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Pri.Sci.Nat # 400045/08

BOTANICAL ASSESSMENT OF PROPOSED NEW CULTIVATION ON ERF 1995, MCGREGOR, WESTERN CAPE.

Submitted to: Lornay Environmental, Hermanus

7 Nov 2024

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, N.A. Helme, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.

NA Helme

The author believes that the information presented in this report complies with the PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES (Government Gazette No. 43855 of 30 October 2020).

Abridged CV:

Contact details as per letterhead.
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University of Cape Town, South Africa. BSc (Honours) – Botany (Ecology & Systematics). 1990.

Since 1997 I have been based in Cape Town, and have been working as a specialist botanical consultant, specialising in the diverse flora of the great Cape Floristic Region. Since the end of 2001 I have been working on my own and trade as Nick Helme Botanical Surveys.

A selection of previous work undertaken in the region is indicated below:

- Scoping and IA vegetation studies for CWA airport (PHS Consulting 2022-2024)

- Macassar WWTW IA (Zutari 2023)
- Botanical assessment of Strandfontein Coastal Node IA (Infinity Environmental 2024)
- Botanical assessment of Hazendal Ptns 31& 33 (Monique Sham 2024)
- N7 weighbridge IA (SES 2023); Suikerbekkie PV project, Joostenberg (CoCT 2022)
- Botanical assessment of proposed new cultivation on Erf 357, McGregor (Green365 2021)
- Botanical assessment of proposed new limestone mine on Vaderlandsche Rietkuil 308, Vanrhynsdorp (Cape Lime 2021)
- Terrestrial Ecology impact assessment of proposed Zandheuvel phosphate mine, Saldanha (Exigo3 2020)
- Botanical assessment of proposed new cultivation on Welbedacht farm, Tra Tra Mountains (Footprint Environmental 2020)
- Botanical assessment of Mooreesburg WWTW expansion (Aurecon 2020)
- Botanical assessment of proposed new cultivation on Portion of Wittewater 148, Piketberg (Cornerstone Environmental 2019)
- Botanical assessment of Droogerivier farm Leipoldtville (Footprint Environmental 2018)
- Botanical assessment of Sebulon farm, Redelinghuys (Natura Libra Environmental Services 2018)
- Botanical assessment of proposed gypsum prospecting on Ptn 4 of Farm 256, Vanrhynsdorp (Venatouch 2016)
- Botanical assessment of proposed cultivation on Farm Andriesgrond, Clanwilliam (Cederberg Environmental Assessment Practise 2015)
- Assessment of proposed Elandsfontein phosphate mine, east of Langebaan (Braaf Environmental 2014)
- Botanical impact assessment of proposed Zirco mineral sand mine west of Garies, Northern Cape (CES 2014)
- Botanical assessment of Remainder of Farm Draaihoek 293, Vredendal (Cederberg Environmental Assessment Practise 2013)
- Botanical assessment of Farm Gideonsooord 303, Klawer (Cederberg Environmental Assessment Practise 2013)
- Botanical baseline study for proposed Namakwa Sands expansion, Brand se Baai (SRK Consulting 2012)
- Scoping study of proposed Karookop Wind Energy Facility near Vredendal (CSIR 2012)

- Botanical assessments for various proposed limestone & gypsum prospecting areas in the Knersvlakte (Vapopart & Tulsanite (Pty) Ltd 2012)
- Scoping study of proposed Photovoltaic Solar Energy Facility near Graafwater (Savannah Environmental 2012)
- Scoping study of proposed Olifants River Wind Energy Facility near Lutzville (Savannah Environmental 2011)
- Basic Assessment of three proposed sites for a new landfill for Matsikamma Municipality (Anel Blignaut Environmental Consultants 2010)
- Botanical assessment of proposed wind energy facility in the Knersvlakte near Juno substation, Vredendal (DJ Environmental 2010)
- Botanical assessment for five proposed limestone prospecting areas in the Knersvlakte (Stellenryck Environmental Solutions 2010)
- Botanical scoping and impact assessment for proposed Eskom Wind Energy Facility near Vredendal (Savannah Environmental 2007)
- Fine Scale vegetation mapping project in NW Sandveld (CapeNature 2007)

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1. INTRODUCTION

This biodiversity assessment was commissioned as part of the environmental authorisation process being followed for the proposed cultivation of two areas (totalling about 3.7ha) of natural vegetation on Erf 1995, in the McGregor area, part of the Robertson district (see Figures 1 and 1b). The study area is about 16ha in extent, is part of Houtbaai farm, and lies 1km southwest of the village of McGregor, in the Western Cape.

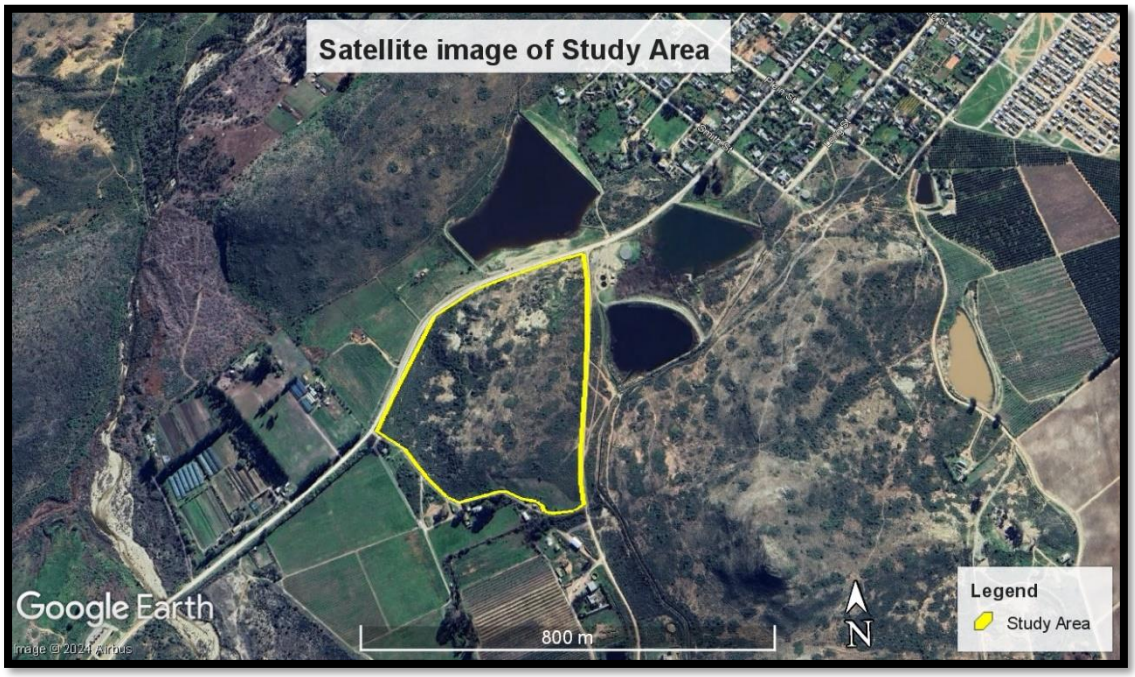

Figure 1: Satellite image showing the extent and position of the study area. Satellite image dated July 2023.

Figure 1b: Map of proposed development areas as per Alternative 1 (client's proposal).

2. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- Undertake a site visit to assess the vegetation in the study area (during the appropriate late winter - spring season)
- compile a report that describes the vegetation in the study area and places it in a regional context, including its status in terms of the relevant CapeNature Spatial Biodiversity Plan
- identify and locate (as Google Earth kmz polygons) any plant Species of Conservation Concern (SoCC) in the study area, and note any likely SoCC that may be in the area
- provide an overview and map of the botanical conservation significance (sensitivity) of the study area
- identify the botanical impacts of the proposed development
- assess the significance of the botanical impacts of the proposed development, and of the No Go alternative, as per standard Impact Assessment methodology
- provide any feasible mitigation recommendations in order to minimise or mitigate the identified botanical impacts of the proposed development.

3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The study area was visited on 15 September 2024, which was within the optimal spring flowering season in this strongly winter rainfall region. All perennial plant species were identifiable, and many (but not all) of the potential bulbs and annuals were also evident and identifiable. There is a low to medium likelihood that certain plant Species of Conservation Concern may have been overlooked due to the inevitable constraints associated with a once-off site visit, notably some of the early and later flowering annuals and bulbs. The author believes that sufficient information was available to make an accurate assessment of the vegetation and its significance, and the confidence level in the accuracy of the findings is high.

The vegetation in the study area was surveyed on foot, and all plant species were noted in the field, and various digital photographs were taken, using a gps enable Xiaomi cellphone, and a Fuji XT2 mirrorless camera. The biodiversity website iNaturalist.org was consulted for additional records from the area, and my photographs were also uploaded to this website. Mapping on site was done directly onto imagery on the Field Area Measure gps enabled app, and was then downloaded to Google Earth for final presentation mapping. Conclusions were drawn based on this documentation and twenty five years of professional experience in the area and the region.

Google Earth aerial imagery dated July 2023 and prior imagery (such as March 2003) was used to verify vegetation patterns, and for mapping purposes. Google Earth was used to measure polygon areas. The applicant's initial proposed layout is known as Alternative 1, and is shown in Figure 1b. Alternative 2 has been proposed as the mitigated alternative, with all new cultivation outside any High sensitivity areas.

It is assumed that all mitigation recommendations made in this report will be included as Conditions of Authorisation in any subsequent Record of Decision, and that they will be adequately and timeously implemented.

The No Go alternative would be no further cultivation or loss of vegetation in the study area.

4. STUDY AREA AND REGIONAL CONTEXT

Soils in the study area range from deep to very shallow loamy clays, derived from the underlying shales. There is extensive exposed shale bedrock in the central part of the study area, with some white quartz in places. There is no vegetation indicative of seasonal drainage lines or wetlands in the study area. Vegetation in the southeastern corner has been brushcut (about 0.5ha; see Plate 1), and the northeastern corner was previously partly quarried (see Plate 5; but last disturbed more than twenty years ago). The site does not appear to have been grazed or trampled by livestock in the last ten years.

Plate 1: Brushcut area in the High sensitivity southeastern corner of the study area. Very high density and diversity of annuals (mostly in seed in this photo) and geophytes in this area. This is within the applicants proposed eastern development area (Alt 1).

Plate 2: View of High sensitivity central section of the study area. Thin soils with sparser vegetation, grading into deeper soils with denser vegetation. No cultivation proposed here.

Plate 3: View of part of the high density population of the Near Threatened vygie *Brianhuntleya intrusa* in the central, rocky part of site, looking southwest to proposed cultivation area along the southwestern edge of site.

Plate 4: Previously disturbed area in northeastern corner of the study area, looking south (Medium sensitivity).

Plate 5: Medium sensitivity proposed cultivation area in the southwest, with *Pteronia incana* (asbos) dominant.

4.1 National and Regional Context

The site is part of the Rainshadow Valley Karoo bioregion, and is within the Succulent Karoo biome, which is itself a key part of what is now known as the Core Cape Region of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is one of only six Floristic Regions in the world, and is the only one largely confined to a single country (the Succulent Karoo component extends into southern Namibia). It is also by far the smallest floristic region, occupying only 0.2% of the world's land surface, and supporting about 11500 plant species, over half of all the plant species in South Africa (on 12% of the land area). At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Many of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. Data from the nationwide plant Red Listing process undertaken is that 67% of the threatened plant species in the country occur only in the southwestern Cape, and these total over 1800 species (Raimondo *et al* 2009)! It should thus be clear that the southwestern Cape is a major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species.

The upper to middle Breede River valley (Tulbagh to Bonnievale) has a long history as a grape, fruit and vegetable growing area, and much of the low-lying land is now cultivated, and farmers are expanding into the surrounding areas, placing pressure on the remaining areas of suitable habitat. The CapeNature Spatial Biodiversity Plan (Pence 2017) has mapped terrestrial and aquatic Critical Biodiversity Areas (CBAs) in the region, but none have been mapped for the study area. No ESAs (Ecological Support Areas) nor lower level ONAs (Other Natural Area) have been mapped in the area either, and hence no copy of this map is provided as it adds little value. I do not agree with the CapeNature SBP mapping in this area, and the lacked of mapped priority areas is clearly due to an absence of grountruthed floristic data at the time ((2016), and in this case specifically an absence of records of *Brianhuntleya intrusa* (Near Threatened), which is common on site (see Plate 3).

5. DESCRIPTION OF THE VEGETATION ON SITE

The SA Vegetation Map (Mucina & Rutherford 2006 and 2018 update) shows that all the original natural vegetation in the study area is all **Robertson Karoo**, and the author agrees with this. No copy of this vegetation is shown as it adds little value. The valleys to the east and west supported Breede Alluvium Renosterveld, now mostly lost to cultivation.

Robertson Karoo is currently gazetted as Least Concern on a national basis (Government of South Africa 2022). This unit has less than 84% of its total original extent still remaining, <1% is formally conserved, and the national conservation target is 16% (Rouget *et al* 2004). The low level of formal conservation means that the unit is vulnerable to further habitat loss, notably from agriculture and mining, as most of the land is in private ownership, and is experiencing rapid ongoing habitat loss (pers. obs.).

The central part of the area has thin soils with exposed shale, and even some ledges and small cliffs. Deeper soils are located in the west, east and southeast of the site.

Areas with thin soils are dominated by *Brianhuntleya intrusa, Drosanthemum speciosum, Pteronia paniculata, Mesembryanthemum longistylum, Crassula tetragona, C. atropurpurea* and *Moraea polyanthos*.

Areas with deeper soils are dominated by *Pteronia incana, Pentzia incana, Dicerothamnus rhinocerotis, Oxalis pes-caprae, Eriocephalus africanus, Arctotheca calendula, Oncosiphon suffruticosus, Euphorbia mauritanica* and *Ruschia carolii*.

Additional indigenous species noted include *Ruschia approximata*, *Euphorbia burmanii, Gazania krebsiana, Oxalis flava, O. obtusa, Indigofera heterophylla, Anisodontea elegans, Cyanella lutea, Ornithogalum thyrsoides, Drosanthemum asperulum, Rhynchopsidium pumilum, Freesia refracta, Gladiolus permeabilis, Searsia pallens, Lapeirousia pyramidalis, Roepera spinosa, Ursinia anthemoides, Cotyledon orbiculata, Arctotheca calendula, Tetragonia sarcophylla, Oedera squarrosa, Leysera gnaphalodes, Berkheya rigida, Curio radicans, Tulista pumila, Othonna auriculifolia, Crassula nudicaulis, C. muscosa, C. cotyledonis, Adromischus marianae, Aizoon africanum, Cotula turbinata, Chrysocoma ciliata, C. valida, Aspalathus lactea* ssp*. breviloba, Felicia tenella, Moraea gawleri, Pelargonium karroicum, Sebaea solaris, Polygala affinis, Osteospermum sinuatum, Roepera spinosa, Tylecodon paniculatus, Euclea undulata, Carissa haematocarpa, Oedera squarrosa, Macledium spinosum, Cynanchum viminale, Gasteria disticha, Ruschia tenella, Lobostemon echioides, Aloe microstigma, Helichrysum cymosum, H. rosum, Albuca tortilis, Thesium spicatum, Albuca cooperi, Ehrharta calycina, Bulbine frutescens, Anthospermum galioides, Pentzia*

incana, Atriplex lindleyi (invasive alien), *Mesembryanthemum junceum, Hermannia amoena, H. scabra, H. alnifolia, Holothrix aspera, Chaenostoma sp,. Tripteris aghillana* and *Lycium ferocissimum*.

Two plant **Species of Conservation Concern** (SoCC) were recorded in the study area, and there is a moderate likelihood of one or two other species being present in low numbers.

Brianhuntleya intrusa is a vygie Redlisted as Near Threatened (Raimondo *et al* 2004), as it is restricted to thin shale soils in a fairly small area from just west of Robertson to Bonnievale. The species is very common on the rocky, central parts of the site (see Plate 3), with a population of about 1000 plants, and this is regarded as a significant population. Most of this lies outside the proposed cultivation areas.

The shrubby *Aspalathus lactea* ssp*. breviloba* is one of the few *Aspalathus* species found on pure shale soils, and a small population of about ten plants is found in the central area on thin soils (not in proposed cultivation area). The species is Redlisted as Vulnerable (Raimondo *et al* 2004), and is found between Touwsrivier and McGregor.

5.2 Botanical Conservation Value

The botanical conservation value of an area is a product of plant species diversity, plant community composition, rarity of habitat, degree of habitat degradation, rarity of species, ecological viability and connectivity, restoration potential and reversibility of threats.

About 10ha of the study area (63%) is deemed to be of High botanical sensitivity (see Figure 2). This area supports the two plant SoCC recorded on site, as well as being home to the bulk of the plant diversity (>70%). The remainder of the site (about 5ha) is deemed to be of Medium botanical sensitivity, and includes the area of deeper soil along the western boundary and the previously disturbed area in the north.

Factors informing this assessment include the following: 1) the underlying vegetation type is Least Threatened on a national basis, but is poorly conserved, and under constant threat of further loss; 2) no mapped Critical Biodiversity Areas occur within the study area; 3) the recorded presence of at least two plant

Species of Conservation Concern, one of which has at least 1000 plants on site; 4) disturbance history and 5) higher plant species and structural diversity in some areas.

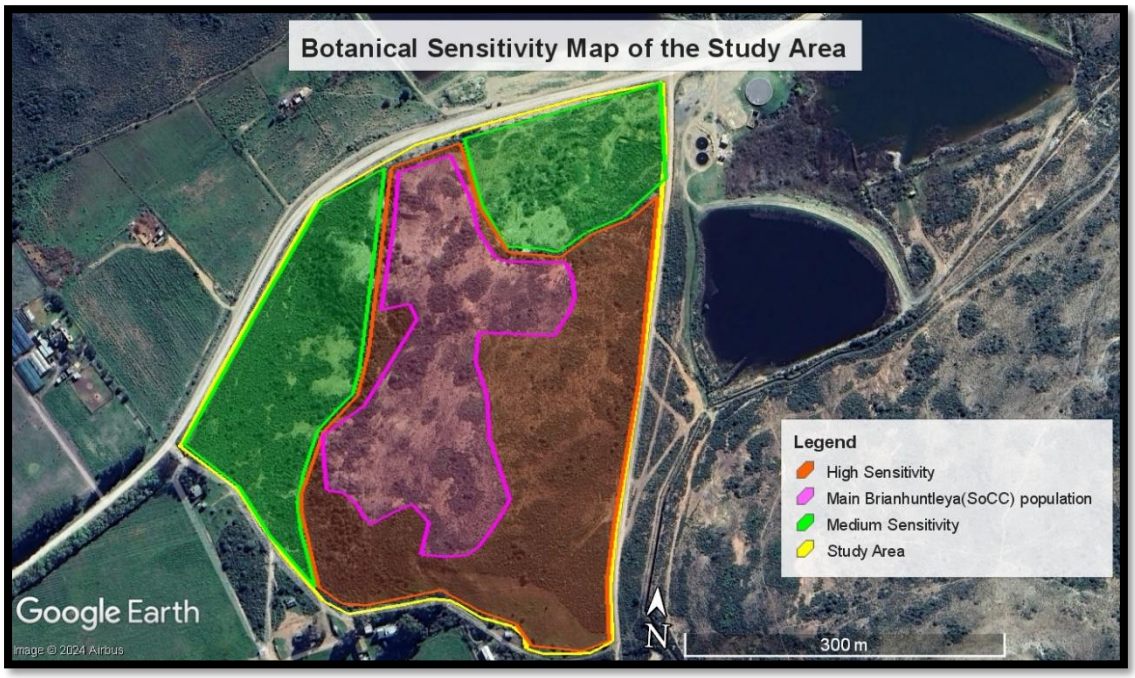

Figure 2: Botanical sensitivity map of the study area.

6. IMPACT ASSESSMENT

6.1 Identification and assessment of likely botanical impacts

The primary botanical impacts are those associated with the permanent loss of the approximately 3.7ha area of natural and partly natural vegetation within the two proposed development areas. All areas in the study area are either of Medium or High botanical sensitivity. An additional impact for Alternative 1 would be the loss of a small part (<10%) of the large site population of a single plant Species of Conservation Concern (*Brianhuntleya intrusa*; Near Threatened). The population of *Aspalathus lactea* ssp*. breviloba* population (Vulnerable) will not be impacted by either of the proposed development areas.

All botanical impacts are negative.

Primary mitigation, as per the mitigation hierarchy (avoid, minimise, then mitigate) would involve the avoidance of all areas of mapped High sensitivity vegetation, with relocation of the development area within High sensitivity vegetation into an area of Medium sensitivity (as per Figure 2), which will also

result in conservation of essentially all the site subpopulation of *Brianhuntleya intrusa* (Near Threatened), and all of the site population of *Aspalathus lactea* ssp*. breviloba* population (Vulnerable). However, the applicant does not wish to consider any change to the proposed layout shown in Figure 1b.

Construction Phase Impacts

Alternative 1

In the case of this project the primary construction phase impact is loss of natural vegetation and partly natural vegetation within the new agricultural development footprint.

For purposes of this assessment it is assumed that about 1.65ha of Medium sensitivity vegetation and about 2.1ha of High sensitivity vegetation will be lost in the Alternative 1 construction phase. This will occur within a vegetation type classified as Least Threatened on a national basis (Robertson Karoo), but which is very poorly conserved (<1%) and subject to ongoing cumulative agricultural impacts.

An additional impact will be the loss of <10% of the large site population of one recorded plant Species of Conservation Concern (*Brianhuntleya intrusa*; Near Threatened).

The loss of about 1.65ha of natural vegetation of Medium conservation value is likely to be of Low to Medium negative botanical significance, whereas the loss of another 2.1ha of High sensitivity natural vegetation is likely to be of **Medium negative botanical significance,** before mitigation.

Table 1 summarises this assessment. The magnitude of the impacts will be High (by definition, in that ecological functioning previously present in the development areas will be totally eliminated), duration will be permanent, and extent will be site specific (local).

Alternative	**Extent of impact**	**Duration of impact**	**Intensity**	**Probability of occurrence**	**Degree of confidence**	**Significance (before and after mitigation)**
Alternative 1	Local	Permanent	High	Definite	High	Medium negative
No Go alternative	Local	Unknown; possibly temporary	Low (but unknown)	Low	Medium	Neutral

Table 1: Impact table for Construction Phase botanical impacts associated with the proposed cultivation alternatives, and the No Go. Impacts include loss of natural vegetation, plus loss of portion of local sub-population of at least one plant Species of Conservation Concern (SCC; Alternative 1 only).

Operational Phase Impacts

The most obvious operational phase impact is likely to be increased habitat fragmentation and loss of current levels of terrestrial ecological connectivity across the cultivated parts of the currently natural study area. The overall intensity of this change is likely to be low in a regional context, as there will still be fairly good ecological connectivity in the central and northern part of the site. However, there is currently cultivation to the west, north and south of the site, so ecological connectivity in the study area has already been compromised and restricted.

The proposed cultivation will not result in the loss of any mapped CBAs or ESAs.

The project is not likely to have a negative impact on ecological processes in the region, as it does not impact on any major ecological corridors, wetlands or climate change corridors.

Pesticide and fertigation drift (under windy conditions often prevalent during spraying) into the adjacent natural veld is known to have a significant negative effect on the natural insect life and consequently on the pollination and seed set of various plants (Knight *et al* 2005; Pretorius 2010), and is thus likely to be an issue on this site, and although its magnitude is very difficult to assess it is likely to be relatively low. Runoff of excess fertiliser typically induces a rapid growth of weeds, which soon outcompete the natural vegetation in any areas where this occurs. This can be seen on the existing edges of cultivation in many areas.

The long term conservation of the High sensitivity natural vegetation in the study area could be viewed as a minor positive impact that takes place over the operational phase of the project, and in this regard it helps to reduce the negative operational phase impacts.

Overall, combined, operational phase botanical impacts are likely to be of Low to Medium negative significance for Alternative 1.

Alternative	**Extent of impact**	**Duration of impact**	**Intensity**	**Probability of occurrence**	**Degree of confidence**	**Significance (before and after mitigation)**
Alternative 1	Local	Permanent	Medium	Very likely	High	Low to Medium negative
No Go alternative	Local	Unknown; possibly temporary	Low (but unknown)	Low	Medium	Neutral

Table 2: Impact table for Operational Phase botanical impacts associated with the proposed cultivation. Impacts include habitat fragmentation and pesticide and fertigation drift from fields into adjacent natural areas.

6.2. The No Go Alternative

The No Go alternative usually implies the continuation of the status quo (no cultivation). In this case this would be the preferred option from a botanical perspective, with no significant botanical impacts.

6.3 Cumulative Impacts

The cumulative botanical impacts of the approximately 3.7ha of new cultivation are understood to be broadly equivalent to the regional botanical impacts, in that the vegetation type impacted by the development has been, and will continue to be, impacted by numerous agricultural developments and other factors (the cumulative impacts) within the region. Although agriculture is by far the most important factor causing habitat loss, additional cumulative factors include urbanisation, infrastructure development and mining.

Without layout mitigation the cumulative impact is likely to be Low - Medium negative.

The conservation of the High sensitivity natural habitat/vegetation on site could be viewed as a minor positive impact that takes place over the operational phase of the project, and in this regard it helps to reduce the negative operational phase impacts.

7. REQUIRED MITIGATION

The following is regarded as essential, feasible and reasonable mitigation and is factored into the assessment:

- The approved development areas must be surveyed and clearly demarcated on the ground prior to any site development, so that no accidental disturbance of the conservation areas occurs.
- No disturbance or loss of vegetation should be allowed within the Medium and High sensitivity areas outside the proposed development footprints at any stage in the future.
- Search and Rescue of all translocatable bulbs and succulents from within the development footprints must be undertaken prior to any site development. All specimens of the NT vygie *Brianhuntleya intrusa* and the dwarf succulent *Tulista pumila* within the authorised footprint must be rescued. This must be undertaken by a qualified Search and Rescue contractor approved by the botanist. Some of the material should be used to help rehabilitate the previously disturbed northeastern part of the site, and the remainder can be used elsewhere (at contractor and botanist's discretion).

8. CONCLUSIONS AND RECOMMENDATIONS

- The development of the approximately 3.7ha of new cultivation on site is likely to have an acceptable Medium negative botanical impact at a regional scale, which would be Low to Medium negative if only the western proposed development area is cultivated.
- Although the vegetation type on site (Robertson Karoo) is Least Threatened on a national basis it is still very poorly conserved (<1%), making it vulnerable to further loss (especially from agriculture, which is ongoing at pace in the region) unless steps are taken to address this.
- At least two plant Species of Conservation Concern were recorded in the study area, but only one of these SoCC (*Brianhuntleya intrusa*) is likely to lose about 10% of its site population to the proposed development, with the other SoCC not likely to be impacted.

- All mitigation outlined in Section 7 must be adequately and timeously implemented.
- It is recommended that the applicant make a significant donation (>20% of the total development costs of the proposed cultivation and vineyard expansion) to the nearby Vrolikheid Nature Reserve (managed by CapeNature, and conserving a similar vegetation type) in order to help mitigate the botanical impacts of the development, and this funding should be used for management on or off the Reserve, or for Reserve expansion.

9. REFERENCES

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