NICK HELME BOTANICAL SURVEYS
PO Box 22652 Scarborough 7975
Ph: 021 780 1420 cell: 082 82 38350 email: botaneek@iafrica.com
Pri.Sci.Nat # 400045/08

BOTANICAL ASSESSMENT OF STIKLAND HOSPITAL GROUNDS, BELLVILLE, WESTERN CAPE.

Compiled for: Infinity Environmental, Cape Town

Applicant: Western Cape Government: Department of Infrastructure

12 September 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.

NA Helme

ABRIDGED CV:

Contact details as per letterhead.
Surname : HELME
First names : NICHOLAS ALEXANDER
Date of birth : 29 January 1969
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 south-western Cape. Since the end of 2001 I have been the Sole Proprietor of Nick Helme Botanical Surveys, and have undertaken over 2000 site assessments in this period.

A selection of relevant previous botanical work is as follows:

- Botanical assessment erf 666, Hout Bay (Monique Sham Consultants 2024)
- Botanical assessment of Ptns 31 & 33 Hazendal (Monique Sham Consultants 2024)
- Botanical constraints on Kransduinen 791, Mamre (UrbanEye 2024)
- Cape Winelands Airport Vegetation Scoping report (PHS Consulting 2023)
- Botanical assessment of Zeekoevlei weir upgrades (Infinity Environmental 2022)
- Botanical assessment of proposed development on Ptn 29 of Farm 410 Caledon (PHS Consulting 2022)

- 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 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)

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.

This report may not be altered or added to without the prior written consent of the author, and this also applies to electronic copies of this report, which are supplied for purposes of inclusion in other reports, including in the report of EAPs. 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 separate section to the main report.

TABLE OF CONTENTS

1. INTRODUCTION

This botanical assessment was requested to inform the environmental planning and authorisation process being followed for the potential redevelopment of the Stikland Hospital precinct (Remainder Erf 6300), in the Bellville area of the Western Cape (see Figure 1). The high security central area (shown in blue in Figure 1) was excluded from this study for access reasons, and because there is no significant natural vegetation remaining in this area. No proposed development layout was provided for assessment as this is essentially a botanical constraints study that will be used for planning purposes.

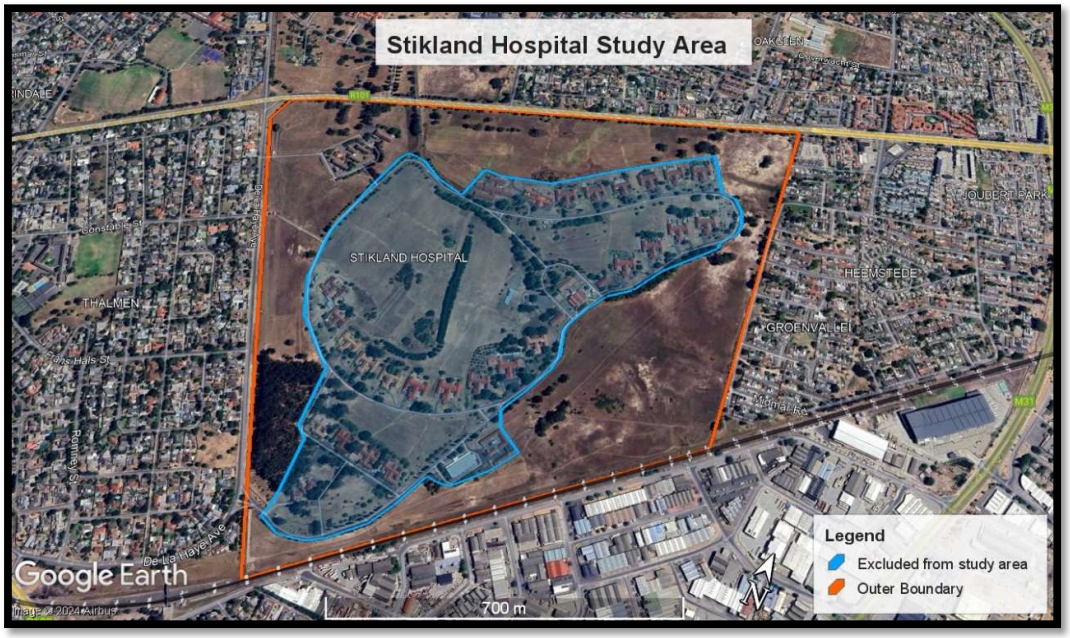

Figure 1: Satellite image showing the location of the study area – being the area between the excluded central area (blue shading) and the outer perimeter. Satellite image dated February 2024.

2. TERMS OF REFERENCE

The ToR were as follows:

- Undertake a site visit to assess the vegetation on site
- Identify and describe the vegetation in the area
- Provide an overview and map of the botanical and ecological conservation significance (sensitivity) of the site (High, Medium and Low); this will essentially be an ecological opportunities and constraints map and should be provided as Google Earth kmz files
- Indicate if more than 300m^2 of indigenous vegetation is present
- Indicate the acceptability of the development of this area from an ecological perspective

- Discuss the environmental constraints, including City of Cape Town BioNet, etc.
- Indicate how and whether the sensitivity of the vegetation on site differs from any Screening Tool assessment.
- Recommend any possible mitigation measures to avoid and/or minimise impacts.

3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The site was visited on 10 September which was within the optimal winter – spring flowering season in this winter rainfall area, and most of the likely geophytes and annuals were thus evident and identifiable, whilst all perennial plants were identifiable. There were thus few seasonal constraints on the accuracy of the botanical findings, and the confidence in the accuracy of the botanical findings is high in terms of data collection, although interpretation of this data is a more subjective matter. 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 was driven and walked (in areas of interest), and all plants on site were noted. Photographs of the site were made using a Fuji mirrorless slr camera and a Xiaomi gps enabled cellphone, and photos uploaded to the biodiversity website inaturalist.org. Mapping was done directly onto satellite imagery using the app Field Area Measure. Data from this app was then exported to Google Earth, for final mapping. Satellite imagery dated February 2024 (and earlier) was used to inform this assessment, and for mapping. It is assumed that there is no significant natural vegetation remaining within the central, excluded area. 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.

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 City of Cape Town Biodiversity Network has not mapped any habitat in this area (hence no copy of map provided), which is clearly an oversight, perhaps related to access constraints. The study area is something of an open space island in an otherwise densely developed and populated area.

5. THE VEGETATION AND ITS SENSITIVITY

According to the SA Vegetation Map the original natural vegetation in the study area is mostly **Cape Flats Sand Fynbos**, with a tongue of **Swartland Shale Renosterveld** in the northern area (Mucina & Rutherford 2018; see Figure 2). Based on my ground-truthing I agree with this mapping.

Cape Flats Sand Fynbos is gazetted as **Critically Endangered** on a national basis (Government of South Africa 2022), with only 19% of its total original extent remaining intact, less than 1% conserved, and a national conservation target is 30% (Rouget *et al* 2004). The unit is thus threatened in terms of habitat

loss and low percentage conserved, as well as the very high number of threatened and endemic plant species found in the vegetation unit. This unit occurs on nutrient poor, acid sandy soils on the Cape Flats, and the vegetation type needs fire for optimal ecological functioning (Helme *et al* 2016).

Swartland Shale Renosterveld is also gazetted as **Critically Endangered** on a national basis (Government of South Africa 2022), with less than 9% of its total original extent remaining intact, less than 1% conserved, and a national conservation target of 26% (Rouget *et al* 2004). The unit is thus threatened in terms of habitat loss and low percentage conserved, as well as the very high number of threatened and endemic plant species found in the vegetation unit. This unit occurs on nutrient rich, loamy soils from Piketberg to Somerset West, and the vegetation type needs fire for optimal ecological functioning (Helme *et al* 2016).

The fire history of the vegetation on site is not known, but most of it does get mown every year, and mowing was in fact taking place during the site visit.

There is very clearly much more than 300m^2 of natural vegetation in the study area, as probably close to 25% of the study area vegetation could be considered indigenous, making up an area of at least 8ha.

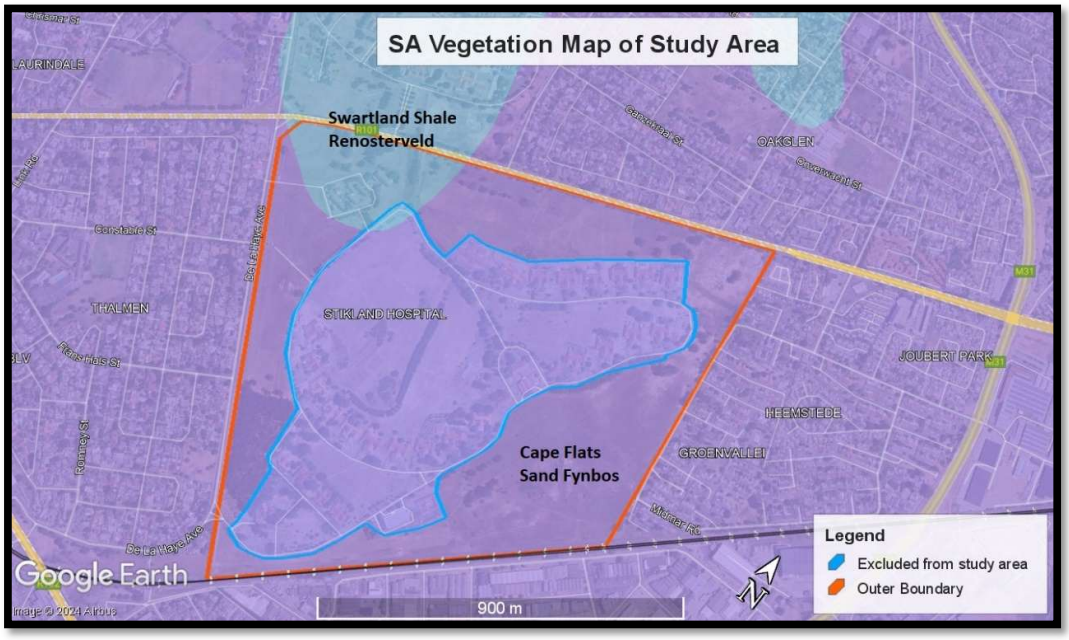

Figure 2: Extract of SA Vegetation Map for the study area, showing the distribution of the two vegetation types in the area.

Plate 1: *Paurida aquatica* (sterretjies) growing in an as yet unmowed seasonal wetland in southwestern corner of the site.

Plate 2: Recently mowed area in southwestern corner, with the seasonal wetland shown in Plate 1 visible at left. Assigning habitat sensitivity to a recently mowed area is not easy, but this area is provisionally deemed to be of Low or Medium sensitivity.

Plate 3: Bokbaai vygies (*Cleretum bellidiforme*) and reengousblomme (*Dimorphotheca pluvialis*) annuals, with alien invasive Port Jackson seedlings (*Acacia saligna).*

Plate 4: Very High sensitivity patch of Sand Fynbos in the northeastern corner, with the restio *Willdenowia teres* prominent.

Plate 5: High diversity damp meadow in the northern area, with *Oxalis purpurea* (suuring) prominent. Although mown regularly this large area still supports many millions of bulbs and is of High sensitivity.

Plate 6: The highly fragrant *Babiana nana* is an Endangered bulb found in a small part of the northern area, in a rocky area not so regularly mown. This is a Very High sensitivity area.

Indigenous plant species diversity ranges from low to fairly high, this being related mainly to the level of soil disturbance, as well as soil type, with the drier sands being more degraded than the seasonally wet loams in the north. It is not known whether the site was ever cultivated, and certainly since the development of the Hospital the primary disturbance has clearly been the regular mowing, typically undertaken by tractors with mower attachments. Additional important sources of degradation include sewer leaks, with at least one currently active.

Alien invasive herbs, grasses and shrubs are certainly present, but do not dominate all of the study area. Common alien invasive species include *Cenchrus C. clandestinum* (kikuyu), *Echium plantagineum* (Patterson's curse), *Brassica tourneforti, Plantago lanceolata, Briza* spp., *Bromus pectinatus* (brome), *Lolium* spp. (ryegrass), *Avena* spp. (wild oats), *Cerastium* sp., Lactuca spp., and *Hypochaeri*s sp., plus shrubs such as *Acacia saligna* (Port Jackson).

Indigenous species observed include *Cynodon dactylon*, *Osteospermum moniliferum, Ursinia anthemoides, Arctotheca calendula, Cleretum bellidiforme, Pelargonium triste, Hermannia pinnata, Hesperantha falcata, Ornithogalum thyrsoides, Willdenowia teres, Aspalathus ternata, Cliffortia polygonifolia, Gladiolus carinatus, Oxalis glabra, O. purpurea, O. tenuifolia, O. pes-caprae, Babiana nana, Ferraria crispa, Lampranthus emarginatus, Pauridia aquatica, Lampranthus explanatus, Wachendorfia multiflora, Trachyandra divaricata, Trachyandra sp., Haemanthus pubescens ssp. pubescens, Lachenalia variegata,*

Sparaxis bulbifera, Triglochin striata, Babiana tubiflora, Cissampelos capensis, Putterlickia pyracantha, Senecio elegans, Wiborgia obcordata, Crassula natans, C. lanceolata, C. umbellata, Conicosia pugioniformis, Carpobrotus edulis, Ehrharta calycina, E. villosa, Ornithoglossum viride, Zantedeschia aethiopica, Salvia lanceolata and *Phyllopodium capillare.*

The sheer number of bulb and annuals in parts of the study area is astonishing, with literally millions of plants present (see Plates 3 & 5).

Five plant Species of Conservation Concern (SoCC) were recorded on site (see Table 1), and there is a moderate likelihood of at least one or two others being present.

Species	**Redlist Status**	**Notes**
Aspalathus ternata	Near Threatened	Northeastern areas; about 60 plants in a small patch
Babiana nana ssp. *nana*	Endangered	Northern areas; about 100 plants in a small patch
Lampranthus explanatus	Near Threatened	Northeastern areas; about 50 plants
Phyllopodium capillare	Near Threatened	Eastern and southern areas; hundreds of plants; annual, widely scattered
Trachyandra sp.	Unknown, pending id.	Northern areas; <20 plants, in a small patch

Table 1: List of the five plant Species of Conservation Concern (SoCC) recorded on site.

5.1 Botanical Sensitivity

The majority of the study area is of Low botanical sensitivity (see Figure 3), and these areas do not support any of the recorded Species of Conservation Concern (SoCC).

There are also significant patches of higher sensitivity. Four patches of Very High sensitivity have been mapped, one of which is a seasonal wetland (Plate 1), and the other three all support the five recorded plant Species of Conservation Concern (see Table 1). Surrounding and linking these are two patches of Medium to High sensitivity. In the southeast are three patches of Medium sensitivity that support none of the SoCC except the annual *Phyllopodium capillare*.

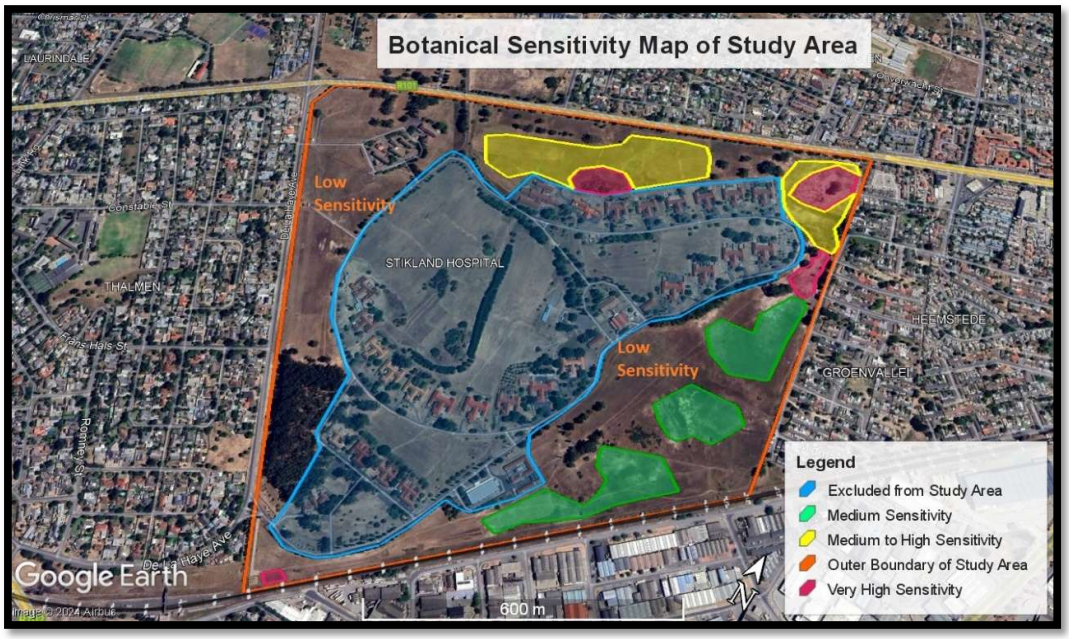

Figure 3: Botanical Constraints map of the study area. Unshaded areas within the study area are deemed to be of Low botanical sensitivity.

6. CONCLUSIONS AND RECOMMENDATIONS

- The study area supports notable remnants of two Critically Endangered vegetation types, with at least five plant Species of Conservation Concern. At least 8ha of mostly indigenous vegetation remains in the area. The absence of any mapped areas of importance in the City of Cape Town's Biodiversity Network for this site is clearly an error/oversight, presumably originating from lack of site access.
- The majority of the study area is of Low botanical sensitivity, and these areas do not support any of the recorded Species of Conservation Concern (SoCC).
- There are four patches of Very High sensitivity (see Figure 3), one of which is a seasonal wetland, and the other three all support the five recorded plant Species of Conservation Concern.
- Surrounding and linking these are two patches of Medium to High sensitivity. In the southeast are three patches of Medium sensitivity that support none of the SoCC except the annual *Phyllopodium capillare*.
- If the entire study area were to be developed the significance of the loss of the vegetation on this site would be Very High negative.

- In line with the mitigation hierarchy (avoid, minimise, mitigate) the Very High and Medium to High sensitivity patches should not be disturbed or developed at all, and should ideally be managed for long term conservation. In the short term this means no mowing in the flowering period of June – mid October, along with proper invasive alien plant removal (methodology as per Martens *et al* 2021).
- The Medium sensitivity areas should ideally also be considered and managed as conservation areas, as they have good rehabilitation potential, and their loss would be associated with Medium negative botanical impact, which if not avoided, could trigger the need for a biodiversity offset.
- Only the Low sensitivity areas could be developed without significant botanical impact, and even there a large scale Search and Rescue program would be needed as mitigation, at the appropriate seasons, as these areas still support notable biodiversity, which could be used to rehabilitate other areas.
- This constraints mapping has significant consequences for the proposed redevelopment masterplan, which should thus be changed to accommodate these findings.

7. REFERENCES

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. In: Cadman, A (ed.). *Ecosystem Guidelines for Environmental Assessment in the Western Cape, Ed*.2. Fynbos Forum, Fish Hoek, South Africa.

Holmes, P., J. Wood and C. Dorse. 2008. Updated (June 2018) and groundtruthed CoCT Biodiversity Network, together with City of Cape Town – Biodiversity Report. Environmental Management Branch, City of Cape Town. Available from: www.bgis.sanbi.org

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.* 2018 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 and online updates at sanbi.redlist.org. 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.