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BOTANICAL ASSESSMENT OF PROPOSED DEVELOPMENT ON PORTION 126 OF FARM 559, BETTY'S BAY, WESTERN CAPE.

Compiled for: Lornay Consulting, Hermanus

Client: Mr Geoff Heald

21 Aug 2023

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.

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ABRIDGED CV:

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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 south-western Cape. Since the end of 2001 I have been the Sole Proprietor of Nick Helme Botanical Surveys, and have undertaken over 1700 site assessments in this period.

A selection of relevant previous botanical work is as follows:

- Botanical assessment of Ptns 3 & 6 of Farm 563 Kleinmond (Lornay Environmental 2021)
- Botanical assessment of Ptn 9 of Farm 429 Gabrielskloof, Caledon (Infinity Environmental 2021)
- Baseline ecological assessment of Karwyderskraal 584, Caledon (Terramanzi 2021)
- Botanical impact assessment of proposed development of Ptn 29 of Farm 410, Caledon (PHS Consulting 2021)
- Botanical assessment of proposed new cultivation on Welbedacht farm, Tra Tra Mountains (Footprint Environmental 2020)

- Biodiversity Compliance Statement Philippi erf 1/1460 (Infinity Environmental 2020)
- Botanical assessment of Kleinmond WWTW expansion (Aurecon 2020)
- Botanical assessment of Mooreesburg WWTW expansion (Aurecon 2020)
- Botanical assessment of Struisbaai cemetery sites (Infinity Environmental 2020)
- Botanical assessment of MoPama development site, Swellendam (Landscape Dynamics 2020)
- Botanical assessment of Ptn of Rem of Erf 1 Caledon (Theewaterskloof Municipality 2019)
- 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 new cultivation on Ptn 2 of farm Groenevalley 155, Piketberg (Cederberg Environmental Assessment Practise 2017)
- Botanical assessment of proposed new cultivation on Groot Patrysvlei, Clanwilliam (Cederberg Environmental Assessment Practise 2017)
- Botanical assessment of proposed new cultivation on farm Rosendal, Koue Bokkeveld (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on farm Kransvlei, Clanwilliam (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on farm Erfdeel, Bo-Swaarmoed, Ceres (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on farm Kransvlei and Kriedouberg, Clanwilliam (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed prospecting areas on Raskraal 255, Vanrhynsdorp (Venatouch 2016)
- Botanical assessment of proposed dam expansion on farm De Vlei, De Doorns (Cederberg Environmental Assessment Practise 2015)
- Botanical assessment of proposed cultivation on Rem. Andriesgrond 204, Clanwilliam (Cederberg Environmental Assessment Practise 2015)
- Botanical assessment of proposed dam on Modderfontein farm, Citrusdal (Cederberg Environmental Assessment Practise 2015)

CONDITIONS RELATING TO THIS REPORT:

The methodology, findings, results, conclusions and recommendations in this report are based on the author's best scientific and professional knowledge, and on referenced material and available knowledge. Nick Helme Botanical Surveys and its staff reserve the right to modify aspects of the report, including the recommendations and conclusions, if and when additional relevant information becomes available.

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1. INTRODUCTION

This botanical baseline assessment was requested to inform the environmental planning and authorisation process being followed for the proposed development of a dwelling on Portion 126 of Farm 559, Betty's Bay, in the Western Cape. Portion 126 is 23/02ha in extent, and is located along the R44, with Municipal land to the east, and private land to the west (see Figure 1). Part of the Municipal land to the north of the R44 is currently being used as a new cemetery area, and the Municipal Wastewater Treatment Works is located south of the study area and south of the R44.



Figure 1: Satellite image showing the location of the study area, with relevant adjacent properties labelled. Satellite image dated January 2023.

2. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- Undertake a site visit to assess the vegetation on site
- compile a baseline 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
- provide an overview of the botanical conservation significance (sensitivity) of the study area

- provide recommendations for feasible mitigation (as per mitigation hierarchy: avoid, minimise, mitigate) of the identified impacts, including layout change and optimal alignment of access roads and house position
- provide a professional opinion on whether the project proposal could be authorised within acceptable levels of environmental impact.

3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The site was visited on 21 July 2023. This was just within the optimal winter – spring flowering season in this mainly winter rainfall area, and most of the likely geophytes and annuals were thus evident, whilst all perennial plants were identifiable. There were thus some minor seasonal constraints on the accuracy of the botanical findings, but given the heavy dominance of perennials in this area – which can be used as indicators of habitat sensitivity - the confidence in the accuracy of the botanical findings is high. The author has undertaken extensive work within the region, which facilitates the making of local and regional comparisons and inferences of habitat quality and conservation value.

The study area (portions 124, 125, 126 and the Municipal Land north of the R44) was walked, and key plant species were noted. Photographs of certain plant species were made (using a Fuji mirrorless slr camera), and uploaded to the inaturalist.org website. On site mapping was undertaken using the Fields Area Measure app, directly onto a gps enabled smartphone, and these shapefiles and points were then uploaded to Google Earth for final mapping and presentation. Satellite imagery dated November 2022 (and earlier) was used to inform this assessment, and for mapping. It is assumed that development of any hard surfaces (roads, driveways, houses, etc.) would result in the permanent loss of all natural or partly natural vegetation in that area.

The botanical sensitivity of a site is a product of plant species diversity, plant community composition, rarity of habitat, degree of habitat degradation, rarity of species, ecological viability and connectivity, restorability of habitat, vulnerability to impacts, and reversibility of threats.

The exact meaning of the No Go alternative in this case is not known, but presumably it would be permission for just one building and no subdivision, but as the location or size of any such dwelling has not been provided it cannot be accurately assessed.

4. **REGIONAL CONTEXT OF THE VEGETATION**

The study area is part of the Southwest Fynbos bioregion (Mucina & Rutherford 2006), and is part of the Fynbos biome, located within what is now known as the Core 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 project indicate 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 Southwest Fynbos bioregion is characterised by relatively high winter rainfall, strong rainfall gradients, poor, sandy soils, high topographic diversity, and large urban areas and high levels of alien invasive vegetation. Due to this combination of factors the loss of natural vegetation in this bioregion has been severe (>60% of original extent lost within the region), and the bioregion has a very high number of threatened plant species (Raimondo *et al* 2009).

The CapeNature Spatial Biodiversity Plan (Pence 2017; Figure 2) indicates that that most of Portion 126 is mapped as CBA1 (terrestrial), with a small bit on the east as CBA1 (aquatic). After ground-truthing the site I largely agree with this mapping. Note that the Municipal land, which includes the new cemetery area, is mapped as Protected Area, which is clearly not totally accurate, as no cemetery development should have taken place in a truly Protected Area.

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Figure 2: Extract of CapeNature Spatial Biodiversity Plan (Pence 2017) showing that most of Portion 126 is mapped as CBA1 (terrestrial), with a small bit on the east as CBA1 (aquatic). After ground-truthing the site I largely agree with this mapping. Note that the Municipal land, which includes the new cemetery area, is mapped as Protected Area, which is clearly not totally accurate, as no cemetery development should have taken place in a truly Protected Area.

5. THE VEGETATION AND ITS SENSITIVITY

According to the SA Vegetation Map most of the natural vegetation in the study area is mapped as **Kogelberg Sandstone Fynbos**, with a small portion of **Hangklip Sand Fynbos** on the southeastern side (Mucina & Rutherford 2018, Figure 3). Based on my ground-truthing I would largely agree with this mapping.

Kogelberg Sandstone Fynbos is gazetted as **Critically Endangered** on a national basis (Government of South Africa 2022). About 83% of its total original extent remains intact, more than 59% is conserved, and the national conservation target is 30% (Rouget *et al* 2004). The unit is known to support a very large number of plant Species of Conservation Concern (Raimondo *et al* 2009), many of which are rare and localised, but face few direct threats other

derived soils on the coastal mountains, in a high rainfall zone, and the vegetation type needs fire for optimal ecological functioning (Helme & Rebelo 2016).

Hangklip Sand Fynbos is now gazetted as **Critically Endangered** on a national basis (Government of South Africa 2022). Less than 68% of its total original extent remains intact, less than 17% is conserved, and the national conservation target is 30% (Rouget *et al* 2004). The unit is known to support a large number of plant Species of Conservation Concern (Raimondo *et al* 2009), most of which are threatened by habitat loss to urban development, alien invasive vegetation and cultivation. This unit occurs on nutrient poor, sandstone derived soils on the coastal lowlands, and the vegetation type needs fire for optimal ecological functioning (Helme & Rebelo 2016).





All of Portion 126 would appear to have burnt in 2013 (CapeNature data on Cape Farm Mapper). This means that the vegetation on site is now ready for a burn, as this type of Fynbos is generally meant to burn once every 8-12 years for optimal ecological functioning (Helme & Rebelo 2016)



Plate 1: View of re-established indigenous vegetation in the old gravel quarry on Portion 126, marked as quarry 1 in Figure 4. This is the ecologically preferred position for the dwelling, and is about 0.24ha in extent.



Plate 2: View, looking north, from close to the eastern boundary of Portion 126, some 150m north of the cemetery. This area includes a drainage line and narrow wetland (just left of the powerlines) and highly sensitive Hangklip Sand Fynbos that is not present elsewhere on site, and is not suitable for an access road, due to the ecological sensitivity of this area. At least 5 plant Species of Conservation Concern occur in this area (and would also have occurred in what is now the cemetery).

All of Portion 126 can be considered undisturbed and pristine, except for the two old gravel quarries, which have now naturally rehabilitated to some extent since being quarried some 10-15yrs ago (see Plate 1). Quarry 1 is about 0.24ha in extent, and the smaller quarry 2 is about 0.05ha. The vegetation in the old quarries is a subset of what is present outside the quarries, and is dominated by *Protea repens* and *Leucadendron laureolum*. No plant Species of Conservation Concern (SoCC) occur in the quarries.

At the time of the survey, after heavy rains, there was water flowing into the upper northwest corner of quarry 1, but this is clearly seasonal, and would normally be dry for about 9 months a year, and does not constitute a wetland, as the water disappears under the surface within 3m. The only wetland indicator species is *Berzelia lanuginosa*, which is present only within this 3m strip, and nowhere else in the quarry. Various invasive alien plant species are present (*Pinus* and *Hakea drupacea*), and there is evidence that these have been felled in the past. The quarries are the only parts of Portion of 126 that are not of High or Very High botanical sensitivity, and are mapped as Medium sensitivity (see Figure 4).

A seasonal drainage line is present in the northern part of Portion 126, flowing southeast towards the western side of the cemetery, where it forms a large wetland on the Municipal land above the R44. Soils in the wettest parts of this drainage line are black, peaty sands, with a moisture gradient from east (driest) to west (wettest). Typical indigenous plant species in this wetland and drainage line area include *Neesenbeckia punctoria*, *Berzelia albiflora*, *Gleichenia polypodiodes*, *Elegia asperiflora*, *Psoralea pinnata*, *Osmitopsis asteriscoides*, *Platycaulos compressus*, *Cliffortia odorata*, *Morella integra* and *Pteridium aquilinum*.

Most of Portion 126 is well drained habitat supporting Kogelberg Sandstone Fynbos, and the terrain is steep and rocky in many parts. Plant species diversity is very high, with many SoCC. Common indigenous species in the better drained sands are *Pentameris curvifolia, Restio egregius, Thamnochortus gracilis, Anthospermum spathulatum, Cliffortia atrata, Staberoha cernua, Metalasia densa, Protea repens, Leucospermum prostrata, L. oleifolium, L. conocarpodendron, Diastella fraterna, Aulax umbellata, Mastersiella digitata, Oftia africana, Diospyros glabra, Elegia aggregatum, E. filacea, E. stipularis, Erica axillaris, E. fascicularis, E. serrata, E. plukenetii, E. pulchella, E. imbricata, E. corifolia, E.* paucifolia, Nivenia stokoei, Passerina corymbosa, Serruria adscendens, S. elongata, Spatalla longifolia, Mimetes cucullatus, Leucadendron laureolum and Leucadendron salignum. Additional species include Pteridium aquilinum, Rafnia capensis ssp. pedicellata, Colpoon speciosa, Tetraria bromoides, Spatalla racemosa, Capelio tabularis, Phylica imberbis, Agapanthus africanus, Carpobrotus edulis, Brunia paleacea, Ficinia pallens, Erica muscosa, E. tenella, E. monadelpha, Pterocelastrus tricuspidatus, Restio hyalinus, R. cincinnatus, R. dispar, R. festuciformis, Oxalis luteola, Edmondia sesamoides, Penaea mucronata, Pelargonium cucullatum, Hypodiscus aristatus, Lanaria lanata, Berkheya barbata, Hermas villosa and Phaenocoma prolifera. The botanical sensitivity of the undisturbed Kogelberg Sand Fynbos part of the study area is High on a local and regional scale (see Figure 4).

The Hangklip Sand Fynbos portion occurs on the flatter parts of the site, close to the cemetery. Species observed here and nowhere else on site include *Othonna* sp. nov, *Ixia micrandra* and *Rhynchosia ferulifolia*. The *Othonna* is an undescribed species known from lowland sands between here and Bredasdorp, and once described should probably be Redlisted as Vulnerable. The botanical sensitivity of the Hangklip Sand Fynbos part of the study area is Very High on a local and regional scale (see Figure 4).

Species	Redlist Status	Notes
Diastella fraterna	Rare	
Erica paucifolia ssp paucifolia	Endangered	Sandy areas
Ixia micrandra	Near Threatened	Sand Fynbos areas
Leucospermum conocarpodendron	Near Threatened	
viridum		
Leucospermum oleifolium	Near Threatened	
Leucospermum prostratum	Vulnerable	
Nivenia stokoei	Rare	Rocky areas
Othonna sp. nov.	Undescribed; Vulnerable	Sand Fynbos areas
Serruria adscendens	Near Threatened	
Serruria elongata	Near Threatened	
Spatalla longifolia	Near Threatened	

Table 1: The recorded plant Species of Conservation Concern on site.

At least 11 plant **Species of Conservation Concern** (SoCC) were recorded on site, most being quite well scattered, with the exception of the two Sand Fynbos species (see Table 1). None (except the *Ixia micrandra*) can be successfully

transplanted, as they are shrubs, with very sensitive root systems. There is a moderate likelihood of other undetected SoCC in the study area.



Figure 4: Botanical Sensitivity map of the study area. Unshaded areas in the study area are of High sensitivity.

6. CONCLUSIONS AND RECOMMENDATIONS

- All except about 0.3ha of Portion 126 is of High or Very High botanical sensitivity, as the two underlying vegetation types are gazetted as Critically Endangered, and at least 11 plant Species of Conservation Concern were recorded.
- The preferred sites for any dwellings would be in either of the two old gravel quarries, which are of Medium sensitivity. It is thus strongly recommended that any dwellings on site be located in these old quarry areas.
- In terms of site road access there is only one suggested route, as shown in Figure 5, which would have an acceptable Medium negative botanical impact. Any other routes would not only be longer (higher impact), but would also traverse Very High sensitivity areas, wetlands or areas with high concentrations of plant Species of Conservation Concern, and would hence be associated with potentially High negative construction phase botanical impacts.

• The vegetation on site is now due for a burn, and should thus ideally be burnt prior to any development on the site, which will also help reduce fire hazard in the near future.



Figure 5: Map showing the only proposed site access for Portion 126, via the shortest and least sensitive route from R44.

7. REFERENCES

DEA. 2011. Threatened Terrestrial Ecosystems in South Africa. *Government Gazette* Vol. 1002: No. 34809. National Printer, Pretoria.

DEA. 2022. National Biodiversity Offset Guideline. *Government Gazette* 25 March 2022, No. 46088. National Printer, Pretoria.

Government of South Africa. 2022. South African Red List of Terrestrial Ecosystems: assessment details and ecosystem descriptions. Government Notice 2747, Gazette 4526. Technical Report #7664, SANBI Pretoria, South Africa.

Helme, N., P. Holmes & A. Rebelo. 2016. Lowland Fynbos Ecosystems. <u>In:</u> Cadman, A (ed.). *Ecosystem Guidelines for Environmental Assessment in the Western Cape, Ed*.2. Fynbos Forum, Fish Hoek, South Africa. Manning, J. and P. Goldblatt. 2012. Plants of the Greater Cape Floristic Region 1: The Core Cape flora. *Strelitzia 29*. South African National Biodiversity Institute, Pretoria.

Martens, C., Deacon, G., Ferreira, D., Auret, W., Dorse, C., Stuart, H., Impson, F., Barnes, G. and C. Molteno. 2021. *A practical guide to managing invasive alien plants: A concise handbook for land users in the Cape Floral Region.* WWF South Africa, Cape Town, South Africa.

Mucina, L. and M. Rutherford. *Eds.* 2014 update. Vegetation map of South Africa, Lesotho, and Swaziland. *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.

Pence, G. 2017. Western Cape Biodiversity Spatial Plan. CapeNature, Cape Town, South Africa.

Raimondo, D., Von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A., and Manyama, P.A. (eds.) 2009. Red List of South African Plants 2009. *Strelitzia 25*. South African National Biodiversity Institute, Pretoria.

Rouget, M., Reyers, B., Jonas, Z., Desmet, P., Driver, A., Maze, K., Egoh, B. & Cowling, R.M. 2004. *South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 1: Terrestrial Component.* Pretoria: South African National Biodiversity Institute.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. *South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm*. South African National Biodiversity Institute, Pretoria.