



Terrestrial Biodiversity Assessment

Kranshoek Portions 7 & 8

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Terrestrial Biodiversity Assessment

Kranshoek Portions 7 & 8

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Compiled for: **Sharples Environmental Services**

Date of report: **13/03/2026**

Final Draft Report

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1 Introduction & Background

1.1 Background

Sharples Environmental Services cc (SES) has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Assessments for the Proposed mixed use housing development on Ptn 7 and Ptn 8 of Farm Kranshoek, Western Cape. (Figure 1). As part of this application, a Terrestrial Biodiversity & Plant Specialist Assessment is required.

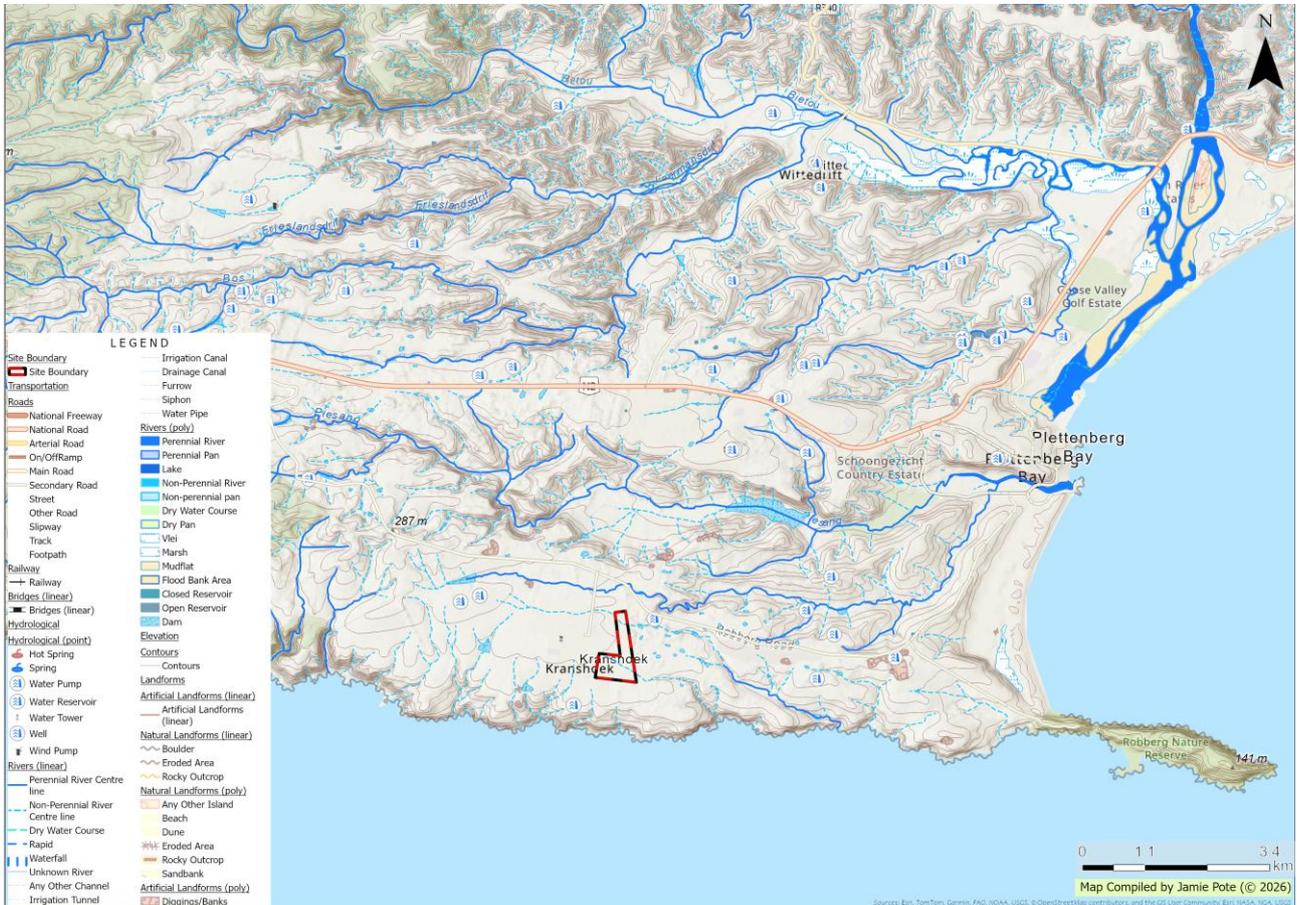


Figure 1: Locality Map.

1.2 Project Description

1.2.1 Aspects of the project that could potentially have Biodiversity related Impacts

The key components of the project and their respective impacts upon terrestrial biodiversity and ecological processes include the following:

Component	Potential Biodiversity and Ecological Impacts
SITE DEVELOPMENT	
The proposed development will require permanent clearing of the site as depicted in the layout plan.	The terrestrial environment will be permanently impacted where vegetation clearing is required to construct the proposed development. A minor perennial watercourse traverse=s the site, which has been excluded as open space.

1.2.2 Activity Location and Description

The proposed project is located to the west of Plettenberg Bay in the Western Cape, in the Kranshoek area. The proposed development consists of a mixed-use housing development on Portions 7 and 8 of Farm 432 (Kranshoek) as depicted in Figure 2.

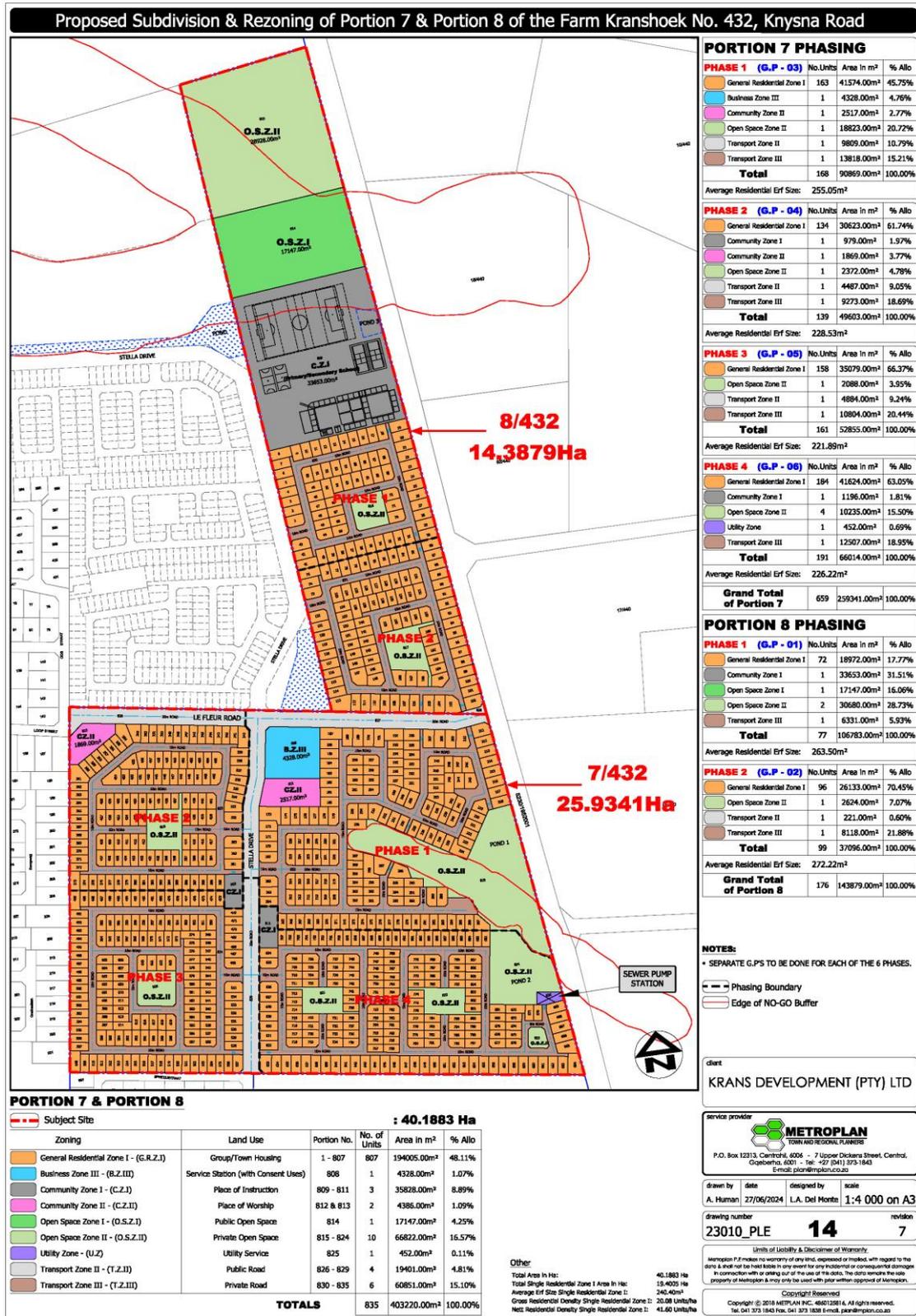


Figure 2: Proposed Mixed Use housing development layout plan (Map 23010_PLE Rev 7).

1.3 Methodology and Approach

The proposed methodology and approach followed in this assessment are outlined below:

- Conduct a comprehensive desktop study and identify potential risks relating to vegetation and flora of the site and surrounding area, for a Terrestrial Biodiversity Assessment Report. This will include the relevant Regional Planning and legislated frameworks, which will also be represented in a series of associated maps.
- Conduct a detailed site visit to assess the following:
 - Detailed field survey of vegetation, flora and habitats present.
 - Comprehensive species list, highlighting species that are of special concern, threatened, Red Data species and species requiring permits for destruction/relocation in terms of NEMBA and the Provincial Nature Conservation Ordinance No. 19 of 1974.
 - Detailed mapping of the various habitat units and assessment of habitat integrity, ecological sensitivity, levels of degradation and transformation, alien invasion and Species of Conservation Concern, the outcome being a detailed sensitivity map ranked into high, medium or low classes.
- Reporting will be comprised of a preliminary summary, with identification of anticipated impacts and risks for any scoping phase report (where applicable), a draft detailed Assessment Report (for public review and comment) and a Final Assessment Report for submission. The draft and final detailed reports will include the following:
 - Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks.
 - A detailed species list highlighting the various Species of Conservation Concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds).
 - Description and assessment of the habitat units and site sensitivities ranked into high, medium or low classes based on sensitivity and conservation importance. A standard methodology has been developed based on other projects in the specific area.
 - Assessment of Impacts and Mitigation Measure, as well as specific measure that may be required for alternative development plans.
 - A comprehensive EMPr for inclusion in the reports and EMP with specific management actions for construction and Operation.
 - A habitat sensitivity map will be compiled, indicating the sensitivities as described above.
 - A map indicating buffers (if required) to accommodate Regional Planning and any other requirements.

1.3.1 Site visit

A site visit was conducted on 15 August 2023 during late winter (~early spring). The site falls within a winter rainfall area and for the purposes of this report, based on favourable seasonal rainfall and on-site observations, the site visit is deemed to be adequate. A follow up site visit will be conducted at a late stage in the Scoping and EIA phase in order to supplement the species list. The site visit and assessment were undertaken by Mr Jamie Pote, SACNASP registered ecological scientist with a BSc (Hons) degree in Botany and a BSc degree in Botany and environmental Science, with nearly 20 years' experience undertaking ecological and terrestrial biodiversity assessments.

1.4 Purpose of Report

1.4.1 Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes

This report has been compiled to fulfil the requirement for a **Terrestrial Biodiversity Assessment** as per the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA (GNR 320), **as gazetted on 20 March 2020**.

This report is undertaken as supporting information as part of a greater environmental application process and is compliant in terms of the requirements in the above regulations in terms of Terrestrial Biodiversity.

In terms of the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted **on 30 October 2020**, relating to requirements relating specifically to the **Terrestrial Plant species theme**, this report includes these flora species requirements. The terrestrial biodiversity assessment also gives consideration of fauna, as per protocol requirements for terrestrial biodiversity reporting.

The principles that guide this process include protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources which are fundamental to sustainable development. Since the ecology of a landscape is a function of the relationships between living organisms, including humans, and their physical environment, this terrestrial biodiversity or ecological assessment report will consider not only vegetation but also flora and fauna as well as the physical environment in which they occur, which will determine the ecological processes that are affected within the site and immediate surrounds (area of influence).

1.4.2 Data sources and references

A comprehensive list of references, including data sources is provided in Section 9.1. Data sources that have been used in this report include the following:

- National (DFFE) Web Based Environmental Screening Tool (referred to as NEST in this report) – to generate the sites potential environmental sensitivity.
- National Vegetation Map 2018 (NVM, 2018), Mucina & Rutherford (2006) and National Biodiversity Assessment (NBA, 2019) – description of vegetation types, species (including endemic) and vegetation unit conservation status.
- National and Regional Legislation including Provincial Nature Conservation Ordinances and NEM:BA Threatened or Protected Species (ToPS).
- Botanical Database of Southern Africa (BODATSA) and New Plants of Southern Africa (POSA) – lists of plant species and potential species of concern found in the general area (SANBI)
- International Union for Conservation of Nature (IUCN) – Red List of Threatened Species
- Animal Demography Unit Virtual Museum (VM) – potential faunal species
- Global Biodiversity Information Facility (GBIF) – potential faunal species
- Southern African Bird Atlas Project 2 (SABAP2) – for bird species records
- National Red Books and Lists – mammals, reptiles, frogs, dragonflies & butterflies
- National Freshwater Ecosystem Priority Areas assessment (NFEPA, 2011) – important catchments
- National Protected Areas Expansion Strategy (NPAES, 2018) and South Africa Protected Area database (2020) – protected area information.
- Western Cape Biodiversity Spatial Plan (2017)
- Garden Route Biodiversity Sector Plan (2010)
- SANBI BGIS – All other biodiversity GIS datasets
- Aerial Imagery – Google Earth, Esri, Chief Surveyor General (<http://csg.dla.gov.za>)
- Cadastral and other topographical country data – Chief Surveyor General (<http://csg.dla.gov.za>)
- Other sources include peer-reviewed journals, regional and local assessments and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans (as above), and any pertinent masters and doctoral theses, among others.

A Glossary and list of Abbreviations is provided in Section 9.6 Appendix E: Abbreviations and Glossary.

1.4.3 Assumptions, Uncertainties and Gaps in Knowledge

The findings and recommendations of this report may be susceptible to the following uncertainties and limitation:

- Any botanical surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times. Additionally, the composition of fire adapted vegetation may vary depending on level of maturity or time since last burn. As far as possible, site collected data has been supplemented with desktop and database-centred distribution data.
- No assessment has been made of aquatic processes relating to any wetlands, pans and rivers/seeps and/or estuaries outside of the scope of those having an influence on the terrestrial biodiversity.

2 Policy

2.1 Company Policy

No company policy is applicable to this assessment.

2.2 Legislation Framework

In terms of NEMA EIA Regulations (07 April 2014, as amended), the following specific listing notices have bearing on this report¹:

Listing Notice 1 (GNR 327):

19. The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse but excluding where such infilling, depositing, dredging, excavation, removal or moving—

~~(a) will occur behind a development setback;~~

~~(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;~~

~~(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;~~

~~(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or~~

~~(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.~~

This listed activity will be triggered, due to watercourse crossings being present. Although buffers are included in the layout, access roads may require excavation and/or infill.

27. The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—

~~(i) — the undertaking of a linear activity; or~~

~~(ii) — maintenance purposes undertaken in accordance with a maintenance management plan.~~

This listed activity will be triggered, due to more than 20 Ha of indigenous vegetation being cleared. Although most of the site has been determined to be secondary indigenous vegetation due to historical clearing, the site does not appear to have been ‘lawfully disturbed during the preceding 10 years’².

28. Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:

¹ The listed activities itemized are only those with Biodiversity relevance to this report and is not a complete list. Additional listed activities may be applicable.

² Indigenous vegetation refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.

- (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or
- (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

~~excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.~~

This listed activity will be triggered, due to the land being used for agriculture on or after 01 April 1998.

Listing Notice 2 (GNR 325):

15. The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—

- ~~(i) the undertaking of a linear activity; or~~
- ~~(ii) maintenance purposes undertaken in accordance with a maintenance management plan.~~

This listed activity will be triggered, due to more than 20 Ha of indigenous vegetation being cleared. While the old lands are secondary vegetation, based on available aerial imagery, portions of the previously cultivated lands have not been cleared for more than 10 years. As per the definition of indigenous vegetation, it includes vegetation on old lands over 10 years.

Listing Notice 3 (GNR 324):

12. The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

(i) Western Cape

~~(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004.~~

~~(ii) Within critical biodiversity areas identified in bioregional plans.~~

~~(iii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas.~~

~~(iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or~~

~~(v) On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.~~

This listed activity will unlikely be triggered, as although more than 300 square meters of indigenous vegetation will be cleared, the additional triggers (Critical Biodiversity Areas, or Endangered/Critically Endangered Ecosystem) are not present within the site. Ecological Support Areas are not included in this listed activity.

14. The development of -

~~(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or~~

(ii) infrastructure or structures with a physical footprint of 10 square metres or more.

where such development occurs -

(a) within a watercourse.

~~(b) in front of a development setback; or~~

(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.

~~excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.~~

(i) Western Cape

(i) Outside urban areas—

~~(aa) A protected area identified in terms of NEMPAA, excluding conservancies.~~

~~(bb) National Protected Area Expansion Strategy Focus areas.~~

~~(cc) World Heritage Sites.~~

(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.

(ee) Sites or areas listed in terms of an international convention.

(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

(gg) Core areas in biosphere reserves; or

(hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.

This listed activity is unlikely to be triggered.

Implications:

- The proposed activity exceeds listing notice criteria limits for clearing of more than 20 Ha of indigenous vegetation, hence triggering the requirements for a full Scoping and EIA application process.
- Additional listed activities as described above are also triggered.

Other potentially relevant legislation, which will be evaluated as required, includes the following:

- **NEMA:** Environmental management principles set out in NEMA, and other Specific Environmental Management Acts (SEMA's) should guide decision making throughout the project life cycle to reflect the objective of sustainable development. One of the most important and relevant principles is that disturbance of ecosystems, loss of biodiversity, pollution and degradation of environment and sites that constitute the nation's cultural heritage should be avoided, minimised or as a last option remedied. This is supported by the Biodiversity Act as it relates to loss of biodiversity.
- **Liability for any environmental damage, pollution, or ecological degradation:** Arising from all -related activities occurring inside or outside the area to which the permission/right/permit relates is the responsibility of the rights holder. The National Water Act and NEMA both oblige any person to take all reasonable measures to prevent pollution or degradation from occurring, continuing or reoccurring (polluter pays principle). Where a person/company fails to take such measures, a relevant authority may direct specific measures to be taken and, failing that, may carry out such measures and recover costs from the person responsible.
- **Public participation:** Public consultation and participation processes prior to granting licences or authorisations can be an effective way of ensuring that the range of ways in which the activities impact on the environment, social and economic conditions are addressed, and taken into account when the administrative discretion to grant or refuse the licence is made. No specific public participation is undertaken as part of this assessment; however, it will be undertaken as part of the environmental application for which this report has been compiled. As part of that process, any comments raised in that process will be addressed as required. Where applicable, local persons, including landowners and residents, will be informally interviewed, where information pertaining to the terrestrial environment may provide value or information.
- **Constitution of Republic of South Africa (1996):** Section 24(a) of the Constitution states that everyone has the right 'to an environment that is not harmful to their health or well-being'. Construction activities must comply with South African constitutional law by conducting their activities with due diligence and care for the rights of others.
- **National Forests Act 84 of 1998 with Amendments:** Lists Protected trees, requiring permits for removal Department of Agriculture, Forestry and Fisheries). Section (3)(a) of the National Forests Act stipulate that 'natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits'.

- Provincial Nature and Environmental Conservation Ordinances: Lists Protected species, requiring permits for removal.
- The National Water Act (No. 36 of 1998): Requires that provision is made both in terms of water quantity and quality for ‘the reserve’, namely, to meet the ecological requirements of freshwater systems and basic human needs of downstream communities. It is essential in preparing an EMP that any impacts on water resources be they surface water or groundwater resources, and/ or impacts on water quality or flow, are carefully assessed and evaluated against both the reserve requirement and information on biodiversity priorities. This information will be required in applications for water use licenses or permits and/or in relation to waste disposal authorisations.
- Conservation of Agricultural Resources Act 43 of 1993: Lists Alien invasive species requiring removal.
- Sustainable Development Goals: Goal 15: Life on Land: Protect, restore, and *promote sustainable use of terrestrial ecosystems*, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. The approach, assessment methodology and recommendations contained within this report are in line with this sustainable development goal.

2.3 Systematic Planning Frameworks Summary

A screening of Systematic Planning Framework for the region was undertaken (summarised in Table 1), that included the following features:

- Critically Endangered, Endangered and Vulnerable Ecosystems.
- Critical Biodiversity Areas and Ecological Support Areas.
- River, Estuarine and Wetland Freshwater Ecosystem Priority Areas (FEPAs) and buffers.
- Regional Planning Frameworks (WCBSF, 2017 & GRBSP, 2010)
- Protected Areas (and buffers) and Protected Area Expansion Strategy (PAES).
- Critical Habitat for endemic, protected and threatened species.

A summary of the key implications of the respective ecological receptors and indicators is provided in the sections below and further information is also provided in [Section 9.4: Appendix D: Systematic Planning Frameworks](#).

Table 1: Summary of Regional Planning Biodiversity features.

FEATURE ³	DESCRIPTION	IMPLICATIONS/COMMENT
National Environmental Screening Tool (Terrestrial Biodiversity)	Very High Terrestrial Biodiversity High & Moderate Animal Species Moderate & Low Plant Species Very High Aquatic Sensitivity	ESA 1 & ESA 2, FEPA sub-catchment, SANParks (Buffer) – Garden Route National Park, SWSA (Outeniqua). Animal & Plant species of conservation concern potentially present in proximity to site (refer to species assessment sections). ESA 1: Aquatic, FEPA sub-catchment, SWSA (Outeniqua).
National Vegetation Map (NVM, 2018)	South Outeniqua Sandstone Fynbos	Least Concern
Regional Planning: WCBSF (2017)	Ecological Support Area (ESA 1 & 2), and Other Natural Areas (ONA)	Portion 8 of the site intersects narrow designated ESA 1 band towards the north and portion 7 of the site intersects narrow designated ESA 2 band running through the centre associated with watercourses.
Regional Planning: Garden Route BSP (2010)	Ecological Support Area	The majority of the site is indicated as transformed (cultivated) with the

³ Refer to Figure 7 to Error! Reference source not found. and Section 9.4: Appendix D: Systematic Planning Frameworks.

FEATURE ³	DESCRIPTION	IMPLICATIONS/COMMENT
		watercourses with buffer designated Ecological Support Area (which roughly corresponds to current WC BSP designation).
Critically Endangered and Endangered Ecosystems (NBA 2018)	None	N/A
Vulnerable Ecosystems (NBA)	None	N/A
Protected Areas (SAPAD)	The proposed development footprint is situated in the vicinity of protected areas. Nearest Protected Area is the situated less 500 m south of the site (Robberg Coastal Corridor Protected Environment).	No protected areas or ecological processes associated with are directly affected.
NPAES	None directly affected nor in close proximity. Nearest NPAES (Area Under Negotiation) is 5.7 km to the north-east of the proposed development.	No NPAES or ecological processes within are likely affected.
Strategic Water Source Areas (SWSA)	The site footprint is outside of any Strategic Water Source Areas.	Specific activity unlikely to have any impact to downstream water resources exceeding baseline levels.
Freshwater Ecosystem Priority Areas (FEPA's)	A section of Portion 8 of the site is situated within a River FEPA. Both portions have a minor watercourse running through them.	Specific activity will unlikely have any significant impact above baseline levels on nearby rivers and watercourses outside of localised crossing impacts but if constructed to standard specifications, no impacts of significance on terrestrial biodiversity related processes would be anticipated. Area and watercourses are generally significantly modified as a result of historical agriculture and ongoing alien invasion.
Important Bird Areas (IBA's)	None directly affected nor in close proximity.	Specific activity is unlikely to have any impact on any IBA's.
Key Biodiversity Areas (KBA's)	None	N/A
Marine/Coastal areas	None	N/A
RAMSAR sites	None	N/A
Within 32 m of Watercourse	Both portions intersect with a non-perennial watercourse.	Terrestrial impact associated with the watercourses will likely be negligible.
Within 100 m of River	The site footprints are not within 100 m of any river.	Terrestrial impact will be negligible associated with construction of the development.
Within 500 m of Wetland	Several wetlands and dams are within 500 m of the proposed development footprint.	Terrestrial impact will be negligible associated with construction of the proposed development.
Forest	No forest is present.	None
Regional Hotspots & Regions of Endemism	Site is outside but in proximity to the Cape Floristic Region, which excludes the area south of the Outeniqua and Tsitsikamma mountains, which is considered a largely Afromontane Forest enclave.	Several endemic species are known from the wider surrounding area, however the likelihood of any being significantly affected by the proposed activity is low due to the disturbed nature of the area surrounding the site.

FEATURE ³	DESCRIPTION	IMPLICATIONS/COMMENT
Surrounding Land Uses	The site is surrounded by developed and undeveloped rural farm portions and urban settlements.	
Critical Habitat for listed endemic/ protected species	The endemic and other protected species that are present are generally having widespread distributions and the activity is unlikely to pose any significant threat to any species or population. Several species are flagged and require site investigation, however since the proposed footprint is largely within old lands, and otherwise disturbed areas adjacent to a road reserve, the risk is low. Residual risk of a species within footprint are investigated during site visit, as there is a low risk, although unlikely, that some species could occur in disturbed areas. (Refer to Sections 3.1.8 & 0).	

Implications:

- South Outeniqua Sandstone Fynbos are not of conservation concern (Least Concern).
- Ecological Support Areas are identified in the most recent conservation plan (WCBS 2017, and GRBSP 2010) along watercourses which are excluded as open space from the site development plan.
- Protected Areas, National Protected Area Expansion Strategy areas and IBA's are present in the vicinity of the site but not directly affected.

2.3.1 National Environmental Screening Tool

The DEA Screening Tool indicates the following (dated 27/02/2026)

- Terrestrial Biodiversity is **Very High** (Figure 3). *This assessment.*
- Plant species sensitivity is **Medium and Low** (Figure 4). *This assessment.*
- Animal Species sensitivity is **High and Medium** (Figure 5). *Refer to separate fauna assessment.*
- Aquatic Sensitivity is **Very High** (Figure 6). *Refer to separate aquatic assessment.*

Terrestrial Sensitivity	Feature(s) in proximity
Very High	CBA 1 & 2 (Terrestrial), ESA 2 (Restore form other land use), FEPA sub-catchment, SWSA (Outeniqua)
High	None
Medium	None
Low	None
Plant Sensitivity	Feature(s) in proximity
Very High	None
High	None
Medium	<i>Aspalathus bowieana</i> , Sensitive species 131, <i>Leucospermum glabrum</i> , <i>Mimetes pauciflorus</i> , <i>Erica glandulosa</i> subsp. <i>fourcadei</i> , <i>Pterygodium newdigateae</i> , <i>Osteospermum pterigoideum</i> , <i>Acmadenia alternifolia</i> , <i>Muraltia knysnaensis</i> , <i>Erica glumiflora</i> , <i>Pterygodium cleistogamum</i>
Low	Present
Animal Sensitivity	Feature(s) in proximity
Very High	None
High	<i>Circus ranivorus</i> , <i>Neotis denhami</i> , <i>Bradypterus sylvaticus</i> (birds)
Medium	<i>Chlorotalpa duthieae</i> , Sensitive species 8 (mammals), <i>Neotis denhami</i> & <i>Bradypterus sylvaticus</i> (birds), <i>Afrixalus knysnae</i> (amphibian), <i>Aloeides thyra orientis</i> & <i>Aneuryphymus montanus</i> (insects),
Low	None

Terrestrial Sensitivity	Feature(s) in proximity
Very High	ESA 1: Aquatic, FEPA sub-catchment, SWSA (Outeniqua)
High	None
Medium	None
Low	None



Figure 3: Terrestrial Biodiversity Sensitivity (NEST).



Figure 4: Plant Species Sensitivity (NEST).

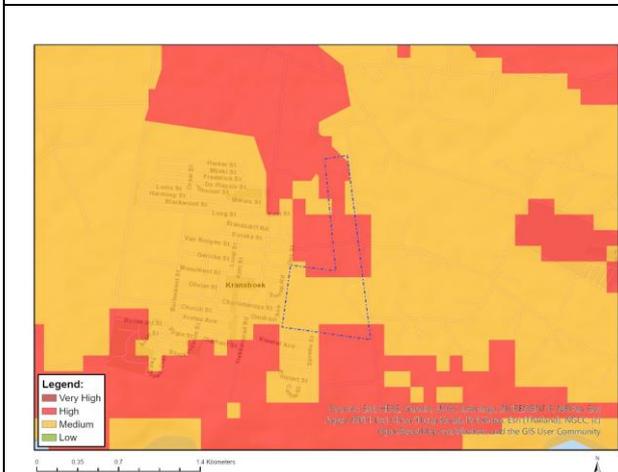


Figure 5: Animal Species Sensitivity (NEST).



Figure 6: Aquatic Sensitivity (NEST).

The site assessment will physically screen for the presence of the listed, and other possible species or sensitivities that are not identified in the screening tool. Not all features are directly affected, but being in proximity, the risks associated with the activity will be investigated further and addressed in the report.

2.3.2 Vegetation of Southern Africa

A single vegetation unit (Table 1, Figure 7) is present within the site footprints (Mucina & Rutherford, 2006). The site is located entirely within **South Outeniqua Sandstone Fynbos** (Least Concern). A general description of the vegetation unit is provided in **Section 9.4: Appendix D: Systematic Planning Frameworks** (as per Mucina & Rutherford, 2006) as a reference point for the baseline vegetation composition.

The project area is generally characterised by gentle to steep south-facing slopes, relatively broad with some moderately sloping intramontane valleys. The dominant vegetation is a tall, open to medium dense shrubland with medium dense, medium tall shrub understorey— mainly proteoid and restioid fynbos,

with extensive ericaceous fynbos on the upper slopes. Some grassy fynbos at lower altitudes, and scrub fynbos in riverine areas.

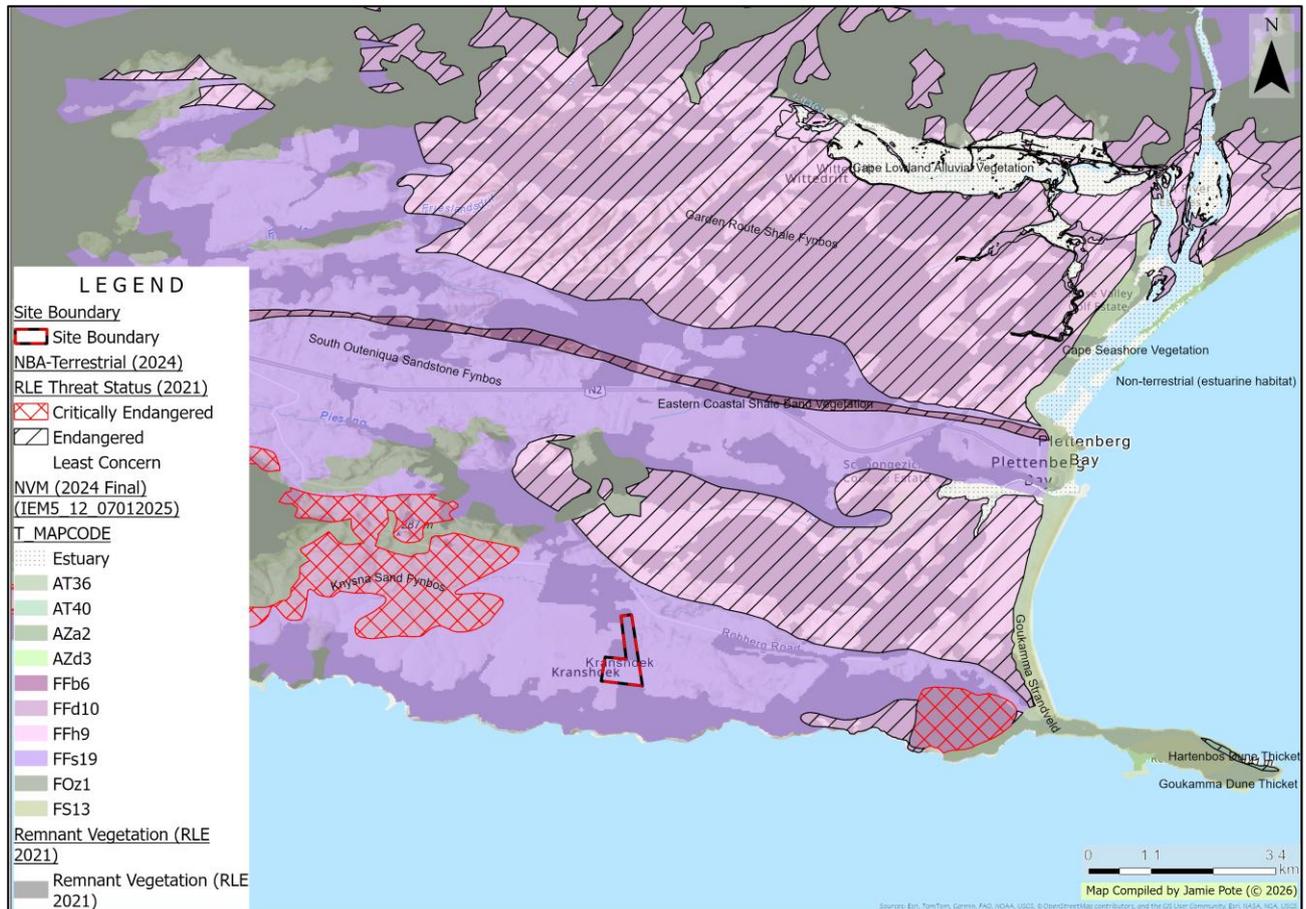


Figure 7: Vegetation of Southern Africa (National).

Implications:

- South Outeniqua Sandstone Fynbos is relatively widespread and not of conservation concern (Least Concern).
- The vegetation assessed on site is typical of the vegetation unit, refer to [Section 3.1](#) for specific description.
- Several South Africa and Eastern Cape endemic species are recorded from the represented vegetation units and broader area, some having localised distributions and others are widespread. Refer to [Sections 3.1.8](#) and [9.3](#).

2.3.3 Red List of Ecosystem Status and National Biodiversity Assessment

The National Biodiversity Assessment (NBA, 2018) and more recent Red List of Ecosystem Status (RLE, 2022) are the primary tools for monitoring and reporting on the state of biodiversity in South Africa and informs policies, strategic objectives, and activities for managing and conserving biodiversity more effectively. The RLE/NBA is especially important for informing the National Biodiversity Strategy and Action Plan (NBSAP), the National Biodiversity Framework (NBF) and the National Protected Area Expansion Strategy (NPAES) and informs other national strategies and frameworks across a range of sectors, such as the National Spatial Development Framework, the National Water and Sanitation Master

Plan and the National Biodiversity Economy Strategy. Ecosystem protection level is an indicator that tracks how well represented an ecosystem type is in the protected area network. It has been used as a headline indicator in national reporting in South Africa since 2005. It is computed by intersecting maps of ecosystem types and ecological condition with the map of protected areas. Ecosystem types are then categorised based on the proportion of the biodiversity target for each ecosystem type that is included in one or more protected areas. For terrestrial ecosystems, biodiversity targets are set for each ecosystem type using established species–area accumulation curves (ranging between 16 and 34%).

The outcome of the most recent National Biodiversity Assessment (2018, Figure 7) indicates that *South Outeniqua Sandstone Fynbos* has a *Least Concern* conservation status (Table 1), which is the lowest threat status elevation. This indicates that more than 60 % of the unit remains intact. There is a moderate to low level of utilization of this unit with lower degradation and transformation compared to units having an elevated status. Development of a portion of the site will thus not significantly affect conservation targets for the affected vegetation unit(s).

As is evident from land-use coverages, the broader area is currently somewhat fragmented by urban and rural development as well as roads. The specific site is almost completely modified historically, and vegetation is either secondary and/or has high levels of alien infestation which generally result in ecological changes even with rehabilitation.

Implications:

- The vegetation units, *Outeniqua Sandstone Fynbos*, has a *Least Concern* RLE (2022) status, indicating that less than 40% has been transformed and there is currently minimal loss or disruptions to ecological functioning at a regional level.
- The activity is unlikely to significantly affect conservation targets of the vegetation unit, having a limited footprint in an area that is almost entirely transformed historically and/or significantly invaded with alien vegetation where ecological integrity is compromised.
- The social benefits to the community would likely exceed any terrestrial biodiversity risks or impacts, with implementation of recommended mitigation measures.

2.3.4 Western Cape Biodiversity Spatial Plan (WC BSP, 2023)

The Western Cape Biodiversity Sector Plan (WCBSP, 2023) was developed in line with the principles and methods described in the "Guideline regarding the determination of Bioregions and the Preparation of and publication of Bioregional Plans" (GN 291 of 2009) gazetted in terms of the National Environmental Management: Biodiversity Act, No. 10 of 2004). The management objectives required to achieve the desired state, as described by the WCBSP(2023) are provided in Table 9 contained in Section 9.4: Appendix D: Systematic Planning Frameworks.

Figure 8 indicates the WCBSP (2023) categorisation of the site and surrounding area. The site is traversed by two linear ESA designated areas that correspond to the watercourses that traverse the site, a common feature of the WC BSP. No CBA designated areas are situated within the site.

The WC BSP guidelines recommend the following for CBA and ESA areas:

- Designated ESA areas (**present**) are not essential for meeting biodiversity conservation targets, but that play an important role in supporting the functioning of PA's or CBAs and maintain ecological connectivity. Note that broad level ecological processes are already impacted by the existing road corridor. Land-use guidelines for ESA areas recommend maintaining in a functional, near-natural state, however, some habitat loss is acceptable, provided the underlying biodiversity objectives and

ecological functioning are not compromised. With reference to the particular site, it is recommended that these are retained, which has been accommodated in the proposed site development plan (Figure 2), as open space areas. This corridor will connect along the watercourse on the northern side of the site with the surrounding landscape

- The background levels of disturbance are high due to the historical use of the site and surrounding area and further fragmentation and/or disturbance to the ESA as a result of the proposed development will be limited to the site footprint, on a site located in close proximity to already disturbed and fragmented surrounds.
- Designated CBA areas (present) are essential for meeting biodiversity conservation targets, and loss thereof should be minimised. Land-use guidelines for CBA areas recommend no further loss of habitat and/or restoration of degraded/transformed habitat. CBA habitat is designated as present as per most recent bioregional plan (WC BSP, 2023).
- The disturbance levels within the site are high due to the historical use of the site and surrounding area and further fragmentation and/or disturbance to the CBA as a result of the proposed development will be limited to the site footprint, on a site located in close proximity to already disturbed and fragmented surrounds. Habitat within the site is a mixture of heavily degraded and transformed and conservation potential is limited.

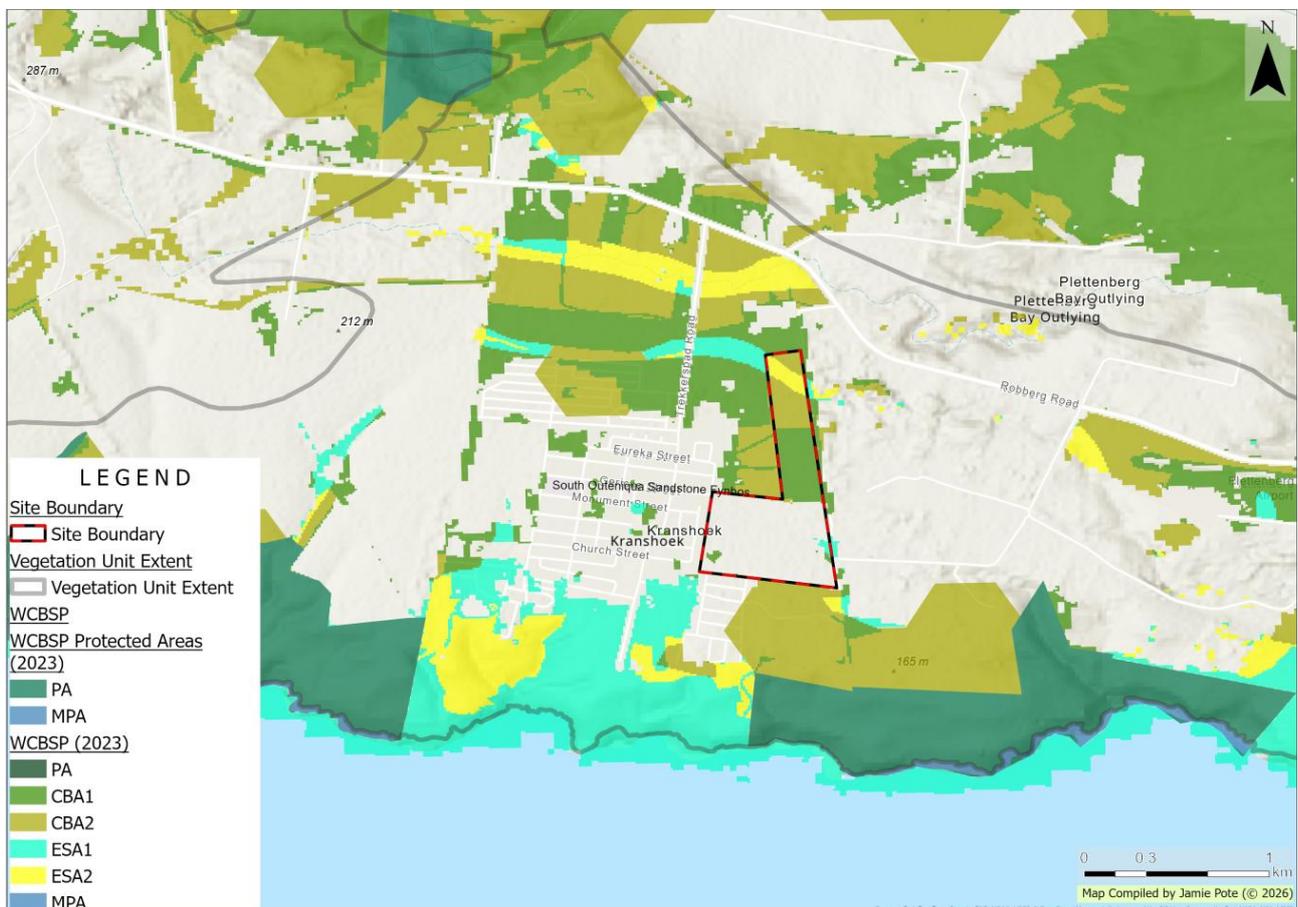


Figure 8: Western Cape Biodiversity Spatial Plan (2023) designation. Extent of the vegetation unit is indicated.

Implications:

- The proposed activity intersects within an WCBSP designated CBA 1, and 2 areas associated as per WCBSP 2023.
- The vegetation unit is not under threat (Least Concern); hence the area would not be deemed to be irreplaceable as other habitat is available.

2.3.5 Western Cape Biodiversity Spatial Plan (WC BSP, 2017)

Western Cape Biodiversity Sector Plan (2017) is now superseded by the Western Cape Biodiversity Sector Plan (2023), however, Figure 9 is provided for historical change context. As is evident, the historical plan designated only small ESA corridors across the site.

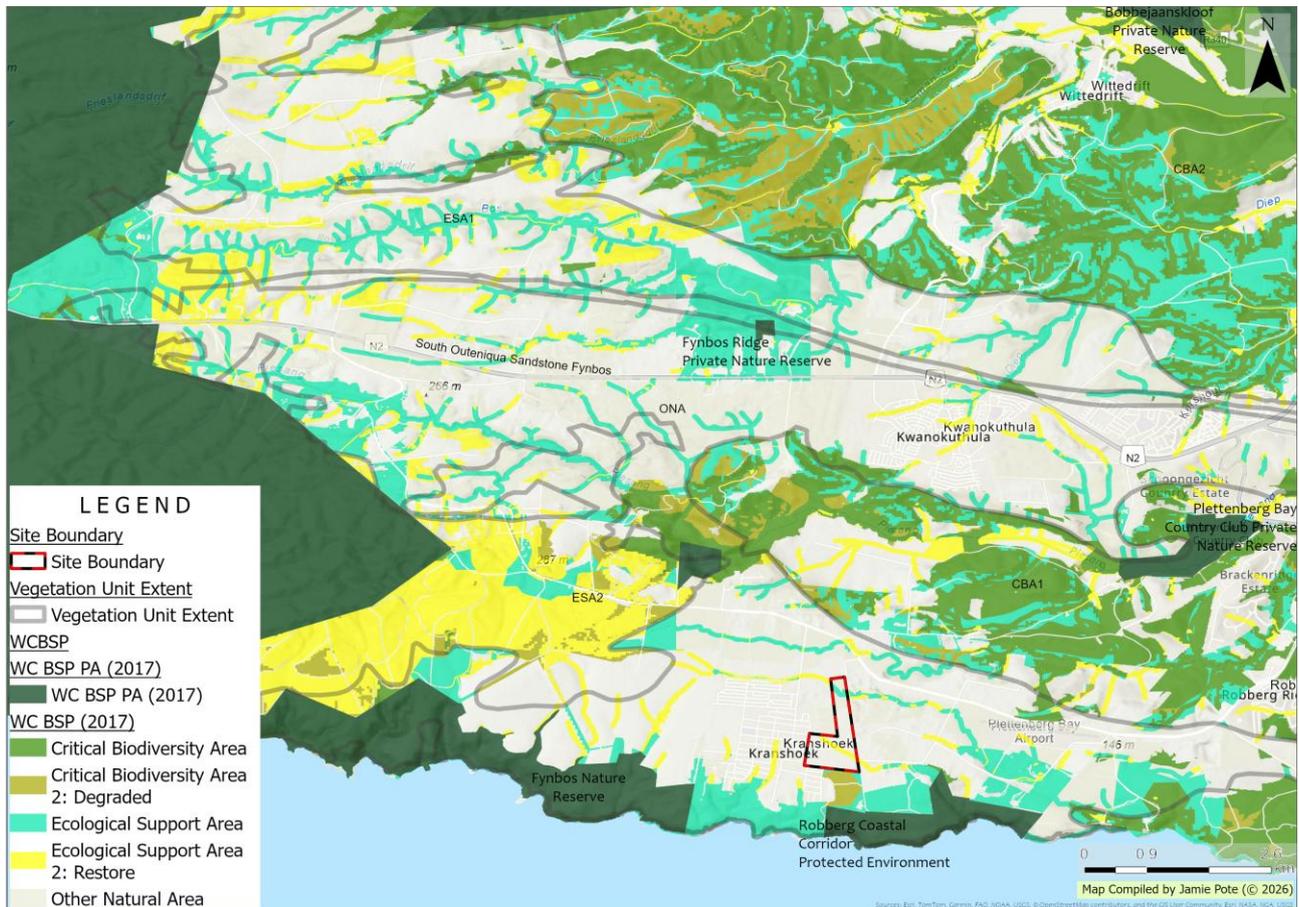


Figure 9: Western Cape Biodiversity Spatial Plan (2017) designation. Extent of the vegetation unit is indicated.

2.3.6 Garden Route Biodiversity Sector Plan (2010)

The Garden Route BSP (GRBSP, 2007) identified the vegetation as being Roodefontein Grassy Fynbos with elements of the Groot Brak River & Floodplain. The Garden Route BSP further indicates the site as intersecting with a designated Ecological Support Area along the southern boundary. The Garden Route BSP is largely integrated with and/or superseded by the Western Cape BSP.

Figure 10 indicates the GRBSP (2010) vegetation categorisation and CBA/ESA designations of the site and surrounding area.

Roodefontein Grassy Fynbos

This habitat is the most species rich and floristically interesting Grassy Fynbos unit. It differs from all the other units in having *Leucadendron eucalyptifolium* and *Protea mundii* often abundant along drainage areas. The uncommon narrow-leaved variant of *Protea cynaroides* also occurs sporadically on moist south-facing slopes. Many seasonal wetlands are also present in this unit. These sites are indicated by an abundance of *Cliffortia linearifolia*, often along with an abundance of *Stenotaphrum secundatum*. This unit is rich in geophyte species, usually with many *Watsonia knysnana* present, but also several orchid species (especially *Satyrium* species). Restios (especially *Restio triticeus*) are quite abundant and Cyperaceae less common than in other units. Ericoid shrubs (especially *Erica formosa*, *Erica sessiliflora*, *Erica sparsa* and *Erica versicolor*) are usually abundant. An interesting feature is the

presence of several species that reach their westernmost distribution here, e.g., *Dierama pendula* and *Kniphofia praecox*. We suspect that the long-lost *Cyclopia laxiflora* occur(ed) in this unit.

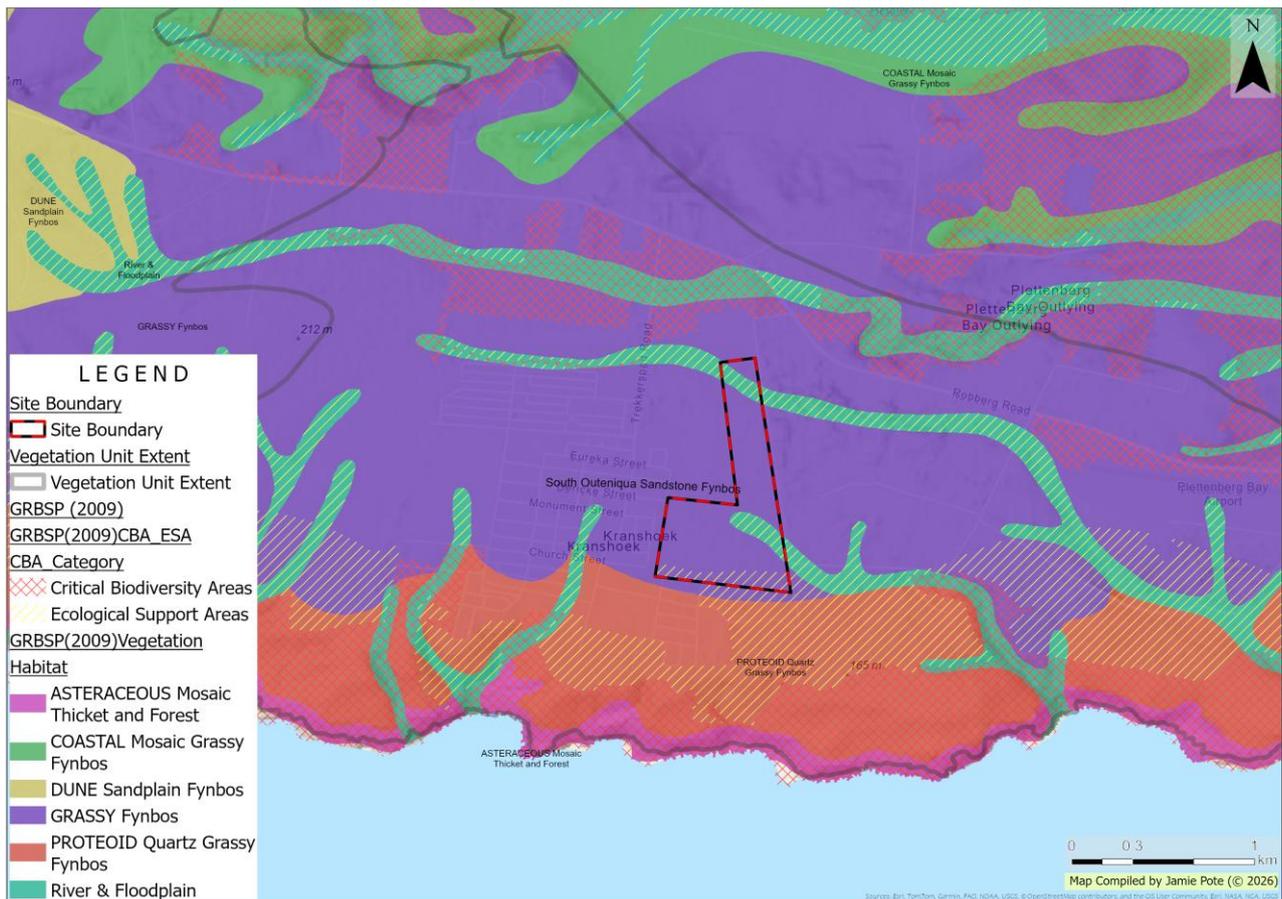


Figure 10: Garden Route Biodiversity Sector Plan (2007) designation and CBA/ESA status.

Implications:

- The site is situated on the edge of designated Ecological Support Area by the GR BSP but is none the less transformed and thus secondary vegetation. The Garden Route BSP is largely superseded by the more recent WC BSP.
- The GR BSP Roodefontein Grassy Fynbos more or less corresponds to the National Vegetation Map Outeniqua Sandstone Fynbos.

2.3.7 Other Biodiversity Sector Plans

The site is outside of the planning domain of any other Biodiversity Sector Plans.

2.3.8 Protected areas

The South Africa Protected Areas Database (SAPAD) database, a comprehensive database of various protected area categories, is updated on a quarterly basis, and provides a comprehensive source of all national and private nature reserves, world heritage sites and other formal legally protected conservation areas situated within South Africa (Figure 11).

When projects are located in legally protected and internationally recognized areas, clients should ensure that project activities are consistent with any national land use, resource use, and management criteria (including Protected Area Management Plans, National Biodiversity Strategy and Action Plans (NBSAP's), or similar documents).

No protected areas nor any ecological processes associated with them are directly affected nor likely to be indirectly affected.

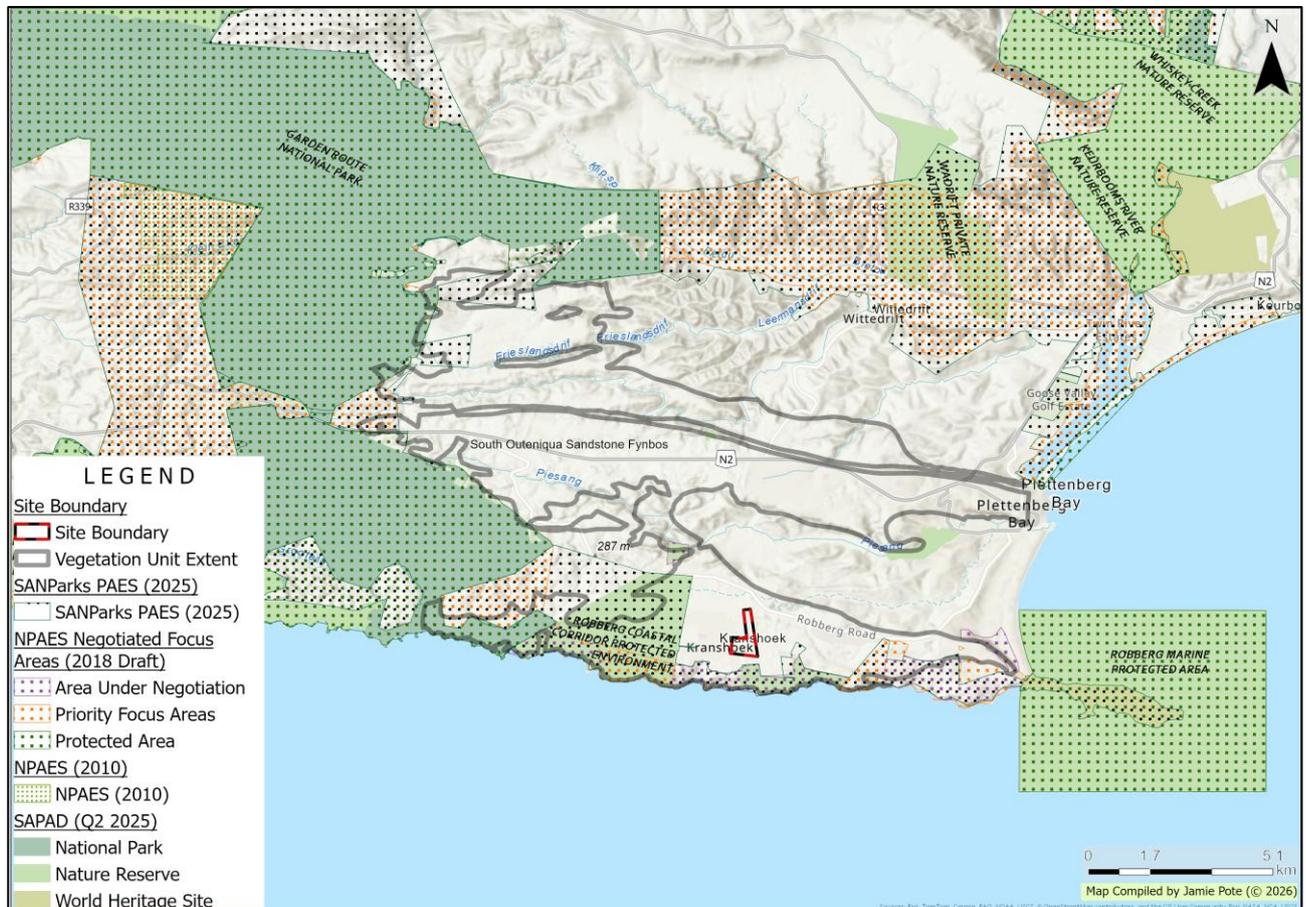


Figure 11: Protected Areas and NPAES in vicinity of the site.

Implications:

- The activity will have no direct, indirect or cumulative impact on any protected environment.

2.3.9 Key Biodiversity Areas

The site falls within the Garden Route Key Biodiversity Area (Figure 12)

2.3.10 Important Bird Areas

Important Bird and Biodiversity Areas (IBA's) are sites of international significance for the conservation of the world's birds and other biodiversity. They also provide essential benefits to people, such as food, materials, water, climate regulation and flood attenuation, as well as opportunities for recreation and ~spiritual fulfilment. The site does not fall within any designated Important Bird Areas (IBA's), but is

within 10 km of the Outeniqua mountains IBA and ~6km of the Tsitsikamma-Plettenberg Bay IBA (Figure 12).



Figure 12: Key Biodiversity Areas and Important Bird Areas in vicinity of the site.

Implications:

- The proposed activity is situated outside of any *designated* IBA's and while the site may have occasional visits from transient bird or other faunal species known from nearby IBA's, no direct or indirect impact is anticipated as the disturbance will not be significantly above current baseline levels, being in close proximity to a busy surfaced provincial road.

2.3.11 Strategic Water Source Areas

Strategic water source areas (Figure 13) are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy. Strategic water source areas are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy.

Despite being flagged by the NEST screening tool. The site footprint is not situated within the **Outeniqua Strategic Water Source Area** or any other **SWSA**, and the specific activity is unlikely to have an impact on any Strategic Water Source area, as it will not alter water flows.

3 Biodiversity Risk Identification and Assessment

3.1 Baseline Biodiversity Description

3.1.1 Site Locality

The proposed project is located to the west of Plettenberg Bay in the Western Cape, in the Kranshoek area. The proposed development consists of a mixed-use housing development as depicted in Figure 2.

3.1.2 Topography and Drainage

The site falls within a flat, drained by a network of perennial watercourses.

3.1.3 Terrestrial Landscape Features (Habitat)

Overview

The general project area is generally characterised by gentle to steep south-facing slopes, over a 160 km long area, relatively broad with some moderately sloping intramontane valleys. The specific site is relatively flat. The dominant vegetation is a tall, open to medium dense fynbos shrubland with medium dense, medium tall shrub understorey—mainly proteoid and restioid fynbos, with extensive ericaceous fynbos on the upper slopes. Some grassy fynbos at lower altitudes, and scrub fynbos in riverine areas. Patches of this unit are not confined to south-facing slopes but are found on all slopes south of the highest peaks in the range.

The local landscape is drained by a network of occasional non-perennial watercourses, which tend to have a denser woody (tree and shrub) component along the banks where natural, but otherwise densely invaded with various wattle, pine and gum species.

This offers habitat for a limited suite of animal species, although animals have largely been displaced by people. In the surrounding area, lack of topological complexity, including slope and aspect, limit the availability of microhabitats for a diverse range of different species.

The habitats and microhabitats present on the project site are not unique and are somewhat widespread in the general area, hence the localised impact associated with the site footprint would in general be of low to very low significance with implementation of recommended mitigation measures, since the site is mostly significantly degraded and/or historically transformed.

Based on site observations and historical aerial imagery it is evident that the site was cultivated from at least the early 2000's in phases as described and illustrated below. The vegetation on most of the site (almost the entire portion 8, excluding dwellings and structures, and the southern two-thirds of portion 7) is thus secondary sandstone fynbos., with species composition typical of the pioneer elements of the vegetation unit.

Common species, predominantly shrub elements, include *Chrysanthemoides monilifera*, *Anthospermum aethiopicum*, *Aspalathus angustifolia*, *Cliffortia stricta*, *Helichrysum cymosum*, *Eriospermum capense*, *Drosera trinervia*, *Erica formosa*, *Erica sparsa*, *Gerbera piloselloides*, *Helichrysum felinum*, *Metalasia muricata*, *Bobartia aphylla*, *Metalasia densa*, *Restio fourcadei* *Leucadendron ericifolium*, *Leucadendron salignum* and *Watsonia fourcadei*.



Figure 14: Aerial Photograph of the site and surrounding area.

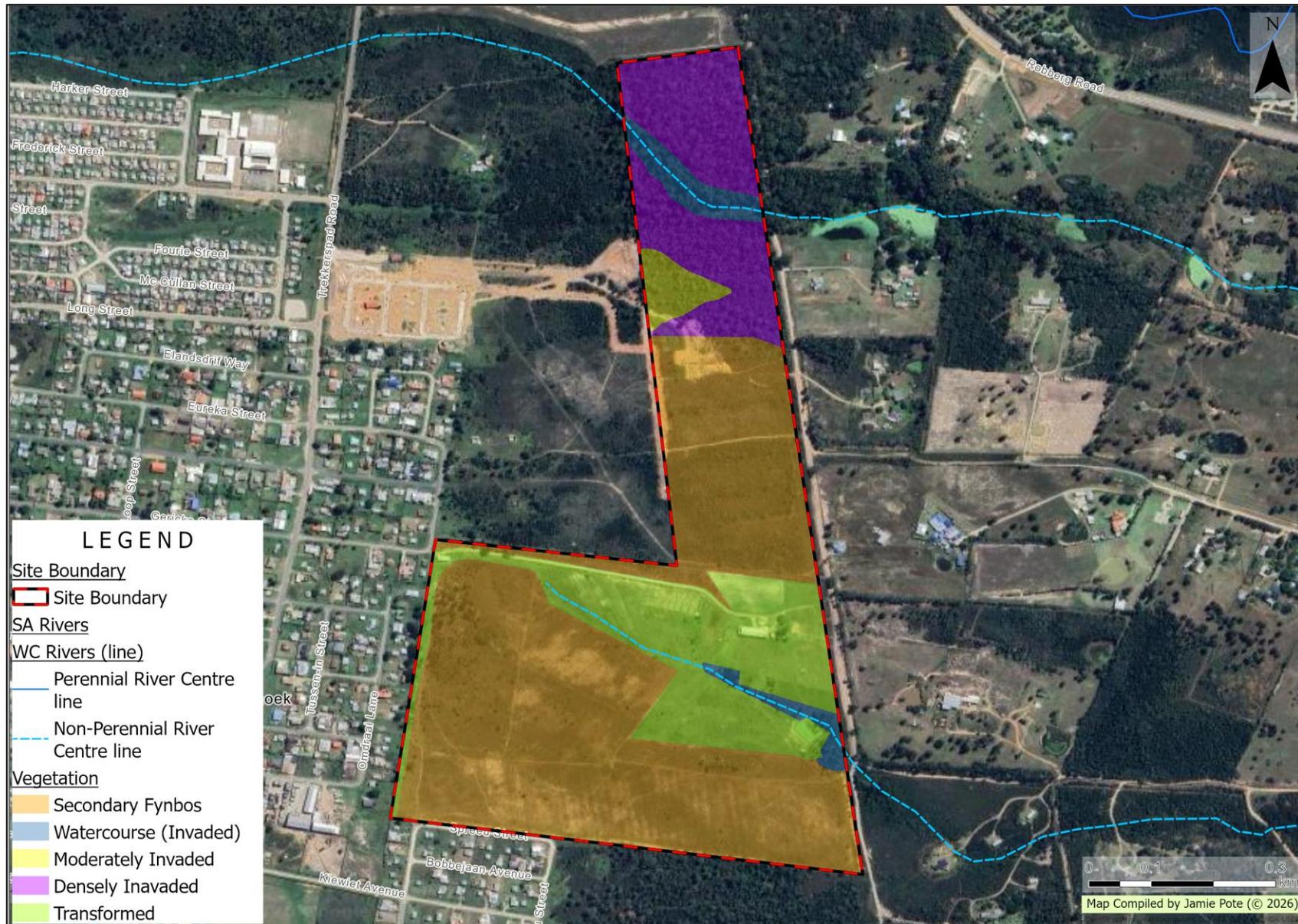


Figure 15: Mapped Vegetation and habitat of the site and surrounding area.

Occasional small tree species include *Diospyros dichrophylla*, *Rapanea melanophloeos*, *Searsia lucida*, *Virgilia divaricata* and *Halleria lucida*, which occur in and around dense thickets of *Acacia melanoxylon*, *Acacia saligna*, *Acacia cyclops*, *Pinus* spp. and *Eucalyptus* spp. where a false forest-like micro-climate is created.

Historical Context

Analysis of aerial imagery from the period 2004 to 2016 (Figure 16 to Figure 19) clearly indicated that most of Farm Portion 7 of 432 (Kranshoek) was cultivated at a point during that time-period. The vegetation on portion 7 is thus almost entire secondary or transformed while the vegetation on portion 8 is significantly to moderately degraded.

Portion 8 of 432 (Kranshoek) was natural to near natural but the northern two-thirds had become progressively invaded with wattle and gum trees in more recent times (Figure 22 to Figure 27). Earliest available Aerial imagery and imagery after fire suggests that the southern half of portion 8 may have been cultivated during an earlier time-period (pre-2004) as plough ridges are visible. Based on an abundance of *Cyclopia subternata* (Honeybush) in the old lands, it is probably that it was cultivated at some point historically.



Figure 16: Aerial image dated 01 2004 (Kranshoek Portion 7).



Figure 17: Aerial Image dated 11 2010 (Kranshoek Portion 7).



Figure 18: Aerial Image dated 08 2011 (Kranshoek Portion 7).



Figure 19: Aerial Image dated 03 2016 (Kranshoek Portion 7).



Figure 20: Aerial image dated 12 2022 (Kranshoek Portion 7).

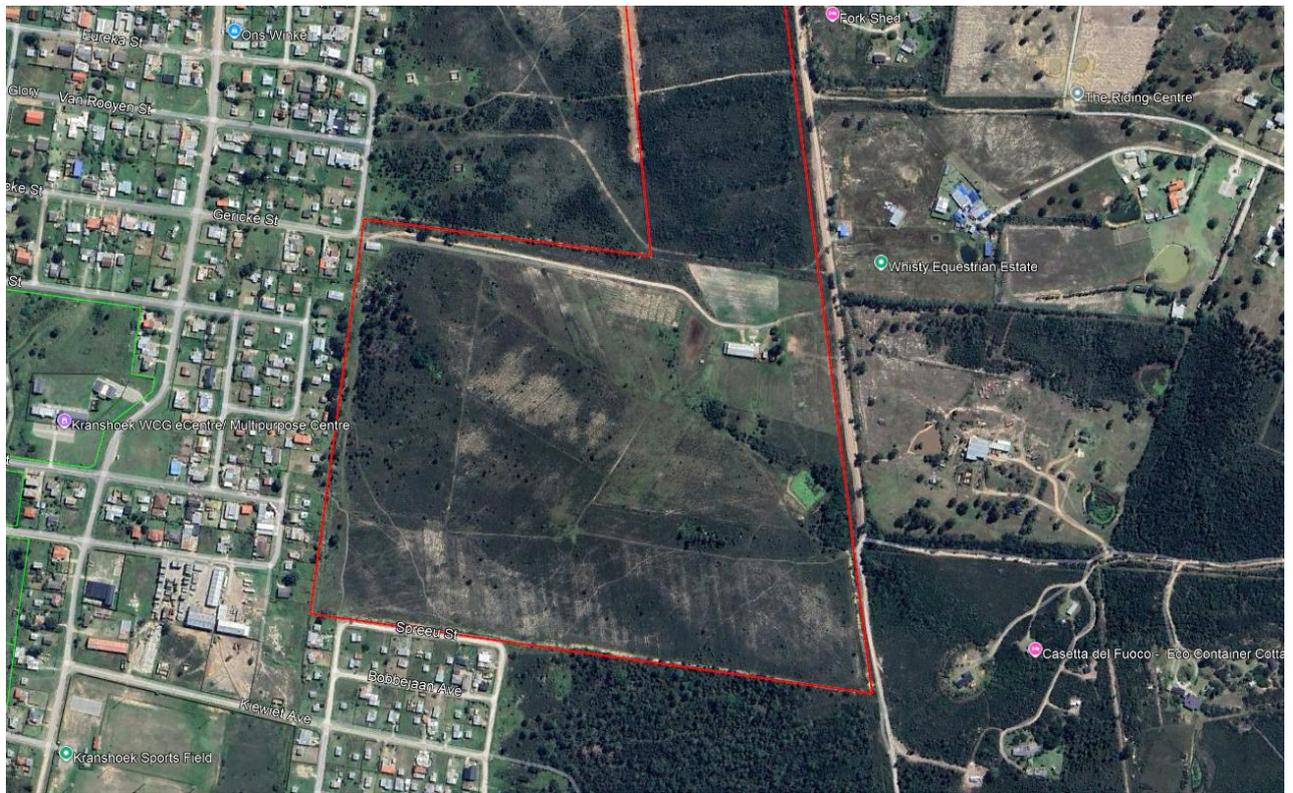


Figure 21: Aerial image dated 03-2025 (Kranshoek Portion 7).



Figure 22: Aerial image dated 01-2004 (Kranshoek Portion 8).

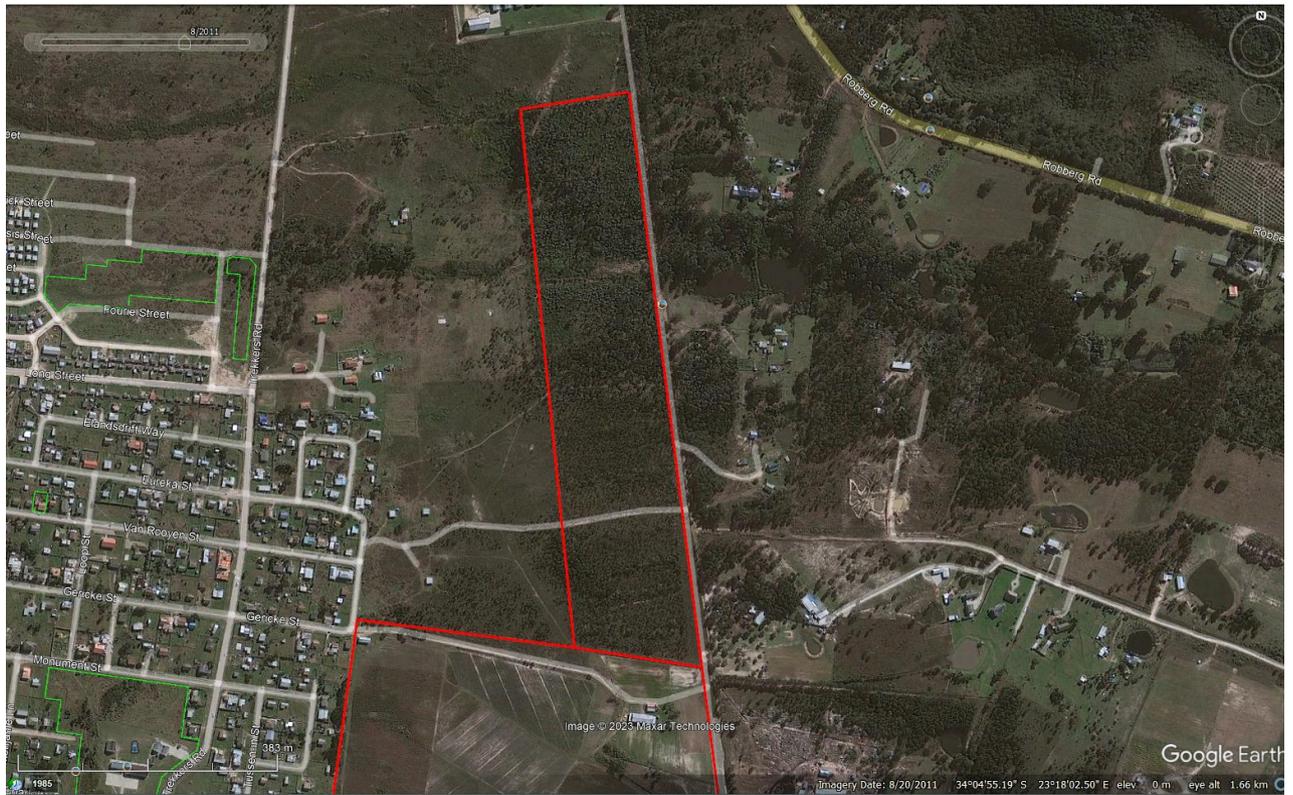


Figure 23: Aerial image dated 08 2011 (Kranshoek Portion 8).

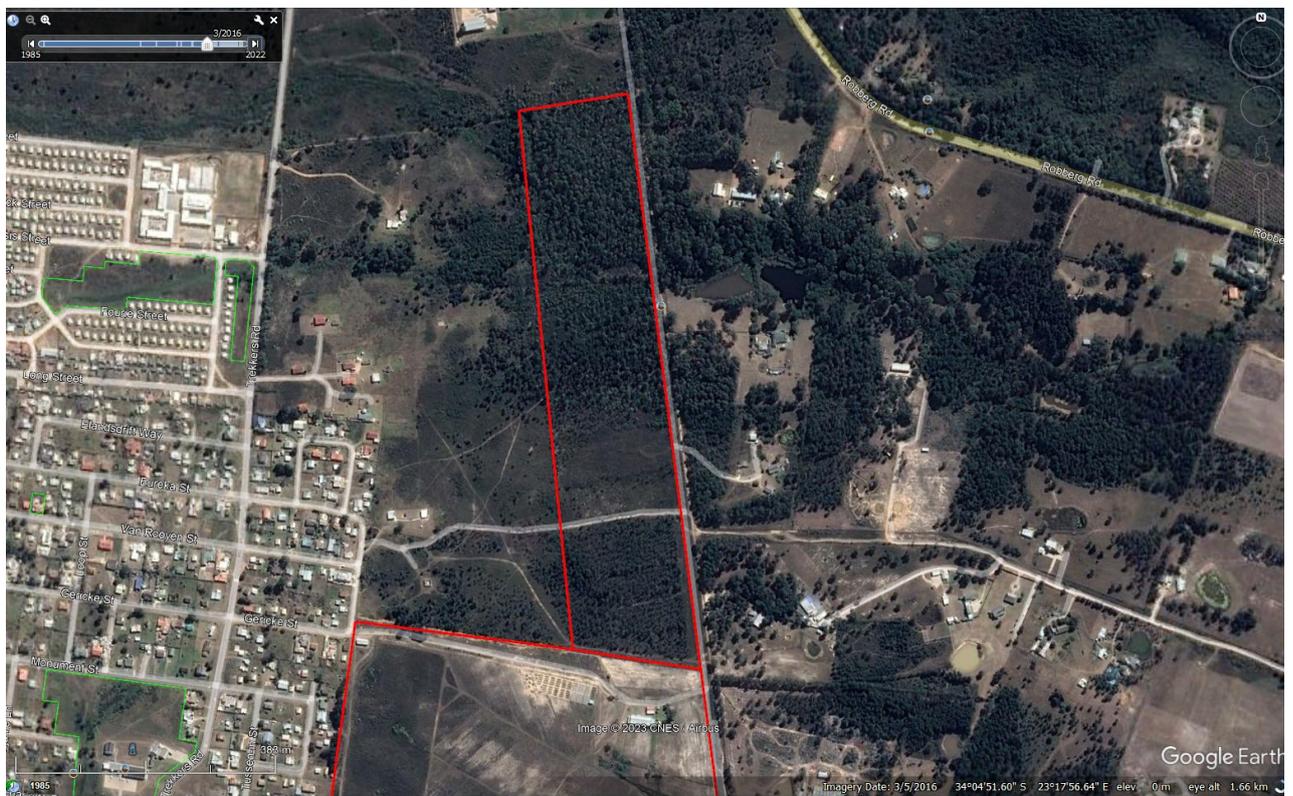


Figure 24: Aerial image dated 03 2016 (Kranshoek Portion 8).

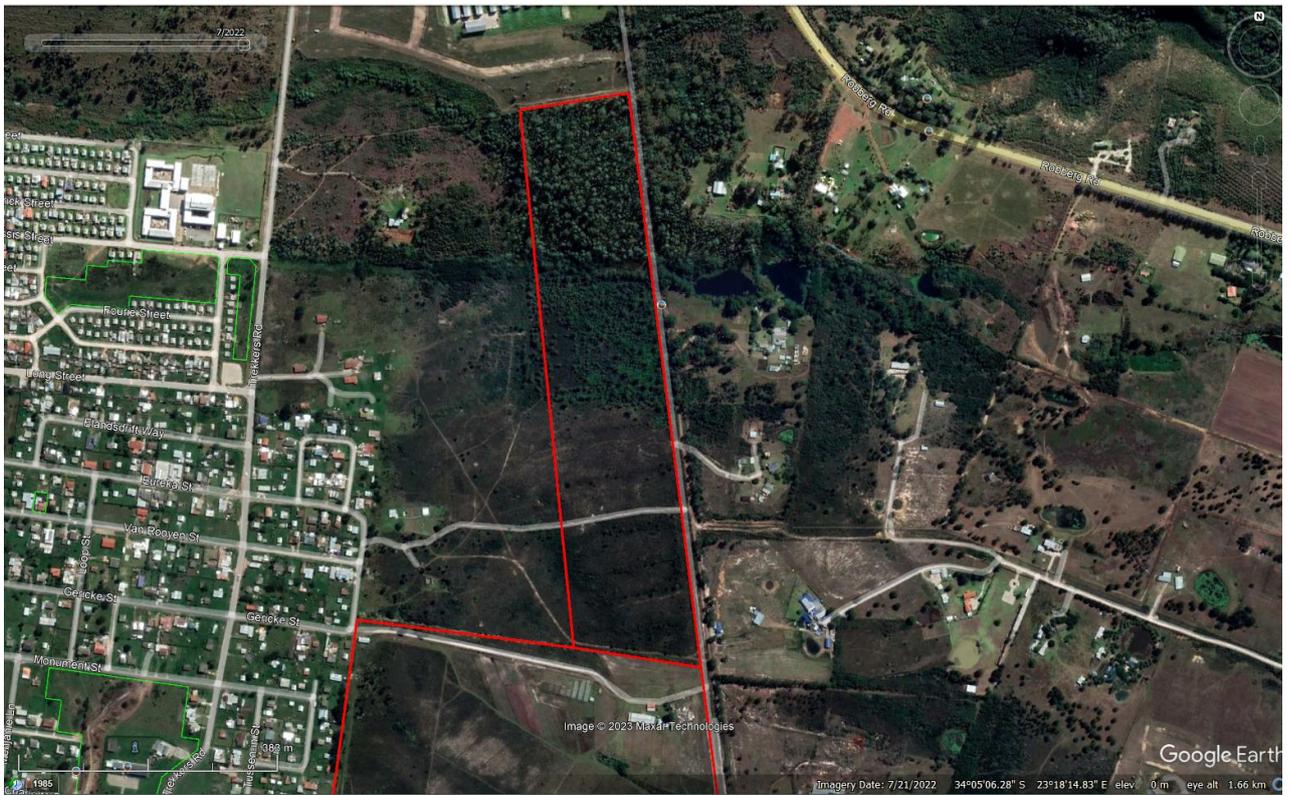


Figure 25: Aerial image dated 07 2022 (Kranshoek Portion 8).

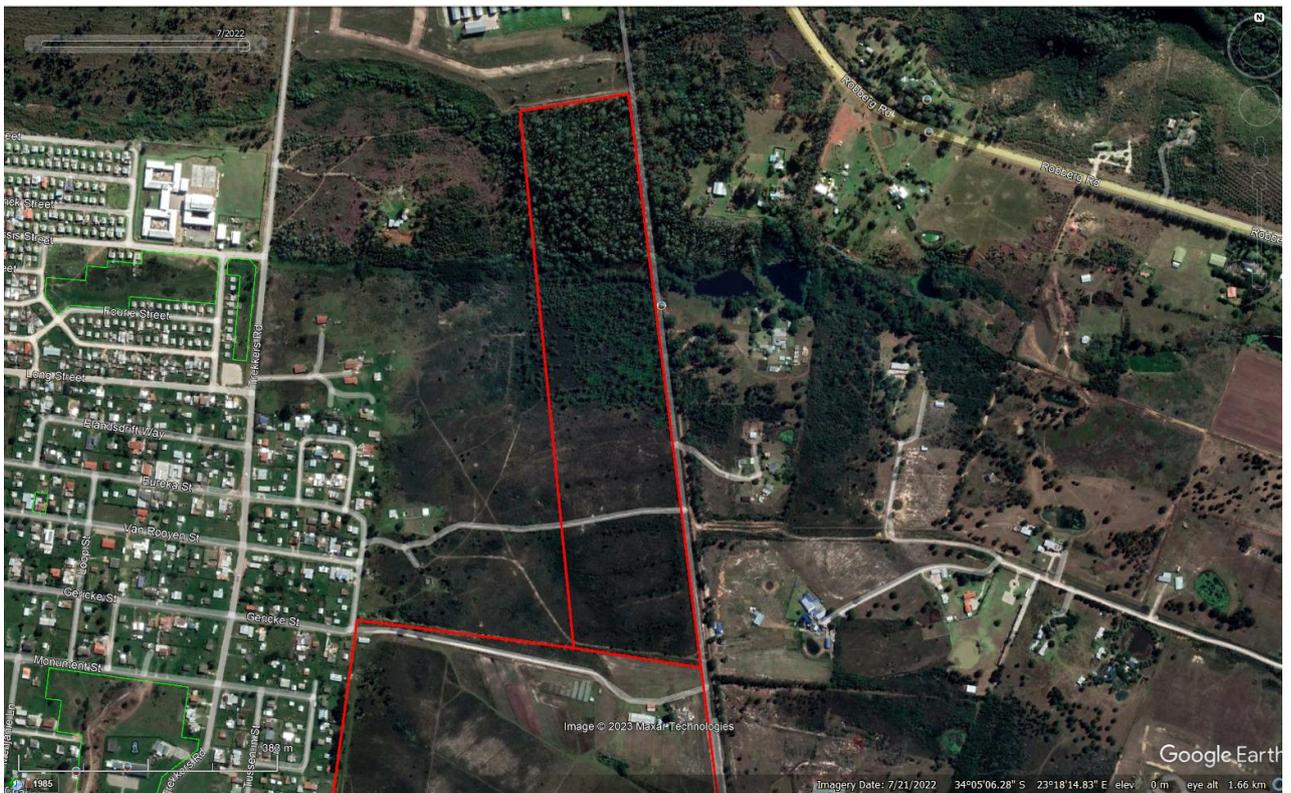


Figure 26: Aerial image dated 07 2022 (Kranshoek Portion 8).



Figure 27: Aerial image dated 03-2025 (Kranshoek Portion 8).

3.1.4 Aquatic Habitat

Aquatic systems do not function in isolation and in terms of ecological processes, the aquatic systems are very closely linked to the terrestrial system. Perennial, non-perennial watercourses, and wetlands/dams are present in the wider area and the site is traversed by two watercourses, one running centrally through portion 7 and another through portion 8. The watercourse on portion 8 is surrounded by dense alien infestation including wattle, pine and gum species. The watercourse on portion 7 is more open but generally modified with some alien vegetation pockets and transformed habitat (cultivated areas).

Both watercourses are included in the Western Cape BSP as Ecological Support Areas inclusive of a buffer and have been incorporated into the open space of the site development plan. During site clearing and rehabilitation, all invasive trees and weeds should be removed, and the habitat rehabilitated to a natural state, which will most likely occur with minimal intervention.

3.1.5 Present Ecological State

In summary, the following general observations can be noted regarding the Present Ecological State of the site:

- Alien invasion on portion 7 is low, moderate on the southern half of portion 8 and high to very high on the northern part of portion 8.
- Erosion and erosion risk is generally low across the site, being relatively flat. Erosion risk will be elevated around the watercourses temporarily when alien trees are removed.
- The fynbos vegetation on site is generally transformed, secondary or significantly invaded.

The site is adjacent to an urban settlement on the west side and small farms on the remaining sides.

In summary, the site is located within a rural area, to the east of a populated urban settlement. The Fynbos vegetation is generally significantly degraded, fragmented, transformed or densely invaded with alien vegetation and mostly secondary. The vegetation is widespread hence the status is not elevated and not presently under any threat. The site has two small designated Ecological Support Area corridors associated with watercourses, but no a Critical Biodiversity Area, which suggests that connectivity and ecological processes are locally more important than the conservation of natural habitat. These corridors are accommodated in the Site Development Plan. While there are several range-restricted endemic species in the surrounding area and the vegetation types, none were found to be present or likely to be present within the largely secondary and disturbed habitat.

3.1.6 Flora

Flora composition of the site is typical of secondary vegetation of the unit, with commonly occurring, primarily pioneer species being present. Several endemic and range restricted species are known from the surrounding area, some in proximity to the site, in natural and near natural areas. None were found to be present nor are likely to be present due to the historical land use changes and degradation. Note, there is a residual very-low possibility that these species could be present, and cannot be discounted without extensive seasonal sampling, which is generally outside the scope of such an assessment, unless a specific risk is identified. Due to the localised nature of the impact, as well as the level of degradation of the site, the risk of a species suffering any significant loss is low.

3.1.7 Fauna

The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. The site is unlikely to provide significant or important faunal habitat due to levels of transformation and proximity to urban settlement, other than transient or occasional visits.

Transient faunal species may visit the site (i.e., flying over or foraging) and no flagged species of conservation concern were found to be present within the footprint, during the site visit. In terms of terrestrial processes, none are deemed to be of significance. Refer to separate faunal assessment.

Mammals

Larger mammal species such as duiker and other mammals, while maybe occasional transient visitors, are unlikely to occur due to levels of transformation and proximity to an urban settlement. Should any be occasionally present, they are likely to be mobile species that would move away from disturbance during construction and with intact habitat available in the immediate surrounds are unlikely to be negatively affected by the development.

Small mammals within the habitat are generally mobile and likely to be transient to the area. As with all construction sites there is a latent risk that there will be some accidental mortalities. Generally, these small mammals are mobile and will vacate the area once construction commences. The faunal assessment confirmed the presence of *Chlorotalpa duthieae* (Duthies Golden Mole) in the alien invaded northern portion of the site. The consequence being that this area is excluded from the proposed footprint and will be retained as open space. The wattle trees will need to remain in order to retain the habitat. Refer to Faunal Assessment.

The risk of any other species of conservation concern being impacted significantly is low, and it is unlikely that there will be any impact to populations of such species because of the activity. A faunal search and

rescue is recommended as a precaution before commencement. Refer to separate faunal assessment for specific recommendations.

Avifauna and Bats

The proposed activity is unlikely to pose any significant risk to birds or bats, which may be transient visitors. Refer to separate faunal assessment.

Reptiles

Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. Should any reptiles be found during constructions, a reptile handler should be on called. Refer to separate faunal assessment.

Amphibians

Since most of the site covers terrestrial habitat with limited sources of aquatic habitat, which are generally modified or significantly degraded, amphibians are not anticipated to be found to occur in abundance. The watercourse areas are none the less excluded from the site development plan. Refer to separate faunal and aquatic assessments.

Invertebrates

Two insects are flagged as possibly occurring. No know populations are present in close proximity to the site. Refer to separate faunal assessment.

3.1.8 Species of Conservation Concern occurring in the region

Several endemic and range restricted species are known from the general surrounding area and there is a residual likelihood that they could be present, but cannot be discounted without comprehensive seasonal sampling, which is generally outside the scope of such an assessment, unless a specific risk is identified. Due to the localised nature of the impact, with vegetation clearing only required for site development, as well as the level of degradation, the risk of a species suffering any significant population loss is low. There is always a residual risk to species for any activity.

Red Listed, Endemic and Protected Flora

As per Table 3, the site falls within the broader distribution range of a few flora species several Vulnerable, Endangered or Critically Endangered flora species as well as species protected in terms of the Provincial Nature Conservation Ordinance (PNCO). The site has high levels of historical transformation and disturbance as well as alien invasion that has transformed the site. Suitable habitat is thus absent and PNCO protected species that are present generally have a widespread distribution and are not under threat.

Table 2: Flora Species of Conservation Concern.

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
<i>Acmadenia alternifolia</i>	Rutaceae	VU B1ab (ii,iii,iv)+2ab	EOO 466 km ² , between five and nine locations and declining due to loss of habitat to housing development, invasive alien plants and too

4 IUCN - Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Least Concern (LC); End – Endemic; PNCO – Western Cape Provincial Nature Conservation Ordinance; Ex, Exotic/Invasive/Weed; NFA – National Forest Act; ToPS – Threatened or Protected Species.

5 FFs19 – South Outeniqua Sandstone Fynbos

SCIENTIFIC NAME	FAMILY	STATUS4	COMMENT/PRESENCE5
		(ii,iii,iv), NEST (M)	frequent fire. Knysna to Plettenberg Bay, possibly extending as far as Nature's Valley. Forestry is a past threat around Harkerville. The subpopulation above Stevens Bank in the Harkerville forestry area has declined due to disturbance (quarrying) of the headland. Coastal development is a severe ongoing threat around Plettenberg Bay, especially in the area east of the Keurbooms River. Invasive alien plants are an ongoing threat throughout this species' range. There has been past population decline due to habitat loss to plantations and urban development. Two of the 11 recorded subpopulations have been lost and the existence of four is uncertain. Data for four subpopulations show that most are small (10-50 mature individuals) while one subpopulation has >1000 individuals. Not recorded, unlikely to be present.
<i>Acmadenia gracilis</i>	Rutaceae	VU B1ab (ii,iii,v)+2ab(ii,iii,v)	FFs19
<i>Acmadenia maculata</i>	Rutaceae	NT B1ab (ii,iii,iv,v)	FFs19
<i>Acmadenia rupicola</i>	Rutaceae	VU D2	FFs19
<i>Acmadenia tetragona</i>	Rutaceae	NT B1ab (iii)+2ab(iii)	FFs19
<i>Agathosma alaris</i>	Rutaceae	DDD	FFs19
<i>Amphithalea flava</i>	Fabaceae	VU D2	FFs19
<i>Aspalathus bowieana</i>	Fabaceae	EN B1ab (i,ii,iii, iv, v), NEST (M)	Aspalathus bowieana has an extent of occurrence of 1732 km ² , and an area of occupancy of <550 km ² . There are five known remaining locations, and the population continues to decline due to competition from alien invasive plants and inappropriate fire management. This species occurs in the Outeniqua and Tsitsikamma mountains on the border between the Western and Eastern Cape provinces. This species has already lost nearly 30% of its habitat, mainly to timber plantations on the southern slopes of the Outeniqua and Tsitsikamma Mountains. Remaining subpopulations are threatened by competition from alien invasive plants, as well as inappropriate fire management. Not recorded, unlikely to be present.
<i>Aspalathus bowieana</i>	Fabaceae	EN B1ab (i,ii,iii, iv, v)	FFs19
<i>Aspalathus digitifolia</i>	Fabaceae	VU A2c; D2	FFs19
<i>Erica aneimensa</i>	Ericaceae	VU B1ab (iii)+2ab(iii), PNCO	FFs19
<i>Erica cordata</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica deflexa</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica densifolia</i>	Ericaceae	LC, PNCO	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
<i>Erica discolor</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica formosa</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica fuscescens</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica gillii</i>	Ericaceae	VU D ₂ , PNCO	FFs19
<i>Erica glandulosa</i> subsp. <i>fourcadei</i>	Ericaceae	VU B _{1ab} (ii,iii,iv,v), NEST (M)	EOO 5225 km ² , between eight and 12 severely fragmented subpopulations confined to a narrow coastal area continue to decline due to ongoing habitat loss, degradation and fragmentation as a result of coastal development, forestry plantations, lack of fire and competition from alien invasive plants. Mossel Bay to Cape St Francis. This species' coastal habitat is already >36% transformed, predominantly due to coastal development, agriculture and forestry plantations. In addition, large sections are densely invaded by alien invasive plants. In some areas, due to the exclusion of fires from small fragments, this species' habitat is changing from open coastal fynbos to dense thicket. This taxon is restricted to highly transformed and fragmented coastal lowlands. Many recent records indicate that this species is more common than previously estimated (occurring at between 10 and 20 locations), however, except for the area between Sedgefield and Knysna, where this species is still quite common, particularly in the Goukamma Nature Reserve, all other subpopulations are isolated due to habitat loss and fragmentation. Not recorded, unlikely to be present.
<i>Erica glomiflora</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica glumiflora</i>	Ericaceae	VU B _{1ab} (i,ii,iii,iv,v), NEST (M)	EOO <6740 km ² , known from six locations. Although it is conserved in four nature reserves, these are all within the western portion of the range. In the eastern part of the range, coastal development and alien plant invasion are causing continuing declines to subpopulations. Wilderness to East London, and extending inland around Grahamstown. Sandy coastal flats and dunes and low coastal hills. Not recorded, unlikely to be present.
<i>Erica gracilis</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica hispidula</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica inconstans</i>	Ericaceae	VU B _{1ab} (ii,iii,v)+2ab(ii,iii,v)	FFs19
<i>Erica juniperina</i>	Ericaceae	EN D	FFs19
<i>Erica lanata</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica lehmannii</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica nabea</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica outeniquae</i>	Ericaceae	VU D ₂	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
<i>Erica priorii</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica similis</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica simulans</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica sparsa</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica triceps</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica uberiflora</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica unicolor</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica velatiflora</i>	Ericaceae	VU ^{D1+2} , PNCO	FFs19
<i>Erica versicolor</i>	Ericaceae	LC, PNCO	FFs19
<i>Geissorhiza bracteata</i>	Iridaceae	LC, PNCO	FFs19
<i>Geissorhiza fourcadei</i>	Iridaceae	LC, PNCO	FFs19
<i>Geissorhiza inconspicua</i>	Iridaceae	LC, PNCO	FFs19
<i>Geissorhiza outeniquensis</i>	Iridaceae	NT ^{D2} , PNCO	FFs19
<i>Lampranthus pauciflorus</i>	Aizoaceae	EN B1ab(ii,iii,iv, v), PNCO	FFs19
<i>Leucadendron comosum</i> subsp. <i>comosum</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron conicum</i>	Proteaceae	NT ^{A4c} , PNCO	FFs19
<i>Leucadendron ericifolium</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron eucalyptifolium</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron olens</i>	Proteaceae	NT ^{D2} , PNCO	FFs19
<i>Leucadendron salignum</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron spissifolium</i> subsp. <i>fragrans</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron uliginosum</i> subsp. <i>uliginosum</i>	Proteaceae	NT B1ab(iii)+2a b(iii)	FFs19
<i>Leucospermum cuneiforme</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucospermum glabrum</i>	Proteaceae	EN B1ab (iii,v)c(iv)+2 ab(iii,v)c(iv); C2a(i), PNCO, NEST (M)	EOO 1005 km ² , AOO 54 km ² , 14 severely fragmented subpopulations continue to decline due to alien plant invasion, afforestation and fire break maintenance. Fire-related population fluctuations occur in small subpopulations, only three subpopulations have more than 100 plants. Total population is less than 1000 mature individuals. Dormant subpopulations are easily missed in vegetation surveys and EIAs. Wet south slopes in sandstone fynbos. Mature individuals are killed by fires, and only seeds survive. Seeds are released after ripening, and dispersed by ants to their underground nests, where they are protected from predation

SCIENTIFIC NAME	FAMILY	STATUS4	COMMENT/PRESENCE5
			and fire. It is pollinated by birds. Not recorded, unlikely to be present.
<i>Leucospermum hamatum</i>	Proteaceae	EN B1ac (iv)+2ac(iv), PNCO	FFs19
<i>Leucospermum wittebergense</i>	Proteaceae	LC, PNCO	FFs19
<i>Linconia alopecuroidea</i>	Bruniaceae	EN D	FFs19
<i>Mimetes cucullatus</i>	Proteaceae	LC, PNCO	FFs19
<i>Mimetes pauciflorus</i>	Proteaceae	VU A2c+ 3c+ 4c, NEST (M)	
<i>Mimetes pauciflorus</i>	Proteaceae	VU A2c+3c+ 4c	FFs19, A past population reduction of at least >30% is estimated based habitat loss to forestry plantations. Land transformation models (Bomhard et al. 2005) predict a further 50% habitat loss by 2025. However, forestry is in decline in the area and therefore future habitat loss projected by models is probably an overestimate. Generation length is 20 years. Outeniqua and Tsitsikamma Mountains. Tsitsikamma Sandstone Fynbos, South Outeniqua Sandstone Fynbos Moist south-facing slopes in sandstone fynbos, 450-1400 m. Mature individuals are killed by fires, and only seeds survive. Seeds are released after ripening, and dispersed by ants to their underground nests, where they are protected from predation and fire. It is pollinated by birds. Not recorded, unlikely to be present.
<i>Muraltia knysnaensis</i>	Polygalaceae	EN B1ab (ii,iii,iv,v), NEST (M)	EOO 2046 km ² , between three and eight severely fragmented subpopulations remain on remnants of natural habitat after most of this species' habitat has been transformed for crop cultivation, forestry plantations and coastal development around Knysna and Plettenberg Bay. It continues to decline due to ongoing habitat degradation as a result of fire exclusion on small fragments. Coastal lowlands between Mossel Bay and the Keurbooms River. <i>Muraltia knysnaensis</i> is known from only four recent records, and at three locations, plants are threatened by ongoing habitat loss, degradation and fragmentation. One subpopulation of fewer than 10 plants was found in 2009 on the edge of a newly established forestry plantation, and this subpopulation declined to only one plant in 2012 (D. Turner pers. obs. 2012). A fourth small subpopulation of fewer than 10 plants were recorded in a private nature reserve and is not threatened. Coastal fynbos within this species' known range is at least 58% transformed, however, at at least four other locations known through historical records intact habitat still remains, and it is likely that other

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
			subpopulations still exist. Due to extensive habitat transformation however, subpopulations have become isolated and are considered severely fragmented. Not recorded, unlikely to be present.
<i>Osteospermum pterigoideum</i>	Asteraceae	EN B1ab (ii,iii,v)+2ab(ii,iii,v), NEST (M)	EOO 300 km ² , of six historical locations, four have been lost due to afforestation and crop cultivation. There are only two possibly extant locations remaining, both are threatened by ongoing loss and degradation of habitat due to invasive alien plants. George and Humansdorp. Large areas of this species' habitat has been afforested in the past and it is estimated that at least 50% of subpopulations were lost. Around George, habitat has also been lost to crop cultivation. Remaining subpopulations continue to decline due to competition from alien invasive plants as well as ongoing habitat degradation. Not recorded, unlikely to be present.
<i>Otholobium carneum</i>	Fabaceae	Rare	FFs19
<i>Podalyria sericea</i>	Fabaceae	VU C2a(i)	FFs19
<i>Prismatocarpus rogersii</i>	Campanulaceae	NT B1ab(iii)	FFs19
<i>Protea cynaroides</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea lorifolia</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea mundii</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea neriifolia</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea repens</i>	Proteaceae	LC, PNCO	FFs19
<i>Pterygodium cleistogamum</i>	Orchidaceae	VU B1ab (ii,iii), NEST (M), PNCO	EOO 5950 km ² , known from 10 locations, but only seen at three recently. Experiencing ongoing habitat loss due to coastal development. Declining along the coast due to habitat destruction, mainly as a result of coastal development (A. Pauw, pers. comm. 2005). Not recorded, unlikely to be present.
<i>Pterygodium newdigateae</i>	Orchidaceae	CR Possibly Extinct, NEST (M), PNCO	Known only from collections made before 1923. Several searches over many years in the area where it is presumed to have been collected have failed to relocate it in the wild, and it is possibly extinct. South Outeniqua Sandstone Fynbos. Stony slopes near sea level. The population was possibly lost to development or timber plantations, but since the precise area of occurrence is unknown, the reason for the disappearance of this species is unknown. Not recorded, unlikely to be present.
<i>Romulea fibrosa</i>	Iridaceae	LC, PNCO	FFs19
Sensitive species 131		CR (Possibly Extinct)	A very rare and poorly known species, known from only four collections from a small area (EOO <600 km ²) in the southern Cape where it was last collected in the late 1800's. These early collectors gave no specific locality information,

SCIENTIFIC NAME	FAMILY	STATUS ⁴	COMMENT/PRESENCE ⁵
			nor a description of the habitat the species was found in. Natural vegetation on the coastal lowlands between Knysna and Plettenberg Bay is extensively transformed for coastal development, commercial forestry plantations, agriculture and degraded due to alien invasive plant infestations. Fynbos in the coastal mountain ranges in this area have also been extensively converted to timber plantations, and many areas are densely invaded by alien plants, but some natural areas still remain. Several searches for this species have failed to locate any remaining wild populations, but as the species' preferred habitat is not known, a small chance remains that it may still be rediscovered. According to Goldblatt and Manning (2000), this species occurs on sandy flats, however, at least one specimen is a mixed collection with <i>Cyclopia subternata</i> , a montane species. At least two other collections indicate that they were collected in montane sites. Possibly threatened by habitat loss to development on coastal lowlands, and habitat loss to commercial forestry plantations and alien invasive plants in coastal mountains between Knysna and Plettenberg Bay. Not recorded, unlikely to be present.
<i>Tetraria cuspidata</i>	Cyperaceae	NE	FFs19
<i>Tritoniopsis caffra</i>	Iridaceae	LC, PNCO	FFs19
<i>Ursinia coronopifolia</i>	Asteraceae	Rare	FFs19
<i>Watsonia fourcadei</i>	Iridaceae	LC, PNCO	FFs19
<i>Xiphotheca phyllicoides</i>	Fabaceae	CR B1ab (ii,iii)	FFs19
<i>Zyrphelis outeniquae</i>	Asteraceae	VU D2	FFs19

Listed species (Table 2) were flagged from various database sources, including the National Environmental Screening Tool, as occurring in the region and having an elevated status. All were cross-checked for distribution overlay and were actively screened for presence/absence on site. Other species may be endemic, but distribution range has been checked and are generally widespread. Sensitive species names have not been included. Species that are protected in terms of the PNCO will require permits for destruction before clearing of the site commences.

A pre-commencement flora search and rescue procedure is recommended before commencement. Respective PNCO permits will be required before vegetation clearing commences and as a precautionary measure a final screening and flora search and rescue is advisable for the few geophytic species that are present.

National Environmental Screening Tool Listed Flora (Plant) Species

The distribution of the species flagged in the National Environmental Screening Tool are indicated in Figure 28 (species in proximity) and Figure 29 (species in broader area).

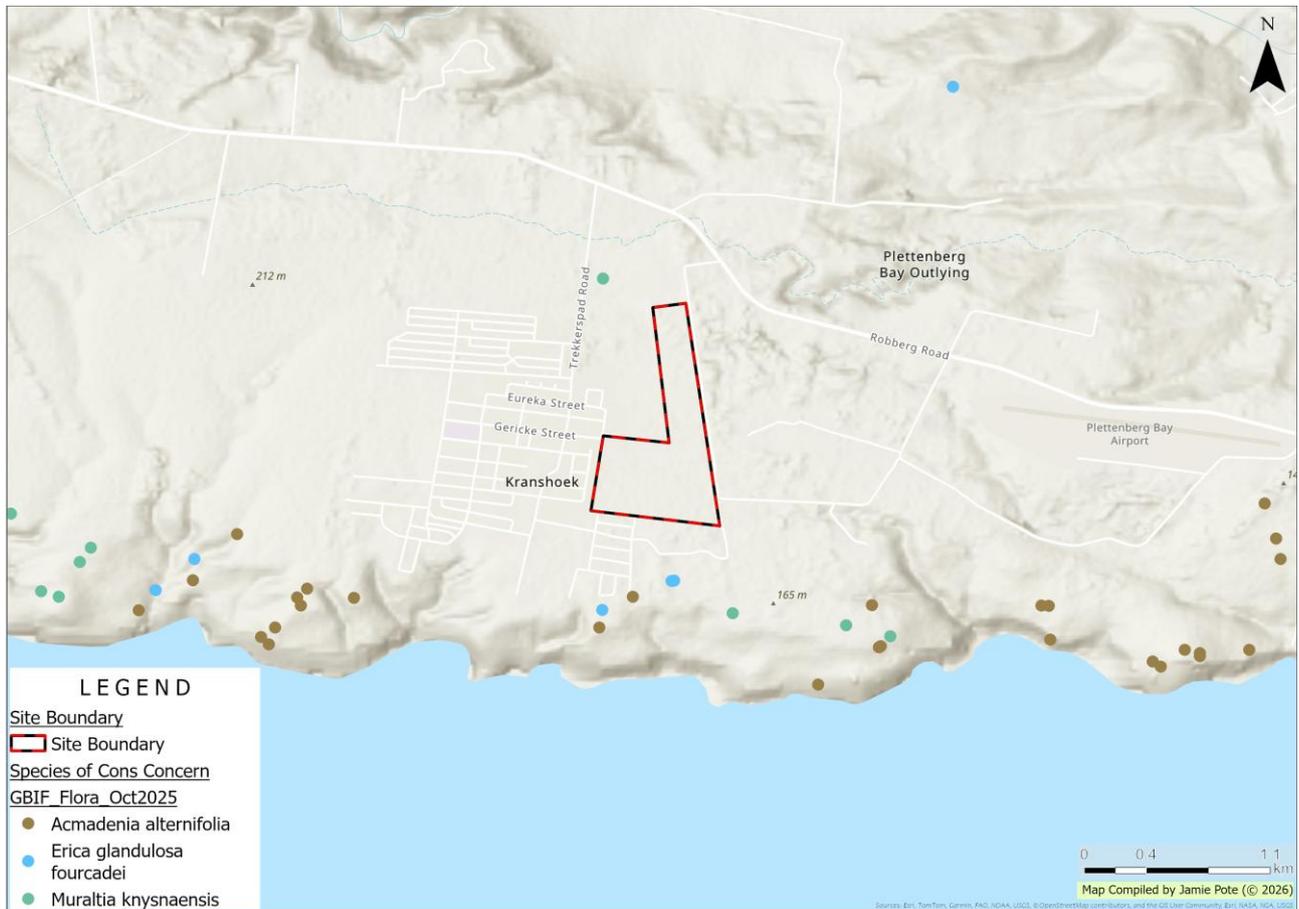


Figure 28: Known distribution of flagged Flora Species of Conservation Concern in proximity to the site.

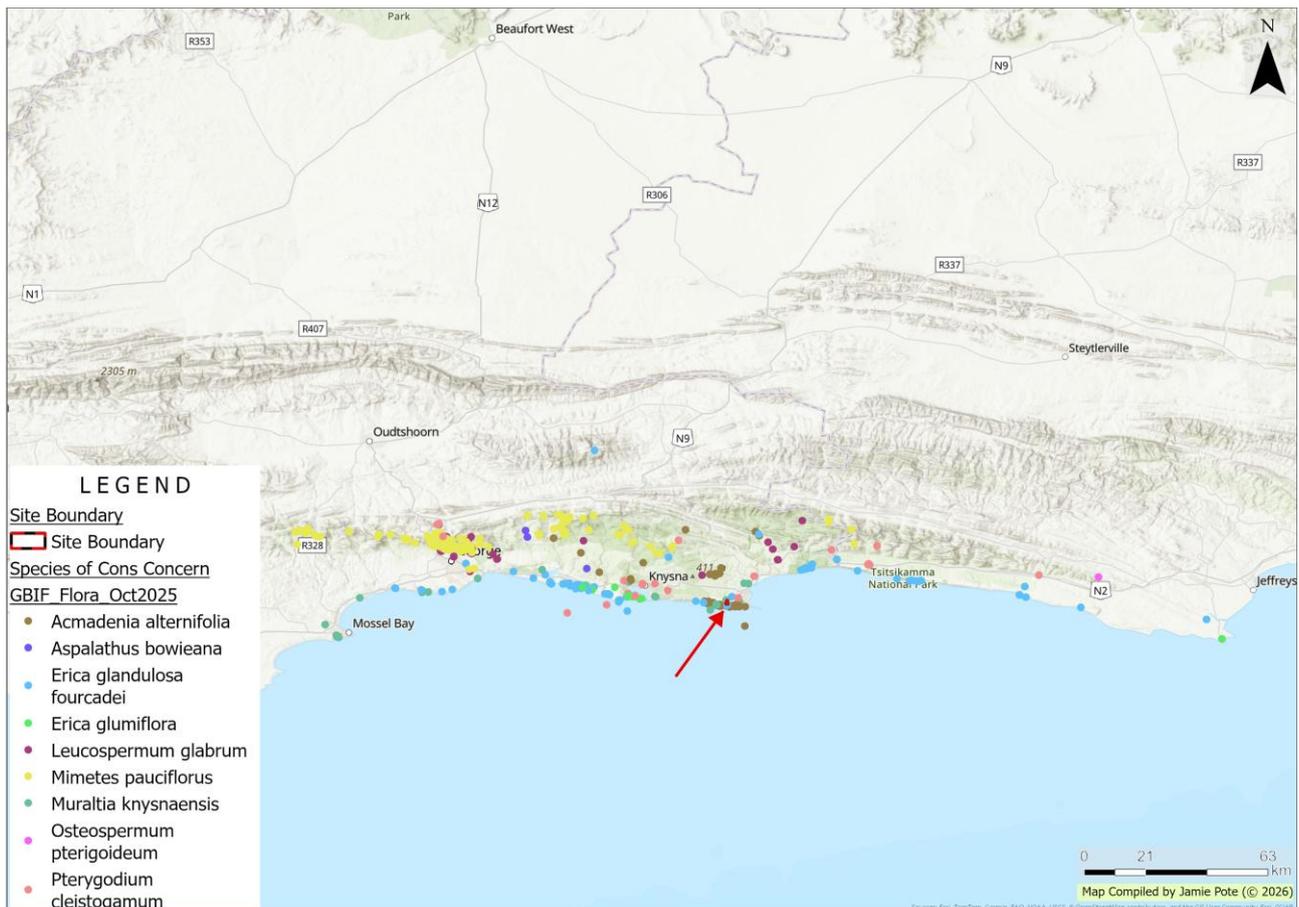


Figure 29: Known distribution of flagged Flora Species of Conservation Concern in the broader area.

Species known to be present in the nearby surrounding natural and near natural vegetation include *Acmadenia alternifolia* (Vulnerable), *Erica glandulosa* subsp. *fourcadei* (Vulnerable) and *Muraltia knysnaensis* (Endangered). These species generally occur in natural areas and were not observed on the site. A few individuals were noted to be present in an adjacent property, but in a patch of near natural vegetation rather than transformed. The species also has a somewhat widespread distribution, so the proposed activity is unlikely to pose any significant threat. The remaining species known from the broader area are less likely to be present, some being known from the inland mountainous areas.

Red Listed and Protected Fauna

The site is historically transformed with high levels of alien invasion on the northern portion and abutted by an urban settlement on the western side. Any significant population of faunal Species of Conservation Concern are more than likely already displaced historically. Suitable untransformed habitat is also absent or limited. Table 3 lists species having an elevated conservation status and/or are listed in terms of the National Environmental Screening Tool.

Since the project footprint has extensive outlying areas of natural habitat, any disturbance or displacement associated with increased activity or habitat destruction as a direct result of the activity during the construction phase is unlikely to pose a significant negative impact to faunal species which will be able to relocate. Less mobile species including reptiles and amphibians may require manual relocation before commencement as a precautionary measure.

Table 3: Fauna Species of Conservation Concern

SCIENTIFIC NAME	COMMON NAME	STATUS ⁶	COMMENT/PRESENCE
MAMMALS			
<i>Chlorotalpa duthieae</i>	Duthies Golden Mole	VU, NEST (M)	The species is known from only nine locations in southern Cape Afrotropical Forests, clustered in two subpopulations: an eastern subpopulation in the suburban parts of Port Elizabeth (three locations); and a western subpopulation in the indigenous coastal forest belt from Wilderness to Tsitsikamma (six locations). Suitable forest habitat is not present; however, it was confirmed to be present in the alien invaded area at the north end of the property. Refer to separate Faunal Assessment, confirmed present on site and habitat designated as No-Go.
Sensitive species 8		NEST (M), VU	This is a widespread and abundant species with total population numbers estimated at more than seven million. Its ability to withstand hunting pressure and habitat degradation enable it to adapt to increasing human colonization of its forest habitats, although even this abundant, highly resilient species is

⁶ IUCN - Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Least Concern (LC); End - Endemic; PNCO - Western Cape Provincial Nature Conservation Ordinance; Ex, Exotic/Invasive/Weed; NFA - National Forest Act; ToPS - Threatened or Protected Species.

SCIENTIFIC NAME	COMMON NAME	STATUS ⁶	COMMENT/PRESENCE
			suffering some decline in its distribution as human populations continue to grow and expand and rates of harvest are known to be increasing. May be a transient visitor but preferred forest habitat is not present.
BIRDS			
<i>Bradypterus sylvaticus</i>	Knysna Warbler	VU, NEST (H, M)	May be a transient visitor
<i>Circus ranivorus</i>	African Marsh Harrier	EN, NEST (H)	May be a transient visitor
<i>Neotis denhami</i>	Denham's Bustard	VU, NEST (H, M), VU	May be a transient visitor
REPTILES			
None of Concern			
AMPHIBIANS			
<i>Afrixalus knysnae</i>	Knysna Banana Frog or Knysna Leaf-folding Frog	EN, NEST (M)	Listed as Endangered, in view of its extent of occurrence being 816 km ² , the area of occupancy being 27 km ² , with all individuals in five locations, and a continuing decline in the quality of its habitat, area of occupancy, and number of mature individuals. This species is known from around five locations at low altitudes, on either side of the border between the Eastern Cape and Western Cape Provinces in South Africa. It lives in a coastal mosaic of vegetation types, including mountain fynbos heathland and forest. It breeds in small dams and shallow semi-permanent water with much emergent vegetation, and even in well vegetated ornamental garden ponds. It is suspected that this species requires high water quality for breeding. Species in this genus deposit between 20 and 50 eggs on vegetation above water, folded in a grass leaf. Tadpoles emerge, drop into the water and remain there until metamorphosis. May be present in streams but unlikely preferred habitat due to degradation and alien infestation.
INVERTEBRATES			
<i>Aloeides thyra orientis</i>	Eastern Red Copper	EN, NEST (M)	No known populations in vicinity. Preferred host plants not abundant in area and historical cultivation likely makes habitat unsuitable.
<i>Aneuryphymus montanus</i>	Yellow-winged Grasshopper Agile	VU, NEST (M)	Unlikely to be present due to historical cultivation and degradation.

Listed species (Table 2) were flagged from various database sources, including the National environmental Screening Tool, as occurring in the region and having an elevated status. All were cross-

checked for distribution overlay and were actively screened for presence/absence on site. Other species may be endemic, but distribution range has been checked and are generally widespread. Sensitive species names have not been included. As per Table 2, no Endangered or Critically Endangered fauna species were confirmed to be present nor are known to be present in the affected area; however a single Vulnerable species (*Chlorotalpa duthieae*, Duthies Golden Mole) was confirmed to be present in the northern portion of the site where densely invaded with alien trees. Typically, a forest dwelling species, the site is typically outside of its preferred habitat., however it is likely that the alien tree invasion has created artificial suitable habitat. Refer to separate faunal assessment for a more detailed assessment of faunal species, including the Golden Mole. Since the area where this species occurs is densely invaded with declared alien invasive trees, which require removal in terms of CARA/NEMBA, permits may be required to retain the exotic tree species.

A fauna search and rescue is recommended required before commencement as a precautionary measure for all other faunal species. PNCO permits will be required for the removal of protected species as listed above.

National Environmental Screening Tool Listed Fauna (Animal) Species

The flagged mammal (Sensitive species 8) is unlikely to occur when more suitable habitat is present in the wider area, other than as transient visitors. The flagged Golden Mole (*Chlorotalpa duthieae*) was confirmed present and the habitat where it occurs has been excluded from the development footprint.

The flagged bird species (*Bradypterus sylvaticus*, *Circus ranivorus* & *Neotis denhami*) if present, would largely be transient visitors and are unlikely to be affected by development of the limited footprint within the broader landscape.

The flagged amphibian (*Afrixalus knysnae*) would more likely be present in forest streams or less disturbed dams than the heavily alien infested streams that are present on the site.

The flagged invertebrate species (*Aloeides thyra orientis* & *Aneuryphymus montanus*), if present in the area is more likely to occur in the natural and near natural habitat available to the south of the site. Refer to separate faunal assessment for a more detailed assessment of faunal species.

Alien Invasive Species

On 18 September 2020, the Minister of Environmental Affairs published the Alien and Invasive Species Regulations (“the Regulations”) which came into effect on the 18 October 2020 in a bid to curb the negative effects of IAPs. The Regulations call on landowners and sellers of land alike to assist the Department of Environmental Affairs to conserve our indigenous fauna and flora and to foster sustainable use of our land. Non-adherence to the Regulations by a landowner or a seller of land can result in a criminal offence punishable by a fine of up to R 5 million (R 10 million in case of a second offence) and/or a period of imprisonment of up to 10 years.

Category 1a and 1b listed invasive species must be controlled and eradicated. Category 2 plants may only be grown if a permit is obtained, and the property owner ensures that the invasive species do not spread beyond his or her property. The growing of Category 3 species is subject to various exemptions and prohibitions. Some invasive plants are categorised differently in different provinces. For example: the Spanish Broom plant is categorised as a category 1b (harmful) invasive plant in Eastern Cape and Western Cape, but it is a category 3 (less harmful) invasive plant in the other seven provinces.

Invasive alien plants have a significant negative impact on the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Landowners are under legal obligation to control alien plants occurring on their properties. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014). Alien control programs are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is essential. This will save time, money and significant effort. Collective management and planning with neighbours allow for more cost-effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses. All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing. A general rule of thumb is to first target lightly infested areas before tackling densely invaded areas and prioritize sensitive areas such as riverbanks and wetlands. Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms but are often the most difficult to detect and control.

As indicated in Figure 15, the northern half of Portion 7 is vegetated with a dense stand of alien invasive tree species that have progressively invaded since the early 2000's. At significant densities these invasive thickets tend to alter biophysical conditions and while rehabilitation is feasible, it is unlikely to return to a natural state. The dominant tree species include Blackwood, Black Wattle, Port Jacksons Willow, Eucalyptus and Pine species. Several other exotic invasive and weed species including shrubs were noted within the broader site including portion 8, although usually only the occasional individual. The dense localised infestations of these tree species have a noticeable and definite impact to the habitat present and are a significant source of degradation. An alien weed management programme, as part of the construction contract including an after-care period will be required, until such time as natural vegetation has become adequately re-established within the open space areas that are designated around the watercourses. A two year after-care period is recommended. A list of species is included in Table 4. Some weed species listed are not within the site but may be introduced during construction from the adjacent area including the access road.

Table 4: Alien (exotic) invasive and other weed species and status.

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATUS ⁷	PRESENCE
<i>Acacia mearnsii</i>	Black Wattle	Fabaceae	CARA 2	Common, dense stands in alien invaded area.
<i>Acacia melanoxylon</i>	Blackwood	Fabaceae	CARA 2	Common, dense stands in alien invaded area.
<i>Acacia saligna</i>	Port Jackson Willow	Fabaceae	CARA 1b	Common, dense stands in alien invaded area.
<i>Cirsium vulgare</i>	Scotch Thistle	Asteraceae	CARA 1b	Present, few individuals
<i>Datura spp.</i>	Thorn Apple	Solanaceae	CARA 1b	Present, few individuals
<i>Eucalyptus spp</i>	Gum/Eucalyptus tree	Myrtaceae	CARA 1b	Common, dense stands in alien invaded area.
<i>Pennisetum clandestinum</i>	Kikuyu	Poaceae	CARA 1b	Present, common in transformed areas
<i>Pinus spp.</i>	Pine tree	Pinaceae	CARA 1b	Common, dense stands in alien invaded area.
<i>Solanum mauritianum</i>	Bugweed	Solanaceae	CARA 1b	Present, few individuals
<i>Solanum sisymbriifolium</i>	Wild tomato	Solanaceae	CARA 1b	Present, few individuals

⁷ CARA - Conservation of Agricultural Resources Act (1993); National List of Invasive Species in Terms Sections 70(1), 71(3) and 71A (2016). Refer to Section 2.2 & Table 10 for detailed procedures and requirements.

Eradication protocol

The act required the removal of these species, being the responsibility of the landowner, as described in [Section 9.5.6: Alien Invasive Species](#). It is likely that the disturbed areas will be prone to alien infestation after construction is completed and follow up maintenance period will be required.

A single Vulnerable faunal species (*Chlorotalpa duthieae*, Duthies Golden Mole) was confirmed to be present in the northern portion of the site where densely invaded with alien trees. Typically, a forest dwelling species, the site is typically outside of the Golden Moles preferred habitat., however it is likely that the alien tree invasion has created artificial suitable habitat in the absence of preferred habitat. Refer to separate faunal assessment for a more detailed assessment of faunal species, including the Golden Mole. Since the area where this species occurs is densely invaded with declared alien invasive trees, predominantly *Acacia mearnsii* (Black Wattle), *Acacia melanoxylon* (Blackwood) and *Acacia saligna* (Port Jackson Willow), which under normal circumstances require removal in terms of CARA/NEMBA, permits may be required to retain the exotic tree species.

Specific eradication and management procedures must be stipulated in the EMP as to the methods to be implemented to remove and control the various alien invasive species as they tend to require species specific techniques. A management plan should be incorporated into the EMP, and a detailed action plan compiled and implemented by the ECO. All removed trees must either be removed from site or disposed of at a registered waste disposal facility. Alternatively, the plant material can be mulched using a woodchipper on site. And seed-bearing material is to be disposed of at a registered landfill.

3.1.9 Terrestrial Vegetation Sensitivity Assessment

An overall Biodiversity Sensitivity assessment, incorporating key vegetation and ecological indicators was undertaken and includes the following key criteria:

- relative levels of *intactness* i.t.o overall loss of indigenous vegetation cover.
- presence, diversity and abundance of *Species of Conservation Concern* (weighted in favour of local endemic species).
- extent of *invasion* (severity and overall ecological impact), as well as the degree to which successful rehabilitation could take place.
- overall degradation incorporating above factors.
- relative importance of the vegetation communities relative to regional conservation status – indicated as vulnerability of the area because of loss.

Intactness

Three basic classes are differentiated as follows:

- **Low:** > 75 % of original vegetation has been removed or lost; and/or no Species of Conservation Concern present that are critically endangered, endangered or endemic with highly localised distribution.
- **Moderate:** 25 – 75 % of original vegetation has been removed/lost; and or presence of Species of Conservation Concern but not having high conservation status or high levels of endemism or highly localised distributions.
- **High:** < 25 % of original vegetation has been removed or lost; and or presence of species with a highly endemism and or high conservation status (endangered or critically endangered).

Intactness for the site is generally Low due to historical transformation and alien invasion.

Alien Invasion

Three classes are differentiated as follows:

- **Low:** no or few scattered individuals.
- **Moderate:** individual clumps of invasives present but cover less than 50% of original area.
- **High:** dense, impenetrable stands of invasives present, or cover > 50 % of area with substantial loss functioning. Rehabilitation will most likely require specialised techniques over an extended period (> 5 years).

Alien invasion for the site is Low for the portion 7 and the southern half of portion 8 and Moderate to High for the northern half of portion 8.

Degradation

Overall Degradation is determined from the above alien invasion and intactness scores, according to the following matrix:

INTACTNESS	INVASION		
	LOW	MODERATE	HIGH
High	Pristine	Near Pristine	Moderately Degraded
Moderate	Near Pristine	Moderately Degraded	Severely Degraded
Low	Moderately Degraded	Severely Degraded	Transformed

Degradation for the site is High due to alien infestation and historical cultivation.

Overall Sensitivity score

Overall Biodiversity Sensitivity of the vegetation within the site is calculated according to the following matrix which combines degradation and overall conservation status of the vegetation units of the site.

DEGRADATION	CONSERVATION STATUS			
	LEAST THREATENED	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED
Severely degraded/ Transformed	Very Low	Low	Moderate	Moderate – High
Moderately degraded	Low	Moderate	High	High
Ecologically Pristine or near Pristine	Moderate	Moderate – High	High	Very High (No-Go area)

Refer to Figure 30 for overall sensitivity map.

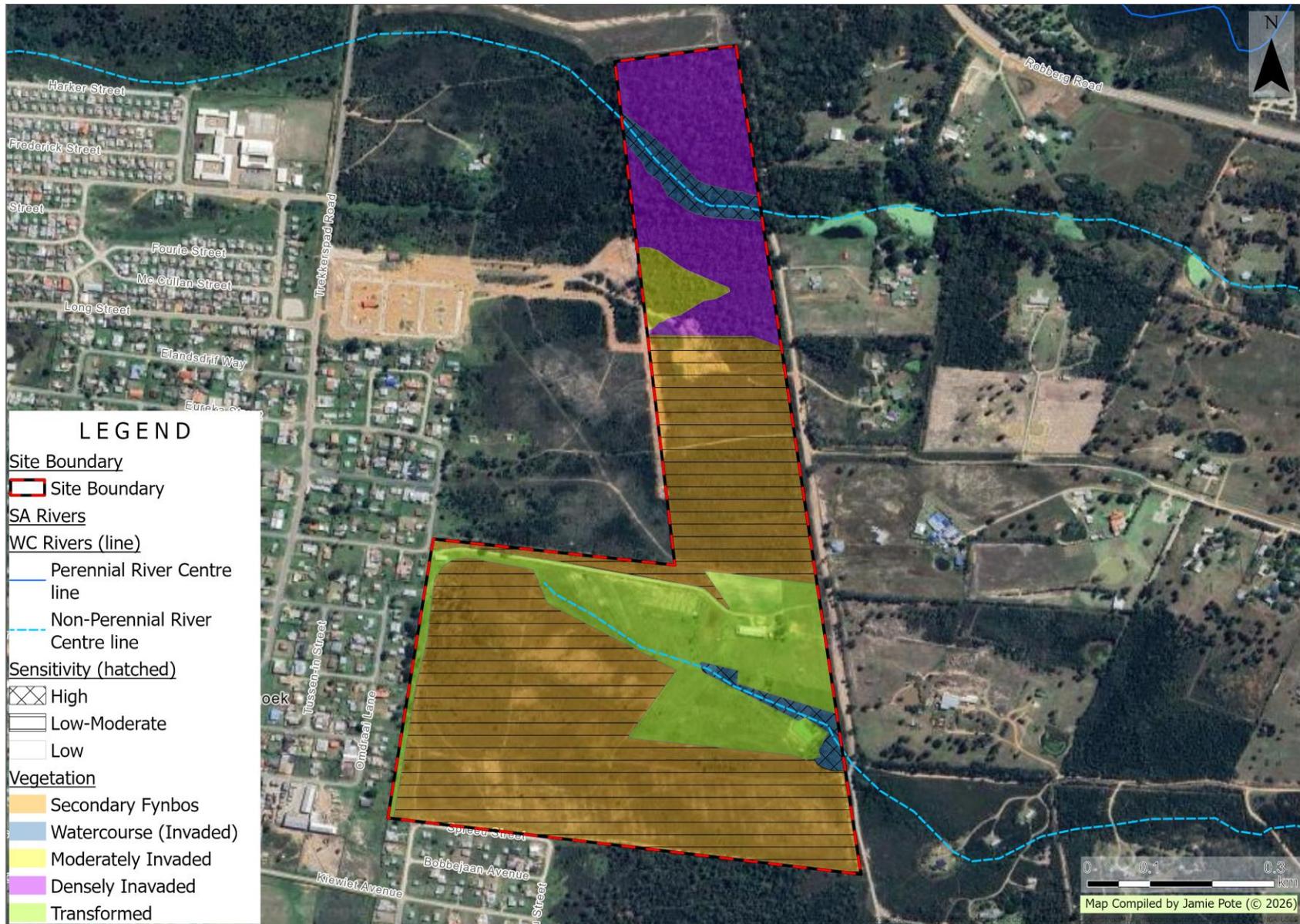


Figure 30: Overall Vegetation & Habitat Sensitivity.

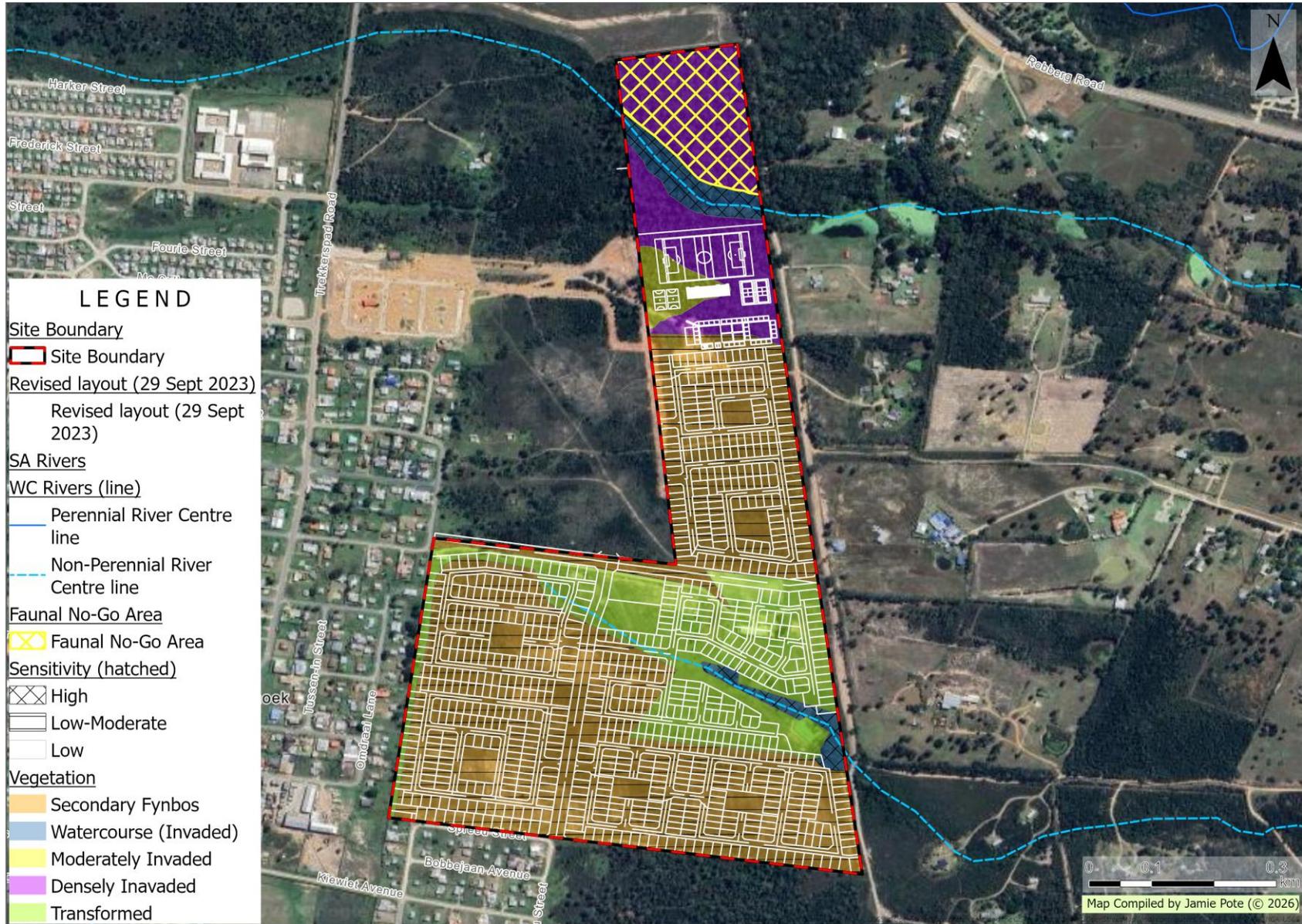


Figure 31: Overall Sensitivity with proposed layout overlay & Faunal No-Go Area.

The site sensitivity can be summarised as follows:

- Areas scoring an overall LOW sensitivity include the portions of the site that are completely transformed or severely degraded, that have a low conservation status, or where there is very dense alien infestation. Loss of these areas will not significantly compromise the current conservation status of the vegetation unit at a regional level, nor is its loss likely to compromise the ecological functioning of surrounding areas. Low sensitivity areas include transformed areas and high-density alien invaded areas.
- Areas scoring an overall LOW-MODERATE sensitivity include the portions of the site that contain secondary vegetation older than 10 years where some ecological functioning has returned but are still not considered to be in a near natural or natural state. Low-Moderate sensitivity areas include the old lands where some Fynbos regeneration has occurred.
- Areas scoring an overall MODERATE sensitivity include the portions of natural vegetation that is mostly intact, but not having specific biodiversity related issues of significance or where proposed activity will have limited overall impact and recovery will be good with minimal intervention. No Moderate sensitivity areas area designated.
- Areas scoring an overall HIGH sensitivity include those areas having intact vegetation and deemed to have a sensitivity, including being within intact Critical Biodiversity Areas and connectivity corridors, or are deemed critical habitat for fauna and/or flora species that are considered to be vulnerable and/or have confirmed presence of species of conservation concern. High sensitivity terrestrial areas are not identified but do include the ESA designated buffers around the watercourses and some relict natural vegetation around these watercourses.
- Areas scoring an overall VERY HIGH sensitivity (No-Go Areas) include areas having a Critically Endangered or Endangered conservation status, or that are irreplaceable in terms of Critical Biodiversity Areas or are critical habitat (refer to Section o) for any faunal species that is endangered or critically endangered. For the purposes of this assessment no specific Very High sensitivity terrestrial areas have been identified (which would imply irreplaceable habitat).

The high sensitivity areas (watercourse corridors) as well as the area identified by the faunal specialist and additional aquatic buffers have been adequately incorporated into the revised final site development plan (Figure 31).

3.1.10 Critical Habitat

The following Critical Habitat features have been identified within the site:

1. Criterion 1: Habitat for Critically Endangered (CR) and/or Endangered (EN) species
 - No Endangered or Critically Endangered Flora species were recorded. Several species known from general area were screened to confirm that most likely localities do not overlap with the site, which is significantly degraded and/or transformed.
 - No other Endangered Mammals, Reptiles, Amphibians, or Invertebrates are known to be present on the site or will be affected, which is significantly degraded and/or transformed.
2. Criterion 2: Habitat for Endemic or restricted-range species
 - Several range restricted flora and fauna species are potentially present in the surrounding area and vegetation types, none of which were confirmed to be present other than Duthies Golden Mole. The area where this species occurs has been incorporated into open space.
3. Criterion 3: Habitat for Migratory or congregatory species
 - No such terrestrial habitat will be directly or indirectly affected.
4. Criterion 4: Habitat for Highly threatened and/or unique ecosystems

- No such terrestrial habitat will be directly or indirectly affected.

5. Criterion 5: Habitat for Key evolutionary processes

- No such terrestrial habitat will be directly or indirectly affected.

3.1.11 Other Important or Sensitive Habitat

Special Habitats include areas that are rare within a region, or which support important species, ecosystems or ecological processes. Species of Conservation Concern refers to red data species and important habitats include the locations where these species are known to occur. The following are generally considered to be important or sensitive habitats, none of which are present within the site.

Feature	Desired State
Rocky Outcrops	No rocky outcrop habitat of significance is directly affected.
Wetland habitat	No wetlands are directly affected.
Priority Estuaries	No Estuaries are affected by the proposed activity.
Forest	No forest is present, occasional typically pioneer forest species are present, which is common in the area being in proximity to extensive natural forest.
Fynbos	Fynbos is present, almost entirely as secondary vegetation with commonly occurring species and also somewhat species poor.
Colonies or Populations of Threatened or Protected Species	No colonies or populations of threatened or protected species are present or in proximity to the activity that may be directly or indirectly affected.

3.1.12 No-Go Areas

The designated ESA areas along the watercourses should be considered no-go areas and are excluded from the site development plan. Care should be exercised in the vicinity of the watercourse and measures to be implemented to address stormwater and erosion adequately as well as alien tree removal and post construction rehabilitation.

3.1.13 Potential Development Footprints

The proposed site is suitable for the proposed activity.

3.2 Risks and Potential Impacts to Biodiversity

3.2.1 Summary of actions, activities, or processes that require mitigation

The main impacts likely to result from the proposed activity include the following:

1. Permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
2. Loss of flora Species of Conservation Concern during pre-construction site clearing activities. Numerous Species of Conservation Concern are potentially present within the affected area, which could be destroyed during site preparation.
3. Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
4. Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed

- areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.
5. Disturbances to ecological processes. Activity may result in disturbances to ecological processes.
 6. Aquatic and Riparian processes. Diversion and increased velocity of surface water flows – Changes to the hydrological regime and increased potential for erosion. Impact of changes to water quality. Loss of riparian vegetation / aquatic habitat. Loss of Species of Conservation Concern.
 7. Loss of Faunal Habitat: Activity will result in the loss of habitat for faunal species.
 8. Loss of faunal SCC due to construction activities: Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.

3.2.2 Potential Terrestrial Biodiversity Impacts (Direct)

A summary of potential ecological and terrestrial biodiversity risks and impacts are listed in Table 5.

Table 5: Potential Impacts to Terrestrial Biodiversity

IMPACT	Nature of Impact
Vegetation	<u>Permanent or temporary loss of indigenous vegetation</u> cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
Flora Species	<u>Loss of flora Species of Conservation Concern</u> during pre-construction site clearing activities. Several species of conservation concern are known from surrounding areas, which could be destroyed during site preparation, none of which were confirmed to be present.
Alien Invasive Species	<u>Susceptibility of post construction disturbed areas to invasion</u> by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.
Erosion	<u>Susceptibility of some areas to erosion</u> because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
Ecological Processes	<u>Disturbances to ecological processes</u> : Activity may result in disturbances to ecological processes.
Aquatic and Riparian processes	<u>Aquatic and Riparian processes</u> : None present/affected
Faunal Habitat	<u>Loss of Faunal Habitat</u> : Activity may result in the loss of habitat for faunal species, which could result in disturbance and displacement of faunal species.
Faunal Processes	Impacts to <u>faunal processes</u> because of the activity
Faunal Species	<u>Loss of faunal SCC</u> due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.

3.2.3 Potential Terrestrial Biodiversity Impacts (Indirect)

No significant additional ancillary linear infrastructure, such as roads, conveyors, power lines, pipelines and railways, which can impact on biodiversity and ecosystem services are expected.

3.2.4 Potential Terrestrial Biodiversity Impacts (Cumulative)

No cumulative impacts are expected because of the development of the site providing recommendation and mitigation measures are adhered to, due to the limited disturbance area.

3.3 Assessment of Risks and Impacts to Biodiversity

3.3.1 Criteria of assigning significance to potential impacts

The following methodology is to be applied in the specialist studies for the assessment of potential impacts.

CRITERIA	EXPLANATION
Nature of impact	Review the type of effect that a proposed activity will have on the environment and should include “what will be affected and how?”
Extent	Indicate whether the impact will be: <ul style="list-style-type: none"> • (S) <i>local</i> and limited to the immediate area of development (the site). • (L) limited to within 5 km of the development: or • (R) whether the impact may be realized regionally, nationally or even internationally.
Duration	Review the lifetime of the impact, as being: <ul style="list-style-type: none"> • (V) very short term (0 – 1 years), • (S) <i>short term</i> (1 – 5 years), • (M) medium (5 – 15 years), • (L) <i>long term</i> (>15 years but where the impacts will cease after the operation of the site), or • (P) permanent.
Intensity	Establish whether the impact is destructive or innocuous and should be described as either: <ul style="list-style-type: none"> • (L) <i>low</i> (where no environmental functions and processes are affected) • (M) <i>medium</i> (where the environment continues to function but in a modified manner) or • (H) <i>high</i> (where environmental functions and processes are altered such that they temporarily or permanently cease), including loss of critical endangered ecosystem and or critically endangered species (population).
Probability	Consider the likelihood of the impact occurring and should be described as: <ul style="list-style-type: none"> • (I) <i>improbable</i> (low likelihood) • (P) <i>probable</i> (distinct possibility) • (H) <i>highly probable</i> (most likely) or • (D) <i>definite</i> (impact will occur regardless of prevention measures).
Status of the impact	Description as to whether the impact will be positive (a benefit), negative (a cost), or neutral.
Degree of confidence	The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as high, medium or low.
Significance	<ul style="list-style-type: none"> • (VL) <i>Very Low</i>: Considered to be negligible • (L) <i>Low</i>: Where the impact will not have an influence on the decision or require to be significantly accommodated in the project design • (M) <i>Medium</i>: Where it could have an influence on the environment which will require modification of the project design or alternative mitigation. • (H) <i>High</i>: Where it could have a ‘no-go’ implication for the project unless mitigation or re-design is practically achievable. • (VH) <i>Very High</i>: Confirmed No-Go area, no mitigation feasible, redesign and avoidance are required, where activity will have a significant permanent and irreversible impact on a critically endangered ecosystem or species population.

3.3.2 Significance Rating

INTENSITY		DURATION				
		PERMANENT	LONG TERM	MEDIUM TERM	SHORT TERM	VERY SHORT TERM
HIGH INTENSITY						
EXTENT	National	Very High	Very High	High	High	Medium
	Regional	Very High ⁸	High	High	High	Medium
	Local	High	High	Medium	Medium	Medium
	Site specific	Medium	Medium	Medium	Medium	Medium
MEDIUM INTENSITY						
EXTENT	National	High	High	High	Medium	Medium
	Regional	High	High	High	Medium	Medium
	Local	Medium	Medium	Medium	Medium	Medium
	Site specific	Medium	Medium	Medium	Medium	Low
LOW INTENSITY						
EXTENT	National	Medium	Medium	Medium	Medium	Medium
	Regional	Medium	Medium	Medium	Medium	Low
	Local	Medium	Medium	Medium	Low	Very Low
	Site specific	Low	Low	Low	Very Low	Very Low

Furthermore, the following must be considered:

1. Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
2. All impacts should be evaluated for both the construction, operation and decommissioning phases of the project, where relevant.
3. The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.
4. Management actions: Where negative impacts are identified, specialists must specify practical mitigation objectives (i.e., ways of avoiding or reducing negative impacts). Where no mitigation is feasible, this should be stated, and the reasons given. Where positive impacts are identified, management actions to enhance the benefit must also be recommended.

3.3.3 Assessment of Terrestrial Biodiversity Impacts

Construction and operations can result in a range of negative impacts on terrestrial, marine and other aquatic ecosystems if not effectively managed. A summary of potential ecological and terrestrial biodiversity risks and impacts are listed in Table 5.

Table 5 describes impacts that may potentially occur in the site (as per DEA&DP guidelines) as well indicating the relevant EMP section. The predicted significance of these during the construction phase are summarised in Table 6 and during the operational phase are summarised in Table 7.

Table 6 : Construction Phase Assessment (Refer to Sections 3.3.1 & 3.3.2 for methodology).

Nature of impact	Extent	Duration	Intensity	Probability	Status of the impact	Degree of confidence	Significance (before)	Significance (after)
Vegetation	S	V	L	H	-ve	H	M	L

⁸ Considered a regional impact if activity will result in significant permanent and irreversible loss to a critically endangered species population or ecosystem (vegetation type)

Nature of impact	Extent	Duration	Intensity	Probability	Status of the impact	Degree of confidence	Significance (before)	Significance (after)
Flora Species	S	V	L	H	-ve	H	M	L
Alien Invasive Species	S	V	L	H	-ve	H	M	L
Erosion	S	V	L	H	-ve	H	M	L
Ecological Processes	S	V	L	H	-ve	H	M	L
Aquatic & Riparian Processes	S	V	L	H	-ve	H	M	L
Faunal Habitat	S	V	L	H	-ve	H	H	L
Faunal Processes	S	V	L	H	-ve	H	H	L
Faunal Species	S	V	L	H	-ve	H	H	L

Table 7: Operational Phase Assessment (Refer to Sections 3.3.1 & 3.3.2 for methodology).

Nature of impact	Extent	Duration	Intensity	Probability	Status of the impact	Degree of confidence	Significance (before)	Significance (after)
Vegetation	S	V	L	H	-ve	H	M	L
Flora Species	S	S	L	H	-ve	H	M	L
Alien Invasive Species	S	S	L	H	-ve	H	M	L
Erosion	S	S	L	H	-ve	H	M	L
Ecological Processes	S	S	L	H	-ve	H	M	L
Aquatic & Riparian Processes	S	S	L	H	-ve	H	M	L
Faunal Habitat	S	S	L	H	-ve	H	H	L
Faunal Processes	S	S	L	H	-ve	H	H	L
Faunal Species	S	S	L	H	-ve	H	H	L

Impacts can be summarised as follows:

- Impacts relating to loss of vegetation and disruption to ecological processes are deemed to be **medium** before mitigation and **low** after mitigation.
- Impacts relating to disturbance and displacement of faunal habitat and faunal species of conservation concern are deemed to be **high** before mitigation, due to confirmed presence of Duthies Golden Mole and **low** after mitigation. The habitat for this species has been excluded from the development plan and must be retained in its current form, which will include retaining the invasive wattle species, which is in contradiction of CARA/NEMA requirements to removal of alien invasive species. Any impact to other faunal species is likely to be temporary during construction and/or will result in displacement of species into nearby suitable habitat which is present.
- Impacts relating to disturbance of flora species of conservation concern located in the site will be **medium** before mitigation and **low** after mitigation.
- All other impacts are assessed to be of **medium** significance before mitigation and can be reduced to **low** with the implementation of the mitigation measures.

The assessment most recent bioregional plan designation

3.3.4 Terrestrial Biodiversity Impact Reversibility

Due to the already transformed nature of the site, Impact Reversibility in areas where there are non-hardened surfaces will be high, but low where hardened surfaces are constructed.

3.3.5 Impacts and Risks to Irreplaceable Biodiversity Resources

The site may have occasional visits from transient faunal species from the adjacent area, although it is unlikely that the proposed development and associated infrastructure would provide a direct or indirect risk to any species or population, specifically as it will not significantly exceed current baseline levels of transformation.

3.3.6 Residual Risks and Uncertainties

No significant additional ancillary linear infrastructure, such as roads, conveyors, power lines, pipelines and railways, which can impact on biodiversity and ecosystem services are expected.

3.4 Findings, Outcomes and Recommendations

3.4.1 Summary of Findings

- The proposed activity intersects within an WC BSP designated CBA 1, and 2 areas associated as per WC BSP 2023.
- The vegetation unit is not under threat (Least Concern); hence the area would not be deemed to be irreplaceable as other habitat is available (i.e. alternative CBA areas are available).
- The habitat on site is significantly degraded and/or transformed and offers limited conservation potential, compounded by the fact that it is adjacent to dense housing area and degradation of the site is likely to persist and potentially increase.
- No flora species of conservation concern under threat were found on site, although limited suitable habitat is present. A flora search and rescue is recommended before commencement.
- Areas scoring an overall **LOW** sensitivity include the portions of the site that are completely transformed or severely degraded, that have a low conservation status, or where there is very dense alien infestation. Loss of these areas will not significantly compromise the current conservation status of the vegetation unit at a regional level, nor is its loss likely to compromise the ecological functioning of surrounding areas. [Low sensitivity areas include transformed areas and high-density alien invaded areas.](#)
- Areas scoring an overall **LOW-MODERATE** sensitivity include the portions of the site that contain secondary vegetation older than 10 years where some ecological functioning has returned but are still not considered to be in a near natural or natural state. [Low-Moderate sensitivity areas include the old lands where some Fynbos regeneration has occurred.](#)
- Areas scoring an overall **MODERATE** sensitivity include the portions of natural vegetation that is mostly intact, but not having specific biodiversity related issues of significance or where proposed activity will have limited overall impact and recovery will be good with minimal intervention. No [Moderate sensitivity areas area designated.](#)
- Areas scoring an overall **HIGH** sensitivity include those areas having intact vegetation and deemed to have a sensitivity, including being within intact Critical Biodiversity Areas and connectivity corridors, or are deemed critical habitat for fauna and/or flora species that are considered to be vulnerable and/or have confirmed presence of species of conservation concern. [High sensitivity terrestrial areas are not identified but do include the ESA designated buffers around the watercourses and some relict natural vegetation around these watercourses.](#)
- Areas scoring an overall **VERY HIGH** sensitivity (No-Go Areas) include areas having a Critically Endangered or Endangered conservation status, or that are irreplaceable in terms of Critical Biodiversity Areas or are critical habitat (refer to [Section 0](#)) for any faunal species that is endangered or critically endangered. [For the purposes of this assessment no specific Very High sensitivity terrestrial areas have been identified \(which would imply irreplaceable habitat\).](#)
- [No-Go areas](#) – include the ESA designated buffers around the watercourses which have been retained as open space in the proposed site development plan.

- Cumulative impacts because of the development of the site, are negligible.
- The site development plan includes an open space corridor to be rehabilitated to accommodate species of conservation concern as well as connectivity to the surrounding landscape. This will also contribute positively to conservation targets.

All impacts are assessed to be of **low significance after mitigation** and specific mitigation measures are outlined in Section 4: Management Programs as well as in the general Environmental Management Plan (Section 9.7: Appendix F: Biodiversity Environmental Management Plan). Impacts are anticipated to be as follows:

- Impacts relating to loss of vegetation and disruption to ecological processes are deemed to be **medium** before mitigation and **low** after mitigation.
- Impacts relating to disturbance and displacement of faunal habitat and faunal species of conservation concern are deemed to be **high** before mitigation, due to confirmed presence of Duthies Golden Mole and **low** after mitigation. The habitat for this species has been excluded from the development plan and must be retained in its current form, which will include retaining the invasive wattle species, which is in contradiction of CARA/NEMA requirements to removal of alien invasive species. Any impact to other faunal species is likely to be temporary during construction and/or will result in displacement of species into nearby suitable habitat which is present.
- Impacts relating to disturbance of flora species of conservation concern located in the site will be **medium** before mitigation and **low** after mitigation
- Impacts relating to disturbance of flora species of conservation concern located in the site will be **medium** before mitigation and **low** after mitigation.
- All other impacts are assessed to be of **medium** significance before mitigation and can be reduced to **low** with the implementation of the mitigation measures.

3.4.2 Recommendations

- It is the conclusion of this terrestrial biodiversity assessment that the proposed mixed-use development can be constructed within acceptable terrestrial biodiversity impact limits providing the recommended mitigation actions are adhered to as well as avoiding the area as designated by the faunal specialist.
- The open space areas designated in the site development plan, which correspond to the designated ESA corridors must be retained. Under normal circumstances, these areas would require removal of alien tree vegetation, however the presence of the Golden Mole in this artificial habitat will require that the alien trees are retained, which may require consent from the relevant authorities. A phased alien clearing plan is recommended within the northern buffer area (suited to fynbos vegetation and not forest-like vegetation), where alien vegetation will be initially removed from the northern watercourse buffer and rehabilitated to forest-like vegetation through the planting of indigenous trees. The densely invaded northern area should then be cleared of alien vegetation in phased manner from the northern boundary towards the watercourse over a period of four to five years, which will allow natural secondary fynbos regeneration and also permit time for the golden mole to migrate to the watercourse, where natural trees and forest-like vegetation will be able to grow. Refer to Section 4.2: Rehabilitation and Landscaping Plan.
- The implementation of the management actions relating to flora and fauna as well erosion and stormwater management and post-construction rehabilitation will minimise biodiversity impacts.

4 Management Programs

Table 8 lists specific mitigation measures that must be implemented and adhered to. These must be considered to be conditions of authorisation.

Table 8: Specific Mitigation Measures and Recommendations

IMPACT	MITIGATION MEASURES
Vegetation	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the site. No clearing outside of footprint to take place. Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from watercourses.
Flora Species	<ul style="list-style-type: none"> A flora search and rescue is <u>recommended before commencement</u>. Respective permits to be obtained beforehand.
Alien Invasive Species	<ul style="list-style-type: none"> Alien trees and weeds must be removed from the site as per CARA/NEMBA requirements, excluding the norther area as determined by the faunal specialist where the alien tree forest will need to be retained to preserve the habitat for the Golden Mole. A suitable weed management strategy to be implemented in construction and operation phases. After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust.
Erosion	<ul style="list-style-type: none"> Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed. Topsoil must be stripped and stockpiled separately and replaced on completion. If natural vegetation re-establishment does not occur, a suitable grass must be applied.
Ecological Processes	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences.
Aquatic and Riparian processes	<ul style="list-style-type: none"> Suitable structures to be constructed at watercourse crossings that do not alter flows. Stormwater discharge into watercourses to be protected against erosion.
Faunal Habitat	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the footprint. It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
Faunal Processes	<ul style="list-style-type: none"> The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of Species of Conservation Concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may

IMPACT	MITIGATION MEASURES
	<p>thus move onto site once construction is underway. A retile handler should be on call for such circumstances.</p> <ul style="list-style-type: none"> • Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented.
Faunal Species	<ul style="list-style-type: none"> • A pre-commencement faunal search and rescue is recommended. • Respective permits to be obtained beforehand. • No animals are to be harmed or killed during the course of operations. • Workers are NOT allowed to snare any faunal species.

4.1 Site Preparation and Vegetation Clearing Plan

The following flora relocation plan is recommended for inclusion in the EMP and Flora removal permit applications:

- A pre-commencement fauna relocation is unlikely to be required but recommended as a precautionary measure. Most faunal species in proximity are likely to vacate the area once earth moving equipment commences clearing and construction, however some species may require manual relocation.
- A pre-commencement flora relocation is unlikely to be required but recommended as a precautionary measure for occasional geophytic species. Seed bearing fynbos material can also be harvested for use in rehabilitation of the open space areas along the watercourses.

4.2 Rehabilitation and Landscaping Plan

The dense wattle and gum infestation on the northern side of the site, between the watercourse and the northern boundary) requires clearing and removal in terms of CARA/NEMBA. There is however a conflict, in that the Golden Mole population is found to occur in the same area. The golden mole is not conducive to relocation, and the wattle/gum creates an artificial habitat. The shallow poor soils in that area are also not suited to establishment of trees or the correct forest-like habitat. Wattle and gum trees are able to grow in shallow poor soils, but the local tree species do not.

In order to accommodate both conflicting biodiversity matters, it is proposed that a process will be implemented in a phased manner where the alien infestation is cleared along the watercourse and suitable trees planted (a mix of fast and slow growing forest species), where conditions are adequate for forest-like habitat to generate. The area to the north of the watercourse will then be cleared in a phased manner from the northern boundary towards the watercourse in the south. It must be done in phases over a period of at least 5 years (which aligns with the proposed project implementation timeline. This slow clearing will create conditions where, over time, the golden mole population is slowly 'herded' towards the watercourse over the 5 year period and by the time the final alien vegetation is cleared (i.e. in year 5), the planted trees along the watercourse will have has some time to create suitable aerial cover and leaf litter on the ground for the golden mole to become established.

4.3 Open Space Management/Conservation Plan

The open space corridor to be managed in perpetuity as a natural corridor and the respective management plans to be applied for the duration of the operational phase.

4.4 Maintenance Management Plan

Ongoing maintenance is likely to be required in the long-term, which could include re-excavation of portions of the site for maintenance/replacement of defective components and leak repair where applicable for services. All measures of this report, including the EMPr should be adhered for any such maintenance requirements. Any excavated areas must be stabilised and rehabilitated as per the measures indicated in this report.

5 Organizational Capacity and Competency

Successful Implementation will be in part be dependent on the organisational capacity and competency of the applicant and any implementing agents. The following aspects are likely to pose risk to the successful mitigation of the project:

- Budget constraints – budget allocated for environmental management tends to be inadequate for construction projects.
- Organisational Structure – implementing agents may or may not have adequate capacity and competency to ensure appropriate and adequate environmental management.

6 Emergency Preparedness and Response

Emergency Preparedness Plan must be included in the EMPr and should address specific measures relating to the following emergency risks:

- Fire management and response
- Spill management and incident response
- Waste management and incident response
- Response to emergency site shutdown, including labour and protest actions.

7 Stakeholder Engagement

Possible Stakeholders relating to Biodiversity could include the following key groups:

- Neighbouring Property Owners
- Local Regional and National Conservation Authorities

No Stakeholder Engagement was conducted specifically by the Specialist. Stakeholder Engagement will be undertaken by the EAP as part of the environment application public participatory process. Any comments raised relating to Biodiversity will be addressed by the specialist in the final report.

8 Monitoring and Review

Key monitoring activities should include the following:

1. Pre-construction
 - a) Ensure flora permits are in place timeously (PNCO only) – allow at least 1 or 2 months before commencement.
 - b) Environmental Awareness and training (EAT) – Ensure all labour are informed and plant operators are aware of risks, issues, dos and don'ts and no-go areas.
2. Bush clearing
 - a) Ensure working plant has no oil or hydraulic leaks.

- b) Check delineated footprints area not exceeded.
 - 3. Construction
 - a) Regular checks on trenches for trapped animals and possible drowning risks
 - b) Regular checks of fences for snares
 - 4. Rehabilitation
 - a) Check quality of topsoil and weed free.
 - b) Check for weed regrowth and manage timeously (before seed is set)
 - 5. Operation monitoring
 - a) Weed management on ongoing basis.
- Erosion to be addressed on ongoing basis

9 Appendices

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9.2 Appendix B: Site Photographic Record











9.3 Appendix C: Flora and Fauna Species Lists

9.3.1 Flora

Marked species were flagged from various database sources as occurring in the region and having an elevated status. All were cross checked for distribution overlay and were actively screened for presence/absence on site.

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
Sensitive species 131		CR (Possibly Extinct)	A very rare and poorly known species, known from only four collections from a small area (EOO <600 km ²) in the southern Cape where it was last collected in the late 1800's. These early collectors gave no specific locality information, nor a description of the habitat the species was found in. Natural vegetation on the coastal lowlands between Knysna and Plettenberg Bay is extensively transformed for coastal development, commercial forestry plantations, agriculture and degraded due to alien invasive plant infestations. Fynbos in the coastal mountain ranges in this area have also been extensively converted to timber plantations, and many areas are densely invaded by alien plants, but some natural areas still remain. Several searches for this species have failed to locate any remaining wild populations, but as the species' preferred habitat is not known, a small chance remains that it may still be rediscovered. According to Goldblatt and Manning (2000), this species occurs on sandy flats, however, at least one specimen is a mixed collection with <i>Cyclopia subternata</i> , a montane species. At least two other collections indicate that they were collected in montane sites. Possibly threatened by habitat loss to development on coastal lowlands, and habitat loss to commercial forestry plantations and alien invasive plants in coastal mountains between Knysna and Plettenberg Bay. Not recorded, unlikely to be present.
<i>Xiphotheca phyllicoides</i>	Fabaceae	CR B1ab(ii,iii)	FFs19
<i>Pterygodium newdigateae</i>	Orchidaceae	CR Possibly Extinct, NEST (M), PNCO	Known only from collections made before 1923. Several searches over many years in the area where it is presumed to have been collected have failed to relocate it in the wild, and it is possibly extinct. South Outeniqua Sandstone Fynbos. Stony slopes near sea level. The population was possibly lost to development or timber plantations, but since

⁹ IUCN - Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Least Concern (LC); End - Endemic; PNCO - Western Cape Provincial Nature Conservation Ordinance; Ex, Exotic/Invasive/Weed; NFA - National Forest Act; ToPS - Threatened or Protected Species.

¹⁰ FFs19 - South Outeniqua Sandstone Fynbos

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
			the precise area of occurrence is unknown, the reason for the disappearance of this species is unknown. Not recorded, unlikely to be present.
<i>Agathosma alaris</i>	Rutaceae	DDD	FFs19
<i>Aspalathus bowieana</i>	Fabaceae	EN B1ab (i,ii,iii, iv, v), NEST (M)	Aspalathus bowieana has an extent of occurrence of 1732 km ² , and an area of occupancy of <550 km ² . There are five known remaining locations, and the population continues to decline due to competition from alien invasive plants and inappropriate fire management. This species occurs in the Outeniqua and Tsitsikamma mountains on the border between the Western and Eastern Cape provinces. This species has already lost nearly 30% of its habitat, mainly to timber plantations on the southern slopes of the Outeniqua and Tsitsikamma Mountains. Remaining subpopulations are threatened by competition from alien invasive plants, as well as inappropriate fire management. Not recorded, unlikely to be present.
<i>Osteospermum pterigoideum</i>	Asteraceae	EN B1ab (ii,iii,v)+2ab(ii,iii,v), NEST (M)	EOO 300 km ² , of six historical locations, four have been lost due to afforestation and crop cultivation. There are only two possibly extant locations remaining, both are threatened by ongoing loss and degradation of habitat due to invasive alien plants. George and Humansdorp. Large areas of this species' habitat has been afforested in the past and it is estimated that at least 50% of subpopulations were lost. Around George, habitat has also been lost to crop cultivation. Remaining subpopulations continue to decline due to competition from alien invasive plants as well as ongoing habitat degradation. Not recorded, unlikely to be present.
<i>Leucospermum glabrum</i>	Proteaceae	EN B1ab (iii,v)c(iv)+2ab(iii,v)c(iv); C2a(i), PNCO, NEST (M)	EOO 1005 km ² , AOO 54 km ² , 14 severely fragmented subpopulations continue to decline due to alien plant invasion, afforestation and fire break maintenance. Fire-related population fluctuations occur in small subpopulations, only three subpopulations have more than 100 plants. Total population is less than 1000 mature individuals. Dormant subpopulations are easily missed in vegetation surveys and EIAs. Wet south slopes in sandstone fynbos. Mature individuals are killed by fires, and only seeds survive. Seeds are released after ripening, and dispersed by ants to their underground nests, where they are protected from predation and fire. It is pollinated by birds. Not recorded, unlikely to be present.
<i>Aspalathus bowieana</i>	Fabaceae	EN B1ab(i,ii,iii, iv, v)	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
<i>Muraltia knysnaensis</i>	Polygalaceae	EN B1ab (ii,iii,iv,v), NEST (M)	EOO 2046 km ² , between three and eight severely fragmented subpopulations remain on remnants of natural habitat after most of this species' habitat has been transformed for crop cultivation, forestry plantations and coastal development around Knysna and Plettenberg Bay. It continues to decline due to ongoing habitat degradation as a result of fire exclusion on small fragments. Coastal lowlands between Mossel Bay and the Keurbooms River. <i>Muraltia knysnaensis</i> is known from only four recent records, and at three locations, plants are threatened by ongoing habitat loss, degradation and fragmentation. One subpopulation of fewer than 10 plants was found in 2009 on the edge of a newly established forestry plantation, and this subpopulation declined to only one plant in 2012 (D. Turner pers. obs. 2012). A fourth small subpopulation of fewer than 10 plants were recorded in a private nature reserve and is not threatened. Coastal fynbos within this species' known range is at least 58% transformed, however, at least four other locations known through historical records intact habitat still remains, and it is likely that other subpopulations still exist. Due to extensive habitat transformation however, subpopulations have become isolated and are considered severely fragmented. Not recorded, unlikely to be present.
<i>Lampranthus pauciflorus</i>	Aizoaceae	EN B1ab (ii,iii,iv,v), PNCO	FFs19
<i>Leucospermum hamatum</i>	Proteaceae	EN B1ac (iv)+2ac(iv), PNCO	FFs19
<i>Erica juniperina</i>	Ericaceae	EN D	FFs19
<i>Linconia alopecuroidea</i>	Bruniaceae	EN D	FFs19
<i>Agathosma planifolia</i>	Rutaceae	LC	FFs19
<i>Andropogon appendiculatus</i>	Poaceae	LC	FFs19
<i>Anginon difforme</i>	Apiaceae	LC	FFs19
<i>Anisodontea scabrosa</i>	Malvaceae	LC	FFs19
<i>Anthochortus ecklonii</i>	Restionaceae	LC	FFs19
<i>Aspalathus angustifolia</i> subsp. <i>angustifolia</i>	Fabaceae	LC	FFs19
<i>Aspalathus ciliaris</i>	Fabaceae	LC	FFs19
<i>Aspalathus rubens</i>	Fabaceae	LC	FFs19
<i>Berzelia intermedia</i>	Bruniaceae	LC	FFs19
<i>Blechnum attenuatum</i>	Blechnaceae	LC	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
<i>Brunia nodiflora</i>	Bruniaceae	LC	FFs19
<i>Caesia contorta</i>	Hemerocallidaceae	LC	FFs19
<i>Cannomois parviflora</i>	Restionaceae	LC	FFs19
<i>Cannomois scirpoides</i>	Restionaceae	LC	FFs19
<i>Cannomois virgata</i>	Restionaceae	LC	FFs19
<i>Capeobolus brevicaulis</i>	Cyperaceae	LC	FFs19
<i>Carpacoce spermacocea</i>	Rubiaceae	LC	FFs19
<i>Cassytha ciliolata</i>	Lauraceae	LC	FFs19
<i>Centella affinis</i>	Apiaceae	LC	FFs19
<i>Centella virgata</i>	Apiaceae	LC	FFs19
<i>Chrysanthemoides monilifera</i>	Asteraceae	LC	FFs19
<i>Chrysitrix capensis</i>	Cyperaceae	LC	FFs19
<i>Cliffortia ilicifolia</i>	Rosaceae	LC	FFs19
<i>Cliffortia stricta</i>	Rosaceae	LC	FFs19
<i>Cyathocoma hexandra</i>	Cyperaceae	LC	FFs19
<i>Dichrocephala integrifolia</i> subsp. <i>integrifolia</i>	Asteraceae	LC	FFs19
<i>Dodonaea viscosa</i> var. <i>angustifolia</i>	Sapindaceae	LC	FFs19
<i>Drosera trinervia</i>	Droseraceae	LC	FFs19
<i>Ehrharta dura</i>	Poaceae	LC	FFs19
<i>Ehrharta rupestris</i> subsp. <i>tricostata</i>	Poaceae	LC	FFs19
<i>Elegia fistulosa</i>	Restionaceae	LC	FFs19
<i>Elegia galpinii</i>	Restionaceae	LC	FFs19
<i>Elegia juncea</i>	Restionaceae	LC	FFs19
<i>Epischoenus adnatus</i>	Cyperaceae	LC	FFs19
<i>Euryops pinnatipartitus</i>	Asteraceae	LC	FFs19
<i>Ficinia gracilis</i>	Cyperaceae	LC	FFs19
<i>Halleria lucida</i>	Scrophulariaceae	LC	FFs19
<i>Helichrysum felinum</i>	Asteraceae	LC	FFs19
<i>Hypodiscus albo-aristatus</i>	Restionaceae	LC	FFs19
<i>Hypodiscus aristatus</i>	Restionaceae	LC	FFs19
<i>Hypodiscus striatus</i>	Restionaceae	LC	FFs19
<i>Hypodiscus synchroolepis</i>	Restionaceae	LC	FFs19
<i>Ischyrolepis gaudichaudiana</i>	Restionaceae	LC	FFs19
<i>Lachnaea diosmoides</i>	Thymelaeaceae	LC	FFs19
<i>Lanaria lanata</i>	Lanariaceae	LC	FFs19
<i>Laurophyllus capensis</i>	Anacardiaceae	LC	FFs19
<i>Linum villosum</i>	Linaceae	LC	FFs19
<i>Liparia hirsuta</i>	Fabaceae	LC	FFs19
<i>Lobelia neglecta</i>	Lobeliaceae	LC	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
<i>Mairia crenata</i>	Asteraceae	LC	FFs19
<i>Mastersiella purpurea</i>	Restionaceae	LC	FFs19
<i>Merxmuellera decora</i>	Poaceae	LC	FFs19
<i>Merxmuellera rufa</i>	Poaceae	LC	FFs19
<i>Metalasia densa</i>	Asteraceae	LC	FFs19
<i>Metalasia trivialis</i>	Asteraceae	LC	FFs19
<i>Osteospermum junceum</i>	Asteraceae	LC	FFs19
<i>Passerina falcifolia</i>	Thymelaeaceae	LC	FFs19
<i>Penaea acutifolia</i>	Penaeaceae	LC	FFs19
<i>Penaea cneorum subsp. cneorum</i>	Penaeaceae	LC	FFs19
<i>Penaea cneorum subsp. gigantea</i>	Penaeaceae	LC	FFs19
<i>Pentameris distichophylla</i>	Poaceae	LC	FFs19
<i>Pentaschistis colorata</i>	Poaceae	LC	FFs19
<i>Pentaschistis malouinensis</i>	Poaceae	LC	FFs19
<i>Pentaschistis pallida</i>	Poaceae	LC	FFs19
<i>Phaenocoma prolifera</i>	Asteraceae	LC	FFs19
<i>Phylica confusa</i>	Rhamnaceae	LC	FFs19
<i>Phylica curvifolia</i>	Rhamnaceae	LC	FFs19
<i>Platycaulos anceps</i>	Restionaceae	LC	FFs19
<i>Platycaulos compressus</i>	Restionaceae	LC	FFs19
<i>Podalyria burchellii</i>	Fabaceae	LC	FFs19
<i>Pseudobaeckea cordata</i>	Bruniaceae	LC	FFs19
<i>Psoralea affinis</i>	Fabaceae	LC	FFs19
<i>Psoralea vlokii</i>	Fabaceae	LC	FFs19
<i>Pteridium aquilinum</i>	Dennstaedtiaceae	LC	FFs19
<i>Pterocelastrus tricuspoidatus</i>	Celastraceae	LC	FFs19
<i>Relhania calycina</i>	Asteraceae	LC	FFs19
<i>Restio fourcadei</i>	Restionaceae	LC	FFs19
<i>Restio strictus</i>	Restionaceae	LC	FFs19
<i>Restio triticeus</i>	Restionaceae	LC	FFs19
<i>Rhodocoma gigantea</i>	Restionaceae	LC	FFs19
<i>Senecio glastifolius</i>	Asteraceae	LC	FFs19
<i>Staberoha aemula</i>	Restionaceae	LC	FFs19
<i>Stoebe alopecuroides</i>	Asteraceae	LC	FFs19
<i>Struthiola eckloniana</i>	Thymelaeaceae	LC	FFs19
<i>Syncarpha paniculata</i>	Asteraceae	LC	FFs19
<i>Tetraria capillacea</i>	Cyperaceae	LC	FFs19
<i>Tetraria fimbriolata</i>	Cyperaceae	LC	FFs19
<i>Tetraria involucreta</i>	Cyperaceae	LC	FFs19
<i>Tetraria microstachys</i>	Cyperaceae	LC	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
<i>Tetraria sylvatica</i>	Cyperaceae	LC	FFs19
<i>Tetraria thermalis</i>	Cyperaceae	LC	FFs19
<i>Tetraria ustulata</i>	Cyperaceae	LC	FFs19
<i>Thamnochortus cinereus</i>	Restionaceae	LC	FFs19
<i>Themeda triandra</i>	Poaceae	LC	FFs19
<i>Thesium virgatum</i>	Santalaceae	LC	FFs19
<i>Ursinia scariosa</i> subsp. <i>scariosa</i>	Asteraceae	LC	FFs19
<i>Ursinia trifida</i>	Asteraceae	LC	FFs19
<i>Widdringtonia nodiflora</i>	Cupressaceae	LC	FFs19
<i>Willdenowia teres</i>	Restionaceae	LC	FFs19
<i>Erica cordata</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica deflexa</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica densifolia</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica discolor</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica formosa</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica fuscescens</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica glomiflora</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica gracilis</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica hispidula</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica lanata</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica lehmannii</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica nabea</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica priorii</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica similis</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica simulans</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica sparsa</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica triceps</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica uberiflora</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica unicolor</i>	Ericaceae	LC, PNCO	FFs19
<i>Erica versicolor</i>	Ericaceae	LC, PNCO	FFs19
<i>Geissorhiza bracteata</i>	Iridaceae	LC, PNCO	FFs19
<i>Geissorhiza fourcadei</i>	Iridaceae	LC, PNCO	FFs19
<i>Geissorhiza inconspicua</i>	Iridaceae	LC, PNCO	FFs19
<i>Leucadendron comosum</i> subsp. <i>comosum</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron ericifolium</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron eucalyptifolium</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron salignum</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucadendron spissifolium</i> subsp. <i>fragrans</i>	Proteaceae	LC, PNCO	FFs19

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
<i>Leucospermum cuneiforme</i>	Proteaceae	LC, PNCO	FFs19
<i>Leucospermum wittebergense</i>	Proteaceae	LC, PNCO	FFs19
<i>Mimetes cucullatus</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea cynaroides</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea lorifolia</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea mundii</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea neriifolia</i>	Proteaceae	LC, PNCO	FFs19
<i>Protea repens</i>	Proteaceae	LC, PNCO	FFs19
<i>Romulea fibrosa</i>	Iridaceae	LC, PNCO	FFs19
<i>Tritoniopsis caffra</i>	Iridaceae	LC, PNCO	FFs19
<i>Watsonia fourcadei</i>	Iridaceae	LC, PNCO	FFs19
<i>Tetraria cuspidata</i>	Cyperaceae	NE	FFs19
<i>Leucadendron conicum</i>	Proteaceae	NT A4c, PNCO	FFs19
<i>Acmadenia maculata</i>	Rutaceae	NT B1ab (ii,iii,iv,v)	FFs19
<i>Prismatocarpus rogersii</i>	Campanulaceae	NT B1ab(iii)	FFs19
<i>Acmadenia tetragona</i>	Rutaceae	NT B1ab(iii)+2a b(iii)	FFs19
<i>Leucadendron uliginosum</i> subsp. <i>uliginosum</i>	Proteaceae	NT B1ab (iii)+2ab(iii)	FFs19
<i>Geissorhiza outeniquensis</i>	Iridaceae	NT D2, PNCO	FFs19
<i>Leucadendron olens</i>	Proteaceae	NT D2, PNCO	FFs19
<i>Otholobium carneum</i>	Fabaceae	Rare	FFs19
<i>Ursinia coronopifolia</i>	Asteraceae	Rare	FFs19
<i>Aspalathus digitifolia</i>	Fabaceae	VU A2c; D2	FFs19
<i>Mimetes pauciflorus</i>	Proteaceae	VU A2c+3c+4c, NEST (M)	
<i>Mimetes pauciflorus</i>	Proteaceae	VU A2c+3c+4c	FFs19, A past population reduction of at least >30% is estimated based habitat loss to forestry plantations. Land transformation models (Bomhard et al. 2005) predict a further 50% habitat loss by 2025. However, forestry is in decline in the area and therefore future habitat loss projected by models is probably an overestimate. Generation length is 20 years. Outeniqua and Tsitsikamma Mountains. Tsitsikamma Sandstone Fynbos, South Outeniqua Sandstone Fynbos Moist south-facing slopes in sandstone fynbos, 450-1400 m. Mature individuals are killed by fires, and only seeds survive. Seeds are released after ripening, and dispersed by ants to their underground nests, where they are protected from predation and fire. It is

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
			pollinated by birds. Not recorded, unlikely to be present.
<i>Erica glumiflora</i>	Ericaceae	VU B1ab (i,ii,iii,iv,v), NEST (M)	EOO <6740 km ² , known from six locations. Although it is conserved in four nature reserves, these are all within the western portion of the range. In the eastern part of the range, coastal development and alien plant invasion are causing continuing declines to subpopulations. Wilderness to East London, and extending inland around Grahamstown. Sandy coastal flats and dunes and low coastal hills. Not recorded, unlikely to be present.
<i>Pterygodium cleistogamum</i>	Orchidaceae	VU B1ab (ii,iii), NEST (M), PNCO	EOO 5950 km ² , known from 10 locations, but only seen at three recently. Experiencing ongoing habitat loss due to coastal development. Declining along the coast due to habitat destruction, mainly as a result of coastal development (A. Pauw, pers. comm. 2005). Not recorded, unlikely to be present.
<i>Acmadenia alternifolia</i>	Rutaceae	VU B1ab (ii,iii,iv)+2ab (ii,iii,iv), NEST (M)	EOO 466 km ² , between five and nine locations and declining due to loss of habitat to housing development, invasive alien plants and too frequent fire. Knysna to Plettenberg Bay, possibly extending as far as Nature's Valley. Forestry is a past threat around Harkerville. The subpopulation above Stevens Bank in the Harkerville forestry area has declined due to disturbance (quarrying) of the headland. Coastal development is a severe ongoing threat around Plettenberg Bay, especially in the area east of the Keurbooms River. Invasive alien plants are an ongoing threat throughout this species' range. There has been past population decline due to habitat loss to plantations and urban development. Two of the 11 recorded subpopulations have been lost and the existence of four is uncertain. Data for four subpopulations show that most are small (10-50 mature individuals) while one subpopulation has >1000 individuals. Not recorded, unlikely to be present.
<i>Erica glandulosa</i> subsp. <i>fourcadei</i>	Ericaceae	VU B1ab (ii,iii,iv,v), NEST (M)	EOO 5225 km ² , between eight and 12 severely fragmented subpopulations confined to a narrow coastal area continue to decline due to ongoing habitat loss, degradation and fragmentation as a result of coastal development, forestry plantations, lack of fire and competition from alien invasive plants. Mossel Bay to Cape St Francis. This species' coastal habitat is already >36% transformed, predominantly due to coastal development, agriculture and forestry plantations. In addition, large sections are densely invaded by alien invasive plants. In some areas, due to the exclusion of fires from small fragments, this species' habitat is changing from open coastal fynbos to dense thicket.

SCIENTIFIC NAME	FAMILY	STATUS ⁹	COMMENT/PRESENCE ¹⁰
			Population This taxon is restricted to highly transformed and fragmented coastal lowlands. Many recent records indicate that this species is more common than previously estimated (occurring at between 10 and 20 locations), however, except for the area between Sedgefield and Knysna, where this species is still quite common, particularly in the Goukamma Nature Reserve, all other subpopulations are isolated due to habitat loss and fragmentation. Not recorded, unlikely to be present.
<i>Acmadenia gracilis</i>	Rutaceae	VU B1ab (ii,iii,v)+2ab(ii,iii,v)	FFs19
<i>Erica inconstans</i>	Ericaceae	VU B1ab (ii,iii,v)+2ab(ii,iii,v)	FFs19
<i>Erica aneimensa</i>	Ericaceae	VU B1ab (iii)+2ab(iii), PNCO	FFs19
<i>Podalyria sericea</i>	Fabaceae	VU C2a(i)	FFs19
<i>Erica velatiflora</i>	Ericaceae	VU D1+2, PNCO	FFs19
<i>Acmadenia rupicola</i>	Rutaceae	VU D2	FFs19
<i>Amphithalea flava</i>	Fabaceae	VU D2	FFs19
<i>Erica outeniquae</i>	Ericaceae	VU D2	FFs19
<i>Zyrphelis outeniquae</i>	Asteraceae	VU D2	FFs19
<i>Erica gillii</i>	Ericaceae	VU D2, PNCO	FFs19

9.3.2 Fauna

Marked species were flagged from various database sources as occurring in the region and having an elevated status. All were cross checked for distribution overlay and were actively screened for presence/absence on site.

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
MAMMALS			
<i>Acomys (Subacomys) subspinosus</i>	Cape Spiny Mouse	LC	
<i>Amblysomus corriae</i>	Fynbos Golden Mole	NT	
<i>Aonyx capensis</i>	African Clawless Otter	NT	
<i>Atilax paludinosus</i>	Marsh Mongoose	LC	
<i>Bathyergus suillus</i>	Cape Dune Mole-rat	LC	
<i>Canis mesomelas</i>	Black-backed Jackal	LC	
<i>Caracal caracal</i>	Caracal	LC	
<i>Chlorocebus pygerythrus</i>	Vervet Monkey	LC	

¹¹ IUCN - Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Least Concern (LC); End - Endemic; PNCO - Western Cape Provincial Nature Conservation Ordinance; Ex, Exotic/Invasive/Weed; NFA - National Forest Act; ToPS - Threatened or Protected Species.

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Chlorocebus pygerythrus pygerythrus</i>	Vervet Monkey (subspecies <i>pygerythrus</i>)	LC	
<i>Chlorotalpa duthieae</i>	Duthies Golden Mole	VU, NEST (M)	The species is known from only nine locations in southern Cape Afrotemperate Forests, clustered in two subpopulations: an eastern subpopulation in the suburban parts of Port Elizabeth (three locations); and a western subpopulation in the indigenous coastal forest belt from Wilderness to Tsitsikamma (six locations). Suitable forest habitat is not present; however, it was confirmed to be present in the alien invaded area at the north end of the property. Refer to separate Faunal Assessment.
<i>Crocidura flavescens</i>	Greater Red Musk Shrew	LC	
<i>Cryptomys hottentotus</i>	Southern African Mole-rat	LC	
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	
<i>Dendromus mesomelas</i>	Brants's African Climbing Mouse	LC	
<i>Dendromus mystacalis</i>	Chestnut African Climbing Mouse	LC	
<i>Epomophorus wahlbergi</i>	Wahlberg's Epauletted Fruit Bat	LC	
<i>Felis silvestris</i>	Wildcat	LC	
<i>Genetta genetta</i>	Common Genet	LC	
<i>Genetta tigrina</i>	Cape Genet (Cape Large-spotted Genet)	LC	
<i>Georchus capensis</i>	Cape Mole-rat	LC	
<i>Gerbilliscus afra</i>	Cape Gerbil	LC	
<i>Graphiurus (Graphiurus) murinus</i>	Forest African Dormouse	LC	
<i>Herpestes ichneumon</i>	Egyptian Mongoose	LC	
<i>Herpestes pulverulentus</i>	Cape Gray Mongoose	LC	
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	
<i>Ictonyx striatus</i>	Striped Polecat	LC	
<i>Kerivoula lanosa</i>	Lesser Woolly Bat	LC	
<i>Leptailurus serval</i>	Serval	NT	
<i>Lepus saxatilis</i>	Scrub Hare	LC	
<i>Mastomys natalensis</i>	Natal Mastomys	LC	
<i>Mastomys sp.</i>	Multimammate Mice		
<i>Megaptera novaeangliae</i>	Humpback Whale	LC	
<i>Mellivora capensis</i>	Honey Badger	LC	
<i>Miniopterus fraterculus</i>	Lesser Long-fingered Bat	LC	
<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	LC	
<i>Miniopterus schreibersii</i>	Schreibers's Long-fingered Bat	NT	
<i>Mus (Nannomys) minutoides</i>	Southern African Pygmy Mouse	LC	
<i>Myomyscus verreauxi</i>	Verreaux's Mouse	LC	

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Myomyscus verreauxii</i>	Verreaux's White-footed Rat	LC	
<i>Myosorex longicaudatus</i>	Long-tailed Forest Shrew	EN	
<i>Myosorex varius</i>	Forest Shrew	LC	
<i>Neoromicia capensis</i>	Cape Serotine	LC	
<i>Otocyon megalotis</i>	Bat-eared Fox	LC	
<i>Otomys irroratus</i>	Southern African Vlei Rat (Fynbos type)	LC	
<i>Panthera pardus</i>	Leopard	VU	
<i>Papio ursinus</i>	Chacma Baboon	LC	
<i>Pipistrellus melckorum</i>	Melcks' Serotine		
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	
<i>Potamochoerus porcus</i>	Red River Hog		
<i>Procavia capensis capensis</i>	Cape Rock Hyrax	LC	
<i>Raphicerus melanotis</i>	Cape Grysbok	LC	
<i>Rattus norvegicus</i>	Brown Rat	LC	
<i>Rattus rattus</i>	Roof Rat	LC	
<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	LC	
<i>Rhinolophus capensis</i>	Cape Horseshoe Bat	LC	
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC	
<i>Rousettus (Rousettus) aegyptiacus</i>	Egyptian Rousette	LC	
Sensitive species 8		NEST (M), VU	This is a widespread and abundant species with total population numbers estimated at more than seven million. Its ability to withstand hunting pressure and habitat degradation enable it to adapt to increasing human colonization of its forest habitats, although even this abundant, highly resilient species is suffering some decline in its distribution as human populations continue to grow and expand and rates of harvest are known to be increasing. May be a transient visitor but preferred forest habitat is not present.
<i>Tragelaphus scriptus</i>	Bushbuck	LC	
BIRDS¹²			
<i>Actitis hypoleucos</i>	Common Sandpiper		
<i>Alcedo cristata</i>	Malachite Kingfisher		
<i>Alopochen aegyptiaca</i>	Egyptian Goose	LC	
<i>Amaurornis flavirostris</i>	Black Crake		
<i>Anas capensis</i>	Cape Teal		
<i>Anas erythrorhyncha</i>	Red-billed Teal (Duck)		
<i>Anas smithii</i>	Cape Shoveler		
<i>Anas undulata</i>	Yellow-billed Duck		

¹² BLSA – Birdlife South Africa

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Andropadus importunus</i>	Sombre Greenbul (Bulbul)		
<i>Anhinga rufa</i>	African Darter		
<i>Anthreptes [Hedydipna] collaris</i>	Collared Sunbird		
<i>Anthropoides paradiseus</i>	Blue Crane	Global: VU; BLSA: NT	
<i>Apalis thoracica</i>	Bar-throated Apalis		
<i>Aplopelia larvata</i>	Lemon (Cinnamon) Dove		
<i>Apus barbatus</i>	African Black (Black) Swift		
<i>Aquila pennatus</i>	Booted Eagle		
<i>Ardea cinerea</i>	Grey Heron		
<i>Ardea melanocephala</i>	Black-headed Heron		
<i>Ardea purpurea</i>	Purple Heron		
<i>Batis capensis</i>	Cape Batis		
<i>Bostrychia hagedash</i>	Hadedda Ibis		
<i>Bradornis (Malaenornis) pammelaina</i>	Southern Black-Flycatcher		
<i>Bradypterus sylvaticus</i>	Knysna Warbler	VU, NEST (H, M)	May be a transient visitor
<i>Bubo africanus</i>	Spotted Eagle-Owl		
<i>Bubulcus ibis</i>	Cattle Egret		
<i>Burhinus capensis</i>	Spotted Thick-knee (Dikkop)		
<i>Burhinus vermiculatus</i>	Water Thick-knee (Dikkop)		
<i>Buteo [augur] rufofuscus</i>	Jackal Buzzard		
<i>Buteo buteo</i>	Steppe (Common) Buzzard		
<i>Buteo trizonatus</i>	Forest Buzzard	NT	
<i>Calidris ferruginea</i>	Curlew Sandpiper	LC	
<i>Calidris minuta</i>	Little Stint		
<i>Campethera notata</i>	Knysna Woodpecker	NT	
<i>Centropus burchellii</i>	Burchell's Coucal (split)		
<i>Ceryle rudis</i>	Pied Kingfisher		
<i>Charadrius pecuarius</i>	Kittlitz's Plover		
<i>Chrysococcyx caprius</i>	Dideric (Diederik) Cuckoo		
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo		
<i>Circus ranivorus</i>	African Marsh Harrier	EN, NEST (H)	May be a transient visitor
<i>Cisticola fulvicapillus [fulvicapilla]</i>	Neddicky (Piping Cisticola)		
<i>Cisticola tinniens</i>	Levaillant's (Tinkling) Cisticola		
<i>Colius colius</i>	White-backed Mousebird		
<i>Colius striatus</i>	Speckled Mousebird		
<i>Columba arquatrix</i>	African Olive- (Rameron) Pigeon		
<i>Columba guinea</i>	Speckled (Rock) Pigeon		
<i>Columba livia</i>	Rock (Feral) Dove (Pigeon)		
<i>Coracias garrulus</i>	European Roller	NT	
<i>Corvus albicollis</i>	White-necked Raven		

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Corvus capensis</i>	Cape (Black) Crow		
<i>Cossypha caffra</i>	Cape Robin-chat		
<i>Cossypha dichroa</i>	Chorister Robin-Chat		
<i>Coturnix coturnix [africana]</i>	Common Quail		
<i>Cuculus clamosus</i>	Black Cuckoo		
<i>Cygnus atratus</i>	Black Swan		
<i>Dendrocygna bicolor</i>	Fulvous (Whistling) Duck		
<i>Dendropicos griseocephalus</i>	Olive Woodpecker		
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo		
<i>Egretta alba</i>	Great Egret		
<i>Egretta garzetta</i>	Little Egret		
<i>Elanus caeruleus</i>	Black-shouldered (Winged) Kite		
<i>Estrilda [Coccyptia] melanotis</i>	Swee (Black-faced) Waxbill (Swee)		
<i>Estrilda astrild</i>	Common Waxbill		
<i>Euplectes capensis</i>	Yellow (Yellow-rumped) Bishop (Widow)		
<i>Euplectes orix</i>	Southern Red (Red) Bishop		
<i>Falco amurensis</i>	Amur (Eastern Red-footed) Falcon (Kestrel)		
<i>Falco concolor</i>	Sooty Falcon	Global: NT; BLSA: NA	
<i>Gallinago nigripennis</i>	African (Ethiopian) Snipe		
<i>Gallinula chloropus</i>	Common Moorhen		
<i>Geocolaptes olivaceus</i>	Ground Woodpecker		
<i>Haliaeetus vocifer</i>	African Fish-Eagle		
<i>Himantopus himantopus</i>	Black-winged Stilt		
<i>Hirundo albigularis</i>	White-throated Swallow		
<i>Hirundo cucullata</i>	Greater Striped-Swallow		
<i>Hirundo rustica</i>	Barn (European) Swallow		
<i>Indicator variegatus</i>	Scaly-throated Honeyguide		
<i>Laniarius ferrugineus</i>	Southern Boubou		
<i>Lanius collaris</i>	Southern Fiscal		
<i>Limosa lapponica</i>	Bar-tailed Godwit	LC	
<i>Lophaetus occipitalis</i>	Long-crested Eagle		
<i>Lybius torquatus</i>	Black-collared Barbet		
<i>Macronectes giganteus</i>	Southern Giant-Petrel	NT	
<i>Macronyx capensis</i>	Cape (Orange-throated) Longclaw		
<i>Megaceryle maxima (H. maximus)</i>	Giant Kingfisher		
<i>Melierax canorus</i>	Southern Pale Chanting Goshawk		
<i>Monticola rupestris</i>	Cape Rock-thrush		
<i>Motacilla aguimp</i>	African Pied Wagtail		
<i>Motacilla capensis</i>	Cape Wagtail		
<i>Muscicapa adusta</i>	African Dusky Flycatcher		

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Muscicapa striata</i>	Spotted Flycatcher		
<i>Nectarinia [Anthobaphes] violacea</i>	Orange-breasted Sunbird		
<i>Nectarinia [Chalcomitra] amethystina</i>	Amethyst (Black) Sunbird		
<i>Nectarinia [Cinnyris] afra</i>	Greater Double-collared Sunbird		
<i>Nectarinia [Cinnyris] chalybea [chalybeus]</i>	Southern Double-collared Sunbird		
<i>Nectarinia [Cinnyris] famosa</i>	Malachite Sunbird		
<i>Nectarinia [Cinnyris] veroxii</i>	Grey (Mouse-coloured) Sunbird		
<i>Neotis denhami</i>	Denham's Bustard	VU, NEST (H, M), VU	May be a transient visitor
<i>Numenius arquata</i>	Eurasian (Curlew) Curlew	NT	
<i>Numenius phaeopus</i>	Common (Whimbrel) Whimbrel		
<i>Numida meleagris</i>	Helmeted Guineafowl		
<i>Onychognathus morio</i>	Red-winged Starling		
<i>Oriolus larvatus</i>	Black-headed (Eastern) Oriole		
<i>Pandion haliaetus</i>	Osprey		
<i>Passer diffusus</i>	Southern Greyheaded Sparrow (split)		
<i>Passer domesticus</i>	House Sparrow		
<i>Phalacrocorax africanus</i>	Reed (Long-tailed) Cormorant		
<i>Phalacrocorax capensis</i>	Cape Cormorant	EN	
<i>Phalacrocorax lucidus</i>	White-breasted (Great) Cormorant		
<i>Philomachus pugnax</i>	Ruff		
<i>Phoenicopterus roseus</i>	Greater Flamingo	NT	
<i>Phoeniculus purpureus</i>	Green (Red-billed) Wood-hoopoe		
<i>Phyllastrephus terrestris</i>	Terrestrial Brownbul (Bulbul)		
<i>Plectropterus gambensis</i>	Spur-winged Goose		
<i>Plegadis falcinellus</i>	Glossy Ibis		
<i>Ploceus capensis</i>	Cape Weaver		
<i>Polyboroides typus</i>	African Harrier-Hawk (Gymnogene)		
<i>Porphyrio madagascariensis</i>	African Purple (Purple) Swampphen (Gallinule)		
<i>Prinia maculosa</i>	Karoo Prinia (split)		
<i>Procellaria aequinoctialis</i>	White-chinned Petrel (split)	VU	
<i>Prodotiscus regulus</i>	Brown-backed (Sharp-billed) Honeybird (Honeyguide)		
<i>Psalidoprocne holomelas/pristoptera</i>	Black Saw-wing		
<i>Pseudochloroptila (Serinus) totta</i>	Cape Siskin		

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Pternistis afer</i>	Red-necked Spurfowl (Francolin)		
<i>Pycnonotus capensis</i>	Cape Bulbul		
<i>Rallus caerulescens</i>	African Rail		
<i>Recurvirostra avosetta</i>	Pied (Avocet) Avocet		
<i>Riparia paludicola</i>	Brown-throated (Plain) Martin		
<i>Saxicola torquata</i>	African (Common) Stonechat		
<i>Serinus albogularis</i>	White-throated Canary		
<i>Serinus canicollis</i>	Cape (Yellow-crowned) Canary		
<i>Serinus gularis</i>	Streaky-headed Seedeater (Canary)		
<i>Serinus scotops</i>	Forest Canary		
<i>Serinus sulphuratus</i>	Brimstone (Bully) Canary		
<i>Sigelus silens</i>	Fiscal Flycatcher		
<i>Sphenoeacus afer</i>	Cape Grassbird		
<i>Streptopelia capicola</i>	Cape Turtle (Ring-necked) Dove		
<i>Streptopelia semitorquata</i>	Red-eyed Dove		
<i>Streptopelia turtur</i>	European Turtle-Dove	Global: VU; BLSA: NA	
<i>Sturnus vulgaris</i>	Common (European) Starling		
<i>Tachybaptus ruficollis</i>	Little Grebe (Dabchick)		
<i>Tauraco corythaix</i>	Knysna Turaco (split)		
<i>Thalassornis leuconotus</i>	White-backed Duck		
<i>Threskiornis aethiopicus</i>	African Sacred (Sacred) Ibis		
<i>Tringa glareola</i>	Wood Sandpiper		
<i>Tringa nebularia</i>	Common Greenshank		
<i>Tringa stagnatilis</i>	Marsh Sandpiper		
<i>Trochocercus cyanomelas</i>	Blue-mantled Crested-Flycatcher		
<i>Turdus olivaceus</i>	Olive Thrush (split)		
<i>Upupa africana</i>	African Hoopoe		
<i>Vidua macroura</i>	Pin-tailed Whydah		
<i>Zosterops virens</i>	Cape White-eye (split)	LC	
REPTILES			
<i>Acontias meleagris</i>	Cape Legless Skink	LC	
<i>Afrogecko porphyreus</i>	Marbled Leaf-toed Gecko	LC	
<i>Agama atra</i>	Southern Rock Agama	LC	
<i>Amplorhinus multimaculatus</i>	Many-spotted Snake	LC	
<i>Bitis arietans arietans</i>	Puff Adder	LC	
<i>Boaedon capensis</i>	Brown House Snake	LC	
<i>Bradypodion damaranum</i>	Knysna Dwarf Chameleon	LC	
<i>Caretta caretta</i>	Loggerhead Turtle	VU	
<i>Causus rhombeatus</i>	Rhombic Night Adder	LC	

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
<i>Chamaesaura anguina anguina</i>	Cape Grass Lizard	LC	
<i>Chersina angulata</i>	Angulate Tortoise	LC	
<i>Cordylus cordylus</i>	Cape Girdled Lizard	LC	
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	LC	
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	
<i>Dispholidus typus typus</i>	Boomslang	LC	
<i>Duberria lutrix lutrix</i>	South African Slug-eater	LC	
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	LC	
<i>Homopus areolatus</i>	Parrot-beaked Tortoise	LC	
<i>Homoroselaps lacteus</i>	Spotted Harlequin Snake	LC	
<i>Hydrophis platurus</i>	Yellow-bellied Sea Snake	LC	
<i>Lamprophis aurora</i>	Aurora House Snake	LC	
<i>Lamprophis guttatus</i>	Spotted House Snake	LC	
<i>Lycodonomorphus inornatus</i>	Olive House Snake	LC	
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	LC	
<i>Ninurta coeruleopunctatus</i>	Blue-spotted Girdled Lizard	LC	
<i>Nucras lalandii</i>	Delalande's Sandveld Lizard	LC	
<i>Pachydactylus geitje</i>	Ocellated Gecko	LC	
<i>Pedioplanis lineocellata pulchella</i>	Common Sand Lizard	LC	
<i>Pelomedusa galeata</i>	South African Marsh Terrapin	Not evaluated	
<i>Philothamnus hoplogaster</i>	South Eastern Green Snake	LC	
<i>Philothamnus occidentalis</i>	Western Natal Green Snake	LC	
<i>Psammophis crucifer</i>	Cross-marked Grass Snake	LC	
<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	LC	
<i>Pseudaspis cana</i>	Mole Snake	LC	
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	LC	
<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	
<i>Tetradactylus seps</i>	Short-legged Seps	LC	
<i>Trachylepis homalocephala</i>	Red-sided Skink	LC	
<i>Tropidosaura gularis</i>	Cape Mountain Lizard	LC	
<i>Varanus albigularis albigularis</i>	Rock Monitor	LC	
AMPHIBIANS			
<i>Afrixalus knysnae</i>	Knysna Banana Frog or Knysna Leaf-folding Frog	EN, NEST (M)	Listed as Endangered, in view of its extent of occurrence being 816 km ² , the area of occupancy being 27 km ² , with all individuals in five locations, and a continuing decline in the quality of its habitat, area of occupancy, and number of mature individuals. his species is known from around five locations at low altitudes, on either side of the border between the Eastern Cape and Western Cape Provinces in South Africa. It lives in a

SCIENTIFIC NAME	COMMON NAME	STATUS ¹¹	COMMENT/PRESENCE
			coastal mosaic of vegetation types, including mountain fynbos heathland and forest. It breeds in small dams and shallow semi-permanent water with much emergent vegetation, and even in well vegetated ornamental garden ponds. It is suspected that this species requires high water quality for breeding. Species in this genus deposit between 20 and 50 eggs on vegetation above water, folded in a grass leaf. Tadpoles emerge, drop into the water and remain there until metamorphosis. May be present in streams but unlikely preferred habitat due to degradation and alien infestation.
<i>Amietia delalandii</i>	Delalande's River Frog	LC	
<i>Amietia fuscigula</i>	Cape River Frog	LC	
<i>Breviceps fuscus</i>	Plain Rain Frog	LC	
<i>Cacosternum boettgeri</i>	Common Caco	LC	
<i>Cacosternum nanum</i>	Bronze Caco	LC	
<i>Heleophryne regis</i>	Southern Ghost Frog	LC	
<i>Hyperolius horstockii</i>	Arum Lily Frog	LC	
<i>Hyperolius marmoratus</i>	Painted Reed Frog	LC	
<i>Sclerophrys capensis</i>	Raucous Toad	LC	
<i>Sclerophrys pardalis</i>	Eastern Leopard Toad	LC	
<i>Semnodactylus wealii</i>	Rattling Frog	LC	
<i>Strongylopus bonaespei</i>	Banded Stream Frog	LC	
<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC	
<i>Strongylopus grayii</i>	Clicking Stream Frog	LC	
<i>Tomopterna delalandii</i>	Cape Sand Frog	LC	
<i>Xenopus laevis</i>	Common Platanna	LC	
INVERTEBRATES			
<i>Aloeides thyra orientis</i>	Eastern Red Copper	EN, NEST (M)	no known populations in vicinity. Preferred host plants not abundant in area and historical cultivation likely makes habitat unsuitable.
<i>Aneuryphymus montanus</i>	Yellow-winged Agile Grasshopper	VU, NEST (M)	Unlikely to be present due to historical cultivation and degradation.

9.4 Appendix D: Systematic Planning Frameworks

9.4.1 Vegetation of Southern Africa

A general description of the vegetation units is provided below (as per Mucina & Rutherford, 2006, as amended) as a reference point for the baseline vegetation composition.

South Outeniqua Sandstone Fynbos (FFs 19)

VT 4 Knysna Forest (80%), VT 70 False Macchia (18%) (Acocks 1953). Wet Mountain Fynbos (48%), Mesic Mountain Fynbos (32%) (Moll & Bossi 1983). LR 64 Mountain Fynbos (78%) (Low & Rebelo 1996). BHU 69 Outeniqua Mountain Fynbos Complex (54%), BHU 71 Tsitsikamma Mountain Fynbos Complex (23%), BHU 100 Knysna Afromontane Forest (17%) (Cowling et al. 1999b, Cowling & Heijnis 2001).

Distribution Western Cape Province: Southern slopes of the Outeniqua Mountains from the Cloetesberg northeast of Albertinia in the west to the upper reaches of the Keurbooms River where it borders on FFs 20 Tsitsikamma Sandstone Fynbos. It includes sandstone outcrops on the lowlands from the vicinity of the Goukamma River near Knysna in the west and Komkromma Point near Nature's Valley in the east. Altitude from the coast to 1 579 m on Cradock's Berg north of George.

Vegetation & Landscape Features Gentle to steep south-facing slopes, over a 160 km long area, relatively broad with some moderately sloping intramontane valleys in the west where it is over 10 km wide. The dominant vegetation is a tall, open to medium dense shrubland with medium dense, medium tall shrub understorey—mainly proteoid and restioid fynbos, with extensive ericaceous fynbos on the upper slopes. Some grassy fynbos at lower altitudes, and scrub fynbos in riverine areas. Patches of this unit are not confined to south-facing slopes, but are found on all slopes south of the highest peaks in the range. Thus, there are extensive northern slopes in some intramontane valley systems, the most significant of those found in the Doring River Wilderness Area.

Geology & Soils Acidic lithosol soils derived from Ordovician sandstones of the Table Mountain Group (Cape Supergroup). Land types mainly Ib, Gb and Fa.

Climate MAP 360–1 170 mm (mean: 785 mm), with a slight bimodal winter and a low in December. Mean daily maximum and minimum temperatures 27.8°C and 4.8°C for January and July, respectively. Frost incidence 2–10 days per year. See also climate diagram for FFs 19 South Outeniqua Sandstone Fynbos (Figure 4.21).

Important Taxa (^TCape thickets, ^WWetlands) Small Tree: *Widdringtonia nodiflora*. Tall Shrubs: *Chrysanthemoides monilifera* (d), *Laurophyllus capensis*^T (d), *Leucadendron conicum* (d), *L. eucalyptifolium* (d), *L. uliginosum* subsp. *uliginosum* (d), *Metalasia densa* (d), *Protea neriifolia* (d), *P. repens* (d), *Anginon difforme*, *Dodonaea viscosa* var. *angustifolia*, *Halleria lucida*^T, *Leucospermum glabrum*, *Liparia hirsuta*, *Metalasia trivialis*, *Mimetes pauciflorus*, *Osteospermum junceum*, *Passerina falcifolia*, *Podalyria burchellii*, *P. sericea*, *Protea mundii*, *Psoralea affinis*, *Pterocelastrus tricuspidatus*^T. Low Shrubs: *Berzelia intermedia* (d), *Brunia nodiflora* (d), *Erica cordata* (d), *E. densifolia* (d), *E. glomiflora* (d), *E. triceps* (d), *E. uberiflora* (d), *Leucadendron ericifolium* (d), *Penaea cneorum* subsp. *cneorum* (d), *P. cneorum* subsp. *gigantea* (d), *Acmadenia maculata*, *A. tetragona*, *Anisodonteia scabrosa*, *Aspalathus angustifolia* subsp. *angustifolia*, *A. ciliaris*, *A. rubens*, *Cliffortia ilicifolia*, *C. stricta*, *Erica deflexa*, *E. discolor* variant 'speciosa', *E. formosa*, *E. fuscescens*, *E. gracilis*, *E. hispidula*, *E. lanata*, *E. nabea*, *E. similis*, *E. simulans*, *E. sparsa*, *E. versicolor*, *Euryops pinnatipartitus*, *Lachnaea diosmoides*, *Leucadendron comosum* subsp. *comosum*, *L. salignum*, *L. spissifolium* subsp. *fragrans*, *Leucospermum cuneiforme*, *L. wittebergense*, *Linconia alopecuroidea*, *Lobelia neglecta*, *Mimetes cucullatus*, *Otholobium carneum*, *Phaenocoma prolifera*, *Phylica confusa*, *Protea cynaroides*, *P. lorifolia*, *Pseudobaeckea cordata*, *Relhania calycina*, *Senecio glastifolius*, *Stoebe alopecuroides*, *Struthiola eckloniana*, *Syncarpha paniculata*, *Ursinia coronopifolia*, *U. scariosa* subsp. *scariosa*, *U. trifida*. Semiparasitic Shrub: *Thesium virgatum*. Herbs: *Carpacoce spermacocea*, *Centella affinis*, *C. virgata*, *Dichrocephala integrifolia* subsp. *integrifolia*, *Helichrysum felinum*, *Mairia crenata*. Geophytic Herbs: *Pteridium aquilinum* (d), *Blechnum attenuatum*, *Caesia contorta*, *Geissorhiza bracteata*, *G. fourcadei*, *G. inconspicua*, *Lanaria lanata*, *Romulea fibrosa*, *Tritoniopsis caffra*, *Watsonia fourcadei*. Carnivorous Herb: *Drosera trinervia*^W. Herbaceous Parasitic Climber: *Cassytha ciliolata*. Graminoids: *Cannomois parviflora* (d), *C. virgata* (d), *Ehrharta dura* (d), *E. rupestris* subsp. *tricotata* (d), *Elegia fistulosa* (d), *E. galpinii* (d), *E. juncea* (d), *Epischoenus adnatus* (d), *Hypodiscus albo-aristatus* (d), *H. aristatus* (d), *H. striatus* (d), *H. synchroolepis* (d), *Ischyrolepis gaudichaudiana* (d), *Merxmullera rufa* (d), *Pentameris distichophylla* (d), *Platycaulos anceps* (d), *P. compressus* (d), *Restio fourcadei* (d), *R. triticeus* (d), *Rhodocoma gigantea*^W (d), *Tetraria cuspidata* (d), *T. involucrata* (d), *T. microstachys* (d), *Andropogon appendiculatus*, *Anthochortus ecklonii*, *Cannomois scirpoides*, *Capeobolus brevicaulis*, *Chrysitrix capensis*, *Cyathocoma hexandra*^W, *Ficinia gracilis*, *Mastersiella purpurea*, *Merxmullera decora*, *Pentastichis colorata*, *P. malouinensis*, *P. pallida*, *Restio strictus*, *Staberoha aemula*,

Tetraria capillacea, *T. fimbriolata*, *T. sylvatica*, *T. thermalis*, *T. ustulata*, *Thamnochortus cinereus*, *Themeda triandra*, *Willdenowia teres*.

Endemic Taxa (^WWetlands) Low Shrubs: *Erica unicolor* (d), *Penaea acutifolia* (d), *Acmadenia gracilis*, *A. rupicola*, *Agathosma alaris*, *A. planifolia*, *Amphithalea flava*, *Aspalathus bowieana*, *A. digitifolia*, *Erica aneimensis*, *E. gillii*, *E. inconstans*, *E. juniperina*, *E. lehmannii*, *E. outeniquae*, *E. priorii*, *E. velatiflora*, *Leucadendron olens*, *Leucospermum hamatum*, *Phyllica curvifolia*, *Prismatocarpus rogersii*, *Psoralea vlokii*, *Xiphotheca phyllicoides*, *Zyrphelis outeniquae*. Succulent Shrub: *Lampranthus pauciflorus*. Herb: *Linum villosum*. Geophytic Herb: *Geissorhiza outeniquensis*^W.

Conservation Vulnerable. Target 23%. Statutorily conserved (47%) in the proposed Garden Route National Park, Doring River Wilderness Area as well as in Ruitersbos and Witfontein Nature Reserves. About 2% protected in private nature reserves. Some 28% transformed (pine plantations, cultivation). Alien *Pinus pinaster* and *Hakea sericea* scattered over part of the area. Erosion very low.

Remarks The western boundaries of this unit are discussed under FFs 16 South Langeberg Sandstone Fynbos. The Cedarberg Shale Bands were not adequately mapped within this unit due to a lack of proper geological coverage. The eastern boundary is also more of a transition zone and is somewhat arbitrarily taken as approximating the Keurbooms River (for the mountain section). It can be refined when sufficient distributional data become available.

References Bond (1978b, 1981), Cameron (1980), Van Daalen (1984), Vermeulen (1995).

9.4.2 Red List of Ecosystem Status and National Biodiversity Assessment

The National Biodiversity Assessment (NBA, 2018) and more recent Red List of Ecosystem Status (RLE, 2022) are the primary tools for monitoring and reporting on the state of biodiversity in South Africa and informs policies, strategic objectives, and activities for managing and conserving biodiversity more effectively. The RLE/NBA is especially important for informing the National Biodiversity Strategy and Action Plan (NBSAP), the National Biodiversity Framework (NBF) and the National Protected Area Expansion Strategy (NPAES) and informs other national strategies and frameworks across a range of sectors, such as the National Spatial Development Framework, the National Water and Sanitation Master Plan and the National Biodiversity Economy Strategy. Ecosystem protection level is an indicator that tracks how well represented an ecosystem type is in the protected area network. It has been used as a headline indicator in national reporting in South Africa since 2005. It is computed by intersecting maps of ecosystem types and ecological condition with the map of protected areas. Ecosystem types are then categorised based on the proportion of the biodiversity target for each ecosystem type that is included in one or more protected areas. For terrestrial ecosystems, biodiversity targets are set for each ecosystem type using established species–area accumulation curves (ranging between 16 % and 34%). The status categorisation is based on a complex set of criteria, but for the purposes of this reporting, can be summarised as follows (NBA, 2018; IUCN RLE, 2022):

STATUS	DESCRIPTION
Least Concern	These <u>ecosystems</u> have lost only a small proportion (~more than 80 % remains) of their original natural habitat and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild).
Vulnerable	<u>Vulnerable terrestrial ecosystems</u> have lost some (~more than 60 % remains) of their original natural habitat and their functioning will be compromised if they continue to lose natural habitat.
Endangered	<u>Endangered terrestrial ecosystems</u> have lost significant amounts (~less than 40 % remains) of their original natural habitat, so their functioning is compromised.
Critically Endangered	<u>Critically Endangered terrestrial ecosystems</u> have lost significant amounts (~less than 20 % remains) of their original natural habitat, and therefore considered to have an extremely high risk of collapse.

9.4.3 Western Cape Biodiversity Spatial Plan

The Western Cape is endowed with world-renowned biodiversity and natural resources. Together with this unparalleled endowment comes international responsibilities as well as significant opportunities for our people and the biodiversity economy. The Western Cape Biodiversity Spatial Plan (WC BSP, 2017) represents the “state of the art” provincial systematic biodiversity planning product. It represents the priority biodiversity areas and ecological infrastructure that need to be secured in the long-term in order that we, together with CapeNature, fulfil our core provincial mandate for biodiversity management.

The development and implementation of the Western Cape Biodiversity Spatial Plan (WC BSP, 2017) is a core output for the Provincial Biodiversity Strategy and Action Plan (2016) which is aligned to the Aichi Targets for the United Nations Convention on Biological Diversity as well as the National Biodiversity Strategy and Action Plan (2015). This *Western Cape Biodiversity Spatial Plan Handbook* thus provides all stakeholders with the strategic and practical guidance on how to ensure that planning and decision-making build resilience of our ecological infrastructure. Critically, the WC BSP must be used to inform how we invest in ecological infrastructure to ensure that our natural resources are managed to improve resilience and water security into the future. This will be crucial in enabling “future proof” development as part of our response to climate change, including adaptation and disaster risk reduction.

The CBA map indicates areas of land as well as aquatic features which must to be safeguarded in their natural state if biodiversity is to persist and ecosystems are to continue functioning. Land in this category is referred to as a Critical Biodiversity Area. CBAs incorporate:

- I. areas that need to be safeguarded in order to meet national biodiversity thresholds.
- II. areas required to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services; and/or
- III. important locations for biodiversity features or rare species.

Ecological Support Areas (ESAs) are supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. An ESA may be an ecological process area that connects and therefore sustains Critical Biodiversity Areas or a terrestrial feature. None are present with the site or immediate vicinity.

Table 9: Criteria defining Critical Biodiversity Areas (Source: WC BSP, 2017)

CBA MAP CATEGORY:	DEFINING CRITERIA
Protected Areas (Not present)	Areas that are proclaimed as protected areas under national or provincial legislation. Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity. A benchmark for biodiversity.
Critical Biodiversity Areas 1 (CBA) (Not Present)	Areas in a natural 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.
Critical Biodiversity Areas 1 (CBA 2) (Not present)	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 functional, natural, or near-natural state, with no further loss of natural habitat. These areas should be rehabilitated.
Ecological Support Areas 1 (ESA 1) (Present)	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PA's or CBA's and are often vital for delivering ecosystem services.

CBA MAP CATEGORY:	DEFINING CRITERIA
	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.
Ecological Support Areas 2 (ESA 2) (Present)	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PA's or CBA's and are often vital for delivering ecosystem services. Restore and/or manage to minimise impact on ecological infrastructure functioning; especially soil and water-related services.
Other Natural Areas (ONA) (Present)	Areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem. Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high-impact land uses.
No Natural Area Remaining (NNAR) (Present)	Areas that have been modified by human activity to the extent that they are no longer natural, and do not contribute to biodiversity targets. These areas may still provide limited biodiversity and ecological infrastructure functions, even if they are never prioritised for conservation action. Manage in a biodiversity-sensitive manner, aiming to maximise ecological functionality. Offers the most flexibility regarding potential land uses, but some authorisation may still be required for high impact land uses.

9.4.4 Other Biodiversity Sector Plans

The site is outside of the planning domain of any other Biodiversity Sector Plans.

9.4.5 Strategic Water Source Areas

Strategic water source areas (Figure 32) are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy. Strategic water source areas are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy.

Strategic water source areas can be regarded as natural “water factories”, supporting growth and development needs that are often far away. Deterioration of water quality and quantity in these areas can have a disproportionately large negative effect on the functioning of downstream ecosystems and the overall sustainability of growth and development in the regions they support. Appropriate management of these areas, which often occupy only a small fraction of the land surface area, can greatly support downstream sustainability of water quality and quantity.

In South Africa, such management is particularly important for enhancing downstream water quality and quantity. Not only are the country's surface water resources extremely limited – South Africa is considered to be one of the driest countries (per capita), with 98 per cent of its surface water already developed – but the country also has a growing water quality problem.

Overloading with nutrients and other pollutants from urban, agricultural and industrial waste has resulted in many dams shifting to an algae-dominated, or eutrophic, state. Sixty-five per cent of the country's dams are now estimated to be eutrophic or borderline eutrophic, with most of these algal blooms containing cyanobacteria (blue-green algae) that is toxic to human health. This renders water of high quality unavailable if not treated, which coupled with failing water infrastructure, represents a major challenge to water security in the near future. Water managers are inevitably faced with finding

new and innovative ways of improving both water quality and quantity to meet the increasing water demands of the country. Managing strategic water source areas is one way to meet this challenge.

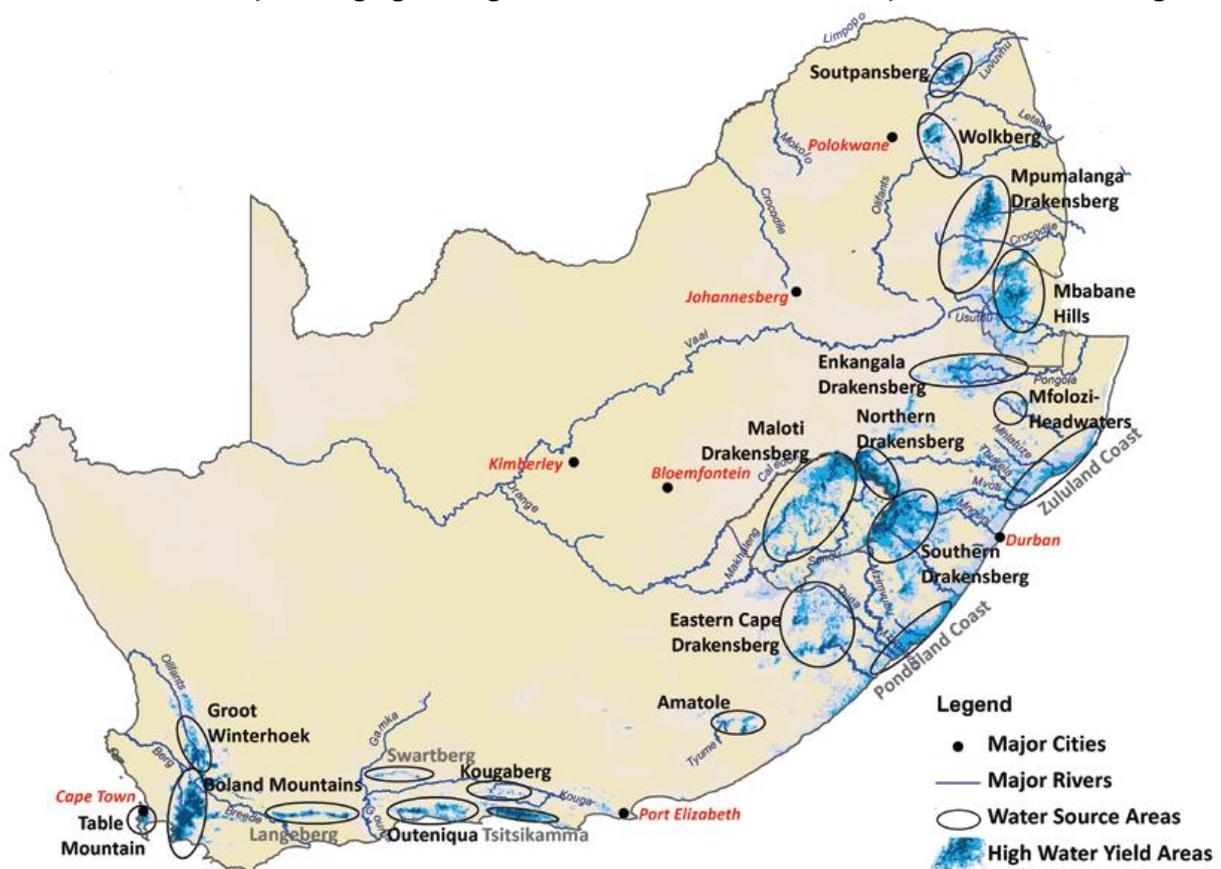


Figure 32: South Africa Water Source Areas [Source: Nel, et al, 2013]

9.4.6 Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) project responds to the high levels of threat prevalent in river, wetland and estuary ecosystems of South Africa. It provides strategic spatial priorities for conserving the country's freshwater ecosystems and supporting sustainable use of water resources. These strategic spatial priorities are known as Freshwater Ecosystem Priority Areas, or 'FEPAs'.

Biodiversity targets set minimum, quantitative requirements for biodiversity conservation. They reflect scientific best judgement and will need to be refined as knowledge evolves. Quantitative biodiversity targets were set for fish species, river ecosystem types, wetland ecosystem types, priority estuaries, wetland clusters and free-flowing rivers:

1. Threatened and near-threatened freshwater fish species – all populations (100%) of considered to be critically endangered or endangered species, and at least ten populations of species that are in the International Union for Conservation of Nature (IUCN) vulnerable or near threatened categories and some populations of special concern (e.g., very restricted distributions in South Africa)
2. River ecosystem types – 20% of total length per type
3. Wetland ecosystem types – 20% of total area per type
4. Wetland clusters – 20% of total area per wetland vegetation group
5. Free-flowing rivers – 20% of total length per ecoregion group
6. Priority estuaries – 100% of all priority estuaries, which already took into account biodiversity targets of 20% for estuary ecosystem types and habitat, 50% of the populations of threatened

species; 40% of the populations of exploited estuarine species; 30% of the populations of all other estuarine species.

Terrestrial and aquatic resources are interdependent, with one affecting the other. For example, to ensure the healthy functioning of rivers, wetlands and estuaries, it is essential to protect mountain catchment areas where the water originates, and to safeguard riverside vegetation because these plants prevent soil erosion, sedimentation and water pollution (Vromans et al., 2012).

The health of a river ecosystem is largely dependent on the presence of natural vegetation or “riparian habitat” along its banks, including good vegetative cover within the surrounding landscape (catchment area). Riparian bank vegetation filters pollutants, helps maintain water temperatures, supplies organic matter (‘food’) in support of aquatic life (fish, insects etc.) and acts as a buffer to adjacent land-uses. The roots of the riparian plants also reduce the effects of floods, by binding riverbanks and thus preventing erosion. Furthermore, bank storage is increased by slowing run off during floods. For these reasons, it is essential that new developments are separated from a river and its “riparian habitat” by a buffer area.

9.4.7 Key Biodiversity Areas

Important Bird Areas

Important Bird and Biodiversity Areas (IBA’s) are sites of international significance for the conservation of the world’s birds and other biodiversity. They also provide essential benefits to people, such as food, materials, water, climate regulation and flood attenuation, as well as opportunities for recreation and spiritual fulfilment. By conserving IBA’s, we look after all the ecosystem goods and services they provide, which means in effect that we support a meaningful component of the South African economy (such as water management and agriculture). Since the late 1970s, more than 12 000 IBA’s have been identified in virtually all of the world’s countries and territories, both on land and at sea. In 1998, 122 South African IBA’s were identified and listed in Barnes (1998). This inventory was revised to 112 IBA’s in 2015. IBA’s have also had considerable and increasing relevance when responses have been developed to several wider environmental issues, such as habitat loss, ecosystem degradation, climate change and the sustainable use of resources. The core aims of the IBA Programme are:

- To identify, monitor and conserve the sites and habitats that support South Africa’s priority bird species.
- To develop a network of partners, from grassroots to national level, who collaborate to conserve IBA’s.
- To gather new data regularly and monitor IBA’s in order to track status and trends across the network and so that up-to-date information can be passed on to decision-makers, enabling them to take appropriate conservation action.
- To confirm periodically that existing IBA’s continue to meet the selection criteria and to identify other critical sites that may qualify for recognition as IBA’s as new information becomes available.
- To build capacity in the IBA Programme by sourcing funding, and to acquire and develop appropriate skills in staff and volunteers so that these objectives can be implemented at a regional scale.

The extension of the IBA approach to several other wildlife groups has led to the identification of Important Plant Areas, Prime Butterfly Areas, Important Mammal Areas and Key Biodiversity Areas for Freshwater Biodiversity. South Africa is also the first mega diverse country to practically test the Key Biodiversity Areas (KBA’s) standards across a full range of species groups and ecosystems but is not yet published.

9.5 Vegetation and Ecological Processes and Corridors

9.5.1 Critical Biodiversity Areas

Given that the objective of CBAs is to identify biodiversity priority areas which should be maintained in a natural to near natural state, development within these areas is not encouraged. The following issues need to be considered when considering development within a CBA:

- Are there alternative areas within the site but outside of the CBA that could be developed?
- Does the project undermine the overall ecological functioning of the broad CBA area?
- Can mitigation measures reduce the impact of the development on ecological processes?

9.5.2 Ecosystem Processes

Distinct ecological processes are generally associated with surface geology and soils, climate, topography, drainage systems, and the make-up of the remaining native vegetation. These features could be missed or only partly incorporated into land use plans unless they are specifically identified and targeted. Ideally, areas maintaining adaptive diversification (e.g., environmental gradients) or containing historically isolated populations should be identified and protected. The spatial aspect of ecological processes also needs to be determined and such insights incorporated in conservation planning. Finally, connectivity within these areas should be ensured to maintain species migration and gene flow. However, the spatial components of processes have rarely been considered in conservation planning – an approach that is also especially useful for development planning in biodiversity hotspots. Three types of ecological processes are discussed below.

9.5.3 Ecosystem Services

“Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services, recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling”. (Millennium Ecosystem Assessment (MEA), 2005)

Terrestrial (or land) ecosystems provide valuable ecosystem services that contribute to human well-being. They can provide¹³:

- buffers against natural hazards such as fire and floods[®]
- carbon sequestration (storage), important for reducing the impacts of climate change[®]
- regulation of water supply[®]
- grazing for wild animals and livestock[®]
- natural spaces for recreation & tourism[®]
- the air we breathe[®]
- spiritual, ritual and ceremonies[®]
- horticultural & wildflower industries
- natural heritage[®]
- food, timber, fibre and medicinal plants[®]

Rivers are central to human welfare and economic development. They provide:

- water for agricultural, industrial and domestic uses[®]

¹³ Within the study area, terrestrial ecosystem services are marked (e).

- flood attenuation and regulation[®]
- food and medicinal plants[®]
- transport and/or purification of biodegradable wastes[®]
- tourism, recreational and cultural use[®]
- enhanced property values

Estuaries, together with an associated buffer of natural vegetation, perform several valuable functions, especially in relation to:

- subsistence fishing
- commercial fisheries (as they provide a refuge for commercial fishes when they are young)
- wildlife habitat e.g., nursery and refuge (providing habitat for amphibians, birds, fish and mammals for all or portions of their life cycles)
- tourism, recreational, cultural use and craft materials
- enhanced property values

Ecological corridors provide valuable ecosystem services that are often impossible or very costly to replicate or offset. For example, they:

- support the migration (movement) and long-term survival of plant and animal species and their ecological processes (e.g., fire, pollination, seed dispersal), in response to global climate change.
- are important areas for storing carbon to reduce the impacts of global climate change.
- are important areas for regulating water supply (e.g., filtering and storing drinking water, keeping excess nutrients out of wetlands and rivers, ensuring a high-water yield from mountain catchments).
- supply good quality water from mountain catchment areas, both surface and groundwater.
- the supply of water quality and quantity is not only for human consumption but for ensuring the survival of downstream estuaries, wetlands (vleis) and streams (which in turn provide us with other ecosystem services).
- are of important scenic value, contributing to tourism and the 'sense of place'.[®]
- Coastal & marine areas
- Subsistence & commercial fishing (food)
- Medicinal & Cosmetic resources e.g., kelp & microscopic plants for the feed, food, cosmetics, & pharmaceutical industries.
- Mining (sand and heavy mineral)
- Recreational value (sport and fishing)
- Retail value (market-value of housing)[®]

Net Primary production[®]: This critical ecological process involves the process of photosynthesis – which translates into the amount of carbon plants can fix on an annual basis. This is important for each LM within the district as the amount of carbon fixed translates directly into the amount of forage produced and thus made available for grazing. Consequently, livestock management directly impacts upon forage production as overgrazing reduces the vegetations' ability to maintain this ecosystem process. This ecological process is especially significant for the ORT, as the main land use comprises of livestock grazing. Therefore, this factor has a direct bearing on both the amount of food available for livestock, and the amount of plant material available regarding reducing runoff in wetland areas.

Water production: In more arid areas, many municipalities and towns rely on groundwater or local water resources to supply to town with drinking water. Thus, the higher rainfall areas are key recharge zones for these groundwater resources. Consequently, land use management of these catchment areas are critical for the maintenance of the quality and quantity of water sourced from each area. For example, water courses and wetlands that have been cleared for agricultural purposes, or overgrazed,

will not only cause soil erosion, but most importantly cause increased water runoff, thus reducing the amount of water that feeds back into the water table for consumption. Groundwater is also a critical resource for agriculture and food production.

Species movement corridors and climatic refuges: Global climate change is undoubtedly a threat in the coming decades. A key action to mitigate its effects is the maintenance of species' ability to migrate to new locations as the climatic conditions which they require move across the landscape. These corridor and refuge migration strategies occur on both a micro and macro level. On the macro scale corridors provide for species movement at landscape scales. This entails the ability of fauna and flora to undertake large scale movements towards areas which continue to provide the conditions required by a species for growth and reproduction. Movements could entail migrations of up to hundreds of kilometres, and corridors of mostly natural or near natural vegetation across the landscape are needed to permit this to occur. Climactic refuges can be localized areas that have moderated climates – such as mountain kloofs and south facing slopes. These areas provide cooler habitats where species under threat from changing climates can colonise or species and vegetation not widely found in surrounding area.

9.5.4 Ecological Support Areas

These include supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. An ESA may be an ecological process area that connects and therefore sustains Critical Biodiversity Areas or a terrestrial feature. The ESA'S are not well defined in the ECBCP (refer to Section 2.3.7). ESAs are generally extensions to the CBA area incorporating small areas that are perhaps no longer natural, or are comprised of secondary vegetation, generally following the drainage line ecological corridors within the wider surrounding landscape that will improve connectivity.

9.5.5 Critical/Important Terrestrial Habitats

Special Habitats include areas that are rare within a region, or which support important species, ecosystems or ecological processes. Species of Conservation Concern refers to red data species and important habitats include the locations where these species are known to occur. Red data species are plant, animal or other organisms (e.g., reptiles, insects etc) that have been assessed and classified according to their potential for extinction in the near future. All known species are listed in the Red Data Book and classified as Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened or Least Concern. Red Data species are those species classified as Extinct, Critically Endangered, Endangered or Vulnerable. Some of the red data species are listed within the NEMBA Threatened or Protected Species (TOPS), and some are protected by provincial ordinances. Critical habitats include those areas that are known locations for such red data species that are under threat of extinction.

9.5.6 Alien Invasive Species

On 18 September 2020, the Minister of Environmental Affairs published the Alien and Invasive Species Regulations (“the Regulations”) which came into effect on the 18 October 2020 in a bid to curb the negative effects of IAPs. The Regulations call on landowners and sellers of land alike to assist the Department of Environmental Affairs to conserve our indigenous fauna and flora and to foster sustainable use of our land. Non-adherence to the Regulations by a landowner or a seller of land can result in a criminal offence punishable by a fine of up to R 5 million (R 10 million in case of a second offence) and/or a period of imprisonment of up to 10 years.

Category 1a and 1b listed invasive species must be controlled and eradicated. Category 2 plants may only be grown if a permit is obtained, and the property owner ensures that the invasive species do not spread beyond his or her property. The growing of Category 3 species is subject to various exemptions

and prohibitions. Some invasive plants are categorised differently in different provinces. For example: the Spanish Broom plant is categorised as a category 1b (harmful) invasive plant in Eastern Cape and Western Cape, but it is a category 3 (less harmful) invasive plant in the other seven provinces.

Invasive alien plants have a significant negative impact on the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Landowners are under legal obligation to control alien plants occurring on their properties. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014). Alien control programs are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is essential. This will save time, money and significant effort. Collective management and planning with neighbours allow for more cost-effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses. All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing. A general rule of thumb is to first target lightly infested areas before tackling densely invaded areas and prioritize sensitive areas such as riverbanks and wetlands. Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms but are often the most difficult to detect and control.

Eradication protocol

The act required the removal of these species, being the responsibility of the landowner, as described in Table 10 below.

Table 10: Legislation regarding invasive alien species.

The National Environmental Management Act: Alien and Invasive Species Act (18 September 2020) stipulates the following:

6. Control measures

(1) In order to achieve the objects of this Act the Minister may prescribe control measures which shall be complied with by land users to whom they apply.

(2) Such control measures may relate to –

(1) the control of weeds and invader plants.

(3) A control measure may –

(a) contain a prohibition or an obligation with regard to any matter referred to in subsection (2).

(5) Any land user who refuses or fails to comply with any control measure which is binding on him, shall be guilty of an offence.

In this regard, Government Notice R. 598 – National Environmental Management: Biodiversity Act (10/2004): Alien and Invasive Species Regulations, 2014 (Gazette number 37885), dated August 2014, further stipulates the following:

CHAPTER 2: CATEGORIES OF LISTED INVASIVE SPECIES

2. Category 1a: Listed Invasive Species

(1) Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combatted or eradicated.

(2) A person in control of a Category 1a Listed Invasive Species must-

(a) comply with the provisions of section 73(2) of the Act.

(b) immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of the Act; and

© allow an authorised official from the Department to enter onto land to monitor, assist with or implement the combatting or eradication of the listed invasive species.

If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must combat or eradicate the listed invasive species in accordance with such programme.

3. Category 1b: Listed Invasive Species

(1) Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled.

(2) A person in control of a Category 1 b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of the Act.

(3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.

(4) A person contemplated in sub-regulation (2) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of the Act.

4. Category 2: Listed Invasive Species

(1) Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.

(2) Unless otherwise indicated in the Notice, no person may carry out a restricted activity in respect of a Category 2 Listed Invasive Species without a permit.

(3) A landowner on whose land a Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land, or the area specified in the Notice or permit.

(4) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.

(5) Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1 b Listed Invasive Species and must be managed according to Regulation 3.

(6) Notwithstanding the specific exemptions relating to existing plantations in respect of Listed Invasive Plant Species published in Government Gazette No. 37886, Notice 599 of 1 August 2014 (as amended), any person or organ of state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.

5. Category 3: Listed Invasive Species

(1) Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.

(2) Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3.

(3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme.

CHAPTER 7: ISSUING, AMENDMENT AND CANCELLATION OF PERMITS**29. Sale or transfer of alien and listed invasive species**

(1) If a permit-holder sells a specimen of an alien or listed invasive species or sells the property on which a specimen of an alien or listed invasive species is under the permit-holder's control, the new owner of such specimen or such property must apply for a permit in terms of Chapter 7 of the Act.

(2) The new permit-holder contemplated in sub-regulation (1) will be subject to the same conditions as the permit-holder who has sold the specimen of an alien or listed invasive species, or the property on which a specimen of an alien or listed invasive species occurs, unless specific circumstances require all such permit conditions to be revised, in which case full reasons must be giving in writing by the issuing authority.

(3) The seller of any immovable property must, prior to the conclusion of the relevant sale agreement, notify the purchaser of that property in writing of the presence of listed invasive species on that property.

CHAPTER 9: COMPLIANCE AND ENFORCEMENT

35. Offences and penalties

- (1) Any offence committed in terms of section 101 of the Act shall, upon conviction, carry the penalties referred to in section 102 of the Act.
- (2) Any person who contravenes or fails to comply with a provision of these regulations is guilty of an offence and is liable, on conviction, to-
- (a) a fine not exceeding five million rand, and in the case of a second or subsequent conviction, to a fine not exceeding R 10 million; or
 - (b) imprisonment for a period not exceeding 10 years; or
- © to both such fine and imprisonment.

The seller of any immovable property must also, prior to the conclusion of the relevant sale agreement, notify the purchaser of that property in writing of the presence of listed IAPs on the property. Property sales agreements dated 1 October 2014 and onwards, should also incorporate a clause in terms of which the purchaser acknowledges that he has acquainted himself with the extent and the nature of the property he is buying and that he accepts the property as such, including the vegetation on the property.

Specific eradication and management procedures must be stipulated in the EMP as to the methods to be implemented to remove and control the various alien invasive species as they tend to require species specific techniques. A management plan should be incorporated into the construction EMP, and a detailed action plan compiled and implemented by the ECO. Any seed-bearing material is to be disposed of at a registered landfill.

9.6 Appendix E: Abbreviations and Glossary

9.6.1 Abbreviations

CARA	Conservation of Agricultural Resources Act, Act 43 of 1983
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs (<i>now DEFF, see below</i>)
DFFE	The Department of Environmental Affairs was renamed the <u>Department of Forestry Fisheries and the Environment</u> , incorporating the forestry and fisheries functions from the previous Department of Agriculture, Forestry and Fisheries.
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DEDEAT	Eastern Cape Department of Economic Development, Environmental Affairs and Tourism
DEMC	Desired Ecological Management Class
DWS	Department of Water Affairs and Sanitation
DWAF	Department of Water Affairs and Forestry (former department name)
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMC	Ecological Management Class
EMP	Environmental Management Plan
EMPr	Environmental Management Programme report
ER	Environmental Representative
ESS	Ecosystem Services
IAP's	Interested and Affected Parties
IEM	Integrated Environmental Management
LM	Local Municipality
masl	meters above sea level
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, Act 107 of 1998
NFA	National Forests Act
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NFA	National Forest Act, Act 84 of 1998
PEMC	Present Ecological Management Class
PES	Present Ecological State
PNCO	Provincial Nature and Environment Conservation Ordinance (No. 19 of 1974).
RDL	Red Data List
RHS	Right Hand Side
RoD	Record of Decision
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SoER	State of the Environment Report
SCC	Species of Conservation Concern
ToPS	Threatened of Protected Species
ToR	Terms of Reference
+ve	Positive
-ve	Negative

9.6.2 Glossary

Alien Invasive Species (AIS)	An alien species whose introduction and/or spread threaten biological diversity (Convention on Biological Diversity). Note: “Alien invasive species” is considered to be equivalent to “invasive alien species”. An alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity (IUCN).
Best Environmental Practice	The application of the most appropriate combination of environmental control measures and strategies (Stockholm Convention).
Best Management Practice	Established techniques or methodologies that, through experience and research, have proven to lead to a desired result (BBOP).
Biodiversity	Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.
Biodiversity Offset	Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem function and people’s use and cultural values associated with biodiversity (BBOP).
Bioremediation	The use of organisms such as plants or microorganisms to aid in removing hazardous substances from an area. Any process that uses microorganisms, fungi, green plants, or their enzymes to return the natural environment altered by contaminants to its original condition.
Boundary	Landscape patches have a boundary between them which can be defined or fuzzy (Sanderson and Harris, 2000). The zone composed of the edges of adjacent ecosystems is the boundary.
Connectivity	The measure of how connected or spatially continuous a corridor, network, or matrix is. For example, a forested landscape (the matrix) with fewer gaps in forest cover (open patches) will have higher connectivity.
Corridors	Have important functions as strips of a landscape differing from adjacent land on both sides. Habitat, ecosystems or undeveloped areas that physically connect habitat patches. Smaller, intervening patches of surviving habitat can also serve as “steppingstones” that link fragmented ecosystems by ensuring that certain ecological processes are maintained within and between groups of habitat fragments.
Critically Endangered (CR)	A category on the IUCN Red List of Threatened Species which indicates a taxon is considered to be facing an <u>extremely high risk of extinction in the wild</u> (IUCN).
Cultural Ecosystem Services	The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience, including, e.g., knowledge systems, social relations, and aesthetic values (Millennium Ecosystem Assessment).
Cumulative Impacts	The total impact arising from the project (under the control of the developer), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project’s impact is therefore one part of the total cumulative impact on the environment. The analysis of a project’s incremental impacts combined with the effects of other projects can often give a

	more accurate understanding of the likely results of the project's presence than just considering its impacts in isolation (BBOP).
Data Deficient (DD)	A <u>taxon is Data Deficient</u> when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat(IUCN).
Degraded Habitat/Land	Land that has been impacted upon by human activities (including introduction of invasive alien plants, light to moderate overgrazing, accelerated soil erosion, dumping of waste), but still retains a degree of its original structure and species composition (although some species loss would have occurred) and where ecological processes still occur (albeit in an altered way). Degraded land is capable of being restored to a near-natural state with appropriate ecological management.
Disturbance	An event that significantly alters the pattern of variation in the structure or function of a system, while fragmentation is the breaking up of a habitat, ecosystem, or land-use type into smaller parcels. Disturbance is generally considered a natural process.
Ecological Processes	Ecological processes typically only function well where natural vegetation remains, and where the remaining vegetation is well-connected with other nearby patches of natural vegetation. Loss and fragmentation of natural habitat severely threatens the integrity of ecological processes. Where basic processes are intact, ecosystems are likely to recover more easily from disturbances or inappropriate actions if the actions themselves are not permanent. Conversely, the more interference there has been with basic processes, the greater the severity (and longevity) of effects. Natural processes are complex and interdependent, and it is not possible to predict all the consequences of loss of biodiversity or ecosystem integrity. When a region's natural or historic level of diversity and integrity is maintained, higher levels of system productivity are supported in the long run and the overall effects of disturbances may be dampened.
Ecology	Ecology (from Greek: οἶκος, "house" and -λογία, "study of") is the study of the <u>relationships between living organisms, including humans, and their physical environment</u> . Ecology considers organisms at the individual, population, community, ecosystems, and biosphere level. Ecology overlaps with the closely related sciences of biogeography, evolutionary biology, genetics, ethology and natural history. Ecology is a branch of biology, and it is not synonymous with environmentalism.
Ecosystem Status	Ecosystem status of terrestrial ecosystems is based on the degree of habitat loss that has occurred in each ecosystem, relative to two thresholds: one for maintaining healthy ecosystem functioning, and one for conserving the majority of species associated with the ecosystem. As natural habitat is lost in an ecosystem, its functioning is increasingly compromised, leading eventually to the collapse of the ecosystem and to loss of species associated with that ecosystem (Millennium Ecosystem Assessment).
Ecosystem Services	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. Supporting Ecosystem services are those that are necessary for the maintenance of all other ecosystem services. Some examples include biomass production, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.
Ecosystem	All the organisms of a habitat, such as a lake or forest, together with the physical environment in which they live. A dynamic complex of plant, animal and micro-

	organism communities and their non-living environment interacting as a functional unit.
Ecotone	The transitional zone between two communities. Ecotones can arise naturally, such as a lakeshore, or can be human created, such as a cleared agricultural field from a forest. The ecotonal community retains characteristics of each bordering community and often contains species not found in the adjacent communities. Classic examples of ecotones include fencerows; forest to marshlands transitions; forest to grassland transitions; or land-water interfaces such as riparian zones in forests. Characteristics of ecotones include vegetational sharpness, physiognomic change, and occurrence of a spatial community mosaic, many exotic species, ecotonal species, spatial mass effect, and species richness higher or lower than either side of the ecotone.
Edge	The portion of an ecosystem near its perimeter, where influences of the adjacent patches can cause an environmental difference between the interior of the patch and its edge. This edge effect includes a distinctive species composition or abundance in the outer part of the landscape patch. For example, when a landscape is a mosaic of perceptibly different types, such as a forest adjacent to a grassland, the edge is the location where the two types adjoin. In a continuous landscape, such as a forest giving way to open woodland, the exact edge location is fuzzy and is sometimes determined by a local gradient exceeding a threshold, as an example, the point where the tree cover falls below thirty-five percent.
Emergent Tree	Trees that grow above the top of the canopy
Endangered (En)	<u>Endangered terrestrial ecosystems</u> have lost significant amounts (more than 60 % lost) of their original natural habitat, so their functioning is compromised. <u>A taxon (species)</u> is Endangered when the best available evidence indicates that it meets any of the criteria for Endangered, and it is therefore considered to be facing a <u>very high risk</u> of extinction in the wild (<u>IUCN</u>).
Endemic	A plant or animal species, or a vegetation type, which is naturally restricted to a defined region or limited geographical area. Many endemic species have widespread distributions and are common and thus are not considered to be under any threat. They are however noted to be unique to a region, which can include South Africa, a specific province or a bioregion, vegetation type, or a localised area. In cases where it is highly localised or known only from a few or a few localities, and is under threat, it may be red listed either in terms of the South Africa Threatened Species Programme, NEMBA Threatened or Protected Species (ToPS) or the IUCN Red List of Threatened Species.
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Exotic	Non-indigenous; introduced from elsewhere, may also be a weed or alien invasive species. Exotic species may be invasive or non-invasive.
Ecological Structure	The composition, or configuration, and the proportion of different patches across the landscape. Relates to species diversity, the greater the diversity, the more complex the structure. A description of the organisms and physical features of environment including nutrients and climatic conditions.
Ecological Function	How each of the elements in the landscape interacts based on its life cycle events [Producers, Consumers, Decomposers Transformers]. Includes the capacity of natural processes and components to provide goods and services that satisfy human needs, either directly or indirectly.
Ecological Pattern	The contents and internal order of the landscape, or its spatial (and temporal) components. May be homogenous or heterogenous. Result from the ecological processes that produce them.

Ecological Process	Includes <i>Physical processes</i> [Climate (precipitation, insolation), hydrology, geomorphology]; <i>Biological processes</i> [Photosynthesis, respiration, reproduction]; <i>Ecological processes</i> [Competition, predator-prey interactions, environmental gradients, life histories]
Fragmentation (Habitat Fragmentation)	The ‘breaking apart’ of continuous habitat into distinct pieces. Causes land transformation, an important current process in landscapes as more and more development occurs.
Habitat Banking	A market where credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time (IEEP).
Habitat	The home of a plant or animal species. Generally, those features of an area inhabited by animal or plant which are essential to its survival.
IFC PS6	International Finance Corporation Performance Standard 6 – A standard guiding biodiversity conservation and sustainable management of living natural resources for projects financed by the International Finance Corporation (IFC)
Indicator	Information based on measured data used to represent an attribute, characteristic, or property of a system.
Indicator species	A species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition.
Indigenous	Native; occurring naturally in a defined area.
Indigenous vegetation (NEMA)	Refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years;
Indigenous Species (Native species)	A species that has been observed in the form of a naturally occurring and self-sustaining population in historical times (<i>Bern Convention 1979</i>). A species or lower taxon living within its natural range (past or present) including the area which it can reach and occupy <u>using its natural dispersal systems</u> (<i>modified after the Convention on Biological Diversity</i>)
Indirect Impact	Impacts triggered in response to the presence of a project, rather than being directly caused by the project’s own operations (BBOP)
Intact Habitat / Vegetation	Land that has not been significantly impacted upon by man’s activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and functioning of ecological processes.
Intrinsic Value	The inherent worth of something, independent of its value to anyone or anything else.
Keystone Species	Species whose influence on ecosystem function and diversity are disproportionate to their numerical abundance. Although all species interact, the interactions of some species are more profound and far-reaching than others, such that their elimination from an ecosystem often triggers cascades of direct and indirect changes on more than a single trophic level, leading eventually to losses of habitats and extirpation of other species in the food web.
Landscape	An area of land that contains a mosaic of ecosystems, including human-dominated ecosystems (Millennium Ecosystem Assessment).
Landscape Approach	Dealing with large-scale processes in an integrated and multidisciplinary manner, combining natural resources management with environmental and livelihood considerations (FAO).
Landscape connectivity	The degree to which the landscape facilitates or impedes movement among resource patches.

Least threatened / Least Concern (LC)	<p>These <u>ecosystems</u> have lost only a small proportion (more than 80 % remains) of their original natural habitat and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild).</p> <p>A <u>taxon (species)</u> is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category (<i>IUCN</i>).</p>
Matrix	The “ <i>background ecological system</i> ” of a landscape with a high degree of connectivity.
Natural Forest (Indigenous Forest)	<p>The definition of “<i>natural forest</i>” in the National Forests Act of 1998 (NFA) Section 2(1)(xx) is as follows: ‘A natural forest means a group of indigenous trees</p> <ul style="list-style-type: none"> • whose crowns are largely contiguous • or which have been declared by the Minister to be a natural forest under section 7(2) <p>This definition should be read in conjunction with Section 2(1)(x) which states that ‘Forest’ includes:</p> <ul style="list-style-type: none"> • A natural forest, a woodland, and a plantation • The forest-produce in it; and • The ecosystems which it makes up. <p>The legal definition must be supported by a technical definition, as demonstrated by a court case in the Umzimkulu magisterial district, relating to the illegal felling of Yellowwood (<i>Podocarpus latifolius</i>) and other species in the Gonqogonqo forest. From scientific definitions (also see Appendix B) we can define natural forest as:</p> <ul style="list-style-type: none"> • A generally multi-layered vegetation unit • Dominated by trees that are largely evergreen or semi-deciduous. • The combined tree strata have overlapping crowns, and crown cover is >75% • Grasses in the herbaceous stratum (if present) are generally rare • Fire does not normally play a major role in forest function and dynamics except at the fringes. • The species of all plant growth forms must be typical of natural forest (check for indicator species) • The forest must be one of the national forest types
Near Threatened (NT)	A <u>taxon (species)</u> is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future (<i>IUCN</i>).
Patch	A term fundamental to landscape ecology, is defined as a relatively homogeneous area that differs from its surroundings. Patches are the basic unit of the landscape that change and fluctuate, a process called patch dynamics. Patches have a definite shape and spatial configuration and can be described compositionally by internal variables such as number of trees, number of tree species, height of trees, or other similar measurements.
Protected Area	A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.
Range restricted species	<p>Species with a geographically restricted area of distribution. Note: Within the IFC PS6, restricted range refers to a limited <u>extent of occurrence</u> (EOO):</p> <ul style="list-style-type: none"> • For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometres (km²).

Refugia	A location which supports an isolated or relict population of a once more widespread species. This isolation can be due to climatic changes, geography, or human activities such as deforestation and overhunting.
Resilience	The capacity of a natural system to recover from disturbance (OECD).
Rehabilitation	Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised. Rehabilitation emphasizes the reparation of ecosystem processes, productivity and services, whereas the goals of restoration also include the re-establishment of the pre-existing biotic integrity in terms of species composition and community structure (BBOP).
Restoration	The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. An ecosystem has recovered when it contains sufficient biotic and abiotic resources to continue its development without further assistance or subsidy. It would sustain itself structurally and functionally, demonstrate resilience to normal ranges of environmental stress and disturbance, and interact with contiguous ecosystems in terms of biotic and abiotic flows and cultural interactions (IFC).
Riparian	Pertaining to, situated on or associated with the banks of a watercourse, usually a river or stream.
River Corridors	River corridors perform several ecological functions such as modulating stream flow, storing water, removing harmful materials from water, and providing habitat for aquatic and terrestrial plants and animals. These corridors also have vegetation and soil characteristics distinctly different from surrounding uplands and support higher levels of species diversity, species densities, and rates of biological productivity than most other landscape elements. Rivers provide for migration and exchange between inland and coastal biotas.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED).
Terrestrial	Occurring on, or inhabiting, land.
Threatened Species	Umbrella term for any species categorised as Critically Endangered, Endangered or Vulnerable by the IUCN Red List of Threatened Species (IUCN). Any species that is likely to become extinct within the foreseeable future throughout all or part of its range and whose survival is unlikely if the factors causing numerical decline or habitat degradation continue to operate (EU).
Traditional Ecological Knowledge	Knowledge, innovations and practices of indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal breeds. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, and forestry (CBD).
Transformation	In ecology, transformation refers to adverse changes to biodiversity, typically habitats or ecosystems, through processes such as cultivation, forestry, drainage of wetlands, urban development or invasion by alien plants or animals. Transformation results in habitat fragmentation – the breaking up of a continuous habitat, ecosystem, or land-use type into smaller fragments.
Transformed Habitat/Land	Land that has been significantly impacted upon as a result of human interferences/disturbances (such as cultivation, urban development, mining, landscaping, severe overgrazing), and where the original structure, species composition and functioning of ecological processes have been irreversibly

	altered. Transformed habitats are not capable of being restored to their original states.
Tributary	A small stream or river flowing into a larger one.
Untransformed Habitat/Land	Land that has not been significantly impacted upon by man's activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and functioning of ecological processes.
Vulnerable (Vu)	<u>Vulnerable terrestrial ecosystems</u> have lost some (more than 60 % remains) of their original natural habitat and their functioning will be compromised if they continue to lose natural habitat. A <u>taxon (species)</u> is Vulnerable when the best available evidence indicates that it meets any of the criteria for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild (<u>IUCN</u>).
Watercourse	Natural or man-made channel through or along which water may flow. A river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows. and a reference to a watercourse includes, where relevant, its bed and banks;
Weed	An indigenous or non-indigenous plant that grows and reproduces aggressively, usually a ruderal pioneer of disturbed areas. Weeds may be unwanted because they are unsightly, or they limit the growth of other plants by blocking light or using up nutrients from the soil. They can also harbour and spread plant pathogens. Weeds are generally known to proliferate through the production of large quantities of seed.
Wetlands	A collective term used to describe lands that are sometimes or always covered by shallow water or have saturated soils, and where plants adapted for life in wet conditions usually grow.
Catchment	In relation to a watercourse or watercourses or part of a watercourse, means the area from which any rainfall will drain into the watercourse or watercourses or part of a watercourse, through surface flow to a common point or common points.
Estuary	a partially or fully enclosed body of water - (a) which is open to the sea permanently or periodically; and (b) within which the sea water can be diluted, to an extent that is measurable, with fresh water drained from land.
Instream habitat	Includes the physical structure of a watercourse and the associated vegetation in relation to the bed of the watercourse;
Riparian Habitat	Includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.

9.7 Appendix F: Biodiversity Environmental Management Plan

Specific measures relating to management of Biodiversity Impacts that must be included in the project Environmental Management Programme (EMPr). This Environmental Management Plan (EMP) contains guidelines, operating procedures and rehabilitation control requirements, which will be binding on the holder of the environmental authorisation after approval of the EMP. The impacts identified and listed in 3.3 will be managed / controlled as set out under mitigating measures (3.3) and as detailed in this section for the more significant impacts during the operational phase.

9.7.1 Protection of Flora and Fauna

The following actions must be implemented at construction phase.

- Search and rescue operations for Species of Conservation Concern must be undertaken before the commencement of site clearing activities.
- Indigenous vegetation encountered on the sites that are to be conserved and left intact.
- It is important that clearing activities are kept to the minimum and take place in a phased manner. This allows animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
- Stripped vegetation should be temporarily stored during operations and to be used later to stabilise slopes. This excludes exotic invasive species.
- No animals are to be harmed or killed during the course of operations.
- Workers are NOT allowed to collect any flora or snare any faunal species. All flora and fauna remain the property of the landowner and must not be disturbed, upset or used without their expressed consent.
- It is the responsibility of the Contractor to provide sufficient fuel for cooking and heated as needed by the staff.
- No domestic animals are permitted on the sites.
- Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO.
- Rehabilitation of vegetation of the site must be done as described in the Rehabilitation Plans.

Flora search and Rescue

The following flora relocation plan is recommended:

- Once the final layout has been determined the botanist will be consulted in order to finalise the plant relocation and vegetation clearing plan.
- Respective permits to be obtained.
- Flora search and rescue is to be conducted before vegetation clearing takes place.
- Areas should only be stripped of vegetation as and when required and once Species of Conservation Concern have been relocated for that area.
- Once site clearing is to commence, the area to be cleared of vegetation will be surveyed by the vegetation and plant search and rescue team clearing under the supervision of the botanist to identify and remove species suitable for rescue and commence removal of plants.
- These species are to be replanted immediately in a suitable area of similar vegetation, where future development is unlikely to occur, or within a protected area.

9.7.2 Alien and Invasive Plan Management Plan

The following mitigation measures have been identified in order to ensure that the introduction and spread of alien invasive vegetation is minimised:

- Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements.

- A suitable weed management strategy must be implemented in the construction phase and carried through the operational phase.
- Weeds and alien species must be cleared by hand before the rehabilitation phase of the areas. Removal of alien plants are to be done according to the Working for Water Guidelines.
- The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.
- In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary). Areas within the confines of the site are to be included.
- All alien plant material (including brushwood and seeds) should be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free.
- After clearing is completed, an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner.

9.7.3 Fires

- The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/users/managers should also be informed or otherwise involved.
- Enclosed areas for food preparation should be provided and the Contractor must strictly prohibit the use of open fires for cooking and heating purposes.
- The use of branches of trees and shrubs for fire-making must be strictly prohibited.
- The Contractor should take all reasonable and active steps to avoid increasing the risk of fire through their activities on-site. No fires may be lit except at places approved by the ECO.
- The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services.
- The Contractor must supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment.
- Fires and “hot work” must be restricted to demarcated areas.
- A braai facility may be considered at the discretion of the Contractor and in consultation with the ECO. The area must be away from flammable stores. All events must be under management’s supervision and a fire extinguisher will be immediately available. “Low-smoke” fuels must be used (e.g., charcoal) and smoke control regulations, if applicable, must be considered.
- The Contractor must take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains.

9.7.4 Soil Aspects

- Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas.
- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations.
- The removed topsoil shall be stored on high ground within the site footprint outside the 1:50 flood level within demarcated areas.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds.

9.7.5 Dust

- To manage complaints relation to impacts on the nearby communities, a dust register will be developed.
- If required, water spray vehicles will be used to control wind cause by strong winds during activities on the works.
- No over-watering of the site or road surfaces.
- Wind screens should be used to reduce wind and dust in open areas.

9.7.6 Infrastructural Requirements

Topsoil

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the Regional Manager prior to commencement of any operations.
- The removed topsoil shall be stored on high ground within the footprint outside the 1:50 flood level within demarcated areas (Appendix 1)
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The use of a suitable grass seed/runner mix will facilitate soil protection and minimise weeds/weed growth.

Stormwater and Erosion Control

- Stormwater Management Plans must be developed for the site and should include the following:
 - The management of stormwater during construction.
 - The installation of stormwater and erosion control infrastructure.
 - The management of infrastructure after completion of construction.
- Temporary drainage works may be required to prevent stormwater to prevent silt laden surface water from draining into river systems in proximity to the site. Stormwater must be prevented from entering or running off site.
- To ensure that site is not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes should be profiled at a maximum 1:3 gradient.
- Diversion channels should be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site.
- Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works will take place).
- Existing vegetation must be retained as far as possible to minimise erosion problems.
- It is importation that the rehabilitation of site is planned and completed in such a way that the runoff water will not cause erosion.
- Visual inspections will be done on a regular basis with regard to the stability of water control structure, erosion and siltation.
- Sediment-laden runoff from cleared areas must be prevented from entering rivers and streams.
- No river or surface water may be affected by silt emanating from the site.

Site Office / Camp Sites

- No site offices or camp sites will be constructed on the site under current operating conditions, existing structures will be used.

Operating Procedures in the Site

- Construction shall only take place within the approved demarcated site.

- Construction may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the environmental authorisation shall ensure that operations take place only in the demarcated areas as described in this report.
- Watering to minimise the effect of dust generation should be carried out as frequently as necessary. Noise should also be kept within reason.
- No workers will be allowed to damage or collect any indigenous plant or snare any animal.
- Grass and vegetation of the immediate environment or adapted grass / vegetation will be re-established on completion of construction activities, where applicable.
- No firewood to be collected on site and the lighting of fires must be prohibited.
- Cognisance is to be taken of the potential for endangered species occurring in the area. It is considered unlikely, however, that these species will be affected by the proposed activity.

Excavations

Whenever any excavation is undertaken, the following procedures shall be adhered to:

- Topsoil shall be handled as described in this EMP.
- Excavations shall take place only within the approved demarcated site.
- Excavations must follow the contour lines where possible.
- The construction site will not be left in any way to deteriorate into an unacceptable state.
- The excavated area must serve as a final depositing area for waste rock and overburden during the rehabilitation process.
- Once excavations have been filled with overburden, rocks and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previous stored topsoil shall be returned to its original depth over the area.
- The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally occurring flora.

Rehabilitation of Processing and Excavation Areas

- On completion of construction, the surface of the processing areas especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with suitable grasses and local indigenous seed mix.
- Excavations may be used for the dumping of construction wastes. This shall be done in such a way as to aid rehabilitation.
- Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the activity, be corrected and the area be seeded with a vegetation seed mix to his or her satisfaction. This must be done in conjunction with the ECO.
- Final rehabilitation must comply with the requirements mention in the Rehabilitation Plan.

9.7.7 Rehabilitation Plan

Rehabilitation Objective

The overall objective of the rehabilitation plan is to minimize adverse environmental impacts associated with the activity whilst maximizing the future utilization of the property. Significant aspects to be borne in mind in this regard is, revegetation of undeveloped footprint and stability and

environmental risk. The depression and immediate area of the working must also be free of alien vegetation. Additional broad rehabilitation strategies / objectives include the following:

- Rehabilitating the worked-out areas to take place concurrently within prescribed framework established in the EMP.
- All infrastructure, equipment, plant and other items used during the construction period will be removed from the site.
- Waste material of any description, including scrap, rubble and tyres, will be removed entirely from the site and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

Topsoil and Subsoil Replacement

Topsoil and subsoil will be stripped and stockpiled separately and only used in rehabilitation work towards the end of the operation. This is in contrast to the gravel activity where rehabilitation and topsoil replacement was earmarked at the completion of each phase.

Stripped overburden will be backfilled into the worked-out areas where needed. Stripped topsoil will be spread over the re-profiled areas to an adequate depth to encourage plant regrowth. The vegetative cover will be stripped with the thin topsoil layer to provide organic matter to the relayed material and to ensure that the seed store contained in the topsoil is not diminished. Reseeding may be required should the stockpiles stand for too long and be considered barren from a seed bank point of view. Stockpiles should ideally be stored for no longer than a year.

The topsoil and overburden will be keyed into the reprofiled surfaces to ensure that they are not eroded or washed away. The topsoiled surface will be left fairly rough to enhance seedling establishment, reduce water runoff and increase infiltration.

Revegetation

All prepared surfaces will be seeded with suitable grass species to provide an initial ground cover and stabilize the soil surface. The following grass seed that is commonly available and suitable.

Botanical name	Common name	Approx seed mixture /Ha
<i>Cynodon dactylon</i>	Kweek	12 kg/ Ha
<i>Eragrostis curvula</i>	Weeping Love Grass	6 kg/ Ha
<i>Eragrostis tef</i>	Teff	2 kg/ Ha
<i>Digitaria eriantha</i>	Smuts Grass	4 kg/ Ha
Other indigenous veld grasses can be added to the seed mix		± 4 kg/Ha

The overall revegetation plan will, therefore, be as follows:

- Ameliorate the aesthetic impact of the site.
- Stabilise disturbed soil and rock faces.
- Minimize surface erosion and consequent siltation of natural water course located on site.
- Control wind-blown dust problems
- Enhance the physical properties of the soil.
- Re-establish nutrient cycling.
- Re-establish a stable ecological system.

Every effort must be made to avoid unnecessary disturbance of the natural vegetation during operations.

Drainage and Erosion Control

To control the drainage and erosion at site the following procedures will be adopted:

- Areas where construction is completed should be rehabilitated immediately.
- Areas to be disturbed in future activities will be kept as small as possible (i.e., conducting the operations in phases), thereby limiting the scale of erosion.
- Slopes will be profiled to ensure that they are not subjected to excessive erosion but capable of drainage runoff with minimum risk of scour (maximum 1:3 gradient).
- All existing disturbed areas will be re-vegetated to control erosion and sedimentation.
- Existing vegetation will be retained as far as possible to minimize erosion problems.

Visual Impacts Amelioration

The overall visual impact of the proposed activities will be minimised by the following mitigating measures:

- Confining the footprint to an area as small as possible
- Re-topsoiling and vegetating all disturbed areas.

9.7.8 Monitoring and Reporting

Adequate management, maintenance and monitoring will be carried out annually by the applicant to ensure successful rehabilitation of the property until a closure certificate is obtained.

To minimise adverse environmental impacts associated with operations it is intended to adopt a progressive rehabilitation programme, which will entail carrying out the proposed rehabilitation procedures concurrently with activity.

9.7.9 Closure objectives and extent of alignment to pre-construction environment

Closure Objectives

The closure of the site will involve removal of all debris and rehabilitation of areas disturbed during the construction phase of the project. This will comprise the scarification of compacted areas, reshaping of areas, topsoiling and rehabilitating all prepared surfaces.

9.8 Appendix G: General Impact Rating Scale

To ensure a direct comparison between various specialist studies, six standard rating scales are defined and used to assess and quantify the identified impacts. This is necessary since impacts have several parameters that need to be assessed.

These scales are:

1. The Severity/ Benefit Scale, which assesses the importance of the impact from a purely technical perspective.
2. The Spatial Impact Scale, which assesses the extent or magnitude of the impact (the area that will be affected by the impact).
3. The Temporal Impact Scale, which assesses how long the impact will be felt. Some impacts are of a short duration, whereas others are permanent.
4. The Degree of Certainty Scale, which provides a measure of how confident the author feels about their prediction.
5. The Likelihood Scale, which provides an indication of the risk or chance of an impact taking place.
6. The Environmental Significance Scale, which assesses the importance of the impact in the overall context of the affected system or party.

To ensure integration of social and ecological impacts, to facilitate specialist assessment of impact significance, and to reduce reliance on value judgments, the severity of the impact within the scientific field in which it takes place (e.g., vegetation, fauna etc.) was assessed first. Thereafter, each impact was assessed within the context of time and space, and the probability of the impact occurring was quantified using the degree of certainty scale.

The impact was then assessed in the context of the whole environment to establish the “environmental significance” of the impact to the flora and vegetation.

The scales are described in detail below.

9.8.1 The Severity/ Beneficial Scale

The *severity scale* was used to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on an affected system (for ecological impacts) or an affected party. This methodology attempts to remove any value judgments from the assessment, although it relies on the professional judgment of the specialist.

NEGATIVE IMPACT	POSITIVE IMPACT
<p><u>Very severe</u> An irreversible and permanent change to the affected system(s) which cannot be mitigated. For example, change in topography resulting from a quarry.</p>	<p><u>Very Beneficiary</u> A permanent and very substantial benefit to the affected system(s) with no alternative to achieve this benefit.</p>
<p><u>Severe</u> Long-term impacts on the affected system(s) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.</p>	<p><u>Beneficial</u> A long-term impact and substantial benefit to the affected system(s). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.</p>
<p><u>Moderately severe</u> Medium- to long-term impact on the affected system(s) that could be mitigated.</p>	<p><u>Moderately beneficial</u> A medium- to long-term impact of real benefit to the affected system(s) Other ways of optimising are equally difficult, expensive and time consuming (or a combination of these), as achieving them in this way.</p>
<p><u>Slight</u></p>	<p><u>Slightly beneficial</u> A short- to medium-term impact and negligible benefit to the affected system(s) Other ways of</p>

NEGATIVE IMPACT	POSITIVE IMPACT
Medium- to short term impacts on the affected system(s) Mitigation is very easy, cheap, less time consuming or not necessary.	optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
<u>No effect</u> The system(s) is not affected by the proposed development.	<u>Do not know/Cannot know</u> In certain cases, it may not be possible to determine the severity of the impact.

The severity of impacts can be evaluated with and without mitigation order to demonstrate how serious the impact is when nothing is done about it. For beneficial impacts, optimisation means anything that can enhance the benefits. However, mitigation or optimisation must be practical, technically feasible and economically viable.

9.8.2 Spatial and Temporal Scales

Two additional factors were considered when assessing the impacts, namely the relationship of the impact to Spatial and Temporal Scales.

The *spatial scale* (shown in italics) defines the impact at the following scales.

SPATIAL SCALE	EXPLANATION
Localised	at a localised scale (i.e., few hectares in extent). The specific area to which this scale refers is defined for the impact to which it refers.
Study Area	the site, some effects to surrounding area (~10 km)
District	the site, some effects to wider surrounding area (~100 km)
Regional	the site, some effects to surrounding area (+250 km)
National	Impacts will affect at a country level
International	Impacts extend beyond country boundary

The *temporal scale* (shown in italics) defines the impact at the following scales.

TEMPORAL SCALE	EXPLANATION
Short Term	Less than 5 years. Many construction phase impacts will be of a short duration
Medium Term	Between 5 and 20 years
Long Term	Between 20 and 40 years, and from a human perspective essentially permanent.
Permanent	Over 40 years and resulting in a permanent and lasting change.

9.8.3 The Degree of Certainty and the Likelihood Scale

It is also for each specialist to state the degree of certainty, or the confidence attached to their prediction of significance. For this reason, a 'degree of certainty' scale (shown in bold) must be used.

DEGREE	DESCRIPTION
Definite:	More than 90% sure of fact. To use this one will need to substantial supportive data.
Probable:	Between 70% and 90% sure of fact.
Possible:	Between 40% and 70% sure of fact.
Unsure:	Less than 40% sure of fact.

The risk or likelihood (shown in normal font) of impacts being manifested differs. There is no doubt that some impacts would occur, but certain other (usually secondary data) impacts are not as likely and

may or may not result. Although these impacts maybe severe, the likelihood of them occurring may affect their overall significance and must therefore be considered. It is therefore necessary for the author to state his estimate of the likelihood of an impact occurring, using the following likelihood scale:

DEGREE	DESCRIPTION
Very unlikely	The chance of these impacts occurring is extremely slim, e.g., natural forces destroying a dam wall.
Unlikely	The risk of these impacts occurring is slight.
May occur	The risk of these impacts is more likely, although it is not definite.
Very Likely	Slight chance that this impact will not occur.
Definite	There is no chance that this impact will not occur.

9.8.4 The Environmental Significance Scale

The environmental significance scale is an attempt to evaluate the significance of an impact, the severity or benefit of which has already been assessed. This evaluation needs to be assessed in the relevant context, as an impact can either be ecological or social, or both. Since the severity of impacts with and without mitigation will already have been assessed, significance was only evaluated after mitigation. In many cases, this mitigation will take place, as it has been incorporated into project design. A six-point significance scale is applied as follows:

SIGNIFICANCE	DESCRIPTION
Very High (6)	Impacts considered to have a major and permanent change to natural environment and are rate as VERY HIGH, usually resulting to severe or very severe/ beneficial to highly beneficial effects.
High (5)	Long term change and are rated as HIGH resulting to severe or moderately severe effects/ beneficial to moderately beneficial.
Moderate (4)	Medium to long-term effects. Impacts are rated as MODERATE with moderately severe or moderately beneficial effects.
Low (3)	Medium to short term effects. Impacts are rated as MODERATE resulting in moderately severe or moderately beneficial effects.
Insignificant (2)	Short term effects are present. Impacts are rated as SLIGHT resulting in SLIGHTLY BENEFICIAL effects. Residual effects are present but are of no consequence.
No Significance (1)	No primary or secondary effects, resulting in NO SIGNIFICANT impact.
Do not Know (0)	Not possible to determine the significance of impacts

9.8.5 Absence of Data

In certain instances, an assessment must be produced in the absence of all the relevant and necessary data, due to paucity or lack of scientific information on the study area. It is more important to identify all the likely environmental impacts than to precisely evaluate the more obvious impacts. It is important to be on the conservative side in reporting likely environmental impacts. Because assessing impacts with a lack of data is more dependent on scientific judgment, the rating on the certainty scale cannot be too high. It is for these reasons that a degree of certainty scale has been provided, as well as the categories DON'T KNOW or CAN'T KNOW.

9.9 Appendix H: Declaration, Specialist Profile and Registration

DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I JAMIE POTE....., as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

- In terms of the general requirement to be independent:
 - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
 - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.


Signature of the EAP:

22/08/2023
Date:

N/A
Name of company (if applicable):



Jamie Pote

SENIOR ECOLOGIST AND ENVIRONMENTAL
SCIENTIST

CONTACT

-  (+27) 76 888 9890
-  jamiepote@live.co.za
-  Port Elizabeth, South Africa
-  [Linkedin.com](https://www.linkedin.com)
-  JamiePote
-  [Bluesky-SA](https://bluesky.com)

EDUCATION

- Bachelor of Science
Rhodes University
2001 (Botany & Environmental Science)
- Bachelor of Science (Honours)
Rhodes University
2002 (Botany)
- Professional Natural Scientist
SACNASP
2016

SERVICES

- Terrestrial Biodiversity/Ecological Assessments*
- Environmental & Ecological Risk-Assessments*
- Bioremediation, Restoration & Rehabilitation Plans*
- Environmental Management Plans & Programmes*
- GIS Mapping & Analysis & Web maps*
- Alien Invasive Management (Terrestrial)*
- Environmental Auditing & Monitoring (ECO)*
- Flora Search & Rescue & Relocation*
- Independent Environmental & Ecological review*
- Permit and License applications*
- Environmental & Mining Applications*

ABOUT ME

16 years broad professional experience in Biodiversity, Ecological and Vegetation Assessments on over 220 projects in southern, western and central Africa. Senior Environmental Consultant and EAP on over 50 projects in the mining, infrastructure, housing and agricultural sectors. Environmental monitoring and auditing on over 50 civil infrastructure and construction projects. Have managed all aspects of projects from inception through to implementation. GIS mapping and analytics.

EXPERIENCE AND CLIENTS

Key Sectors

- *Wind, Solar Energy Facilities*
- *Infrastructure and Housing*
- *Agriculture and Forestry*
- *Mining and Industrial*

Key Projects

- *Over 220 independent Biodiversity/Ecological Assessments throughout southern, western and central Africa.*
- *Mining applications and construction auditing on over 40 projects and more than 300 gravel borrow pits for the Eastern Cape Department of Roads and Public Works, Department of Transport and the South African National Roads Agency (SANRAL) throughout the Eastern Cape.*
- *South-End Precinct Mixed Use Development for Mandela Bay Development Agency - Environmental application, Ecological assessments and Construction monitoring.*
- *Coega Development Corporation IDZ projects – Ecological assessments, Flora search & rescue and Construction monitoring.*
- *Environmental applications, construction monitoring and auditing for a wide range of projects, including infrastructure and housing for various clients including the Department of Transport and SANRAL.*
- *Various agricultural expansion and infrastructure projects.*
- *Various wind and solar energy and associated infrastructure projects.*
- *Numerous infrastructure projects including electrical, water and roads.*
- *Various Environmental Management and Rehabilitation Plans.*



herewith certifies that
Jamie Robert Claude Pote
Registration Number: 115233
is a registered scientist

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

Effective **20 July 2016**

Expires **31 March 2026**



Chairperson

Chief Executive Officer



To verify this certificate scan this code

MR JAMIE POTE BSC (HONS) PR.SCI.NAT.

PROJECT EXPERIENCE

PERFORMANCE STANDARD BIODIVERSITY AND CRITICAL HABITAT ASSESSMENTS

- Critical Habitat & Biodiversity Assessment - Roggeveld Wind Energy Project 2020
- Biodiversity Assessment for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo 2008

WIND FARM AND PHOTOVOLTAIC INFRASTRUCTURE PROJECTS

- Ecological Assessment for Windcurrent Wind Farm, Eastern Cape 2012
- Ecological Assessment for Universal Windfarm, NMB 2011
- Ecological Assessment for Inca Energy Windfarm, Northern Cape 2011
- Ecological Assessment for Broadlands Photovoltaic Farm, Eastern Cape 2011
- Botanical Assessment for Electrawinds Windfarm Coega, NMB 2010
- Botanical Assessment and Open Space Management Plan for Mainstream WEF Phase 2, Eastern Cape 2010

SPECIALISED ECOLOGICAL REPORTS

- Rehabilitation Plan for Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- Green Star Rating Ecological Assessment for SANRAL office, Bay West City, NMBM 2015
- Section 24G Assessment and Rehabilitation Plan for Bingo Farm, Eastern Cape 2014
- Mapping and Ecological services for Congo Agriculture, Republic of Congo 2013
- Rehabilitation Plan for Nieu Bethesda, Eastern Cape 2011
- Mapping of pipeline for Kenton Water Board, Eastern Cape 2010
- Rehabilitation Plan for N2 Upgrade - Coega to Colchester, NMB 2010
- Representative for landowner group for Seaview burial Park, NMB 2010
- Botanical Sensitivity Analysis for LSDF, Greenbushes-Hunters Retreat, NMB 2008
- Forestry Rehabilitation Assessment Report for Amahlathi Forest Rehabilitation, Eastern Cape 2007
- Botanical & Riparian Assessment for Orange River Weirs-Boegoeberg, Douglas Dam and Sendelingsdrif, Northern Cape 2006
- Botanical Assessment for State of the Environment Report for Chris Hani District Municipality SoER, Eastern Cape 2003

GENERAL INFRASTRUCTURE DEVELOPMENT PROJECTS

- Ecological Assessment for Vermaak Boerdery Hydro Turbine (Cookhouse), Eastern Cape 2020
- Ecological Assessment for Amalinda crossing, BCM, Eastern Cape 2019
- Ecological Assessment for Cookhouse Bridge rehabilitation and temporary deviation, Eastern Cape 2019
- Ecological Assessment for Nelson Mandela University Access Road, NMB 2019
- Botanical Assessment for Zachtevlei Dam (Lady Grey), Eastern Cape 2017
- Botanical Assessment for Gcebula River bridge (Peddie), Eastern Cape 2017
- Botanical Assessment for Kouga Dam wall upgrade, Eastern Cape 2012
- Botanical Assessment for Jansenville Cemetery, Eastern Cape 2009
- Botanical Assessment for Radar Mast construction for South African Weather Service – BCM & NMB 2008
- Botanical Assessment and GIS mapping for golf course realignment for East London Golf Course, BCM, Eastern Cape 2007
- Botanical Assessment for PE Airport Extension, NMB 2006
- Botanical Assessment for Kidd's Beach Desalination Plant, BCM, Eastern Cape 2006

ROAD AND RAILWAY INFRASTRUCTURE PROJECTS

- Ecological Assessment for CDC IDZ Mn Terminal, conveyor and railway line, NMB 2013

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• Ecological Assessment Review for Penhoek Road widening, Eastern Cape	2012
• Ecological Assessment for R61 road widening, Eastern Cape	2012
• Botanical Assessment for Chelsea RD - Walker Drive Ext., NMB	2010
• Botanical Assessment for Motherwell - Blue Water Bay Road, NMB	2010
• Ecological Assessment for Port St John Road, Eastern Cape	2010
• Botanical Basic Assessment for Bholani Village Rd, Port St Johns, Eastern Cape	2009
• Botanical Report, EMP and Rehab Plan for Coega-Colchester N2 Upgrade, NMB	2009
• Botanical Assessment for Manganese Conveyor Screening Report, NMB	2008
• Ecological Assessment for Road Layout for Whiskey Creek- Kenton, Eastern Cape	2006

MINING PROJECTS

• Ecological Assessment for Bochum Borrow Pits, Limpopo	2013
• Ecological Assessment and Mining and Rehabilitation Plan for Greater Soutpansberg Mining Project, Limpopo (3 proposed Mines)	2013
• Ecological Assessment for Thulwe Road Borrow Pits, Limpopo	2013
• Ecological Assessment and Mining and Rehabilitation Plan for Baghana Mining, Ghana	2010
• Botanical Assessment for Zwartbosch Quarry, Eastern Cape	2008
• Botanical description & map production for Quarry - Rudman Quarry, Eastern Cape	2008
• Botanical Basic Assessment, Rehab Plan & Maps for Borrow Pit - Rocklands/Patensie, Eastern Cape	2008
• Botanical Assessment & Maps for Sandman Sand Gravel Mine, Eastern Cape	2008
• Botanical Assessment & GIS maps for Shamwari Borrow Pit, Eastern Cape	2008
• Detailed Botanical Assessment, EMP and Rehab Plan for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo	2008
• Botanical Assessment, Rehab Plan & Maps for Borrow Pit Humansdorp/Oyster Bay, Eastern Cape	2008
• Botanical Assessment, Rehab Plan & Maps for AWRM - Cala, Eastern Cape	2008
• Botanical Assessment, Rehab Plan & Maps for AWRM - Camdeboo, Eastern Cape	2008
• Botanical Assessment, Rehab Plan & Maps for AWRM - Somerset East, Eastern Cape	2008
• Botanical Assessment, Rehab Plan & Maps for AWRM - Nkonkobe, Eastern Cape	2008
• Botanical Assessment, Rehab Plan & Maps for AWRM - Ndlambe, Eastern Cape	2008
• Botanical Assessment, Rehab Plan & Maps for AWRM - Blue Crane Route, Eastern Cape	2008
• Botanical Assessment, EMP and Rehabilitation Plan for AWRM - Cathcart, Eastern Cape	2008
• Botanical Assessment, GIS maps and Rehab Plan for Mthatha Prospecting, Eastern Cape	2008
• Regional Botanical Map for mining prospecting permit, Welkom	2008
• Botanical Assessment for Scoping Report and Detailed Botanical Assessment and Rehab Plan for Elitheni Coal Mine, Eastern Cape	2007
• Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Oyster Bay, Eastern Cape	2007
• Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Bathurst/GHT, Eastern Cape	2007
• Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Jeffreys Bay, Eastern Cape	2007
• Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Storms river/Kareedouw, Eastern Cape	2007
• Biophysical Assessment for Humansdorp Quarry, Eastern Cape	2006
• Botanical Assessment, Rehab Plan & Maps for Quarry-Cathcart & Somerset East, Eastern Cape	2006
• Botanical Assessment, Rehab Plan & Maps for Quarry - Despatch Quarry, NMB	2006
• GIS Mapping & Botanical Assessment and Rehab Plan for Quarry - JBay Crushers, Eastern Cape	2006
• Botanical Assessment, EMP and Rehabilitation Plan for Polokwane Silicon Smelter, Limpopo	2006
• Application for Mining Permit for Bruce Howarth Quarry, Eastern Cape	2006

POWERLINE INFRASTRUCTURE PROJECTS

• Ecological Assessment: Dieprivier-Karreedouw 132kV Powerline realignment, Kouga LM	2016
• Eskom Ecological Walkdown: Dieprivier-Karreedouw 132 kV Powerline, Kouga LM	2016
• Eskom Solar one Ecological Walkdown: Nieuwehoop 400 kV powerline	2015
• Rehabilitation Plan and Auditing for Grassridge-Poseidon Powerline Rehab, Eastern Cape	2013
• Ecological Assessment for Dieprivier Karreedouw 132kV Powerline, Eastern Cape	2012

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• Flora and Fauna search and Rescue plan for Van Stadens Windfarm Powerline, NMB	2012
• Botanical Assessment for Dedisa-Grassridge Powerline, Eastern Cape	2010
• Ecological Assessment for Grahamstown-Kowie Powerline, Eastern Cape	2010
• Species of Special Concern Mapping Transmission Line for San Souci to Nivens Drift 132kV powerline, NMB	2009
• Botanical Assessment for Eskom Powerline - Albany-Kowie, Eastern Cape	2009
• Botanical Assessment for Eskom 132 kV Dedisa Grassridge Power line-Coega, NMB	2006
• Botanical Assessment for Eskom Power line – Tylara-Wilo, Eastern Cape	2006
• Botanical Assessment for Steynsburg - Teebus 132 kV powerline, Eastern Cape	2004

PIPELINE INFRASTRUCTURE PROJECTS

• Terrestrial Biodiversity Assessment for Thornhill Phase 2 Sanitation Link, Ndlambe, Eastern Cape	2020
• Botanical Assessment for Ngqamakhwe Regional Water Supply Scheme (Phase 3)	2018
• Ecological Assessment for Butterworth Emergency Bulk Water Supply Scheme	2017
• Ecological Assessment for Karringmelkspruit Emergency Bulk Water Supply (Lady Grey)	2017
• Ecological Assessment for Wanhoop-Willowmore Bulk Water Supply, Eastern Cape	2016
• Ecological Assessment for Steytlerville Bulk Water Supply, Eastern Cape (Phase 4)	2013
• Ecological Assessment for Steytlerville Bulk Water Supply, Eastern Cape (Phase 5)	2013
• Detailed Ecological Assessment for Suikerbos Pipeline, Gauteng	2012
• Basic Botanical Assessment for Wanhoop farm pipeline, Eastern Cape	2010
• Basic Botanical Assessment for Chatty Sewer, NMB	2010
• Species of Special Concern Mapping for Seaview Pipeline, NMB	2009
• Species of Special Concern Mapping for Chelsea Bulk Water Pipeline, NMB	2009
• Map Production for Russell Rd Stormwater, NMB	2008
• Basic Botanical Assessment for Albany Pipeline, Eastern Cape	2008
• Environmental Risk Assessment for Elands River pipeline, Eastern Cape	2007
• Detailed Botanical Assessment for Motherwell Pipeline, NMB	2007
• Detailed Botanical Assessment, GIS maps for Erasmuskloof Pipeline, Eastern Cape	2007
• Botanical & Floristic Report for Hankey pipeline, Eastern Cape	2006
• Detailed Botanical Assessment for Port Alfred water pipeline, Eastern Cape	2004

HOUSING DEVELOPMENT PROJECTS

• Terrestrial Biodiversity Assessment for Erf 1820 Mthatha, KSDM, Eastern Cape	2020
• Ecological Assessment for Erf 599 Walmer Mixed Use Development, Nelson Mandela Bay	2019
• Ecological Assessment for erf 14, Kabega, Port Elizabeth	2017
• Ecological Assessment for Fairwest Rental Housing, Port Elizabeth	2017
• Ecological Assessment for Hankey Housing, Kouga District Municipality	2015
• Ecological Assessment for Lebowakgoma Housing, Limpopo	2013
• Ecological Assessment for Giyani Development, Limpopo	2013
• Ecological Assessment for Palmietfontein Development, Limpopo	2013
• Ecological Assessment for Seshego Development, Limpopo	2013
• Botanical Assessment for Sheerness Road, BCM, Eastern Cape	2013
• Ecological Assessment for Ethembeni Housing, NMB	2012
• Ecological Assessment for Pelana Housing, Limpopo	2012
• Flora Search and Rescue Plan for Kwanobuhle Housing, Western Cape	2011
• Botanical Assessment for The Craggs 288/03, Western Cape	2010
• Ecological Assessment Revision Report for Fairview Housing, NMB	2010
• Botanical Assessment, EMP and Open Space Management Plan for Hornlee Housing Development, Western Cape	2010
• Botanical Assessment for Little Ladywood, Western Cape	2010
• Botanical Assessment and Open Space Management Plan for Motherwell NU31, NMB	2010
• Botanical Assessment and Open Space Management Plan for Plett 443/07, Western Cape	2010

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• Botanical Assessment for Willow Tree Farm, NMB	2010
• Botanical Assessment for Kouga RDP Housing, Eastern Cape	2009
• Botanical Assessment for Fairview Erf 1226 (Wonderwonings), NMB	2009
• Species List Compilation for Zeekoerivier Humansdorp, Eastern Cape	2009
• Botanical Assessment for Woodlands Golf Estate (Farm 858), BCM, Eastern Cape	2009
• Botanical Assessment for Plettenberg Bay - 438/4, Western Cape	2009
• Vegetation Assessment for Kwanokuthula RDP housing project, Western Cape	2008
• Site screening assessment for Greenbushes Site screening, NMB	2008
• Botanical Assessment for Fairfax development, Eastern Cape	2008
• Botanical Assessment for Plettenberg Bay Brakkloof 50&51, Western Cape	2008
• Botanical Assessment, GIS mapping for Theescombe Erf 325, NMB	2008
• Site Screening for Mount Road, NMB	2008
• Botanical Assessment for Greenbushes Farm 40 Swinburne 404, NMB	2008
• Botanical Assessment for Greenbushes 130, NMB	2008
• Botanical Assessment for Greenbushes Kuyga no. 10, NMB	2008
• Botanical Assessment for Plettenberg Bay - 438/24, Western Cape	2007
• Botanical Assessment for Plettenberg Bay - Olive Hills 438/7, Western Cape	2007
• Botanical Assessment for Gonubie Portion 809/9, BCM, Eastern Cape	2006
• Botanical Assessment for Glengariff Farm 723, BCM, Eastern Cape	2006
• Botanical Assessment for Gonubie Portion 809/10, BCM, Eastern Cape	2006
• Botanical Assessment for Gonubie Portion 809/4 & 5, BCM, Eastern Cape	2006
• Botanical Assessment for Plettenberg bay - Ladywood 438/1&3, Western Cape	2006
• Botanical Assessment and Rehab Plan for Winterstrand Desalination Plant, BCM	2006
• Botanical Assessment for Bosch Hoogte, NMB	2006
• Botanical Assessment for Plettenberg bay Farm 444/38, Western Cape	2006
• Botanical Assessment for Plettenberg Bay - 444/27, Western Cape	2006
• Botanical Assessment for Leisure Homes, BCM, Eastern Cape	2006
• Botanical Basic Assessment for Trailees Wetland Assessment, Eastern Cape	2005
• Botanical Assessment and Rehab Plan for Arlington Racecourse - PE, NMB	2005
• Botanical Assessment for Smart Stone, NMB	2005
• Botanical Assessment for Peninsular Farm (Port Alfred), Eastern Cape	2005
• Botanical Assessment for Mount Pleasant - Bathurst, Eastern Cape	2005
• Botanical Assessment and RoD amendments for Colchester Erven 1617 & 1618 (Riverside), NMB	2005
• Basic Botanical Assessment for Parsonsvelei 3/4, Eastern Cape	2005
• Botanical Assessment for Bridgemoor – Malabar PE, NMB	2004

AGRICULTURAL PROJECTS

• Ecological Assessment for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape	2015
• Ecological Assessment for Doornkraal Pivot (Hankey), Eastern Cape	2014
• Ecological Assessment for Citrus expansion on Farm 960, Patensie	2014
• Ecological Assessment for Tzaneen Chicken Farm, Limpopo	2013
• Botanical Assessment and Open Space Management Plan for Kudukloof, NMB	2010
• Botanical Assessment and Open Space Management Plan for Landros Veeplaats, NMB	2010
• Botanical Assessment and Flora Relocation Plan for Wildemans Plaas, NMB	2006

GOLF ESTATE AND RESORT DEVELOPMENT PROJECTS

• Species List& Comments Report for Kidds Beach Golf Course, BCM, Eastern Cape	2009
• Botanical Assessment for Plettenberg Bay -Farm 288/03, Western Cape	2009
• Botanical Assessment for Rockcliff Golf Course, BCM, Eastern Cape	2008
• Botanical Assessment for Rockcliff Resort Development, BCM, Eastern Cape	2007
• Botanical Assessment, EMP and Rehabilitation Plan for Tiffendel Ski Resort, Eastern Cape	2006

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MIXED USE DEVELOPMENT PROJECTS

- Ecological Assessment for South-End Precinct Mixed Use Development, Nelson Mandela Bay 2018
- Botanical Assessment, EMP and Open Space Management Plan for Bay West City, NMB 2010
- Botanical Assessment, GIS maps, Open Space and Rehab Plans for Fairview Erf 1082, NMB 2009
- Botanical Assessment and GIS maps for Utopia Estate PE, NMB 2008
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park, NMB 2007
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park, NMB 2007
- Botanical Basic Assessment for Cuyler Manor (Farm 320), Uitenhage, NMB 2007

BUSINESS AND INDUSTRIAL DEVELOPMENT PROJECTS

- Ecological Assessment for Parsonsvei Erf 984 & 1134 Parsonsvei, NMB 2020
- Ecological Assessment for Walmer Erf 11667 - Bidfood Warehousing Development, NMB 2020
- Ecological Assessment for Portion 87 of the Farm Little Chelsea No 10, NMB 2020
- Ecological Assessment for Bay West City ENGEN Service Station, NMB 2015
- Ecological Assessment for Green Star grading for SANRAL, NMB 2014
- Ecological Assessment for OTGC Tank Farm, NMB 2012
- Botanical Assessment and Open Space Management Plan for Petro SA Refinery, Coega IDZ, NMB 2010
- Botanical Assessment for Bluewater Bay Erf 805, NMB 2009
- Ecological Assessment for Bay West City, NMB 2007
- Botanical Assessment for Kenton Petrol Station, Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester Petrol Station, NMB 2005

ECO-ESTATE DEVELOPMENT PROJECTS

- Botanical Re-Assessment of Swanlake Eco Estate, Aston Bay, Eastern Cape 2018
- Detailed Botanical Assessment and Open Space Management Plan for Olive Hills, Western Cape 2010
- Botanical Assessment and EMP for Zwartbosch Road, Eastern Cape 2010
- Botanical Assessment - Poultry Farm for Coega Kammaskloof Farm 191, NMB 2008
- Botanical Assessment - Housing development for Coega Ridge, NMB 2008
- Botanical Assessment, Rehabilitation Plan, EMP and GIS maps for Amanzi Estate, NMB, 2008
- Botanical Assessment for Roydon Game farm, Queenstown, Eastern Cape 2007
- Botanical Assessment for Winterstrand Estate (Farm 1008), BCM, Eastern Cape 2007
- Botanical Assessment for Homeleigh Farm 820, BCM, Eastern Cape 2007
- Botanical Basic Assessment, Rehab Plan & Maps for Candlewood, Tsitsikamma, Western Cape 2007
- Botanical Assessment, EMP and Rehab Plan for Carpe Diem Eco development, Eastern Cape 2007
- Botanical Assessment, EMP and Rehabilitation Plan for Seaview Eco-estate, NMB 2006
- Botanical Assessment for Kidd's Beach portion 1076, BCM, Eastern Cape 2006
- Botanical Assessment for Palm Springs, Kidds Beach East London, BCM, Eastern Cape 2006
- Botanical Assessment for Nahoon Farm 29082, BCM, Eastern Cape 2006
- Botanical Assessment for Rosehill Farm, Eastern Cape 2005
- Botanical Assessment for Resolution Game Farm, Eastern Cape 2005
- Botanical Assessment for Gonubie Portion 809/11, BCM, Eastern Cape 2005
- Botanical Assessment for Kidd's Beach portion 1075, BCM, Eastern Cape 2005

FLORA AND FAUNA RELOCATION PLANS, PERMITS AND IMPLEMENTATION

- Flora Search and Rescue for Nelson Mandela University Phase 2 & 3 Residences, Eastern Cape 2020
- Flora Search and Rescue for Fairwest Housing Estate, Nelson Mandela Bay, Eastern Cape 2019
- Flora Search and Rescue for Utopia Estate, Nelson Mandela Bay, Eastern Cape 2019
- Flora Search and Rescue for Citrus expansion on Boschkraal Citrus Farm, Sunland, Eastern Cape 2018
- Flora Search and Rescue for Wanhoop pipeline, Willowmore, Eastern Cape 2018
- Flora Search and Rescue for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017

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• Flora Search and Rescue for Steytlerville Bulk Water Supply, Eastern Cape (Phase 5)	2016
• Flora Search and Rescue for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery)	2016
• Flora Search and Rescue for Steytlerville Bulk Water Supply & WTW, Eastern Cape (Phase 4)	2015
• Flora and Fauna Search and Rescue for Riversbend Citrus Farm, NMB	2014
• Flora and Fauna Search and Rescue for Mainstream Windfarm, Eastern Cape	2013
• Flora Search and Rescue for Steytlerville Bulk Water Supply, Eastern Cape (Phase 1, 2 & 3)	2013
• Flora and Fauna Search and Rescue for OTGC Tank Farm, Coega IDZ, NMB	2013
• Flora and Fauna Search and Rescue for Jeffreys Bay School, Eastern Cape	2013
• Flora Search and Rescue Plan for Red Cap Wind Farm, Eastern Cape	2012
• Flora Relocation for Disco Poultry Farm, NMB	2010
• Flora Relocation for Mainstream Windfarm, Eastern Cape	2010

ENVIRONMENTAL MANAGEMENT PLANS

• Final Environmental Management Programme (EMPr) and Maintenance Management Plan for South End Precinct Mixed Use Zone, Nelson Mandela Bay Municipality	2020
• Final Environmental Management Programme (EMPr) for Coega Land-Based Aquaculture Development Zone (ADZ), Coega Industrial Development Zone (IDZ), Nelson Mandela Bay Municipality	2019
• Basic Botanical Assessment for Kromensee EMP (Jeffries Bay), Eastern Cape	2010
• Wetland Management Plan for NMB Portnet, NMB	2010
• Baseline Botanical Study, Vegetation mapping and EMP for Local Nature Reserve for Plettenberg Bay Lookout LNA, Western Cape	2009
• Biodiversity & Ecological Processes for Bathurst-Commonage, Eastern Cape	2006
• EMP for Kromensee EMP (Jeffries Bay), Eastern Cape	2006
• Floral Survey for Mbotyi Conservation Assessment, Eastern Cape	2005
• Identifying and Assessment on Aquatic Weeds for Pumba Private Game Reserve, Eastern Cape	2005

ENVIRONMENTAL MANAGEMENT, AUDITING, COMPLIANCE AND MONITORING PROJECTS

• ECO for DRPW IRM Road Maintenance projects, Baviaans LM	2019
• ECO for DRPW IRM Road Maintenance projects, Senqu LM	2019
• ECO for DRPW IRM Road Maintenance projects, Kouga/Koukamma LM	2019
• ECO for DRPW IRM Road Maintenance projects, Sakhisizwe/Engcobo LM	2019
• ECO for DRPW IRM Road Maintenance projects, Elundini LM	2019
• ECO for DRPW IRM Road Maintenance projects, Emalahleni/Intsika Yethu LM	2019
• ECO for Construction of Fairwest Village Housing Project	2019
• ECO for Construction of Utopia Estate	2019
• ECO for Construction of NMU West End Student Residences Phases 1 & 3	2019
• ECO for DRPW IRM Road Maintenance projects, Raymond Mahlaba LM	2018
• ECO for DRPW IRM Road Maintenance projects, Inkwanca (Enoch Mgijima) LM	2018
• ECO for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery)	2017
• ECO for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape	2017
• DEO for improvement of national route R67 section 5 from Whittlesea (km 0.00) to Swart Kei river (km 15.40) – Murray & Roberts	2017
• ECO for SANRAL RRP Road Maintenance projects, Mbizana LM	2017
• ECO and Botanical Specialist for the special maintenance of national route R61 Section 2 from Elinus Farm (km 42.2) to N10 (km 85.0) (SANRAL)	2016
• Environmental Control Officer (ECO): Construction of NSRI Slipway - Port Elizabeth Harbour	2016
• ECO for SANRAL RRP Road Maintenance projects, Mbashe LM	2016
• ECO for SANRAL RRP Road Maintenance projects, Nkonkobe LM	2016
• ECO for SANRAL RRP Road Maintenance projects, Mbizana LM	2016
• ECO for SANRAL RRP Road Maintenance projects, Senqu LM	2016
• ECO for SANRAL RRP Road Maintenance projects, Elundini LM	2016

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• ECO and Environmental Management for closure of Bushmans River Landfill site	2016
• ECO for DRPW IRM Road Maintenance projects, Amahlathi Municipality	2015
• ECO for DRPW IRM Road Maintenance projects, Makana/Ndlambe Municipality	2015
• ECO for DRPW IRM Road Maintenance projects, Mbashe/Mqume Municipality	2015
• ECO for DRPW IRM Road Maintenance projects, Port St Johns, Mbizana, Ingquza Hill LM's	2015
• ECO for Riversbend Citrus Farm, NMB	2014
• ECO for Alfred Nzo DM Road resurfacing - DR08071, DR08649, DR08092, DR08418, DR08452, DR08015, DR08085, DR08639 & DR08073, Eastern Cape - MSBA	2014
• ECO Audits for Koukamma Flood Damage Road Repairs – Hatch Goba	2014
• EMP and ECO for Utopia Estate, NMB	2013
• Final EMP submission for Seaview Garden Estate, NMB	2012
• ECO audits for NMB Road surfacing, NMB (multiple contacts)	2011
• EMP submission and ECO for Seaview Garden Estate, NMB	2010
• ECO for Mainstream Windfarm wind monitoring mast installation, Eastern Cape	2010
• EMP and ECO for Sinati Golf Estate EMP, BCM, Eastern Cape	2009
• Flora Relocation Plan and Permit application for Wildemans Plaas, NMB	2006

BASIC ASSESSMENT APPLICATION PROJECTS (DEDEAT)

• Basic Assessment Application for Parsonsvei Erf 984 & 1134 Parsonsvei	2020
• Basic Assessment Application for Vermaak Boerdery Hydro Turbine (Cookhouse)	2020
• Basic Assessment Application for Walmer Erf 11667 Bidfood Warehousing Development	2020
• Basic Assessment Application for Portion 87 of the Farm Little Chelsea No 10	2020
• Basic Assessment Application for Nelson Mandela University Access Road, NMB	2019
• Basic Assessment Application for Erf 599 Walmer Mixed Use Development, Nelson Mandela Bay	2019
• Basic Assessment Application for Cookhouse Bridge rehabilitation and temporary deviation	2019
• Basic Assessment Application for Erf 14 Kabega, NMBM	2017
• Basic Assessment Application for Hankey Housing, Kouga District Municipality	2017
• Basic Assessment Application for Fairwest Rental Housing, Nelson Mandela Bay	2017
• Basic Assessment Application for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape	2015
• Basic Assessment Application for Hankey Housing, Kouga District Municipality	2015
• Basic Assessment Application for Citrus expansion on farm 960, Patensie (AIN du Preez Boerdery)	2014
• Basic Assessment Application for South-End Precinct Mixed Use Development, Nelson Mandela Bay 2018	

ENVIRONMENTAL SCREENING PROJECTS

• Environmental Screening Report for Proposed Life Hospital parking expansion, NMB	2019
• Environmental Screening Report for Erf 984 & 1134 development, Parsonsvei, NMB	2019
• Environmental Screening Report for proposed Khayaletu School, Buffalo City	2018
• Environmental Screening Report for Proposed Housing Development of Erf 8700, Kabega Park, NMB	2017
• Environmental Screening Report for Proposed Housing Development of Erf 14, Kabega Park, NMB	2017
• Environmental Screening Report for Proposed Fairwest Social Housing project, Fairview, NMB	2016
• Environmental Screening Report for Development of Little Chelsea No 25, NMB	2016
• Terrestrial Vegetation Risk Assessment for proposed Skietnek Citrus Farm development (Kirkwood)	2015
• Preliminary Environmental Risk Assessment: NSRI Slipway Port Elizabeth	2015
• Environmental Screening Report for Proposed Development of a Dwelling on Erf 899, Theescombe	2015
• Environmental Screening Report for Proposed Development on Erf 559, Walmer, Port Elizabeth	2015
• Environmental Screening Report for Proposed Housing Scheme Development of Erf 8709, Wells Estate	2015
• Environmental Screening Report for Development of Portion 10 of Little Chelsea No 87, NMB	2015

MINING PERMIT/ENVIRONMENTAL MANAGEMENT PROGRAMME APPLICATIONS (DMR)

• Mining BAR/EMP's for Blue Crane Route LM Borrow Pits – (DoT)	2019
• Mining BAR/EMP's for 24 Borrow Pits in 6 districts within the Eastern Cape– (SANRAL)	2018
• Mining BAR/EMP's for Ingquza Hill LM Borrow Pits – (SANRAL)	2017
• Mining BAR/EMP's for Baviaans LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Senqu LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Kouga/Koukamma LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Inkwanca (Enoch Mgjijima) LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Kouga/Koukamma LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Sakhisizwe/Engcobo LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Raymond Mahlaba LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Camdeboo LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Elundini LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Emalahleni/Intsika Yethu LM Borrow Pits – (DRPW)	2017
• Mining BAR/EMP's for Nkonkobe LM Borrow Pits – (SANRAL)	2016
• Mining BAR/EMP's for Mbashe LM Borrow Pits – (SANRAL)	2016
• Mining BAR/EMP's for Mbizana LM Borrow Pits – (SANRAL)	2016
• Mining BAR/EMP's for Senqu LM Borrow Pits – (SANRAL)	2016
• Mining BAR/EMP's for Elundini LM Borrow Pits – (SANRAL)	2016
• Mining BAR/EMP's for Emalahleni LM Borrow Pits – (SANRAL)	2016
• Mining BAR/EMP's for Emalahleni LM Borrow Pits – (DRPW)	2016
• Mining BAR/EMP's for Ikwezi/Baviaans LM Borrow Pits – (DRPW)	2016
• Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (Tarkastad) (DRPW)	2015
• Mining BAR/EMP's for Chris Hani DM Borrow Pits – Intsika Yethu and Emalahleni (DRPW)	2015
• Mining BAR/EMP's for Joe Gqabi DM Borrow Pits – Senqu (DRPW)	2015
• Mining BAR/EMP's for Makana/Ndlambe LM Borrow Pits – Sarah Baartman (DRPW)	2015
• Mining BAR/EMP's for Amahlathi LM Borrow Pits – Amatole (DRPW)	2015
• Mining BAR/EMP's for Mbashe/Mqume LM Borrow Pits – Amatole (DRPW)	2015
• Mining BAR/EMP's for Sundays River Valley LM Borrow Pits – Sarah Baartman (DRPW)	2015
• Mining BAR/EMP's for Kouga LM Borrow Pits – Sarah Baartman (DRPW)	2015
• Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (DRPW)	2014
• Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR02581 (DRPW)	2014
• Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08041, DR08247, DR08248 & DR08504 (DRPW)	2014
• Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08599, DR08601 & DR08570 (DRPW)	2014
• Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08235, DR08551 & DR08038 (DRPW)	2014
• Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08092, DR08093 & DR08649 (DRPW)	2014
• Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08090, DR08412, DR08425, DR08129, DR08109, DR08106, DR08104 & DR08099 – Matatiele (DRPW)	

SECTION 24G APPLICATIONS

• 12 000 ML Dam constructed on farm 960, Patensie (MGM Trust)	2015
• Illegal clearing of 20 Ha of lands on Hitgeheim Farm, Sunland, Eastern Cape	2015

GIS AND IT DEVELOPMENT

• Development of iAuditor Environmental Audit templates (DRPW audits)	2014
• Landsat Image classification and analysis (Congo Agriculture)	2010
• Development of GIS databases and mapping tools for Manifold GIS software	2008

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CONFERENCES AND PUBLICATIONS

- Pote, J., Shackleton, C.M., Cocks, M. & Lubke, R. 2006. Fuelwood harvesting and selection in Valley Thicket, South Africa. *Journal of Arid Environments*, 67: 270-287.
- Pote, J., Cocks, M., Dold, T., Lubke, R.A. and Shackleton, C. 2004. The homegarden cultivation of indigenous medicinal plants in the Eastern Cape. *Indigenous Plant Use Forum*, 5 - 8 July 2004, Augsburg Agricultural School, Clanwilliam, Western Cape.
- Pote, J. & Lubke, R.A. 2003. The selection of indigenous species suitable for use as fuelwood and building materials as a replacement of invasive species that are currently used by the under-privileged in the Grahamstown commonage. *Working for Water Inaugural Research Symposium* 19 - 21 August 2003, Kirstenbosch. Poster presentation.
- Pote, J. & Lubke, R.A. 2003. The screening of indigenous pioneer species for use as a substitute cover crop for rehabilitation after removal of woody alien species by WfW in the grassy fynbos biome in the Eastern Cape. *Working for Water Inaugural Research Symposium* 19 - 21 August 2003, Kirstenbosch, South Africa.

OTHER RESEARCH EXPERIENCE

- Resource assessment of bark stripped trees in indigenous forests in Weza/Kokstad area (June 2000; Dr C. Geldenhuis & Mr. M. Kaplin).
- Working for Water research project for indigenous trees for woodlots (December 2000/January 2001; Prof R.A. Lubke, Rhodes University).
- Project coordinator and leader of the REFYN project – A BP conservation gold award: Conservation and Restoration of Grassy-Fynbos. A multidisciplinary project focusing on management, restoration and public awareness/education (2001 – 2002).
- Conservation Project Management Training Workshops: Royal Geographical Society, London 2001 – Fieldwork Techniques, Habitat Assessment, Biological Surveys, Project Planning, Public Relations and Communications, Risk Assessment, Conservation Education
- Selection and availability of wood in Crossroads village, Eastern Cape, South Africa. Honours Research Project 2002. Supervisors: Prof. R.A. Lubke & Prof. C. Shackleton.
- Floral Morphology, Pollination and Reproduction in *Cyphia* (LOBELIACEAE). Honours Research Project 2002. Supervisor: Mr. P. Phillipson.
- Forestry resource assessment of bark-stripped species in Amatola District (December 2002; Prof R.A. Lubke).
- Homegarden Cultivation of Medicinal Plants in the Amathole area. Postgraduate Research Project (2003-2005; Prof R.A. Lubke, Prof C.M. Shackleton and Ms C.M., Cocks).

9.10 Appendix I: Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity

SCOPE

The protocol (*Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020)*) provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation.

The protocol (*Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted on 30 October 2020*), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.

These protocols replace the requirements of Appendix 6 of the Environmental Impact Assessment Regulation¹⁴.

The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (<https://screening.environment.gov.za/screeningtool>). The requirements for terrestrial biodiversity are for landscapes or sites which support various levels of biodiversity. The relevant terrestrial biodiversity data in the screening tool has been provided by the South African National Biodiversity Institute¹⁵.

SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool must be confirmed by undertaking a site sensitivity verification.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken using:
 - a. a desk top analysis, using satellite imagery,
 - b. a preliminary on-site inspection; and
 - c. any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
 - a. confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.
 - b. contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; and
 - c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

TERRESTRIAL BIODIVERSITY SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

¹⁴ The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act 107 of 1998).

¹⁵ The biodiversity dataset has been provided by the South African National Biodiversity Institute (for details of the dataset, click on the options button to the right of the various biodiversity layers on the screening tool).

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	General Information	
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified on the screening tool as being "very high sensitivity" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment.	✓
1.2	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being 'low sensitivity' for terrestrial biodiversity, must submit a Terrestrial Biodiversity Compliance Statement.	✓
1.3	However, where the information gathered from the site sensitivity verification differs from the designation of 'very high' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.	✓
1.4	Similarly, where the information gathered from the site sensitivity verification differs from that identified as having a 'low' terrestrial biodiversity sensitivity on the screening tool, a Terrestrial Biodiversity Specialist Assessment must be conducted.	✓
1.5	If any part of the proposed development footprint falls within an area of 'very high' sensitivity, the assessment and reporting requirements prescribed for the 'very high' sensitivity apply to the entire footprint, excluding linear activities for which impacts on terrestrial biodiversity are temporary and the land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any area that will be disturbed.	✓
	VERY HIGH SENSITIVITY RATING for terrestrial biodiversity features	
2	Terrestrial Biodiversity Specialist Assessment	
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	✓
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	✓
2.3	The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:	✓
2.3.1	a description of the ecological drivers or processes of the system and how the proposed development with impact these;	✓
2.3.2	ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	✓
2.3.3	the ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	✓
2.3.4	the description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA) sub catchments);	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
2.3.5	a description of terrestrial biodiversity and ecosystems on the preferred site, including:	✓
(a)	main vegetation types;	✓
(b)	threatened ecosystems, including listed ecosystems as well as locally important habitat types identified;	✓
(c)	ecological connectivity, habitat fragmentation, ecological processes and fine-scale habitats; and	✓
(d)	species, distribution, important habitats (e.g., feeding grounds, nesting sites, etc.) and movement patterns identified;	✓
2.3.6	the assessment must identify any alternative development footprints within the preferred site which would be of 'low' sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	✓
2.3.7	the assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:	✓
2.3.7.1	terrestrial critical biodiversity areas (CBAs), including:	✓
(a)	the reasons why an area has been identified as a CBA;	✓
(b)	an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;	✓
(c)	the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to remaining extent of the ecosystem type(s);	✓
(d)	the impact on ecosystem threat status;	✓
(e)	the impact on explicit subtypes in the vegetation;	✓
(f)	the impact on overall species and ecosystem diversity of the site; and	✓
(g)	the impact on any changes to threat status of populations of species of conservation concern in the CBA;	✓
2.3.7.2	terrestrial ecological support areas (ESAs), including:	✓
(a)	the impact on the ecological processes that operate within or across the site;	✓
(b)	the extent the proposed development will impact on the functionality of the ESA; and	✓
(c)	loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;	✓
2.3.7.3	protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including	✓
(a)	an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;	✓
2.3.7.4	priority areas for protected area expansion, including-	✓
(a)	the way in which in which the proposed development will compromise or contribute to the expansion of the protected area I network;	✓
2.3.7.5	Strategic Water Source Areas (SWSAs) including:	✓
(a)	the impact(s) on the terrestrial habitat of SWSA; and	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
(b)	the impacts of the proposed development on the SWSA water quality and quantity (e.g., describing potential increased runoff leading to increased sediment load in water courses),	✓
2.3.7.6	FEPA sub catchments, including-	✓
(a)	the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;	✓
2.3.7.7	indigenous forests, including:	✓
(a)	impact on the ecological integrity of the forest and	✓
(b)	percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.	✓
2.4	The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report	✓
3	Terrestrial Biodiversity Specialist Assessment Report	
3.1	The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:	✓
3.1.1	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	✓
3.1.2	a signed statement of independence by the specialist;	✓
3.1.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment,	✓
3.1.4	description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modeling used, where relevant;	✓
3.1.5	a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	✓
3.1.6	a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	✓
3.1.7	additional environmental impacts expected from the proposed development;	✓
3.1.8	any direct, indirect, and cumulative impacts of the proposed development;	✓
3.1.9	the degree to which impacts, and risks can be mitigated;	✓
3.1.10	the degree to which the impacts and risks can be reversed;	✓
3.1.11	the degree to which the impacts and risks can cause loss of irreplaceable resources;	✓
3.1.12	proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr),	✓
3.1.13	a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a 'low' terrestrial biodiversity sensitivity and that were not considered appropriate,	✓
3.1.14	a substantiated statement based on the findings of the specialist assessment, regarding the acceptability, or not. of the proposed development if it should receive approval a not; and	✓
3.1.15	any conditions to which this statement is subjected.	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	✓
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓
	LOW SENSITIVITY RATING – for terrestrial biodiversity features	
4	Terrestrial Biodiversity Compliance Statement	✓
4.1	The compliance statement must be prepared by a specialist registered with the SACNASP and having expertise in the field of ecological sciences.	✓
4.2	The compliance statement must:	✓
4.2.1	be applicable to the preferred site and proposed development footprint;	✓
4.2.2	confirm that the site is of 'low' sensitivity for terrestrial biodiversity; and	✓
4.2.3	indicate whether or not the proposed development will have any impact on the biodiversity feature.	✓
4.3	The compliance statement must contain, as a minimum, the following information:	✓
4.3.1	the contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	✓
4.3.2	a signed statement of independence by the specialist;	✓
4.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
4.3.4	a baseline profile description of biodiversity and ecosystems of the site;	✓
4.3.5	the methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modeling used, where relevant;	✓
4.3.6	in the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures propped, the land can be returned to the current state within two years of completion of the construction phase;	✓
4.3.7	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	✓
4.3.8	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	✓
4.3.9	any conditions to which this statement is subjected.	✓
4.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓

ANIMAL SPECIES SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	General Information	
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "very high" or "high" sensitivity for terrestrial animal species must submit a Terrestrial Animal Species Specialist Assessment Report.	✓

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1.2	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of “medium sensitivity” for terrestrial animal species must submit either a Terrestrial Animal Species Specialist Assessment Report or a Terrestrial Animal Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4.	✓
1.3	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of “low” sensitivity for terrestrial animal species must submit a Terrestrial Animal Species Compliance Statement.	✓
1.4	Where the information gathered from the site sensitivity verification differs from the screening tool designation of “very high” or “high”, for terrestrial animal species sensitivity and it is found to be of a “low” sensitivity, then a Terrestrial Animal Species Compliance Statement must be submitted.	✓
1.5	Where the information gathered from the site sensitivity verification differs from the screening tool designation of “low” terrestrial animal species sensitivity and it is found to be of a “very high” or “high” terrestrial animal species sensitivity, a Terrestrial Animal Species Specialist Assessment must be conducted.	✓
1.6	If any part of the development falls within an area of confirmed “very high” or “high” sensitivity, the assessment and reporting requirements prescribed for the “very high” or “high” sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol means, the area on which the proposed development will take place and includes the area that will be disturbed or impacted.	✓
1.7	The Terrestrial Animal Species Specialist Assessment and the Terrestrial Animal Species Compliance Statement must be undertaken within the study area.	✓
1.8	Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.	✓
1.9	Where the nature of the activity is expected to have an impact on SCC beyond the boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline ¹⁶ , and the study area must include the PAOI, as determined.	✓
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial animal species	
2	Terrestrial Animal Species Specialist Assessment	✓
	VERY HIGH SENSITIVITY RATING Critical habitat for range-restricted species ¹⁷ of conservation concern, that have a global range of less than 10 km ² .	✓

¹⁶ Available at <https://bgis.sanbi.org/>

¹⁷ Species with a geographically restricted area of distribution.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	<p>SCC listed on the IUCN Red List of Threatened Species¹⁸ or on South Africa's National Red List website¹⁹ as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare.</p> <p>Species aggregations that represent $\geq 1\%$ of the global population size of a species, over a season, and during one or more key stages of its life cycle.</p> <p>The number of mature individuals that ranks the site among the largest 10 aggregations known for the species.</p> <p>These areas are irreplaceable for SCC.</p> <p>HIGH SENSITIVITY RATING</p> <p>Confirmed habitat for SCC.</p> <p>SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.</p> <p>These areas are unsuitable for development due to a very likely impact on SCC.</p>	
2.1	The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with a field of practical experience relevant to the taxonomic group ("taxa") for which the assessment is being undertaken.	✓
2.2	The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline ²⁰ ; and must:	✓
2.2.1	identify the SCC which were found, observed or are likely to occur within the study area;	✓
2.2.2	provide evidence (photographs or sound recordings) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility ²¹ , immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	✓
2.2.3	identify the distribution, location, viability ²² and provide a detailed description of population size of the SCC, identified within the study area;	✓
2.2.4	identify the nature and the extent of the potential impact of the proposed development on the population of the SCC located within the study area;	✓
2.2.5	determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases, including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;	✓
2.2.6	determine the potential impact of the proposed development on the habitat of the SCC located within the study area;	✓

¹⁸ <https://www.iucnredlist.org/>

¹⁹ This category includes the categories Extremely Rare, Critically Rare, and Rare

²⁰ Available at <https://bgis.sanbi.org/>

²¹ The preferred platform is iNaturalist.org but any other national or international virtual museum.

²² the ability to survive and reproduce in the long term.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
2.2.7	include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, include a motivation for the deviation;	✓
2.2.8	identify any dynamic ecological processes occurring within the broader landscape that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;	✓
2.2.9	identify any potential impact of ecological connectivity in relation to the broader landscape, resulting in impacts on the identified SCC and its long-term viability;	✓
2.2.10	determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC;	✓
2.2.11	discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species ²³ ; or roosting and breeding or foraging areas used by migratory species where these species show significant congregations, occurring in the vicinity; and	✓
2.2.12	identify any alternative development footprints within the preferred site which would be of “low” or “medium” sensitivity as identified by the screening tool and verified through the site sensitivity verification.	✓
2.3	The findings of the assessment must be written up in a Terrestrial Animal Species Specialist Assessment Report.	✓
3	Terrestrial Animal Species Specialist Assessment Report	✓
3.1	This report must include as a minimum the following information:	✓
3.1.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	✓
3.1.2	a signed statement of independence by the specialist;	✓
3.1.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
3.1.4	a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	✓
3.1.5	a description of the mean density of observations/number of sample sites per unit area ²⁴ and the site inspection observations;	✓
3.1.6	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓
3.1.7	details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported ²⁵ ;	✓

²³ Undescribed species are to be assessed as “High Sensitivity”.

²⁴ Species Environmental Assessment Guideline

²⁵ The actual name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain. It should be referred to as a sensitive plant or animal and its IUCN extinction risk category should be included e.g., Critically Endangered sensitive plant or Endangered sensitive butterfly.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1.8	the online database name, hyperlink, and record accession numbers for disseminated evidence of SCC found within the study area;	✓
3.1.9	the location of areas not suitable for development and to be avoided during construction where relevant;	✓
3.1.10	a discussion on the cumulative impacts;	✓
3.1.11	impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	✓
3.1.12	a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	✓
3.1.13	a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above that were identified as having “low” or “medium” terrestrial animal species sensitivity and were not considered appropriate.	✓
3.2	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓
4	MEDIUM SENSITIVITY SPECIES OF CONSERVATION CONCERN CONFIRMATION	
	MEDIUM SENSITIVITY RATING – for terrestrial animal species: Suspected habitat for SCC based either on historical records (prior to 2002) or being a natural area included in a habitat suitability model for this species ²⁶ . SCC listed on the IUCN Red List of Threatened Species or South Africa’s National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	✓
4.1	Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 or is based on habitat suitability modelling.	✓
4.2	The presence or likely presence of the SCC identified by the screening tool must be investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups (“taxa”) for which the assessment is being undertaken.	✓
4.3	The assessment must be undertaken within the study area.	✓
4.4	The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guidelines.	✓
4.5	The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC identified within the site identified as “medium” sensitivity by the screening tool.	✓

²⁶ The methodology by which habitat suitability models have been developed are explained within the Species Environmental Assessment Guideline.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
4.6	Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Animal Species Specialist Assessment must be submitted in accordance with the requirements specified for “very high” and “high” sensitivity in this protocol.	✓
4.7	Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a Terrestrial Animal Species Compliance Statement must be submitted.	✓
5	LOW SENSITIVITY RATING – for terrestrial animal species	
	Terrestrial Animal Species Compliance Statement Areas where no natural habitat remains. Natural areas where there is no suspected occurrence of SCC.	✓
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Zoological Science or Ecological Science).	✓
5.2	The compliance statement must:	✓
5.2.1	be applicable to the study area;	✓
5.2.2	confirm that the study area, is of “low” sensitivity for terrestrial animal species; and	✓
5.2.3	indicate whether or not the proposed development will have any impact on SCC.	✓
5.3	The compliance statement ²⁷ must contain, as a minimum, the following information:	✓
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	✓
5.3.2	a signed statement of independence by the specialist;	✓
5.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✓
5.3.5	the mean density of observations/ number of samples sites per unit area.	✓
5.3.6	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	✓
5.3.7	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	✓
5.3.8	any conditions to which the compliance statement is subjected.	✓
6	A signed copy of the Terrestrial Animal Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	✓

²⁷ An example of a what is contained in a Compliance Statement for Animal Species Impact Assessment can be found in the Species Environmental Impact Assessment Guideline

PLANT SPECIES SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	General Information	
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of “very high” or “high” sensitivity for terrestrial plant species must submit a Terrestrial Plant Species Specialist Assessment Report.	✓
1.2	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of “medium sensitivity” for terrestrial plant species must submit either a Terrestrial Plant Species Specialist Assessment Report or a Terrestrial Plant Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4.	✓
1.3	An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of “low” sensitivity for terrestrial plant species must submit a Terrestrial Plant Species Compliance Statement.	✓
1.4	Where the information gathered from the site sensitivity verification differs from the screening tool designation of “very high” or “high”, for terrestrial plant species sensitivity and it is found to be of a “low” sensitivity, then a Terrestrial Plant Species Compliance Statement must be submitted.	✓
1.5	Where the information gathered from the site sensitivity verification differs from the screening tool designation of “low” terrestrial plant species sensitivity and it is found to be of a “very high” or “high” terrestrial plant species sensitivity, a Terrestrial Plant Species Specialist Assessment must be conducted.	✓
1.6	If any part of the development falls within an area of confirmed “very high” or “high” sensitivity, the assessment and reporting requirements prescribed for the “very high” or “high” sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol means, the area on which the proposed development will take place and includes the area that will be disturbed or impacted.	✓
1.7	The Terrestrial Plant Species Specialist Assessment and the Terrestrial Plant Species Compliance Statement must be undertaken within the study area.	✓
1.8	Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.	✓
1.9	Where the nature of the activity is expected to have an impact on SCC beyond the boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline ²⁸ , and the study area must include the PAOI, as determined.	✓
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial plant species	
2	Terrestrial Plant Species Specialist Assessment	✓

²⁸ Available at <https://bgis.sanbi.org/>

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	<p>VERY HIGH SENSITIVITY RATING Critical habitat for range-restricted species²⁹ of conservation concern, that have a global range of less than 10 km². SCC listed on the IUCN Red List of Threatened Species³⁰ or on South Africa's National Red List website³¹ as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare. Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle. The number of mature individuals that ranks the site among the largest 10 aggregations known for the species. These areas are irreplaceable for SCC.</p> <p>HIGH SENSITIVITY RATING Confirmed habitat for SCC. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare. These areas are unsuitable for development due to a very likely impact on SCC.</p>	✓
2.1	The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with a field of practical experience relevant to the taxonomic group (“taxa”) for which the assessment is being undertaken.	✓
2.2	The assessment must be undertaken within the study area.	✓
2.3	The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline ³² ; and must:	✓
2.3.1	Identify the SCC which were found, observed or are likely to occur within the study area;	✓
2.3.2	provide evidence (photographs) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility ³³ , immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	✓
2.3.3	identify the distribution, location, viability ³⁴ and provide a detailed description of population size of the SCC, identified within the study area;	✓
2.3.4	identify the nature and the extent of the potential impact of the proposed development on the population of the SCC located within the study area;	✓
2.3.5	determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national	✓

²⁹ Species with a geographically restricted area of distribution.

³⁰ <https://www.iucnredlist.org/>

³¹ This category includes the categories Extremely Rare, Critically Rare, and Rare

³² Available at <https://bgis.sanbi.org/>

³³ The preferred platform is [iNaturalist.org](https://www.inaturalist.org/) but any other national or international virtual museum.

³⁴ the ability to survive and reproduce in the long term.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
	and international databases, including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;	
2.3.6	determine the potential impact of the proposed development on the habitat of the SCC located within the study area;	✓
2.3.7	include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, include a motivation for the deviation;	✓
2.3.8	identify any dynamic ecological processes occurring within the broader landscape that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;	✓
2.3.9	identify any potential impact of ecological connectivity in relation to the broader landscape, resulting in impacts on the identified SCC and its long-term viability;	✓
2.3.10	determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC;	✓
2.3.11	discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species ³⁵ ;	✓
2.3.12	identify any alternative development footprints within the preferred site which would be of “low” or “medium” sensitivity as identified by the screening tool and verified through the site sensitivity verification.	✓
2.4	The findings of the assessment must be written up in a Terrestrial Plant Species Specialist Assessment Report.	✓
3	Terrestrial Plant Species Specialist Assessment Report	✓
3.1	This report must include as a minimum the following information:	✓
3.1.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	✓
3.1.2	a signed statement of independence by the specialist;	✓
3.1.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
3.1.4	a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	✓
3.1.5	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓
3.1.6	a description of the mean density of observations/number of sample sites per unit area ³⁶ and the site inspection observations;	✓

³⁵ Undescribed species are to be assessed as “High Sensitivity”.

³⁶ Species Environmental Assessment Guideline

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
3.1.7	details of all SCC found or suspected to occur on site, ensuring sensitive species ³⁷ are appropriately reported;	✓
3.1.8	the online database name, hyperlink, and record accession numbers for disseminated evidence of SCC found within the study area;	✓
3.1.9	the location of areas not suitable for development and to be avoided during construction where relevant;	✓
3.1.10	a discussion on the cumulative impacts;	✓
3.1.11	impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	✓
3.1.12	a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	✓
3.1.13	a motivation must be provided if there were any development footprints identified as per paragraph 2.3.12 above that were identified as having “low” or “medium” terrestrial plant species sensitivity and were not considered appropriate.	✓
3.2	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	✓
4	MEDIUM SENSITIVITY SPECIES OF CONSERVATION CONCERN CONFIRMATION	
	MEDIUM SENSITIVITY RATING – for terrestrial plant species: Suspected habitat for SCC based either on there being records for this species collected in the past, prior to 2002, or being a natural area included in a habitat suitability model ³⁸ . SCC listed on the IUCN Red List of Threatened Species or South Africa’s National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	✓
4.1	Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 or is based on habitat suitability modelling.	✓
4.2	The presence or likely presence of the SCC identified by the screening tool must be investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups (“taxa”) for which the assessment is being undertaken.	✓
4.3	The assessment must be undertaken within the study area.	✓
4.4	The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guidelines.	✓

³⁷ The actual name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain. It should be referred to as a sensitive plant or animal and its IUCN extinction risk category should be included e.g., Critically Endangered sensitive plant or Endangered sensitive butterfly.

³⁸ The methodology by which habitat suitability models have been developed are explained within the Species Environmental Assessment Guideline.

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
4.5	The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC identified within the site identified as “medium” sensitivity by the screening tool.	✓
4.6	Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Plant Species Specialist Assessment must be submitted in accordance with the requirements specified for “very high” and “high” sensitivity in this protocol.	✓
4.7	Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a Terrestrial Plant Species Compliance Statement must be submitted.	✓
5	LOW SENSITIVITY RATING – for terrestrial plant species	
	Terrestrial Plant Species Compliance Statement Areas where no natural habitat remains. Natural areas where there is no suspected occurrence of SCC.	✓
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science).	✓
5.2	The compliance statement must:	✓
5.2.1	be applicable to the study area;	✓
5.2.2	confirm that the study area, is of “low” sensitivity for terrestrial plant species; and	✓
5.2.3	indicate whether or not the proposed development will have any impact on SCC.	✓
5.3	The compliance statement ³⁹ must contain, as a minimum, the following information:	✓
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	✓
5.3.2	a signed statement of independence by the specialist;	✓
5.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✓
5.3.5	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	✓
5.3.6	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓
5.3.7	the mean density of observations/ number of samples sites per unit area ⁴⁰ ; and	✓
5.3.8	any conditions to which the compliance statement is subjected.	✓

³⁹ An example of a what is contained in a Compliance Statement for Plant Species Impact Assessment can be found in the Species Environmental Impact Assessment Guideline

⁴⁰ Refer to the Species Environmental Assessment Guideline

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
6	A signed copy of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	

9.11 Appendix J: Site Sensitivity Verification Report

9.11.1 Purpose of Report

The “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24 (5) (a) and (h) and 44 of the Act, when applying for Environmental Authorisation”, as published on 20 March, 2020 in National Gazette, No. 43110 in terms of NEMA (Act 107 of 1998) sections 24(5)(a), (h) and 44, lists protocols and minimum report requirements for environmental impacts on terrestrial biodiversity and provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation. The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the National web based Environmental Screening Tool. Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a **site sensitivity verification**, which must include the following.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken through the use of:
 - a. a desk top analysis, using satellite imagery.
 - b. a preliminary on -site inspection; and
 - c. any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
 - a. confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool.
 - b. contains a motivation and evidence of either the verified or different use of the land and environmental sensitivity; and
 - c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

The National Web Based Screening Tool was used to generate the potential environmental sensitivity of the site which has then been compared to various online and other databases and information sources in order to verify and confirm the validity of the screening tool findings. This was further supported with on-site observations and analysis of most recent aerial photography.

This terrestrial biodiversity site verification has been undertaken as per the requirements of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020).

9.11.2 Data sources and references

Data sources that were utilised for this report include the following:

- National (DFFE) Web Based Screening Tool – to generate the sites potential environmental sensitivity.
- National Vegetation Map 2018 (NVM, 2018), Mucina & Rutherford (2006) and National Biodiversity Assessment (NBA, 2019) – description of vegetation types, species (including endemic) and vegetation unit conservation status.
- National and Regional Legislation including Provincial Nature Conservation Ordinance (P.N.C.O). NEM:BA Threatened or Protected Species (ToPS).
- Botanical Database of Southern Africa (BODATSA) and New Plants of Southern Africa (POSA) – lists of plant species and potential species of concern found in the general area (SANBI.)
- International Union for Conservation of Nature (IUCN) - Red List of Threatened Species.
- Animal Demography Unit Virtual Museum (VM) – potential faunal species.

- Global Biodiversity Information Facility (GBIF) – potential faunal species.
- Southern African Bird Atlas Project 2 (SABAP2) – for bird species records.
- National Red Books and Lists - mammals, reptiles, frogs, dragonflies & butterflies.
- National Freshwater Ecosystem Priority Areas assessment (NFEPA, 2011) - important catchments.
- National Protected Areas Expansion Strategy (NPAES, 2018) and South Africa Protected Area database (2020) – protected area information.
- SANBI BGIS – All other biodiversity GIS datasets.
- Western Cape Biodiversity Spatial Plan (2017).
- The Garden Route Biodiversity Sector Plan for the George, Knysna and Bitou Municipalities (2010).
- Aerial Imagery – Google Earth, ESRI, Chief Surveyor General (<http://csg.dla.gov.za>).
- Cadastral and other topographical country data - Chief Surveyor General (<http://csg.dla.gov.za>).
- Other sources include peer-reviewed journals, regional and local assessments, and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans (as above), and any pertinent masters and doctoral theses, among others.

9.11.3 Site visit

A site visit was conducted on 15 August 2023 during late winter. The site falls within a winter rainfall area and for the purposes of this report, based on favourable seasonal rainfall and on-site observations, the site visit is deemed to be adequate. A follow up site visit will be conducted at a late stage in the Scoping and EIA phase in order to supplement the species list. The site visit and assessment were undertaken by Mr Jamie Pote, SACNASP registered ecological scientist with a BSc (Hons) degree in Botany and a BSc degree in Botany and environmental Science, with nearly 20 years' experience undertaking ecological and terrestrial biodiversity assessments.

9.11.4 Assumptions, Uncertainties and Gaps in Knowledge

The findings and recommendations of this report may be susceptible to the following uncertainties and limitation:

- No assessment has been made of aquatic aspects relating to any wetlands, pans and rivers/seeps and/or estuaries outside of the scope of a terrestrial biodiversity report and have been undertaken by an aquatic specialist.
- No specific faunal assessment has been undertaken, but animals have been assessed in term of the terrestrial Biodiversity Assessment requirements.
- Any flora surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times.
- As far as possible, site collected data has been supplemented with desktop and database-centred distribution data as well as previous studies undertaken in the area.

9.11.5 Site and Activity Description

The proposed project is located to the west of Plettenberg Bay in the Western Cape, in the Kranshoek area. The proposed development consists of a mixed-use housing development on Portions 7 and 8 of Farm 432 (Kranshoek).

9.11.6 National Environmental Screening Tool

The DEA Screening Tool indicates the following (dated 27/02/2026)

- Terrestrial Biodiversity is **Very High** (Figure 33). *This assessment.*
- Plant species sensitivity is **Medium and Low** (Figure 34). *This assessment.*
- Animal Species sensitivity is **High and Medium** (Figure 35). *Refer to separate fauna assessment.*
- Aquatic Sensitivity is **Very High** (Figure 36). *Refer to separate aquatic assessment.*



Figure 33: Terrestrial Biodiversity Sensitivity (NEST).



Figure 34: Plant Species Sensitivity (NEST).

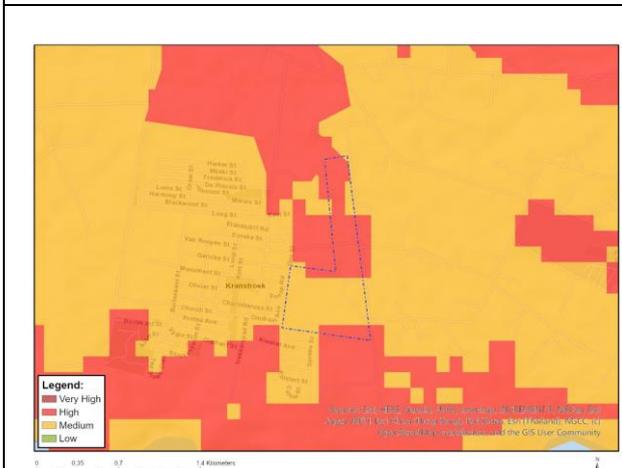


Figure 35: Animal Species Sensitivity (NEST).



Figure 36: Aquatic Sensitivity (NEST).

Terrestrial Sensitivity	Feature(s) in proximity
Very High	CBA 1 & 2 (Terrestrial), ESA 2 (Restore from other land use), FEPA sub-catchment, SWSA (Outeniqua)
High	None
Medium	None
Low	None
Plant Sensitivity	Feature(s) in proximity
Very High	None
High	None
Medium	<i>Aspalathus bowieana</i> , Sensitive species 131, <i>Leucospermum glabrum</i> , <i>Mimetes pauciflorus</i> , <i>Erica glandulosa</i> subsp. <i>fourcadei</i> , <i>Pterygodium newdigateae</i> , <i>Osteospermum pterigoideum</i> , <i>Acmadenia alternifolia</i> , <i>Muraltia knysnaensis</i> , <i>Erica glumiflora</i> , <i>Pterygodium cleistogamum</i>
Low	Present
Animal Sensitivity	Feature(s) in proximity
Very High	None

Terrestrial Sensitivity	Feature(s) in proximity
High	<i>Circus ranivorus</i> , <i>Neotis denhami</i> , <i>Bradypterus sylvaticus</i> (birds)
Medium	<i>Chlorotalpa duthieae</i> , Sensitive species 8 (mammals), <i>Neotis denhami</i> & <i>Bradypterus sylvaticus</i> (birds), <i>Afrixalus knysnae</i> (amphibian), <i>Aloeides thyra orientis</i> & <i>Aneuryphymus montanus</i> (insects),
Low	None
Aquatic Sensitivity	Feature(s) in proximity
Very High	ESA 1: Aquatic, FEPA sub-catchment, SWSA (Outeniqua)
High	None
Medium	None
Low	None

The site assessment will physically screen for the presence of these, and other possible species or sensitivities that are not identified in the screening tool. Not all features are directly affected, but being in proximity, the risks associated with the activity will be investigated further and addressed in the report.

The following is deduced from the DFFE National Environmental Screening Tool:

- As apparent from the National Environmental Screening Tool, the terrestrial biodiversity theme is Very-High due to portions of the site being designated ESA 1 & 2 (along watercourses) as well as falling within FEPA sub catchment, SANParks (Buffer) – Garden Route National Park, SWSA (Outeniqua).
- Several flora (plant) species regarded as being of concern are flagged and will be assessed further in the report, however none were found to be present during the site visit and are furthermore not deemed likely to be present due to the disturbed and/or transformed nature of the site.
- Several fauna (animal) species regarded as being of concern are flagged and will be assessed further in the report as well as the separate faunal specialist assessment report.
- The aquatic sensitivity is High due to falling within a designated FEPA sub catchment and SWSA (Outeniqua). Watercourse that are present include only 2 small non-perennial watercourses.
- The terrestrial flora and fauna impacts are assessed further in the relevant report sections for flora and fauna in the accompanying report.

The site assessment has physically screened for the presence of any species as listed in the National Environmental Screening Tool, as well as other possible species or sensitivities that are not identified in the screening tool. Not all features are directly affected, but being in proximity, the risks associated with the activity will be investigated further and addressed in the report.

9.11.7 Findings, Outcomes and Recommendations

Terrestrial Biodiversity

Site verification of the Terrestrial Biodiversity sensitivities is summarised in Table 11 and depicted in Figure 37, where ESA 1 is dark blue and ESA 2 is light. Both ESA 1 & 2 are associated with watercourses.

Table 11: Terrestrial Biodiversity Features.

Feature	COMMENT	
Critical Biodiversity Area 1	Partially present	Significantly degraded and offers limited conservation value as an island of vegetation. Disconnected from the north by dense alien invasion and to the south by transformed habitat.
Critical Biodiversity Area 2	Partially present	Significantly degraded and offers limited conservation value as an island of vegetation. Disconnected from the

Feature	COMMENT	
		north by dense alien invasion and to the south by transformed habitat.
Ecological Support Area 1	Present	Associated with watercourse on portion 8. Excluded from development plan as open space.

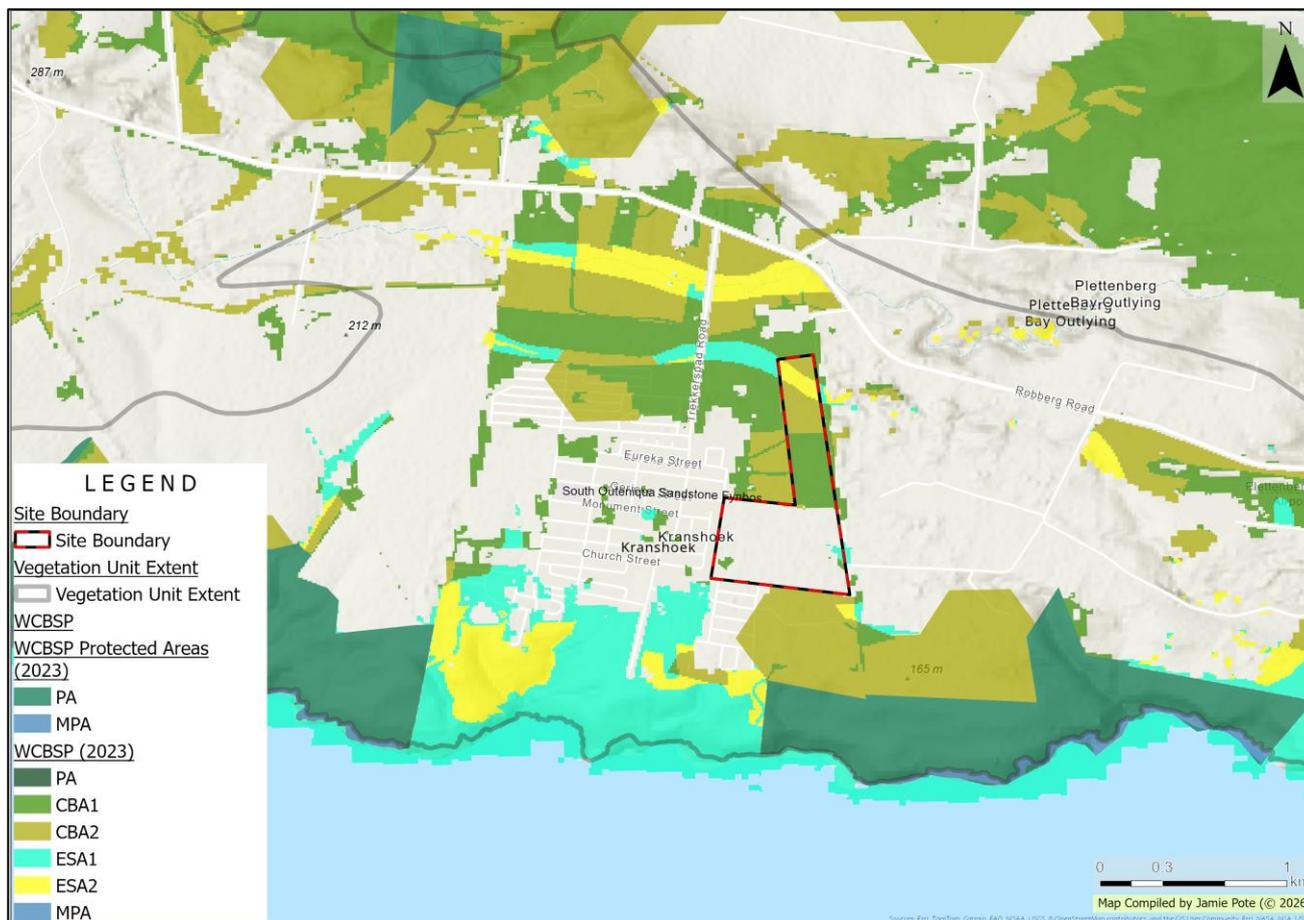


Figure 37: Map indicating Western Cape Biodiversity Spatial Plan (2017).

Plant Species (Flora)

National Environmental Screening Tool flagged several flora species. Further screening of species on the site concluded that no species of conservation concern having an elevated status and/or limited distribution range are confirmed present.

Animal Species (Fauna)

National Environmental Screening Tool flagged several fauna species. Further screening of species on the site concluded that other than *Chlorotalpa duthieae*, which was confirmed to be present by the faunal specialist, no other fauna species of conservation concern having an elevated status and/or limited distribution range are likely to be significant and directly affected. Refer to separate faunal assessment.

Aquatic

Wetland and River features are present in the broader area, including non-perennial watercourses traversing the site. These are generally modified. Refer to separate aquatic assessment.

9.11.8 Conclusions

The site verification thus confirms that the site falls within the terrestrial biodiversity screening tool designated Ecological Support Area 1 and 2. These designations of a buffer around watercourses are standard in the WC BSP across the western cape province and represent important ecological corridors.

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