

Alien Invasive Species

Management Plan

**Farm Donegal no 217 Agricultural
Development, Hopetown, Northern
Cape Province**

April 2018

Compiled for:

Olyf Trust

Compiled by:

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Abbreviations

BA	Basic Assessment
CBA	Critical Biodiversity Area
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment

Details of the Specialist

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M.Env.Sci. Ecological remediation and sustainable utilisation (NWU: Potchefstroom)

South African Council for Natural Scientific Professions (SACNASP): Professional Ecological Scientist
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Abbreviated Curriculum Vitae

Qualifications

- M.Env.Sci Ecological Remediation and Sustainable Utilisation/Vegetation Ecology
 - 2010 - North West University Potchefstroom
- B.Sc Botany and Zoology (Cum Laude)
 - 2008 - North West University Potchefstroom

Accredited courses completed

- Implementing Environmental Management Systems ISO 14001
 - 2011 - North West University Potchefstroom
- Environmental Law for Environmental Managers
 - 2011 - North West University Potchefstroom
- SASS 5 Aquatic Biomonitoring Training Course
 - 2017 – GroundTruth Consulting

Professional registrations

- South African Council for Natural Scientific Professions (**SACNASP**)
 - Professional Ecological Scientist Registration number 115601

- International Association for Impact Assessment (**IAIA**)
 - Registration number 5232
- South African Green Industries Council (**SAGIC**) Invasive Species training
 - Registration number 2405/2459

Employment and Experience Background

Upon completion of his studies, Rikus started his career in 2011 as an **Environmental Professional in Training (PIT) at Anglo American Thermal Coal: Environmental Services**. He received environmental training and practical implementation experience in all environmental facets of the mining industry with the focus on: Environmental rehabilitation, land management (biodiversity and invasive species eradication), waste & water-, air quality-, game reserve-, environmental management and legislation, as well as corporate reporting. He was also appointed as the Biodiversity management custodian at Anglo American Thermal Coal collieries.

He was subsequently employed by **Fraser Alexander Tailings from October 2011 to the end of November 2015 as an Environmental Contracts Manager**, where he was responsible for the technical and operational management of all Fraser Alexander Tailings' mining environmental rehabilitation work. He was responsible for all facets of project management, as well as implementation of rehabilitation and environmental strategies, by planning activities, organising physical, financial and human resources, delegating task responsibilities, leading people, controlling risks and providing technical support.

He conducted a significant amount of quantitative and qualitative ecological vegetation monitoring during his employment period with the company. Such monitoring mainly included environmentally rehabilitated mining areas in the open-cast coal-, gold-, platinum- and chrome mining industries situated in the Free State, Gauteng, Mpumalanga, North-West and Limpopo Provinces. He was involved with analysis, processing and interpretation of environmental monitoring data and compilation of high quality technical/scientific environmental monitoring reports for clients. He was subsequently further involved with providing adequate ecological management and maintenance recommendations for rehabilitated areas. He also provided technical/scientific environmental rehabilitation support to mining clients, with regards to sufficient soil preparation and amelioration, grassing processes, as well as grass species mixtures and ratios.

He was then employed by **Enviroworks Consulting from January 2016 to the end of May 2017 as a Senior Ecological Specialist** where he was responsible for virtually all Ecological, Aquatic and Wetland specialist assessments and reporting related to Environmental Impact Assessment (EIA) and Basic Assessment (BA) projects. He also completed numerous EIA and BA projects as the main project Environmental Assessment Practitioner (EAP).

Rikus then subsequently established the company EcoFocus Consulting (Pty) Ltd, which provides high quality professional environmental and ecological specialist services and solutions to the industrial development-, construction-, mining-, agricultural and other sectors, at the end of May 2017.

He possesses significant qualifications, vast knowledge, skills and practical experience in the specialist field of ecological and environmental management. This, coupled with his disciplined, determined and goal-driven mind-set, as well as his high level of personal standards, ensure high quality, timely and outcomes based outputs and service delivery relating to any project.

Ecological Specialist Report Completion

2018

- Completion of a specialist ecological assessment and report for the proposed 30 ha Portion 30 of the Farm Lilyvale no 2313 Residential development project in Bloemfontein, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 20 ha Luckhoff Waste Facility development project in Luckhoff, Free State Province.
- Completion of a specialist ecological assessment and report for a proposed 19 ha agricultural development project outside Griekwastad, Northern Cape Province.
- Completion of a specialist ecological assessment and report for a proposed 135 ha agricultural development project outside Griekwastad, Northern Cape Province.
- Completion of five specialist ecological assessments and reports for the proposed Dawid Kruiper Local Municipality Residential Developments around Upington, Northern Cape Province.
- Completion of a specialist Grazing and Erosion Management Plan for the Retiefs Nek no 123, outside Bethlehem, Free State Province.
- Completion of a specialist Grazing and Erosion Management Plan for the Dekselfontein no 317, outside Bethlehem, Free State Province.

- Completion of a specialist ecological assessment and report for a proposed 12 ha agricultural development project in Petrusville, Northern Cape Province.
- Completion of a specialist ecological and wetland assessment and report for a proposed 270 ha industrial park development project in Secunda, Mpumalanga Province.
- Completion of a specialist ecological assessment and report for the proposed Dawid Kruiper Local Municipality Residential Development around Upington, Northern Cape Province.

2017

- Completion of a specialist ecological assessment and report for the proposed Phethogo Consulting filling station development project in Bloemfontein, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 132 kV CENTLEC Harvard transmission line development project in Bloemfontein, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed Zevenfontein filling station development project in Johannesburg, Gauteng Province.
- Completion of a specialist ecological assessment and report for the proposed Olifantsvlei Curro School development project in Johannesburg, Gauteng Province.
- Completion of a specialist ecological assessment and report for the proposed 23 ha Babereki Agricultural development project in Hartswater, Northern Cape Province.
- Completion of a specialist ecological assessment and report for the proposed Eikenhof Curro School development project in Johannesburg, Gauteng Province.
- Completion of a specialist ecological assessment and report for the proposed 40 ha CoGHSTA residential development project in Norvalspont, Northern Cape Province.
- Completion of a specialist ecological assessment and report for the proposed 9 ha CoGHSTA residential development project in Williston, Northern Cape Province.
- Completion of a specialist ecological and wetland assessment and report for the proposed 100 ha Musgrave residential and commercial development in Bloemfontein, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 15 ha BVI Engineering Waste Water Treatment Works and associated pipeline development project in Britstown, Northern Cape Province.
- Completion of a specialist ecological walkthrough assessment and report and relocation of provincially protected species *Eucomis autumnalis* individuals for the Bloemwater 33.6 km Brandkop Bypass water supply pipeline in Bloemfontein, Free State Province.

- Completion and execution of a Species Relocation and Re-establishment Plan for 13 individuals of the provincially protected species, *Eucomis autumnalis*, for the Bloemwater 33.6 km Brandkop Bypass water supply pipeline in Bloemfontein, Free State Province.
- Completion of a specialist ecological exemption letter for the proposed Siloam Crematorium development in Welkom, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 0.5 ha Vuna Afrika Agricultural feedmill pelletizing plant development project outside Wepener, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 0.4 ha Olympic Flame filling station development project in Welkom, Free State Province.
- Completion of a specialist ecological assessment and report for a proposed 3000 ha agricultural development project outside Douglas, Northern Cape Province.
- Completion of a specialist ecological assessment and report for the proposed 46.04 ha University, Industrial and Residential development project in Orania, Northern Cape Province.
- Completion of a specialist ecological assessment and report for a proposed 482 ha Piet Louw NEMA Section 24G agricultural development project outside Hopetown, Northern Cape Province.
- Completion of a specialist ecological assessment and report for a proposed 500 ha Wolfkop Valley Estate development project outside Bloemfontein, Free State Cape Province.
- Completion of a specialist Erosion and Rehabilitation Management Plan for the Farms Die Kranse no 1174 and De Rotsen no 52 outside Vrede, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 4.1 ha Plot 31 Spitskop Residential development project in Bloemfontein, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 26.8 ha Oxidation Dam development project in Orania, Northern Cape Province.
- Completion of five specialist ecological assessments and reports for the proposed Dawid Kruiper Local Municipality Residential Developments around Upington, Northern Cape Province.
- Completion of a specialist Grazing and Invasive Species Management Plan for the Farm Smaldeel no 15032 outside Paul Roux, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 16.4 ha Truckstop and Filling Station development project in Senekal, Free State Province.

2016

- Completion of a specialist ecological assessment and report for the proposed 3 km Olifantshoek Bulk Water Supply and reservoir development project in Olifantshoek, Northern Cape Province.
- Completion of two specialist ecological and wetland assessments and reports for the proposed respective 16 ha and 6 ha N8 highway gravel quarries development project near Ladybrand, Free State Province.
- Completion of a specialist ecological assessment and report for the proposed 100 ha De Eelt vineyard development project near Prieska, Northern Cape Province.
- Completion of two specialist ecological and wetland assessments and reports for the Lafarge cement production facility and quarry, respectively near Lichtenburg, North-West Province.
- Completion of a specialist ecological assessment and report for the proposed 12 ha Nooitgedacht Retirement Estate development project near Nelspruit, Mpumalanga Province.
- Completion of a specialist ecological assessment and report for the proposed 42 km Ventersburg Bulk Water Supply and reservoir development project between Ventersburg and Riebeeckstad, Free State Province.

Declaration of Independence

I, Adriaan Johannes Hendrikus Lamprecht, ID 870727 5043 083, declare that I:

- am the Director and Ecological Specialist of EcoFocus Consulting (Pty) Ltd
- act as an independent specialist consultant in the field of botany and ecology
- am assigned as the Ecological Specialist consultant by the applicant, Olyf Trust, for the proposed project
- do not have or will not have any financial interest in the undertaking of the proposed project activity other than remuneration for work as stipulated in the Purchase Order terms of reference
- confirm that remuneration for my services relating to the proposed project is not linked to approval or rejection of the project by the competent authority
- have no interest in secondary or subsequent developments as a result of the authorisation of the proposed project
- have no and will not engage in any conflicting interests in the undertaking of the activity
- undertake to disclose to the applicant and the competent authority any information that has or may have the potential to influence the decision of the competent authority
- will provide the applicant and competent authority with access to all relevant project information in my possession whether favourable or not

AJH Lamprecht



Signature

1. Introduction

The project applicant, Olyf Trust proposes to develop a natural portion of virgin soil into an approximate 15 ha cultivated pivot land on the Remaining Extent of the Farm Donegal no 217. The farm is situated approximately 17 km north of the town of Hopetown, Northern Cape Province. The purpose of the cultivation will either be for commercial organic planting, harvesting of pumpkins for export purposes or for planting of grazing pastures. The final crops to be planted will be dependent on the results of the soil suitability assessment. Irrigation water will be obtained from four existing boreholes located directly adjacent north-west of the assessment area.

Eco-Con Environmental was appointed by the applicant as the independent Environmental Practitioner (EAP) to conduct the Basic Assessment (BA) process.

Due to the nature of the potential impacts of the proposed development on the local ecology, an Ecological study was required. This was required in order to determine the potential presence of ecologically significant species, habitats or wetland areas within the proposed project footprint which may be affected by the proposed development.

EcoFocus Consulting was therefore subsequently appointed by the applicant as the independent ecological specialist to conduct the required Ecological study for the proposed project.

A site visit/assessment for the proposed development footprint area was conducted on 27 March 2018 and the final Ecological Impact Assessment Report was subsequently completed and submitted on 17 April 2018.

2. Management Plan Rational

Alien species are either non-indigenous plant, animal or invertebrate species which were introduced to the country in the past or they can even be indigenous species which have been translocated to outside its natural distribution range due to human intervention. Invasive species constitute such alien species as described above which cause or have the potential to cause environmental, economic or harm to human health. Such invasive species have the potential to rapidly establish themselves at the cost of indigenous species. This results in damage to ecosystems and habitats, loss of biodiversity and often in the case of plant species, excessive water consumption in a country already classified as semi-arid.

The National Environmental Management: Biodiversity Act (Act 10 Of 2004); Alien and Invasive Species Regulations, 2014 legally governs the management of alien invasive species. It lists 383 invasive plant species into four categories that must be managed, controlled or eradicated from areas where they may cause harm to the indigenous environment. These four categories are:

- Category 1a: Invasive species which must be combated and eradicated. Any form of trade or planting is strictly prohibited.
- Category 1b: Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited.
- Category 2: Invasive species or species deemed to be potentially invasive, in that a permit is required to carry out a restricted activity. Category 2 species include commercially important species such as pine, wattle and gum trees. Plants in riparian areas are Cat 1b
- Category 3: Invasive species which may remain in prescribed areas or provinces. Further planting, propagation or trade is however prohibited. Plants in riparian areas are Cat 1b.

There are currently virtually no alien invasive species present within the assessment area. Only a small isolated linear clump of the legally declared invasive species *Agave sp.* (Category 2) is present. These individuals will in fact be removed during the construction phase which will prove to be beneficial to the environment. The assessment area and surrounding areas could however potentially be prone to significant continued alien invasive species establishment due to initial and continual disturbances caused by vegetation clearance as well as soil preparation and cultivation activities during the construction and operational phases.

In order to ensure legislative compliance, alien invasive species which may establish on the assessment area during the construction and operational phases, therefore need to be adequately

managed in accordance with the requirements of the legal categories into which they fall. Adequate planning and a structured, systematic approach to alien invasive species management forms a crucial aspect in ensuring the success of the process. Poor planning can significantly increase the cost involved as well as negatively impact on the desired success of the process. It is therefore imperative that a structured and practically implementable management plan be followed.

3. Objectives of the Alien Invasive Species Management Plan

- Provide management and monitoring guidelines for the prevention of significant alien invasive species establishment and spreading during the construction and operational phases of the proposed development.

4. Study Area

The assessment area consists of two alternative footprint areas. Alternative 1 (preferred) is approximately 15 ha in size and Alternative 2 is approximately 5 ha in size. Both alternatives are situated on the Remaining Extent of the Farm Donegal no 217 (SG 21 Digit Code: C0320000000021700000). The farm is situated approximately 17 km north of the town of Hopetown. The farm forms part of the Siyancuma Local Municipality which in turn, forms part of the Pixley Ka Seme District Municipality, Northern Cape Province. Access to the assessment area is obtained via the R 385 provincial road and subsequent dirt road from the south.

See locality map below.

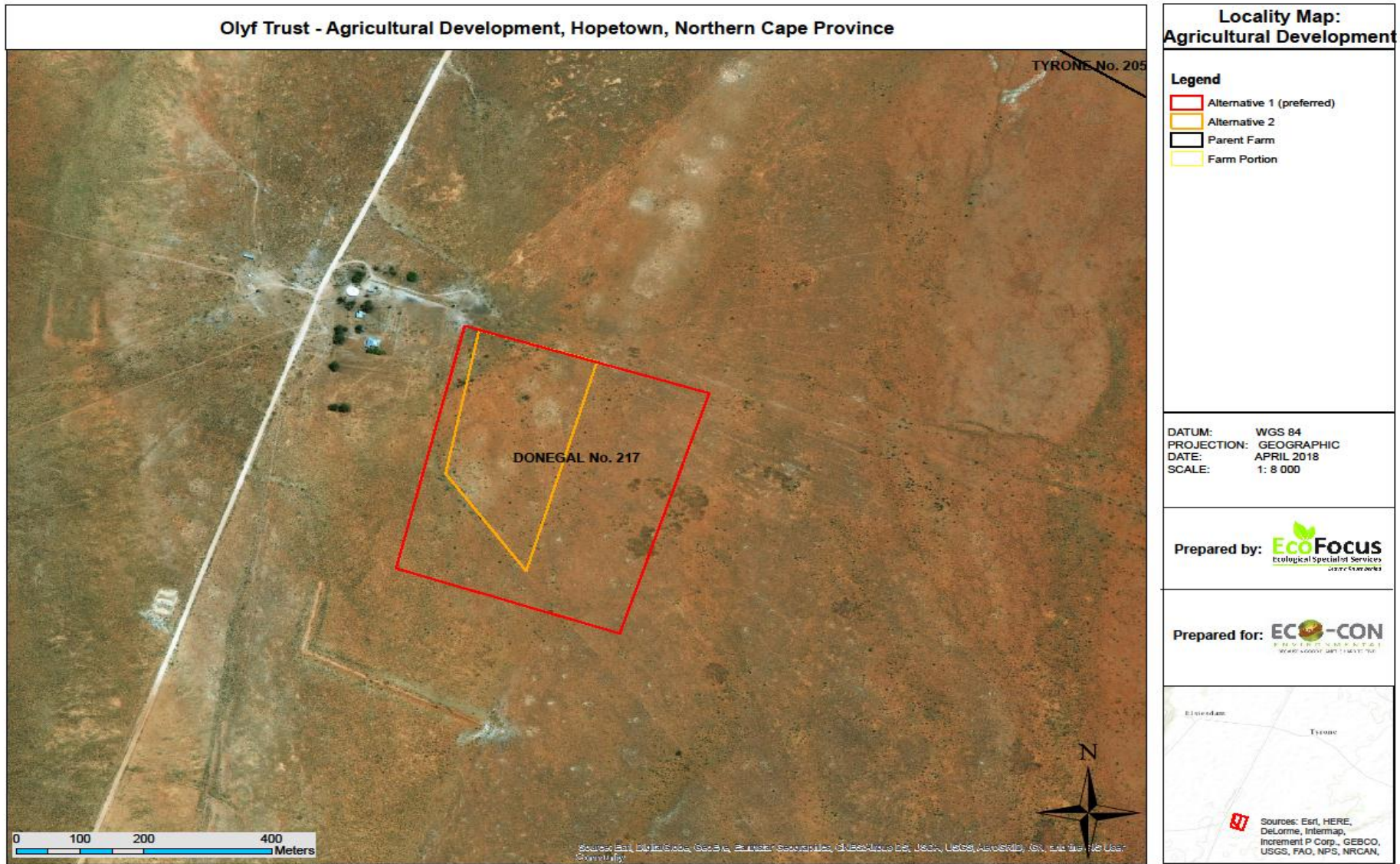


Figure 1: Locality map illustrating the assessment area (see A3 sized map in the Appendices)

4.1. Climate

The rainfall of the region peaks during the summer months and the Mean Annual Precipitation (MAP) of the area is approximately 322 mm (www.climate-data.org). The average monthly temperature is approximately 25.5°C in the summer months and approximately 9°C during the winter. Average maximum monthly temperatures can reach up to 33.2°C in the summer months and dip to as low as 0.5°C during the winter.

4.2. Geology and Soils

According to Mucina & Rutherford (2006) the geology of the landscape and associated vegetation type can be described as the following:

The underlying geology is mainly formed by shales of the Volksrust Formation and to a lesser extent the Prince Albert Formation (both of the Ecca Group) as well as Dwyka Group diamictites. Broad areas are covered by superficial deposits including calcretes of the Kalahari Group. Soils are variable from shallow to deep, red-yellow apedal and freely draining with potential scattered rocky dolerite outcrops.

4.3. Vegetation and Conservation Status

According to Mucina & Rutherford (2006), the entire assessment area falls within the Northern Upper Karoo vegetation type (NKu 3) which mainly consists of flat to slightly sloping shrubland, dominated by dwarf karoo shrubs and sparse grasses. This vegetation type is merely classified as least threatened as very little has been transformed thus far (Mucina & Rutherford, 2006).

The entire assessment area is merely categorised as other natural land in accordance with the Northern Cape Provincial Spatial Biodiversity Plan.

The mechanical clearance and soil preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing surface vegetation on the assessment area.

See vegetation and sensitivity maps below.

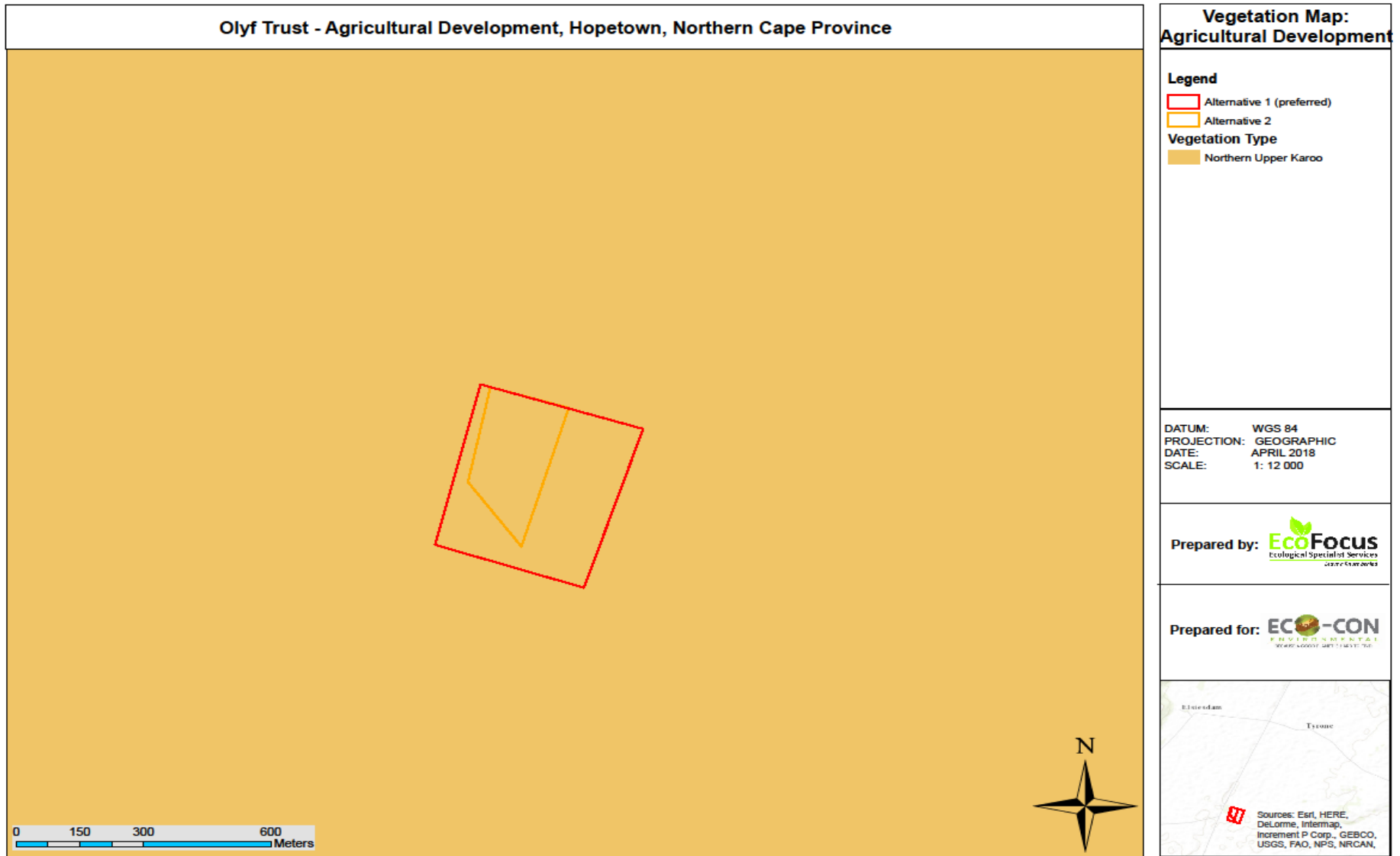


Figure 2: Vegetation map illustrating the vegetation type associated with the assessment area (see A3 sized map in the Appendices)

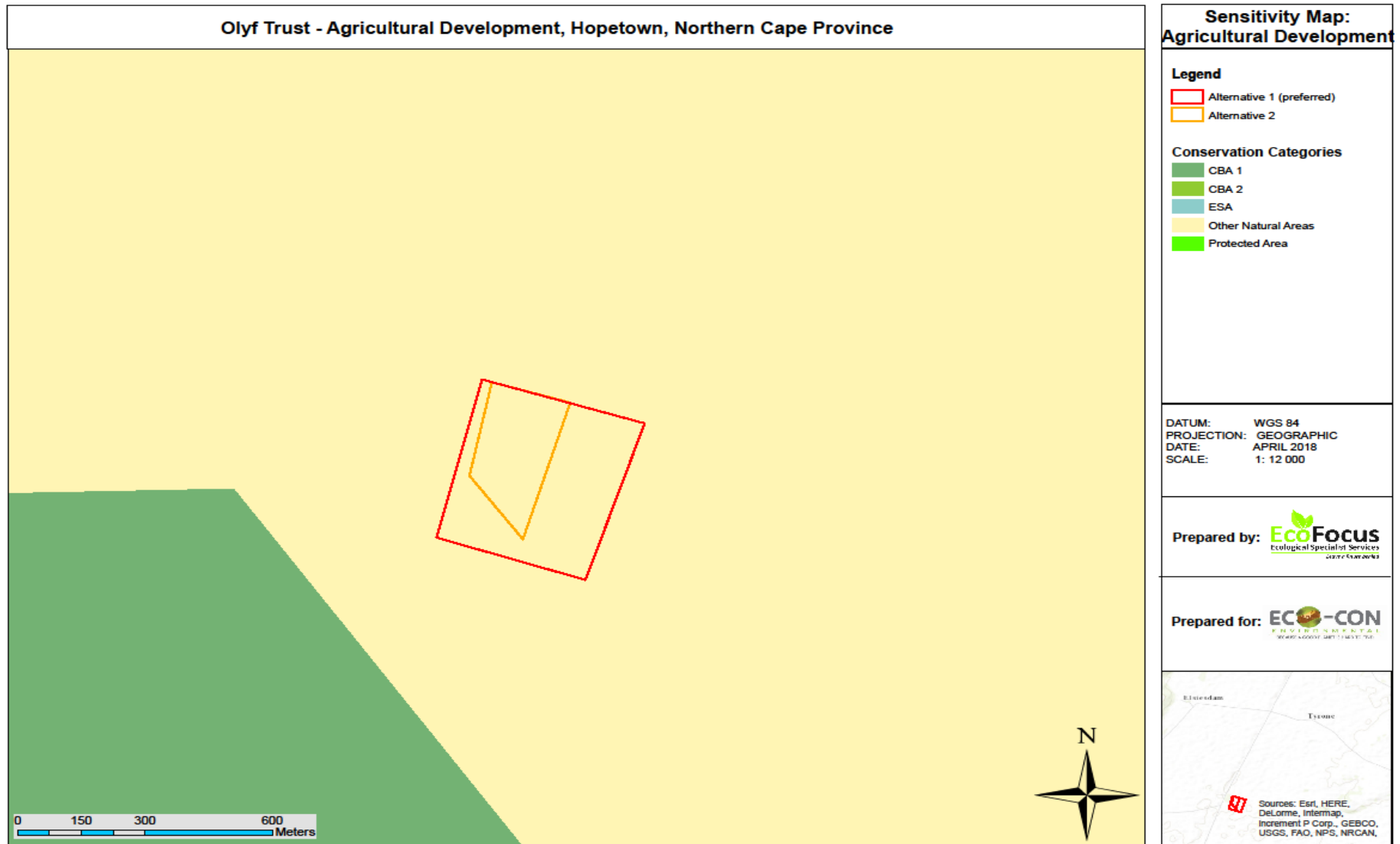


Figure 3: Sensitivity map illustrating the conservation status associated with the assessment area (see A3 sized map in the Appendices)

5. Potential Problematic Alien Invasive Species on Site

There are currently virtually no alien invasive species present within the assessment area. Only a small isolated linear clump of the legally declared invasive species *Agave sp.* (Category 2) is present. Although there are currently no significant establishments of different alien invasive species on site, an existing seedbank of various such species will be present within the soils. Such alien invasive species are known as opportunistic pioneer species which usually colonise newly disturbed areas. Therefore, once vegetation clearance and disturbance of the development footprint commences, it will create a suitable environment for the emergence and potential establishment of such alien invasive species. Problematic alien invasive species usually associated with agricultural developments and activities include the following (alphabetical order):



Scientific Name	Common Name	Listed Category
<i>Agave sp.</i>	Sisal hemp	2



Scientific Name	Common Name	Listed Category
<i>Argemone mexicana</i>	Yellow-flowered Mexican poppy	1b



Scientific Name	Common Name	Listed Category
<i>Cirsium vulgare</i>	Spear thistle, Scottish thistle, Skotse dissel	1b



Scientific Name	Common Name	Listed Category
<i>Datura stramonium/ D ferox</i>	Common thorn apple, olieboom	1b



Scientific Name	Common Name	Listed Category
<i>Prosopis glandulosa/ P velutina</i>	Honey mesquite, velvet mesquite	3



Scientific Name	Common Name	Listed Category
<i>Ricinus communis</i>	Cator oil plant, kasterolieboom	2



Scientific Name	Common Name	Listed Category
<i>Solanum elaeagnifolium</i>	Silver-leaf bitter apple, satansbos	1 b



Scientific Name	Common Name	Listed Category
<i>Solanum sisymbriifolium</i>	Wild tomato, dense throned bitter apple, wilde tamatie	1 b



Scientific Name	Common Name	Listed Category
<i>Verbena bonariensis</i>	Wild verbena, tall verbena, purple top, pers verbena	1 b



Scientific Name	Common Name	Listed Category
<i>Xanthium spinosum/ X strumarium</i>	Spiny cocklebur, large cocklebur, boetebos	1 b

6. Alien Invasive Species Management Process

The alien invasive species management process is divided into two headings namely for the construction phase and operational phase of the proposed development.

6.1. Construction Phase

As the applicant is planning to implement either organic planting and harvesting of pumpkins for export purposes or planting of grazing pastures, chemical control processes such as herbicide and pesticide application cannot be used for management of any alien invasive species. Biological and physical control processes will therefore have to be followed to prevent significant alien invasive species establishment and spreading.

- Once the vegetation clearance and soil preparation processes commence, conduct a bi-weekly (every two weeks) walkthrough of the proposed development area as well as a minimum 50 m perimeter around the area, in order to identify all seedlings of any alien invasive species which might start to germinate and establish.
- Physically remove all identified alien invasive species seedlings from the soil by manually pulling them out with as much as possible of their root systems still intact.
- Place all removed alien invasive species seedlings in a metal drum or any other suitable containing unit and close the drum/containing unit in order to isolate the seedlings.
- Place the closed drum/containing unit on a concrete slab or any other suitable impermeable surface in direct sunlight in order to isolate the alien invasive species seedlings from any natural vegetation and prevent spreading of materials.
- Leave the closed drum/containing unit in direct sunlight for a minimum period of one week in order for all alien invasive species seedlings and materials to adequately dry out and die.
- Once all alien invasive species seedlings and materials have adequately dried out and died, remove the material from the drum/containing unit and place the materials in a minimum 1 m deep hole which is isolated from any natural vegetation.
- Safely burn all the dried out and dead alien invasive species seedlings and materials inside the hole and close the hole up again after the fire has died.
- It is recommended that the same hole be utilised for every burning event in order to keep the burnt materials contained and isolated to one location.
- The Geographic Information System (GIS) coordinates of the hole location where the burning is being done must be captured.

- If burning and underground burial of dried out and dead materials is not possible, materials will have to be transported and disposed of at a suitable registered bio-hazard waste site. This can however prove to be a very costly exercise.
- Photographs must be taken of all the individual steps.

6.2. Operational Phase

As the applicant is planning to implement either organic planting and harvesting of pumpkins for export purposes or planting of grazing pastures, chemical control processes such as herbicide and pesticide application cannot be used for management of any alien invasive species. Biological and physical control processes will therefore have to be followed to prevent significant alien invasive species establishment and spreading.

Biological Control

- Cover crops can be planted in between the intended commercial crops in order to assist with biological deterrence of agricultural pests and limitation of alien invasive species establishment.

Physical Control

- The same management process as for the construction phase needs to be implemented during the operational phase.
- During the planting and harvesting season, conduct a bi-weekly (every two weeks) walkthrough of the cultivated area as well as a minimum 50 m perimeter around the area, in order to identify all seedlings of any alien invasive species which might start to germinate and establish.
- During the off season, conduct a monthly walkthrough of the cultivated area as well as a minimum 50 m perimeter around the area, in order to identify all seedlings of any alien invasive species which might start to germinate and establish.
- Physically remove all identified alien invasive species seedlings from the soil by manually pulling them out with as much as possible of their root systems still intact.
- Place all removed alien invasive species seedlings in a metal drum or any other suitable containing unit and close the drum/containing unit in order to isolate the seedlings.
- Place the closed drum/containing unit on a concrete slab or any other suitable impermeable surface in direct sunlight in order to isolate the alien invasive species seedlings from any natural vegetation and prevent spreading of materials.

- Leave the closed drum/containing unit in direct sunlight for a minimum period of one week in order for all alien invasive species seedlings and materials to adequately dry out and die.
- Once all alien invasive species seedlings and materials have adequately dried out and died, remove the material from the drum/containing unit and place the materials in a minimum 1 m deep hole which is isolated from any natural vegetation.
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- It is recommended that the same hole be utilised for every burning event in order to keep the burnt materials contained and isolated to one location.
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- If burning and underground burial of dried out and dead materials is not possible, materials will have to be transported and disposed of at a suitable registered bio-hazard waste site. This can however prove to be a very costly exercise.
- Photographs must be taken of all the individual steps.

7. Conclusion

If the alien invasive species management process is adequately followed and completed as per this report, it is anticipated that this should be sufficient to prevent the significant establishment or spreading of any legally declared alien invasive species within and around the proposed development area. Other best-practice clearing methods for different alien invasive species can also be obtained from the following website: <http://www.dwaf.gov.za/wfw/Control> if required.

A short description of the process followed during the construction phase and all the photographs of the individual steps must be provided to the specialist upon completion in order to provide final feedback to the competent authority.

8. References

Collins, N.B. 2017. Free State Province Biodiversity Plan: Technical Report v1.0. Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs. Internal Report.

Mucina, L. & Rutherford, M.C. (eds.) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Northern Cape Nature Conservation Act (Act 9 of 2009)

www.climate-data.org