Terrestrial Plant Species Assessment: Farm Rocklands 57/633 Agricultural Development

Attention:

Michelle Naylor

Lornay Environmental

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APPOINTMENT OF SPECIALIST

I, Jacques van Rensburg, Director of Nature Works Environmental Consultancy, was appointed by Ace Environmental Solutions to provide specialist biodiversity consulting services for the proposed Helios tower cellular site.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998, specialists involved in Impact Assessment processes must declare their independence and include an abbreviated Curriculum Vitae.

I, Jacques van Rensburg, hereby declare that I am financially and otherwise independent of the client and their consultants, and have no interest, be it business, financial or personal, in the proposed activities. All opinions expressed in this document are my own.

I declare that I am confident in the results of this study, and the conclusions drawn from it.

Mr. Jacques Jansen van Rensburg

October 2023

CONDITIONS RELATING TO THIS REPORT

The methodology, findings, results, conclusions, and recommendations in this report are based on my best scientific and professional knowledge. I reserve the right to modify aspects of the report, including the recommendations and conclusions, should additional relevant information become available. This report may not be altered or added to without the prior written consent of the author. Any recommendations, statements or conclusions drawn from, or based on this report, must cite this report and should not be taken out of context, and may not change, alter or distort the intended meaning of the original in any way. If these extracts or summaries form part of a main report relating to this study or investigation, this report must be included in its entirety as an appendix, or as a separate section to the main report.

DETAILS OF THE SPECIALIST

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Expertise

- Qualifications: Hons (2012), Environmental Management & MSc (2017) in Botany at Unisa and Stellenbosch University respectively.
- Ecologist with 14 years' experience in the field of Environmental Management and Ecological Surveys.

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1. Introduction

Farm Rocklands 57/633, located to the east of Hermanus as depicted in Figure 1, spans an area of approximately 49 hectares. In 2020, a portion of the site, approximately 9 hectares, was cleared to make way for agricultural development. An investigation conducted by the Department of Environmental Affairs and Development Planning (DEADP) confirmed that the cleared area encompassed critical ecosystems, specifically the Elim Ferricrete Fynbos and Agulhas Limestone Fynbos. Furthermore, this development commenced without the necessary environmental authorization.

In response to these developments, Lornay Environmental has been appointed to submit a Section 24G (s24G) application to obtain the requisite environmental authorization. The national screening tool used for this purpose indicated that the plant species theme's significance was determined to be of medium sensitivity. Subsequently, Lornay Environmental has engaged Nature Works Environmental Consultancy to perform the required Botanical Impact Assessment. The objective of this report is to assess the environmental sensitivities associated with the proposed development footprint and provide insights into its potential impact from a botanical perspective.

The assessment aims to offer an understanding of the ecological context and impact significance of the agricultural development on Farm Rocklands 57/633. By doing so, this report seeks to facilitate an informed decision-making process.

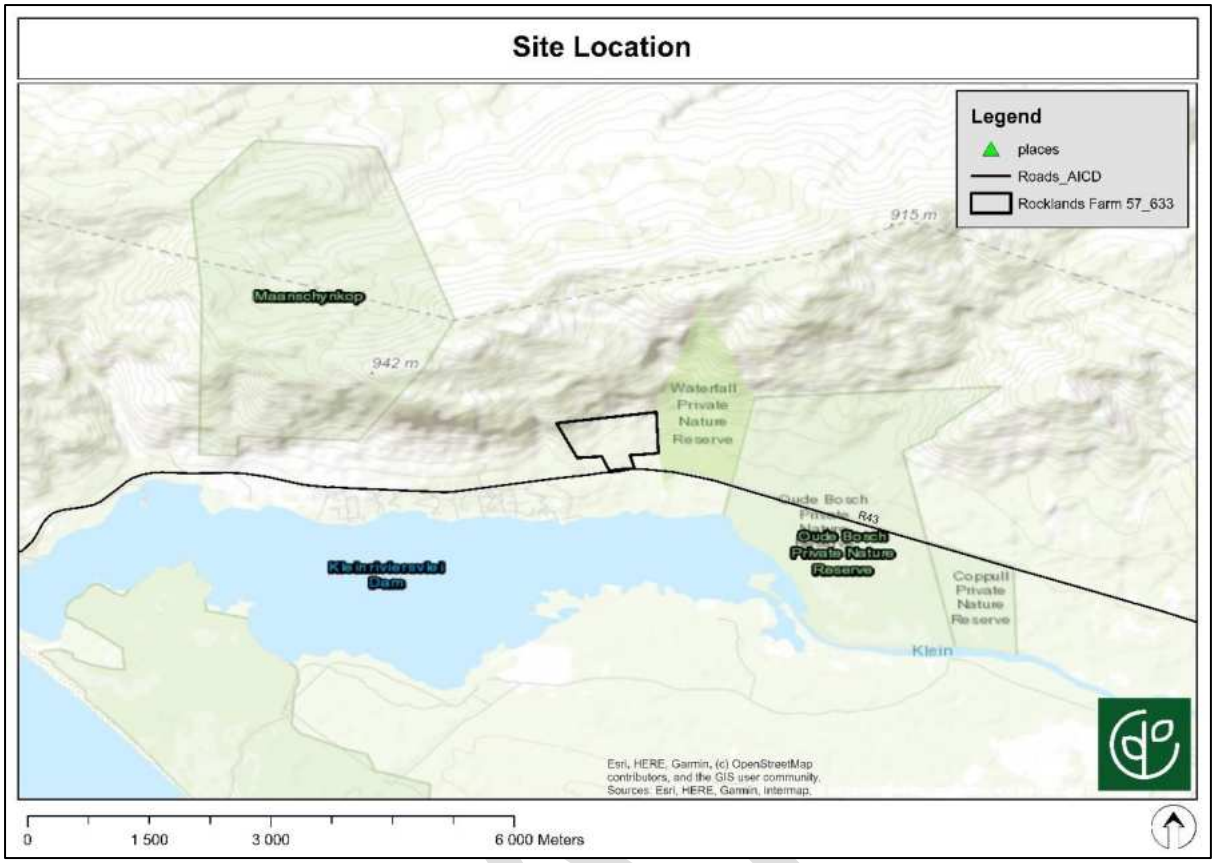

Figure 1: Locality map (scale 1:50 000).

2. Protocol for determining level of reporting

The sensitivity of the site was predetermined using the Department of Environmental Affairs (DEA) screening tool (https://screening.environment.gov.za/screeningtool/). The study area is rated to have a medium sensitivity rating for terrestrial plant species. However, due to the presence or likely presence of SCC identified by the screening tool, it is required to conduct a Terrestrial Plant Species Specialist Assessment in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol (Government Gazette 2020).

3. Terms of Reference

3.1 General

The terrestrial plant species assessments followed guidelines outlined in the following documents:

- Department of Environmental Affairs and Development Planning (DEA&DP) Guidelines for Involving Biodiversity Specialists in the EIA Process (Brownlie, 2005).

- Ecosystem Guidelines for Environmental Assessment in the Western Cape (Cadman et al., 2016).
- The requirements of CapeNature for providing comments on agricultural, environmental, mine planning, and water-use related applications (Turner, 2013).
- Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 (Government Gazette GN.320, 2020).
- Guidelines for the implementation of the Terrestrial and Aquatic Ecosystem Protocols for environmental impact assessments in South Africa (Draft, July 2021).

3.2 Specific Terms of Reference

The specific terms of reference followed for this assessment are as follows:

- Identify and describe biodiversity patterns at community and ecosystem level (main vegetation type, plant communities in the vicinity and threatened/vulnerable ecosystems), at species level (threatened Red List species, presence of alien species) and in terms of significant landscape features.
- Assess the local and regional importance of the vegetation communities and plant species within the affected areas based on the relevant biodiversity plans, bioregional planning documents and Environmental Management Frameworks etc.
- Describe the sensitivity of the site and its environs and map these resources.
- Identify any areas not suitable for development or related activities (No-Go Areas) and related buffers that should be observed.
- Describe the direct, indirect, and cumulative botanical impacts (both before and after mitigation) and an assessment of the significance of the impacts.
- Describe the measures to mitigate any impacts, and an indication of whether the measures (if implemented) would change the significance of the impact, for the construction and operational phases of the project; and
- Include any rehabilitation or monitoring measures that may be required.

4. Methodology, Limitations and Assumptions

The study area was visited on 13 October 2023 and surveyed on foot. During the site inspections, photographs of the area of influence were taken for record purposes. A visual observation was made of the footprint and surrounding area, taking note of the land use, land

cover and specifically the vegetation cover of the development footprint, and any evidence of the plant species of conservation concern.

The following sources have been used to inform this study:

- Site boundaries: The property boundaries have been downloaded from the Cape Farm Mapper Website (https://gis.elsenburg.com/apps/cfm/).
- Vegetation Types: Based on The Vegetation of South Africa, Lesotho, and Swaziland (VEGMAP) (Mucina & Rutherford, 2006). The South African National Biodiversity Institute (SANBI) has updated the mapping for the VEGMAP (2018), and these latest shapefiles have been used where appropriate. Where fine scale vegetation maps are available these are also used (e.g., C.A.P.E. Fine Scale Integrated Vegetation Map (2007)).
- Ecosystem threat status: Informed by the List of Threatened Terrestrial Ecosystems (Government Gazette, 2011) and CapeNature's (2014) updated ecosystem status based on criterion A1 only (irreversible loss of habitat). An update of the ecosystem threat status has been produced as part of the Western Cape Biodiversity Spatial Plan (CapeNature, 2016) and is used as the most up to date information on ecosystem threat status in the Western Cape.
- Biodiversity planning: The Western Cape Biodiversity Spatial Planning GIS layer was obtained from SANBGIS, the layer is important for determining the conservation importance of the designated habitat. Ground-truthing is an essential component in terms of determining the habitat condition.
- Important species: The presence or absence of threatened (i.e., species of conservation concern) and ecologically important species informs the ecological condition and sensitivity of the site. The latest conservation status of species is checked on the Red List of South African Plants (Raimondo et al. 2009) via the website (www.redlist.sanbi.org).
- Previous studies: Previous botanical studies in the region of the study area provide additional information that can support the findings of the once-off nature of a typical impact assessment report.

I conducted the botanical assessment on the 13th of October 2023, which is considered the optimal season for such assessments. It's important to note a key limitation: due to prior site development, I was unable to obtain a true reflection of the vegetation and SCC that may have been present on the site. Consequently, I focused my evaluation on the natural areas directly adjacent to the disturbed area, which I considered representative of the site.

5. The vegetation of the Study Area

5.1 The national vegetation and ecosystem threat status

According to the Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018) (VEGMAP), the vegetation type occurring in the study area and surrounds is Elim Ferricrete Fynbos and Agulhas Limestone Fynbos (Figure 2).

Elim Ferricrete Fynbos, as assessed by the IUCN Red List of Ecosystems (IUCN RLE v1.1), is categorized as "Critically Endangered." This designation is based on specific trigger criteria (A3) that indicate a severe decline in its spatial extent and overall health.

Spatial Decline: National land cover and supplementary provincial and metropolitan land cover data reveal that Central Ruens Shale Renosterveld, which includes the Elim Ferricrete Fynbos, has experienced a dramatic decline of approximately 90% of the original extent. This significant loss of habitat is a major concern for the ecosystem's survival.

Biodiversity and Structural Diversity: Elim Ferricrete Fynbos is characterized by undulating hills and plains, featuring open to closed dwarf shrubland with occasional scattered tall shrubs. It is a diverse unit, encompassing various structural fynbos types. Extensive areas are covered with asteraceous fynbos, which is dominated by low proteoid elements.

Degradation: When degraded, this vegetation type becomes dominated by *Elytropappus rhinocerotis*.

Geology and Soils: Elim Ferricrete Fynbos grows on Glenrosa and Mispah soils derived from various geological formations, including Bokkeveld Shale, Cape Granite (of the Hermanus Suite), ferricrete, and silcrete. The land types are primarily Fb and Db.

Climate: The ecosystem experiences a mainly winter-rainfall regime, with some summer rain. The mean annual precipitation (MAP) ranges from 350 to 770 mm, with a peak from May to August. Mean daily maximum and minimum temperatures for January and July are 25.8°C and 6.7°C, respectively.

Overall, Elim Ferricrete Fynbos is facing a critical threat due to substantial spatial declines, degradation, and changes in species composition. The diverse and unique nature of this fynbos ecosystem, with its proteoid elements and other distinctive plant species, makes its conservation crucial for maintaining regional biodiversity.

Agulhas Limestone Fynbos, as assessed by the IUCN Red List of Ecosystems (IUCN RLE v1.1), is classified as "Critically Endangered".

Vegetation & Landscape Features, Agulhas Limestone Fynbos is primarily found on the low hills and plains along the coastal margin of the Agulhas coastal forelands. It also occurs at higher altitudes, such as on Soetanysberg. The ecosystem is characterized by moderately dense, low shrublands containing tall, emergent proteoids. It comprises mainly asteraceous and proteoid fynbos, with restioid fynbos in sandy areas and on limestone pavements. Wetter areas, including waterlogged bottomlands, are dominated by *Leucadendron linifolium,* restioid fynbos, transitioning to Agulhas Sand Fynbos in deeper sand areas.

Geology & Soils: Agulhas Limestone Fynbos grows on shallow alkaline bedrock and alkaline, grey, regic sands located on limestones of the Bredasdorp Formation. Land types are mainly classified as Hb, Db, and Fa.

Climate: The ecosystem experiences a mean annual precipitation (MAP) ranging from 410 to 660 mm, with a peak slightly from June to August. It is the wettest of all the limestone fynbos units. Mean daily maximum and minimum temperatures for January and July are 25.5°C and 7.0°C, respectively. Frost incidence occurs about three days per year.

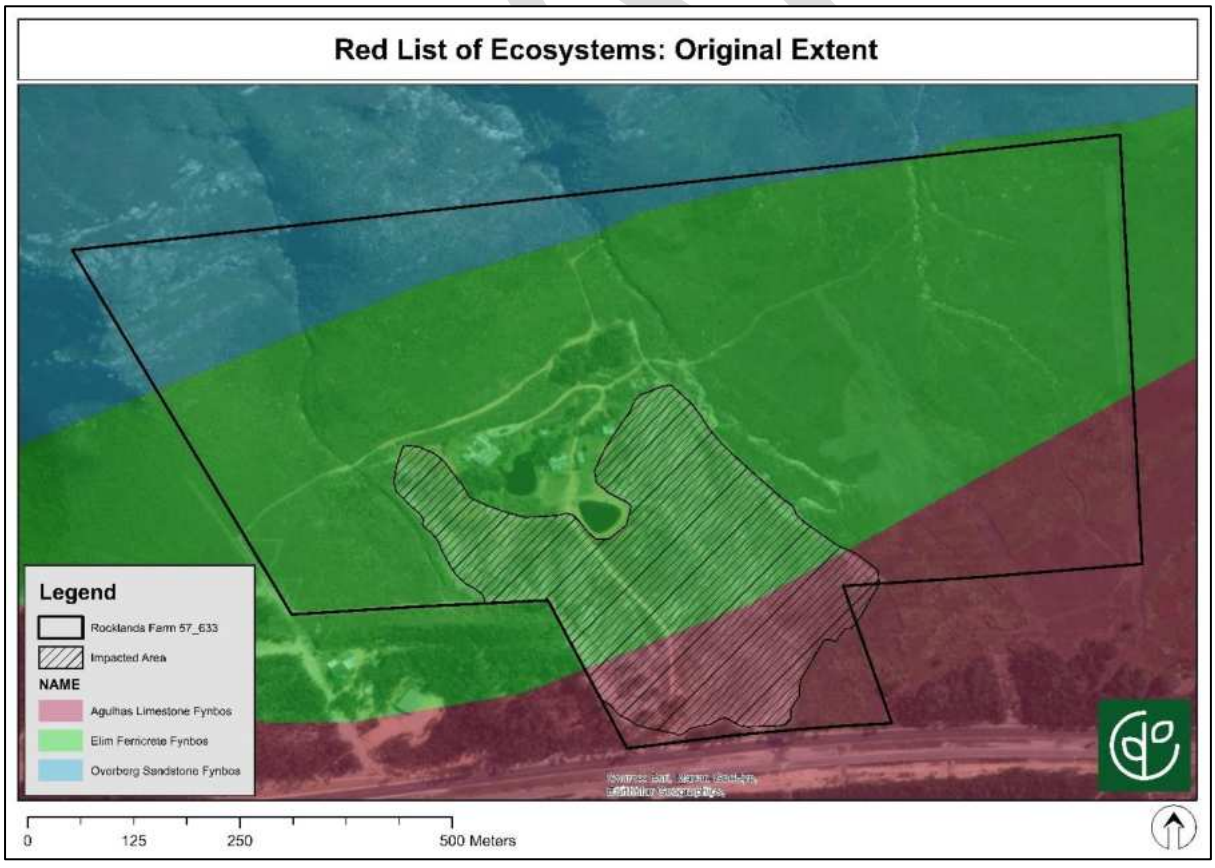

Figure 2: Vegetation types within the impacted area and immediate surrounds.

The agricultural development has resulted in the approximate loss of 6.428 ha and 2.975 ha of Elim Ferricrete Fynbos and Agulhas Limestone Fynbos, respectively. The impact significance of the respective habitat loss is assessed in section 8.

5.2 Western Cape Biodiversity Plan

5.2.1 Terrestrial Critical Biodiversity Areas (CBAs)

The Western Cape Biodiversity Spatial Plan (WCBSP; Pool-Stanvliet *et al*., 2017) employs a systematic biodiversity planning approach to identify priority areas and ecological infrastructure within the province. The WCBSP serves as a spatial tool, comprising a map of priority areas, along with contextual information and land use guidelines, thereby providing valuable biodiversity information for land use and development planning, environmental assessment and regulation, as well as natural resource management (Pool-Stanvliet et al., 2017).

The WCBSP Map encompasses biodiversity importance in the terrestrial and freshwater realms, as well as significant coastal and estuarine habitats. This Biodiversity Spatial Plan is structured according to five primary biodiversity priority categories, as outlined in SANBI's Technical Guidelines for biodiversity maps, namely: Protected Areas (PA), Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), Other Natural Areas (ONA), and Severely Modified or No Natural Remaining (NNR). The map delineates CBAs and ESAs, which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services (Pool-Stanvliet et al., 2017).

According to the WCBSP, the development on the site directly impacts CBA1: Aquatic, CBA1: Terrestrial, CBA2: Terrestrial, and ESA2: Restore from other land use, comprising 0.04 Ha, 0.979 Ha, 8.042 Ha, and 0.08 Ha, respectively (Figure 3).

CBA1 is defined as areas in a natural condition that are necessary to meet biodiversity targets for species, ecosystems, or ecological processes and infrastructure. The objectives are to maintain the habitat in a natural or near-natural state with no further loss of natural habitat. Degraded areas should be rehabilitated, and only low-impact, biodiversity-sensitive land uses are considered appropriate.

CBA2 is defined as areas in a degraded or secondary condition that are required to meet biodiversity targets for species, ecosystems, or ecological processes and infrastructure. The objectives are to maintain these areas in a natural or near-natural state with no further loss of habitat. Degraded areas should be rehabilitated, and only low-impact, biodiversity-sensitive land uses are considered appropriate.

ESA2 is defined as areas that are not essential for meeting biodiversity targets but play a crucial role in supporting the functioning of PAs or CBAs, often being vital for delivering ecosystem services. The objective is to restore and/or manage them to minimize the impact on ecological processes and ecological infrastructure functioning, particularly soil and water-related services, and to allow for faunal movement. Farm Rocklands 57/633 borders with Waterfall Private Nature Reserve to the approximately 260m East of the impacted area.

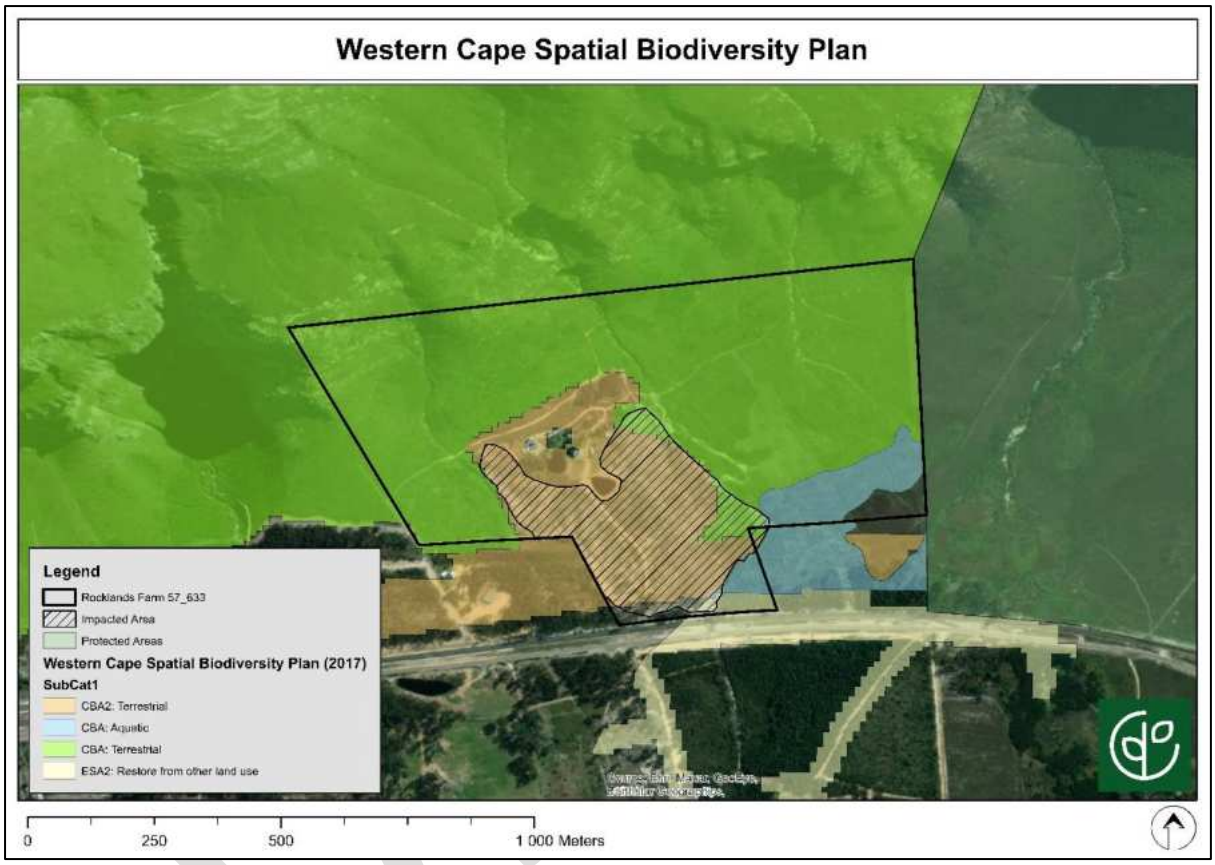

Figure 3: Western Cape Spatial Biodiversity Plan indicating the spatial distribution of WCSBP in relation to the proposed subdivision.

5.3 Water Resources

As per Rivers (NGI), the affected site is bounded by non-perennial drainage lines to the east and west. The wetland to the south of the impacted area is designated by NWM5 as a "Seep wetland" (Figure 4). It's worth noting that from the site assessment, it appears that the extent of the wetland area is underrepresented, indicating a potential need for further study and more accurate delineation.

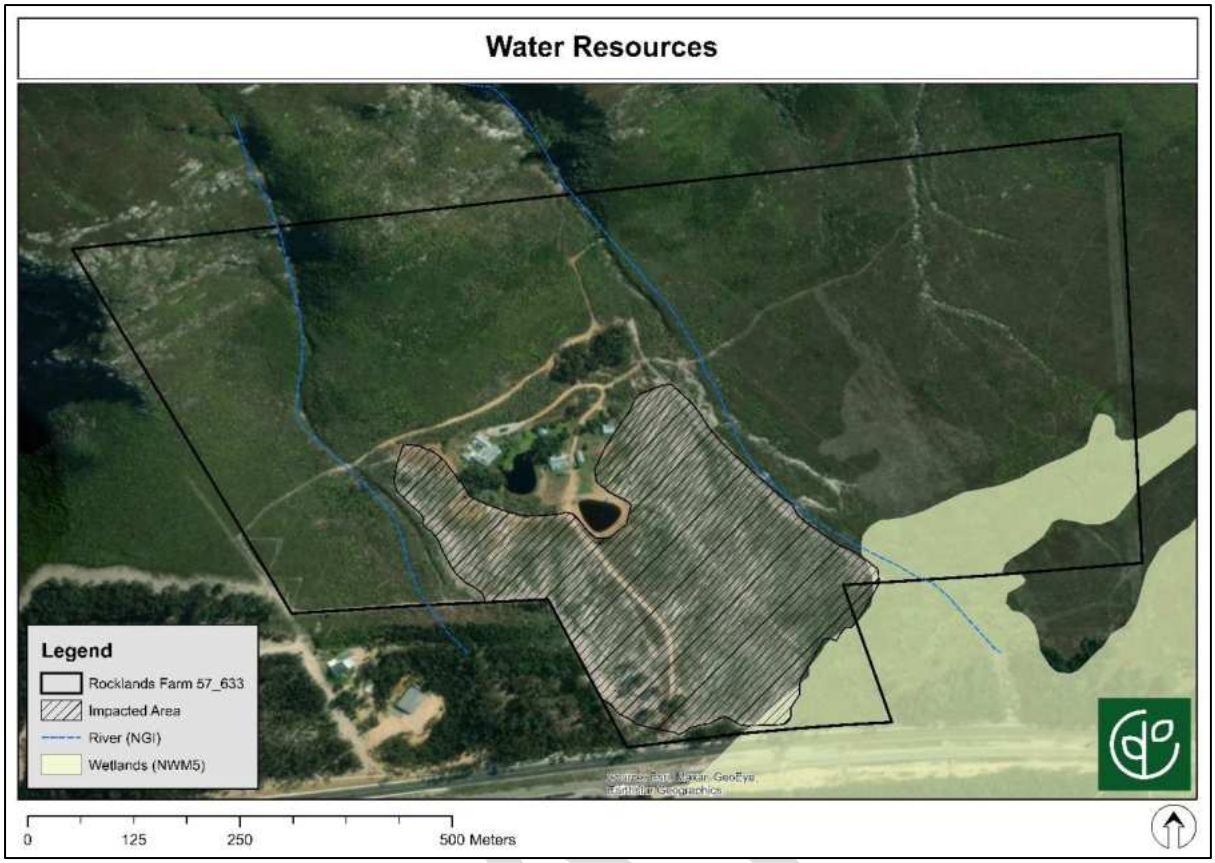

Figure 4: Water resources

6. Habitat Condition of the Study Area

The current surrounding vegetation condition on the site is described below according to habitat categories provided in Table 1. The habitats mapped by the author are represented in Figure 6.

Table 1: A description of the various habitat condition classes.

Habitat condition	Description
Intact vegetation	A true representation of the original vegetation type in terms of structure and species makeup. Minimal soil disturbance. Unlikely to have ever been ploughed. Disturbance may be evident.
Semi-intact	Closely resembles the original vegetation type in terms of structure and species makeup but has undergone some form of current or historical disturbance. Restoration potential is high.
Degraded	Only a few species representative of the original vegetation type are present. The vegetation has undergone heavy disturbance. Restoration potential is either low or moderate.

Highly degraded	The original vegetation is usually absent and has been removed in the past. Only a few remnants or pioneer species are present. Soils usually ploughed in the past. Restoration potential is very low.
Transformed	No remnant species exist anymore. The landscape is altered irreversibly with no restoration potential. Examples include cultivated farmland and the built environment.

6.1 Site Historical context

Given that the site has already undergone transformation from natural habitat to agricultural land, assessing the current habitat condition on-site becomes an impractical task. In light of this, I conducted an assessment of the historical habitat condition using available Google Earth satellite imagery. The following summary outlines the findings from this evaluation, which is primarily based on my knowledge of the local vegetation structure. The objective was to map significant disturbances that could provide evidence and indications of the site's habitat condition before its transformation for agricultural use.

The historical imagery dating back to 2003 reveals that the impacted area experienced various historical disturbances. Notably, in 2003, Invasive Alien Plants (IAPs) were observed in the affected area. By 2006, it was evident that the IAPs had spread throughout the site, a road was constructed to facilitate access for building new dwellings, and two small dams were created directly to the north of the impacted area. In 2012, alien clearing efforts were undertaken, and management actions were implemented by the landowner, resulting in the rehabilitation of the impacted area, as depicted in Figure 5. Therefore, it is reasonable to infer that the site's habitat, prior to the illegal clearing, was in a semi-intact condition.

Figure 5: The 2020 Google Earth imagery offers a visual representation of the site's habitat condition before the vegetation was cleared.

6.2 Current Habitat Condition

There were five different habitat conditions observed during the onsite assessment surrounding the impacted area (Figure 6). These conditions are: intact, semi-intact, degraded, highly degraded, and transformed. A detailed description of each habitat feature is provided below.

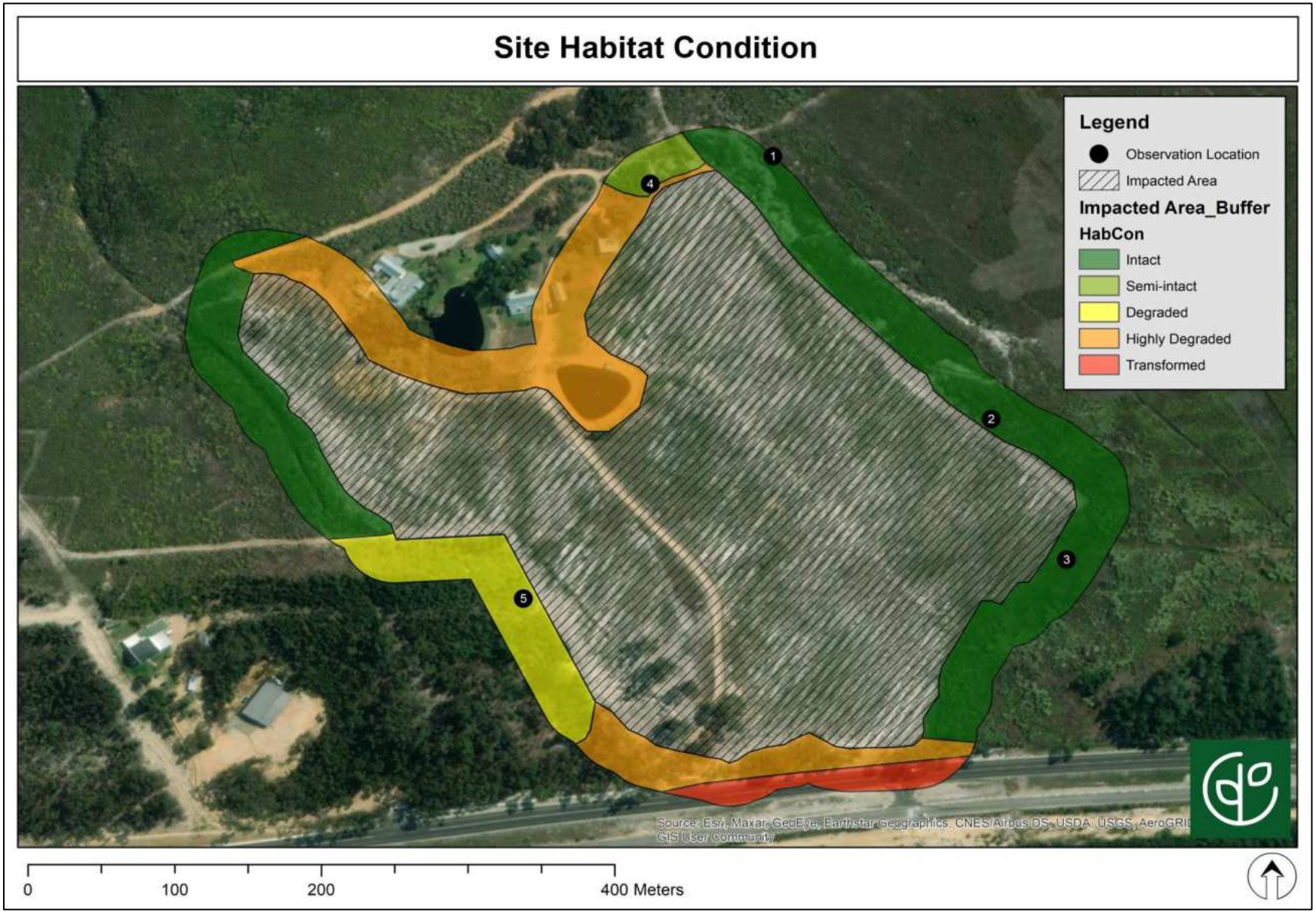

Figure 6: The site habitat condition within a 30m buffer area of the impacted site.

6.2.1 Intact Habitat

Photo 1

General Site Description: The area adjacent to the western boundary of the impacted region exhibits a pristine instance of the Elim Ferricrete Fynbos ecosystem. This habitat predominantly consists of shrubland, with occasional tall shrubs dispersed within. Notably, the site displays a high level of biodiversity, encompassing the full spectrum of structural fynbos types. Importantly, the site demonstrates minimal historical ecological disturbances, maintaining its original, undisturbed state. Moreover, it exhibits robust ecological connectivity to a larger, unaltered expanse of the vegetation westward, ultimately linking to the contiguous private nature reserve, as visually depicted in Figure 3. This unaltered condition, coupled with the limited history of disturbances, firmly establishes the site's status as a pristine representation of the Elim Ferricrete Fynbos ecosystem. **Species Observed:** I observed a non-exhaustive list of species within the study area to the west of the impacted area. Within this area, two Species of Conservation Concern (SCC) were documented, namely *Serruria rubricaulis* (Vulnerable) and *Leucospermum prostratum* (Near Threatened). However, due to time constraints, it was not feasible to assess every square meter of the area. Hence, it is assumed that other SCCs, as identified in the screening tool report, may also be present within the impacted area. A list of species observed during the site assessment can be found in Appendix 3.

Photo 2

General Site Description: The habitat undergoes a transition from the typical vegetation associated with terrestrial habitats to an area exhibiting features indicative of freshwater habitats. This zone is densely vegetated with *Berzelia lanuginosa*, and scattered instances of *Aspalathus carnosa* and *Psoralea pinnata* have been observed throughout.

Photo 3

General Site Description: The southeastern corner of the site exhibits wetland seep features with surface water present in certain areas. Sedges (e.g., Carex species) and rushes (e.g., Juncus species) were observed, along with *Berzelia lanuginosa*. Scattered instances of *Aspalathus carnosa*, *Psoralea pinnata*, *Osmitopsis afra*, and densely packed *Erica perspicua* were also observed.

6.2.2 Semi-intact Habitat

Photo 4

General Site Description: The observed area closely resembles the surrounding vegetation type in terms of structure and species composition but has undergone some historical disturbance. The dominant species observed, namely *Passerina corymbosa*, *Dicerothamnus rhinocerotis*, and *Cliffortia atrata*, are generally associated with disturbed areas and are dominant within the semi-intact habitat.

6.2.3 Degraded Habitat

Photo 5

General Site Description: This area lacks native species that are representative of the native vegetation type. Instead, it is densely invaded by Invasive Alien Plants (IAPs), namely Eucalyptus, *Acacia saligna*, and *Leptospermum laevigatum*.

6.2.4 Highly Degraded and Transformed habitats

In the southern corner of the site, we observe a highly degraded habitat densely populated with Eucalyptus species. No native vegetation typical of the historical vegetation type is evident.

The transformed habitat extends to the south of the impacted area, where the R43 road is situated.

6.2.5 Summary of the habitat conditions of the areas surrounding the impacted site

The assessment of the site's historical and current habitat conditions provides valuable insights into its ecological status. Historically, in 2003, the site showed signs of disturbances, with the presence of Invasive Alien Plants (IAPs) marking an early impact. By 2006, the situation had worsened, with IAPs spreading, a road constructed for new dwellings, and the

creation of dams to the north of the site. In 2012, efforts were made to manage and rehabilitate the area, suggesting that before illegal clearing, the site was in a semi-intact condition, with potential for restoration.

Currently, the habitats surrounding the impacted site exhibits a range of habitat conditions, classified into five categories. The "Intact Habitat" in the western and eastern region adjacent to the impacted area showcases pristine Elim Ferricrete Fynbos, with minimal historical disturbances and a high level of biodiversity. Semi-intact areas closely resemble the native vegetation but have experienced some historical disruption. In contrast, the "Degraded Habitat" lacks native species and is densely invaded by IAPs, including *Eucalyptus* and *Acacia saligna*.

Highly degraded habitats are evident in the southern and northern corners of the site, with a prevalence of Eucalyptus species and little to no native vegetation remaining. The transformed habitat extends southward, where the presence of the R43 road is indicative of extensive modification.

In summary, the site presents a spectrum of habitat conditions, ranging from well-preserved and biodiverse areas to those heavily impacted by invasive plants and human activities.

7. Sensitivity Assessment

It is essential to evaluate the Site Ecological Importance (SEI) for various receptors, such as species of conservation concern, vegetation communities, or habitat types present on the site. SEI is calculated as the sum of two key components: Biodiversity Importance (BI) and Receptor Resilience (RR). BI, in turn, is determined based on Conservation Importance (CI) and Functional Integrity (FI) criteria. CI assesses the significance of the site for supporting biodiversity features of conservation concern, including populations of IUCN-threatened and Near Threatened species, rare species, range-restricted species, globally significant species, and areas of threatened ecosystem types.

It is important to note that, since the site has already undergone transformation, the assessment of historical habitat conditions and site sensitivity was extrapolated based on the current surrounding habitats' biodiversity importance and receptor resilience for a semi-intact to intact habitat, as described in sections 6.2.1 and 6.2.2.

7.1 Site Conservation Importance (CI)

CI is evaluated using internationally recognised principles and criteria, including the IUCN Red List of Species, Red List of Ecosystems, and Key Biodiversity Areas. It was determined at a finer spatial scale through fieldwork data collection and desktop assessment conducted by the specialist (Table 2).

Table 2: Site Conservation Importance

Conservation Importance (CI)	Fulfilling Criteria
Very high	Two SCC were observed nearby the impacted area; we, therefore, assume that these SCC likely occurred within the impacted site. • ***Serruria rubricaulis*** **(VU)** has a population decline of nearly 30% is estimated based on a 32% reduction in range (EOO) and 24% habitat loss due to urban expansion and alien plant invasion in the past 100 year. • ***Leucospermum prostratum*** **(NT),** 24% of this species' habitat is already transformed, and habitat loss models (Bomhard et al. 2005) indicate that habitat loss will exceed 50% by 2025 but that this will be partially offset by climate change. A population reduction of at least 30% is therefore estimated to be reached within the next 20 years (generation length >100 years). The western populations (Rooiels to Hermanus) are under severe threat from urban expansion. According to the Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018) (VEGMAP), the vegetation type occurring in the study area and surrounds is Elim Ferricrete Fynbos and Agulhas Limestone Fynbos. • Semi-intact to Intact habitats of Elim Ferricrete Fynbos (CR) and Agulhas Limestone Fynbos (CR) ecosystems were observed during the site assessment.

7.2 Sites Functional Integrity (FI)

Functional Integrity (FI) of the receptor is assessed by considering its current ability to maintain its ecological structure and functions compared to its ideal conditions. FI criteria include connectivity to other natural areas, the degree of current persistent negative ecological impacts, and the remaining intact and functional area of the habitat (Table 3).

Table 3: Site Functional Integrity

Functional Integrity (FI)	Fulfilling Criteria
Medium	• The impacted area is part of a well-connected and intact natural region to the north, east, and west of the site, including the notable Maanschynkop Nature Reserve to the west and Waterfall Private Nature Reserve to the east. The development has resulted in the loss of approximately 9 hectares of semi-intact habitat. The location of the impacted site has not caused significant fragmentation of the larger landscape's natural areas and is not expected to significantly impact the landscape's fire regimes or species distribution. • The site has experienced some historical disturbances in the form of the introduction and spread of invasive alien species (IAPs). Rehabilitation actions have been implemented and have had a positive impact on the habitat structure and functionality. Further habitat disturbances are evident to the south and southwest of the impacted area due to densely invaded IAPs areas and agricultural activities. • Partial recovery may begin if the agricultural area (impacted area) is left fallow. This was observed during the site visit, as I noted the recruitment of native species within the impacted area.

- The evaluating CI and FI, the Biodiversity Importance is determined to be **High.**

7.3 Site Receptor Resilience (RR)

Receptor Resilience (RR) is defined as the capacity of the receptor to resist major damage from disturbances and recover to its original state with limited or no human intervention. RR assessments consider the estimated recovery time required to restore functionality to the receptor, and it is often linked to specific disturbances or impacts (Table 4).

Table 4: The sites Receptor Resilience (RR)

Receptor Resilience (RR)	Fulfilling Criteria
Medium	Fynbos is fire-dependent, and complete regeneration will only commence after the next fire. A 5-10-year period is, therefore, not applicable. Partial recovery may commence if agricultural land is left fallow. Native vegetation recruitment between the orchard rows was observed, and the site is connected with intact representation of the original vegetation type, which may allow natural recruitment.

7.4 Site Ecological Importance

SEI is determined by combining BI and RR assessments. Based on the **HIGH BI** and **MEDIUM RR**, the SEI for the habitat is classified as **HIGH**. According to the Species Environmental Assessment Guidelines, this classification indicates that avoidance and mitigation measures should be applied wherever possible, offset mitigation may be required for high impact activities.

8. Impact Assessment

The impact assessment determines the impacts imposed on the affected environment, specifically the vegetation, ecological processes, essential species, and habitats. These are considered for the direct, indirect, and cumulative impacts. Mitigation measures are those interventions required to either reduce the impact significance rating (essential mitigation) or to ensure that the project imposes the least possible strain on the affected environment (best practice/general mitigation).

8.1 Direct Impacts

Direct impacts are those that would occur as a direct result of the clearing of the vegetation to accommodate the agricultural development. The agricultural development phase is evaluated for the following impact:

8.1.1 Loss of Elim Ferricrete and Agulhas Limestone Fynbos

The assessment reveals that the agricultural development, in its current state without mitigation, has had an impact significance of medium negative. The proposed mitigations will not fundamentally alter the described impact significance; instead, they are intended to enhance the habitat condition of the surrounding areas and mitigate potential indirect impacts that may arise as a result of the land use.

Criteria	Loss of Threatened Ecosystems	
	Without Mitigation	**With Mitigation**
Nature	Negative (-)	Negative (-)
Extent	Site (1)	Site (1)

Magnitude	High (3)	High (3)
Duration	Long Term (3)	Long Term (3)
Consequence	Moderately detrimental (7)	Moderately detrimental (7)
Probability	Definite (4)	Definite (4)
Significance	**Medium (-)**	**Medium (-)**
Confidence	High	High
Reversibility	Partial recovery may commence if the agricultural area (the impacted zone) is allowed to remain fallow. This observation was made during the site visit, as I observed the recruitment of native species within the affected area. From a botanical perspective, it's essential to recognize that the reversibility of the impact largely depends on the specific conditions of the site and the extent of previous disturbance. The natural regeneration of native species is a positive sign of ecosystem resilience, indicating that the impact may be partially reversible over time. With active restoration efforts, such as reintroducing key native plant species and managing invasive species, it is possible to accelerate the recovery process and restore ecosystem functions and structure more effectively. However, the success of these restoration measures will also depend on factors like soil quality, hydrology, and the presence of any remaining stressors or impediments to recovery. **The site therefore has a medium potential for reversibility.**	
Irreplaceable loss of resources	Approximately 3% of the remaining extent of Elim Ferricrete Fynbos and 11% of the remaining extent of Agulhas Limestone Fynbos were lost due to the development. Degree of Irreplaceable Loss of Resources: ***Medium*** This categorisation implies that there is a medium potential for the loss of irreplaceable resources.	
Cumulative Impacts	The cumulative impacts of the agricultural development are of concern, given the critical status of the affected ecosystems. However, with proactive mitigation measures, habitat restoration, and sustainable land management practices, it is possible to minimize these impacts and work towards the conservation and restoration of the areas surrounding the impacted area. Careful monitoring and adaptive management will be essential to ensure the long-term health of the surrounding affected environment.	
Proposed Mitigation Measures	Since the impact has already occurred, mitigating the impact during the development phase is not possible. Therefore, we recommend	

	mitigation measures that will reduce the impact of agricultural development on the surrounding environment: • Restore and rehabilitate surrounding affected habitats by replanting native vegetation and removing invasive alien species. • Implement effective stormwater management systems to reduce runoff and prevent pollution. • Implement erosion control measures, such as stabilizing slopes, to prevent soil erosion and sedimentation in nearby freshwater bodies. • Ensure proper disposal of waste and hazardous materials, including recycling and safe chemical disposal to prevent environmental contamination. • Establish a regular monitoring and reporting system to track changes in habitat conditions and any potential negative impacts. This can help with a timely response and adjustment of mitigation measures. • Regenerative and sustainable farming practises must be implemented and strictly monitored to prevent any secondary effects and cumulative impacts on the surrounding intact habitats. • Consider setting aside adjacent areas as protected area or conservation easements to offset any habitat loss due to the project.

8.1.2 Loss of two SCC that likely occurred within the impacted area

Considering that the site has already been cleared to accommodate agricultural development, it is unclear whether any SCC would have occurred on-site, especially given the site's history of disturbances in the form of invasive alien plants. However, two confirmed SCCs were observed within the surrounding intact habitats and are therefore likely to be found within the impacted area. The observed species were *Serruria rubricaulis* (Vulnerable, A4c) and *Leucospermum prostratum* (Near Threatened, B1b(iii)+2b(iii)).

The impact significance before mitigation is characterized as having a medium level of significance, while after mitigation measures are implemented, the impact's significance is significantly reduced to a very low level.

Criteria	Loss of SCC Impact Significance

	Without Mitigation	With Mitigation
Nature	Negative (-)	Negative (-)
Extent	Site (1)	Site (1)
Magnitude	High (3)	Low (1)
Duration	Long Term (3)	Medium Term (2)
Consequence	Moderately detrimental (7)	Slightly detrimental (4)
Probability	Definite (4)	Probable (3)
Significance	Medium (-)	Very-Low (-)
Confidence	High	High
Reversibility	Low	Medium
Irreplaceable loss of resources	High	Low
Cumulative Impacts	The combined impact on the environment is low, as it results from a few similar activities in the same geographical area.	
Proposed Mitigation Measures	• Implement habitat restoration programs to promote the recovery of the habitat surrounding the impacted area, particularly for SCC. This may include removing invasive species, planting native vegetation, and ensuring a suitable environment for these species. • Create buffer zones around sensitive habitats to minimize the direct impacts of development activities on these areas. Restrict access to critical habitats. • Establish ongoing monitoring programs to track the recovery and population trends of SCC. Implement adaptive management strategies to adjust mitigation efforts as needed.	

8.1.3 Impact on Ecosystem Structure and Functionality

The impact on ecosystem structure and functionality is assessed as medium negative before the implementation of the proposed mitigation measures. It is expected that, through effective rehabilitation and protection of the surrounding habitats, the local ecosystem's structure and functionality will be significantly improved, resulting in a very low negative impact significance. An important consideration in this context is that the landowner is allowing natural vegetation to grow between the rows of the planted trees. These rows act as a corridor enhancing connectivity between the surrounding natural habitats.

Criteria	Loss of Ecosystem Structure and Functionality	
	Without Mitigation	**With Mitigation**
Nature	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Magnitude	Medium (2)	Medium (2)
Duration	Long Term (3)	Medium Term (2)
Consequence	Moderately detrimental (7)	Moderately detrimental (6)
Probability	Definite (4)	Probable (3)
Significance	Medium (-)	Very Low (-)
Confidence	Medium	Medium
Reversibility	Medium	Medium
Irreplaceable loss of resources	Medium	Low
Cumulative Impacts	The combined impact on the environment is low, as it results from a few similar activities in the same geographical area.	
Proposed Mitigation Measures	• Continue and enhance efforts to control and manage invasive alien plant species in the areas surrounding the impacted area. This will help restore native vegetation and ecosystem functionality. • Strengthen protection of intact and undisturbed areas within the landscape to ensure the maintenance of biodiversity and ecosystem functionality.	

8.3 Indirect impacts

Indirect impacts are those that do not occur as a direct result of the activity on the site but that happen further away. In this case, no indirect impacts were identified.

8.4 No-Go Alternative

The status quo will remain. Given this variability, it is difficult to generalize the No-Go impact and infer likely future impacts. On balance, assuming the continuation of the status quo, the No-Go alternative is expected to have a neutral to low negative impact, considering the historical disturbances observed within the landscape.

9. Conclusion and Recommendations

The agricultural development on Farm Rocklands 57/633 has resulted in the loss of approximately 6.428 ha and 2.975 ha of Elim Ferricrete Fynbos and Agulhas Limestone Fynbos, respectively. The site's surrounding habitats exhibit a range of conditions, from intact and semi-intact areas with high biodiversity and ecological connectivity to highly degraded and transformed habitats heavily impacted by invasive alien plants and agricultural activities. The historical assessment suggests that the impacted site was once in a semi-intact condition, with potential for recovery.

The Site Ecological Importance assessment, considering Conservation Importance, Functional Integrity, and Receptor Resilience, indicates a high SEI. This classification implies that the site holds significant ecological value and should be subject to mitigation measures to reduce impacts.

The impact significance of the assessed impacts were determined to be of medium negative significance. However, the proposed mitigation measures aim to address secondary activities and improve the ecological resilience of the surrounding habitats. Mitigation measures should be applied to restore and rehabilitate surrounding affected habitats, implement effective stormwater management, erosion control, and establish a regular monitoring and reporting system.

It is important to note that the landowner has permitted the natural propagation of indigenous vegetation native to the area between the planted trees. Serving as a corridor, enhancing connectivity between the surrounding natural habitats, and has played a role in rehabilitating the impacted site. The landowner is also committed to implementing regenerative and sustainable farming to prevent any secondary impacts on the surrounding intact habitats.

In summary, while the agricultural development has already had a significant impact on the site, mitigation measures and active restoration efforts can help minimize the negative effects and contribute to the recovery of the affected ecosystems. Long-term monitoring and adaptive management are crucial to ensuring the health and resilience of the surrounding environment. The development's suitability from a botanical perspective depends on the rigorous implementation of these mitigation measures and the commitment to sustainable land management practices.

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Appendix 1: Convention for Assigning Significance Ratings to Impacts

For each impact, the **nature** (positive/negative), **extent** (spatial scale), **magnitude/intensity** (intensity scale), **duration** (time scale), **consequence** (calculated numerically) and **probability** of occurrence is ranked and described. These criteria would be used to ascertain the **significance** of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place.

The tables below show the rankings of these variables and defines each of the rating categories.

Table 5: Assessment criteria for the evaluation of impacts.

CRITERIA	RANK	DESCRIPTION
Nature	**Positive (+)**	The environment will be positively affected.
	Negative (-)	The environment will be negatively affected.
Extent or spatial influence of impact	**National (4)**	Beyond provincial boundaries, but within national boundaries.
	Regional (3)	Beyond a 10 km radius of the proposed activities, but within provincial boundaries.
	Local (2)	Within a 10 km radius of the proposed activities.
	Site specific (1)	On site or within 100 m of the proposed activities.
	Zero (0)	Zero extent.
Magnitude/ intensity of impact (at the indicated spatial scale)	**High (3)**	Natural and/ or social functions and/ or processes are *severely* altered.
	Medium (2)	Natural and/ or social functions and/ or processes are *notably* altered.
	Low (1)	Natural and/ or social functions and/ or processes are *slightly* altered.
	Zero (0)	Natural and/ or social functions and/ or processes remain *unaltered.*

Duration of impact	**Long Term (3)**	More than 10 years, but impact ceases after the operational phase.
	Medium Term (2)	Between 3 – 10 years.
	Short Term (1)	Construction period (up to 3 years).
	None (0)	Zero duration.
Consequence (Nature x (Extent + Magnitude/ Intensity + Duration))	**Extremely beneficial/ detrimental (10 – 11) (+/-)**	The impact is *extremely* beneficial/ detrimental.
	Highly beneficial/ detrimental (8 – 9) (+/-)	The impact is *highly* beneficial/ detrimental.
	Moderately beneficial/ detrimental (6 – 7) (+/-)	The impact is *moderately* beneficial/ detrimental.
	Slightly beneficial/ detrimental (4 – 5) (+/-)	The impact is *slightly* beneficial/ detrimental.
	Negligibly beneficial/ detrimental (1 – 3) (+/-)	The impact is *negligibly* beneficial/ detrimental.
	Zero consequence (0) (+/-)	The impact has zero consequence.
Probability of occurrence	**Definite (4)**	Estimated at a greater than 95% chance of the impact occurring.
	Probable (3)	Estimated 50 – 95% chance of the impact occurring.
	Possible (2)	Estimated 6 – 49% chance of the impact occurring.
	Unlikely (1)	Estimated less than 5% chance of the impact occurring.
	None (0)	Estimated no chance of impact occurring.

The significance of an impact is derived by taking into account the consequence (nature of the impact and its extent, magnitude/intensity and duration) of the impact and the probability of this impact occurring through the use of the following formula:

Significance Score = Consequence x Probability

The means of arriving at a significance rating is explained in Table 4.

Table 6: Definition of significant table.

SIGNIFICANCE SCORE	SIGNIFICANCE RATINGS	
32 – 40	**High (+)**	**High (-)**
25 – 31	**Medium (+)**	**Medium (-)**
19 – 24	**Low (+)**	**Low (-)**

10 – 18	**Very-Low (+)**	**Very-Low (-)**
1 – 9	**Negligible**	

Once the significance of an impact has been determined, the confidence in the assessment of the impact, as well as the degree of reversibility of the impact and irreplaceable loss of resources would be determined using the rating systems outlined in Table 4, 5 and 6 respectively. Lastly, the cumulative impact is ranked and described as outlined in Table 7.

Table 7: Definition of confidence ratings.

CONFIDENCE RATINGS	CRITERIA
High	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Medium	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Low	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 8: Degree of reversibility.

REVERSABILITY OF IMPACT	CRITERIA
High	High potential for reversibility.
Medium	Medium potential for reversibility.
Low	Low potential for reversibility.
Zero	Zero potential for reversibility.

Table 9: Degree of irreplaceability.

IRREPLACEABLE LOSS OF RESOURCES	CRITERIA
High	Definite loss of irreplaceable resources.
Medium	Medium potential for loss of irreplaceable resources.
Low	Low potential for loss of irreplaceable resources.
Zero	Zero potential for loss of irreplaceable resources.

Table 10: Cumulative Impact on the environment.

CUMULATIVE IMPACTS	CRITERIA
High	The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the geographical, physical, biological, social, economic and cultural aspects of the environment.
Medium	The activity is one of a *few* similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the geographical, physical, biological, social, economic and cultural aspects of the environment.
Low	The activity is localised and might have a negligible cumulative impact.
Zero	No cumulative impact on the environment.

Appendix 2: Minimum Content Requirements for Terrestrial Biodiversity Specialist Reports as Per protocols for the Specialist Assessment of Environmental Biodiversity (GN 320 of 20 March 2020)

Terrestrial Specialist Assessment Report	Section
Specialist CV	iii
Signed Statement of independence	ii
Statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	4
Methodology used	4
Description of the mean density of observations/number of sample sites per unit area and the site inspection observations	10
Description of the assumptions made and any uncertainties or gaps in knowledge or data	4
Details of all SCC found or suspected to occur on site	12
The location of areas not suitable for development and to be avoided during construction where relevant	20
Discussion on the cumulative impacts	23
Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr)	23
Reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant	28

Appendix 3: List of Species Observed

Family	Species
Aizoaceae	*Carpobrotus edulis ssp. Edulis* *Lampranthus bicolor*
Fabaceae	*Aspalathus serpens* *Psoralea pinnata (wetland Habitat)* *Aspalathus carnosa*
Proteaceae	*Protea cynaroides* *Serruria rubricaulis (VU)* *Leucospermum prostratum (NT)*
Montiniaceae	*Montinia caryophyllacea*
Iridaceae	*Aristea bakeri* *Tritoniopsis lata*
Campanulaceae	*Lobelia pinifolia* *Lobelia coronopifolia* *Roella incurva*
Thymelaeaceae	*Passerina corymbose* *Gnidia pinifolia*
Geraniaceae	*Pelargonium cucullatum*
Ebenaceae	*Diospyros glabra*
Asteraceae	*Euryops virgineus* *Dicerothamnus rhinocerotis* *Osteospermum moniliferum* *Arctotis scabra* *Ursinia paleacea* *Stoebe capitata* *Osmitopsis afra (wetland habitat)*
Bruniaceae	*Berzelia lanuginose*
Rosaceae	*Cliffortia atrata*
Penaeaceae	*Saltera sarcocolla*
Ericaceae	*Erica perspicua* *Erica mammosa*
Oxalidaceae	*Oxalis livida*
Restionaceae	*Thamnochortus lucens*
Santalaceae	*Colpoon speciosum*

Polygalaceae	*Muraltia heisteria*
Lanariaceae	*Lanaria lanata*
Rhamnaceae	*Phylica lasiocarpa*