

**FRUITS DU SUD KAKAMAS:
ECOLOGICAL OPINION AND PROTECTED AND
THREATENED SPECIES SURVEY**

Prepared for:



August 2017

Prepared by:



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DECLARATION

I, **Marianne Strohbach**, declare that -

- I act as the independent specialist;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in Regulation 8;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of specialist

16 August 2017

Date

EXECUTIVE SUMMARY

Fruits Du Sud (Pty) Ltd would like to develop areas adjacent to its depot on Portion 2371 of the Kakamas South Settlement to enable the cultivation of grapes or other fruit. In order to do so, the envisaged development area will need to be landscaped and an application for the increased use of water will also be submitted.

This report discusses the approach and findings of a desktop and field survey carried out on the study area, to assess the current ecological state and sensitivities regarding the biodiversity present on the study area in an effort to identify any issues regarding such biodiversity as well as the functioning of the ecosystem components on site that should be avoided or mitigated by the proposed new cultivation.

The study area constitutes a remnant of Bushmanland Arid Grasslands, as described by Mucina and Rutherford (2006), between cultivated fields and existing roads, as well as previously disturbed areas.

The area was visited for a field survey on 2 August 2017, mainly to determine the overall ecological condition of the affected habitats and vegetation and the presence and location of protected and threatened plants and the relocation potential of such species. At the time of the field survey, vegetation was reasonably well developed although dry, with a small presence of annual species.

Several protected and threatened plant species were observed within the study area, of which the most unique and sensitive can be relocated with relative ease. In addition, succulent species that will have to be cleared for the proposed cultivation development would be suitable for use in stabilisation of runoff- or small ephemeral drainage lines.

Overall the proposed development will not have a significant impact on the ecosystem or affect the conservation status of any species, but some mitigation measures will have to be implemented to minimise the impact on some of the more vulnerable protected and threatened species.

Amphibian, reptile and small mammal species that were observed or may traverse the area will not be significantly impacted.

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1 INTRODUCTION

1.1 Background

Environmental Compliance Consultancy was appointed to undertake the environmental authorisation process for agricultural developments and associated water-use on Portion 2371 of the Kakamas South Settlement in Northern Cape Province. As part of the process, a terrestrial ecologist was asked to investigate the site for the proposed additional agricultural camps (to be developed into vineyards or orchards) to draft an opinion on the status of the terrestrial biodiversity, especially vegetation on the site. An indication was also sought on whether sensitive vegetation or species of conservation concern could be significantly negatively affected by the proposed developments.

1.2 Specialist Investigator

This report has been prepared by: Marianne Strohbach (MSc, PrSciNat, CV can be supplied upon request).

Specialist affiliation

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1.3 Conditions of this Report

Findings, recommendations and conclusions provided in this report are based on the authors' best scientific and professional knowledge and information available at the time of compilation. The author, however, accepts no liability for any actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, and by the use of the information contained in this document.

No form of this report may be amended or extended *without the prior written consent of the author*.

Any recommendations, statements or conclusions drawn from or based on this report must clearly cite or make reference to this report. Whenever such recommendations, statements or conclusions form part of a main report relating to the current investigation, this report must be included in its entirety in an Appendix.

1.4 Terms of Reference

- Describe the state and main features of the vegetation on the site;
- Confirm the presence or absence of plants or fauna of conservation concern (threatened and protected species);
- Map highlighting sensitive areas, if present;
- Provide a statement to whether the proposed activity could impact on sensitive vegetation; and

- Assess the possible impacts that the proposed development could have on the vegetation or proximate ecological features.

1.5 Legislation

This study has been conducted in accordance with the following legislation (abbreviations used further indicated in bold):

1.1.1 Provincial

- The Northern Cape Nature Conservation Act / **NCN** (Act No 9 of 2009)
 - Specially Protected/Threatened Species: Schedule 1
 - Protected Species: Schedule 2

1.5.1 National

- National Environmental Management Act / **NEMA** (Act No 107 of 1998), and all amendments and supplementary listings and/or regulations
- National Environmental Management Act: Biodiversity Act / **NEMBA** (Act No. 10 of 2004) and amendments, with particular reference to protected and alien invasive species
- National list of ecosystems that are threatened and in need of protection (Government Notice 1002 of 2011)
- National Forest Act 1998 / **NFA** (No 84 of 1998)
- Conservation of Agricultural Resources Act / **CARA** (Act No. 43 of 1983) and amendments

2 STUDY AREA

2.1 Locality

The study area, which covers Portion 2371 of the Kakamas South Settlement, is situated approximately 4 km NNW of Kakamas. This land portion is perched between the N14 on the southern periphery and Augrabies Street (gravel road) on the northern periphery (Figure 1). This is part of the Kai !Garib Municipality within the ZF Mgcawu District (formerly Siyanda).

2.2 Topography and drainage

The site can be described as slightly undulating to dissected, draining in a northerly and easterly direction. Two small ephemeral drainage lines and several local runoff accumulation gullies are situated across and adjacent to the study area. These ephemeral drainage lines appear to result mainly from runoff from higher-lying vineyards as well as the sealed road surface south of the study area. North of the study area, these drainage lines are again restricted to small drainage channels off the vineyards, allowing runoff to drain into the Orange River.

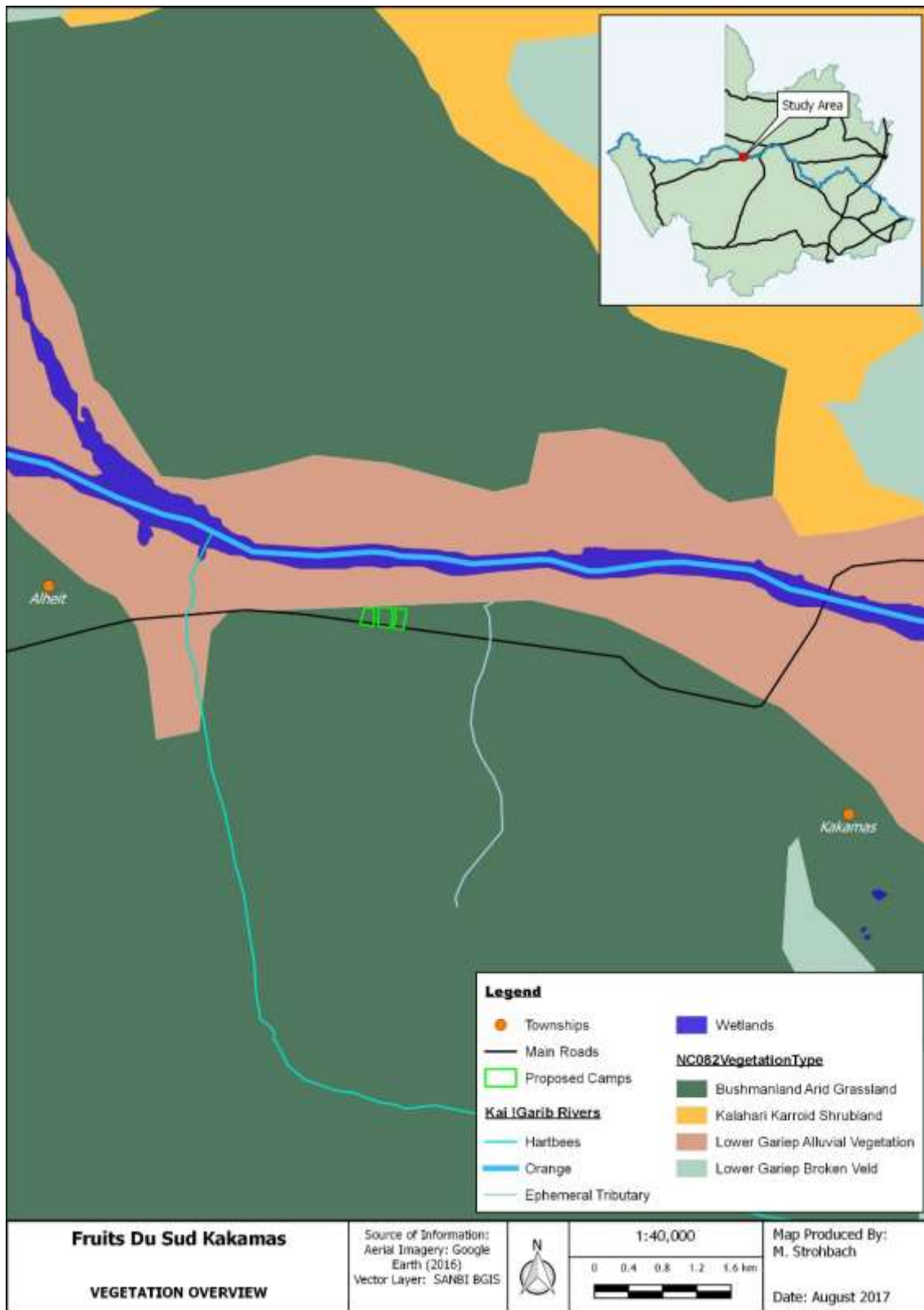


Figure 1: Locality and vegetation types of the study area. The three proposed camps shown are the area that will be directly impacted by the proposed agricultural development.

2.3 Vegetation Overview

The study area is situated in the Nama-Karoo biome. The vegetation type covering the study area is the Bushmanland Arid Grassland (Nkb 3), with Lower Gariiep Broken Veld (NKb1) and Kalahari Karrooid Shrubland (Nkb 5) in the wider surrounding the area, but with elements of such vegetation possible within the study area.

According to Mucina and Rutherford (2006), Bushmanland Arid Grassland constitutes sparsely vegetated extensive to irregular plains, consisting of grassland dominated by white grasses (*Stipagrostis* species). In places low shrubs of *Salsola* or *Zygophyllum* change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

The Lower Gariiep Alluvial Vegetation (AZa 3) occurs north of the study area along the banks and floodplains of the Orange River (where remnants of this riparian vegetation still exist) and is the only vegetation type that has been listed as an *endangered* (see section 2.4) in the region of the study area (Figure 1 above, Mucina & Rutherford 2006). It consists of a complex of riparian thickets (dominated by *Ziziphus mucronata*, *Euclea pseudebenus* and *Tamarix usneoides*), reed beds with *Phragmites australis* as well as flooded grasslands and herblands within and along the river (Mucina & Rutherford 2006). Single species typical of this riparian vegetation were found within the study area, although the riparian vegetation encountered would not constitute a part of this vegetation type (see Section 4).

2.4 Conservation Planning

2.4.1 Listed Ecosystems

The National Environmental Management: Biodiversity Act (Act 10 of 2004) provides for listing threatened or protected ecosystems in one of four categories: critically endangered (CR), endangered (EN), Vulnerable (VU) or Protected (Section 52.1.a of the National Environmental Management: Biodiversity Act; Government Gazette 34809, Government Notice 1002, 9 December 2011). The ecosystem status is based on the percentage of original area remaining untransformed in relation to the biodiversity target and a threshold for ecosystem functioning. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.

The Bushmanland Arid Grassland is not a Listed Threatened Ecosystem.

2.4.2 Municipal Environmental Management Framework

The ZF Mgcauw District Municipality has compiled an Environmental Management Framework (EMF) (<http://www.zfm-dm.co.za>, 2008), in which environmental concerns and conservation priorities for all landscapes within the municipality are listed and mapped.

According to the EMF, Bushmanland Arid Grasslands have a medium conservation priority (Figure 2), but the proposed project area does not fall within areas earmarked for conservation. Similarly, the proposed project area has been mapped as Zone 7 (Figure 3) in the EMF Environmental Control Zones, indicating that the area has relatively less sensitivity than other

zones and no special protection or environmental management parameters or concerns, except those already implemented or required by law.

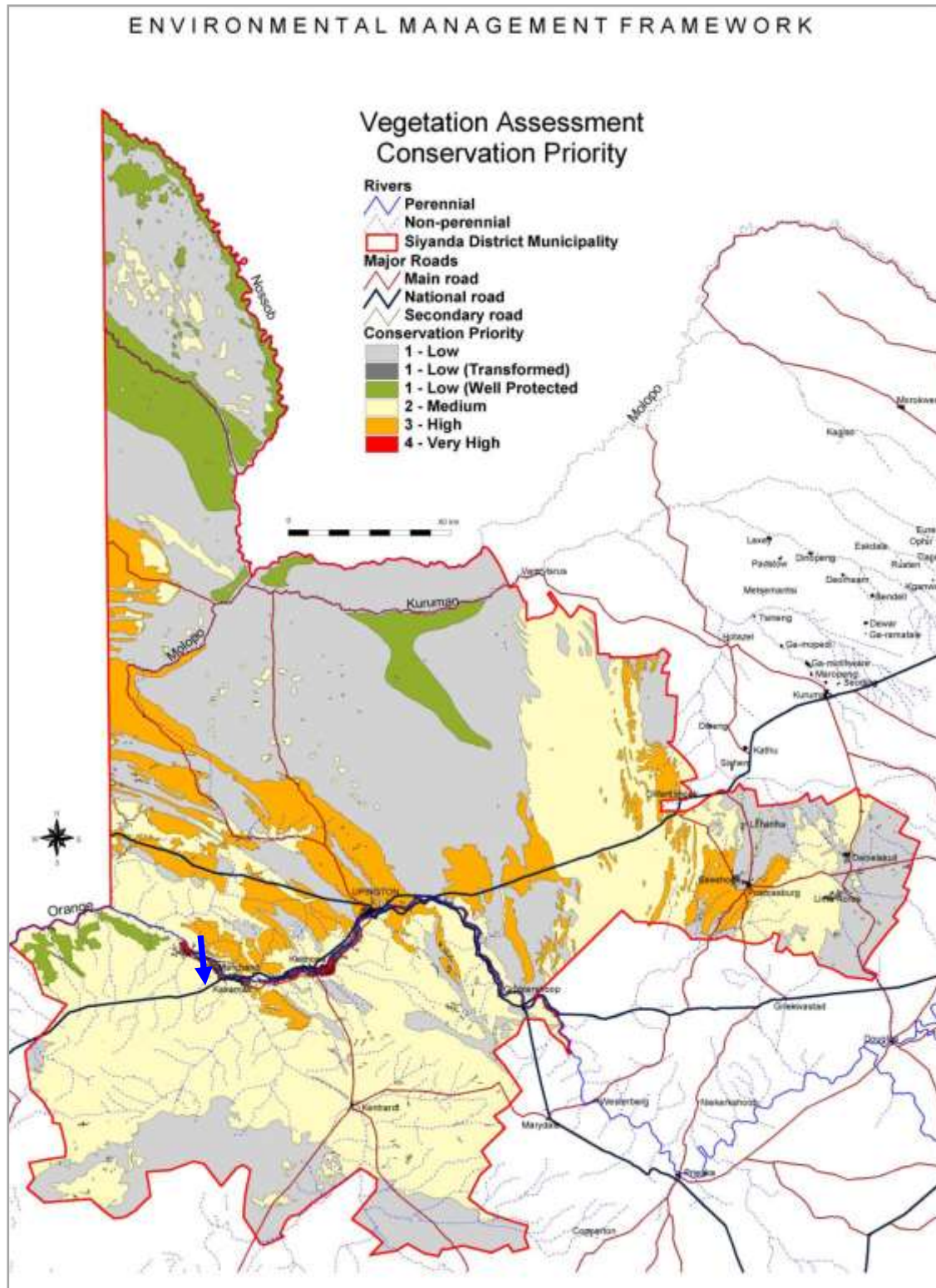


Figure 2: Map from the Siyanda EMF showing the conservation priorities for the vegetation types. The proposed development (blue arrow) falls in a medium conservation value.

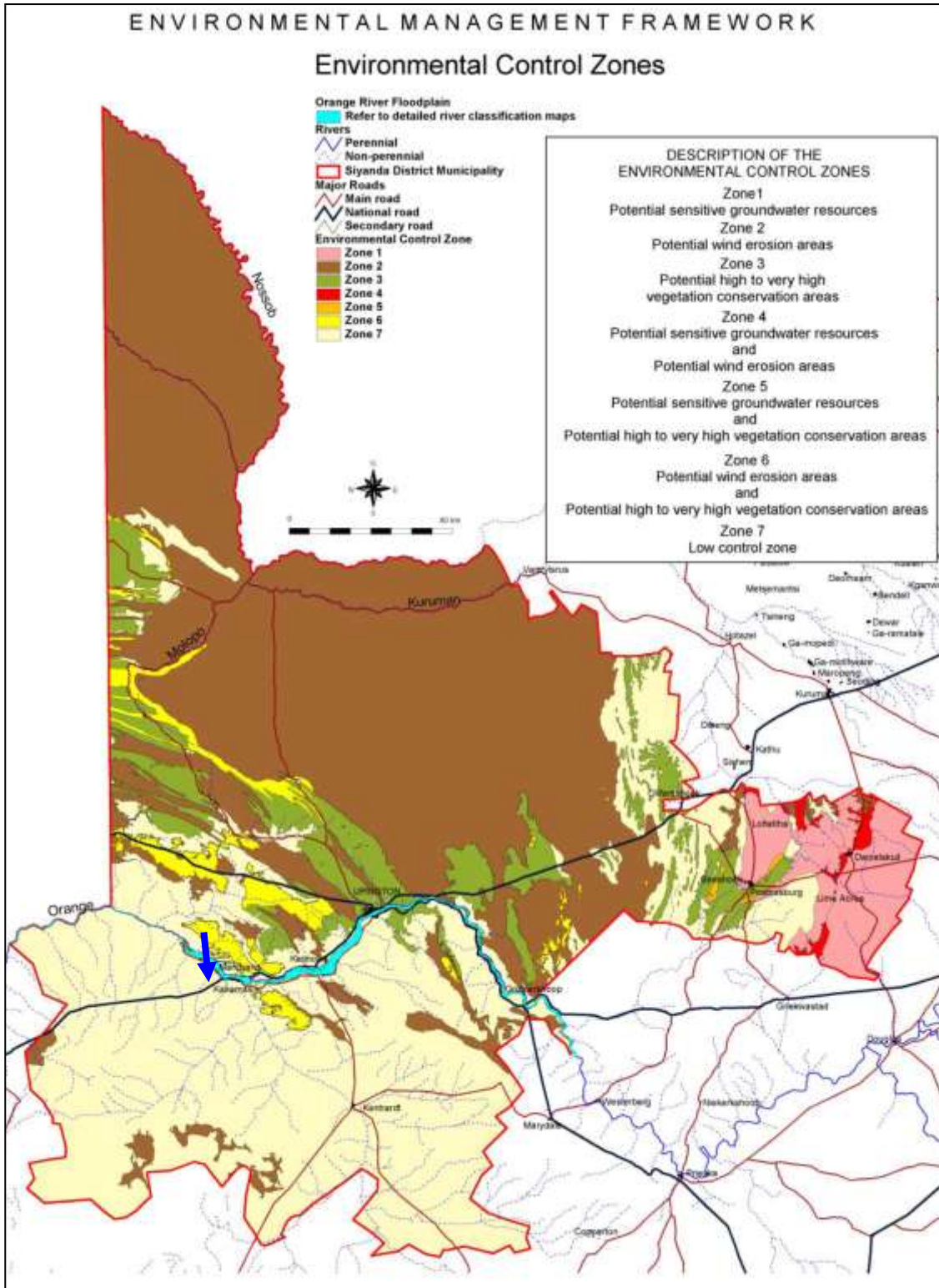


Figure 3: Map from the Siyanda EMF showing the environmental control zones. The proposed development (blue arrow) falls in zone 7, regarded as a zone without significant environmental issues.

This implies that the proposed study area does have a medium conservation value due to species diversity or specific species that may be present, but there is no specific restriction on development of the area.

However, the nearby Lower Gariep Alluvial Vegetation on the banks of the Orange River is regarded as a Critical Biodiversity Area, of which remaining sections have been listed as threatened ecosystems. Although remnants of this vegetation type fall well outside the proposed development, the ephemeral drainage lines across and adjacent to the proposed development site eventually drain into the Orange River, hence contamination or accelerated erosion off the proposed development site could have a negative impact on this important biodiversity area. The proposed development thus must proceed in such a manner that accelerated erosion is not initiated and mitigated if it occurs, and pollution or excessive leaching of fertilizer, pesticides and herbicides is strictly prevented, with measures in place to contain any kind of such pollution or contamination immediately on site, preventing it to reach any of the drainage lines or runoff gullies beyond the land portion.

3 METHODOLOGY

The assessment entailed a literature review which included short listing plants of conservation concern that could potentially occur on the site and immediate surrounds, a field survey, the analysis of data collected and reporting on potentially sensitive sites and protected species.

3.1 Flora Survey

The field survey was undertaken on the 2nd August 2017.

For each homogeneous vegetation unit in this area, the presence of visible plant species was recorded. Notes were additionally made of the general habitat and any other features, biotic and abiotic, that might have an influence on the composition of landscape components and functioning of the landscape. Protected plants that are not very common were mapped as far as possible (bearing in mind that the average accuracy of a hand-held GPS is 3 m, whilst many of these plants are a mere 2-10 cm). For all protected and/or threatened plant species, the approximate or exact number of individuals was counted.

Conservation status of plants observed was cross-referenced with the Red List of South African Plants (Raimondo *et al.* 2009, updated 2017).

Alien invasive species, according to the Conservation of Agricultural Resources Act (Act No.43 of 1983) and NEMBA 2014 (and 2016) Alien and Invasive Species Regulations have been noted.

Plant species nomenclature follows Germishuizen and Meyer (2003), Henderson (2001) and Bromilow (2010), and recent name changes as in the National Assessment: Red List of South African Plants version 2017.1.

3.2 Fauna Survey

The ADU database was queried regarding fauna species historically recorded in the study area and surroundings. The likelihood of mammal species still occurring in the area was verified according to Apps (2000), and species of conservation concern or that are protected and most likely to occur in the study area listed.

3.3 Sensitivity Analysis and Criteria

The determination of specific ecosystem services and the sensitivity of ecosystem components and processes, both biotic and abiotic, is rather complex and no single overarching criterion will apply to all habitats studied. The main aspects of an ecosystem that need to be incorporated in a sensitivity analysis, however, include the following:

- Describing the nature and number of species present, taking into consideration their conservation value as well as the probability of such species to survive or re-establish itself following disturbances, and alterations to their specific habitats, of various magnitudes
- Identifying the species or habitat features that are 'key ecosystem providers' and characterising their functional relationships (Kremen 2005)
- Determining the aspects of community structure that influence function, especially aspects influencing stability or rapid decline of communities (Kremen 2005)
- Assessing key environmental factors that influence the provision of services (Kremen 2005)
- Gaining knowledge about the spatio-temporal scales over which these aspects operate (Kremen 2005).

This implies that in the sensitivity analysis not only aspects that currently prevail on the area should be taken into consideration, but also if there is a possibility of a full restoration of the original environment and its biota, or at least the rehabilitation of ecosystem services resembling the original state after an area has been significantly disturbed.

According to the above, sensitivity classes have been summarised as follows:

- **No Go:** Areas of which the loss will constitute a significant loss of ecosystem function of the specific habitats and all habitats associated with it, or a significant loss of species of conservation concern and their habitats.
- **High Sensitivity:** Areas that are relatively undisturbed or pristine and
 - either very species-rich relative to immediate surroundings,
 - or have a very unique and restricted indigenous species composition
 - alternatively, constitute specific habitats or high niche diversity for fauna and/or flora species of conservation concern, and where the total extent of such habitats and associated species of conservation concern remaining in southern Africa is limited.
 - Excessive disturbance of such habitats may lead to ecosystem destabilisation and/or species loss.
 - This would also include areas where the abiotic environment is of such nature that the habitat and its niche-diversity are the main reason for a higher species diversity and cannot be reconstructed or rehabilitated once physically altered in any way.
- **Medium Sensitivity:** Areas where disturbances are at most limited and
 - Areas with a species diversity representative of its natural state, but not exceptionally high or unique compared to its surroundings

- Areas of which the abiotic or biotic configuration does not constitute a very specific or restricted habitat or very high niche diversity
- Areas that provide ecosystem services needed for the continued functioning of the ecosystem and the continued use thereof (e.g. grazing or pollinator resources).
- Although species of conservation concern may occur on the area, these are not restricted to these habitats only.
- Areas that need to remain intact to ensure the functioning of adjacent ecosystems, or wildlife corridors or portions of land that prevent the excessive fragmentation of natural fauna and flora populations, or areas that will be difficult or impossible to rehabilitate to a functional state after physical alteration
- Depending on functionality of the observed habitats (also in relation to their surrounding habitats), such areas may be designated a sensitivity of Medium-High or Medium-Low.
- **Low Sensitivity:** Areas that have been previously transformed, disturbed or
 - Areas that provide limited ecosystem services, or have a low ecological value.
 - Species diversity may be low or all species present have a much wider distribution beyond this habitat or locality.
 - Species of conservation concern may be present on such areas, but these are not restricted to these habitats and can be relocated with ease.
 - Further arguments may include landscapes where the abiotic nature is such that it can be rehabilitated relatively easy to allow the re-establishment of the original species composition, and where the development will not lead to any unjustified degradation of landscapes or ecosystem services if adequately mitigated.

4 RESULTS

4.1 Vegetation Description

At the time of the field visit on 2 August 2017, it was evident that most of the area of the proposed camps 2 and 3 had been previously affected by extensive groundworks. Although natural vegetation had re-established on these areas, it still contained mostly pioneer species, which would indicate that these groundworks had occurred less than 10 years ago.

In areas that had not been affected by groundworks, the soils present appeared to have minimal development, were usually shallow and on weathering rock. Lime was present in part of the landscape, whilst low ridges with quartz, feldspar and schist, as well as gypsum-like soils were common.

Overall, three main vegetation units could be distinguished (Figure 4):

- **Bushmanland Arid Grasslands**
 - Subdivided according to species occurrence into:
 - Low Shrubland (primary vegetation)
 - Sensitivity: Low
 - Areas of Conservation Concern (primary vegetation)
 - Sensitivity: High
 - Exclusion Ridge (primary vegetation with high presence of species of conservation concern, must be excluded from the development, rescued small species to be re-established here as no other suitable habitat found for such)
 - Sensitivity: High – No Go
- **Riparian Vegetation**
 - Subdivided according to species as well as functionality into:
 - Ephemeral Drainages (primary vegetation)
 - Sensitivity: Medium-High
 - Local Runoff Gullies (secondary vegetation)
 - Sensitivity: Medium-Low
- **Disturbed and/or transformed areas, including**
 - Developed Areas (no natural vegetation remaining)
 - Sensitivity: Low
 - Areas with Previous Groundwork (secondary vegetation)
 - Sensitivity: Low

The sensitivity of the area with the occurrence of the species of conservation concern *that must be rescued and re-established* is shown in Figure 5.

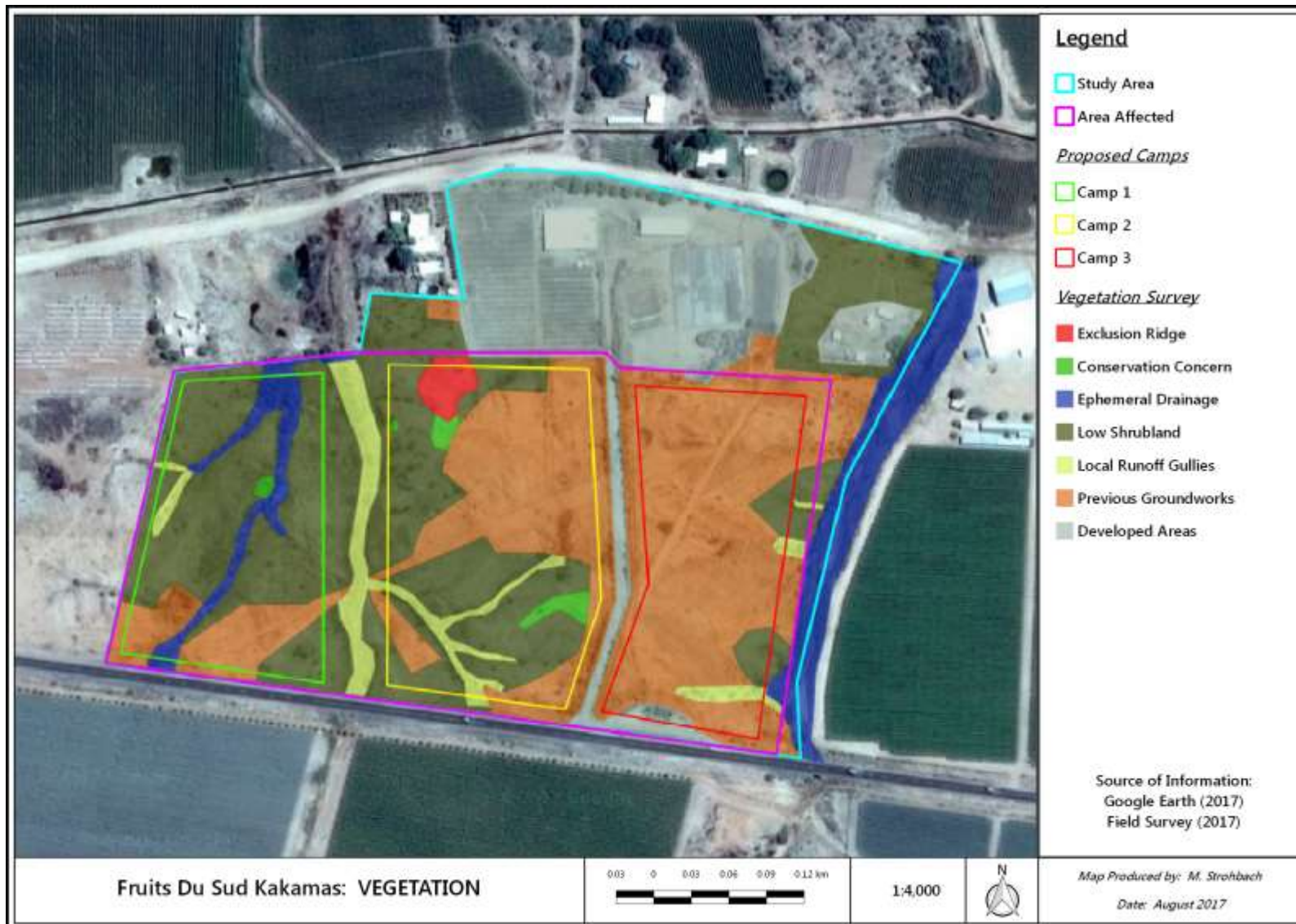


Figure 4: Vegetation Units observed.

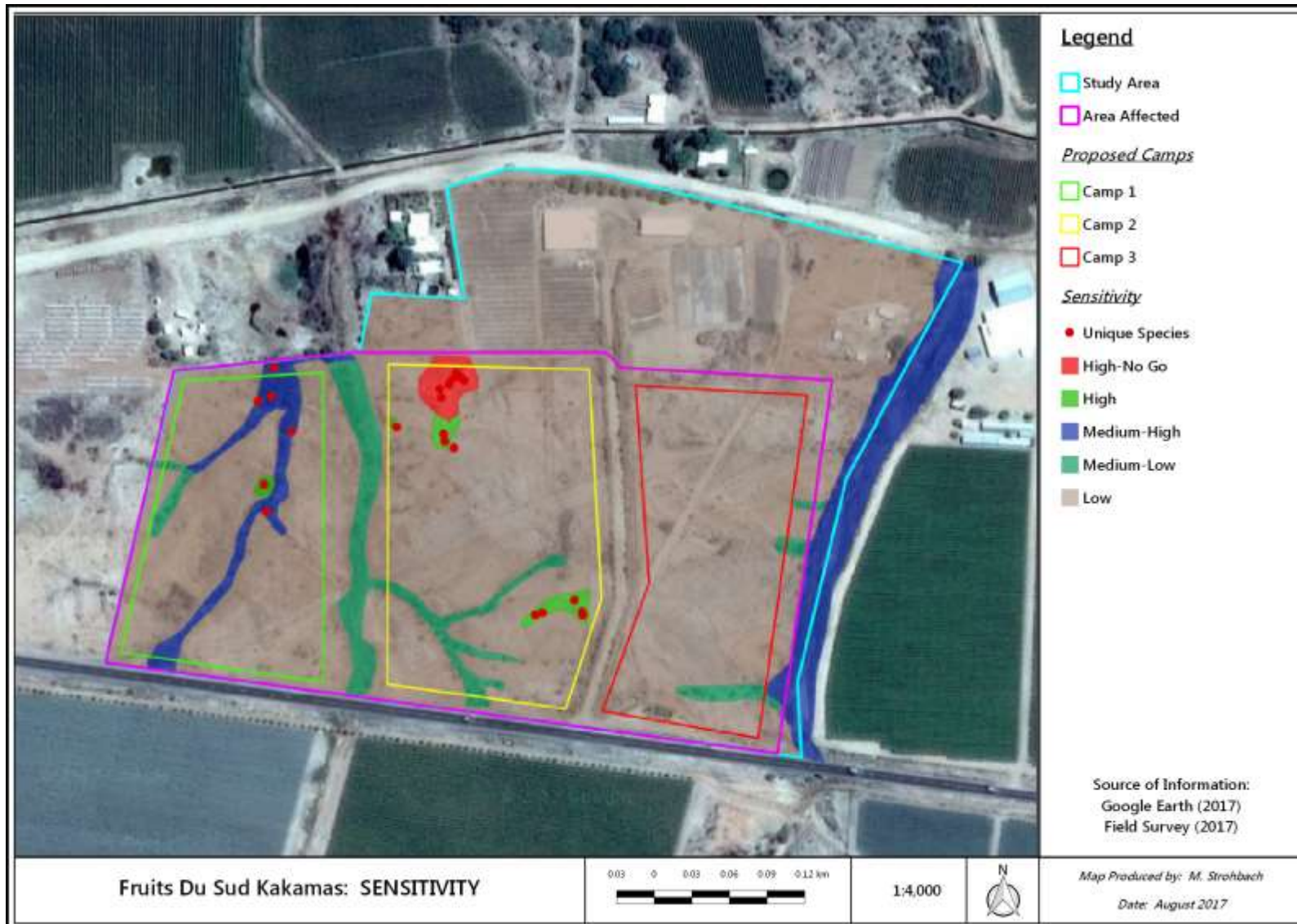


Figure 5: Sensitivity of the Study Area.

The approximate areas of these vegetation units within the land portion's 20.3868 ha is given in Table 1 below.

Table 1: Approximate area of primary, secondary and bare vegetation areas.

Description	Ha Impacted Area	Ha Outside Impacted Area
<u>Primary vegetation</u>		
Low Shrubland	5.7522	0.9495
Conservation Concern	0.1394	0
Exclusion Ridge	0.1626	0
Ephemeral Drainage	0.4696	0.471
<u>Secondary Vegetation</u>		
Local Runoff Gullies	0.8782	0.0046
Previous Groundworks	6.7962	0.2493
<u>No Natural Vegetation Remaining</u>		
Developed Areas	0.565	3.9492
Fruits de Sud Land Portion Total (Outside proposed impacted area)		20.3868 (5.6236)
Proposed Impacted Area	14.7632	

4.1.1 Bushmanland Arid Grasslands

These sparse grasslands with a small to dominant component of dwarf karrooid shrubs covers the majority of the study area (Figure 6) that has not been disturbed by past groundworks. Depending on the nature of the soil surface, the composition of vegetation ranges from very sparse and tiny succulents on otherwise almost bare quartz- and feldspar incursions, to denser areas of *Zygophyllum*-dominated vegetation where soils are more gypsum-like, especially in the proposed Camp 1.

4.1.1.1 Low Shrubland

The low shrubland is dominated by *Zygophyllum cf. dregeanum*. Scattered in-between are several protected species, especially groups of *Aloe claviflora* (Kraal-Aalwyn) and *Euphorbia spinea* and *E. garipeina*. Other prominent species are listed in Table 2:

Table 2: Prominent Species of the Low Shrublands

Species	Status	Species	Status
FORBS		<i>Indigastrum argyraeum</i>	
<i>Acanthopsis disperma</i>		<i>Kohautia caespitosa</i>	
<i>Blepharis obmitrata</i>		<i>Limeum sulcatum</i>	
<i>Chascanum garipense</i>		<i>Peliostomum leucorrhizum</i>	
<i>Hypertelis salsoloides</i>		<i>Rogeria longiflora</i>	

Species	Status
<i>Tephrosia dregeana</i>	
<i>Trianthema parvifolia</i>	
<i>Tribulus pterophorus</i>	
<i>Tripteris aghillana</i>	
GRASSES	
<i>Enneapogon scaber</i>	
<i>Oropetium capense</i>	
<i>Stipagrostis ciliata</i>	
<i>Stipagrostis hirtigluma</i>	
<i>Stipagrostis hochstetteriana</i>	
<i>Stipagrostis obtusa</i>	
<i>Stipagrostis uniplumis</i>	
DWARF SHRUBS	
<i>Aptosimum marlothii</i>	
<i>Asparagus exuvialis</i>	
<i>Dyerophytum africanum</i>	
<i>Hermannia stricta</i>	
<i>Monechma genistifolium</i>	
<i>Plinthus sericeus</i>	
<i>Salsola tuberculata</i>	

Species	Status
<i>Sericorema sericea</i>	
HIGH SHRUBS	
<i>Boscia foetida</i>	P
<i>Lycium oxycarpum</i>	
<i>Phaeoptilum spinosum</i>	
<i>Senegalia mellifera s. detinens</i> (formerly <i>Acacia mellifera</i>)	W
SUCCULENTS	
<i>Aloe claviflora</i>	P
<i>Aloe gariepensis</i>	P
<i>Euphorbia gariepina subsp. gariepina</i>	P
<i>Euphorbia spinea</i>	P
<i>Sarcocaulon crassicaule</i>	
<i>Zygophyllum cf. dregeanum</i>	
Symbols:	
W	= Indigenous species that could potentially become invasive
P	= Protected



Figure 6: Low Shrubveld dominated by *Zygophyllum* on the study site.

4.1.1.2 Areas of Conservation Concern

These are small areas with notable intrusions of, amongst others, Feldspar or Schist (Figure 7). A moderate density of protected species have been found here, which must be relocated to the Exclusion Ridge.

These species include (see Section 4.3):

- *Aloe gariensis*
- *Anacampseros albissima*
- *Anacampseros baeseckeii*
- *Dinteranthus wilmotianus*



Figure 7: Areas with unique species, which need to be rescued and re-established.

4.1.1.3 Exclusion Ridge

This small ridge on the northern periphery of the proposed Camp 2, which is situated in close proximity to an electricity pylon (Figure 8), contains several protected as well as threatened species, of which some specimens are uniquely large and should therefore be conserved. These include (see Section 4.3):

- *Anacampseros baeseckeii*
- *Dinteranthus wilmotianus*
- *Hoodia gordonii*
- *Lithops julii* subsp. *fulleri*



Figure 8: The 'Exclusion Ridge' that must be avoided.

In addition, similar small species from the previous vegetation unit (Section 4.1.1.2) can be relocated onto this area. No other suitable area for the re-establishment of rescued species could be located within or near the study area. This ridge must therefore be excluded from any development and preferably fenced off for protection from pedestrian- or vehicle traffic. Exclusion of small mammals that may browse on these small plants during periods of droughts will also contribute to their conservation.

4.1.2 Riparian Vegetation

4.1.2.1 Ephemeral Drainages

This riparian vegetation is characterised simply by the presence of larger suffrutex (dwarf) as well as more woody shrubs, the latter reaching about 1 – 3 m (Figure 9). There is a tendency of some of these woody shrubs to become invasive (especially *Senegalia mellifera*), whilst occasional stands of the alien invasive Mesquite (*Prosopis* spp) forming unwanted thickets that suffocate indigenous species, including the protected *Euclea pseudebenus*.

Prominent Species are listed in Table 3:

Table 3: Species prominent in Ephemeral Drainages

Species	Status	Species	Status
FORBS		<i>Zygophyllum cf. dregeanum</i>	
<i>Blepharis obmitrata</i>			
<i>Hypertelis salsoloides</i>		HIGH SHRUBS AND TREES	
<i>Lophiocarpus polystachyus</i>		<i>Euclea pseudebenus</i>	P
<i>Nidorella</i> spp		<i>Lycium bosciifolium</i>	
<i>Tribulus pterophorus</i>		<i>Lycium oxycarpum</i>	
<i>Zygophyllum simplex</i>		<i>Pappea capensis</i>	
		<i>Parkinsonia africana</i>	
GRASSES		<i>Prosopis glandulosa</i>	AI (3)
<i>Cenchrus ciliaris</i>		<i>Senegalia mellifera</i> s. <i>detinens</i> (formerly <i>Acacia mellifera</i>)	W
<i>Enneapogon scaber</i>		<i>Ziziphus mucronata</i>	
<i>Stipagrostis hochstetteriana</i>			
<i>Stipagrostis uniplumis</i>		SUCCULENTS	
		<i>Kleinia longiflora</i>	
DWARF SHRUBS		<i>Psilocaulon coriarium</i>	P
<i>Asparagus exuvialis</i>		Symbols:	
<i>Indigofera heterotricha</i>		AI = Alien Invasive Plant, indicated by	
<i>Monechma genistifolium</i>	W	category where listed under NEMBA	
<i>Salsola kali</i>	AI(1b)	W = Indigenous species that could	
<i>Salsola tuberculata</i>		potentially become invasive	
<i>Tapinanthus oleifolius</i>		P = Protected	
<i>Tetragonia calycina</i>			



Figure 9: Views of the ephemeral drainage crossing proposed Camp 1.

4.1.2.2 Local Runoff Gullies

This vegetation is characterised simply by either larger suffrutex (dwarf) as well as higher woody shrubs, the latter reaching about 1 – 3 m (Figure 10). As in the ephemeral drainage channels, some of these woody shrubs form dense stands (especially *Senegalia mellifera*), but the alien invasive Mesquite (*Prosopis* spp) only occurs occasionally. Vegetation overall is much more varied, ranging from low to high shrubland, or open patchy reed beds.

Prominent Species are listed in Table 4:

Table 4: Species prominent in Local Runoff Gullies

Species	Status	Species	Status
FORBS		<i>Stipagrostis obtusa</i>	
<i>Blepharis obmitrata</i>		<i>Stipagrostis uniplumis</i>	
<i>Hypertelis salsoloides</i>			
<i>Nidorella</i> spp		DWARF SHRUBS	
<i>Tribulus pterophorus</i>		<i>Asparagus exuvialis</i>	
<i>Zygophyllum simplex</i>		<i>Monechma genistifolium</i>	W
		<i>Salsola tuberculata</i>	
GRASSES		<i>Zygophyllum</i> cf. <i>dregeanum</i>	
<i>Cenchrus ciliaris</i>			
<i>Enneapogon scaber</i>		HIGH SHRUBS AND TREES	
<i>Phragmites australis</i>		<i>Lycium oxycarpum</i>	
<i>Stipagrostis hochstetteriana</i>		<i>Parkinsonia africana</i>	

Species	Status
<i>Prosopis glandulosa</i>	AI (3)
<i>Senegalia mellifera s. detinens</i> (formerly <i>Acacia mellifera</i>)	W
<i>Ziziphus mucronata</i>	
SUCCULENTS	
<i>Kleinia longiflora</i>	
<i>Psilocaulon coriarium</i>	P

Species	Status
<i>Aloe claviflora</i>	P
<i>Euphorbia gariepina subsp. gariepina</i>	P
Symbols:	
AI	= Alien Invasive Plant, indicated by category where listed under NEMBA
W	= Indigenous species that could potentially become invasive
P	= Protected



Figure 10: Views of local runoff gullies.

4.1.3 Areas with Previous Groundwork

It would appear that the groundwork (either infilling or flattening of surfaces) has been done relatively recently (less than ten years ago). The vegetation is very patchy, and dominated by quick-growing species. Slower-growing species such as *Zygophyllum cf. dregeanum* and *Aloe* species (frequent or dominant on the areas with primary vegetation), are almost entirely absent from these areas. The most common low shrubs include the short-lived *Dyerophytum africanum*, and smaller specimens of *Senegalia mellifera* and *Ziziphus mucronata*, whilst undesirable alien invasive species have also become established, albeit still at a very low rate.

On the edges of these areas, next to the gravel road to the Fruits Du Sud Depot, rows of *Combretum erythrophyllum* have been planted and are maintained by a sprinkler system.

Prominent species are listed in Table 5:

Table 5: Species prominent in Areas with Previous Groundwork

Species	Status	Species	Status
FORBS		<i>Monechma genistifolium</i>	
<i>Blepharis obmitrata</i>		<i>Salsola kali</i>	AI (1b)
<i>Chascanum garipense</i>		<i>Salsola tuberculata</i>	
<i>Indigastrum argyraeum</i>		<i>Sericorema sericea</i>	
<i>Rogeria longiflora</i>			
<i>Trianthema parvifolia</i>		HIGH SHRUBS	
<i>Trichodesma africanum</i>		<i>Prosopis glandulosa</i>	
<i>Tripteris aghillana</i>		<i>Senegalia mellifera s. detinens</i> (formerly <i>Acacia mellifera</i>)	W
		<i>Ziziphus mucronata</i>	
GRASSES			
<i>Enneapogon scaber</i>		SUCCULENTS	
<i>Stipagrostis hirtigluma</i>		<i>Psilocaulon coriarium</i>	P
<i>Stipagrostis obtusa</i>		Symbols:	
<i>Stipagrostis uniplumis</i>		AI = Alien Invasive Plant, indicated by category where listed under NEMBA	
		W = Indigenous species that could potentially become invasive	
DWARF SHRUBS		P = Protected	
<i>Dyerophytum africanum</i>			
<i>Hermannia spinosa</i>			



Figure 11: Views of areas with previous groundworks and secondary vegetation.

4.2 Terrestrial Fauna

The study area was investigated during the vegetation survey for signs or the presence (observations) of amphibians, reptiles, and mammals. An avifaunal assessment has not been part of this study, although many birds do frequent the area to feed on left-overs from the Sultana-drying facilities of the Fruits Du Sud Depot.

Signs of or species sighted during the survey on and in the vicinity of the study area and which are expected to frequent the area include the following:

- Cape Hare (*Lepus capensis*)
- Porcupine (*Hystrix africaeaustralis*)
- Yellow Mongoose (*Cynictis penicillata*)
- Jackal (*Canis mesomelas*)
- Common Ground Agama (*Agama aculeata aculeata*)



Figure 12: Common Ground Agama

4.3 Plant Species of Conservation Concern

Following plant species of conservation concern have been observed *on the area to be impacted by the development*:

<i>Species</i>	Actions	Number	Conservation Status	Protected in RSA by (see 1.5.1)
<i>Aloe claviflora</i>	Relocate if possible	208 clusters	LC	NCN 2
<i>Aloe gariensis</i>	Relocate all	6	LC	NCN 2
<i>Anacampseros albissima</i>	Relocate all in affected areas to exclusion ridge	8	LC	NCN 2
<i>Anacampseros baeseckeii</i>	Relocate as many as possible from affected areas to exclusion ridge	± 500	LC	NCN 2
<i>Boscia foetida</i> subsp. <i>foetida</i>	-	5	LC	NCN 2
<i>Dinteranthus wilmotianus</i>	Relocate all in affected areas to exclusion ridge, most within exclusion ridge to be protected	44	Near Threatened B	NCN 2
<i>Euclea pseudebenus</i>	Avoid where possible	5	LC	DAFF
<i>Euphorbia gariensis</i> subsp. <i>gariensis</i>	-	± 80	LC	NCN 2
<i>Euphorbia spinea</i>	-	± 60	LC	NCN 2
<i>Hoodia gordonii</i>	Within exclusion ridge to be protected	1	DDD	NEMBA/NCN 1
<i>Lithops julii</i> subsp. <i>fulleri</i>	Within exclusion ridge to be protected	2	LC	NCN 2
<i>Psilocaulon coriarium</i>	-	7	LC	NCN 2

The approximate location of species that must be avoided and/or rescued is shown in Figure 13, whilst images of the various species are shown in Appendix A. The relocation and/or destruction of all above species requires a permit from Northern Cape Nature as well as the Department of Forestry (also where no action – presumed to be destruction - is indicated above).

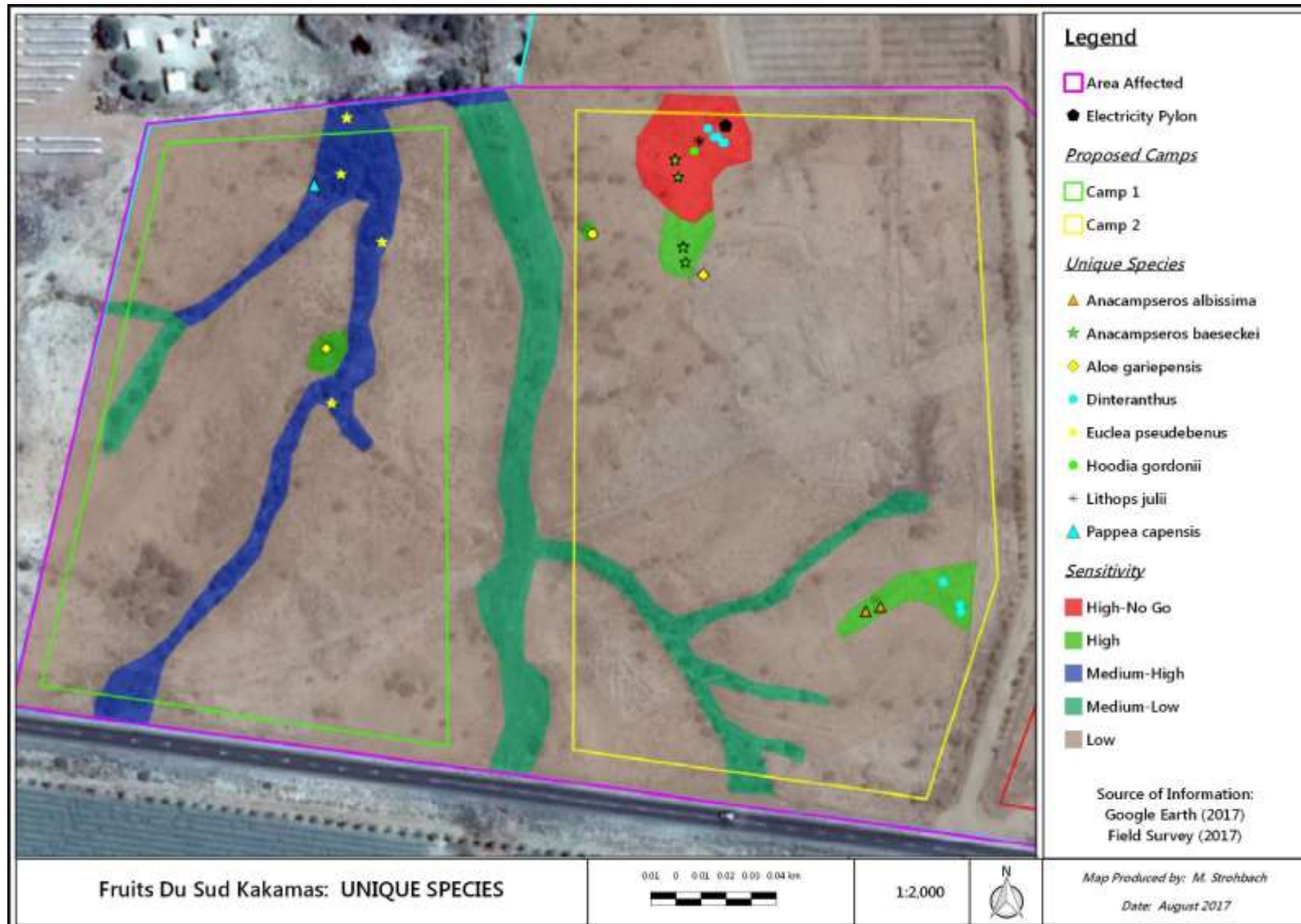


Figure 13: Locality of unique and vulnerable species that must be avoided or relocated where possible.

Notes on conservation status:

- **Least Concern** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
- **Data Deficient - Insufficient Information (DDD)** A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required and that future research could show that a threatened classification is appropriate.
 - This species is very poorly known, with insufficient information on its habitat, population status or distribution to assess it. However, it is highly likely to be threatened. If a Data Deficient species will be affected by a proposed activity, the subpopulation should be well surveyed and the data sent to the Threatened Species Programme. The species will be reassessed and the new status of the species, with a recommendation, will be provided within a short timeframe.
- **Near Threatened (NT)** A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable, and is therefore likely to become at risk of extinction in the near future.
 - B, C: The species is approaching thresholds for listing as threatened but there are still a number of subpopulations in existence and therefore there is need to minimise loss of habitat. Conservation of subpopulations is essential if they occur (i) within a threatened ecosystem or (ii) within an area required for biodiversity conservation in terms of a relevant spatial biodiversity plan or (iii) on a site associated with additional ecological sensitivities.

4.4 Alien Invasive Plant Species

Declared weeds and invader plant species have the tendency to dominate or replace species of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. This again may lead to increased degradation due to habitat loss, loss of grazing as well as accelerated erosion. It is therefore important that these plant species be controlled and eradicated by means of an eradication and monitoring programme.

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. The latest Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within close proximity to a watercourse.

Below is a brief explanation of the categories (as applicable to this study) in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.

Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Alien invasive species that were noticed within the study area are:

Category 1b:

- *Salsola kali*

Species with a high occurrence in the area (road verges) that may become established include:

- *Argemone ochroleuca*
- *Datura stramonium*
- *Flaveria bidentis*
- *Melia azedarach*

Category 3:

- *Prosopis glandulosa*

5 STATEMENT OF ANTICIPATED IMPACTS

From a biodiversity perspective,

- The proposed development of new vineyards or orchards will impact negatively on small areas of occurrence of more sensitive vegetation and/or species.
 - To reduce the impact, the most suitable locality for the relocation of the of the unique and most conservation-sensitive species has been identified as the 'Exclusion Ridge'. As this comprises a small area at the northern periphery of Camp 2 and is in close proximity to an electricity pylon, the exclusion of this area should not be of major significance to the viability of the proposed development.
- It is anticipated that grounds will have to be levelled to be suitable for the proposed development, which will also greatly reduce the local runoff gullies and may also impact on the western ephemeral drainage line with its few protected trees.

- As the catchment of the smaller runoff gullies as well as the ephemeral drainage line across the proposed Camp 1 is limited to the proposed development area and the vineyards immediately south of the N14, the obliteration of such should not have a major impact on the overall ecosystem. However, natural runoff will always occur and tend to follow 'old existing' drainages, hence it would be advisable to retain as much as possible of the existing drainage.
- As most of the area has already been disturbed, as well as being situated between developed and cultivated areas, overall the proposed development will not have a significant impact on the ecosystem or affect the conservation status of any species.

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7 APPENDIX A: SPECIES IMAGES

Protected Species

Aloe claviflora



Aloe gariensis



Anacampseros albissima



Protected Species

Anacampseros baeseckeii



Boscia foetida subsp. *foetida*



Dinteranthus wilmotianus



Protected Species

Euclea pseudebenus



Euphorbia gariepina subsp. *gariepina*



Euphorbia spinea



Protected Species

Hoodia gordonii



Lithops julii subsp. *fulleri*

