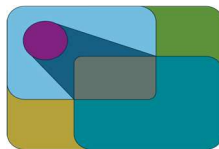
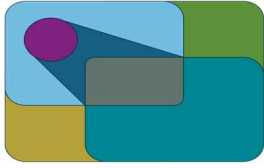


Plants, Animals, and Terrestrial Biodiversity Assessment

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



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Plant Species, Animal Species, and Terrestrial Biodiversity Assessment Report for pipeline at Brandwacht, Western Cape

6 March 2026

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Specialist details and declaration

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

Details of the specialist:

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

Declaration of independence

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

Disclosure

BioCensus (Pty) Ltd undertakes to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the

National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

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

A handwritten signature in black ink, appearing to read 'D Hoare', is positioned above a horizontal line.

6 March 2026

Dr David Hoare

Date

Executive summary

The Environmental Impact Assessment (EIA) for the proposed pipeline through the town Brandwacht, Western Cape, considers biodiversity sensitivities highlighted for the site, namely threatened animal species, a listed threatened ecosystem, and Critical Biodiversity Areas (CBAs).

Impact Assessment of Confirmed Sensitivities

- No plant Species of Conservation Concern (SCC) were recorded on or are likely to occur on site. This is because no intact natural habitats occur within the footprint area.
- There is suspected habitat in the general study area for two bird SCC, namely Denham's Bustard (*Neotis denhami*) and the Martial Eagle (*Polemaetus bellicosus*) and both could occur there. However, they are not limited to any specific habitat and the proposed activity will be very limited in extent. Neither species will be affected.
- CBAs are mapped across the site, but the footprint of the proposed pipeline does not traverse these.
- The site is within an area mapped as occurring within a listed Endangered ecosystem, namely Garden Route Granite Fynbos. There is no remaining natural habitat in the footprint area, except for riparian habitat. The riparian habitat is azonal and not representative of the terrestrial ecosystem. There is secondary vegetation on old lands and on roadsides that is legally defined as being in a natural state. This does not have the characteristics of the original terrestrial vegetation that would have occurred there. No intact areas of the listed ecosystem will therefore be affected.

Restoration/rehabilitation is recommended to minimise risk of alien invasive species spread and erosion.

This project based on the implementation of proposed mitigation measures is supported.

Terms of reference

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

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

The assessment and minimum reporting requirements of these protocols are associated with a level of environmental sensitivity identified by the Department of Forestry, Fisheries and the Environment (DFFE) national web-based environmental screening tool (<https://screening.environment.gov.za/screeningtool>).

Introduction

Site location

The pipeline is to be routed through the town of Brandwacht (Figure 1), near Mossel Bay, Western Cape. There is a short section along the R328, and then turns north-west into Haelkraal street, after which it crosses the Brandwagrivier and deviates east over a farm to re-join the R328.

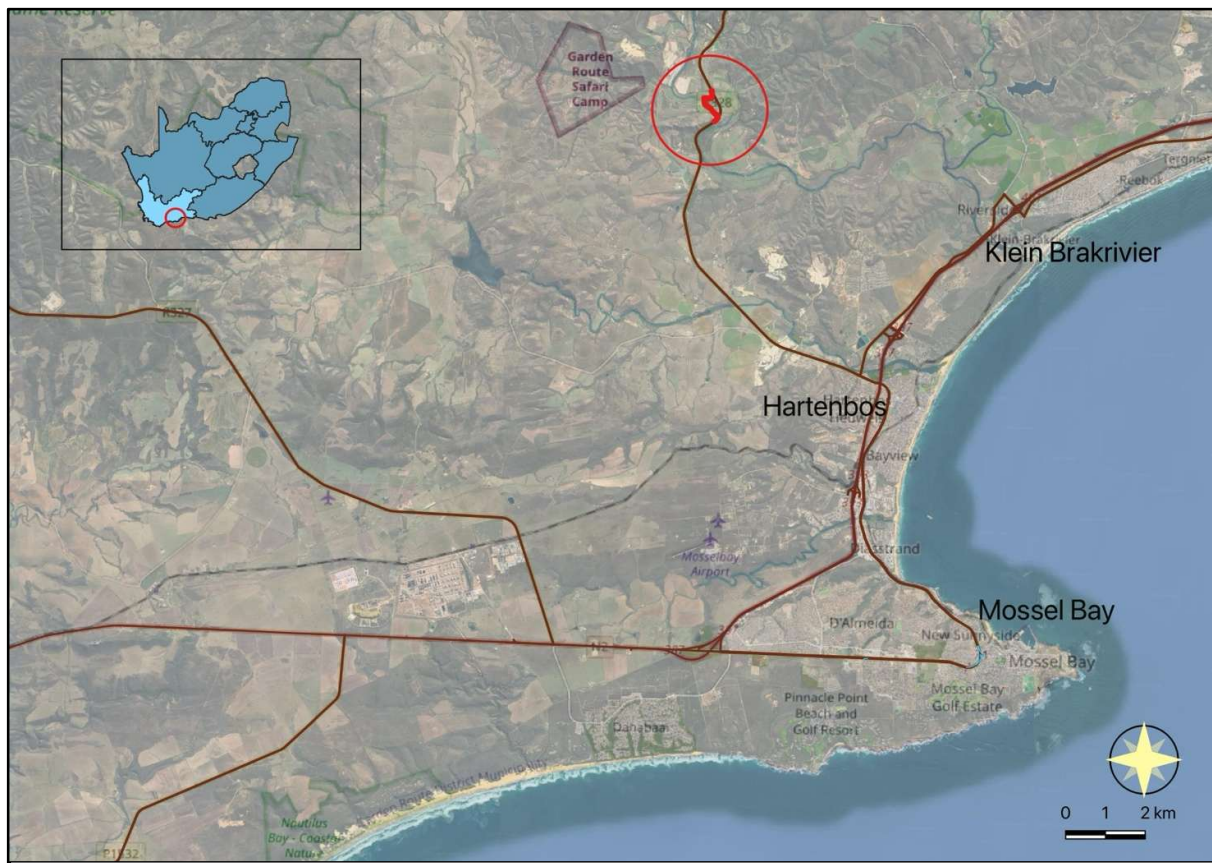


Figure 1: Location of the site (inside red circle).

Aerial imagery (Figure 2) shows a 50 m wide corridor along the proposed pipeline route and surrounding areas. The southern end of the corridor is on the R328 road. The central portion of the corridor is along an existing road that goes through a farm village south of Brandwacht. It crosses the Brandwacht River on an existing bridge and then goes through an old land back to the R328.

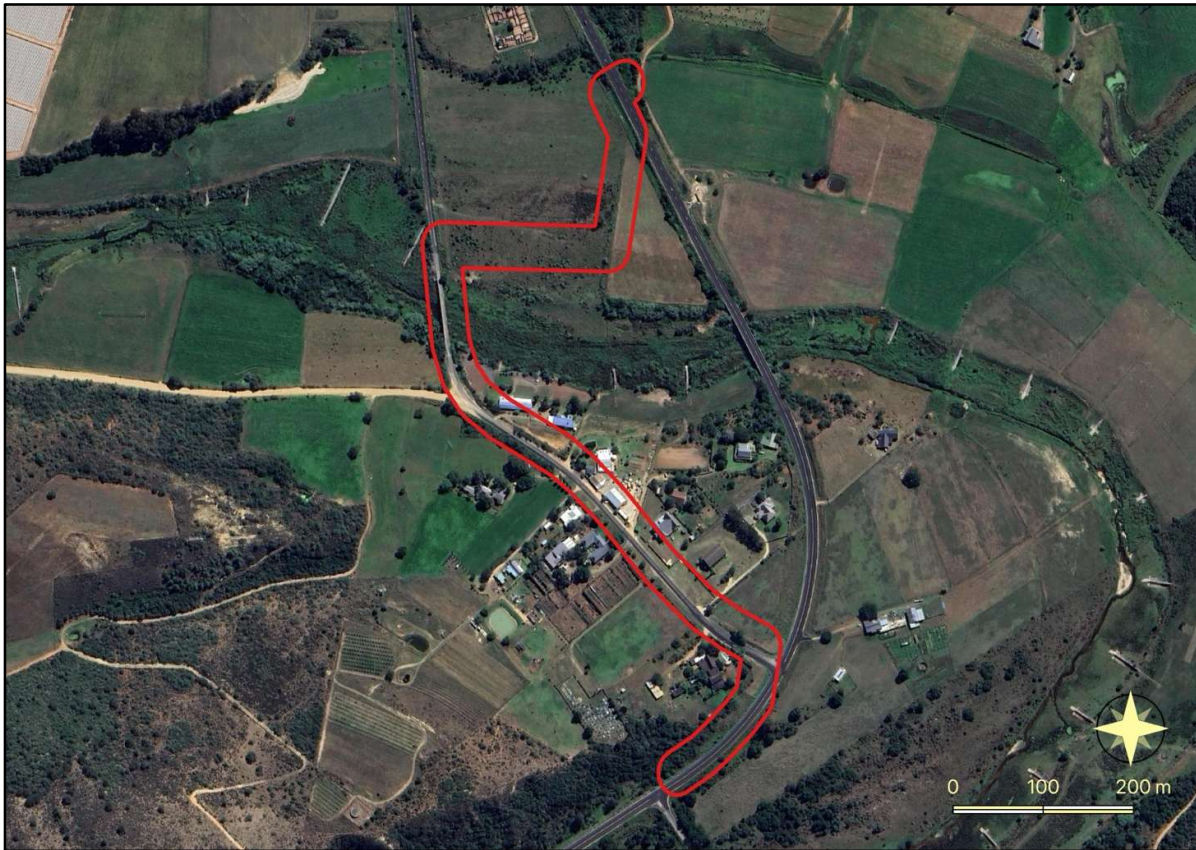


Figure 2: Aerial image of the property and surrounding areas.

Identified Theme Sensitivities

A sensitivity screening report from the DFFE online screening tool was requested in the application category:

Transformation of land | From agriculture or afforestation

The screening tool report for the area, dated 19/8/2025, indicates the following ecological sensitivities:

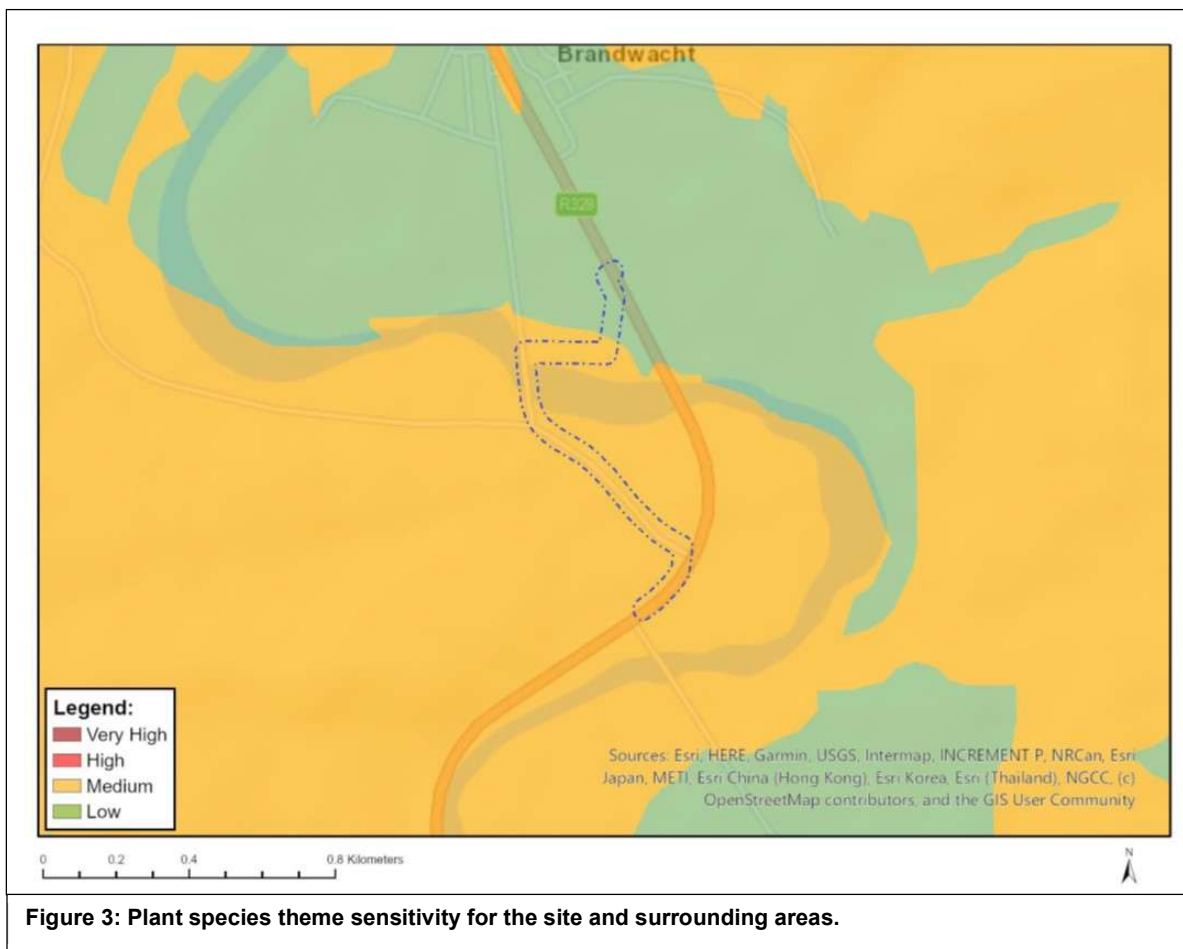
Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species Theme			X	
Animal Species Theme		X		
Terrestrial Biodiversity Theme	X			

Plant species theme

Areas of different sensitivity are shown in Figure 3. Species of Conservation Concern (SCC) that are flagged for the site are as follows:

Sensitivity	Feature
Medium	Lampranthus pauciflorus
Medium	Ruschia leptocalyx
Medium	Aspalathus zeyheri
Medium	Selago ramosissima
Medium	Erica unicolor subsp. mutica
Medium	Hermannia lavandulifolia
Medium	Sensitive species 633
Medium	Sensitive species 268
Medium	Marsilea schelpeana
Medium	Sensitive species 1024
Medium	Athanasia cochlearifolia
Medium	Relhania garnotii
Medium	Euchaetis albertiniana
Medium	Polygala pubiflora
Medium	Sensitive species 980
Medium	Sensitive species 516
Medium	Sensitive species 800
Medium	Elegia squamosa

Medium	Sensitive species 500
Medium	Sensitive species 763
Medium	<i>Diosma passerinoides</i>
Medium	<i>Agathosma microcarpa</i>



Animal species theme

Areas of sensitivity are shown in Figure 4 and SCC that are flagged for the site are indicated as follows:

Sensitivity	Feature
High	<i>Aves-Neotis denhami</i>
High	<i>Aves-Bradypterus sylvaticus</i>
High	<i>Aves-Polemaetus bellicosus</i>
Medium	<i>Sensitive species 8</i>
Medium	<i>Invertebrate-Aneuryphymus montanus</i>

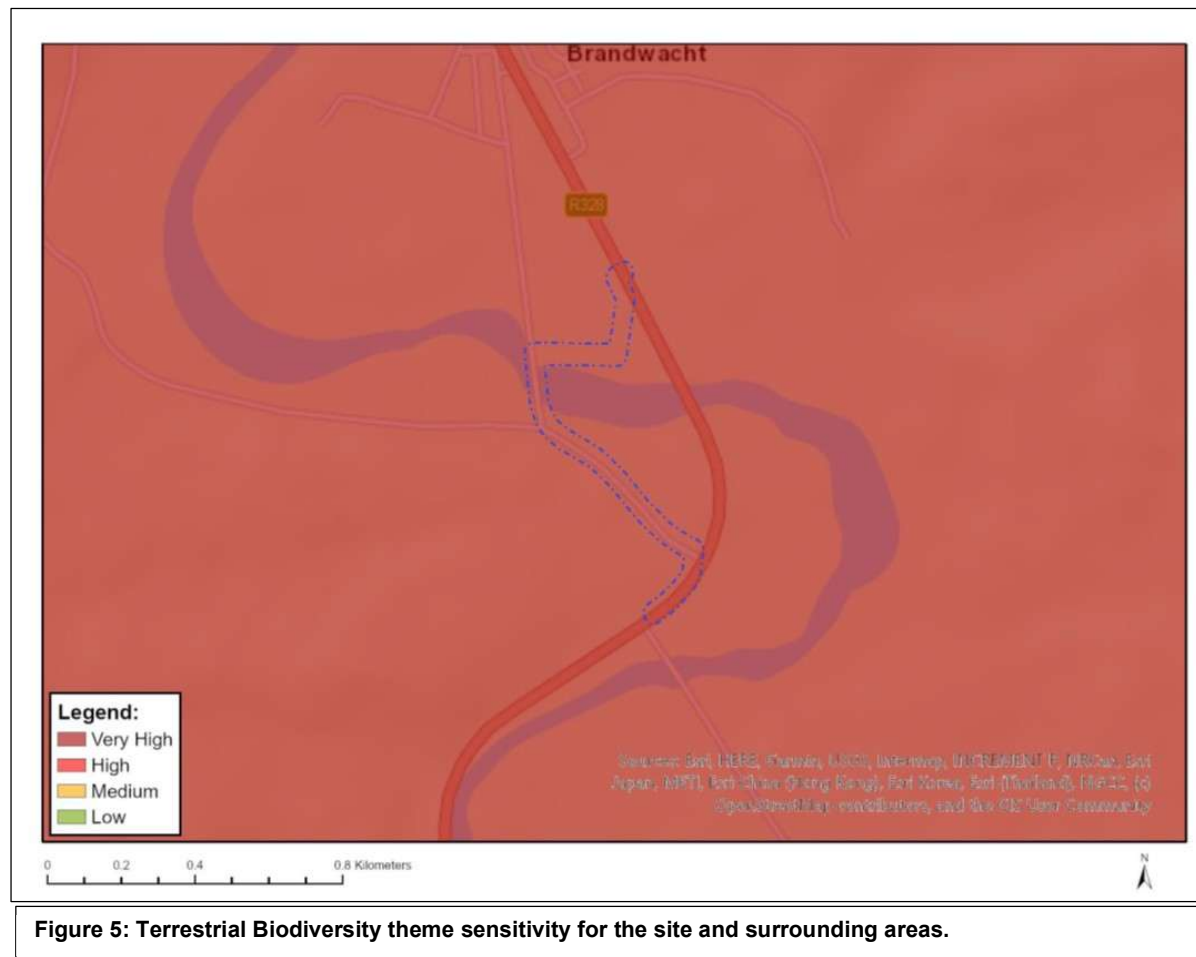


Figure 4: Animal species theme sensitivity for the site and surrounding areas.

Terrestrial Biodiversity theme

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

Sensitivity	Feature
Very High	CBA: Terrestrial
Very High	CBA2: Terrestrial
Very High	CR_Garden Route Granite Fynbos



Assessment methodology

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

Survey timing

The study commenced as a desktop-study followed by a site-specific field study in January 2026. The site is within the Fynbos Biome of the southern Cape which has an all-year rainfall season, with slightly cooler winter months (**Figure 6**). Rainfall seasonality drives most ecological processes, and the timing of the survey in January is therefore satisfactory in terms of assessing the flora and vegetation of the site. It was therefore possible to determine the overall condition of the vegetation with a high degree of confidence.

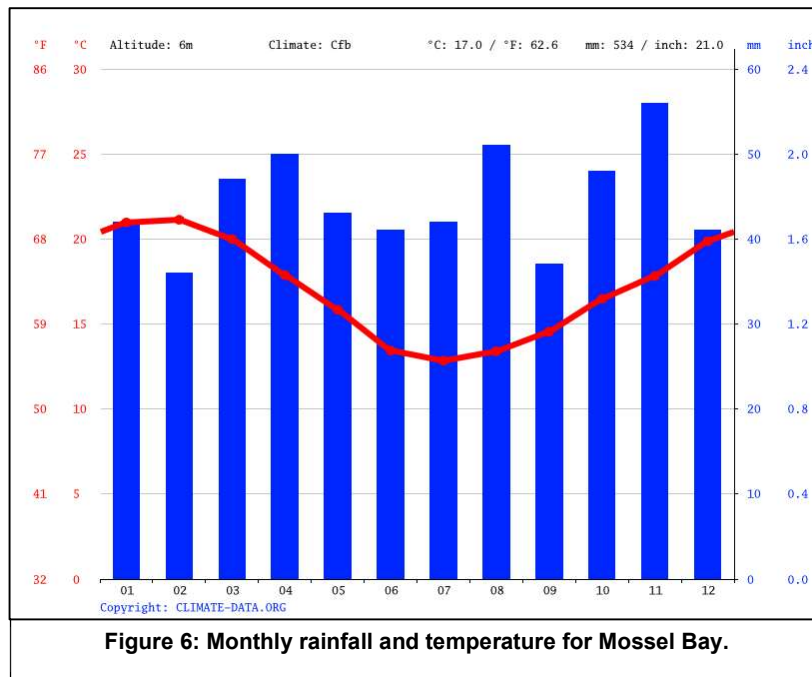


Figure 6: Monthly rainfall and temperature for Mossel Bay.

Field survey approach

The field survey was undertaken on 24 January 2026. Field surveys of the site included meander searches of general areas, and active searching in habitats that were considered to be suitable for specific groups or species. Where sensitive species were encountered, co-ordinates for all individuals that occur on site were obtained as far as possible. A hand-held Garmin GPSMap 64s was used to record a track along which observations were made. Digital photographs were taken of features and habitats on site, as well as of all plant and animal species seen. Images of plants and animals recorded were uploaded to the iNaturalist website (<https://www.inaturalist.org>) and are accessible by viewing the observations for the site (use the Explore menu, zoom and pan until the study area is within the browser window, click the button "Redo search in map", and all observations for that area will be shown and listed).

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

Impact assessment methodology

The analysis of impact uses a detailed assessment methodology based on several factors taking into account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). These factors assess the sensitivity and significance of impacts on biodiversity resources, integrating criteria for biodiversity value and impact magnitude. The details of the impact assessment methodology are described and explained in Appendix 1.

Sources of information

Vegetation and threatened ecosystems

- South African National Biodiversity Institute (2006-2024). The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, <https://bgis.sanbi.org/Projects/Detail/2258>, Version 2024.
- The conservation statuses of the vegetation types were obtained from the Revised National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).

Conservation plans

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

Aerial imagery

Satellite imagery for historical land use and vegetation cover was obtained from Google Earth Pro.

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

Plant species

Plant species description, conservation status, distribution and habitat information was obtained from the following sources:

- South African National Biodiversity Institute (SANBI) available on the Biodiversity Advisor website (<https://biodiversityadvisor.sanbi.org/>) and the NewPosa portal.
- SANBI's Red List (<http://redlist.sanbi.org/>),
- World Flora Online (<https://www.worldfloraonline.org/>)
- Published literature.

Regulations published for the National Forests Act (Act 84 of 1998) (NFA) as amended, provide a list of protected tree species for South Africa.

Animal species

Animal species historically recorded in the study area were obtained from literature sources (see References and Bibliography). This was supplemented with information from the Animal Demography Unit website (adu.uct.ac.za) which has been migrated to iNaturalist (<https://www.inaturalist.org/home>), and Birdlife South Africa.

Threat status, distribution, and habitat information for threatened species was obtained from the IUCN Red List (<https://www.iucnredlist.org/>), SANBI Threatened Species Programme, as well as published literature.

Lists of potential species in and around the site were generated from iNaturalist (<https://www.inaturalist.org/home>).

Limitations

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

- The assessment is based on the site visit as well as a desktop study of the available information. The time spent on site was adequate for understanding general vegetation patterns across the study area.
- Rare and threatened plant and animal species are, by their nature, usually very difficult to locate and can be easily missed. This is partially overcome by undertaking desktop research of possible species of concern. The screening tool

output contains modelled distributions of all species that could occur on site, based on current knowledge of all SANBI databases.

Results

Desktop description of vegetation

The vegetation map shows that the site occurs within Garden Route Granite Fynbos (**Figure 7**). However, the route crosses the Brandwacht River which contains (azonal) riparian vegetation and an associated floodplain that is not mapped as a separate category, but which would not have the characteristics of the terrestrial vegetation type.

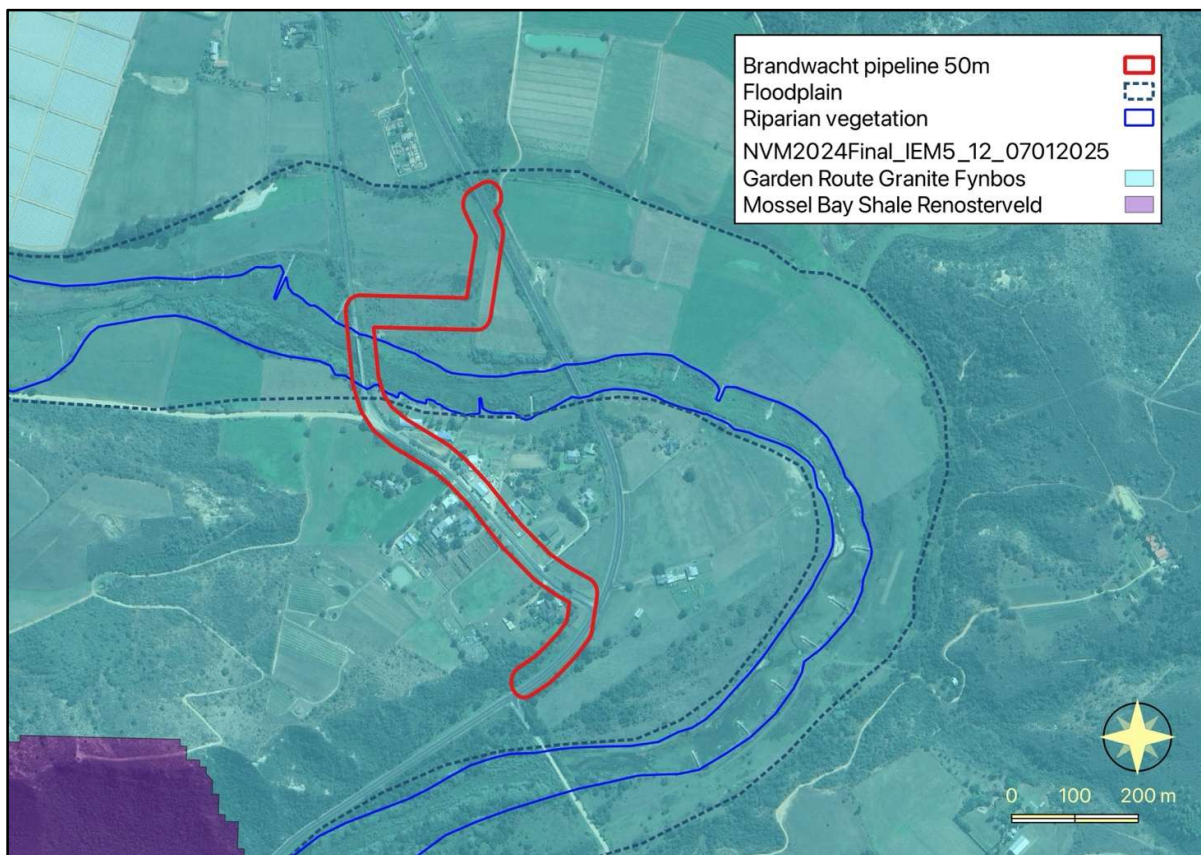


Figure 7: Regional vegetation types of the site and surrounding areas.

Garden Route Granite Fynbos

This vegetation type is found in the Western and Eastern Cape Provinces: patches along the coastal foothills of the Langeberg at Grootberg (northeast of Heidelberg), the Outeniqua Mountains from Cloete's Pass via the Groot Brak River Valley, Hoekwil, Karatara, Barrington and Knysna to Plettenberg Bay. Patches from the Bloukrans Pass along coastal platform shale bands south of the Tsitsikamma Mountains via Kleinbos and Fynboshoek to south of both Clarkson and the Kareedouw Mountains. Altitude 0–500 m.

Vegetation & Landscape Features

Undulating hills and moderately undulating plains on the coastal forelands. Structurally this is tall, dense proteoid and ericaceous fynbos in wetter areas, and graminoid fynbos (or shrubby grassland) in drier areas. Fynbos appears confined to flatter more extensive landscapes that are exposed to frequent fires—most of the shales are covered with afrotemperate forest. Fairly wide belts of *Virgilia oroboides* occur on the interface between fynbos and forest. Fire-safe habitats nearer the coast have small clumps of thicket, and valley floors have scrub forest (Vlok & Euston-Brown 2002).

Geology & Soils

Acidic, moist clay-loam, prismacutanic and pedocutanic soils derived from Caimans Group and Eccia (in the east) shales. Land types mainly Db and Fa.

Important Taxa

Growth form	Species
Tall shrubs	<i>Leucadendron eucalyptifolium</i> (d), <i>Protea aurea</i> subsp. <i>aurea</i> (d), <i>P. coronata</i> (d), <i>Leucospermum formosum</i> , <i>Metalasia densa</i> , <i>Passerina corymbosa</i> , <i>Protea neriifolia</i> , <i>Rhus lucida</i> ^T
Low shrubs	<i>Acmadenia alternifolia</i> , <i>A. tetragona</i> , <i>Anthospermum aethiopicum</i> , <i>Cliffortia ruscifolia</i> , <i>Elytropappus rhinocerotis</i> , <i>Erica hispidula</i> , <i>Helichrysum cymosum</i> , <i>Leucadendron salignum</i> , <i>Pelargonium</i>

cordifolium, *Phylica axillaris*, *P. pinea*, *Psoralea monophylla*, *Selago corymbosa*.

Herbs *Helichrysum felinum*

Geophytic herb *Pteridium aquilinum* (d), *Eriospermum vermiforme*

Succulent herb *Crassula orbicularis*

Herbaceous *Crassula roggeveldii*

succulent

climber

Graminoid *Ischyrolepis sieberi* (d), *Aristida junciformis* subsp. *galpinii*, *Brachiaria serrata*, *Cymbopogon marginatus*, *Elegia juncea*, *Eragrostis capensis*, *Ischyrolepis gaudichaudiana*, *Restio triticeus*, *Themeda triandra*, *Tristachya leucothrix*.

Conservation status of broad vegetation types

The threat status of the vegetation type in which the site is mapped is in accordance with the Revised National List of Ecosystems (Government Notice No 2747 of 18 November 2022) published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), which lists national vegetation types that are afforded protection on the basis of rates of transformation. The site is mapped as Garden Route Granite Fynbos which is classified as a Critically Endangered ecosystem.

Vegetation Type	Conservation status
	Revised National Ecosystem List (NEM:BA) (2022)
Garden Route Granite Fynbos	CR

Fieldwork is conducted to determine whether the characteristics of the vegetation found on site represent the mapped vegetation type, and consequently, the corresponding ecosystem unit.

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

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

Biodiversity Conservation Plans

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

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

The WCBSP map shows that the corridor includes small areas that are mapped within CBA 1 and 2, as well as CBA: River (**Figure 8**). However, the alignment of the pipeline does not cross CBAs 1 and 2.

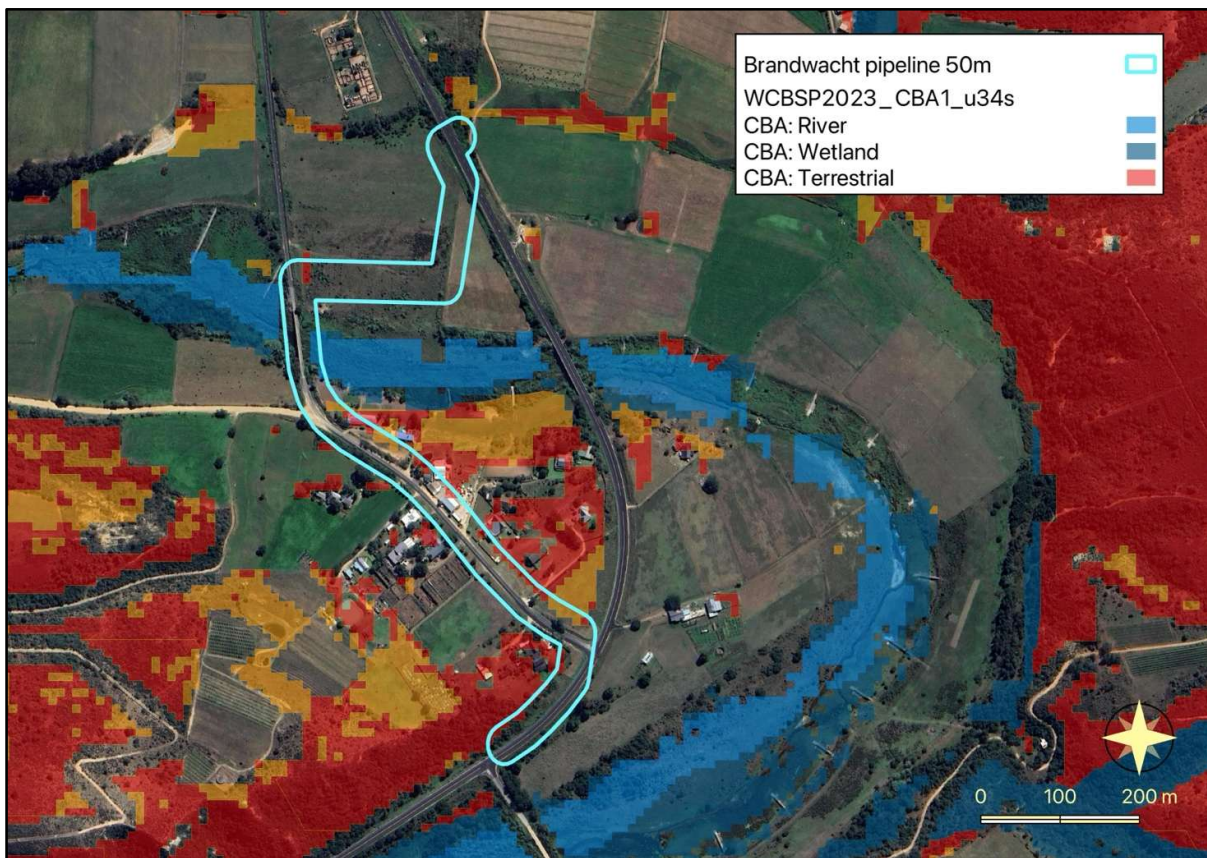


Figure 8: Western Cape Biodiversity Spatial Plan for the site.

Historical disturbance

The vegetation along the entire footprint of the pipeline is disturbed and does not contain any remaining natural habitat. The majority of the pipeline is proposed to be located on the margin of the existing roads. The section over the Brandwacht River will be raised and attached to the existing bridge. The only section that contains any vegetation is the part that crosses from the unnamed road back to the R328. This is secondary vegetation in a previously cultivated land—it was last cultivated in approximately 2006 (see areas indicated in **Figure 9**).



Figure 9: Historical aerial photograph of the site.

Verification of observations on site

According to the "AMENDMENT TO THE PROTOCOLS FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL ANIMAL AND PLANT SPECIES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998", a specialist report must include verifiable evidence from the specialist's site inspection, including as a minimum:

1. a map showing the specialist's GPS track in relation to the study area; and
2. at least four spatially representative sample site descriptions from across the study area that include as a minimum:

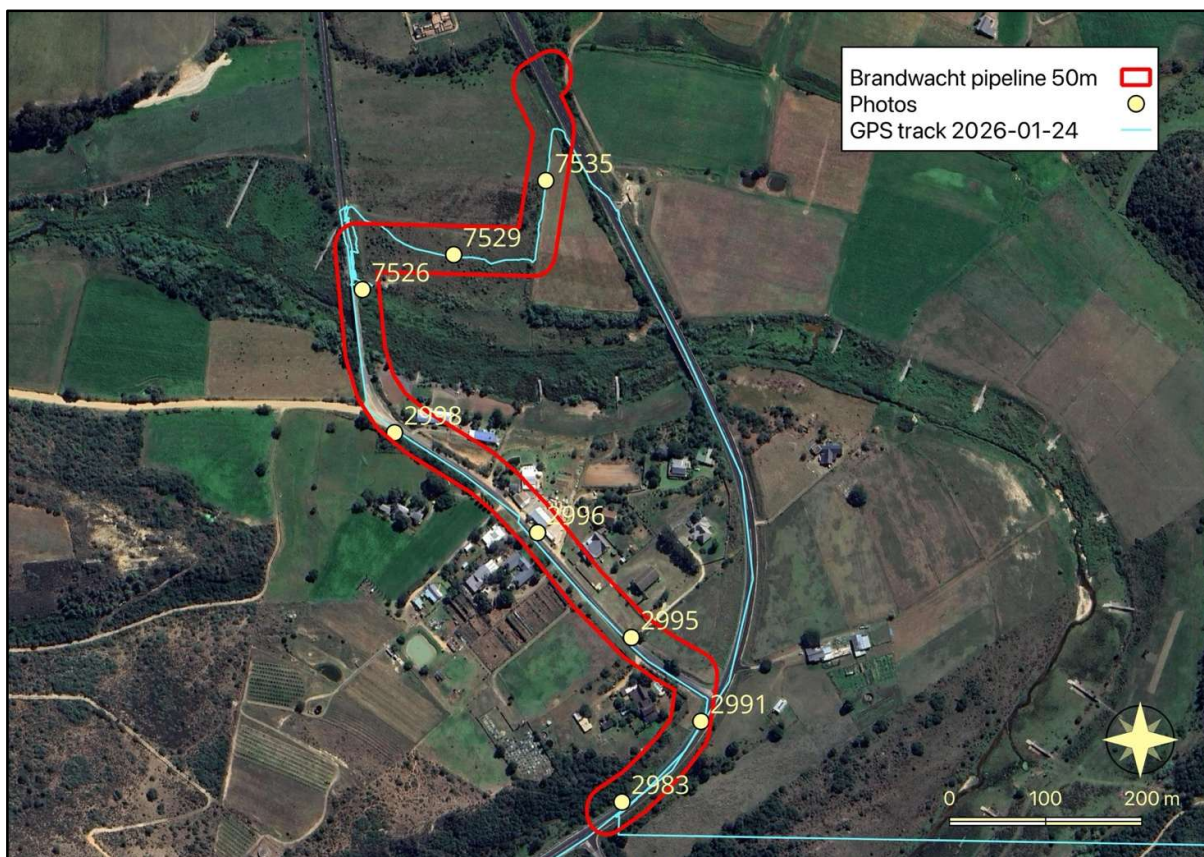


Figure 10: Location of photographs taken on site during the site inspection, as well as the GPS track log of areas traversed during the field assessment of the site.

- (a) precise geographical coordinates of the sample site;
- (b) at least one in situ photograph (taken on site by the specialist during the site inspection) of the sample site; and
- (c) a habitat description of the sample site.

To address these specific requirements, photographs of landscapes on site were taken at various localities to show conditions on site. A map showing the location of these photographs is provided in **Figure 10**. This also shows the GPS track log of areas walked while undertaking this assessment.

A description for each photograph is provided adjacent to each one (below).



Photo 2983

34°03'42.23"S, 22°03'36.77"E

View of the ditch on the side of the road at the southern end of the alignment. There is some secondary thicket between the boundary fence and the road surface that includes species such as *Vachellia karroo* and *Grewia occidentalis*.



Photo 2991

34°03'39.49"S, 22°03'39.94"E

View of the intersection of the unnamed road and the R328 showing lawns on the road verges, typical of most of the alignment through the village.



Photo 2995

34°03'36.68"S, 22°03'37.09"E

Roadside verges with mowed lawns and buildings.



Photo 2996

34°03'33.18"S, 22°03'33.23"E

Roadside verges with gravel paving.



Photo 2998

34°03'29.87"S, 22°03'27.39"E

View down the road towards the bridge over the Brandwacht River. The roadsides contain grasses and weeds typical of disturbed areas, as well as alien trees and shrubs.



Photo 7526

34°03'25.05"S, 22°03'26.03"E

Vegetation in the riverbed under the bridge, dominated by *Phragmites australis* and various exotic weeds.



Photo 7529

34°03'23.84"S, 22°03'29.72"E

Secondary savanna in previously cultivated land, dominated by thorn trees, *Vachellia karroo*, and grasses typical of old lands. These areas are currently being heavily grazed.



Photo 7535

34°03'21.31"S, 22°03'33.42"E

Secondary grassland on old lands near to the northern side of the alignment.

Vegetation found on site

A map of habitats / landcover for the site is provided in **Error! Reference source not found..** Contrary to the map provided by VegMap, the vegetation type is transformed, with any areas that are not cultivated being heavily invaded by alien plants.

The area consists largely of some holdings with buildings, roads and other infrastructure. Each building complex is surrounded by gardens and lawns. Further out from the houses are cultivated fields, as well as old lands that are no longer being cultivated. There are only three areas that currently contain vegetation, the riparian area, roadsides, and secondary vegetation on old lands.

The riparian area is somewhat degraded, but dominated primarily by the common reed, *Phragmites australis*. At the bridge crossing, where the pipeline will be attached to the bridge, there are several weeds and alien invader species.

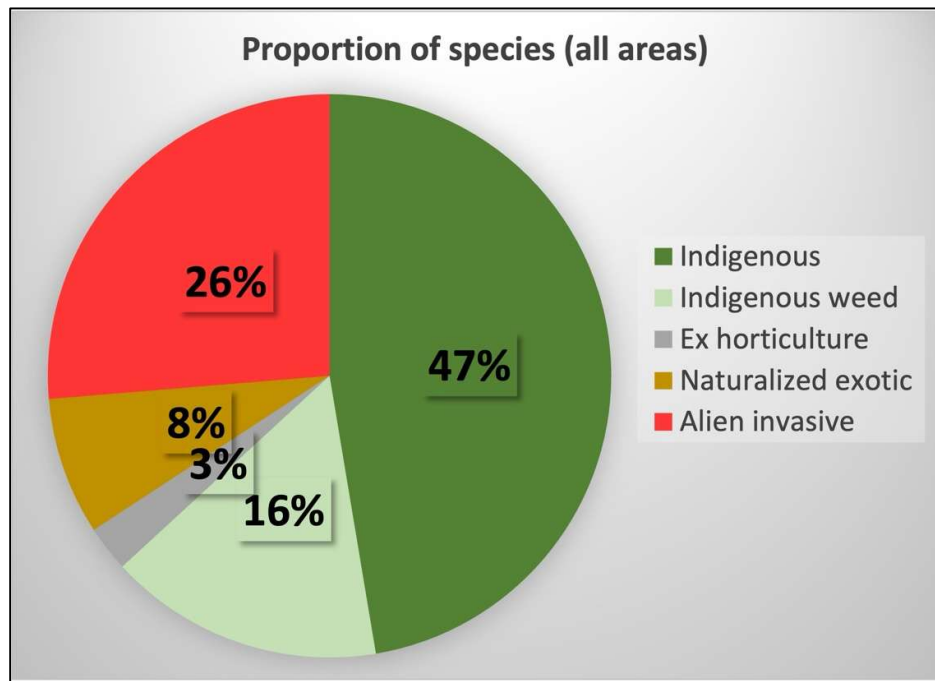
The secondary savanna on old lands is species-poor and overgrazed. The ground layer is dominated by the grasses, *Cynodon dactylon* and *Eragrostis curvula*. The sweet thorn, *Vachellia karroo*, is common, along with the indigenous low shrub, *Lycium cinereum*, and several alien invasive species, including *Lantana camara* and *Opuntia monacantha*.

Roadsides are historically and currently disturbed. They contain a variety of indigenous and exotic shrubs, as well as a long list of weeds and alien invasive species. The dominant vegetation cover consists of a small number of indigenous thicket precursor species, such as *Grewia occidentalis*, *Olea europea* and *Searsia rehmanniana*, along with exotic shrubs, such as *Lantana camara* and *Acacia mearnsii*. All of the invasive species, as well as all other exotic species recorded on site, occur on the roadsides.

A total of 38 species were recorded on the site, of which 10 are alien invasive species. A full checklist of plant species found on site is provided in Appendix 2.

Field assessment has verified that the site does not contain any intact natural vegetation that is representative of the Listed Ecosystem, as listed in the Revised National List of

Ecosystems that are Threatened and need of protection (GN2747 of 2022) and therefore the Terrestrial Biodiversity has LOW sensitivity with respect to this attribute.



Plant Species of Conservation Concern

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

<i>Taxon</i>	<i>IUCN Status</i>	<i>Distribution</i>	<i>Habitat</i>	<i>Probability of occurrence</i>
<i>Agathosma microcarpa</i>	VU	Potberg to Mossel Bay.	Rocky outcrops on dolomitic soils in renosterveld.	Negligible
<i>Diosma passerinoides</i>	VU	Bredasdorp to Albertinia	Dry clayish soils	Negligible
<i>Elegia squamosa</i>	EN	Malmesbury to the Cape Peninsula, Bredasdorp and eastwards to Mossel Bay	Seasonally damp clay flats and lower slopes with heavy soils.	Low
<i>Erica unicolor</i> subsp. <i>mutica</i>	EN	Mossel Bay to Herbetsdale and George.	Lowlands and lower south- and north-facing slopes in fynbos.	Negligible
<i>Euchaetis albertiniana</i>	EN	Albertinia to George.	Deep sandy habitats associated with limestone.	Negligible
<i>Hermannia lavandulifolia</i>	VU	Worcester to Plettenberg Bay.	Clay slopes in renosterveld and valley thicket.	Negligible
<i>Lampranthus pauciflorus</i>	EN	De Hoop to Plettenberg Bay.	On rocky coastal slopes and clay hills.	Negligible
<i>Marsilea schelpeana</i>	VU	Brdeasdorp to Port Elizabeth	Margins of seasonal pools and along water courses from near sea level to about 200 m.	Negligible
<i>Polygala pubiflora</i>	VU	Cape Infanta to Mossel Bay	Limestone and shale rocky outcrops.	Negligible
<i>Relhania garnotii</i> (= <i>Oedera garnotii</i>)	VU	Agulhus to Mossel Bay	Plants grow in lowland shale areas, especially silcrete.	Negligible
<i>Ruschia leptocalyx</i>	EN	Potberg to Hartenbos	Gravelly quartzitic and shale outcrops.	Low
<i>Selago ramosissima</i>	EN	Riviersonderend to Groot Brak River	Clay flats, and shale-sandstone transitions on lower slopes.	Low

Sensitive species 268	EN	Swellendam to Little Brak River, inland to Herbetsdale.	Renosterveld-thicket mosaic in gravelly clay soil on south-facing slopes.	Negligible
Sensitive species 500	EN	Cape Flats to Gqeberha.	Lowland sandy flats, stabilised dunes and coastal rock promontories.	Negligible
Sensitive species 516	EN	Mossel Bay to Herbetsdale and Great Brak River.	Renosterveld, on slopes of low hills.	Negligible
Sensitive species 633	CR	Between Great Brak River and Mossel Bay.	Specific habitats.	Negligible
Sensitive species 763	VU	Coastal belt from Swellendam to Port St Johns.	Dry coastal renosterveld and grassy places in coastal forest on sand to sandy loams, and on rocky outcrops.	Negligible
Sensitive species 800	VU	Cape Peninsula to Knysna.	Limestone and clay loam soil, fynbos and renosterveld on coastal lowlands	Negligible
Sensitive species 980	EN	Tradouw Pass to Groot-Brakrivier.	Seasonally damp south-facing slopes.	Negligible
Sensitive species 1024	EN	Riversdale to Knysna	Relatively dry to moist slopes	Negligible

The footprint of the pipeline is transformed along the entire extent and there is no suitable habitat to support SCC. The site sensitivity with respect to the Plant Species Theme is therefore LOW.

A Terrestrial Plant Species Compliance Statement is submitted in accordance with the requirements specified for LOW sensitivity (GN 1150: PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES).

Animal Species of Conservation Concern

According to the screening tool, five animal SCC are flagged for the site. These are described in more detail below, including an assessment of the likelihood of occurring on site. The probability of occurrence on site was rated on a scale from NEGLIGIBLE (no probability), LOW (habitat suitable but low quality and conspicuous but not found on site

during search), MODERATE (habitat suitable but may be overlooked due to being inconspicuous or mobile), HIGH (habitat suitable and not transformed, distribution within wandering range) to CONFIRMED.

Taxon	IUCN Status	Distribution	Habitat	Probability of occurrence
<i>Aves-Neotis denhami</i>	VU	Wide, fragmented Afrotropical range over much of the mesic eastern half of South Africa.	Nests in small open patches on the ground between higher shrubs to hide the breeding birds. In the Western Cape, it can be locally numerous in mosaics of cultivated pastures, agricultural croplands and natural vegetation, with seasonal differences in the use of each habitat.	High
<i>Aves-Bradypterus sylvaticus</i>	VU	Restricted and fragmented distribution in Eastern and Western Cape.	It occurs along the edges of Afrotropical forests and in thick, tangled vegetation along the banks of watercourses or drainage lines in forest patches in the Fynbos Biome.	Low
<i>Aves-Polemaetus bellicosus</i>	EN	Sub-Saharan Africa to South Africa.	They nest in large trees or pylons often located on hill sides where a large structure (1.2–3m diameter) made of sticks and lined with green leaves.	Moderate
<i>Invertebrate-Aneuryphymus montanus</i>	VU	Betty's Bay to Swellendam.	Rocky arid environments with fynbos vegetation. It has been collected "amongst partly burnt stands of evergreen Sclerophyll in rocky foothills". It is a medium-sized, robust, active geophilous insect which readily flies off when disturbed and is easily distinguished in flight. When observed, occurs in obvious numbers.	Negligible
Sensitive species 8	VU	Throughout Africa. In South Africa ranges from KwaZulu-Natal to George.	The South African population prefers coastal forest, thick coastal bushes and thicket where they can hide from predators and rest; the species requires permanent concealment.	Negligible

No animal species of conservation concern were found on the site, but the habitat on site is potentially suitable to support two SCC flagged for the site.

Denham's Bustard (*Neotis denhami*) has a range that includes the study area and has been recorded several times in proximity to the site. It is therefore highly likely to occur in the area. It is found in natural habitat as well as cultivated lands, therefore the lack of natural vegetation on site does not exclude the species.

The Martial Eagle (*Polemaetus bellicosus*) has a range that includes the study area and has been recorded several times in proximity to the site. It is therefore highly likely to occur in the area, however will be unaffected by the temporary disturbance required to

install and underground service. The site is within the hunting range of the species which will not be affected. No nests or suitable nesting structures were seen along the route.

Suitable habitat exists for animal SCC to occur within the general region, and impacts on site are temporary and will not affect the site sensitivity for the Animal Species Theme which is regarded as LOW.

Outcome of the assessment

Site ecological importance

The Species Environmental Assessment Guidelines require calculation of Site Ecological Importance (SEI) for each habitat on site, and provide methodology for making this calculation. The SEI is calculated as a function of the Biodiversity Importance (BI) of the receptor and its resilience to impacts ($SEI = BI \times RR$). The Biodiversity Importance (BI) in turn is a function of Conservation Importance (CI) and Functional Integrity (FI), i.e. $BI = CI + FI$.

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

Habitat	Conservation importance (CI)	Functional integrity (FI)	Biodiversity Importance (BI = CI + FI)	Receptor resilience (RR)	Site Ecological Importance $SEI = BI \times RR$
Riparian areas	Low No confirmed or highly unlikely populations of SCC.	Medium Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of minor past disturbance. Moderate rehabilitation potential.	Low	High Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the current species composition and functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Very low
Secondary vegetation on old lands	Very low No confirmed and highly unlikely populations of SCC.	Low Several minor and major current negative ecological impacts - previously ploughed area,	Very low	Very high Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the current species composition and functionality, or species that have a very high	Very low

	No natural habitat remaining, only secondary vegetation on old lands.	currently overgrazed.		likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	
Roadsides	Very low No confirmed and highly unlikely populations of SCC. No natural habitat remaining, only secondary vegetation on old lands.	Low Several minor and major current negative ecological impacts - previously ploughed area, currently overgrazed.	Very low	Very high Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the current species composition and functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.	Very low

The calculation of SEI includes an explicit recognition of the ability of each ecosystem to tolerate and recover from disturbance. Guidelines for development activities within different importance levels are given in the table below.

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

Habitat sensitivity

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

1. terrestrial Critical Biodiversity Areas (CBAs).
2. terrestrial Ecological Support Areas (ESAs).
3. protected areas as defined by the National Environmental Management: Protected Areas Act, 2004.
4. priority areas for protected area expansion.

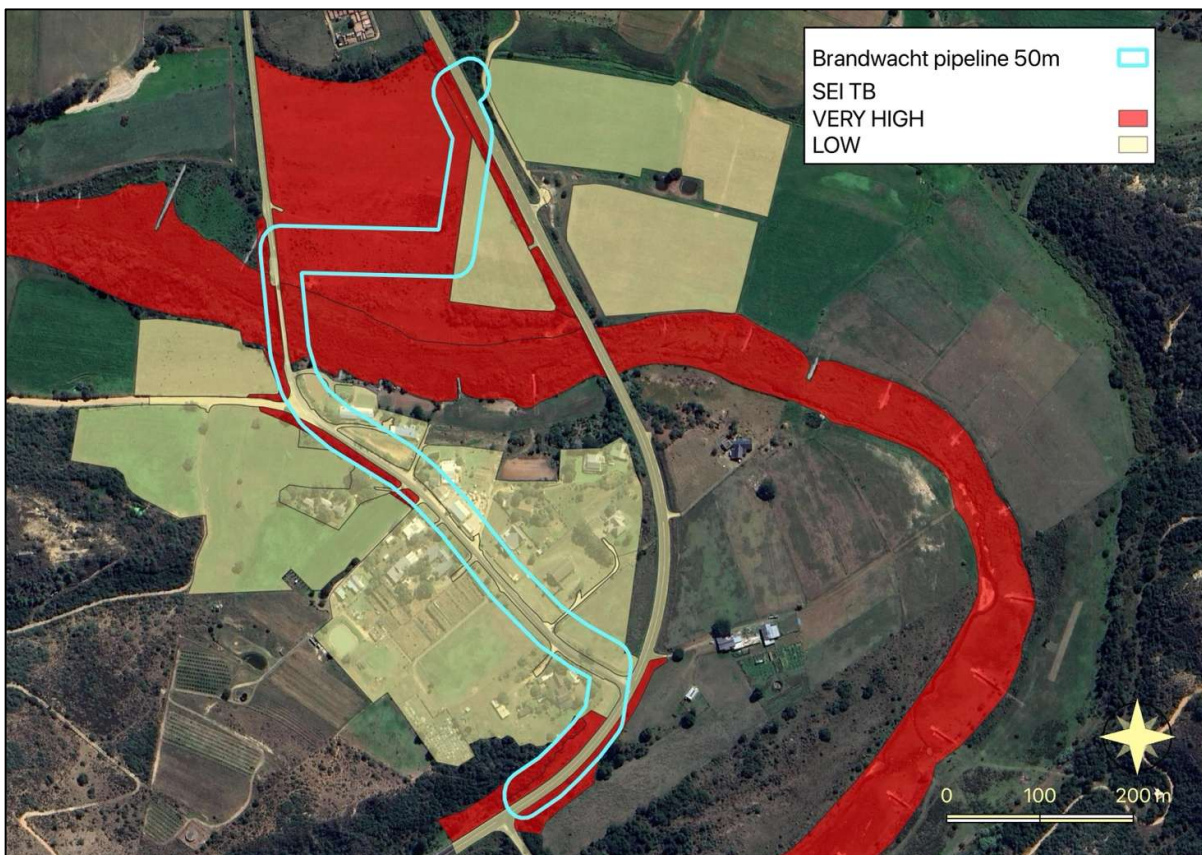


Figure 11: Site Ecological Importance for Terrestrial Biodiversity Theme.

5. Strategic Water Source Areas (SWSAs).
6. Freshwater Ecosystem Priority Areas (FEPA) subcatchments.
7. indigenous forests.

Any area that is in a natural state and that falls within one of these categories is therefore automatically assigned a sensitivity class of VERY HIGH and requires a Terrestrial Biodiversity Specialist Assessment. Areas that do not fall into one of these categories are automatically assigned a sensitivity class of LOW. The current site is mapped within the VERY HIGH category, aside from the road and cleared area, which are LOW.

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

Part of the site contain secondary vegetation on old lands. It is estimated that these were last ploughed in around 2006, which means that they are more than 10 years old and are therefore classified as "natural" according to NEMA. The same applies to roadside verges where secondary vegetation has re-established. Additionally, the riparian area is in a natural state. These areas fall within a listed ecosystem, therefore they automatically have VERY HIGH sensitivity according to the Terrestrial Biodiversity Theme (Figure 11).

No habitats on site are potential habitat for plant SCC. The Site Ecological Importance (SEI) for the Plant Species Theme is therefore LOW for the entire pipeline corridor area.

There are two bird SCC that are likely to occur in the study area. These are Denham's Bustard (*Neotis denhami*) and the Martial Eagle (*Polemaetus bellicosus*). In both cases, the species could possibly occur anywhere in the general area as the habitat is potentially suitable. The entire study area this has MEDIUM sensitivity with respect to these species, however the site sensitivity is LOW due to the temporary nature of the impact.

Impact assessment

The proposal is to construct a water pipeline along the centreline of the corridor. The footprint of the proposed development is within transformed and secondary habitats, except for where it crosses the Brandwacht River. At the river crossing the pipeline will be elevated and attached to the bridge, so no impact on the riparian habitat will take place.

For the remainder of the route, the only area where any vegetation is affected is a section across an old cultivated land where community grazing is ongoing and where some secondary vegetation has developed. This was last cultivated in around 2006 therefore it is legally defined as being in a natural state (more than 10 years since the soil profile was disturbed). The site mapped as occurring within a listed (Endangered) ecosystem. However, the secondary vegetation does not have the attributes of Garden Route Granite Fynbos, nor any untransformed ecosystem, and therefore no impact on an Endangered ecosystem will occur. Any disturbance due to pipeline construction can easily be rehabilitated to its current state and no long-term effect will remain.

There are no terrestrial plant SCC that are likely to occur on site. This is because there is no remaining natural habitat on site.

There are two bird SCC that are likely to occur in the study area. These are Denham's Bustard (*Neotis denhami*) and the Martial Eagle (*Polemaetus bellicosus*). In both cases, the project has a minimal impact on suitable habitat and no long-lasting impacts on habitat for these species will occur. The current *status quo* of the study area for these species will not be altered by the construction of a water pipeline.

Conclusion

PLANT SPECIES THEME:

1. The site was flagged as having MEDIUM sensitivity with respect to the Terrestrial Plant Species Theme.
2. The site inspection and desktop research determined the sensitivity to be LOW due to absence of suitable habitats remaining in which SCC could occur.
3. The proposed development is unlikely to have any impacts on any Terrestrial Plant SCC.

ANIMAL SPECIES THEME:

1. The site was flagged as having HIGH sensitivity with respect to the Terrestrial Animal Species Theme.
2. The site inspection and desktop research determined the sensitivity to be LOW owing to the temporary disturbance of an underground service which will not impact on the suspected habitat for two bird SCC, namely *Neotis denhami* and *Polemaetus bellicosus*. Both species occur in the general area and could occur anywhere in the study area as they are not limited to any specific habitat.
3. The proposed development will have a very minimal localised impact on habitat and it will be easily rehabilitated after construction.
4. The project is therefore unlikely to have any impacts on any Terrestrial Animal SCC.

TERRESTRIAL BIODIVERSITY THEME:

1. The site consists of various transformed habitats.
2. The site was flagged as having VERY HIGH sensitivity with respect to the Terrestrial Biodiversity Theme.
3. The site inspection and desktop research shows that the site contains riparian habitat, as well as secondary vegetation on old lands and on roadsides that are

legally defined as being in a natural state. The riparian habitat is azonal and not representative of the terrestrial ecosystem. The secondary vegetation has recently developed on old lands and does not have the characteristics of the original terrestrial vegetation that would have occurred there. No intact areas of the listed ecosystem will therefore be affected. The site inspection and desktop research determined the sensitivity to be LOW.

4. The proposed development is unlikely to have any impacts on any Terrestrial Biodiversity features.

This project based on the implementation of the following recommendations is supported.

Recommendations

- Avoid damaging of indigenous vegetation alongside the R328.
- Employ construction best practices to minimise soil disturbance, runoff, and vegetation clearing, especially over the Brandwacht River.
- Develop and implement Alien Invasive Species Management Plans pre- and post-construction.
- Plan and monitor phased ecological restoration of disturbed areas, including native species replanting and erosion control.

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Appendix 1

Impact assessment factors used:

- Resource Irreplaceability (I): Measures the uniqueness and rarity of the biodiversity resource. This ranges from widespread/common resources (Low) to critically rare resources with persistence thresholds exceeded (High).
- Threshold (T): The scale of impact relative to the total distribution of the resource, representing how much the impact contributes towards ecological thresholds. Scores range from negligible to impact on a significant proportion.
- Resource Condition (C): The integrity and quality of the biodiversity resource, from severely degraded to fully functional in a natural state.
- Reversibility of Impact (R): How reversible the impact is, from reversible without rehabilitation to irreversible despite mitigation.
- Extent of Impact (E): The geographic scale of the impact, from site-specific to regional or global.
- Duration of Impact (D): Time over which the impact persists, ranging from immediate (0-1 year) to permanent (indefinite).
- Intensity of Impact (M): Degree of alteration, from no impact on processes to permanent cessation.
- Probability of Occurrence (P): Likelihood of impact occurring without mitigation, from improbable to definite.
- Confidence (not always scored explicitly): Level of certainty in the data and assessment.
- Significance of Impact (S): A combined score reflecting the biodiversity value, magnitude, and probability of the impact, classified as very low, low, moderate, high, or very high.
- The significance calculation is a function combining biodiversity importance and impact magnitude, with detailed scoring for each factor allowing an objective and transparent rating of impacts.

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

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

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

Appendix 2

Acacia mearnsii (NEMBA Category 2)
Aloe ferox
Arundo donax (NEMBA Category 1b)
Athanasia trifurcata
Cenchrus clandestinus*
Cynodon dactylon
Cyperus textilis
Ekebergia capensis
Eragrostis curvula
Falkia repens
Salix mucronata
Gladiolus × hortulanus
Grewia occidentalis
Hermannia hyssopifolia
Kiggelaria africana
Lantana camara (NEMBA Category 1b)
Lycium cinereum
Medicago sativa*
Melia azedarach (NEMBA Category 1b)
Melinis repens
Nidorella ivifolia
Olea europaea
Opuntia monacantha (NEMBA Category 1b)
Pelargonium alchemilloides
Phragmites australis
Phytolacca americana (NEMBA Category 1b)
Phytolacca dioica (NEMBA Category 3)
Rapistrum rugosum*
Ricinus communis (NEMBA Category 2)
Rubus rigidus
Rumex sagittatus
Searsia rehmanniana
Seriphium plumosum
Sida rhombifolia
Solanum linnaeanum
Spartium junceum (NEMBA Category 1b)
Vachellia karroo
Verbena bonariensis (NEMBA Category 1b)