Botanical Assessment of the lower section of Portion 3 of Farm Vierfontein 143, Bredasdorp Cape Agulhas Municipality, Western Cape Province

Botanical Surveys & Tours

Report by Dr David J. McDonald
Bergwind Botanical Surveys & Tours CC.
14A Thomson Road, Claremont, 7708
Tel: 021-671-4056
Fax: 086-517-3806

Report prepared for EnviroAfrica CC

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National Legislation and Regulations governing this report

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, as amended.

Appointment of Specialist

David J. McDonald of Bergwind Botanical Surveys & Tours CC was appointed by EnviroAfrica CC, to undertake a botanical assessment of the lower-altitude section of Portion 3 of the Farm Vierfontein 143, Bredasdorp near Napier, Agulhas Municipality, Western Cape Province.

Details of Specialist

Dr David J. McDonald Pr. Sci. Nat.
Bergwind Botanical Surveys & Tours CC
14A Thomson Road
Claremont
7708
Telephone: 021-671-4056
Mobile: 082-876-4051
Fax: 086-517-3806
e-mail: dave@bergwind.co.za
Professional registration: South African Council for Natural Scientific Professions No. 400094/06

Expertise

Dr David J. McDonald:

- Qualifications: BSc. Hons. (Botany), MSc (Botany) and PhD (Botany)
- Botanical ecologist with over 40 years' experience in the field of Vegetation Science.
- Founded Bergwind Botanical Surveys & Tours CC in 2006
- Has conducted over 400 specialist botanical / ecological studies.
- Has published numerous scientific papers and attended numerous conferences both nationally and internationally (details available on request)

Curriculum Vitae – Appendix 3

Independence

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

Conditions relating to this report

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

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

Declaration of independence:

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

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the specialist:

Bergwind Botanical Surveys & Tours CC

Name of company:

Date: 16 May 2020

CONTENTS

1. Introduction

Part of Portion 4 of the farm Vierfontein 143, Bredasdorp has been cultivated with main crops being Cape fynbos species for the local and export market and blue berries. The neighbouring property, Portion 3 of the farm Vierfontein 143, Bredasdorp has not been cultivated at all.

The landowner of Portion 4 wishes to lease 20 ha of the adjoining Portion 3 of Vierfontein 143 in order to expand the area available for blueberry production.

Bergwind Botanical Surveys & Tours CC was commissioned to conduct a botanical assessment to determine the site condition and sensitivity of the lower section (approximately 50 ha) of Vierfontein 143 Portion 3 and, if suitable and acceptable, to make a recommendation about what part of the ± 50 ha could be considered for conversion to agriculture and specifically blueberry production. The intention was to 'find' a suitable area of ± 20 ha that could be converted to agriculture.

This report provides a description of the vegetation found generally on the lower part of Portion 3 of Vierfontein 143. The report places the vegetation in a regional context from a conservation perspective and the investigation follows published guidelines for evaluating potential impacts on the natural vegetation as they pertain to the study area (Brownlie 2005; Cadman *et al.,* 2016). The requirements and recommendations of Cape Nature and the Botanical Society of South Africa for assessment of biodiversity of proposed development sites have been considered and the '*Best Practice Guidelines for the implementation of the Flora (3c) & Terrestrial Fauna (3d) Species Protocols as well as the Aquatic Biodiversity Protocol (3b) for environmental impact assessments in South Africa*' [Draft] (Enviro Insight, 2020) have also been taken into consideration.

2. Terms of Reference

- Provide a broad, baseline description of the vegetation of the study area, placing it in a regional context. Reference should also be made to any bioregional maps of the area.

- Describe the vegetation communities and associated conservation value/sensitivity of the study area and identify any areas of specific concern (e.g. high sensitivity and/or conservation status).

- Provide specific information relating to the vegetation in the study area, with reference to any species of special concern and their conservation status, which can be used as baseline information for the assessment of potential impacts of the proposed project.
- Identify, describe and assess the impacts of the proposed activities on the vegetation.
- If suitable and acceptable, recommend a 20 ha area that could be leased and converted to agriculture within the study area that is the lower ± 50 ha of Portion 3 of Farm Vierfontein 143.
- Recommend appropriate mitigation measures that would reduce all major (significant) impacts or enhance potential benefits, if any.

3. Study Area

3.1 Location

The farm Vierfontein 143, Bredasdorp lies on the north-east-facing slopes of the Soetmuisberg near the town of Napier, Cape Agulhas Municipality, Western Cape Province. This area is part of a greater area known as the Overberg and falls within the Overstrand District Municipality.

Access to Vierfontein 143 is by gravel road from the R316 between Napier and Bredasdorp with the turnoff to the farm 0.5 km from Napier on the southeast side. The location of the study area or 'site' on Portion 3 of Vierfontein 143 lies in the catchment of the Groot Sanddrif River (Figure 1), west of the cultivated Portion 4 of Vierfontein (Figure 2).

The area commissioned for study is indicated by purple shading in the lower part of Portion 3 of Vierfontein. However, I chose to follow the cadastral boundary on the north-west side (Figure 2a). Figure 2b shows the area (grey shading) as the preferred area for further agricultural development.

Portion 3 of Vierfontein 143 (red boundary) extends higher into the mountain catchment (Figure 2c).

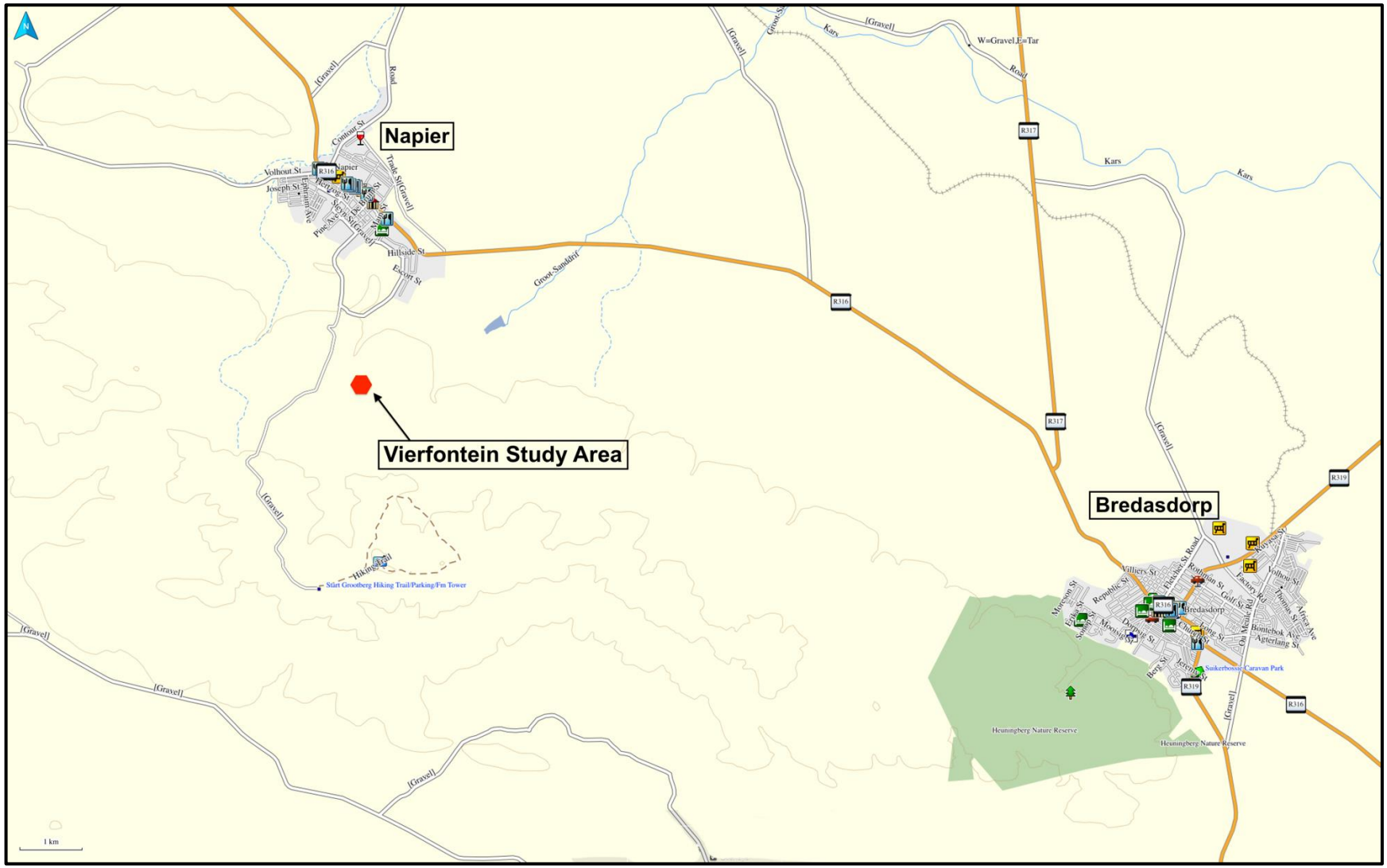

Figure 1.The locality of the study area (red hexagon) relative to the towns of Napier and Bredasdorp, Cape Agulhas Municipality.

Figure 2a. Aerial image (Google Earth ™) with the designated study area shaded purple and with the cadastral boundaries in red, except for the southern red boundary that was drawn for the purposes of this study.

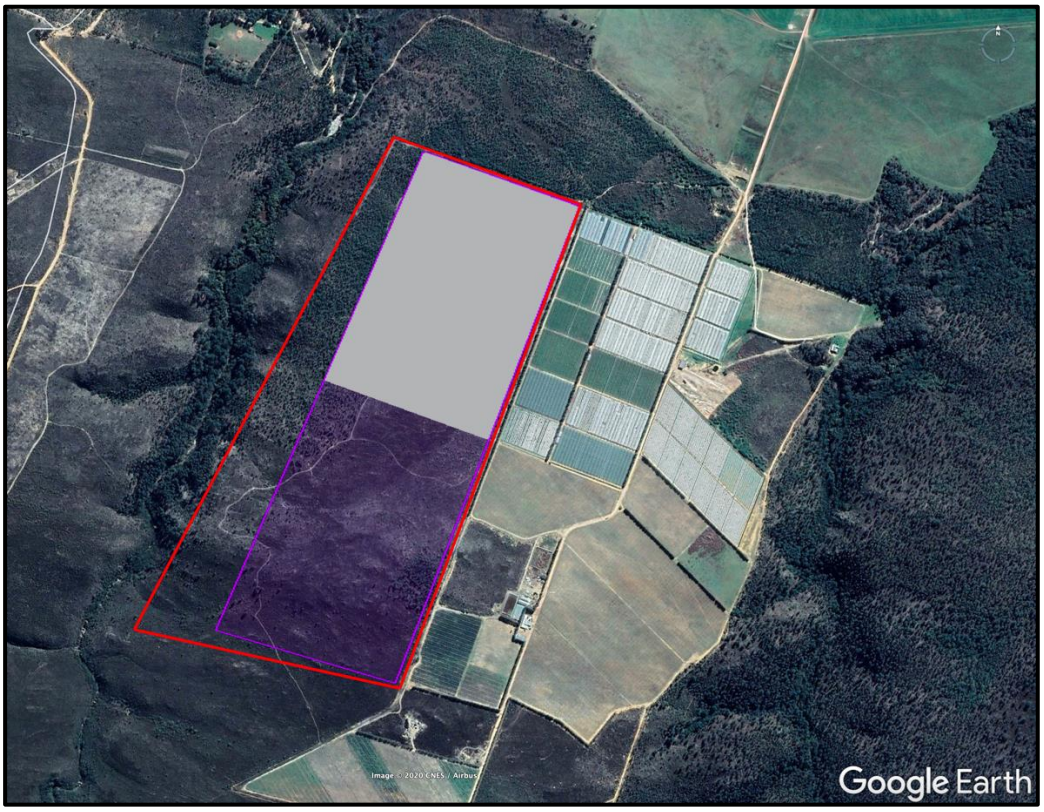

Figure 2b. Aerial image (Google Earth ™) with the designated Vierfontein 143 study area shaded purple and with the cadastral boundaries in red, except for the southern red line boundary that was drawn for the purposes of this study. The area shaded grey (20 ha) is the area sought and preferred for the proposed agricultural development.

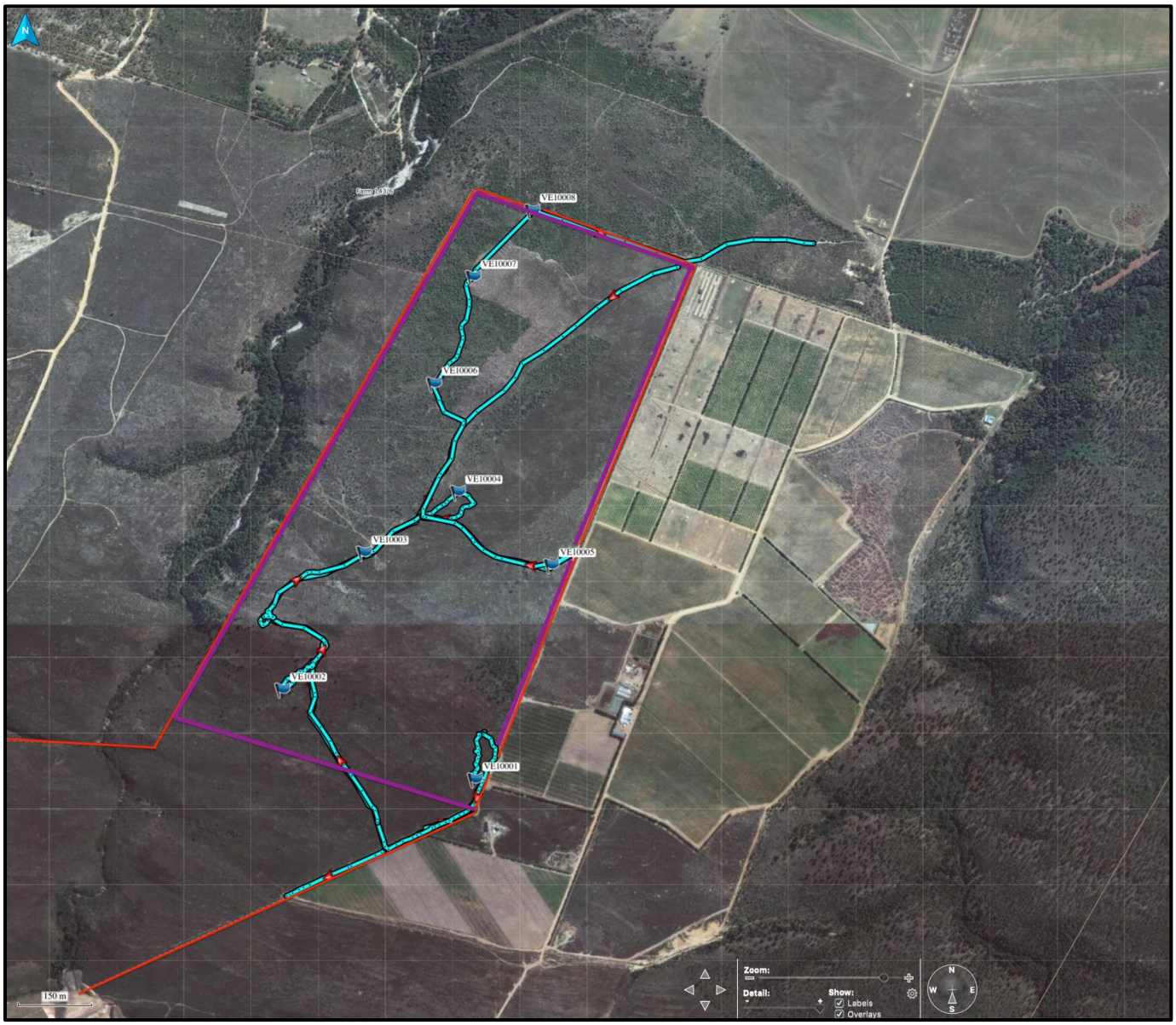

Figure 2c. Aerial image (Bird's Eye Base map) showing the Vierfontein 143 study area (purple boundary) and with the cadastral boundaries of Portion 3 in red. The survey track is indicated in light blue with eight waypoints VE#

3.2 Geology, Topography and Soils

The entire Study Area lies on sandstone sediments of the Nardouw Subgroup of the Table Mountain Group (Figure 3). The orthoquartzitic sandstones have over millennia given rise to well-drained, leached and consequently nutrient-poor (oligotrophic) soils. No clay-rich soils derived from shale are found anywhere on the site.

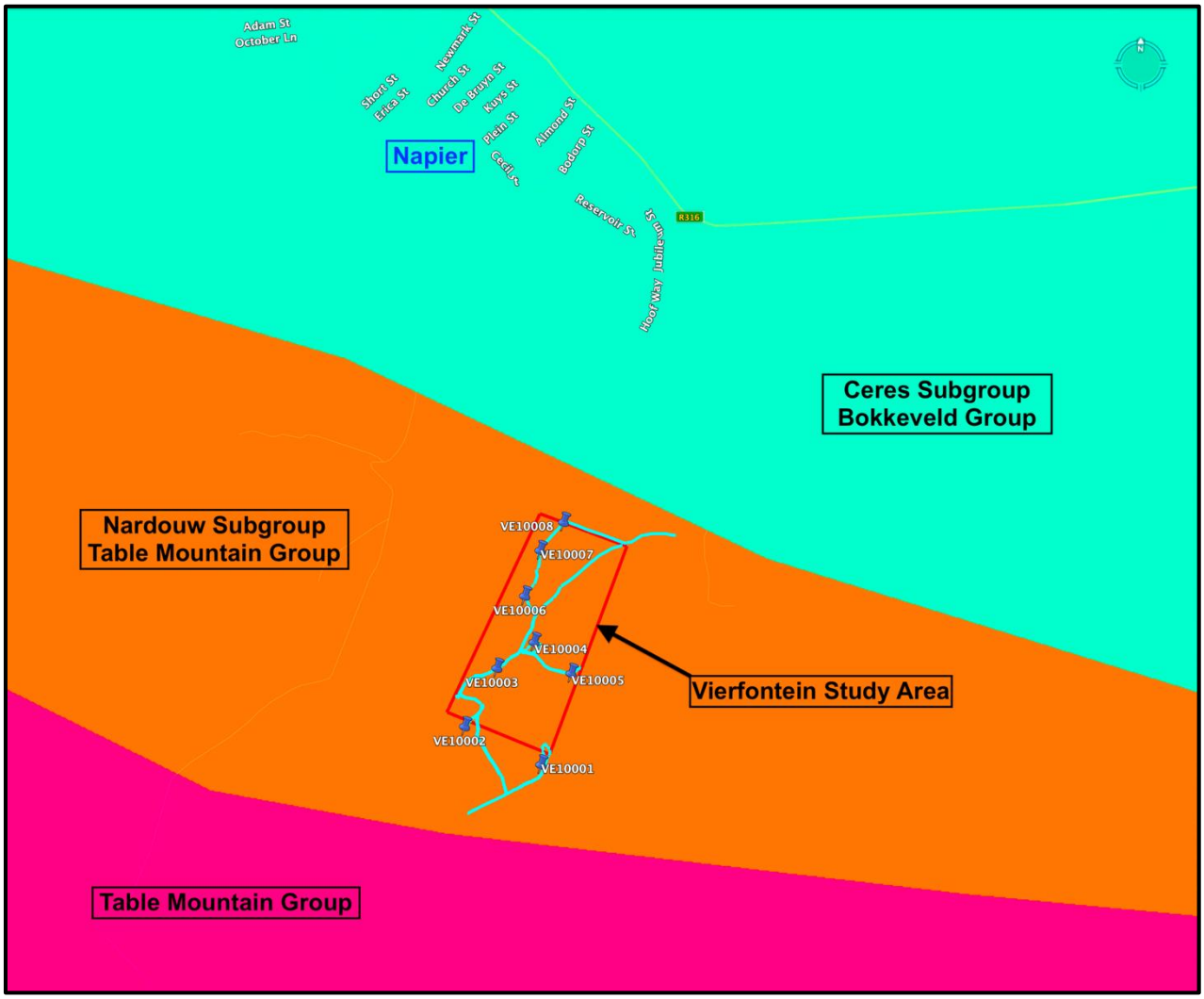

Figure 3. Geological map indicating that the Vierfontein Study Area lies entirely on sediments of the Nardouw Sub-group, Table Mountain Group.

3.3 Climate

Mean Annual Precipitation (MAP) for Overberg Sandstone Fynbos is 585 mm (Figure 4) (Rebelo *et al.* 2006 in Mucina & Rutherford, 2006) and it is outstripped by Mean Annual Potential Evaporation (MAPE). This means that the environment is relatively dry. Most of the rain falls in the winter (May—August) with June to August being the wettest months. Since rain falls mainly in the winter, the climate is classified as a Mediterranean-type climate. South-east winds prevail in summer and have a drying effect; most precipitation occurs when the northwesterly winds blow in winter.

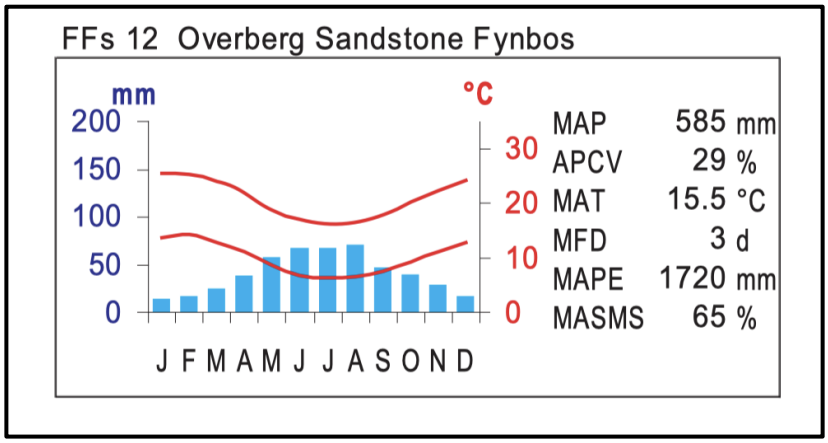

Figure 4. Climate diagram for Overberg Sandstone Fynbos (from Rebelo *et al.* 2006 in Rutherford & Mucina, 2006) showing MAP – Mean Annual Precipitation; ACPV = Annual Precipitation Coefficient of Variance; MAT = Mean Annual Temperature; MFD = Mean Frost Days; MAPE = Mean Annual Potential Evaporation; MASMA = Mean Annual Soil Moisture Stress.

4. Evaluation Method

Aerial photos of the site were examined and the national web-based environmental screening tool for terrestrial plant species was applied (Government Gazette, 2020), to determine site sensitivity (see also Enviro Insight, 2020).

The study area was visited on 2 October 2019 (late spring) on a clear day with moderate temperature. A second visit was conducted on 16 October 2019 with Dr John Rourke, a botanist specializing in the taxonomy of the family Proteaceae, and currently revising the genus *Serruria,* to follow up important species observations on the site (see below).

The survey route and waypoints of the initial visit were recorded on a Garmin GPSmap 66s handheld device. During the survey, notes together with a photographic record (with photos geo-tagged) were compiled on study terrain and surrounds. A total of eight sample waypoints were recorded (see Figures 2 & 3). Approximately 5 hours were spent surveying the site by vehicle and on foot.

5. Limitations and Assumptions

Season was not a limitation since the survey was conducted in spring when a large number of the plant species on the site were in flower and identifiable or are species that can be identified from vegetative parts. Ephemeral species (e.g. annuals and geophytes) were also either visible or their presence could be determined from dried parts.

No assumptions were made since the entire site was accessible and the season was appropriate for the survey of the vegetation.

6. Disturbance regime

The area investigated has never been ploughed (cultivated) and there is no evidence of any form of livestock having been on the site. However, the site is invaded by alien invasive plant species to a greater extent or lesser extent depending where one is on the property. In general, the most northerly area of the site surveyed is heavily (densely) invaded by *Pinus radiata* (Monterey Pine) and *Leptospermum laevigatum* (Australian myrtle). The density of invasion by these woody alien species (shrubs and trees) diminishes as one proceeds southwards and upslope, but clusters of pine and myrtle occur throughout the area investigated. The density of the alien invasive *L. laevigatum* diminishes to almost zero at the southern end of the site whereas scattered individual and small groups of pine trees are still found here. A few individuals of *Hakea sericea* (silky hakea of Australian origin) were also noted at the southern end of the site.

Based on the 2003 aerial photographs (Figure 5) the assumption is made that the entire site was covered by amid-dense to dense cover of pines and probably Australian myrtle prior to 2002. It appears that the site was subject to clearing of alien invasive plants probably from 2002 onwards to 2006 where the greater part of the site was clear of alien plants. A series of historical images obtained from Google Earth ™ (Figures 5—11) show the sequential disturbance of the site by clearing of alien plants and pattern caused by fires.

The invasion by alien plant species has had a negative impact on the fynbos flora whereas the fires have been both good and bad. Fynbos is meant to burnt periodically but at appropriate intervals. The presence of alien plants would have meant hotter fires and more damaging fires, and the fire interval, interpreted from the sequence of aerial photos, was too short between the fire that occurred prior to November 2012 and the next that occurred sometime in late 2013.

Figure 11 is a map overlaid on a Google Earth ™ image of August 2019 which represents the state of the vegetation of the study area close to the time it was visited in October 2019. The southern and eastern part is mostly in good condition fynbos (with only scattered alien invasives). In contrast, the western to northern parts are either heavily infested with alien trees and shrubs or, as in the blue area marked ‘3’, the aliens invasives have been cleared but have been allowed to start returning *en masse*; once again with negative consequences for the fynbos.

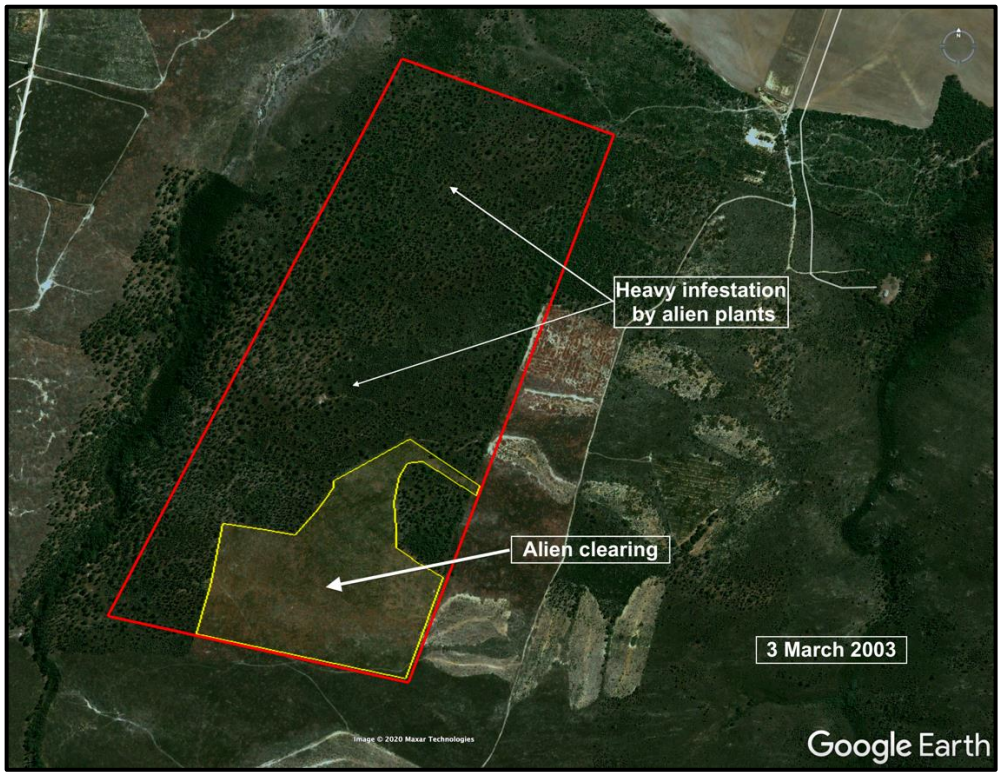

Figure 5. The area of Portion 3 of Vierfontein 143 investigated in this study indicating that alien clearing was undertaken in the southern part prior to 2003. Aerial photo from Google Earth ™ dated 3 March 2003.

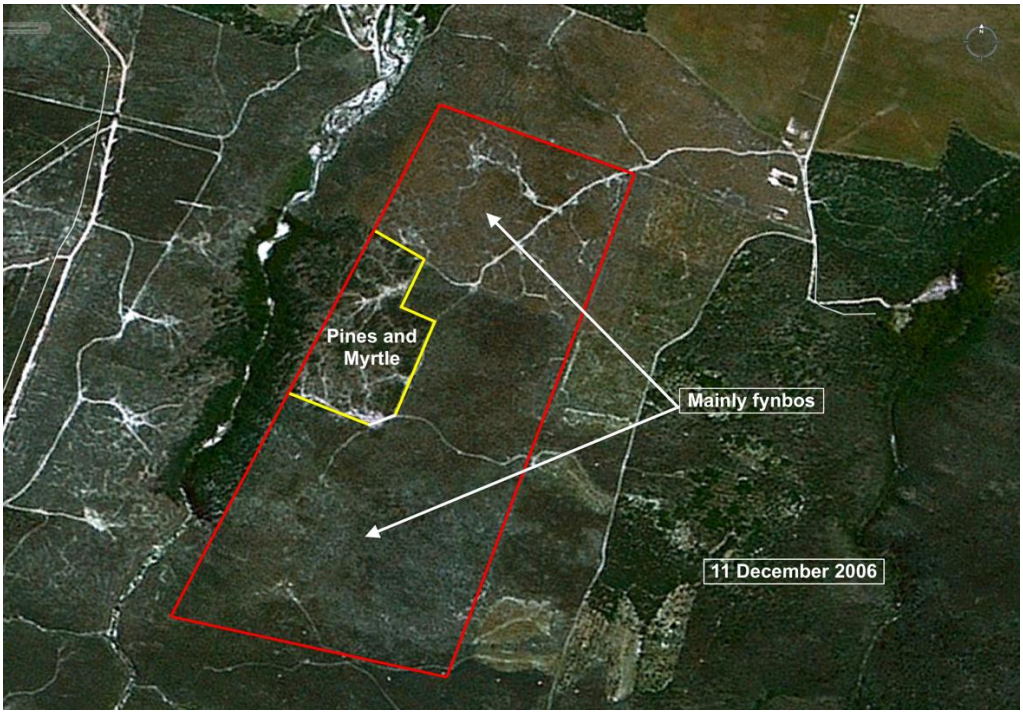

Figure 6. The area of Portion 3 of Vierfontein 143 investigated in this study indicating that alien clearing had resulted on most of the site had been cleared of alien invasive trees except for a small area in the west. Aerial photo from Google Earth ™ dated 11 December 2006.

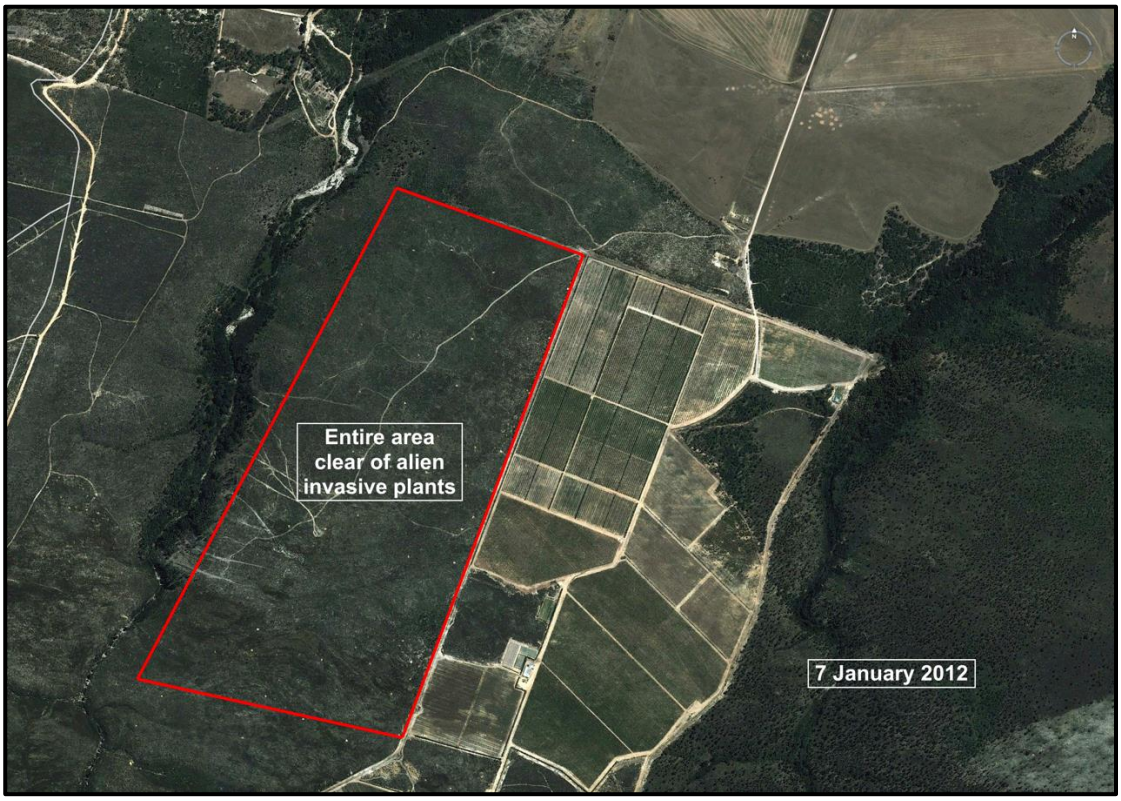

Figure 7. The area of Portion 3 of Vierfontein 143 investigated in this study indicating that alien invasive plants had been cleared from the entire area. Aerial photo from Google Earth ™ dated 7 January 2012.

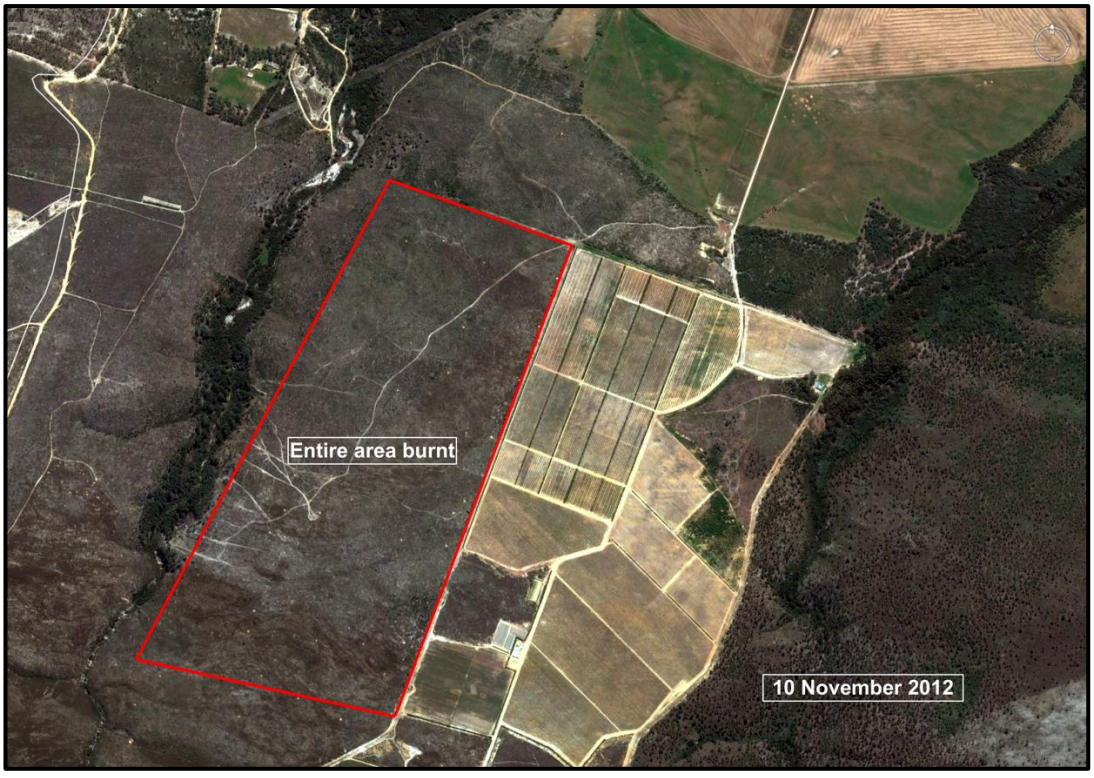

Figure 8. The area of Portion 3 of Vierfontein 143 investigated in this study. The entire area was burnt at some time in 2012 prior to November 2012.

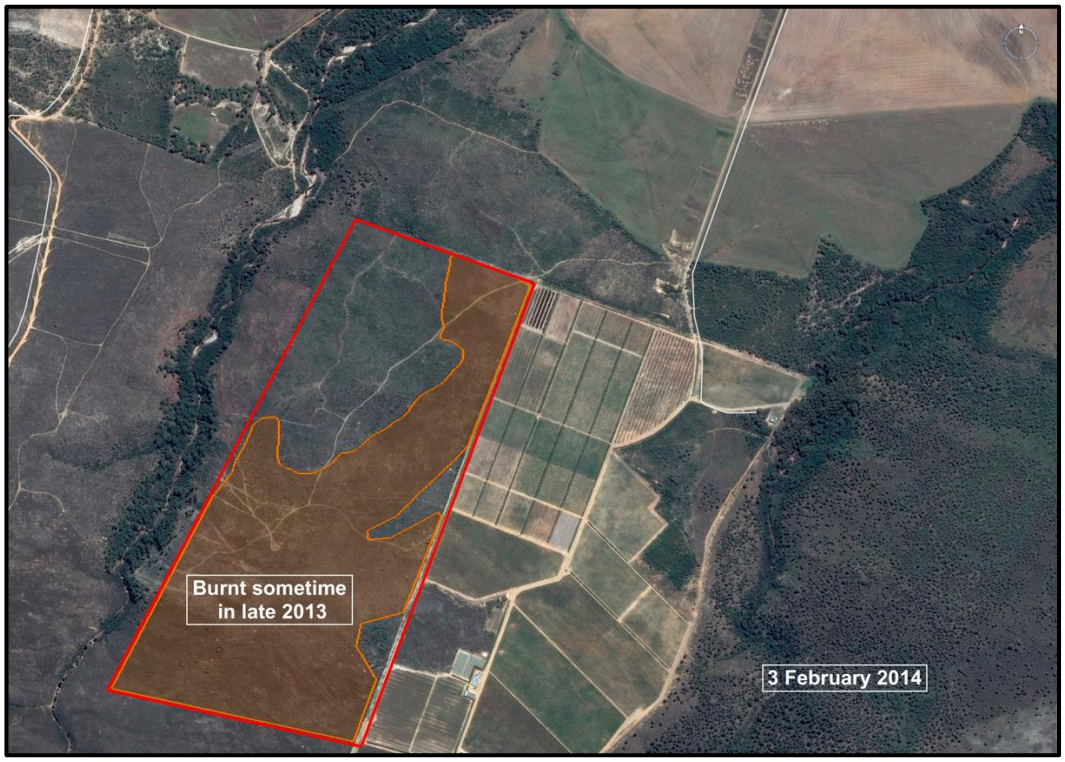

Figure 9. It appears that the area indicated by orange shading burnt again sometime in late 2013 but this could be an artifact. Aerial photo from Google Earth ™ dated 3 February 2014.

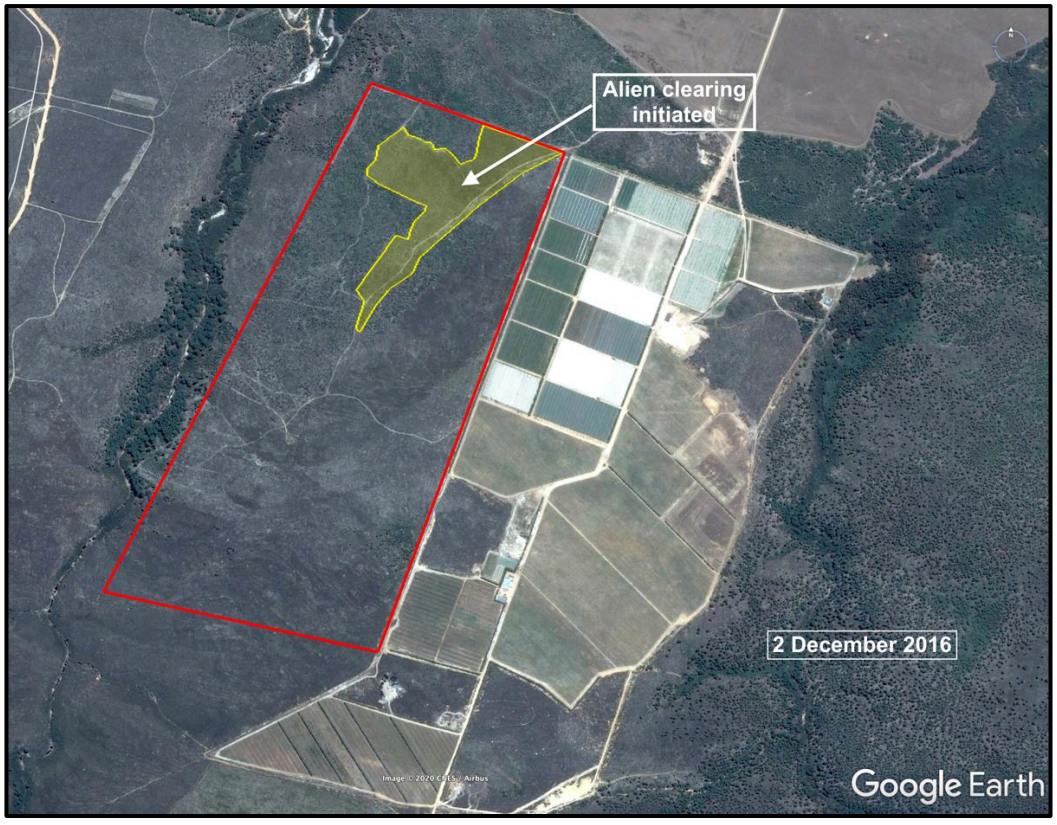

Figure 10. It appears that alien clearing was undertaken sometime in 2015 and 2016 as indicated by the yellow shading. Aerial photo from Google Earth ™ dated 2 December 2016.

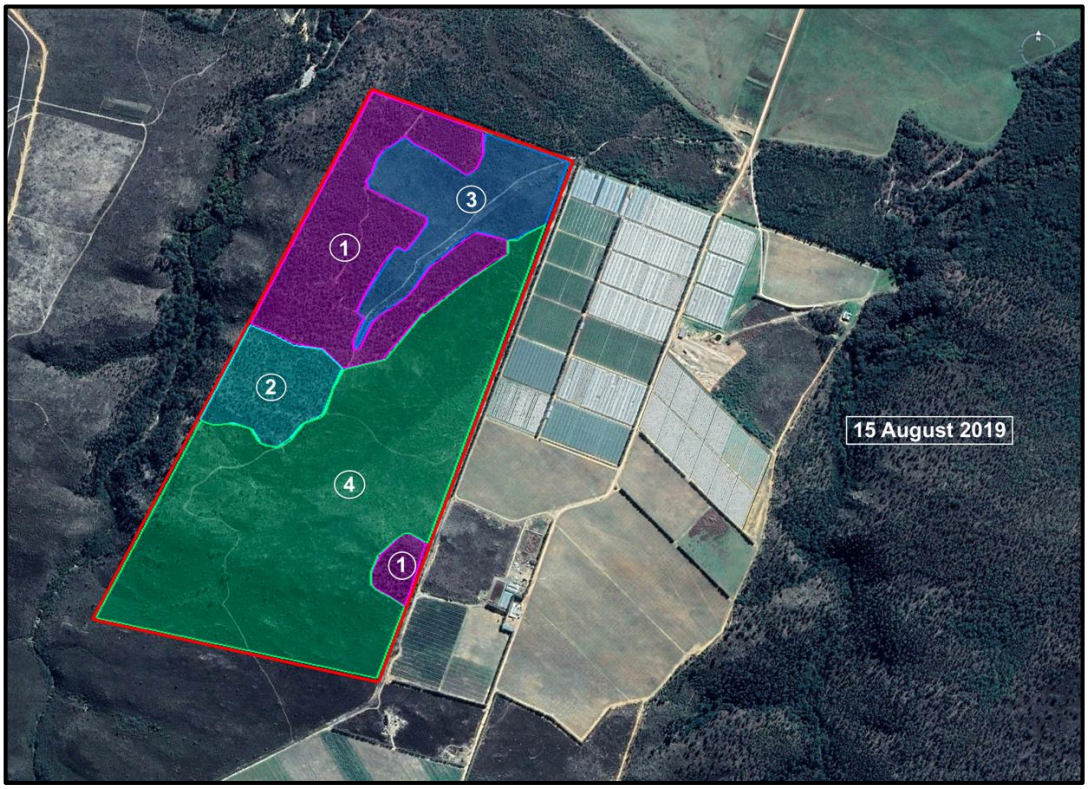

Figure 11. This is the most recent Google Earth image available for the Portion 3 of Vierfontein 143 area investigated and represents the current status. Purple areas marked (1) are areas with dense infestation of alien trees and shrubs; the light blue-green area (2) has a mid-dense cover of alien invasive plants; the blue area in the north cleared of aliens in 2015-2016 but the alien plants are rapidly and aggressively recolonizing the area. The green area (4) is intact fynbos but with scattered alien invasive trees and shrubs.

7. Application of the national web-based environmental screening tool for terrestrial plant species.

The National Web-based Environmental Screening Tool was applied to the study area and the result was ambiguous. The MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY (see below) gave a result of MEDIUM SENSITIVITY whereas the accompanying small table indicated that the sensitivity is HIGH (Figure 12). The reason for this discrepancy is not clear. However, as is described and discussed below, the observations made during the site visits indicate that the sensitivity is HIGH for part of the area (southern fifty percent) and MEDIUM for the northern part of the area, hence the impact assessment as given below (Tables 1 & 2). An excerpt from the report generated by the web-based tool map of the relative **plant species theme sensitivity** with 'checklist' of sensitive species that may or may not occur, is included below.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Erica agglutinans
High	Leucadendron modestum
High	Protea longifolia
High	Serruria rebeloi
Medium	Pentameris scandens
Medium	Ehrharta setacea subsp. uniflora
Medium	Lobostemon sanguineus
Medium	Echiostachys ecklonianus
Medium	Tritoniopsis bicolor
Medium	Sensitive species 438
Medium	Erica williamsiorum
Medium	Erica agglutinans
Medium	Erica colorans
Medium	Erica lageniformis
Medium	Erica melanacme
Medium	Sensitive species 253
Medium	Sensitive species 259
Medium	Staberoha multispicula
Medium	Elegia fenestrata
Medium	Elegia verreauxii
Medium	Sensitive species 284
Medium	Sensitive species 294

Medium	Amphithalea speciosa
Medium	Amphithalea virgata
Medium	Argyrolobium pachyphyllum
Medium	Xiphotheca reflexa
Medium	Lachnaea aurea
Medium	Zyrphelis spathulata
Medium	Osteospermum hispidum var. hispidum
Medium	Aspalathus chenopoda subsp. gracilis
Medium	Aspalathus oblongifolia
Medium	Sensitive species 549
Medium	Phylica anomala
Medium	Otholobium thomii
Medium	Leucadendron elimense subsp. elimense
Medium	Leucadendron laxum
Medium	Leucadendron linifolium
Medium	Leucadendron modestum
Medium	Leucadendron platyspermum
Medium	Leucospermum heterophyllum
Medium	Leucospermum hypophyllocarpodendron subsp. hypophyllocarpodendron
Medium	Leucospermum prostratum
Medium	Protea aspera
Medium	Protea longifolia
Medium	Paranomus abrotanifolius
Medium	Serruria rebeloi
Medium	Merciera azurea
Medium	Rhigiophyllum squarrosum
Medium	Roella arenaria

Figure 12. Excerpt from the report generated by the National Web-based Environmental Screening Tool. The study area is the blue polygon. The map indicates **Medium Sensitivity** whereas the small table indicates **High Sensitivity**.

8. The Vegetation

8.1 General description

The vegetation of the Fynbos Biome was described by Rebelo *et al.* (2006) and included in the Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006). The vegetation, including that of the Fynbos Biome, was mapped by Mucina, Rutherford and Powrie (2005) (VEGMAP) and subsequently by SANBI (2012, 2018) (Figure 13). According to this classification and mapping, the site proposed for agricultural development for Vierfontein Blueberries is located in an area of Overberg Sandstone Fynbos.

Overberg Sandstone Fynbos is a sclerophyllous shrubland consisting typically of mid-high to tall proteoid and ericoid shrubs with a graminoid and low to dwarf shrub understorey, mostly composed of restios, some grasses and Asteraceae (Rebelo *et al.* 2006) . It is species-rich but typically not all the species found in the vegetation type would be found at any one site. In addition, the species listed by the ‘plants species theme’ may not all be represented either.

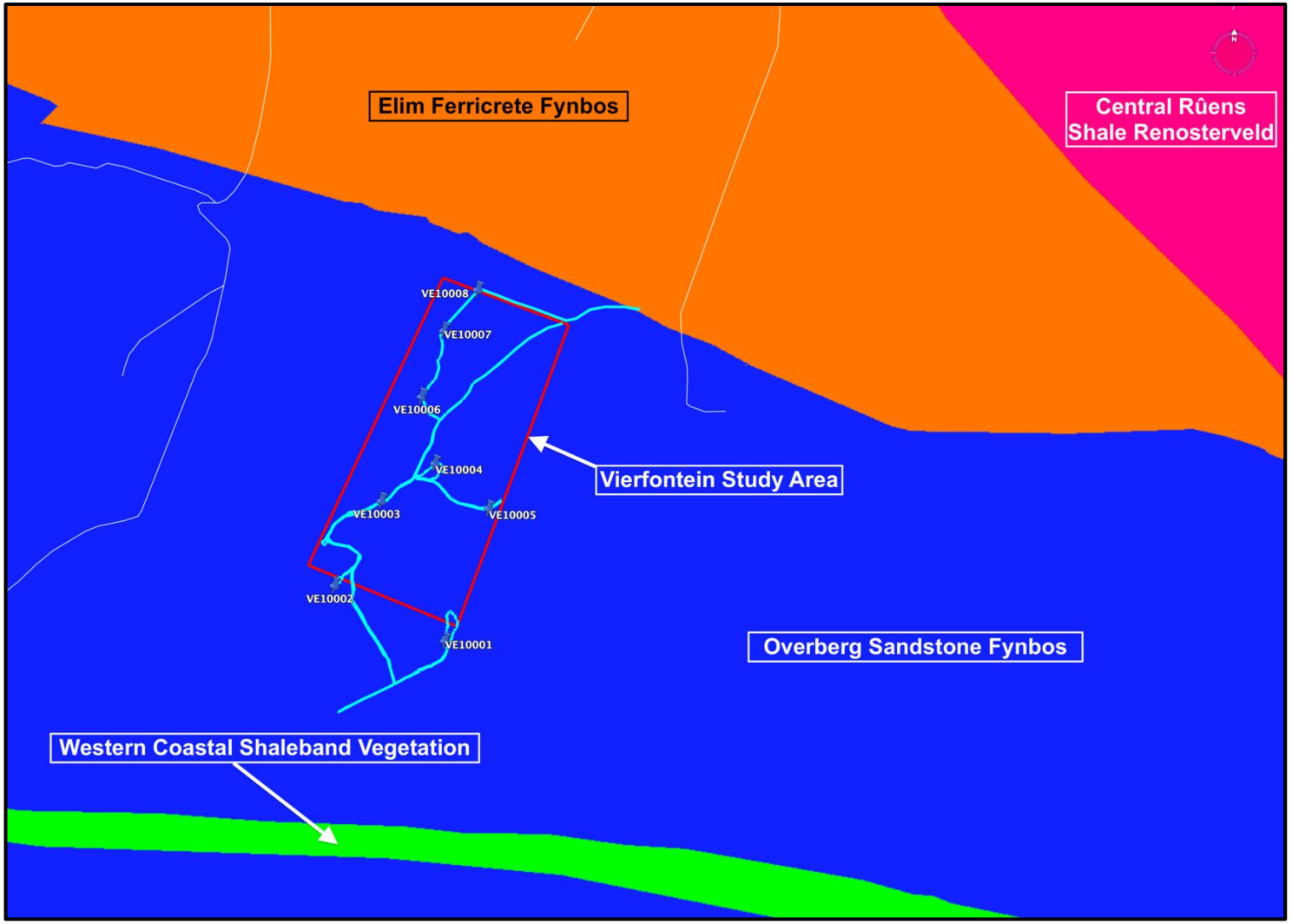

Figure 13. Portion of the *Vegetation Map of South Africa, Lesotho, and Swaziland* (Mucina, Rutherford & Powrie 2005; SANBI, 2018) with the Vierfontein Study Area located in Overberg Sandstone Fynbos.

8.2 Vegetation of the lower section of Portion 3, Vierfontein 143

The following description is of the vegetation recorded at the eight sample waypoints in the survey of the lower section of Portion 3, Vierfontein 143, Bredasdorp. Since the vegetation type occurring throughout the study area is the same type, the approach was to list as many species as possible at the first sample location and then to add to the list any additional species encountered at the subsequent sample locations.

All species marked * are alien invasive species.

VE10001: S 34° 30’ 17.27” E 19° 54’ 07.88”

This sample was recorded at the upper southwest corner of the study area in mature mid-high open to mid-dense proteoid shrubland dominated by *Leucadendron xanthoconus*, with a closed restioid understorey (Figures 14 –16). The soil is sandy with only a few rocks on the surface, all derived from sandstone.

Plants species recorded include, *Acacia longifolia*, Anthospermum aethiopicum, Aristea africana, Atrichantha gemmifera, Aulax umbellata*, *Berzelia lanuginosa,*, *Brunia laevis, Cliffortia* sp., *Edmondia sesamoides, Elegia filacea*, *Elegia juncea, Erica* cf. *plukenetii, Erica longifolia, Erica pogonanthera, Erica* sp. (dwarf shrub with pink bell-shaped flowers), *Hakea sericea*, Ischyrolepis* sp., *Lebeckia sepiaria*, *Leptospermum laevigatum*, Leucadendron xanthoconus, Leucospermum truncatulum, Lobelia pinifolia, Mimetes cucullatus, Phaenocoma prolifera*, *Pinus radiata*, Polygala garcini, Protea longifolia, Restio* sp., *Serruria elongata, Serruria fasciflora* (common), *Serruria* sp. nov., *Struthiola ciliata, Thamnochortus* cf. *gracilis, Thamnochortus fruticosus, Ursinia nudicaulis*, *Xiphotheca sp.*

Alien invasive species such as *Pinus radiata**, *Hakea sericea** and *Leptospermum laevigatum** are scattered in the area around this sample waypoint. They are not dense at present but have the potential to increase rapidly. It is thus imperative that an alien clearing operation should be instituted in this area in the near future.

Figure 14. View north-westwards over the southern part of the Vierfontein Study area. The yellow shrubs are *Leucadendron xanthoconus*.

Figure 15. View northwards over the southern part of the Vierfontein Study area. The yellow shrubs are *Leucadendron xanthoconus*. The dense stand of *Pinus radiata** alongside the eastern boundary is clearly seen in the background.

Figure 16. View southwards over part of the southern part of the Vierfontein Study Area. The eastern boundary can be seen on the left-hand-side.

An important discovery in the area surrounding the sample waypoint on the first site visit was a low-growing, lax, spreading species of *Serruria* new to science (Figures 17--19). The second visit to the site on 16 October 2019 was with Dr John Rourke, formerly Curator of the Compton Herbarium, Kirstenbosch, to collect specimens of the *Serruria* sp. nov. He will now describe the species and include it in the revision of the genus *Serruria* with which he is currently busy.

Figure 17. A flowering shoot of *Serruria* sp. nov. located near waypoint VE10001.

Figure 18. Close-up image of the flower head of *Serruria* sp. nov.

Figure 19. The growth habit of *Serruria* sp. nov., a dwarf shrub 10—15 cm high and spreading up to 1 m^2.

VE10002: S 34° 30’ 11.42” E 19° 53’ 53.72”

Sample waypoint VE10002 is near the northwest corner of the study area. The same plant community as that found at the first sample waypoint site, with *Leucadendron xanthoconus* prominent (Figure 22), is found throughout the area. It is rockier at this locality and the veld is old with abundant dead plant material. A few termite heaps are present which are a good indicator of a functioning ecosystem. *Serruria elongata* (Figure 21) is abundant in this area (Figure 20) and additional species recorded include *Anaxeton* sp., *Corymbium scabrum*, *Crassula fascicularis*, *Erica cordifolia*, *Hypodiscus aristatus*, *Hypodiscus sp., Leucospermum cordifolium*, *Osyris compressa*, *Protea aspera*, *Restio* sp., *Staberoha cernua* and *Tetraria ustulata.*

The area is becoming heavily invaded by *Leptospermum laevigatum** and *Pinus radiata** (Figure 23).

Figure 20. The southwestern area of the Vierfontein study area. Note the encroaching scattered pine trees. This area has an abundance of *Serruria elongata* (Proteaceae).

Figure 21. Inflorescence of *Serruria elongata* (Proteaceae)

Figure 22. Male (yellow) and female (greenish) mature shrubs of *Leucadendron xanthoconus*.

Figure 23. Australian Myrtle and Monterey Pine gaining a foothold in the southwestern part of the Vierfontein Study Area.

VE10003: S 34° 30’ 02.48” E 19° 53’ 59.72”

This location is on the track with the same plant community with a few additional species, *Erica* sp., *Syncarpha* sp. and *Zygophyllum fulvum*. This area is becoming heavily encroached by alien invasive *Pinus radiata** and *L. laevigatum** (Figures 24 & 25).

Figure 24. The area around waypoint VE10003 that is becoming invaded by pines and myrtle.

Figure 25. The farm track showing the white sandy soil with the fynbos becoming aggressively encroached by alien invasive species.

VE10004: S 34° 29’ 58.52” E 19° 54’ 06.63”

Again, at this location the same plant community was found (Figures 26 & 27) with some additional plant species such as *Diospyros glabra, Ehrharta calycina*, *Lanaria lanata*, *Osteospermum moniliferum*, *Penaea mucronata* and *Protea aspera.*

As for elsewhere alien invasive species are present but this area was cleared in the past and the result is that infestation is low. However, the *status quo* could change rapidly if the alien plants are allowed to proliferate.

Figure 26. The fynbos in the vicinity of waypoint VE10004 is in fair to good condition after historical clearing of alien invasive species.

Figure 27. The fynbos in the vicinity of waypoint VE10004 is in fair to good condition after historical clearing of alien invasive species. Some old, decomposing logs are seen in the foreground.

VE10005: S 34° 30’ 03.30” E 19° 54’ 13.50”

Sample waypoint VE10005 is located on the eastern boundary of the study area in fynbos vegetation; all the same plant community that has been described previously. This area has evidence of previous infestation by pine trees as can be seen by stumps and decomposing pine logs. Unfortunately, *Leptospermum laevigatum* is invading aggressively in this area.

Despite the history of the presence of pine trees, the fynbos has reverted to moderate to good condition.

Figure 28. The area around waypoint VE10005(near the eastern boundary) shows the effect of former encroachment by alien pines)not the stumps and logs from clearing). *Leptospermum laevigatum* is aggressively re-invading.

Figure 29. Good condition fynbos in the vicinity of waypoint VE10005. The windbreak of beefwood trees on the boundary is seen in the background.

Of interest is that the Lycaenid butterfly identified as the Yellow Russet (*Aloeides aranda*) (Figures 30 & 31) was found and photographed at this location. These butterflies are sensitive to habitat degradation, hence drawing the conclusion that the habitat is in fair to good condition.

Figure 30. Yellow Russet (*Aloeides aranda*) – underside of red form.

Figure 31. Yellow Russet (*Aloeides aranda*) – underside of brown form.

(Identifications from *Field Guide to Butterflies of South Africa* by Steve Woodhall, 2020)

VE10006: S 34° 29’ 51.45” E 19° 54’ 04.89”

Waypoint sample VE10006 was recorded in an area of dense invasive pine trees and Australian myrtle. The same fynbos community occurs here as elsewhere in the study area, but it is being smothered by the invasives that include *Acacia longifolia* (long-leaved wattle) at this location (Figures 32—34).

The only additional indigenous fynbos species recorded here was *Erica coccinea*.

Figure 32. The area around waypoint VE10006 where the fynbos is being smothered by encroachment of alien trees and shrubs.

Figure 33. Signs of clearing (felled pines) are evident here but the pines and the pines have re-established, and Australian myrtle is ousting the low to mid-high fynbos plant community.

Figure 34. Aggressive invasion by *Leptospermum laevigatum* and *Pinus radiata* in the vicinity of waypoint VE10006.

VE10007: S 34° 29' 17.27" E 19° 54' 07.76"

This waypoint was recorded on the track in the northwestern sector of the study area, west of the area that was cleared of pine trees and other invasives in the past few years. The young pine trees are now returning as is the fynbos vegetation, but the latter is not in good condition. *Leptospermum laevigatum* (Australian myrtle) is present throughout the area (Figure 35 & 36).

A few additional fynbos species of interest were recorded namely *Aspalathus* sp., *Leucospermum calligerum* and *Struthiola tomentosa* (Figures 37—39).

Figure 35. The part of the northern area that has been cleared of alien invasive species, but they are rapidly returning.

Figure 36. The cleared area east of waypoint VE10006 becoming overrun by pines and myrtle again

Figure 37. *Aspalathus* sp.

Figure 38. *Leucospermum calligerum*

Figure 39. *Struthiola tomentosa*

VE10008: S 34° 29’ 40.16” E 19° 54’ 12.11”

This waypoint was recorded at the lower northwest corner of the study area on the track next to the fence. On the right-hand-side of the track is a very dense stand of alien invasive pine and myrtle (Figure 40). Further along the track, the alien vegetation has been cleared of large pine trees, but young trees are returning. *Acacia saligna* (Port Jackson Willow) and *Acacia longifolia* (long-leaved wattle) are also invasive in this area and Australian myrtle occurs in abundance (Figure 41). The fynbos is rapidly being overrun by alien invasive plant species since the last clearing.

Figure 40. Track along the northern boundary of the site with a dense stand of invasive aliens on the right-hand side.

Figure 41. Area south of the boundary track in the northern part of the study area that was cleared of alien but is now being rapidly overrun again. White-flowered Australian myrtle is seen in the foreground with Port Jackson Willow (*Acacia saligna**)

9. Conservation Status

Overberg Sandstone Fynbos is classified as Critically Endangered D1 in the National List of Threatened Ecosystems (Government Gazette, 2011). The D1 criterion in this instance denotes threatened plant species associations and where there are greater than or equal to 80 species of conservation concern (Red List species). The Western Cape Biodiversity Spatial Plan [WCBSP] (CapeNature, 2017; Pence, 2017; Pool-Stanvliet, 2017) overlaid as a layer on a Google Earth ™ aerial image shows that the northern part of the Vierfontein study area is classified as Critical

Biodiversity Area 2 (CBA2) and the southern part is classified as Ecological Support Area 1 (ESA1) (Figure 42).

The situation in the Vierfontein study area is a good example of where the information gathered in the field provides the opposite. It is acknowledged that the study area has been negatively affected by alien invasive species but all records in this study show that the vegetation is the same type with mostly the same species throughout. The northern area has been altered by the effect of alien invasion, physical clearing and re-invasion by alien plant species. This has had a negative impact on the northern part of the study are in contrast to the southern part that is largely intact and not as strongly negatively impacted as the northern part. Consequently, in my view the biodiversity map for the area in question should appear as redrafted in Figure 43, where the northern part is mapped as ESA1 and the southern part as CBA2 (it could even be as high as CBA1 !).

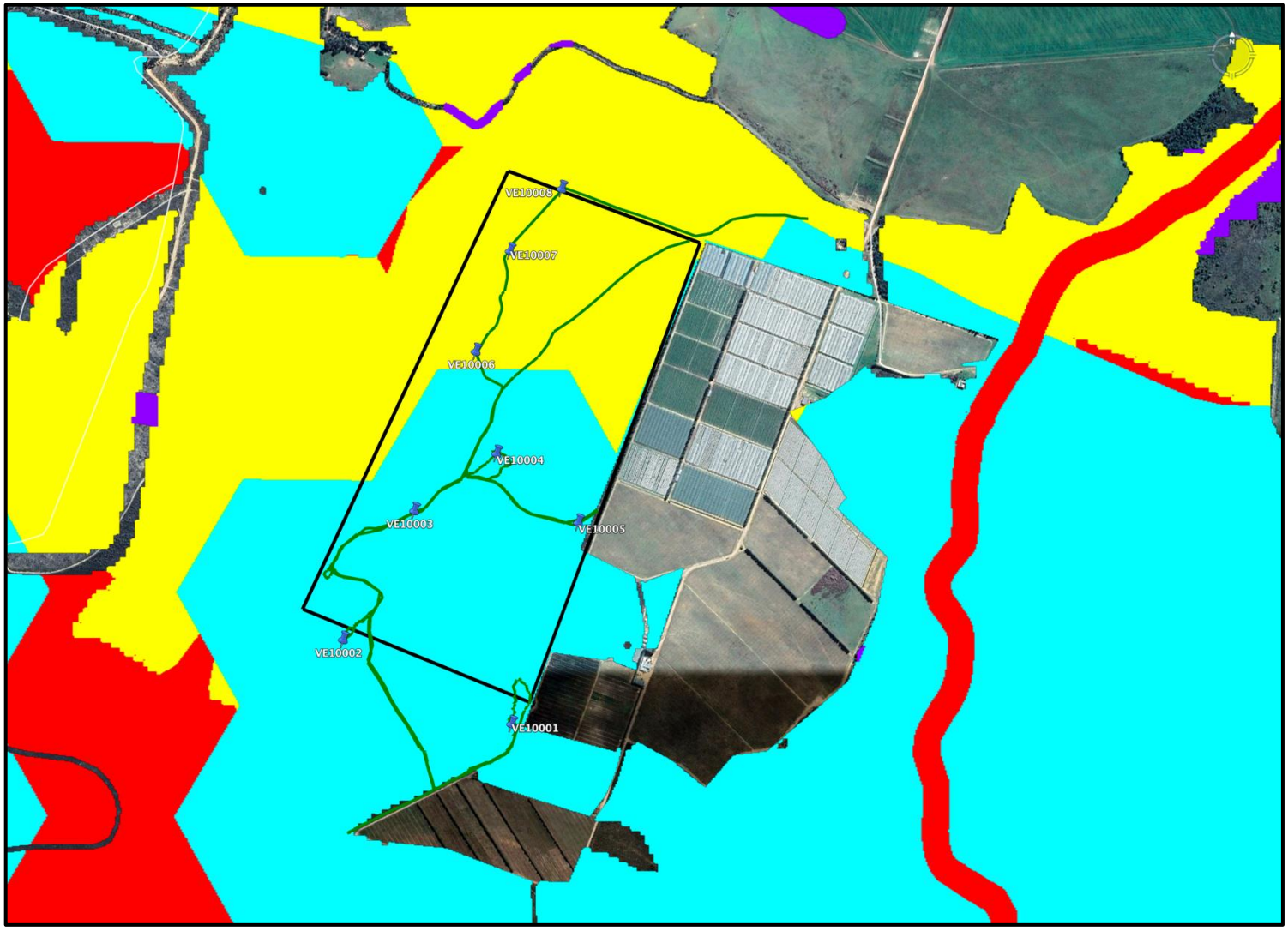

Figure 42. Google Earth ™ aerial image with Western Cape Biodiversity Spatial Plan map superimposed over the Vierfontein study area and surrounds. The red shading indicates Critical Biodiversity Areas (1); the yellow shading represents Critical Biodiversity Areas (2); the light blue shading represents Ecological Support Areas (1) and the purple areas indicate Ecological Support Areas (2).

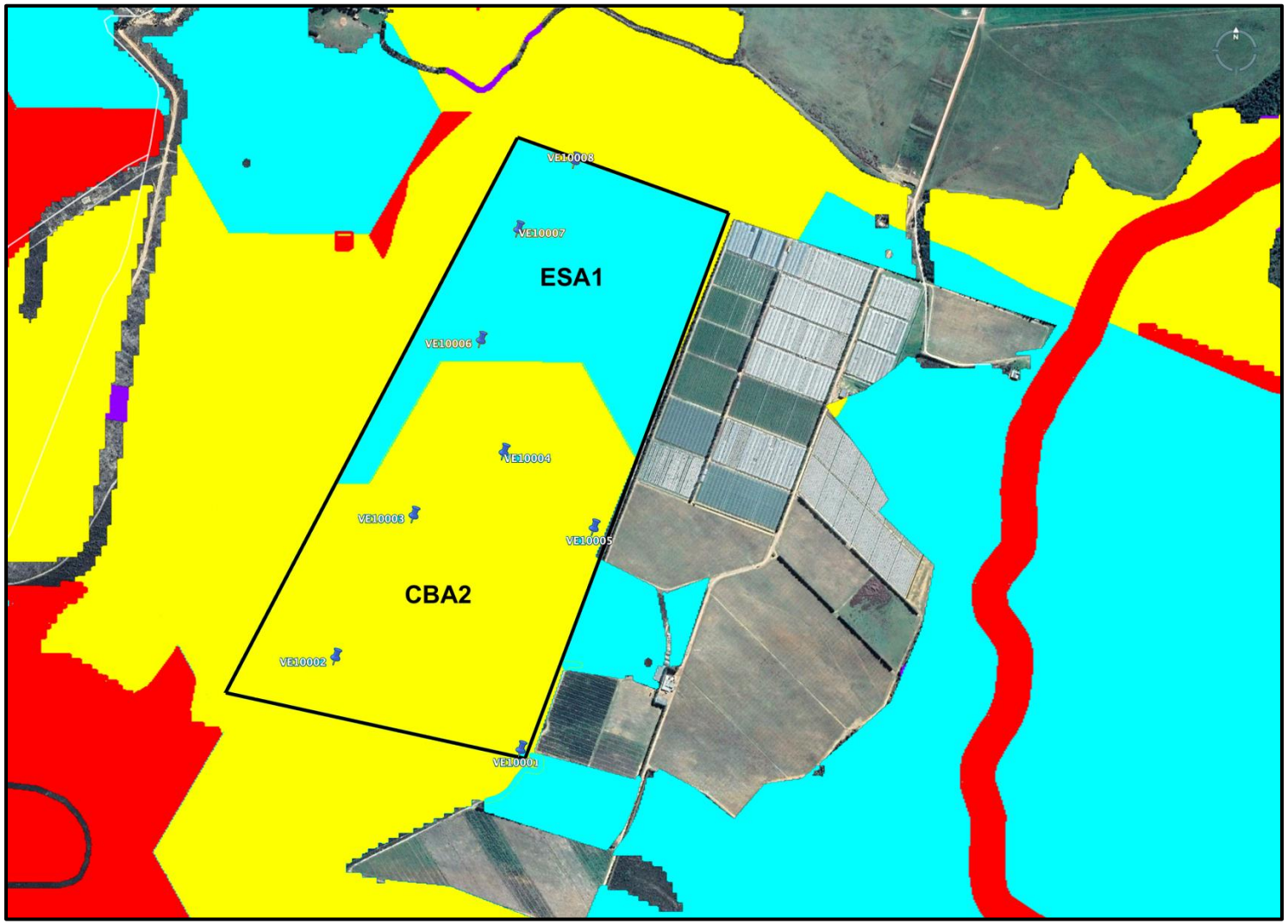

Figure 43. Google Earth ™ aerial image with **modified** Western Cape Biodiversity Spatial Plan map superimposed over the Vierfontein study area and surrounds. The red shading indicates Critical Biodiversity Areas (1); the yellow shading represents Critical Biodiversity Areas (2); the light blue shading represents Ecological Support Areas (1) and the purple areas indicate Ecological Support Areas (2).

10. Impact Assessment

The impacts considered are the 'No Go' Scenario; secondly, the impact of development of 20 ha in the southern fifty percent of the study area and thirdly of the impact of development of the northern 20 ha of the study area.

10.1 The 'No Go' scenario

In the case of the 'No Go' scenario, the proposed agricultural development would not take place and the *status quo* would persist. In all likelihood, apart from possible action by Working for Water teams there would not be great incentive, apart from the statutory requirement, to remove offending invasive plant species. The site would thus remain much as it is, but with the invasive alien plants continuing to be a source of problems, both in terms of spread and fire management. The result would be High Negative (Tables 1 & 2).

10.2 Direct Impacts

Direct impacts are those impacts that would result on the vegetation by the envisaged development of (1) the southern 20 ha or (2) the northern 20 ha on the vegetation.

10.2.1 Direct Impacts on the Southern 20 ha

The development of the southern 20 ha (alternative – not preferred) of the study area would result in **Very High Negative** impacts on the Overberg Sandstone Fynbos since this area is mostly undisturbed Overberg Sandstone Fynbos except for scattered alien invasive species (Table 1). It is also the only currently known locality of *Serruria* sp. nov. and consequently, it should not be developed before more is known about this species and its distribution.

10.2.1.1 Mitigation

Mitigation for the loss of the vegetation in the southern 20 ha would be systematic clearing of all the alien invasive plants in the northern part of the study area, as well as in higher altitude areas of Portion 3 of farm Vierfontein 143. This would have high cost implications. The mitigation measures would lower the impact to **Medium Negative**, that in this ecosystem is still higher than would be desired.

Table 1. Impact and Significance of the loss of Overberg Sandstone Fynbos due to development of the Southern 20 ha of the study area for blueberries.

CRITERIA	'NO GO' ALTERNATIVE	LOSS OF OVERBERG SANDSTONE FYNBOS DUE TO DEVELOPMENT OF THE SOUTHERN 20 HA OF THE STUDY AREA	
Nature of direct impact (local scale)	**Loss of Overberg Sandstone Fynbos**		
		WITHOUT MITIGATION	WITH MITIGATION
Extent	Local	Local	Local
Duration	Long-term	Long-term	Long-term
Intensity	Low	Very High	Low
Probability of occurrence	High	High	High
Confidence	High	High	High
Significance	Low Negative	Very High Negative	Low Negative
Nature of Cumulative impact	**Loss of Overberg Sandstone Vegetation as a vegetation type**		
Cumulative impact prior to mitigation	Medium negative	High Negative	Low Negative
Degree to which impact can be reversed	Very low		
Degree to which impact may cause irreplaceable loss of resources	High		
Degree to which impact can be mitigated	High		
Proposed mitigation	Concerted removal and management of invasive alien invasive trees and shrubs		
Cumulative impact post mitigation	Medium negative		
Significance of cumulative impact (broad scale) after mitigation	Medium negative		

10.2.2 Direct Impacts on the Northern 20 ha

The northern 20 ha is the area that is preferred for agricultural development. There are a number of logistic reasons for this e.g. the proximity to the existing blueberry greenhouses on the adjacent property, lower management and transport costs etc. Although the northern 20 ha still has viable Overberg Sandstone Fynbos present it is the area that has been most affected by invasion of alien plant species and cycles of disturbance such as clearing and leaving fallow with unattended regeneration of the alien shrubs and trees. The fynbos in this area has already been negatively affected and degraded.

The information collected during the vegetation survey clearly indicates that the northern 20 ha would be the preferred area for agricultural development. The impact of the development would be **Medium** due to the level of alien invasive infestation within the area (Table 2).

Table 2. Impact and Significance of the loss of Overberg Sandstone Fynbos due to development of the Northern 20 ha of the study area for blueberries.

CRITERIA	'NO GO' ALTERNATIVE	LOSS OF OVERBERG SANDSTONE FYNBOS DUE TO DEVELOPMENT OF THE NORTHERN 20 HA OF THE STUDY AREA	
Nature of direct impact (local scale)	**Loss of Overberg Sandstone Fynbos**		
		WITHOUT MITIGATION	WITH MITIGATION
Extent	Local	Local	Local
Duration	Long-term	Long-term	Long-term
Intensity	Medium to Low	Medium	Very Low
Probability of occurrence	High	High	High
Confidence	High	High	High
Significance	Medium Negative	Medium Negative	Low Negative
Nature of Cumulative impact	**Loss of Overberg Sandstone Vegetation as a vegetation type**		
Cumulative impact prior to mitigation	Medium negative	Medium Negative	Low Negative
Degree to which impact can be reversed	Very low		
Degree to which impact may cause irreplaceable loss of resources	Low		
Degree to which impact can be mitigated	High		
Proposed mitigation	Removal and management of invasive alien trees and shrubs in the remaining undeveloped area of Portion 3 of Vierfontein 143		
Cumulative impact post mitigation	Low negative		
Significance of cumulative impact (broad scale) after mitigation	Low negative		

10.2.2.1 Mitigation

The loss of 20 ha of Overberg Sandstone Fynbos on the northern slopes of the Soetmuisberg would be negative wherever it occurred, particularly in view of having found an undescribed no-doubt endemic species of *Serruria* and the likelihood of more endemic species present. On balance, however, development of the northern 20 ha is acceptable if mitigation measures are applied. The recommended mitigation is that the alien invasive plant species, *Pinus radiata**, *Leptospermum laevigatum**, *Acacia longifolia**, *Acacia saligna** and *Hakea sericea** should be systematically cleared and removed from the entire part of Portion 3 of Vierfontein 143 i.e. the southern part of the study area and beyond to the higher altitude parts of Portion 3. It is essential that the wood, including all branches, should be removed from the fynbos and destroyed at a designated dumpsite.

The mitigation described above would compensate for the loss of the 20 ha of degraded fynbos in the northern part of the study area and would contribute positively to the efforts of the Napier Mountain Conservancy aimed at eradicating the alien vegetation in the catchments of the Groot Sanddrif River. The implementation of this mitigation that should be conditional to issuing Environmental Authorisation would result in the impact being lessened to **Low Negative** (Table 2).

10.3 Indirect Impacts

No obvious indirect impacts were noted. The most important indirect impact would be to curb spread of alien invasive species due to the movement of vehicles and the planting ow windbreaks of species such as *Casuarina cunninghamiana* (beefwood), a species that is also invasive.

10.5 Cumulative Impacts

The Northern 20 ha of the study area is in relatively poor condition and, if left, the negative impact of the invasive alien species would be roughly equivalent to the effect of development of this area. Cumulative impacts of the development of the Northern 20 ha would thus be low for the vegetation type (Overberg Sandstone Fynbos) as a whole. If the Southern 20 ha were to be developed, the cumulative impact would be much higher since the vegetation is in much better condition.

11. Discussion

The northern slopes of the Soetmuisberg are well-recognized as an area that harbours a number of endemic fynbos species and members of the Napier Mountain Conservancy are aiming to consolidate a significant tract of mountain land for conservation (Keir Lynch pers. comm.) to ensure the future of the fynbos plant communities. Portion 3 of farm Vierfontein 143 has been tagged as one of the desirable properties to be included in the envisaged conservation area. However, in discussions with Mr Keir Lynch, we agreed that the lower northern part (20 ha) of Portion 3 of farm Vierfontein 143 is so heavily infested with alien invasive plants that its desirability for inclusion with the abovementioned conservation area is very low. This sentiment is supported by the observations and assessment in this study that leaving the northern 20 ha unmanaged would result in ever-increasing alien invasive infestations that would have equivalent negative effect to developing the land for agriculture. The ongoing cost of eradication of the alien species in future will be ever more prohibitive.

It is with the above thoughts in mind and with consideration of the vegetation of the higher and less negatively impacted Southern 20 ha, with at least one undescribed plant species in the Proteaceae, that a case is made to develop the Northern 20 ha in preference to the southern 20 ha. The southern 20 ha could then be included in the conservation area with no barrier of agricultural development lying between two undeveloped areas of fynbos.

However, the Northern 20 ha is not entirely worthless to the conservation estate and it is recommended that development of this land should be conditional to a commitment by the developer (lessee) to eradicate all the offending alien invasive trees and shrubs that would remain on the undeveloped parts of Portion 3, farm Vierfontein 143. It is believed that this would be reasonable compensation for the opportunity to develop this land that, apart from the alien invasive species, supports Critically Endangered Overberg Sandstone Fynbos.

12. Conclusions and recommendations

The vegetation found on Portion 3 of farm Vierfontein 143, Bredasdorp, is Overberg Sandstone Fynbos but has its own local character with localized endemic species. For this reason, as much of the fynbos as possible should be conserved. However, at the same time, reasonable demands of land for agriculture should be considered. This is often challenging and the outcome of studies such as this may not please all parties. It is my firm recommendation that the cultivation of the Northern 20 ha should be permitted with the strict proviso that a commitment is made to conserving and actively managing the remaining parts of Portion 3 of farm Vierfontein 143 as part of a meaningful win-win scenario where conservation of the Critically Endangered Overberg Sandstone Fynbos will benefit as well.

In addition to the above, a conservation management plan should be drawn up in conjunction with the Napier Mountain Conservancy, to promote the care of the land within this farm portion as part of a community effort to take responsibility for the natural environment around Napier. It is imperative that a monitoring programme to monitor alien invasion should form part of the management plan. When aliens are encountered, they must be systematically removed.

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Report submitted: 19 May 2020

Appendix 1: Impact Assessment Methodology

Method of Assessing Impact Significance

The identification and assessment of environmental impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of, *inter alia*: the purpose and need for the project; views and concerns of interested and affected parties (I&APs); social and political norms, and general public interest.

Identification and Description of Impacts

Identified impacts are described in terms of the nature of the impact, compliance with legislation and accepted standards, receptor sensitivity and the significance of the predicted environmental change (before and after mitigation). Mitigation measures may be existing measures or additional measures that were identified through the impact assessment and associated specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of mitigation.

Evaluation of Impacts and Mitigation Measures

Introduction

Impacts are assessed using SLR's standard convention for assessing the significance of impacts, a summary of which is provided below.
In assigning significance ratings to potential impacts before and after mitigation the approach presented below is to be followed.

1. **Determine the impact consequence rating:** This is a function of the "intensity", "duration" and "extent" of the impact (see Section 0). The consequence ratings for combinations of these three criteria are given in Section 0.

2. **Determine impact significance rating:** The significance of an impact is a function of the consequence of the impact occurring and the probability of occurrence (see Section 0). Significance is determined using the table in Section 0.

3. **Modify significance rating (if necessary):** Significance ratings are based on largely professional judgement and transparent defined criteria. In some instances, therefore, whilst the significance rating of potential impacts might be "low", the importance of these impacts to local communities or individuals might be extremely high. The importance/value which interested and affected parties attach to impacts will be highlighted, and recommendations should be made as to ways of avoiding or minimising these perceived negative impacts through project design, selection of appropriate alternatives and / or management.

4. **Determine degree of confidence of the significance assessment:** Once the significance of the impact has been determined, the degree of confidence in the assessment will be qualified (see Section 0). Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact.

Criteria for Impact Assessment

The criteria for impact assessment are provided below.

Criteria	Rating	Description
Criteria for ranking of the INTENSITY (SEVERITY) of environmental impacts	**ZERO TO VERY LOW**	Negligible change, disturbance or nuisance. The impact affects the environment in such a way that natural functions and processes are not affected. People / communities are able to adapt with relative ease and maintain pre-impact livelihoods.
	LOW	Minor (Slight) change, disturbance or nuisance. The impact on the environment is not detectable or there is no perceptible change to people's livelihood.
	MEDIUM	Moderate change, disturbance or discomfort. Where the affected environment is altered, but natural functions and processes continue, albeit in a modified way. People/communities are able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.
	HIGH	Prominent change, disturbance or degradation. Where natural functions or processes are altered to the extent that they will temporarily or permanently cease. Affected people/communities will not be able to adapt to changes or continue to maintain-pre impact livelihoods.
Criteria for ranking the DURATION of impacts	**SHORT TERM**	< 5 years.
	MEDIUM TERM	5 to < 15 years.
	LONG TERM	> 15 years, but where the impact will eventually cease either because of natural processes or by human intervention.

Criteria	Rating	Description
	PERMANENT	Where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient.
Criteria for ranking the EXTENT / SPATIAL SCALE of impacts	**LOCAL**	Impact is confined to project or study area or part thereof, e.g. limited to the area of interest and its immediate surroundings.
	REGIONAL	Impact is confined to the region, e.g. coast, basin, catchment, municipal region, etc.
	NATIONAL	Impact is confined to the country as a whole, e.g. South Africa, etc.
	INTERNATIONAL	Impact extends beyond the national scale.
Criteria for determining the PROBABILITY of impacts	**IMPROBABLE**	Where the possibility of the impact to materialise is very low either because of design or historic experience, i.e. ≤ 30% chance of occurring.
	POSSIBLE	Where there is a distinct possibility that the impact would occur, i.e. > 30 to ≤ 60% chance of occurring.
	PROBABLE	Where it is most likely that the impact would occur, i.e. > 60 to ≤ 80% chance of occurring.
	DEFINITE	Where the impact would occur regardless of any prevention measures, i.e. > 80% chance of occurring.
Criteria for determining the DEGREE OF CONFIDENCE of the assessment	**LOW**	≤ 35% sure of impact prediction.
	MEDIUM	> 35% and ≤ 70% sure of impact prediction.
	HIGH	> 70% sure of impact prediction.
Criteria for the DEGREE TO WHICH IMPACT CAN BE MITIGATED - the degree to which an impact can be reduced / enhanced	**NONE**	No change in impact after mitigation.
	VERY LOW	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
	LOW	Where the significance rating drops by one level, after mitigation.
	MEDIUM	Where the significance rating drops by two to three levels, after mitigation.
	HIGH	Where the significance rating drops by more than three levels, after mitigation.
Criteria for LOSS OF RESOURCES - the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable	**LOW**	Where the activity results in a loss of a particular resource but where the natural, cultural and social functions and processes are not affected.
	MEDIUM	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
	HIGH	Where the activity results in an irreplaceable loss of a resource.

Determining Consequence

Consequence attempts to evaluate the importance of a particular impact, and in doing so incorporates extent, duration and intensity. The ratings and description for determining consequence are provided below.

Rating	Description
VERY HIGH	Impacts could be EITHER: of ***high intensity*** at a ***regional level*** and endure in the ***long term***;

Rating	Description
	OR of ***high intensity*** at a ***national level*** in the ***medium term***; OR of ***medium intensity*** at a ***national level*** in the ***long term.***
HIGH	Impacts could be EITHER: of ***high intensity*** at a ***regional level*** and endure in the ***medium term***; OR of ***high intensity*** at a ***national level*** in the ***short term***; OR of ***medium intensity*** at a ***national level*** in the ***medium term;*** OR of ***low intensity*** at a ***national level*** in the ***long term***; OR of ***high intensity*** at a ***local level*** in the ***long term***; OR of ***medium intensity*** at a ***regional level*** in the ***long term.***
MEDIUM	Impacts could be EITHER: of ***high intensity*** at a ***local level*** and endure in the ***medium term***; OR of ***medium intensity*** at a ***regional level*** in the ***medium term***; OR of ***high intensity*** at a ***regional level*** in the ***short term***; OR of ***medium intensity*** at a ***national level*** in the ***short term***; OR of ***medium intensity*** at a ***local level*** in the ***long term***; OR of ***low intensity*** at a ***national level*** in the ***medium term;*** OR of ***low intensity*** at a ***regional level*** in the ***long term.***
LOW	Impacts could be EITHER of ***low intensity*** at a ***regional level*** and endure in the ***medium term***; OR of ***low intensity*** at a ***national level*** in the ***short term***; OR of ***high intensity*** at a ***local level*** and endure in the ***short term***; OR of ***medium intensity*** at a ***regional level*** in the ***short term***; OR of ***low intensity*** at a ***local level*** in the ***long term***; OR of ***medium intensity*** at a ***local level*** and endure in the ***medium term.***
VERY LOW	Impacts could be EITHER of ***low intensity*** at a ***local level*** and endure in the ***medium term***; OR of ***low intensity*** at a ***regional level*** and endure in the ***short term***; OR of ***low to medium intensity*** at a ***local level*** and endure in the ***short term.*** OR **Zero to very low intensity** with any combination of extent and duration.

Determining Significance

The consequence rating is considered together with the probability of occurrence in order to determine the overall significance using the table below.

		PROBABILITY			
		IMPROBABLE	**POSSIBLE**	**PROBABLE**	**DEFINITE**
CONSEQUENCE	**VERY LOW**	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	LOW	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	MEDIUM	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	HIGH	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	VERY HIGH	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

In certain cases it may not be possible to determine the significance of an impact. In these instances the significance is **UNKNOWN**.

Appendix 2: Botanical Assessment Content Requirements of Specialist Reports, as prescribed by Appendix 6 of GN R326.

Regulation	Content as required by NEMA	Specialist Report Section/Annexure Reference
1 (1) (a)	Details of- (i) The specialist who prepared the report; and	Cover & Page 2
	(ii) The expertise of that specialist to compile a specialist report, including a CV.	Page 2, Appendix 3
1 (1) (b)	A declaration that the specialist is independent in a form as may be specified by the competent authority.	Pages 3 & 4
1 (1) (c)	An indication of the scope of, and purpose for which, the report is prepared.	Pages 6 & 7
1 (1)(cA)	An indication of the quality and age of base data used for the specialist report.	Pages 12—17
1 (1)(cB)	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change.	Pages 13—17
1 (1) (d)	The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Page 12.
1 (1) (e)	A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used.	Page 12
1 (1) (f)	Details of an assessment of the specifically identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives.	Pages 37—41
1 (1) (g)	An identification of any areas to be avoided, including buffers.	Pages 40 & 41
1 (1) (h)	A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers.	Pages 9--11, 14, 15—18
1 (1) (i)	A description of any assumptions made and any uncertainties or gaps in knowledge.	Page 12
1 (1) (j)	A description of the findings and potential implications of such findings on the impact of the proposed activity or activities.	Pages 17--36
1 (1) (k)	Any mitigation measures for inclusion in the EMPr.	Page 37, 39, 40
1 (1) (l)	Any conditions for inclusion in the environmental authorisation.	Page 40 & 41
1 (1) (m)	Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Page 41

Regulation	Content as required by NEMA	Specialist Report Section/Annexure Reference
1 (1) (n)	A reasoned opinion- (i) whether the proposed activity, activities or portions thereof should be authorised; and	Page 41
	(iA) regarding the acceptability of the proposed activity or activities; and	Page 41
	(ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Page 41
1 (1) (o)	A description of any consultation process that was undertaken during the course of preparing the specialist report	Page 40
1 (1) (p)	A summary and copies of any comments received during any consultation process and where applicable, all responses thereto	N/A
1 (1) (q)	Any other information requested by the competent authority	N/A

Appendix 3: Curriculum Vitae

Dr David Jury McDonald Pr. Sci. Nat.

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

Work and Home Address: 14 A Thomson Road, Claremont, 7708

Tel: (021) 671-4056 **Mobile:** 082-876-4051 **Fax:** 086-517-3806

E-mail: dave@bergwind.co.za

Website: www.bergwind.co.za

Profession: Botanist / Vegetation Ecologist / Consultant / Tour Guide

Date of Birth: 7 August 1956

Employment history:

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

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

Membership in Professional Societies:

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

Key Qualifications:

- Qualified with a M. Sc. (1983) in Botany and a PhD in Botany (Vegetation Ecology) (1995) at the University of Cape Town.
- Research in Cape fynbos ecosystems and more specifically mountain ecosystems.
- From 1995 to 2000 managed the Vegetation Map of South Africa Project (National Botanical Institute).
- Conducted botanical survey work for AfriDev Consultants for the Mohale and Katse Dam projects in Lesotho from 1995 to 2002. A large component of this work was the analysis of data collected by teams of botanists.
- **Director: Botanical & Communication Programmes** of the Botanical Society of South Africa (2000—2005), responsible for communications and publications; involved with conservation advocacy particularly with respect to impacts of development on centres of plant endemism.

- Further tasks involved the day-to-day management of a large non-profit environmental organisation.
- **Independent botanical consultant** (2005 – to present) over 300 projects have been completed related to environmental impact assessments in the Western, Southern and Northern Cape, Karoo and Lesotho. A list of reports (or selected reports for scrutiny) is available on request.

Higher Education

Degrees obtained
and major subjects passed:

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

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

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

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

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

Employment Record:

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

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