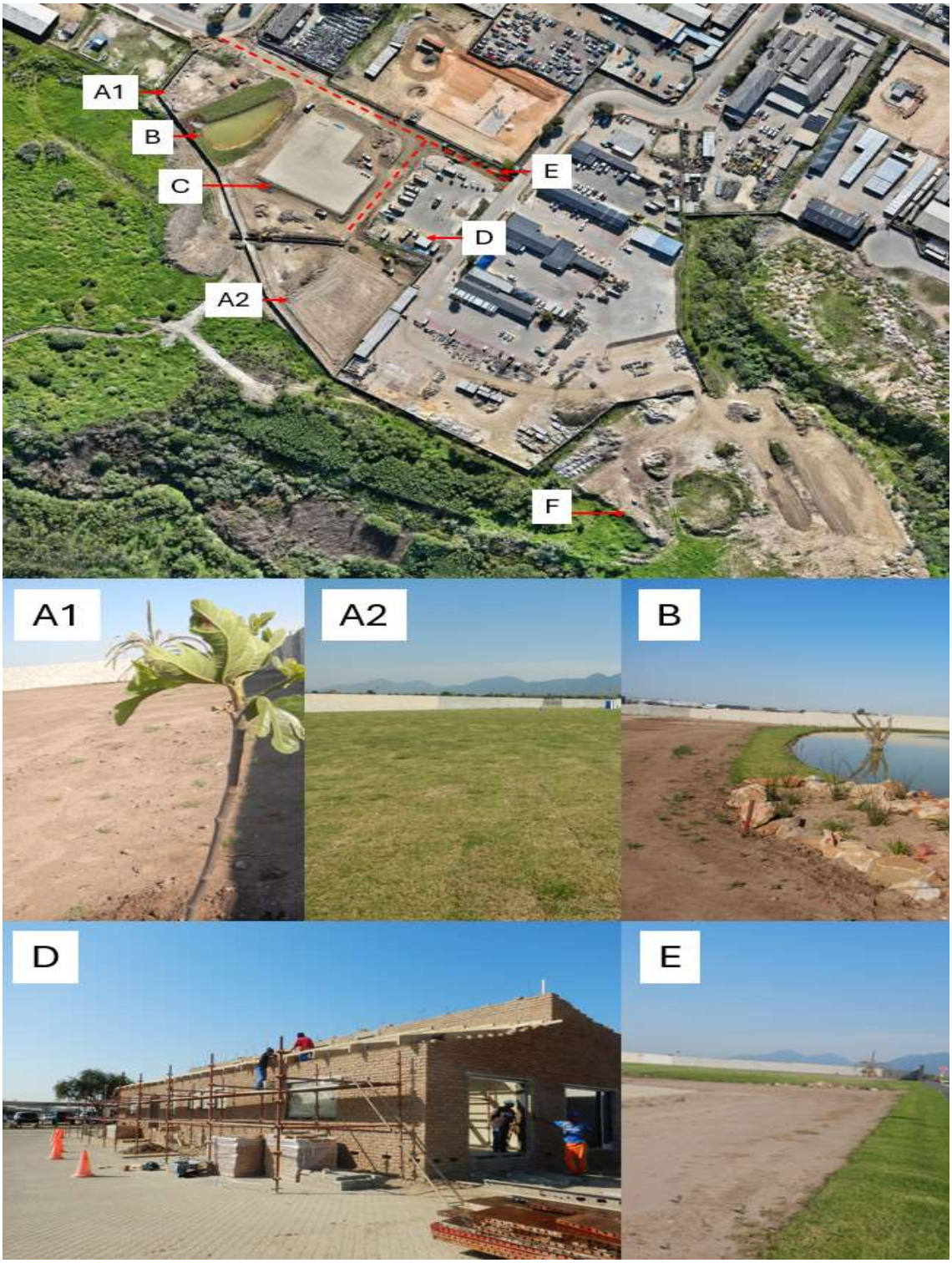


*Figure 6. Aerial and ground images showing areas of existing disturbance for RE/464 defined as the following: A) Areas cleared/ landscaped; B) Stormwater attenuation pond with associated landscaping; C.) The foundations for the water depot proposed, D) The area where office buildings were constructed, E) road proposed shown to already be tarred and, F) Site of illegal dumping of soil.*

The area outside the current fence line of the depot where the future developments are proposed contains remnants of indigenous Garden Route Granite Fynbos as mapped. Though a significant amount of the vegetation has already been cleared, illegal dumping occurs in the area, and alien plant species have established.

### 3.3 Assumptions and Limitations

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

- Only one survey took place during Spring (4 October). Season and time of day play a role in the outcome of a botanical survey. Some species may not have been flowering at the time of the survey and are less conspicuous at certain times compared to others.
- Some species may have been incorrectly identified on the site due to missing key characteristics and identifying features.
- Seasonal and time constraints always play a role in limiting the findings of a terrestrial specialist report. Many plant species flower seasonally and are therefore difficult to identify outside of their flowering season. It is, however, noted that Spring is the ideal season for single-survey sampling as most (but not all) species flower at this time of year.
- Some rare and threatened plant species are difficult to locate and easily overlooked in the field (e.g., geophytes, small succulents, small shrubs, etc.).
- Environmental factors such as the prevailing fire regime, successional stage of the vegetation present, previous cultivation of the land, and the level of alien infestation at the site affects the species visible at the time of assessment (Cowling et al., 2010; Privett et al., 2001).

# 4. RESULTS: DESKTOP ASSESSMENT

## 4.1 Terrestrial Biodiversity

### *4.1.1 Climate, Geology, and Soil*

George has moderately hot summers and cool winters. Climate in the region is described as temperate with no dry season and warm summers according to the Köppen-Geiger Climate Zone classification (Cfb). As such it receives a moderate amount of rainfall throughout the year (673mm mean annual rainfall) with peak precipitation occurring in November (57mm). The coldest month of the year is July ($5^0$C daily minimum with $18^0$C daily maximum, on average) and the hottest months of the year are January and February ($15^0$C daily minimum with $28^0$C daily maximum, on average) (Figure. 7).

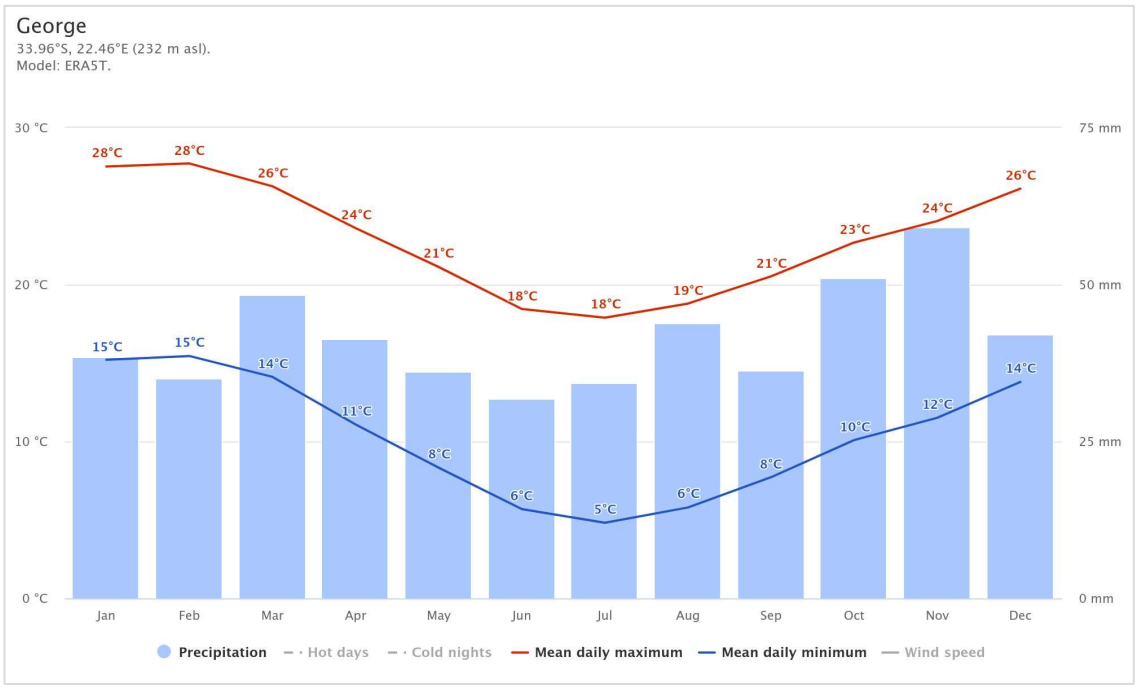


*Figure 7. The climate of George indicating the daily maxima and minima averaged across the month, and precipitation from recent years (https://www.meteoblue.com/)*

Geology is classified as being of the Cape Granite Suite George Pluton Unit (Maalgaten granites). Maalgaten Granite underlies a large region extending from the Wilderness in the east to the Klein Brak River in the west and represents the main component of the George Pluton (Browning & Macey, 2015) of which the lithology is a gneissic granite. One or more of the following soils types may occur: vertic (swelling clay soils), melanic (calcium or magnesium rich soils), and plinthic soils (which may accumulate ferricrete).

### *4.1.2 Vegetation Type*

The vegetation of the property is mapped as **critically endangered (CR) Garden Route Granite Fynbos (FFg 5)** (Figure. 8; Dayaram et al., 2019; Mucina & Rutherford, 2006).

Garden Route Granite Fynbos is found only in the Western Cape Province in three main sections. The largest section of this vegetation type is mapped from Groot Brak River to Woodfield. It is associated with undulating hills on coastal forelands. Garden Route Granite Fynbos is typified by dense proteoid and/or ericoid shrubby grassy fynbos depending on the slope and aspect of the landscape. This vegetation type is listed as critically endangered as over 70% of its original extent has been transformed to agriculture or forestry land uses. Remaining patches of this vegetation type is confined mostly to highly fragmented pockets on steeper slopes. Furthermore, even though it is thought that this vegetation type was once dominated by proteoid fynbos, it seems to be easily converted to graminoid fynbos with more frequent fires and / or augmentation with pasture grasses (Mucina & Rutherford, 2006). Some of the typical plants that are associated with Garden Route Granite Fynbos as described in (Mucina & Rutherford, 2006) include:

**Tall Shrubs**: *Passerina corymbosa, Cliffortia serpyllifolia, Protea coronata, P. lanceolata, P. neriifolia*.

**Low Shrubs**: *Erica discolor variant 'speciosa', E. peltata, Phylica confusa, Syncarpha paniculata, Agathosma ovata, Anthospermum prostratum, Aspalathus asparagoides, Cliffortia falcata, Cullumia bisulca, Erica canaliculata, E. diaphana, E. formosa, Eriocephalus africanus, Hermannia angularis, Leucadendron salignum, Lobelia tomentosa, Metalasia pungens, Mimetes cucullatus, Pelargonium fruticosum, Oedera calycina*.

**Succulent Shrub**: *Lampranthus sociorum*.

**Semiparasitic Shrubs**: *Colpoon compressum, Thesium virgatum*.

**Semiparasitic Epiphytic Shrub**: *Viscum capense*.

**Geophytic Herb**: *Schizaea pectinata*.

**Graminoids**: *Tetraria cuspidata*, *Brachiaria serrata, Eragrostis capensis, Ficinia nigrescens, Heteropogon contortus, Pentaschistis eriostoma, Restio triticeus, Themeda triandra*

The Vlok vegetation map which has a higher resolution outlines the Groot Brak River floodplain as extending into the property with the rest of the site being comprised of Wolvedans grassy fynbos (Figure. 8).


*Figure 8. The national and more local Vlok vegetation map layers for RE/464, George.*

### *4.1.3 Western Cape Biodiversity Spatial Plan*

The Biodiversity Spatial Plan for the Western Cape (WCBSP) contains several conservation planning layers that are used to set priority areas for conserving biodiversity. The definition and objectives of the WCBSP layer mapped on Erf RE/464 is given in Table 2. Most of the property is mapped as a CBA 1 area for the aquatic theme (See Table. 2; Figure. 7). The rest is mapped as CBA 2 for the terrestrial theme with small areas of ESA 2 and classified as "Climate Corridor, River, Wetland" (Figure. 8).

*Table 2: WCBSP categories mapped for the property, their definitions and management objects*

| WCBSP Category | Definition | Management Objective |
|---|---|---|
| Critical Biodiversity Area 1 (CBA 1) | Areas in a natural condition. Required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure. | Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate. |
| Critical Biodiversity Area 2 (CBA 2) | Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. | Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate. |
| Ecological Support Area 2 (ESA 2) | Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. | Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement. |

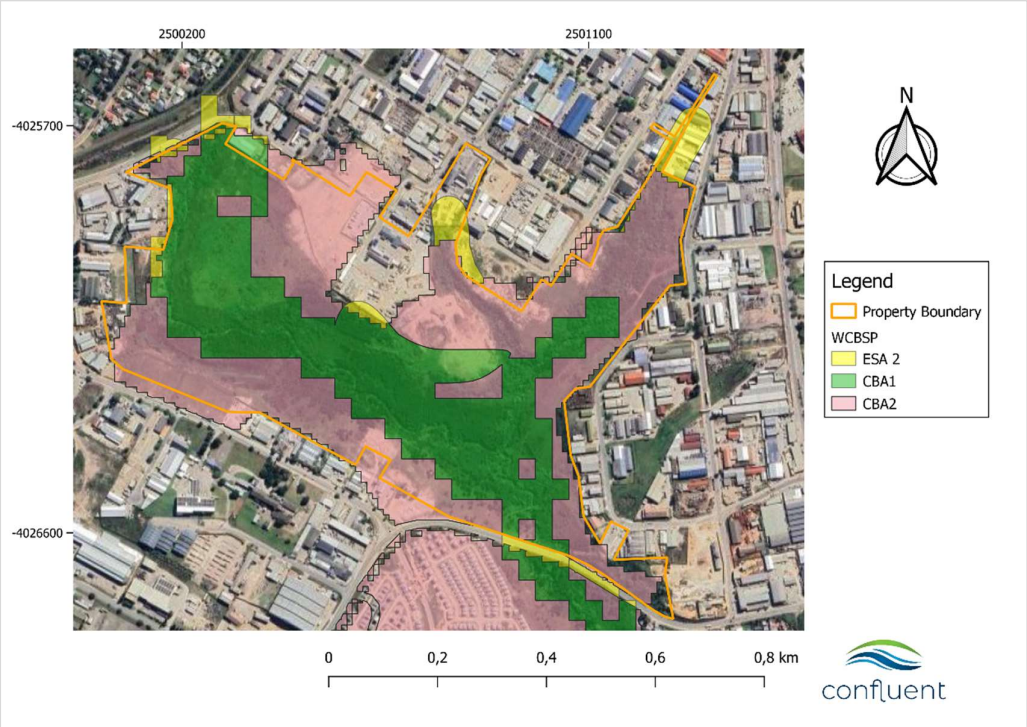


*Figure 9. WCBSP layers mapped for Erf RE/464.*

The reasons for the assignment of the WCBSP layers in this area are listed below (grey reasons either do not apply to the site, or are outside of the scope of this study to comment on):

Bontebok Extended Distribution Range: This WCBSP trigger falls outside of the scope of this study. Refer to the faunal specialist report for comment.

Water source protection- Kaaimans: This trigger is outside of the scope of this report.

Watercourse protection- South-Eastern Coastal Belt: This WCBSP trigger falls outside of the scope of this study. Refer to an aquatic specialist for comment.

### *4.1.4 Historical Aerial Imagery*

In 1939 to 1987, the depot is situated within a largely undeveloped landscape with a few roads and some other infrastructure (Figure. 10). By 1989, there is a vast increase in urbanization, with new infrastructure and housing. During this period the vegetation around the depot remains open. The 2003 image shows an increase in the density of vegetation at the property and the introduction of office buildings. By 2018, the soil dumping area (labelled F in Figure. 6) is already present indicating that past development started this trend rather than the present development. The soil dumping area does, however, show changes in extent until 2024 suggesting its continued use for this purpose. By 2020 and continuing into 2024, further vegetation clearing has occurred, with some areas within the depot being completely cleared.

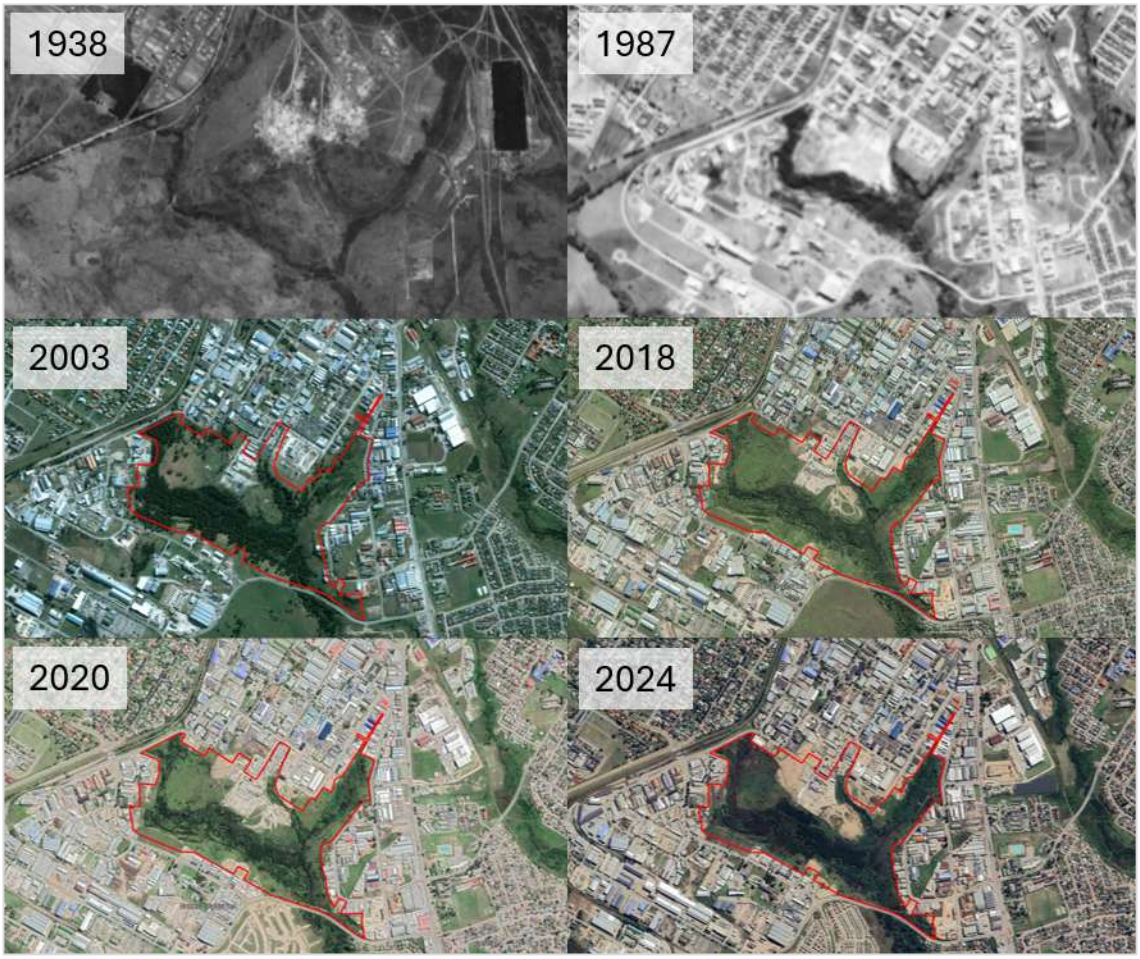


*Figure 10. Historical imagery of development area sourced from the CD:NGI geospatial portal and Google Earth*

## 4.2 Plant Species

The plant species theme sensitivity of Medium is dependent on the presence, or likely presence, of several plant species of conservation concern (SCC).

### *4.2.1 Species of conservation concern (SCC) listed in the screening tool.*

Several SCC have the potential to occur on the site (Table. 3). These species are sourced from the Screening tool and iNaturalist observations in the area, with status verified using the SANBI Red List and IUCN Red List.

*Table 3: SCC with the potential to occur on the site.*

| Species | Source | Red List Status (National; Global) |
|---|---|---|
| *Lampranthus pauciflorus* | Screening Tool | Endangered |
| *Leucospermum glabrum* | Screening Tool | Endangered |
| Sensitive species 1024 | Screening Tool | Endangered |
| Sensitive species 1032 | Screening Tool | Vulnerable |
| Sensitive species 800 | Screening Tool | Vulnerable |
| Sensitive species 500 | Screening Tool | Endangered |

| Species | Source | Red List Status (National; Global) |
|---|---|---|
| *Diosma passerinoides* | Screening Tool | Vulnerable |
| *Disa schlechteriana* | iNaturalist | Vulnerable |
| *Bartholina etheliae* | iNaturalist | Least Concern; Vulnerable |
| *Afrocarpus falcatus** | iNaturalist | Least Concern |
| Sensitive species 1171 | iNaturalist | Rare |
| *Ocotea bullata** | iNaturalist | Endangered |
| *Mimetes pauciflorus* | iNaturalist | Vulnerable |
| *Erica unicolor georgensis* | iNaturalist | Rare |
| *Curtisia dentata** | iNaturalist | Near Threatened |
| *Podocarpus latifolius** | iNaturalist | Protected tree 18 |
| *Disa arida* | iNaturalist | Endangered |
| *Leucospermum praecox* | iNaturalist | Vulnerable |
| *Prunus Africana** | iNaturalist | Vulnerable |
| *Dioscorea sylvatica* | iNaturalist | Vulnerable |

*Protected trees per the National Forest Act 84 of 1998

# 5. RESULTS: FIELD ASSESSMENT

## 5.1 Refined Vegetation Map

The vegetation of most of the property is heavily invaded vegetation close to the watercourse, transformed areas, and cleared areas which includes parts of the site where soil was dumped during construction since these are functionally similar (further detail is provided in Figure. 6; See Figure. 11 for the full refined vegetation map). A heavily invaded (predominantly by Black wattle (*Acacia mearnsii*)) patch of vegetation with some fynbos species (Figure. 12) was observed but no SCCs were found. Outeniqua Yellowwoods (*Afrocarpus falcatus*, Protected tree 16) were spotted in the heavily invaded areas of the site. Further details on field methods and conditions can be found in Section 3.2.

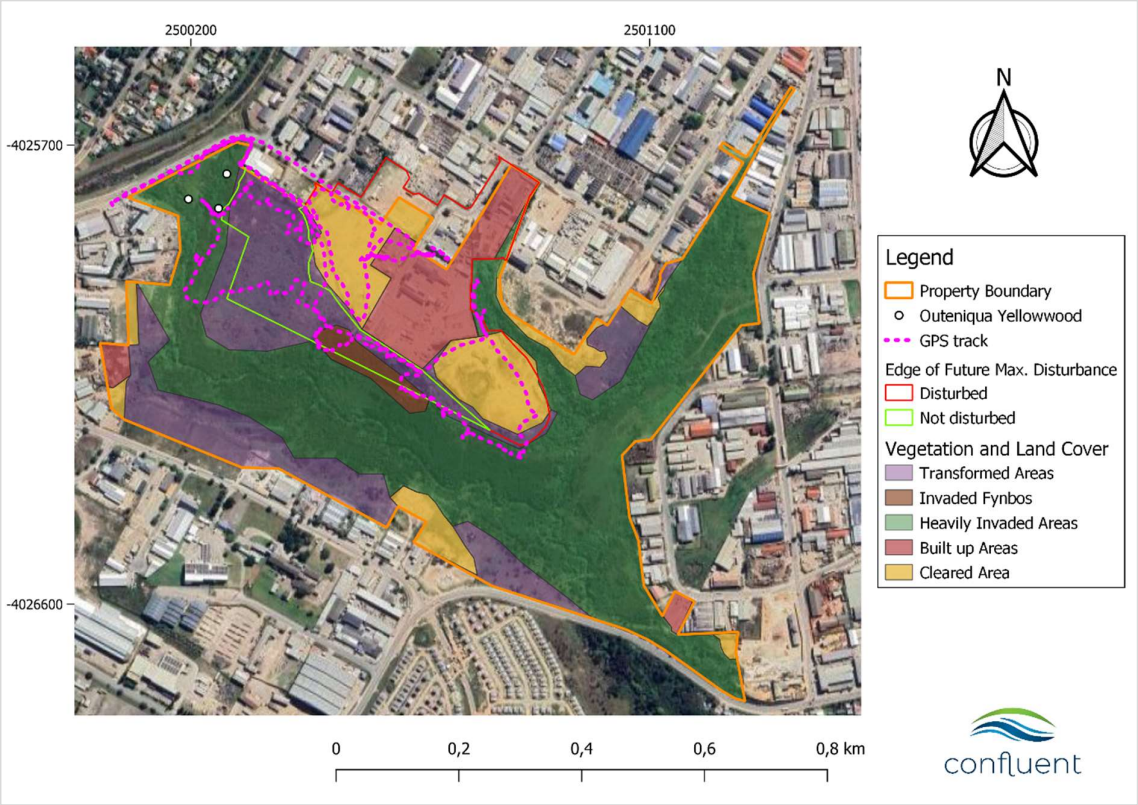


*Figure 11. Vegetation map for Erf RE/464 based on field observations.*

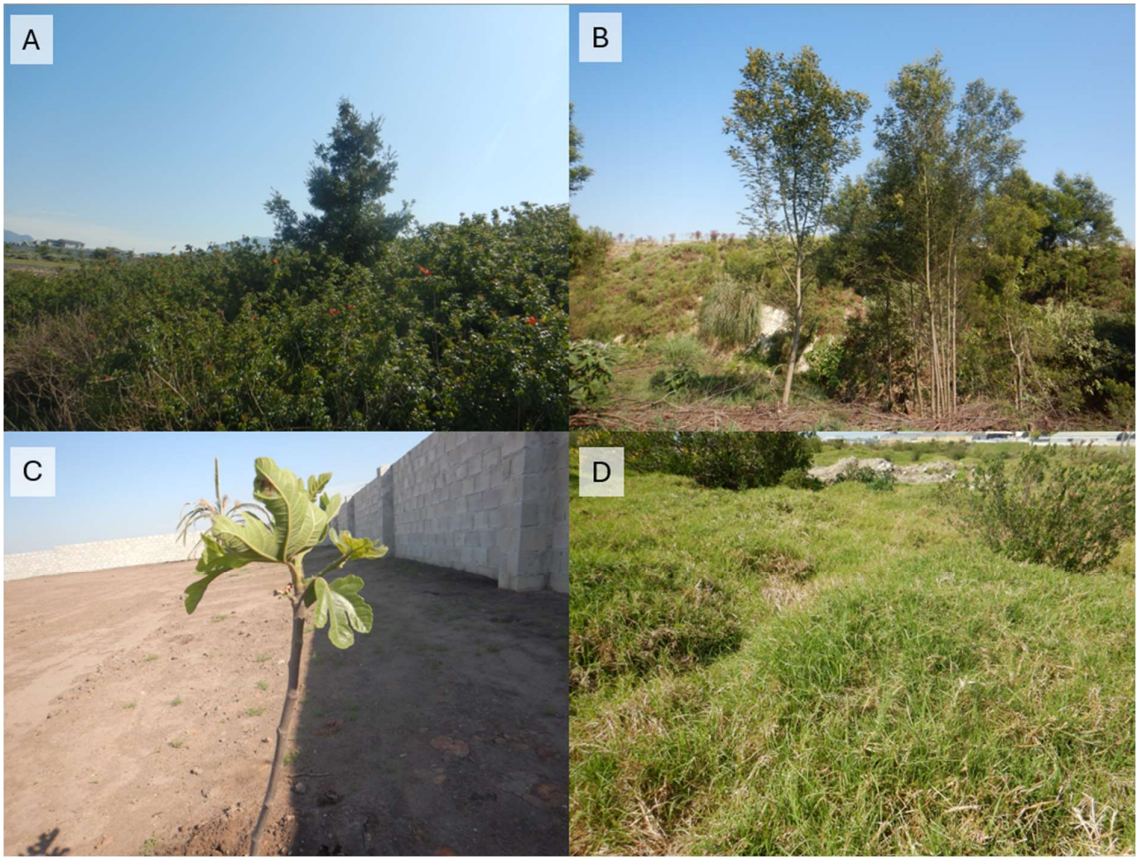


*Figure 12. Some vegetation categories determined during the site visit. (A.) Heavily invaded vegetation with an Outeniqua yellowwood (Afrocarpus falcatus) in the background and Cape honeysuckle (Tecomaria capensis) in the foreground, (B.) Black wattles (Acacia mearnsii) in heavily invaded vegetation with evidence of clearing in the foreground, (C.) An example of the areas labelled as 'cleared vegetation' with a planting of Ficus sp. (further details in Section 3.2 of this report), (D.) Most of the transformed area is dominated with disturbance-loving grasses such as Kikuyu grass (Cenchrus clandestinus).*


*Figure 13. South African endemic species found in the invaded fynbos area. (A.) Struthiola hirsuta, (B.) Moraea unguiculata, (C.) Ixia orientalis, and (D.) Erica quadrangularis.*

## 5.2 Plant Species on Site

No SCC were observed on the site, but individuals of a protected tree species was observed (Figure. 11, Figure 12), namely Outeniqua Yellowwood (*Afrocarpus falcatus*, Protected tree 16). Some endemic species were found at the site, predominantly in the area designated as Invaded Fynbos (Figure. 11; some of these species are shown in Figure. 13). Invasive species occur throughout the site with Blackwood Wattles (*Acacia melanoxylon*), Black wattles (*Acacia mearnsii*) (in 'Heavily Invaded areas'), and Kikuyu Grass (*Cenchrus clandestinus*) (in 'Transformed areas') being the most common (Figure. 12; See Table. 7 for the full list of invasive species).


*Figure 14. Some invasive Species observed during the Site Assessment and found throughout the site. (A.) Ricinus communis), (B.) Acacia mearnsii, (C.) Arundo donax and, (D.) Cenchrus clandestinus.*

## 5.3 Likelihood of Occurrence for SCC

All SCC that may be present on the site have been identified using the screening tool report for the site, iNaturalist nearby observations, and the POSA database (Table. 4). The current state of vegetation at the property and the short duration of the survey made it likely that many species were missed during the site assessment. The probability of occurrence that is stated in this section is a subjective assessment of SCC likelihood on the site.

*Table 4. Plant SCC flagged for the site and nearby surroundings, but that were not observed during site assessment. *Protected trees.*

| Species | Common name | Family | Growth Form | Source | Red List Status | Likelihood of Occurrence |
|---|---|---|---|---|---|---|
| *Lampranthus pauciflorus* | Beach brightfig | Aizoaceae | Succulent | Screening Tool | Endangered | Low<br>The species occurs in rocky and hilly areas. |
| *Leucospermum glabrum* | Outeniqua pincushion | Proteaceae | Shrub | Screening Tool | Endangered | Very Low<br>Occurs on moist slopes not characteristic of this landscape. |
| Sensitive species 1024 | - | - | - | Screening Tool | Endangered | Very Low<br>Occurs on slopes not characteristic of this site. |
| Sensitive species 1032 | - | - | - | Screening Tool | Vulnerable | Very Low<br>This SCC prefers dune habitat. |
| Sensitive species 800 | - | - | - | Screening Tool | Vulnerable | Very Low<br>The species occurs in coastal habitat. |
| Sensitive species 500 | - | - | - | Screening Tool | Endangered | Very Low<br>Preferred habitat is sandy flats, dunes and coastal promontories. |
| *Diosma passerinoides* | Silcrete bitterbuchu | Rutaceae | Shrub | Screening Tool | Vulnerable | Very Low<br>SCC occurs in clay soils in renosterveld with patches of silcrete. |
| *Disa schlechteriana* | Spur disa | Orchidaceae | Geophyte | iNaturalist | Vulnerable | Very Low<br>Habitat preference is dry, north-facing sandstone slopes. |
| *Bartholina etheliae* | Club spider orchid | Orchidaceae | Geophytic ground orchid | iNaturalist | Least Concern; Vulnerable | Very Low<br>Not highlighted as occurring in this vegetation type. |
| *Afrocarpus falcatus** | Outeniqua yellowwood | Podocarpaceae | Tree | iNaturalist | Least Concern | Confirmed<br>This species was found at the site. |
| Sensitive species 1171 | - | - | - | iNaturalist | Rare | Very Low<br>Occurs in seeps on sandstone slopes. |
| Ocotea bullata* | Stinkwood | Lauraceae | Tree | iNaturalist | Endangered | Very Low<br>No suitable forest habitat exists at the site. |

| Species | Common name | Family | Growth Form | Source | Red List Status | Likelihood of Occurrence |
|---|---|---|---|---|---|---|
| *Mimetes pauciflorus* | Treeflower pagoda | Proteaceae | Shrub | iNaturalist | Vulnerable | Low<br>Occurs in Outeniqua and Tsitsikamma Mountains in sandstone fynbos. |
| *Erica unicolor georgensis* | George two-onecolor heath | Ericaceae | Shrub | iNaturalist | Rare | Low<br>Found in the Outeniqua Mountains rather than lowlands. |
| *Curtisia dentata** | Assegai tree | Curtisiaceae | Tree | iNaturalist | Near Threatened | Very low<br>No suitable forest habitat exists at the site. |
| *Podocarpus latifolius** | Broad-leaved yellowwood | Podocarpaceae | Tree | iNaturalist | | Low<br>These trees have high visibility, and none were detected at the site. Individuals located nearby area likely plantings. |
| *Disa arida* | Kleinkaroo disa | Orchidaceae | Geophyte | iNaturalist | Endangered | Low<br>The species prefers sandstone fynbos. |
| *Leucospermum praecox* | Mossel Bay pincushion | Proteaceae | Shrub | iNaturalist | Vulnerable | Very Low<br>This species is endemic to Riversdale Flats, from Puntjie to Mossel Bay. |
| *Prunus africana** | Red Stinkwood | Rosaceae | Tree | iNaturalist | Vulnerable | Very Low<br>The species occurs in forests and bushveld. |
| *Dioscorea sylvatica* | Forest elephantsfoot | Dioscoraceae | Climbing tuberous geophyte | iNaturalist | Vulnerable | Very Low<br>Plants grow in wooded and relatively mesic places not characteristic of this site. |

# 6. SITE SENSITIVITY VERIFICATION

## 6.1 Terrestrial Biodiversity

Most of the property is mapped as a CBA 1 or CBA2 area with the land that was cleared being mapped as a CBA 2 area. The vegetation type mapped for the site is critically endangered.

Most of the property is heavily invaded by Kikuyu grass, Black wattle, and other species. It is noted that a small patch of invaded fynbos was found in an area where clearing of woody invasive species had happened before (as evidenced by slash found in the area). This shows some capacity for recovery of this fynbos. The invaded fynbos patch extends over CBA 1 and CBA 2 areas at the site.

The terrestrial biodiversity of the fynbos patch at the site is assessed as having a **Very High** sensitivity as assigned by the DFFE screening too. The rest of the property is given a **Low** sensitivity which differs from the **Very High** sensitivity assigned by the DFFE screening tool. The area designated as **Very High** sensitivity lies within the boundary of the area of maximum disturbance (as reflected in Figure. 10) which necessitates that a full impact assessment be conducted.

The invaded fynbos patch is aerially indistinct from the surrounding vegetation moving towards the watercourse in the historical imagery due to its high level of invasion by woody species. The last time the cleared area contained vegetation that might be fynbos was in 1938, with the whole area being cleared and transformed vegetation colonizing the space by 1987 (likely with the development of infrastructure at the property). It, however, cannot be guaranteed that the vegetation cleared at the site more recently did not include fynbos elements undetectable in aerial imagery.

## 6.2 Botanical Diversity

Outeniqua Yellowwoods (*Afrocarpus falcatus*) (protected tree 16) were found. The National Forest Act 84 of 1998 makes it illegal to cut, damage or in any way disturb protected trees without a license granted by the Minister of Forestry, Fisheries, and the Environment. No other species highlighted were found on the site during the site assessment. It can be stated with some confidence that many SCC are sensitive to disturbance and would not occupy so transformed, invaded, and built-up a landscape. Additionally, the ecological niche of many SCC highlighted do not accord with conditions observed at the site. The site is therefore assigned a **Low** sensitivity for the botanical theme, as opposed to the **Medium** sensitivity assigned by the DFFE screening tool.

# 7. SITE ECOLOGICAL IMPORTANCE

Site Ecological Importance (SEI) is determined for vegetation and land cover found within the property, taking associated SCC into account (Table. 5).

SEI is a function of biodiversity importance (BI) and receptor resilience (RR) such that: SEI = BI + RR. BI is further defined as a function of conservation importance (CI) and habitat functional integrity (FI), with BI = CI + FI, and is determined by means of a matrix. SEI can therefore be fully understood as SEI = (CI + FI) + RR, where:

- Conservation Importance (CI): The importance of a site for supporting biodiversity features of conservation concern present.
- Functional Integrity (FI): A measure of the ecological condition of the impact receptor (i.e., habitat type) as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.
- Receptor Resilience (RR): The intrinsic capacity of the receptor (i.e., habitat type or SCC) to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.

The SEI is derived for each habitat type or SCC within a project site by making use of two matrixes: first to calculate the BI and then the SEI. These matrices and further details can be found in Appendix 6.

Table 5 provides the SEI calculations for each habitat type and Figure 15 illustrates the SEI results for the property. It is important to note that the SEI reported here is specific to the proposed development and associated activities of this report and can only be used to compare multiple layouts and/or locations for the development.

*Table 5. Site Ecological Importance assessment (SEI) for Erf 464.*

| Land use/ Land cover | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | SEI |
|---|---|---|---|---|---|
| **Invaded Fynbos** | **High**<br>The area contains a very small amount of fynbos (ca. 0.8 ha) relative to how much of the critically endangered ecosystem type (Garden Route Granite Fynbos) remains. | **Very Low**<br>The area is very small and isolated in a large built-up landscape with disturbed vegetation and invasive species. | **Low** | **Medium**<br>VAST Class III: Transformed.<br>Disturbances and invasive plants threaten the biodiversity, but the vegetation is also likely to recover slowly to the same state if remediative measures are in place following disturbance/ invasion. This is evidenced by the occurrence of this fynbos patch after alien clearing. | **Low** |
| **Built-up Areas** | **Very Low**<br>No natural habitat remaining | **Very Low**<br>Several major current negative impacts exist. | **Very Low** | **Very High**<br>VAST Class VI: Removed.<br>Vegetation has been removed and built up. | **Very Low** |
| **Transformed Areas** | **Low**<br>Despite its classification as Garden Route Granite Fynbos (a critically endangered ecosystem type) and the discovery of Outeniqua yellowwood, the habitat cannot be described as natural given the definition for "natural habitat" in the Species Environmental Assessment Guideline (footnote number 25, page 28). | **Low**<br>There is almost no connectivity in this landscape due to the built-up nature of majority of its surroundings. Several major current negative ecological impacts are present. | **Low** | **Very High**<br>VAST Class IV: Replaced-Adventive.<br>Invasive species can be viewed as an issue of poor land management practice since the development and implementation of invasive species management plans is the responsibility of the landowner. However, native vegetation is replaced at the site by spontaneously occurring alien species which are quick to reinvade and recover. | **Very Low** |
| **Heavily Invaded Areas** | **Low**<br>Despite its classification as Garden Route Granite Fynbos, a critically endangered ecosystem type, the habitat cannot be described as natural given the definition for "natural habitat" in the Species Environmental | **Low**<br>Several major current negative ecological impacts are present namely the heavily invaded nature of the site and foot traffic at the site | **Low** | **Very High**<br>VAST Class IV: Replaced-Adventive.<br>Invasive species can be viewed as an issue of poor land management practice since the development and implementation of invasive species management plans is the responsibility of the landowner. However, native vegetation is replaced at the site by spontaneously occurring | **Very Low** |

| Land use/ Land cover | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | SEI |
|---|---|---|---|---|---|
| | Assessment Guideline (footnote number 25, page 28). | functioning as a pathway for disturbance. | | alien species which are quick to reinvade and recover. | |
| **Cleared Areas** | **Very Low**<br>No natural habitat remaining | **Very Low**<br>Several major current negative impacts exist. | **Very Low** | **Very High**<br>VAST Class VI: Removed.<br>Vegetation has been removed/ covered with sand and left as is. | **Very Low** |

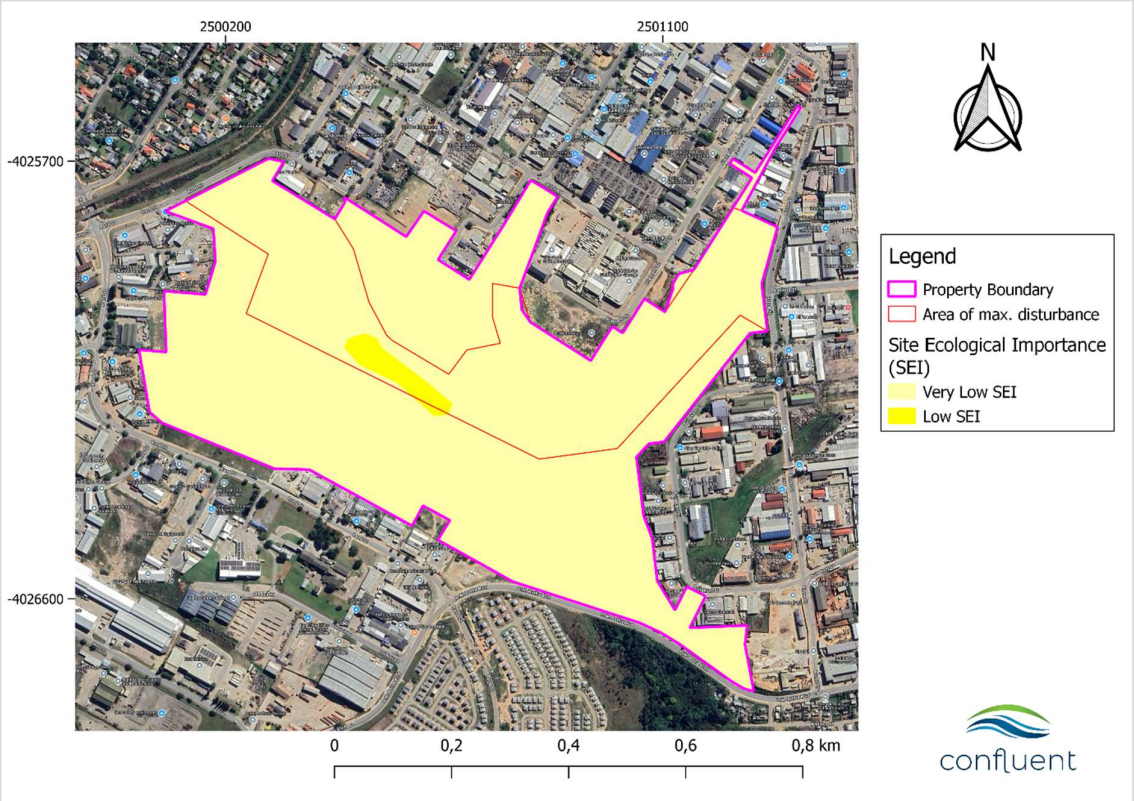


*Figure 15. Site Ecological Importance map showing only areas of Low SEI and Very Low SEI at the site.*

Most of the property has a **Very Low** SEI score for terrestrial biodiversity and botanical diversity (Figure. 14, Table. 5). According to the guidelines for interpreting SEI ratings in terms of development (Table. 6), high impact development is acceptable at **Very Low** SEI sites and restoration may not be required (Table. 6). This indicates that most of the site is suitable for heavy disturbance as is currently proposed. It is noted that invaded fynbos vegetation falls within the footprint of the area of maximum disturbance. Although given a **Low** SEI rating due to its diminutive size (ca. 0.82 ha) and lack of SCCs, restoration is required. The endemism of some species found warrants some level of conservation. For this reason, it is imperative that mitigation measures are strictly adhered to and that all measures are taken to minimize negative impacts on this botanical community.

The **Very Low** SEI score of the unlawfully cleared and developed areas is afforded to it given its current state. According to historical aerial photography, the last time the area contained vegetation that resembles fynbos was in 1938. This was cleared and what seems to be transformed vegetation colonised the space by 1987. The invaded fynbos patch (as observed in the field) is, however, also aerially indistinct from the surrounding vegetation due to its high level of invasion by woody species. This confirms that, although aerial historical photography is our best source of information on the developed and cleared areas, a very high level of confidence cannot be afforded to it in terms of vegetation composition on the ground. It therefore cannot be guaranteed that the vegetation cleared at the site more recently did not include fynbos elements and SCCs undetectable in aerial imagery. Due to the precautionary

principle the vegetation cleared can be declared as the same as the invaded fynbos currently found at the site and given a **Low** SEI.

*Table 6: Guidelines for interpreting Site Ecological Importance for proposed developments (SANBI 2020)*

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

# 8. IMPACT ASSESSMENT

This impact assessment is based on the SDP available at the time of writing this report and will need to be reassessed if this changes in the future. The impacts and associated mitigation measures for each development phase are discussed in the following sections. For ease of reference, an Environmental Compliance Officer (ECO) checklist is provided in Appendix 6 to ensure that all mitigation measures are easily monitored during the various construction-related phases of development.

Impacts (pre- and post-mitigation) are evaluated for the SDP with the methods explained in Appendix 8.

## 8.1 Mitigation hierarchy

The principles of the mitigation hierarchy (Ekstrom *et al.*, 2015; Mitigation hierarchy guideline draft February 2023)) are applied during an impact assessment. Potential impacts on biodiversity are preferentially managed through preventative, rather than remediative, measures (Figure. 16). This is achieved by suggesting avoidance or minimization methods wherever possible. Successive steps in the hierarchy should only be considered once the previous step has been exhausted. Avoidance of negative impacts is a priority. If the impacts of a development cannot be adequately managed through the preventative measures of avoidance and minimization, then restoration and, as a last resort, offsets or compensation are considered.

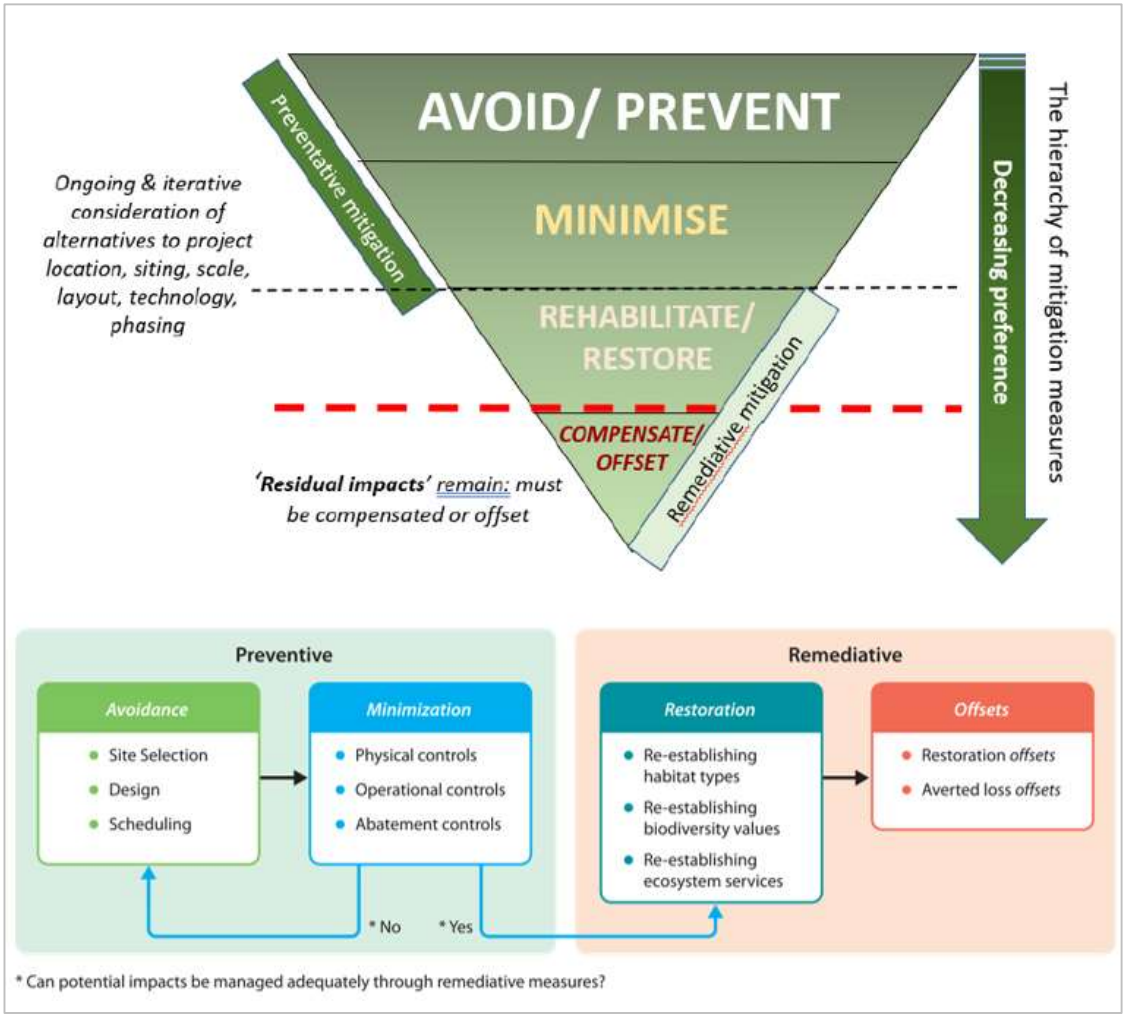


*Figure 16. The iterative process of minimising predicted impacts on biodiversity and ecosystem services, as described in the mitigation hierarchy (Ekstrom et al., 2015; Mitigation hierarchy guideline draft, February 2023).*

## 8.2 Project Area of Influence

The proposed development has a very low potential to have large impacts outside of the development footprint.

## 8.3 Current Impacts

The vegetation at the site is heavily transformed and invaded by the species listed in Table 7. The most widespread species present at the site is varying age classes of Blackwood wattle. It is highly recommended that the current impacts are addressed, and that an alien plant management plan be developed and implemented concurrent with (preferred), or after development at the site.

*Table 7. Invasive species found at the site.*

| Family | Species | Common Name | Invasive Status* |
|---|---|---|---|
| Apocynaceae | *Vinca major* | Greater periwinkle | 1b |
| Asteraceae | *Cirsium vulgare* | Bull Thistle | 1b |
| Cannaceae | *Canna indica* | Indian shot | 1b |
| Euphorbiaceae | *Ricinus communis* | Castor bean | 2 |
| Fabaceae | *Acacia mearnsii* | Black wattle | 2 |
| Fabaceae | *Acacia melanoxylon* | Blackwood wattle | 2 |
| Fabaceae | *Senna didymobotrya* | Peanut-Butter Cassia | 1b |
| Meliaceae | *Melia azedarach* | Chinaberry | 3 in urban areas |
| Poaceae | *Arundo donax* | Giant reed | 1b |
| Poaceae | *Cenchrus clandestinus* | Kikuyu Grass | 1b |
| Poaceae | *Cortaderia selloana* | Pampas Grass | 1b |
| Solanaceae | *Nicandra physalodes* | Apple-of-Peru | 1b |
| Solanaceae | *Solanum mauritianum* | Bugweed | 1b |
| Verbenaceae | *Lantana camara* | Common lantana | 1b |

*See Appendix 7 for details on invasive categories as assigned by the NEMBA List 2024.

## 8.4 Residual Impacts

Residual impacts are those impacts that remain following the implementation of mitigation measures. Residual impacts must be identified and rated (i.e. low, medium or high) in accordance with the Criteria for Assessing Residual Impact (taken from the Western Cape Guideline on Biodiversity Offsets, 2015 (DEA&DP 2015)). As a residual impact pushes the condition of the environment (and biodiversity) from a threshold of potential concern to a threshold of major potential concern to an exclusionary threshold, the significance rating of residual impacts will increase incrementally. Although a number of these impacts are outlined in this report, they are mitigable and manageable as is demonstrated in the mitigation measures outlined below. Residual impacts are therefore given a **Low** score due to its low impact on local biodiversity or valued ecosystem services (see Appendix 6 for a detailed explanation of the criteria for this and all scores).

## 8.5 Layout and Design Phase

Changes in layout are not recommended by this report despite the overlap of the area of maximum disturbance in the development plan with fynbos vegetation in the refined vegetation map. Conservation of so small an area (ca. 0.82ha) would require continuous, rigorous, and expensive management due to increased edge effects and the consequences of fragmentation. This patch would therefore not contribute meaningfully to the ecology of the landscape. Instead, the rescue of individual plants prior to construction is recommended and maintaining the ecological function and native biodiversity of this fynbos patch is prioritised. This is achieved by advocating for the inclusion of salvaged plants and topsoil in soft landscaping rather than the hard landscaping currently observed at this site.

## 8.6 Construction Phase

### *8.6.1 Loss of fynbos vegetation*

**Description:** The permanent loss of ca. 0.82ha area of invaded Garden Route Granite Fynbos to construction or heavy disturbance.

**Consequences of Impact:**

- Disruption of seed dispersal, nutrient cycling, and pollination.
- Disruption of vegetation structure and dominance.
- Accelerated and ongoing spread of invasive and disturbance-loving plant species.

**Impact Assessment:**

| | Without Mitigation | With Mitigation |
|---|---|---|
| **Nature** | Negative | Negative |
| **Duration** | Permanent | Brief |
| **Extent** | Limited | Limited |
| **Intensity** | High | Low |
| **Probability** | Certain/ definite | Rare/ improbable |
| **Confidence** | High | High |
| **Reversibility** | Low | High |
| **Resource Irreplaceability** | Medium | Low |
| **Significance** | **Moderate - negative** | **Negligible - negative** |

**Mitigation Measures:**

1. Prior to construction: A plant search and rescue must be conducted in the entire fynbos patch (with a botanist/ ecologist on the site to provide guidance on best practice).
    a. Plants with a high likelihood of survival must be rescued (geophytes, graminoids, and succulents), and specific important sections in the heavy disturbance footprint must be identified and added to the rescue operation prior to the commencement of construction.

    b. Stands of plants could be removed carefully with an excavator to preserve as much as possible of the soil around the roots of the plants. These could then be temporarily planted elsewhere for the duration of the construction phase.

    c. The rescued plants must be kept in a nursery that should preferably be set up on the site in an existing disturbed area. Alternatively, arrangements with a suitable nursery/ available receptor site should be made to keep and care for removed plants during the construction phase of the project.

    d. Topsoil (excluding topsoil under dense stands of invasive plants) must be stripped to a depth of 30cm and bunded with sandbags to use for replanting of vegetation to preserve the possible soil bank held therein. This topsoil must be maintained (i.e. it must be ensured that no invasive and disturbance-loving species take root in piled topsoil). If the SDP of the proposed development does not have enough space for the storage and protection of topsoil within the disturbance envelope, then the Contractor must identify an alternative temporary stockpile area. Additionally, topsoil must be clearly labelled so that it does not mix with subsoils excavated or any other construction material for the site.

e. The rescued plants must be planted back with the aid of botanists and/ or horticultural specialists within the area of max disturbance when construction concludes. This will promote the regeneration of natural fynbos and and reduce the possibility of negative edge effects on the site.

f. Any additional SCC and plants with a high survival likelihood that are observed during construction within a development footprint must be rescued (soil intact) and added to the rescued plants.

2. Prior to construction, the disturbance footprint of the development should be clearly defined and demarcated to prevent unnecessary additional damage to the surrounding environment:
   a. Construction netting must be used to clearly indicate construction areas. Access roads must be clearly marked so there is no confusion as to where the tracks are or how wide the road is.
   b. Clear signs for “no-go” areas for vehicles and personnel should be placed strategically on the site and along access roads. No-go areas are anywhere outside of the direct area of influence of the construction phase.
   c. A turning area for construction vehicles should be demarcated within the existing footprint of proposed hard surfaces.
3. Prior to construction: Schedule vegetation clearance during the winter (if planning allows) to minimize impact on plant life cycles & pollination. This not compulsory but rather a preference to preserve ecological function at the site.
4. Where vegetation will be cleared to make way for construction, filled sandbags, silt socks, or a silt fence must be used to reduce the intensity of water runoff and flow over the site and thereby reduce erosion potential (Figure. 17). This should be placed around the perimeter of the downslope disturbance footprint and needs regular inspection and adaptive management to ensure the integrity of the system for reducing erosion.

*Figure 17. Examples of silt socks (left) and a silt fence (right) placed perpendicular to the flow of water. These methods reduce the force of water flow, erosion and can prevent unwanted sedimentation at the site.*

**Residual Impacts:**

- Alteration of specific microhabitats that important taxa rely on, such as soil composition, moisture levels, or fire regimes, may cause declines in species that are sensitive to these conditions. The species highlighted at the invaded fynbos area, however, are not SCC so there is little chance for these declines having an impact on overall extinction risk of SSC.
- Removing vegetation can lead to soil erosion since the area where fynbos vegetation is currently is steep. This is accounted for in this impact assessment.
- Potential fynbos lost because of past clearing on the site will remain transformed.
- Despite erosion control measures, there may be long-term soil compaction, erosion, or changes in soil fertility that affect the ability of the land to support native vegetation in the future.

## 8.7 Conclusion of the Construction Phase

The conclusion of any project is an essential, but often overlooked aspect of projects. This relates primarily to the cleaning up of the site once construction has concluded. This is not a separate impact, but it is important enough to warrant a section in this report. The conclusion of the construction phase is technically still included in the construction phase, but unlike other construction impacts, impacts that could occur here are less predictable. All of the mitigation measures proposed above are only meaningful if construction is properly concluded.

- Construction sites must be cleared of all waste material, rubble, and debris associated with the construction phase at regular intervals during, and at the conclusion of the construction phase.
- Revegetation of bare soil following construction is an essential part of concluding the construction phase of the project.
- Drainage structures must be checked to ensure that there are no blockages or pollution that is blocking the free flow of water over the site; these checks will prevent erosion during and after the construction phase that could have potentially far-reaching implications beyond the direct area of influence for the proposed development.

## 8.8 Operational Phase

### *8.8.1 Landscaping & land-use effects on Habitats and Plant Species*

**Description:** Inappropriate landscaping and landscape management

**Consequence of Impact:**

- Fynbos being negatively affected by inappropriate permanent landscaping & landscape management resulting in water attenuation problems.
- Potential long-term biodiversity loss from the cultivation of species that are not indigenous to the vegetation type and surrounding landscape.
- An increase in hard surfaces as it causes changes in microclimate and the interaction of water with the substrate adjacent to the built environment.

- The introduction of non-indigenous species in landscaping can disrupt natural fire regimes
- Non-native plants may not provide suitable habitat or food sources for local wildlife, leading to the disruption of mutualistic relationships between indigenous plants and their pollinators or seed dispersers.
- The presence of non-native species increases the possibility of edge effects in fynbos and may reduce biodiversity, compromising the integrity and functionality of the fynbos ecosystems.

**Impact Assessment:**

| | Without Mitigation | With Mitigation |
|---|---|---|
| **Nature** | Negative | Positive |
| **Duration** | Permanent | Permanent |
| **Extent** | Limited | Limited |
| **Intensity** | Moderate | Moderate |
| **Probability** | Almost certain / Highly probable | Almost certain / Highly probable |
| **Confidence** | High | High |
| **Reversibility** | Low | High |
| **Resource Irreplaceability** | Medium | Low |
| **Significance** | **Moderate - negative** | **Moderate - positive** |

**Mitigation Measures:**

1. Control of alien & invasive plant species according to a management plan. This is a requirement by law.
2. The rehabilitation of the disturbance footprint with topsoil and plants rescued on the site must occur as soon as possible after the conclusion of construction.
3. Select locally indigenous plants for gardens, making use of as many of the rescued plant species as possible. Avoid plants that are hybrids and cultivars
4. Planting during the rainy season (early winter May/June) is preferable, if planning allows. If this is not possible however, appropriate maintenance of plants (such as irrigation) must take place. A 10cm thick layer of wood chip must be added to retain soil moisture
5. Ensure soft landscaping is used as opposed to hard landscaping. Soft landscaping refers to natural spaces around constructed buildings that contain plants. The plants used are often trees, shrubs, and herbs that perform valuable ecosystem functions and services. Soft landscapes support biodiversity if local indigenous species are planted, or better yet, if the natural vegetation is left to recover and grow with minimal to no planting of man-made gardens. This is contrary to what has been observed at the site (See Figure. 18).

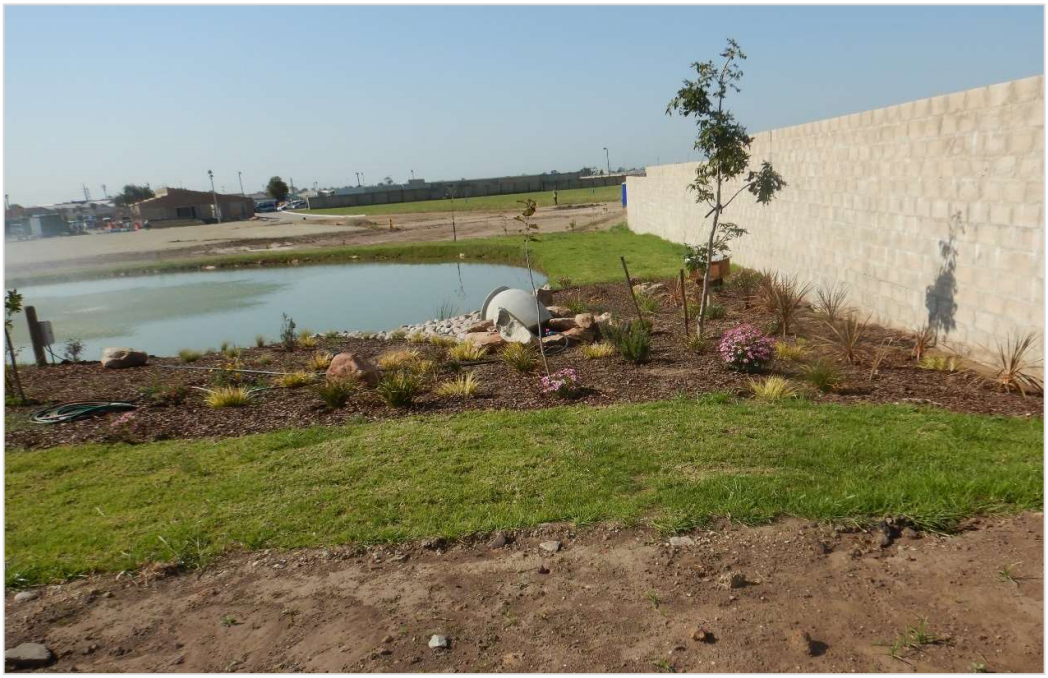

*Figure 18. Landscaping observed at the site. This is an example of hard landscaping, where species that are not naturally occurring in fynbos or Garden Route Granite Fynbos are introduced.*

**Residual Impacts**

- The permanent introduction of non-indigenous species and altered landscaping can result in long-term reductions in local plant and animal diversity. Native species that once thrived may continue to struggle or decline, reducing overall ecosystem health and resilience.
- Genetic pollution from hybridization between indigenous and non-native species may persist, potentially affecting the genetic integrity of local SCC populations and other indigenous flora.
- Non-native plants already used in landscaping may continue to spread and establish themselves in natural areas exacerbating habitat degradation and potentially outcompeting fynbos plant species.

## 9. CONCLUSION

According to the screening tool it is necessary that a full assessment be conducted for the site given its **Very High** terrestrial biodiversity and **Medium** botanical diversity sensitivity scores. Per the WCBSP, the site is mapped as mostly CBA1 and CBA2. Additionally, according to the National Vegetation Map 2024, the property is mapped as containing Garden Route Granite Fynbos, a critically endangered vegetation type.

The site visit confirms that a ca.0.8 ha. patch of Garden Route Granite Fynbos extending over CBA 1 and CBA 2 areas remains. This vegetation, like the rest of the site, is heavily invaded but shows some recovery of endemic and fynbos plant species due to past woody alien species clearing (as evidenced by slash). Due to its invaded state, position in the landscape (between invasive vegetation and transformed vegetation) and size, however, this patch is

given a **Low** SEI in this report which advocates for restoration and allows for high impact development. Given the built-up state of the landscape, few refuges exist for fynbos communities and associated fauna, making the conservation of its biodiversity a priority. This is accounted for in the impact assessment stage of this report by the recommendation that fynbos plants be rescued and replanted as soft landscaping, with species native to the vegetation type being introduced as a restorative measure.

Despite the presence of fynbos vegetation at the site, no SCC are suspected to occur due to the transformed and invaded state of the property, giving the botanical theme a **Low** sensitivity. The presence of Outeniqua Yellowwood (*Afrocarpus falcatus*) (protected tree 16), however, is noted at the property since a permit is required for its removal as outlined in the National Forest Act 84 of 1998. The trees are outside of the area to be disturbed by the current development. It is recommended that the protected tree found at the property is preserved in further development.

Currently, the greatest impact on biodiversity at the site is invasive species. Most of the property is heavily invaded by Kikuyu grass, Black wattle, and other species. It is highly recommended that all alien invasive plant species on the site be actively managed through the development and implementation of alien invasive plant management plan, as this will limit current negative impacts on the property and the surrounding areas and increase natural fynbos habitat.

Although presently of no conservation value in terms of this theme, the following is noted regarding the unlawfully cleared and developed areas assessed in this report: According to historical aerial photography, the last time the area contained vegetation that resembles fynbos was in 1938. This was cleared and what seems to be transformed vegetation colonised the space by 1987. The invaded fynbos patch (as observed in the field) is, however, also aerially indistinct from the surrounding vegetation due to its high level of invasion by woody species. This confirms that, although aerial historical photography is our best source of information on the developed and cleared areas, a very high level of confidence cannot be afforded to it in terms of vegetation composition on the ground. It therefore cannot be guaranteed that the vegetation cleared at the site more recently did not include fynbos elements and SCCs undetectable in aerial imagery. Due to the precautionary principle, it is the specialist's opinion that the vegetation cleared in the past can be declared as the same as the invaded fynbos currently found at the site.

It is the specialist's opinion that this development conforms to the description of high to medium impact and that restoration measures can be carried out as is required by the SEI scores in this report. Development may be considered a favourable land use for this property, pending a full site development plan to confirm this and provided that all mitigation measures are strictly adhered to.

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## APPENDIX 1: PROVISIONAL PLANT SPECIES LIST

A species accumulation curve for all the species recorded on the site during the assessment are presented in Figure. 19. All species that were observed during the site visit are in Table 8. The site assessment species list is not exhaustive.

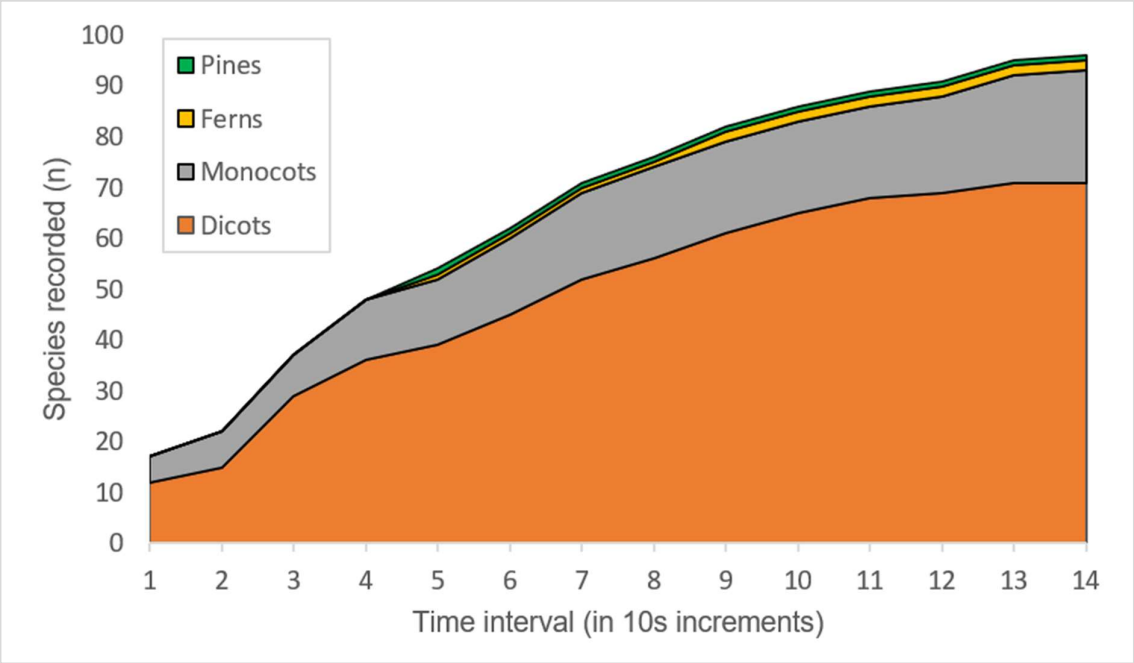


*Figure 19. Plant species accumulation curve for the site assessment.*

*Table 8. Provisional plant species list for the site assessment. Invasive alien species are in red. Protected tree are in green.*

| Family | Species | Common Name |
|---|---|---|
| Amaranthaceae | *Amaranthus cruentus* | Red amaranth |
| Amaranthaceae | *Chenopodium berlandieri* | Pitseed goosefoot |
| Anacardiaceae | *Searsia lucida* | Glossy Currantrhus |
| Anacardiaceae | *Searsia rehmanniana* | Bluntleaf Currantrhus |
| Apiaceae | *Cyclospermum leptophyllum* | Marsh parsley |
| Apiaceae | *Foeniculum vulgare* | Fennel |
| Apocynaceae | *Vinca major* | Greater periwinkle |
| Araceae | *Zantedeschia aethiopica* | Calla lily |
| Asparagaceae | *Agave sisalana* | Sisal |
| Asparagaceae | *Chlorophytum comosum* | Spider plant |
| Asparagaceae | *Chlorophytum saundersiae* | Weeping Anthericum |
| Asparagaceae | *Ornithogalum thyrsoides* | Chincherinchee |
| Asphodelaceae | *Aloe arborescens* | Candelabra Aloe |
| Asteraceae | *Arctotheca prostrata* | Prostrate Capeweed |
| Asteraceae | *Bidens pilosa* | Hairy Beggarticks |
| Asteraceae | *Cirsium vulgare* | Bull Thistle |

| Family | Species | Common Name |
|---|---|---|
| Asteraceae | *Delairea odorata* | Cape-ivy |
| Asteraceae | *Euryops chrysanthemoides* | Paris Daisy |
| Asteraceae | *Euryops virgineus* | Virgin True-Eye |
| Asteraceae | *Helichrysum cymosum* | Fume Everlasting |
| Asteraceae | *Helichrysum petiolare* | Licorice plant |
| Asteraceae | *Helminthotheca echioides* | Bristly oxtongue |
| Asteraceae | *Nidorella ivifolia* | Ivy Vleiweed |
| Asteraceae | *Senecio ilicifolius* | Kowanna Ragwort |
| Asteraceae | *Sonchus* | Sow thistles |
| Bignoniaceae | *Tecomaria capensis* | Cape Honeysuckle |
| Brassicaceae | *Capsella bursa-pastoris* | Shepherd's-purse |
| Brassicaceae | *Raphanus raphanistrum* | Wild radish |
| Campanulaceae | *Monopsis unidentata* | Wild Violet |
| Cannaceae | *Canna indica* | Indian shot |
| Caryophyllaceae | *Spergula arvensis* | Corn spurrey |
| Convolvulaceae | *Cuscuta* | Dodders |
| Crassulaceae | *Crassula* | Stonecrops |
| Cyperaceae | *Schoenus compar* | Ivory Veldrush |
| Ericaceae | *Erica quadrangularis* | Smoke Heath |
| Euphorbiaceae | *Euphorbia helioscopia* | Sun spurge |
| Euphorbiaceae | *Euphorbia peplus* | Petty Spurge |
| Euphorbiaceae | *Ricinus communis* | Castor bean |
| Fabaceae | *Acacia mearnsii* | Black wattle |
| Fabaceae | *Acacia melanoxylon* | Blackwood |
| Fabaceae | *Psoralea stachyera* | Spike Dottypea |
| Fabaceae | *Senna didymobotrya* | Peanut-Butter Cassia |
| Fabaceae | *Trifolium repens* | White clover |
| Fabaceae | *Vicia hirsuta* | Hairy tare |
| Fagaceae | *Quercus robur* | English oak |
| Geraniaceae | *Erodium malacoides* | Soft Stork's-bill |
| Geraniaceae | *Pelargonium capitatum* | Rose-scented geranium |
| Hypoxidaceae | *Hypoxis villosa* | Shaggy Stargrass |
| Iridaceae | *Aristea pusilla* | |
| Iridaceae | *Ixia orientalis* | Eastern Kalossie |
| Iridaceae | *Moraea unguiculata* | White Uintjie |
| Lamiaceae | *Leonotis leonurus* | Common Lionspaw |
| Malvaceae | *Hermannia hyssopifolia* | Fat Dollsrose |
| Malvaceae | *Sida poeppigiana* | - |
| Meliaceae | *Ekebergia capensis* | Cape Ash |
| Meliaceae | *Melia azedarach* | Chinaberry |
| Oleaceae | *Olea europaea* | Olive |
| Onagraceae | *Oenothera rosea* | Rose evening primrose |
| Oxalidaceae | *Oxalis articulata* | Pink-sorrel |
| Papaveraceae | *Fumaria muralis* | Common ramping-fumitory |
| Plantaginaceae | *Veronica persica* | Bird's-eye speedwell |
| Poaceae | *Arundo donax* | Giant reed |

| Family | Species | Common Name |
|---|---|---|
| Poaceae | *Cenchrus clandestinus* | Kikuyu Grass |
| Poaceae | *Cortaderia selloana* | Pampas Grass |
| Poaceae | *Lolium perenne* | Perennial Ryegrass |
| Poaceae | *Setaria megaphylla* | Broadleaf Bristlegrass |
| Poaceae | *Triticum aestivum* | Bread Wheat |
| Podocarpaceae | *Afrocarpus falcatus* | Outeniqua Yellowwood |
| Polygalaceae | *Polygala virgata* | Purple Broom |
| Primulaceae | *Lysimachia arvensis* | Scarlet pimpernel |
| Primulaceae | *Lysimachia loeflingii* | Blue Scarlet Pimpernel |
| Pteridaceae | *Cheilanthes viridis* | Green Cliff Brake |
| Pteridaceae | *Pteris tremula* | Shaking Brake |
| Restionaceae | *Elegia tectorum* | Cape Thatching Reed |
| Rosaceae | *Chaenomeles speciosa* | Chinese quince |
| Rosaceae | *Cliffortia filicaulis* | Finestem Caperose |
| Rosaceae | *Rubus* | Brambles |
| Rubiaceae | *Anthospermum aethiopicum* | Tall Flowerseed |
| Scrophulariaceae | *Selago corymbosa* | Stiff Bitterbush |
| Solanaceae | *Nicandra physalodes* | Apple-of-Peru |
| Solanaceae | *Solanum linnaeanum* | Yellow Bitter-apple |
| Solanaceae | *Solanum mauritianum* | Bugweed |
| Stilbaceae | *Halleria lucida* | African honeysuckle |
| Thymelaeaceae | *Passerina corymbosa* | Common Gonna |
| Thymelaeaceae | *Struthiola hirsuta* | Shaggy Capespray |
| Tropaeolaceae | *Tropaeolum majus* | Garden nasturtium |
| Verbenaceae | *Lantana camara* | Common lantana |
| Viburnaceae | *Sambucus nigra* | European black elderberry |

## APPENDIX 2: VAST CRITERIA

*Table 9: Vegetation Assets, States, and Transitions (VAST) framework with columns representing states. Shifts between states are defined as transitions, as laid out in (Lesslie et al., 2010; Thackway & Lesslie, 2006).*

**Increasing modification**

| | | **Native vegetation cover**<br>Dominant plant species indigenous to the locality and spontaneous in occurrence, i.e. a vegetation community described using definitive vegetation types relative to estimated pre 1750 types | | | | **Non-native vegetation cover**<br>Dominant structuring plant species indigenous to the locality but cultivated; alien to the locality and cultivated; or alien to the locality and spontaneous | | |
|---|---|---|---|---|---|---|---|---|
| **Vegetation cover classes** | | **Class 0: RESIDUAL BARE**<br>Areas where native vegetation does not naturally persist | **Class I: RESIDUAL**<br>Native vegetation community structure, composition, and regenerative capacity intact—no significant perturbation from land use or land management practice. Class I forms the benchmark for classes II to VI | **Class II: MODIFIED**<br>Native vegetation community structure, composition and regenerative capacity intact—perturbed by land use or land management practice | **Class III: TRANSFORMED**<br>Native vegetation community structure, composition and regenerative capacity significantly altered by land use or land management practice | **Class IV: REPLACED-ADVENTIVE**<br>Native vegetation replacement—species alien to the locality and spontaneous in occurrence | **Class V: REPLACED-MANAGED**<br>Native vegetation replacement with cultivated vegetation | **Class VI: REMOVED**<br>Vegetation removed |
| **Diagnostic criteria** | Current regenerative capacity | Natural regenerative capacity unmodified—ephemerals and lower plants | Natural regenerative capacity unmodified | Natural regeneration tolerates or endures under past and or current land management practices | Natural regenerative capacity limited or at risk under past and or current land use or land management practices. Rehabilitation and restoration possible through modified land management practice | Regeneration of native vegetation community has been suppressed by ongoing disturbances of the natural regenerative capacity; limited potential for restoration | Regeneration of native vegetation community lost or suppressed by intensive land management; limited potential for restoration | Nil or minimal |
| | Vegetation structure | Nil or minimal | Structural integrity of native vegetation community is very high | Structure is predominantly altered but intact, e.g. a layer or strata and or growth forms and or age classes removed | Dominant structuring species of native vegetation community significantly altered, e.g. a layer or strata frequently removed | Dominant structuring species of native vegetation community removed or predominantly cleared or extremely degraded | Dominant structuring species of native vegetation community removed | Vegetation absent or ornamental |
| | Vegetation composition | Nil or minimal | Compositional integrity of native vegetation community is very high | Composition of native vegetation community is altered but intact | Dominant structuring species present—species dominance significantly altered | Dominant structuring species of native vegetation community removed | Dominant structuring species of native vegetation community removed | Vegetation absent or ornamental |
| **Examples** | | Bare mud; rock; river and beach sand, salt and freshwater lakes | Old growth forests; native grasslands that have not been grazed; wildfire in native forests and woodlands of a natural frequency and or intensity | Native vegetation types managed using sustainable grazing systems; selective timber harvesting practices; severely burnt (wildfire) native forests and woodlands not of a natural frequency and/or intensity | Intensive native forestry practices; heavily grazed native grasslands and grassy woodlands; obvious thinning of trees for pasture production; weedy native remnant patches; degraded roadside reserves; degraded coastal dune systems; heavily grazed riparian vegetation | Severe invasions of introduced weeds; invasive native woody species found outside their normal range; isolated native tree, shrub or grass species in the above examples | Forest plantations; horticulture; tree cropping; orchards; reclaimed mine sites; environmental and amenity plantings; improved pastures (includes heavy thinning of trees for pasture); cropping. Isolated native trees/ shrubs/grass species in the above examples | Water impoundments; urban and industrial landscapes; quarries and mines; transport infrastructure; salt scalded areas |

## APPENDIX 3: SITE ECOLOGICAL IMPORTANCE METHODS

The site ecological importance (SEI) is defined and calculated as highlighted as per the Species Environmental Assessment Guideline (SANBI 2020), where SEI is a function of biodiversity importance (BI) and receptor resilience (RR) such that: SEI = BI + RR.

BI is further defined as a function of conservation importance (CI) and habitat functional integrity (FI), with BI = CI + FI, and is determined by means of a matrix (Table. 10).

SEI can therefore be fully understood as SEI = (CI + FI) + RR, where:

**Conservation Importance (CI):** The importance of a site for supporting biodiversity features of conservation concern present, e.g., populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes. *Most features included in CI are provided by the screening tool but are evaluated at a finer scale following field work at the site.

**Functional Integrity (FI):** A measure of the ecological condition of the impact receptor (i.e., habitat type) as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.

**Receptor Resilience (RR):** The intrinsic capacity of the receptor (i.e., habitat type or SCC) to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.

*Table 10. Matrix to calculate the biodiversity importance (BI) of a given habitat type identified from desktop and field assessments.*

| **Biodiversity Importance** | | **Conservation Importance** | | | | |
|---|---|---|---|---|---|---|
| | | Very High | High | Medium | Low | Very Low |
| **Functional Integrity** | Very High | Very High | Very High | High | Medium | Low |
| | High | Very High | High | Medium | Medium | Low |
| | Medium | High | Medium | Medium | Low | Very Low |
| | Low | Medium | Medium | Low | Low | Very Low |
| | Very Low | Medium | Low | Very Low | Very Low | Very Low |

The SEI is derived for each habitat type or SCC within a project site by making use of two matrixes: first to calculate the BI (using Table 10. 10) and then the SEI (Table. 11).

SEI is therefore specific to the proposed development and can only be compared between alternative layouts for the same proposed development, but not between different developments.

*Table 11. Matrix to calculate site ecological importance (SEI) of a given habitat type identified from desktop and field assessments.*

| **Site Ecological Importance** | | **Biodiversity Importance** | | | | |
|---|---|---|---|---|---|---|
| | | Very High | High | Medium | Low | Very Low |
| **Receptor** | Very High | Very High | Very High | High | Medium | Low |
| | High | Very High | Very High | High | Medium | Very Low |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Medium | Very High | High | Medium | Low | Very Low |
| | Low | High | Medium | Low | Very Low | Very Low |
| | Very Low | Medium | Low | Very Low | Very Low | Very Low |

## APPENDIX 4: IMPACT ASSESSMENT METHODS

Criteria are ascribed for each predicted impact. These include the intensity (size or degree scale), which also includes the type of impact, being either a positive or negative impact; the duration (temporal scale); and the extent (spatial scale), as well as the probability (likelihood). The methodology is quantitative, whereby professional judgement is used to identify a rating for each criterion based on a seven-point scale (Table 12) and the significance is auto-generated using a spreadsheet through application of the calculations.

For each predicted impact, certain criteria are applied to establish the likely **significance** of the impact, firstly in the case of no mitigation being applied and then with the most effective mitigation measure(s) in place.

These criteria include the **intensity** (size or degree scale), which also includes the **nature** of impact, being either a positive or negative impact; the **duration** (temporal scale); and the **extent** (spatial scale). These numerical ratings are used in an equation whereby the **consequence** of the impact can be calculated. Consequence is calculated as follows:

**Consequence = type x (intensity + duration + extent)**

To calculate the significance of an impact, the **probability** (or likelihood) of that impact occurring is applied to the consequence.

**Significance = consequence x probability**

Depending on the numerical result, the impact would fall into a significance category as negligible, minor, moderate or major, and the type would be either positive or negative.

When assessing impacts, broader considerations are also considered. These include the level of confidence in the assessment rating; the reversibility of the impact; and the irreplaceability of the resource as set out in (Table 13, Table 14, and Table 15), respectively.

*Table 12. Assessment criteria for the evaluation of impacts*

| Criterion | Rating | Category | Description |
|---|---|---|---|
| Duration | 1 | Immediate | Impact will self-remedy immediately |
| | 2 | Brief | Impact will not last longer than 1 year |
| | 3 | Short term | Impact will last between 1 and 5 years |
| | 4 | Medium term | Impact will last between 5 and 10 years |
| | 5 | Long term | Impact will last between 10 and 15 years |
| | 6 | On-going | Impact will last between 15 and 20 years |
| | 7 | Permanent | Impact may be permanent, or in excess of 20 years |
| Extent | 1 | Very limited | Limited to specific isolated parts of the site |
| | 2 | Limited | Limited to the site and its immediate surroundings |
| | 3 | Local | Extending across the site and to nearby settlements |
| | 4 | Municipal area | Impacts felt at a municipal level |
| | 5 | Regional | Impacts felt at a regional level |
| | 6 | National | Impacts felt at a national level |
| | 7 | International | Impacts felt at an international level |
| Intensity | 1 | Negligible | Natural and/ or social functions and/ or processes are negligibly altered |

| Criterion | Rating | Category | Description |
|---|---|---|---|
| | **2** | **Very low** | Natural and/ or social functions and/ or processes are slightly altered |
| | **3** | **Low** | Natural and/ or social functions and/ or processes are somewhat altered |
| | **4** | **Moderate** | Natural and/ or social functions and/ or processes are moderately altered |
| | **5** | **High** | Natural and/ or social functions and/ or processes are notably altered |
| | **6** | **Very high** | Natural and/ or social functions and/ or processes are majorly altered |
| | **7** | **Extremely high** | Natural and/ or social functions and/ or processes are severely altered |
| **Probability** | **1** | **Highly unlikely/ None** | Expected never to happen |
| | **2** | **Rare/ improbable** | Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere |
| | **3** | **Unlikely** | Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur |
| | **4** | **Probable** | Has occurred here or elsewhere and could therefore occur |
| | **5** | **Likely** | The impact may occur |
| | **6** | **Almost certain/ Highly probable** | It is most likely that the impact will occur |
| | **7** | **Certain/ Definite** | There are sound scientific reasons to expect that the impact will definitely occur |

*Table 13. Definition of confidence ratings*.

| Category | Description |
|---|---|
| **Low** | Judgement is based on intuition. |
| **Medium** | Determination is based on common sense and general knowledge. |
| **High** | Substantive supportive data exists to verify the assessment. |

*Table 14. Definition of reversibility ratings.*

| Category | Description |
|---|---|
| **Low** | The affected environment will not be able to recover from the impact - permanently modified. |
| **Medium** | The affected environment will only recover from the impact with significant intervention. |
| **High** | The affected environmental will be able to recover from the impact. |

*Table 15. Definition of irreplaceability ratings*.

| Category | Description |
|---|---|
| **Low** | The resource is not damaged irreparably or is not scarce. |
| **Medium** | The resource is damaged irreparably but is represented elsewhere. |

# APPENDIX 5: RESIDUAL IMPACTS CRITERIA

| Threshold: The importance of biodiversity and/or ecosystem services | Impact significance rating |
|---|---|
| **Exclusionary threshold**<br><br>Impacts in this category could not be fully compensated by offsets because of the high threat status or irreplaceability of affected biodiversity or ecosystem services. Impacts in this category would generally be unacceptable and could lead to:<br><br>a. Irreversible and irreplaceable loss of ecosystem or species<br><br>i) Impacts on critically endangered ecosystems or species or leading to a change in the status of ecosystems or species from endangered to critically endangered.<br><br>ii) Impacts on Critical Biodiversity Areas (CBAs) and River and Wetland FEPAs (including free-flowing rivers53) from provincial biodiversity plans/ the Biodiversity Framework, unless there are spatial options to meet the specific biodiversity targets for which these CBAs were identified.<br><br>iii) Impacts on Ramsar sites.<br><br>b. Irreplaceable loss of key ecological corridors recognised as important for evolutionary processes and climate change adaptation where no spatial options to safeguard these processes exist.<br><br>c. Irreversible impacts on legally protected areas in terms of the Protected Areas Act, including Special Nature Reserves, National Parks and Provincial Nature Reserves; World Heritage Sites; Marine Areas; Specially Protected Forest Areas; and Mountain Catchment Areas.<br><br>d. Irreversible or irreplaceable loss of highly valued ecosystem services at national or provincial scale and/ or where there is a high level of dependence on these ecosystem goods and services by local communities for livelihoods and health, and no feasible substitutes. | Very High |
| **Threshold of major potential concern**<br><br>Impacts in this category could lead to:<br><br>- Irreversible impact, leading to change in ecosystem or species status within the Endangered category, or from Vulnerable to Endangered<br><br>- Irreversible loss of areas constituting important corridors or process areas at provincial level<br><br>- Impacts in buffer zones of protected areas (including buffers around National Parks, World Heritage Sites, and Nature Reserves)<br><br>- Impacts in Trans-Frontier Conservation Areas (outside of protected areas)<br><br>- Impacts on high water yield areas (‘water factories’, ‘water towers’)<br><br>- Impacts in the Coastal Protection Zone | High |

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|---|---|
| - Impacts on priority estuaries, in an estuarine functional zone where no setback line has been determined, and/ or on the estuary side of the development setback line<br>- Impacts within a 1km buffer of river and wetland FEPAs<br>- Impacts seawards of the development setback line or within 1km from the HWM where no development setback line has been determined<br>- Impacts on the watercourse side of a development setback line or within 100m from the edge of a watercourse where no setback line has been determined<br>- Impacts leading to loss or deterioration of valued ecosystem services at provincial level. | |
| **Threshold of potential concern**<br>Impacts in this category could lead to:<br>- Irreversible impact leading to change in ecosystem status from Least Threatened to Vulnerable<br>- Impacts on Vulnerable species<br>- Loss of areas constituting important corridors or ecological process areas at local levels<br>- Impacts on Ecological Support Areas<br>- Impacts on Vulnerable ecosystems in areas where CBAs have not yet been identified.<br>- Impacts on focal areas for protected area expansion (land-based and marine).<br>- Impact comprising a combination of impacts at a local level on two or more of the following:<br>a. a threatened ecosystem,<br>b. threatened species,<br>c. special habitats and,<br>d. ecological corridors or important process areas.<br>- Impact leading to loss or deterioration of valued ecosystem services at local level | Moderate |
| **Threshold of Low concern**<br>Low impact on local biodiversity or valued ecosystem services. Impacts in this category could lead to:<br>- Impacts on Least Threatened ecosystems where they do not: support threatened species or special habitats; constitute important ecological process areas or corridors; and/ or provide priority ecosystem services | Low |
| **Threshold of negligible concern**. e.g. no impact on local biodiversity or valued ecosystem services. Impacts in this category could lead to:<br>- Impacts on heavily modified or transformed natural environments. | Very Low |

# APPENDIX 6: ENVIRONMENTAL COMPLIANCE OFFICER (ECO) CHECKLIST FOR FAUNA MITIGATION MEASURES DURING PRECONSTRUCTION, CONSTRUCTION ANDD THE CONCLUSION OF CONSTRUCTION PHASES OF DEVELOPMENT

| Mitigation measure | Relevant impact; details of methods | Checklist √ |
|---|---|---|
| **Pre-construction phase** | | |
| Plants with a high likelihood of survival must be rescued. | See Section 8.5.1; Mitigation measure 1a and 1b. | |
| Rescued plants are to be maintained in a nursery area until construction concludes. | See Section 8.5.1; Mitigation measure 1c. | |
| Topsoil is to be salvaged to a depth of 30cm, bounded, labelled, set aside and maintained. | See Section 8.5.1; Mitigation measure 1d. | |
| The footprint of the development should be clearly defined and demarcated by means of netting and/or fencing. | See Section 8.5.1; Mitigation measure 2a. | |
| Signage must be clearly visible on site to mark no-go areas (any area outside of the direct influence of the site) for vehicles and personnel. | See Section 8.5.1; Mitigation measure 2b. | |
| A turning area for construction vehicles must be clearly demarcated within the footprint of hard surfaces and planned or existing gravel roads. | See Section 8.5.1; Mitigation measure 2c. | |
| Vegetation clearance to be scheduled for winter. | See Section 8.5.1; Mitigation measure 3. | |
| Filled sandbags, silt socks or a silt fence must be placed around the permiter of the downslope sisturbance footprint and be managed. | See Section 8.5.1; Mitigation measure 4. | |
| **Construction phase** | | |
| Transplanted plants are to be maintained in a nursery area until construction concludes. | See Section 8.5.1; Mitigation measure 1d. | |
| Salvaged topsoil is to be maintained (no invasive and disturbance loving-species take root) | See Section 8.5.1; Mitigation measure 1c. | |
| Additional plants with a high survival likelihood that are observed during construction within a development footprint must be rescued (soil intact) and added to the rescued plants in the indigenous nursery. | See Section 8.5.1; Mitigation measure 1f. | |
| **Conclusion of construction phase** | | |

| | | |
|---|---|---|
| Site to cleared of all waste material, rubble, and debris associated with the construction phase at regular intervals during, and at the conclusion of the construction phase. | See Section 8.5.2 | |
| Rescued plants to be planted back as part of soft landscaping using salvaged topsoil. | See Section 8.5.1 Mitigation measure 1d and 1e. | |
| Revegetate bare soil areas with indigenous plants. | See Section 8.5.2 | |
| Check all drainage structures and remove blockages or pollutants. | See Section 8.5.2 | |

## APPENDIX 7: INVASIVE SPECIES CATEGORIES

The NEMBA (National Environmental Management: Biodiversity Act, Act No. 10 of 2004) categories for the listed invasive species observed are listed in the species list in Table. 7. In short, NEMBA categorizes invasive species into four groups:

- Category 1a: Species that must be eradicated and prevented from being introduced or spread.
- Category 1b: Species that must be controlled to prevent further spread and impact.
- Category 2: Species that can be grown only in specific, controlled conditions, with a focus on prevention of escape.
- Category 3: Species that are already widely spread but must not be introduced or propagated further.