Botanical and Terrestrial Biodiversity Assessment for the proposed development on Portion 4 of Middelburg 643, Stanford (Caledon), Overstrand Local Municipality, Western Cape Province

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Prepared for Lornay Environmental Consulting

October 2025

CONTENTS

i. National Legislation and Regulations governing this report

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, in compliance with the Specialist Protocols (Government Gazette No. 43110, 2020).

ii. Appointment of Specialist

Dr David J. McDonald of Bergwind Botanical Surveys & Tours CC was appointed by Lornay Environmental Consulting to provide specialist ecological consulting services for the proposed development at Portion 4 of Farm Middelburg 643, Caledon (at Stanford) Western Cape Province. The consulting services comprise a study of the vegetation and biodiversity to determine ecological 'Red Flags' and to provide an assessment of possible impacts on the vegetation and biodiversity.

Details of Specialist

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iii. Expertise

Dr David J. McDonald:

- Qualifications: BSc. Hons. (Botany), MSc (Botany) and PhD (Botany)
- Botanical ecologist with over 40 years' experience in the field of Vegetation Science and Ecology.
- Founded Bergwind Botanical Surveys & Tours CC in 2006
- Has conducted over 1000 specialist botanical / ecological studies
- Has published numerous scientific papers and attended numerous conferences both nationally and internationally.

iv. Declaration of Independence:

The views expressed in the document are the objective, independent views of Dr McDonald, and the survey was carried out under the aegis of Bergwind Botanical Surveys and Tours CC. Neither Dr McDonald nor Bergwind Botanical Surveys and Tours CC have any business, personal, financial, or other interest in the proposed development apart from fair remuneration for the work performed.

I, David Jury McDonald, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed 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;
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all the requirements;
- 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
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the specialist:
Company: Bergwind Botanical Surveys & Tours CC Date: 27 October 2025

Curriculum Vitae: Appendix 1.

v. Conditions relating to this report

The content of this report is based on the authors' best scientific and professional knowledge as well as available information. Bergwind Botanical Surveys & Tours CC, its staff, and appointed associates, reserve the right to modify the report in any way deemed fit should new, relevant, or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must refer to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

vi. Terms of Reference

- Conduct a botanical and terrestrial biodiversity assessment as per the Specialist Protocols (NEMA – 2020) of Portion 4 of Farm Middelburg 643, Caledon, at Stanford, taking into consideration:
    1. Sensitive habitats;
    2. Any plant species of conservation concern;
    3. Relevant environmental regulations / policies / plans stipulated by the Department of Environmental Affairs and CapeNature in terms of, amongst others, the National Environmental Management Act (NEMA) and the National Environmental Management Biodiversity Act (NEMBA);

vii. Limitations and Assumptions

- It is assumed that all third-party information used (e.g. GIS data and species historical records) was correct at the time of generating this report.
- A site visit was undertaken on 5 October 2025, in late spring. This was an appropriate time to conduct botanical survey since the dry summer had not started.
- To compensate for the limitations of the survey i.e. poor access into areas that were heavily overgrown, records of plants from the general area in which the study area resides were obtained from the international online database, iNaturalist. This approach provided much more plant-species-specific data than was obtained from the field survey.

1. Introduction and Background

Bergwind Botanical Surveys & Tours CC (Dr D.J. McDonald) was appointed to conduct a botanical and terrestrial biodiversity site sensitivity verification for the proposed development on Portion 4 of Middelburg 643, Caledon at Stanford. Note was taken of the required protocols for biodiversity specialists (Government Gazette No. 43110, 2020) as well as the published guidelines for evaluating potential impacts on the natural vegetation in an area earmarked for development (Brownlie, 2005, Cadman *et al.* 2016).

The property owner wishes to develop parts of the land portion and two alternatives have been developed. The following description of the development proposals is from Lornay Environmental Consultants, the practitioners dealing with the impact assessment:

Alternative 1 (non-preferred)

Alternative 1 proposes the construction and placement of two single residential dwellings on Portion 4 of Farm 643, both of which extend slightly above the 5 m contour of the Klein River Estuary. The siting of the proposed dwellings and associated infrastructure in close proximity to the estuary raises a number of concerns, both from an environmental and a risk perspective.

The primary issue associated with this alternative is the vulnerability of the proposed structures to natural hazards such as flooding and fluctuating water levels within the estuary, during rainfall seasons. The 5 m contour serves as an important buffer zone that accommodates seasonal changes in water levels and storm events, and development within this zone is inherently at risk of inundation. Locating residential dwellings, within this area could lead to long-term maintenance and safety challenges, particularly under conditions of climate change, and increased flood intensity. This would not only pose risks to property and infrastructure but could also result in significant costs for the owners in the future.

Alternative 2 (preferred)

The preferred development layout, Alternative 2, has been carefully designed to avoid negative environmental impacts, mitigate unavoidable impacts, and optimise positive outcomes. The layout focuses on concentrating most of the infrastructure, specifically roads, within previously disturbed or transformed areas of the farm in order to minimise extensive clearance of indigenous vegetation and disturbance of soil elsewhere for road construction.

The residential dwellings are sited along these existing roads, above the 5-metre contour line, and outside sensitive riparian and aquatic zones, further protecting ecological features. House 01 is partially located within an existing disturbed road footprint, while House 02 is positioned to minimize impact on

surrounding natural areas, with only a small area of vegetation clearance required. A manager's cottage is included to facilitate on-site management and oversight, ensuring ongoing compliance with environmental management measures.

Recreational infrastructure, including the slipways and jetties, is located within the High-Water Mark of the Klein River estuary. However, these structures are designed to have minimal ecological impact, as they will be elevated. Their placement and design ensure that they do not significantly alter natural water flow, sediment transport, or aquatic habitats, and they are restricted in scale to support low-intensity recreational use only. In addition to the slipways and jetties, the development layout includes a swimming pool and firepit, of which nearly half of the swimming pool footprint and the firepit are situated below the 5-metre contour line. This placement has been carefully considered during the planning process to minimise impacts on sensitive riparian and aquatic habitats. Appropriate mitigation measures, including restricted construction methods, careful site preparation, and ongoing management of recreational activities, will be implemented to further limit ecological disturbance and ensure that the integrity and functionality of the estuarine and riparian environment are maintained.

2. Study Area

2.1 Location

The study area is Portion 4 of Farm Middelburg 643, Stanford, Caledon, in the Overstrand Local Municipality, Overberg District Municipality (referred to variously as the property or site). It lies northwest of the small town of Stanford, along the Wortelgat Road, and is north of the road as far as the Klein River. The farm portion is 13.53 ha in extent (Figure 1).

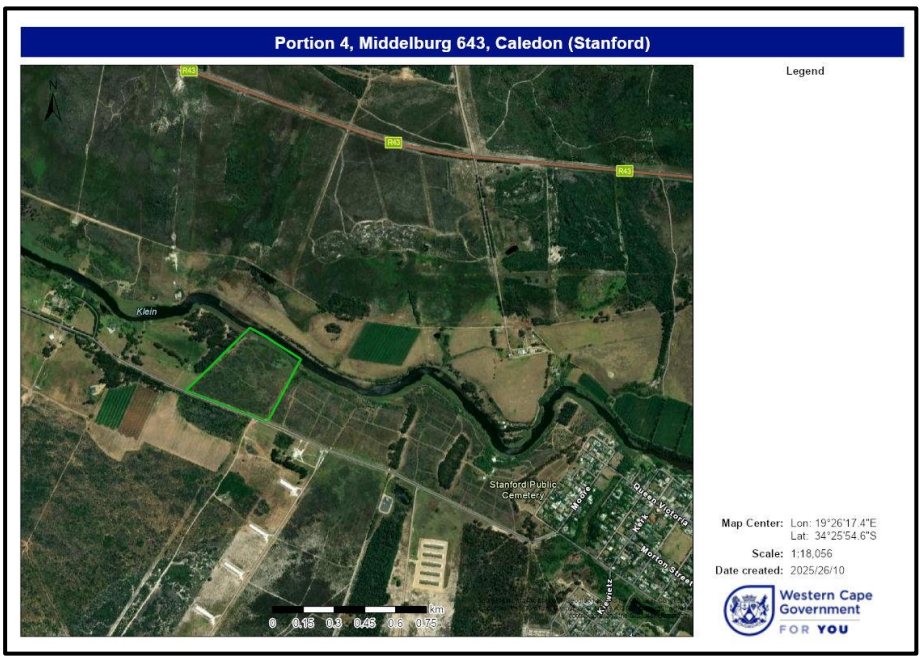


Figure 1.

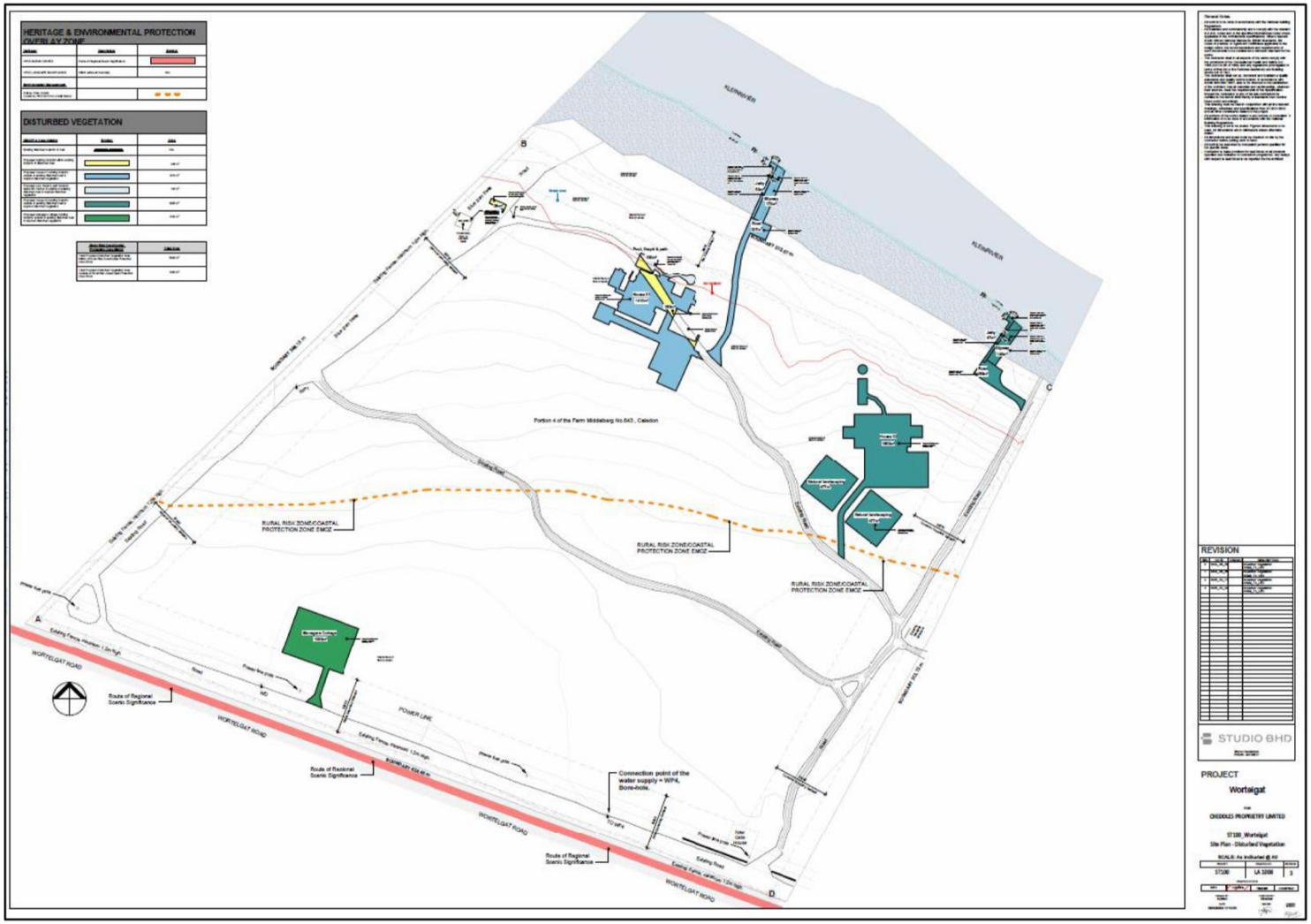


Figure 2. Layout of the proposed development on Portion 4 of Middelburg 643, Caledon (Stanford).

3. Methods

3.1 Approach and Field Sampling

The fieldwork was conducted on 5 October 2025, in late spring. The study area or site was accessed from Wortelgat Road, west of Stanford.

The site was surveyed on foot, and it was found that the vegetation is old and overgrown in many places. Existing farm tracks were used for access. No 'formal' waypoints were recorded where plant species were recorded. However, numerous photographs of the vegetation and plants present were taken. All the photographs were geo-referenced and used for interpreting the plant communities.

In addition to the information collected in this study, iNaturalist, an online database, was interrogated for the study area. It was found that there are no other records apart from those of the author, recorded on Portions 3 and 4 of Middelburg 643, Caledon.

3.2 The National Web-based Environmental Screening Tool

As required per protocol, the National Web-based Screening Tool was applied to the application area and the sensitivity determined for the 'Relative Plant Species Theme Sensitivity' and the 'Relative Terrestrial Biodiversity Theme Sensitivity'.

The outcome of the screening tool application is given below in Section 6.

4. Baseline information for the proposed development of the property

The Vegetation Map of South Africa, Lesotho and Swaziland (referred to further as VEGMAP) (SANBI, 2024) shows that the entire 'project area' is situated in Agulhas Limestone Fynbos. This is strongly disputed and is discussed further below.

4.1 Topography

The topography is relatively flat, sloping gradually downwards from the highest elevation at approximately 12 m above mean sea level (a.m.s.l.) at Wortelgat Road to the Kleinrivier in the north at less than 5 m a.m.s.l. (Figure 3).

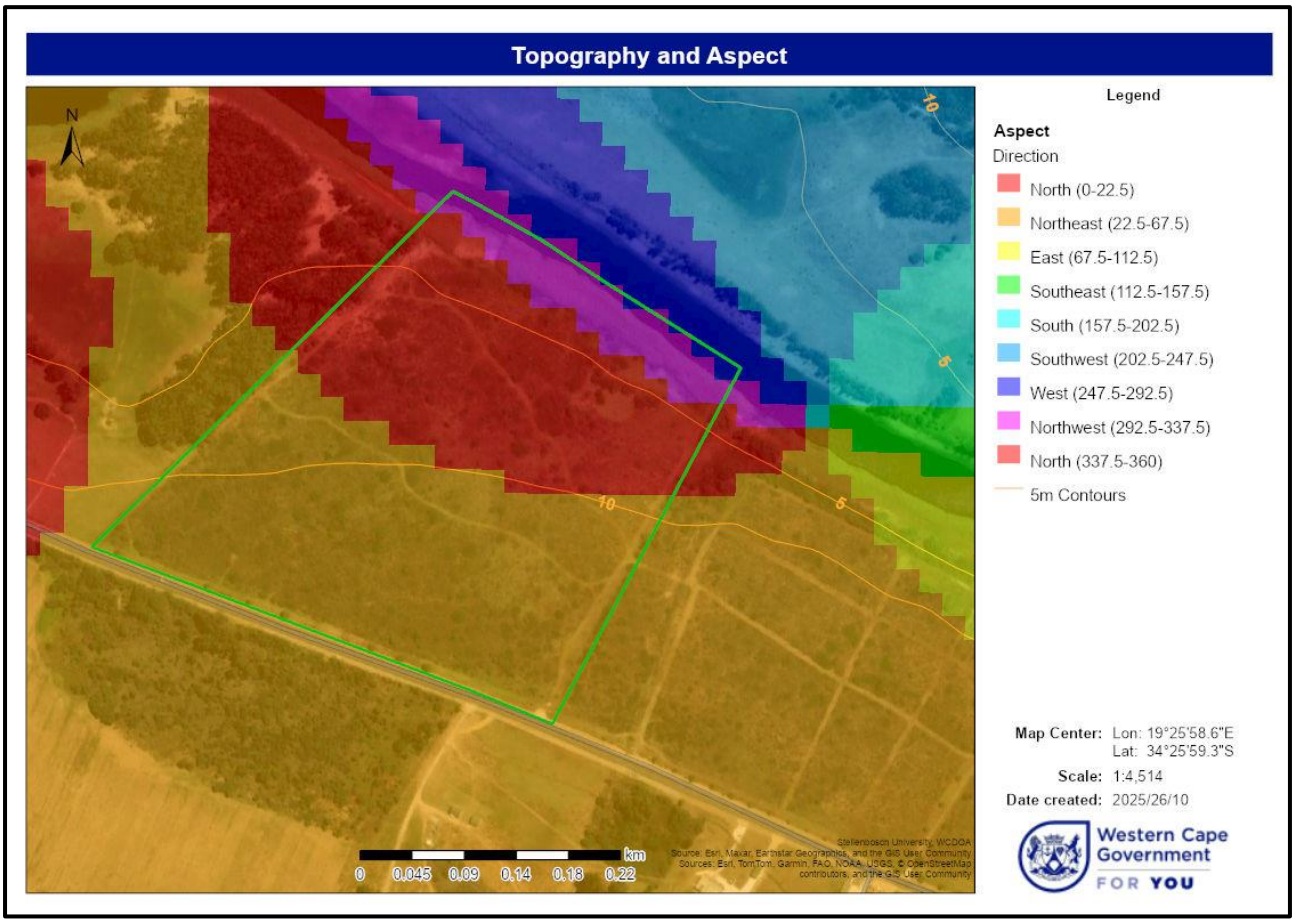


Figure 3. The topography and aspect of the study area at Portion 4 of Middelburg 643, Caledon (Stanford). The site is predominantly north- to northwest-facing.

4.2 Geology and Soils

The underlying geology of the site is mapped as being of the Ceres Subgroup, Bokkeveld Group (Figure 4). These are sedimentary rocks of shale and mudstone. No coastal limestone deposits occur on the site.

During the site visit, it was confirmed that the soils found at Portion 4 of Middelburg No. 643, Caledon at Stanford, are not derived from limestone but from shale and mudstone of the Ceres Subgroup, Bokkeveld Group. Most of the soils are of the CA type that show a strong texture contrast, with only a small area in the southwest corner of the site having soils with limited pedalogical development (Figure 5).

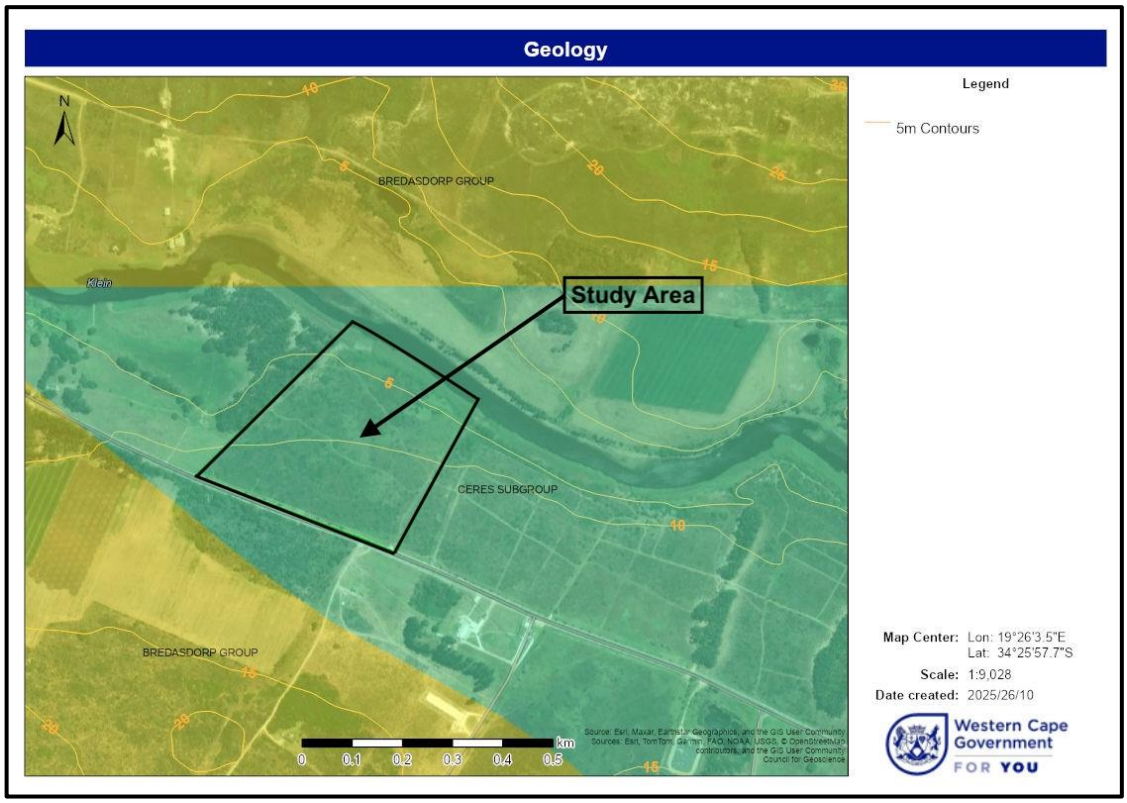


Figure 4. The geology of the study area, indicating that the entire site is underlain by sediments of the Ceres Subgroup, Bokkeveld Group.

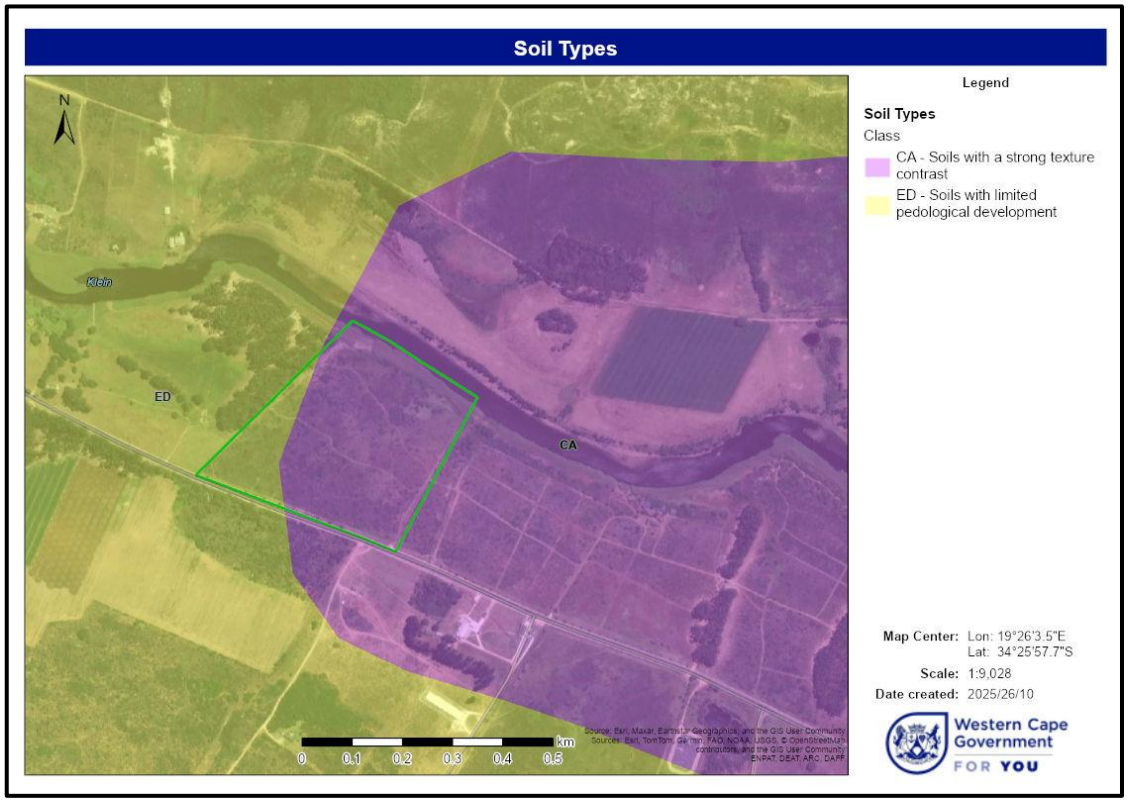


Figure 5. Most of the study area has soils of the CA type with strong texture contrast. Soils of the ED type occur in the southwest of the site.

4.2 Climate

Stanford has a warm-summer Mediterranean climate (Köppen Csb), with a mean annual rainfall of about 527 mm per year. The rain occurs mainly in winter (June—August) with a secondary lower peak in early summer (November). Average daily mean temperatures are around 20.7-20.8 °C in peak summer (January/February); daytime highs ~ 25-26 °C. Average daily mean temperatures in winter (July / August): ~ 11.6-12.3 °C in July/August. Night / minimum temperatures can drop to ~ 7.8 °C in July (Figure 6).

Since Stanford is in the winter-rainfall Mediterranean climate region of the Western Cape, wind patterns are influenced by coastal interactions, high-pressure systems over the South Atlantic, and occasional mid-latitude frontal systems in winter.

During summer the southeast wind effect can bring stronger south-easterly winds in the afternoon along the Western Cape coast. Whereas Stanford is inland a little from the immediate coast, it still feels these effects. In winter, storm fronts may bring more variable wind direction and stronger gusts, especially when low-pressure systems approach from the south or west (Figure 7).

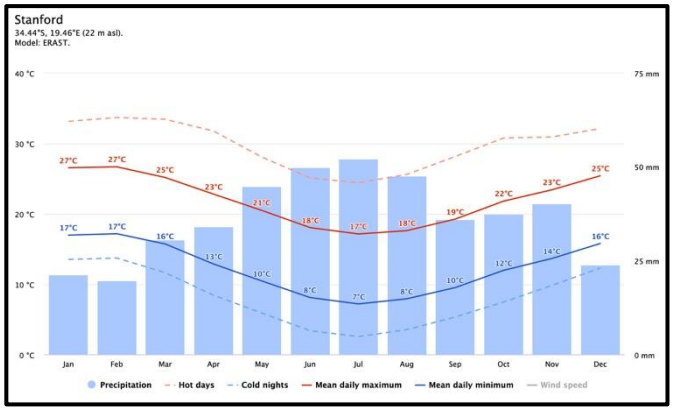


Figure 6. A climate diagram for Stanford, showing the peak rainfall period during the winter (June to August), with the lowest mean minimum temperature at night in July and the highest mean maximum temperature during the day in January and February. (Source: Meteoblue).

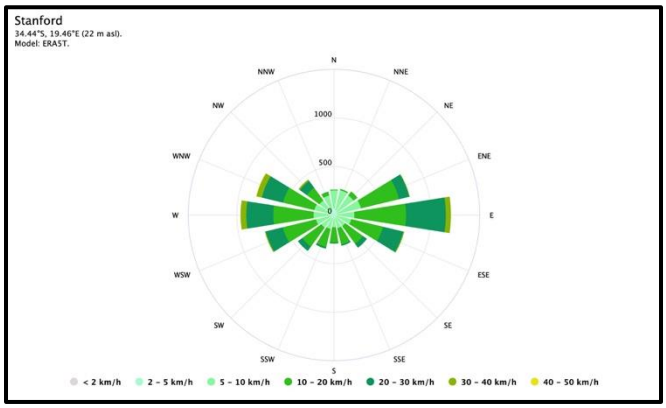


Figure 7. A wind-rose for Stanford showing the annual dominance of easterly winds, with westerlies much less.

5. The Vegetation

5.1 General description

The vegetation found at Portion 4 of Middelburg 643, Caledon (Stanford) is Agulhas Limestone Fynbos according to the VEGMAP (Mucina & Rutherford, 2006; SANBI 2024). The vegetation was carefully considered at the adjacent property, Portion 3 of Middelburg 643, Caledon (Stanford) in April 2024 (McDonald, 2024). It was found that there is no limestone present at the latter site and the same is true at the property dealt with here. The map of the geology of the site (Figure 4) shows that the site is underlain by shale and mudstone of the Ceres Subgroup, Bokkeveld Group. The vegetation is thus more akin to Eastern Rûens Shale Renosterveld even though it does not fit easily into the described concept of this vegetation type.

Mr Sean Privett, who has extensively mapped the vegetation in the Stanford-Agulhas region, was consulted about his views about the vegetation on the subject site. He confirmed that it is NOT Agulhas Limestone Fynbos and that the VEGMAP (Figure 8) is incorrect in this respect.

The implications of the above are far-reaching since Agulhas Limestone Fynbos is classified as Critically Endangered, whereas the vegetation on the site is not. Therefore, the Western Cape Biodiversity Spatial Plan (CapeNature 2024) which is based on the VEGMAP is erroneous in classifying the area as a Critical Biodiversity Area 1 (CBA1).

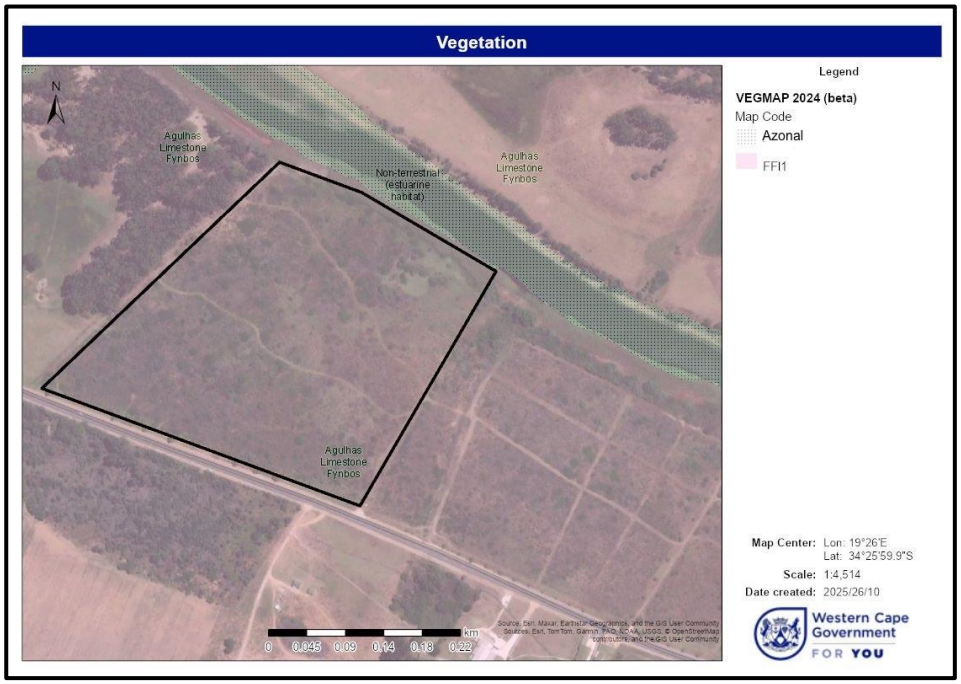


Figure 8. The vegetation type for the study area (black outline) as given in VEGMAP. This classification and hence mapping is incorrect.

5.2 The vegetation found in the study area

In April 2024 the author (McDonald 2024) wrote the following about the vegetation of the adjacent property mentioned above (blue type):

'The current vegetation on the site reflects the past agricultural activities on the site. It is densely shrubby, thicket-like, and lacking in geophytes, a good sign of past disturbance. It is a mid-high shrubland formation with a mix of plant species not indicative of fynbos but more like renosterveld. However, it lacks typical renosterveld species, particularly renosterbos (*Dicerothamnus rhinocerotis*) and is better described as scrub thicket. Plant species recorded include, *Acacia cyclops**, *Anthospermum aethiopicum*, *Calopsis* sp., *Carpobrotus edulis*, *Conyza scabrida*, *Crassula tetragona*, *Crossyne guttata*, *Cynodon dactylon*, *Cyperus thunbergii*, *Dicerothamnus rhinocerotis*, *Diospyros glabra*, *Dittrichia graveolens*, *Eragrostis curvula*, *Euclea racemosa*, *Gnidia oppositifolia* (should be *G. squarrosa*), *Gymnosporia buxifolia*, *Helichrysum patulum*, *Heliophila* sp., *Hyparrhenia hirta*, *Juncus dregeanus*, *Muraltia spinosa*, *Olea europaea* subsp. *cuspidata*, *Orphium frutescens*, *Passerina corymbosa*, *Pentameris colorata*, *Phalaris aquatica*, *Phragmites australis*, *Schinus terebinthifolius**, *Searsia angustifolia*, *Searsia crenata*, *Searsia lucida*, *Searsia rehmanniana*, *Searsia tomentosa*, *Senecio burchellii*, *Senecio pubigera*, *Senecio rigidus*, *Seriphium plumosum*, *Sideroxylon inerme*, *Stenotaphrum secundatum*, *Thamnochortus fruticosus.*

(The plant species names in brown type were those species found on Portion 3 and recorded on Portion 4; all the plant species names in blue type were recorded only on Portion 3).

It appears that the current expression of the vegetation is the result of historical disturbance, and more recently lack of fire or any other agent to thin out the scrub. It is obviously a secondary vegetation, not pertaining to any type, that has colonized the disturbed agricultural lands. However, if it is a valid type, it has not yet been described and accepted.

A more detailed study would be required to properly define this plant community, but the important point is that it is not Agulhas Limestone Fynbos and is not critically endangered, nor does it have high botanical or terrestrial biodiversity sensitivity. No rare plant, insect or animal species were recorded and although one milkwood tree (*Sideroxylon inerme* – protected) was recorded, it would not be affected by the proposed development.

Most of the above holds true for Portion 4 of Middelburg 643, Caledon (Stanford) as well. Many of the species listed above are the same, however, as far as can be ascertained, Portion 4, unlike Portion 3, was not historically cultivated. There are a few tracks through the site, giving access to the vegetation that is otherwise moderately to very dense. The plant species found on Portion 4 in early October 2025 are as follows:

The following are species that were found on Portion 4 but were not previously recorded on the adjacent Portion 3: *Aspalathus hispida, Aspalathus spinosa, Baeometra unifolia, Berkheya rigida, Carpanthea pomeridiana, Chrysocoma ciliata, Cotula pruinosa, Dischisma ciliata, Disphyma crassifolia, Eucalyptus cladocalyx*, Helichrysum cymosum, Helichrysum pandurifolium, Leonotis Leonurus, Lysimachia arvensis*, Melianthus major, Metalasia densa, Moraea miniata, Moraea sp., Ornithopus pinnatus, Ornithopus sativus, Osteospermum moniliferum, Pelargonium alchemilloides, Pelargonium capitatum, Pelargonium triste, Plecostachys serpyllifolia, Salvia africana, Salvia lanceolata, Searsia glauca, Senecio pterophorus, Sparaxis bulbifera, Vicia benghalensis*, Zantedeschia aethiopica.*

There are two main vegetation sub-types on the property, (i) the low-lying riparian floodplain of the Kleinrivier with Common Reed (*Phragmites australis*) on the riverbank. The floodplain is strongly dominated by *Stenotaphrum secundatum* (buffalo grass) that forms a dense grassy sward in which there are emergent shrubs and trees. The shrubs occur as scattered individuals or thickets of multiple individuals of several plant species. Species such as *Gymnosporia buxifolia, Plecostachys serpyllifolia, Senecio halimifolius, Searsia glauca* and *Searsia rehmanniana* occur singly or as part of thickets with *Olea europaea* subsp. *cuspidata* and *Melianthus major*.

Figure 9. The low-lying part of the property close to the Kleinrivier. This area is flooded when the river level is high.

Figure 10. The reed, *Phragmites australis* fringes the riverbank. The dense shrub in the centre of the image is *Gymnosporia buxifolia*.

Figure 11. *Gymnosporia buxifolia*, a shrub or small tree with long thorns.

Figure 12. A spreading shrub of *Searsia glauca* (blue khunibush).

Figure 13. Fruits on a female plant of *Searsia glauca* (blue khunibush).

Figure 14. *Melianthus major* with brown inflorescences forming part of a thicket with tall *Olea europaea* subsp. *cuspidata* (wild olive).

Further upslope from the low-lying floodplain, the vegetation changes, with mostly dense stands of mid-high to tall shrubs of *Passerina corymbosa*, *Gnidia squarrosa* and *Muraltia spinosa* are co-dominant in the upper stratum with low shrubs, including several *Helichrysum* spp., and grasses making up the dense lower stratum (including exotic grasses *Briza maxima* and *Bromus diandrus*). In places the 'matrix shrubland' is punctuated by dense, tall thickets formed by *Searsia crenata* or *Searsia glauca*, with species such as *Gymnosporia buxifolia* associated with them. Scattered *Olea europaea* subsp. *cuspidata* trees are also found.

Figure 15. Dense stands of *Passerina corymbosa* occur over large areas of the property.

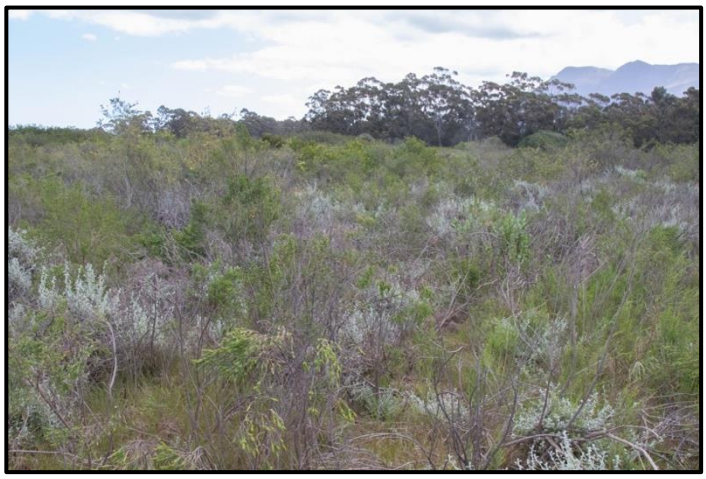


Figure 16. The light grey plants are *Helichrysum* spp. in the understorey of the dense shrubland.

Figure 17. *Gnidia squarrosa* is co-dominant in places in the dense mid-high to tall shrubland.

Figure 18. *Gnidia squarrosa* (Family: Thymelaeaceae).

Figure 19. Occasional widely spreading and tall thickets of *Searsia crenata*.

Parts of the mid-dense to dense shrubland in the upland area are moribund, with many tall shrubs having died. This is typical of vegetation that should be burnt for it to be rejuvenated.

Figure 20. Much of the dense thicket-like shrubland is old and moribund.

5.3 The birds and animals observed in the study area

Not many bird and animal species were observed in the study area. Bokmakierie, Cape Robin-chat and Karoo Prinia were heard calling. An adult endemic Angulate Tortoise, (*Chersina angulata*), was encountered (Figure 21), indicating that the ecosystem supports vertebrate wildlife even though few animals were seen. It is possible that small antelope occur, but none were observed in the dense vegetation. Signs of porcupine (*Hystrix africaeaustralis*) were noted at places where they had dug for roots and bulbs (Figure 22). The porcupines themselves were not seen since they are nocturnal.

Figure 21. Angulate Tortoise (*Chersina angulata*).

Figure 22. A hole dug by a porcupine in search of edible bulbs and corms.

6. Site Sensitivity

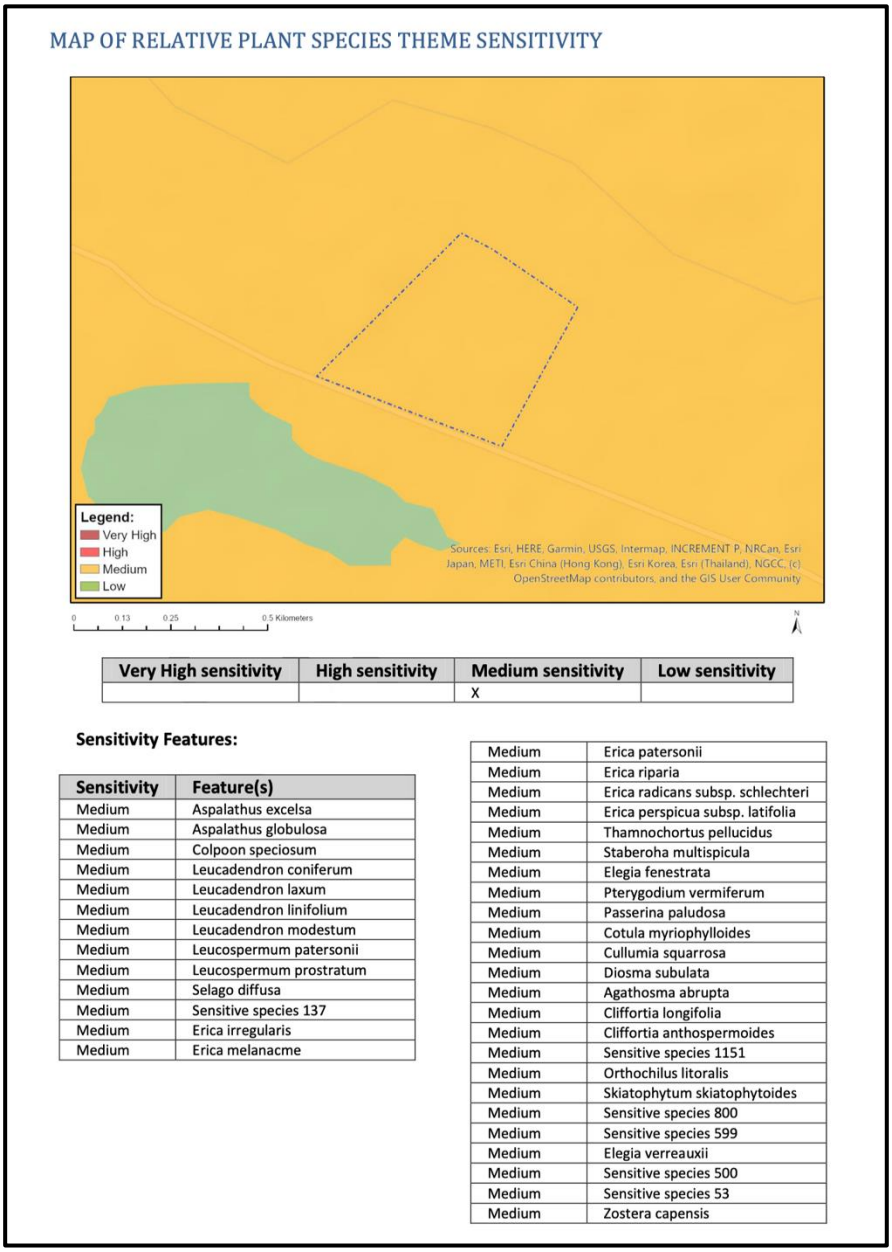
6.1 The National Web-based Environmental Screening Tool

As required per protocol, the National Web-based Screening Tool was applied to the application area and the sensitivity determined for the Relative Plant Species Sensitivity Theme and the Relative Terrestrial Biodiversity Sensitivity Theme.

6.1.1 Relative Plant Species Theme Sensitivity

The result of the screening tool analysis as shown in the map of Figure 23, is that the site has a **MEDIUM** sensitivity, with respect to the relative plant species theme sensitivity. The field observations do not support this classification. The vegetation is not Agulhas Limestone Fynbos, and the sensitivity is **LOW**. The sensitive species names were obtained from the South African National Biodiversity Institute and none of those species were encountered in the survey. As per protocol, those names are not published

here. Furthermore, the list of plant species given in Figure 23 pertain to those found in Agulhas Limestone Fynbos. None of them were found on the site.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

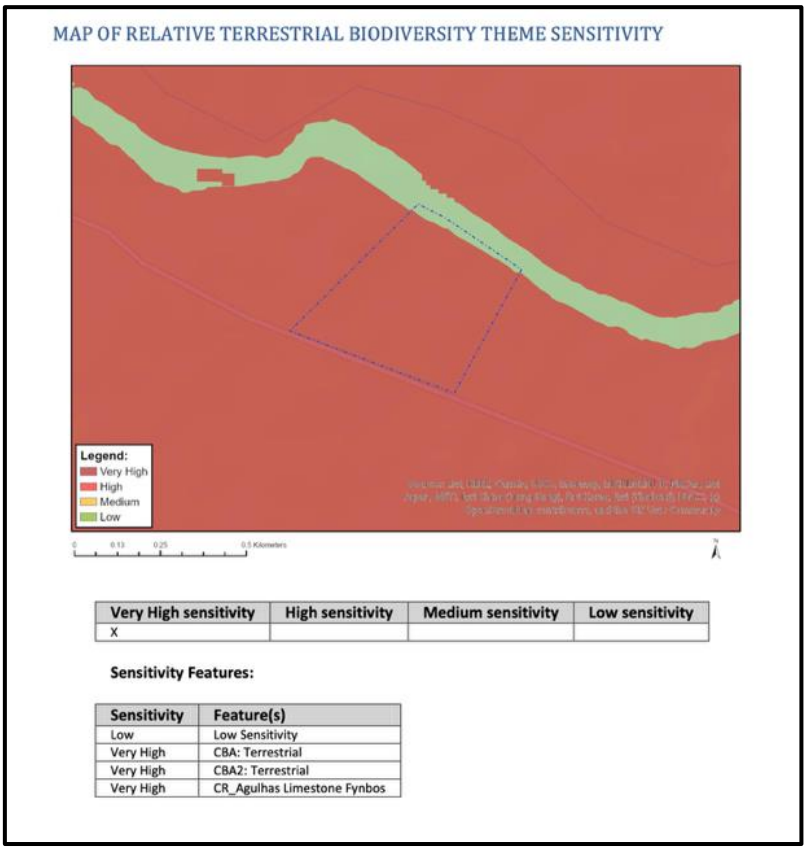
Sensitivity Features:

Sensitivity	Feature(s)
Medium	Aspalathus excelsa
Medium	Aspalathus globulosa
Medium	Colpoon speciosum
Medium	Leucadendron coniferum
Medium	Leucadendron laxum
Medium	Leucadendron linifolium
Medium	Leucadendron modestum
Medium	Leucospermum patersonii
Medium	Leucospermum prostratum
Medium	Selago diffusa
Medium	Sensitive species 137
Medium	Erica irregularis
Medium	Erica melanacme
Medium	Erica patersonii
Medium	Erica riparia
Medium	Erica radicans subsp. schlechteri
Medium	Erica perspicua subsp. latifolia
Medium	Thamnochortus pellucidus
Medium	Staberoha multispicula
Medium	Elegia fenestrata
Medium	Pterygodium vermiferum
Medium	Passerina paludosa
Medium	Cotula myriophylloides
Medium	Cullumia squarrosa
Medium	Diosma subulata
Medium	Agathosma abrupta
Medium	Cliffortia longifolia
Medium	Cliffortia anthospermoides
Medium	Sensitive species 1151
Medium	Orthochilus litoralis
Medium	Skiatophytum skiatophytoides
Medium	Sensitive species 800
Medium	Sensitive species 599
Medium	Elegia verreauxii
Medium	Sensitive species 500
Medium	Sensitive species 53
Medium	Zostera capensis

Figure 23. Sensitivity map (plant species) of Portion 4, Middelburg 643, Caledon at Stanford, as classified by the National Web-based Screening Tool.

6.1.2 Relative Terrestrial Biodiversity Species Theme Sensitivity.

The classification of sensitivity of the terrestrial biodiversity of the site is given as **VERY HIGH** by the screening tool (Figure 24). This is based on the conservation status of Agulhas Limestone Fynbos (Critically Endangered), and that the area is classified as CBA1. However, since the vegetation is **not** Agulhas Limestone Fynbos, it is contended here that the terrestrial biodiversity is **LOW** since Agulhas Limestone Fynbos is absent. Furthermore, the site should not be classified as CBA1.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	CBA: Terrestrial
Very High	CBA2: Terrestrial
Very High	CR_Agulhas Limestone Fynbos

Figure 24. Sensitivity map (terrestrial biodiversity) of Portion 4 of Middelburg 643, Caledon (Stanford) as classified by the National Web-based Screening Tool.

7. Conservation Status

7.1 National Threatened Ecosystems

As noted above, the main vegetation type according to Rebelo *et al.* (2006) is Agulhas Limestone Fynbos that is listed as **Critically Endangered B1(iii)** in the *Revised National List of Ecosystems Threatened and in need of Protection* (Government Gazette, 2022).

In 2021 the National Biodiversity Assessment was updated and emanating from that was the map of threatened ecosystems, for practical purposes called the Red List of Ecosystems (RLE), for the terrestrial realm of South Africa (SANBI, 2022; Skowno & Monyeki, 2021). This database reflects the current remaining natural extent (remnants) of 458 ecosystems. Portion 4 of Middelburg 643, Caledon (Stanford) is mapped as Critically Endangered (Figure 25). This classification is again erroneous since it is based on the incorrect premise that the site supports Agulhas Limestone Fynbos. The ecosystem should be mapped and Least Concern (LC).

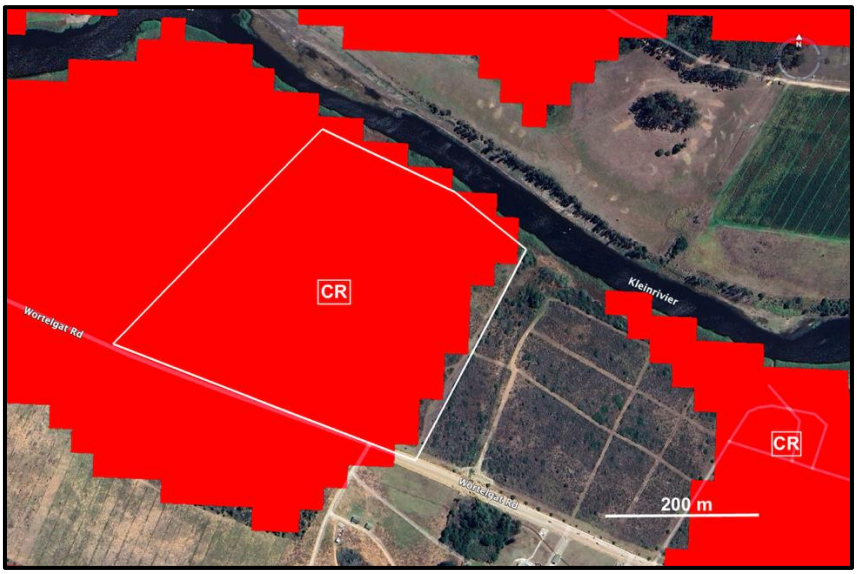


Figure 25. The RLE map for the study area shows **erroneously** that Portion 4 of Middelburg 643, Caledon (Stanford) (white boundary) falls in an area with CRITICALLY ENDANGERED (CR) habitat.

7.2 Western Cape Biodiversity Spatial Plan

In terms of the most recent Western Cape Biodiversity Spatial Plan for the Overberg Municipality (CapeNature, 2024) Portion 4 of Middelburg 643, Caledon (Stanford) is classified as Critical Biodiversity Area 1 (CBA1) (Figure 26). This is incorrect and should be at most Ecological Support Area 2 (ESA2) or an even lower rating of Other Natural Area (ONA). Reference should be made to Table 1 to see the definition of ESA2 and the management objectives.

Figure 26. The study area (black boundary) is incorrectly classified and mapped as CBA1 in the Western Cape Biodiversity Spatial Plan.

Table 1. Definitions of biodiversity spatial plan units and management objectives (Pool-Stanvliet *et al.* 2017)).

Unit		Definition	Management Objective
CBA1		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 natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.
CBA2		Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.	Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.
ESA1		Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs and are often vital for delivering ecosystem services.	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.
ESA2		Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs and are often vital for delivering ecosystem services.	Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.

7.3 Plant species of conservation concern (SCC)

No plant species of conservation concern (SCC) were encountered in the study area. The principal reason for this is that the vegetation type is **not** Agulhas Limestone Fynbos and the list of sensitive species generated by the environmental screening tool (Figure 23) **does not apply**. A secondary reason is

7.4 Site Ecological Importance

The Site Ecological Importance (SEI) is a metric to provide a consistent evaluation of one site relative to others. In this case the study area is incorrectly classified by the Western Cape Biodiversity Spatial Plan as CBA 1 (CapeNature 2024), so this classification is ignored, and the SEI is based on the observations recorded in the field.

The **Site Ecological Importance** (SEI) is calculated using the formula: SEI = BI + RR (Table 3)

…where BI is the **Biodiversity Importance** (Table 2), calculated using the formula**:**

BI = CI + FI, where **CI** is the **Conservation Importance** (**LOW**) and **FI** is the **Functional Integrity** (**MEDIUM**) (Table 2), and **RR** is the receptor resilience (**LOW**) (Table 3) i.e. *'The intrinsic capacity of the receptor to resist major damage from disturbance and / or to recover its original state with limited to no human intervention.'*

The Biodiversity Importance is **LOW** as determined in Table 2.

Table 2. Determination of Biodiversity Importance.

Biodiversity Importance		**Conservation Importance**				
		Very high	High	Medium	Low	Very low
Functional Integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Table 3. Determination of Site Ecological Importance.

Site Ecological Importance		**Biodiversity Importance**				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very High	Very high	Very high	High	Medium	Low
	High	Very high	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very low
	Low	High	Medium	Low	Very Low	Very low
	Very Low	Medium	Low	Very low	Very low	Very low

Therefore, in this case, where the vegetation and habitat have **LOW** sensitivity, the **Site Ecological Importance** is; Biodiversity Importance: **LOW;** Receptor resilience: **MEDIUM,** so

SEI = BI [LOW] + RR [MEDIUM] = **LOW**

For **LOW** Site Ecological Importance, the interpretation guideline is:

*Sites with **LOW** SEI should be subject to minimisation and restoration mitigation. Development activities of medium impact are acceptable followed by appropriate restoration activities.*

8. Impact Assessment

The 'No Go' Alternative and two development alternatives are assessed. Alternative 1 is the Non-preferred alternative and Alternative 2 is the Preferred Alternative (see above: **1. Introduction and Background**). Alternative 1 would be development below the 5 m contour and Alternative 2, above the 5 m contour, making use of existing roads/paths where possible. Both development alternatives involve jetties and slipways.

8.1 The No Go Alternative

In the case of the No-Go Alternative, the proposed development would not happen, so there would be little change to the *status quo* and the vegetation would remain relatively undisturbed.

8.2 Direct Impacts: Alternative 1, the non-preferred alternative i.e. development below the 5 m contour.

The direct impact of the proposed residences, jetties and slipways would be **LOW NEGATIVE** during the '**Planning, Design and Development Phase'**. Terrestrial vegetation and riparian vegetation with **LOW** ecological sensitivity would be affected.

Table 4. Impact: The loss of an undescribed vegetation type, with two sub-types, due to implementation of **Alternative 1.**

Alternative:	1
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Loss of undescribed terrestrial vegetation and riparian reedbeds below 5 m contour**
Nature of impact:	**Negative direct impact**
Extent and duration of impact:	**Local, Short-term**
Consequence of impact or risk:	**Loss of vegetation in the riparian zone and significant risk of the development negatively affecting the ability of the local environment to withstand the effects of flooding.**
Probability of occurrence:	**Definite**
Degree to which the impact may cause irreplaceable loss of resources:	**Moderate**
Degree to which the impact can be reversed:	**Low**
Indirect impacts:	**None identified**
Cumulative impact prior to mitigation:	**Medium**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Low**
Degree to which the impact can be mitigated:	**Medium**
Proposed mitigation:	• Designing the development to stay above the 5 m contour and the estuarine functional zone to reduce ecological impacts. • Using existing roads and paths for access to minimize new disturbances to the environment. • Limiting infrastructure like slipways and jetties, as only one jetty per property is typically permitted and slipways are discouraged. • Clearing of alien invasive plant species.
Residual impacts:	**Medium Negative**
Cumulative impact post mitigation:	**Medium Negative**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium Negative**

OPERATIONAL PHASE	
Potential impact and risk:	• **Loss of low-lying vegetation close to the river that provides stability to the environment.**
Nature of impact:	• **Flooding due to extreme weather events**
Extent and duration of impact:	**Medium term**
Consequence of impact or risk:	**Lowering the buffering of the**
Probability of occurrence:	**Medium**
Degree to which the impact may cause irreplaceable loss of resources:	**Medium**
Degree to which the impact can be reversed:	**Low**
Indirect impacts:	**Non identified**
Cumulative impact prior to mitigation:	**Medium**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium Negative**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Low**
Degree to which the impact can be mitigated:	**Low**
Proposed mitigation:	**No operational phase mitigation would be possible**
Residual impacts:	**Medium Negative**
Cumulative impact post mitigation:	**Medium Negative**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium Negative**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**This phase is not applicable since the proposed development would be in place for more than 25 years**
Nature of impact:	
Extent and duration of impact:	
Consequence of impact or risk:	
Probability of occurrence:	
Degree to which the impact may cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	
Indirect impacts:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	
Degree to which the impact can be managed:	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Residual impacts:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	

Table 5. Impact: The loss of an undescribed vegetation type, with two sub-types, due to implementation of **Alternative 2.**

Alternative:	**2**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	**Loss of terrestrial vegetation with low sensitivity above the 5 m contour and loss of riparian vegetation with medium sensitivity at the river i.e. below 5 m contour.**
Nature of impact:	**Clearing of natural vegetation**
Extent and duration of impact:	**The vegetation clearing would affect the undescribed shrubland vegetation within the footprint of the proposed residences and riparian zone at the location of the jetties and slipways.**
Consequence of impact or risk:	**Low impact on terrestrial vegetation and medium impact on riparian vegetation.**
Probability of occurrence:	**Definite**
Degree to which the impact may cause irreplaceable loss of resources:	**Low**
Degree to which the impact can be reversed:	**Low**
Indirect impacts:	**None identified**
Cumulative impact prior to mitigation:	**Medium Negative**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium Negative**
Degree to which the impact can be avoided:	**Medium**
Degree to which the impact can be managed:	**Moderate**
Degree to which the impact can be mitigated:	**Medium**
Proposed mitigation:	• **Avoidance of the estuarine functional zone to reduce ecological impacts.** • **Existing roads would be used to avoid unnecessary disturbances to the environment.** • **Only one jetty and one slipway would be constructed.** • **Clearing of alien invasive plant species.**
Residual impacts:	**Low Negative**
Cumulative impact post mitigation:	**Low negative**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low Negative**
OPERATIONAL PHASE	
Potential impact and risk:	
Nature of impact:	• **Clearing of terrestrial vegetation beyond the limit of the footprints of the residences to limit danger of wildfires.** • **Slow and imperceptible loss of natural habitat due presence of residents.** • **Long-term** • **Loss of natural vegetation** • **Definite** • **Low** • **Low** • **None identified**

	• **Low Negative** • **Low Negative** • **Low** • **Moderate** • **High – The impact within the sensitive riparian zone would be limited.** • **Development of residences should be above the 5 m contours and should wherever possible avoid well-established old trees, particularly of wild olive (Olea europaea subsp. cuspidata)** • **Low Negative** • **Low Negative** • **Low Negative** •
Extent and duration of impact:	**Long-term**
Consequence of impact or risk:	**Loss of natural vegetation**
Probability of occurrence:	**Definite**
Degree to which the impact may cause irreplaceable loss of resources:	**Low**
Degree to which the impact can be reversed:	**Low**
Indirect impacts:	**None identified**
Cumulative impact prior to mitigation:	**Low Negative**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low Negative**
Degree to which the impact can be avoided:	**Low**
Degree to which the impact can be managed:	**Moderate**
Degree to which the impact can be mitigated:	**High – The impact within the sensitive riparian zone would be limited.**
Proposed mitigation:	**Development of residences should be above the 5 m contours and should wherever possible avoid well-established old trees, particularly of wild olive *(Olea europaea subsp. cuspidata)***
Residual impacts:	**Low Negative**
Cumulative impact post mitigation:	**Low Negative**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low Negative**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**This phase is not applicable since the proposed development would be in place for more than 25 years**
Nature of impact:	
Extent and duration of impact:	
Consequence of impact or risk:	
Probability of occurrence:	
Degree to which the impact may cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	
Indirect impacts:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	

Degree to which the impact can be managed:	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Residual impacts:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	

8.3 Mitigation in the 'Construction' Phase'

The construction phase or 'Planning, Design and Development" phase is the most critical since it is at this stage that the mitigation hierarchy must be carefully considered. By avoiding old and well-established trees and limiting impacts to areas of low habitat sensitivity, the negative impacts can be limited. In general, however, the areas targeted for development of the residences in the Preferred Alternative (Alternative 2) have low habitat sensitivity. (They are not Critical Biodiversity Areas since the classification is erroneous.)

The riparian zone is the exception to the above. Although there is not high species diversity in the azonal vegetation of the riparian zone, it is the interface between the terrestrial habitat and the river. Development in this zone should either be avoided or, if unavoidable, should be treated with caution.

9. Discussion

This study has raised the question as to whether the vegetation being dealt with is Agulhas Limestone Fynbos or not. There has been clear demonstration that the vegetation is not Agulhas Limestone Fynbos but is an undescribed shrubland formation. It therefore is not critically endangered and should not be classified as CBA1 as given at present in the WCBSP. The vegetation has low ecological sensitivity and any low- to moderate-scale development in this vegetation, except below the 5 m contour where riparian vegetation comes into play, is acceptable with residual impacts likely to be **LOW NEGATIVE** in the short- to long-term. There would thus be no requirement for a biodiversity offset even though more than 300 m^2 of indigenous vegetation would be disturbed. The problem with the habitat and vegetation type being incorrectly classified is that all the relevant conservation classifications such as the Western Cape Biodiversity Spatial Plan (**CBA1**), the Red Listed Ecosystems (**CR**) and the Environmental Screening Tool (**HIGH** sensitivity for the Terrestrial Biodiversity Theme) are then based on the premise that the vegetation is **very sensitive** which it is not. This matter can only be conclusively dealt with if a research study was to take place that would definitively change the classification of the type of vegetation being dealt with. If the vegetation was

to be reclassified it would undoubtedly be classified as 'Least Concern' or 'Least Threatened' and all the other classifications would have to accommodate this change.

10. Conclusions

The receiving environment of the proposed residences on Portion 4 of Middelburg 643, Caledon (Stanford) where the Alternative 1 footprint would be is not sensitive and the development is supported from a botanical and terrestrial biodiversity perspective. However, there is some concern that the jetties would result in undetermined negative impacts so in this instance the precautionary principle should be invoked. Since the negative impacts would be low after mitigation there is no indication that a conservation offset would be necessary.

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Appendix 1. Curriculum Vitae – David McDonald

Dr David Jury McDonald Pr.Sci.Nat.

Name of Firm: Bergwind Botanical Surveys & Tours CC. (Independent consultant)

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Website: www.bergwind.co.za

Profession: Botanist / Vegetation Ecologist / Consultant / Tour Guide

Date of Birth: 7 August 1956

Employment history:

- 19 years with National Botanical Institute (now SA National Biodiversity Institute) as researcher in vegetation ecology.
- Five years as Deputy Director / Director Botanical & Communication Programmes of the Botanical Society of South Africa
- Nineteen years as private independent Botanical Specialist consultant (Bergwind Botanical Surveys & Tours CC)

Nationality: South African (ID No. 560807 5018 080)
Languages: English (home language) – speak, read and write
Afrikaans – speak, read and write

Membership in Professional Societies:

- South Africa Association of Botanists
- International Association for Impact Assessment (SA)
- South African Council for Natural Scientific Professions (**Ecological Science, Registration No. 400094/06**)
- Field Guides Association of Southern Africa

Key Qualifications :

- Qualified with a M. Sc. (1983) in Botany and a PhD in Botany (Vegetation Ecology) (1995) at the University of Cape Town.
- Research in Cape fynbos ecosystems and more specifically mountain ecosystems.
- From 1995 to 2000 managed the Vegetation Map of South Africa Project (National Botanical Institute)

- Conducted botanical survey work for AfriDev Consultants for the Mohale and Katse Dam projects in Lesotho from 1995 to 2002. A large component of this work was the analysis of data collected by teams of botanists.
- **Director: Botanical & Communication Programmes** of the Botanical Society of South Africa (2000—2005), responsible for communications and publications; involved with conservation advocacy particularly with respect to impacts of development on centres of plant endemism.

- Further tasks involved the day-to-day management of a large non-profit environmental organisation.

- **Independent botanical consultant** (2005 – to present) over 1000 projects have been completed related to environmental impact assessments in the Western, Southern and Northern Cape, Karoo and Lesotho. A list of reports (or selected reports for scrutiny) is available on request.

Higher Education

Degrees obtained
and major subjects passed:

B.Sc. (1977), University of Natal, Pietermaritzburg
Botany III
Entomology II (Third year course)

B.Sc. Hons. (1978) University of Natal, Pietermaritzburg
Botany (Ecology /Physiology)

M.Sc. - (Botany), University of Cape Town, 1983.
Thesis title: 'The vegetation of Swartboschkloof, Jonkershoek, Cape Province'.

PhD (Botany), University of Cape Town, 1995.
Thesis title: 'Phytogeography endemism and diversity of the fynbos of the southern Langeberg'.

Certificate of Tourism: Guiding (Culture: Local)
Level: 4 Code: TGC7 (Registered Tour Guide: WC 2969).

Employment Record:

January 2006 – present: Independent specialist botanical consultant and tour guide in own company: **Bergwind Botanical Surveys & Tours CC**
August 2000 - 2005 : Deputy Director, later Director Botanical & Communication Programmes, Botanical Society of South Africa
January 1981 – July 2000 : Research Scientist (Vegetation Ecology) at National Botanical Institute
January 1979—Dec 1980 : National Military Service

Further information is available on website: www.bergwind.co.za