2023

Highlands Estate

Initial Alien Vegetation Control Project

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"Nature is not a place to visit. It is home."

Gary Snyders

Background

It is often said that in conservation that, apart from rehabilitation, we cannot make any place better, we can only protect and conserve what is already there. Invasive species pose the greatest risk to biodiversity and natural areas as biodiversity equates to ecosystem health. Accurate, well thought out, user friendly and concise invasive species control plans are a vital tool necessary for ensuring the correct management and control of these harmful species thereby resulting in better protection of our natural areas and real growth for people, planet and business.

As the alien vegetation control & environmental rehabilitation of the Highlands Estate is a huge priority for the owners much emphasis and resources have been set aside for several projects to ensure a good balance is maintained with respect to the biodiversity, habitat management and planned agricultural activities as envisaged for the farm. The property had been neglected for numerous years prior to the new owners taking over the farm.

Several challenges have been identified as the implementation of the Land Use Plan (LUP) and Management Plan is rolled out over time as resources become available. With this particular emphasis was placed on the alien eradication project undertaken between the years 2003 and 2019. This project was the removal of Eucalyptus, Acacia, Pinus, Hakea & Leptospermum species. However, the flood damage and subsequent erosion in 2006 caused enormous challenges in respect of the natural vegetation. This was further exacerbated by the devastating veld fire of 2014 giving rise to conditions favourable to the mass germination of the dormant alien seedbank in the soils of the property.

Legislative context

Conservation of Agricultural Resources Act (Act No. 43 of 1983) In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act (Act No. 43 of 1983), all declared alien plant species must be effectively controlled. Landowners are legally responsible for the control of invasive alien plants on their properties. In terms of this Act alien invasive plant species are ascribed to one of the following categories: » Category 1: Prohibited and must be controlled. » Category 2 (commercially used plants): May be grown in demarcated areas provided that there is a permit and that steps are taken to prevent their spread. » Category 3 (ornamentally used plants): May no longer be planted. Existing plants may be retained as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

Project Description

Implementation of an Alien Vegetation follow-up Programme to be implemented over the next 10 years as a medium-term initiative. This would include the removal of aliens, follow-up initiatives and the monitoring/recordkeeping of the veld.

The recordkeeping is aimed as a mechanism to determine the status of the veld in respect of biodiversity, flora diversity, veld conditions and ultimately also veld fire management requirements.

Initial Phase:

The initial Phase of this Project was started in 2022 with the implementation of a ***Follow-up Alien Vegetation Clearing Programme*** on Highlands Estate. This phase focused on the mapping out of the property into controllable zones which will be monitored regularly to determine the effects of the annual alien vegetation control measures implemented. The zones have been identified as areas of specific topography & vegetation type which will assist in the recording of alien vegetation regenerative rates of the various alien species.

Good recordkeeping of species diversity and the regenerative rate will ensure proper monitoring, control and corrective measures to be taken to determine the success of the overall project over time. In line with this the farm has been divided into sections marked as **Zones "A"** through to **"F"**, depicted on the ***Dia. 1*** under the heading Maps below.

The 2nd phase was *alien vegetation sweep & clearance* on the property was undertaken in 2022 and was the inception phase of an ongoing annual alien vegetation control programme on the Estate.

A 2nd follow-up *alien vegetation sweep & clearance* was completed during the latter part of 2023/24.

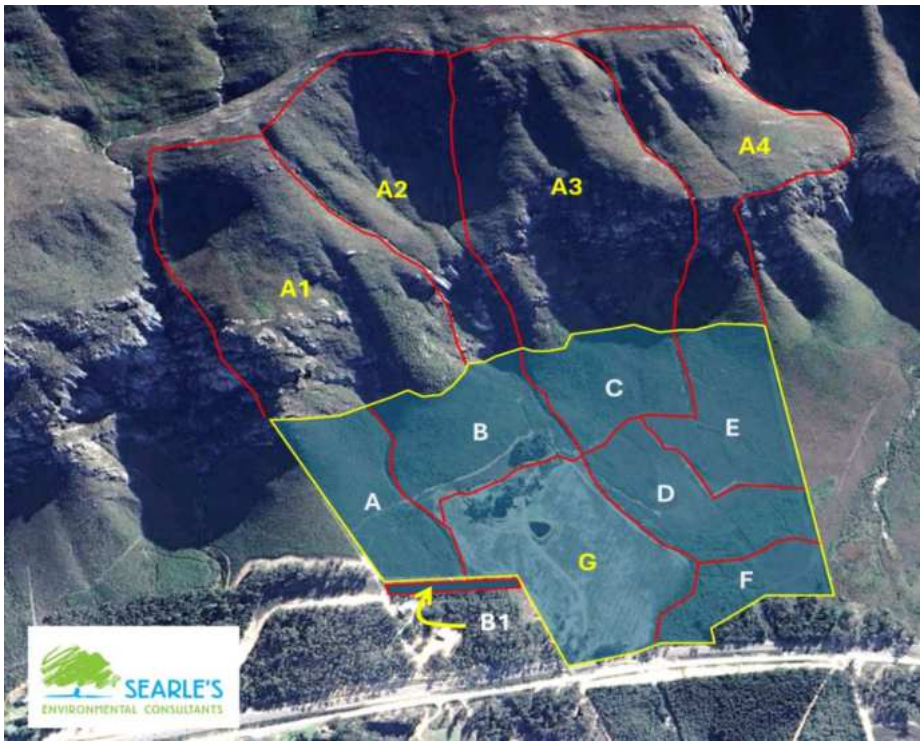
Additional Phase

As part of the mapping, evaluation, and management plan it was recognised that very little control could be exercised over many of the vectors that are responsible for the spread and dissemination of the alien vegetation seed, thus the owners of the farm implemented an additional phase of the initial project in a bid to control the source of the alien vegetation seed "bank". This was identified as the best measure to reduce the spread leading to new infestation. Therefore, neighbouring farms where alien vegetation was still uncontrolled were identified and a concerted effort made to remove all direct sources that posed the direct threat to the Highlands Estate. These areas are also divided into separate areas and are marked as Zones "**A1"** through "**A4"** and "**B1"** on the ***Dia. 1*** under the heading **Maps,** hereunder.

Scope of the project

Map the farm and divide into sections, identifying the alien species and implement a controlled and systematic eradication plan of the alien vegetation infestation in specific phases to be undertaken over time.

Maps



Diag.1

Historic Record

In a bid to understand the topography, vegetation diversity and previous natural influences on the property a study was made of historic aerial photography from May 2003 – May 2023. These images give us a good indication of what has happened on the land over the years.

May 2003

Good indication that property was already infested by alien vegetation some 20 years back. Identified are Eucalyptus, Acacia and Hakea species. The property was fenced, and it appears as though a measure of grazing was managed on the farm for cattle or sheep.

November 2006

Severe precipitation causing flooding, landslip, and erosion off the mountains on the property denuding areas of vegetation and exposing vast sections of land. Portions of the farm is starting to be developed.

November 2011

Soil erosion damage being rehabilitated further development and construction of infrastructure. The control and eradication of alien vegetation also already evident.

November 2012

Dams completed and full, alien vegetation plantations removed and runoff drainage channels all in place. The flood damage rehabilitation efforts evident.

January 2014

The property and surrounding farms ravaged by fire. Alien vegetation all but gone except for a few Eucalyptus trees that have survived the onslaught. This has however created the perfect storm and provided the dormant seeds of not only indigenous species, but also alien vegetation to germinate at a far greater rate than normal.

April 2018

Remarkable recovery of the veld and good work done by the property owners to remove all the debris left after the fire of 2014. Great alien vegetation control practises have resulted in the clearing of the property of almost all the larger populations of the alien vegetation infestation.

July 2019

Further recovery of the veld and erosion control done after the damage done by the floods of 2011 & fire of 2014. Large scale germination of alien vegetation again during the winter of 2019. The development of a longer-term alien vegetation Management Plan is envisaged.

January 2020

Further damage visible because of the Oct 2019 floods. Most of the rehabilitation work was undone and further exacerbated the rate of alien vegetation seed germination.

April 2021

The mechanical clearing of the alien vegetation was undertaken during the latter part of 2021. The implementation of strategic firebreaks and the access to areas in a bid to assist in the event of veld fires was undertaken.

The Alien Vegetation Management Plan is finalised for implementation as from the winter of 2022.

July 2022

Alien Vegetation Management Plan Implemented and the firebreak network established. Vast amounts of alien removed during the initial phase of the project. The mechanical and chemical removal of aliens done in areas A – F as indicated on the dia.1.

May 2023

The 2nd phase of the Alien management Plan is currently underway and was extended to include adjacent areas/farms around the property. These are the areas A – F and the additional areas being A1 – A4 as well as the ESKOM servitude B1 as depicted on the dia.1

The additional area A1 – A4 and the ESKOM servitude was included in a bid to reduce the seed bank of aliens which are not being controlled by the neighbouring property owners and ESKOM.

Identified invasive species on the Estate.

a. **Acacia saligna** - known by various names including golden wreath wattle, orange wattle, blue-leafed wattle, Western Australian golden wattle, but most commonly ***Port Jackson*** willow.

Description:
A small evergreen tree in the family ***Fabaceae***, growing 3-7m high, with blue-green turning bright green leaves.
Bright yellow, globe-shaped flowers bloom from August to November. Brown pods with hardened, whitish margins.
Spread:
Very aggressive invasive species and spreads via seed with the vector being, wind, birds and some mammal species.
Invasive Status:
CARA 2002 - Category 2 NEMBA - Category 1b

b. **Hakea gibbosa** - known as hairy hakea, **Rock hakea** or needle bush hakea.

Description:
A shrub of the family ***Proteaceae*** and is endemic to south-eastern Australia. It has very prickly foliage, hairy shrub, or tree up to 4m high with numerous branches starting from the base. Young twigs and branches very hairy. Greyish-green, needle-shaped leaves which start off densely hairy becoming smooth. Deep cream, small flowers from June to September. Grey woody fruit capsules with a rough surface.
Spread:
Very aggressive invasive species and spreads via seed with the vector being, wind, birds, and some mammal species.
Invasive Status:
CARA 2002 - Category 1 NEMBA - Category 1b

c. **Hakea sericea** – also known as the **Silky hakea** or Syerige hakea (Afrikaans)

Description:

A shrub of the family ***Proteaceae*** and is endemic to south-eastern Australia. Very prickly shrub or tree up to 5m high with numerous branches starting at the base. Young twigs covered in short, fine hairs, older stems smooth. Dark green to grey-green, smooth, needle-shaped leaves. Cream, small flowers from June to September. Wooden fruit capsules which are purplish-brown with paler markings.

Spread:

Aggressive invasive species and spreads via seed with the vector being, wind, birds, and some mammal species.

Invasive Status:

CARA 2002 - Category 1 NEMBA - Category 1b

d. **Hakea suaveolens (or drupacea) –** Also known as the **sweet hakea**.

Description: A shrub of the family ***Proteaceae*** and is endemic to south-eastern Australia. Medium to tall shrub with pale green prickly foliage and white flowers. A rounded shrub or tree up to 6m. Young growth is sparsely hairy. Dark green to grey-green smooth leaves divided into upright, sharp-pointed needles. Cream fragrant flowers from June to September. Woody fruit capsules containing a single winged seed, are yellowish-brown with dark warts.

Spread:

Aggressive invasive species and spreads via seed with the vector being, wind, birds, and some mammal species.

Invasive Status:

CARA 2002 - Category 1 Category 1b

e. **Acacia mearnsii –** Commonly known as the **black wattle** or Swartwattle in Afrikaans.

Description: Of the Fabaceae family and native to South-eastern Australia and Tasmania. An evergreen tree growing 5-10m high, black wattle has dark olive-green finely hairy leaves. Pale yellow or cream spherical flowers in large fragrant sprays blooming from August to September. Fruits are dark brown, finely haired pods.

Spread:

Aggressive invasive species and spreads via seed with the vector being, wind, birds, and some mammal species.

Invasive Status:

CARA 2002 - Category 2 NEMBA - Category 2

f. **Eucalyptus cladocalyx –** Also commonly know as the **sugar gum** or Suikerbloekom (Afrikaans)

Description:

Of the Myrtaceae family, from south Australia. A tall slender, evergreen tree growing 15-40m high with smooth, flaky, tan-coloured bark. The dark green leaves are glossy above and pale below and the foliage is concentrated at the end of the branches. Cream flowers appear from October to February and the tree produces brown fruit capsules. The leaves are poisonous producing prussic acid.

Spread:

Aggressive invader specie and spreads by seed dispersal the vector being wind, birds and small mammals.

Invasive Status:

CARA 2002 - Category 2 NEMBA - a. Category 1b within- (i) riparian areas; (ii) a Protected Area declared in terms of the Protected Areas act; or, (iii) within a Listed Ecosystem or an ecosystem identified for conservation in terms of a Bioregional Plan or Biodiversity Management Plans published under the Act. b. Not listed within Nama-Karoo, Succulent Karoo and Desert biomes, excluding within any area mentioned in (a) above. c. Category 1b in Fynbos, Grassland, Savanna, Albany Thicket, Forest and Indian Ocean Coastal Belt biomes, but- (i) Category 2 for plantations, woodlots, bee-forage areas, wind-rows and the lining of avenues. (ii) Not listed within cultivated land that is at least 50 metres away from untransformed land, but excluding within in any area in (a) above. (iii) Not listed within 50 metres of the main house on a farm, but excluding in (a) above. (iv) Not listed in urban areas for trees within a diameter of more than 400 mm at 1000 mm height at the time of publishing of this Notice, but excluding in (a) above.

g. **Eucalyptus conferruminata –** Also commonly known as the **spider gum**, Bloekom, spinnekop, bushy yate, Bald Island marlock.

Description:

Of the Myrtaceae family, the **Spider Gum** is a small tree with smooth, whitish grey bark. Yellow-green flowers appear from late winter to late spring. It is an attractive, medium-sized shade or screen tree. It is usually multi-trunked with light green, fragrant foliage.

Spread:

Less aggressive invader specie and spreads by seed dispersal the vector being wind, birds and small mammals.

Invasive Status:

NEMBA - Category 1b in fynbos, grassland, savannah, Albany thicket, forest and Indian Ocean coastal belt biomes, but - Category 2 for plantations, woodlots, bee - forage areas, wind rows and the lining of avenues.

h. **Eucalyptus diversicolor -** Commonly known as Karri or Karrie in Afrikaans.

Description:

Of the Myrtaceae family the **Karri** is a tall, dense, massively branched, evergreen tree 25-58m high with smooth bark that is grey-blue in colour with orange-yellow blotches. Dark green leaves which are glossy above and distinctly paler beneath. Cream flowers appear from May to December. The fruit capsules are globular and brown.

Spread:

Less aggressive invader specie and spreads by seed dispersal the vector being wind, birds and small mammals.

Invasive Status:

CARA 2002 - Category 2 NEMBA - a. Category 1b within- (i) riparian areas; (ii) a Protected Area declared in terms of the Protected Areas act; or, (iii) within a Listed Ecosystem or an ecosystem identified for conservation in terms of a Bioregional Plan or Biodiversity Management Plans published under the Act. b. Not listed within Nama-Karoo, Succulent Karoo and Desert biomes, excluding within any area mentioned in (a) above. c. Category 1b in Fynbos, Grassland, Savanna, Albany Thicket, Forest and Indian Ocean Coastal Belt biomes, but- (i) Category 2 for plantations, woodlots, bee-forage areas, wind-rows and the lining of avenues. (ii) Not listed within cultivated land that is at least 50 metres away from untransformed land, but excluding within in any area in (a) above. (iii) Not listed within 50 metres of the main house on a farm, but excluding in (a) above. (iv) Not listed in urban areas for trees within a diameter of more than 400 mm at 1000 mm height at the time of publishing of this Notice, but excluding in (a) above.

i. **Leptospermum laevigatum** – Commonly known as the Australian **Myrtle**, Coast tea tree; small-leaved tea tree (English); Australiese mirteboom (Afrikaans)

Description:

Of the Myrtaceae family the Australian Myrtle is a large, densely branched and untidy spreading small tree reaching up to 8m high. The old stems are twisted and furrowed with flaking bark. Dull greyish-green, leathery leaves with rounded tips which end in a tiny point. Solitary white flowers appear from August to October. The green fruit capsules turn yellow and then grey.

Spread:

Extremely aggressive invader specie and spreads by seed dispersal the vector being wind, birds and small mammals.

Invasive Status:

Existing legislation: CARA 2002 - Category 1 NEMBA - Category 1b

j. **Acacia cyclops –** Commonly known as the red-eye wattle or **rooikrans** (Afrikaans)

Description:

Of the Fabaceae family One of many wattle species originating from Australia, Rooikrans is a serious invader of the Cape Floristic Kingdom. Evergreen shrub 1.5-4m high, with bright green elongated leaves and yellow flowers, was brought to South Africa for the primary purpose of stabilising shifting sand dunes in the Western Cape.

Spread:

Extremely aggressive invader specie and spreads by seed dispersal the vector being wind, birds, and small mammals.

Invasive Status:

CARA 2002 - Category 2 NEMBA - Category 1b

k. **Pinus pinaster –** commonly known as the cluster pine or Trosden (Afrikaans)

Description: Of the **Pinaceae** family, the **cluster pine** is a coniferous tree 8-15m high, conical when young, becoming cylindrical with a tall, bare trunk when older. Reddish-brown bark, deeply cracked into plates. Dull grey-green leaf needles in bundles of two. Cones initially purple, turning light brown 9-18cm long. This pine invades mountains and lowland fynbos.

Spread:

Aggressive invader specie and spreads by seed dispersal the vector being wind, birds, and small mammals.

Invasive Status:

CARA 2002 - Category 2 NEMBA - a. 2 for plantations and wind-rows. b. 1b elsewhere. c. National Heritage Trees or National Monument Trees in terms of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), are not listed.

l. **Pinus radiata:** Commonly known as the Monterey or Radiata pine of the Radiataden (Afrikaans).

Description:

Of the Pinaceae family, **Radiant Pine** is a coniferous tree 12-25m high with a broad, rounded canopy. Dark green leaf needles in bundles of two to three which are very densely arranged. Yellowish-brown, woody cones 7-14cm long. This pine invades fynbos, forest clearings, grasslands, usually on moist mountain slopes.

Spread:

Invader specie and spreads by seed dispersal the vector being wind, birds, and small mammals.

Invasive Status:

CARA 2002 - Category 2 NEMBA - a. 2 for plantations and wind-rows. b. 1b elsewhere. c. National Heritage Trees or National Monument Trees in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), are not listed. d. Specimens with a diameter (calliper width) greater than 400 mm at a height of 1000 mm at the date of publication of this Notice are not listed for urban areas in Cape Town, the Overberg District Council and Winelands District Council, except when in riparian areas where they remain Category 1b.

m. **Schinus terebinthifolius** – Commonly known as the **Brazilian Pepper** Tree, Brazilian holly, Christmas berry tree, pepper hedge, South American pepper (English); Brasiliaanse peperboom (Afrikaans)

Description: The Brazilian pepper is of the **Anacardiaceae** family, an evergreen shrub or tree growing up to 6m high with wide-spreading, horizontal branches. The dark green leaves have prominent, pale veins above and are paler and smoother below, while the leaflets are rounder. Small, creamy-white flowers appear from September to March. Male and female flowers develop on separate trees. Fruits are bright red, slightly fleshy, one-seeded spherical drupes and are poisonous. The sap is a skin irritant and affects the respiratory tract.

Spread:

Invader specie and spreads by seed dispersal the vector being birds, and small mammals.

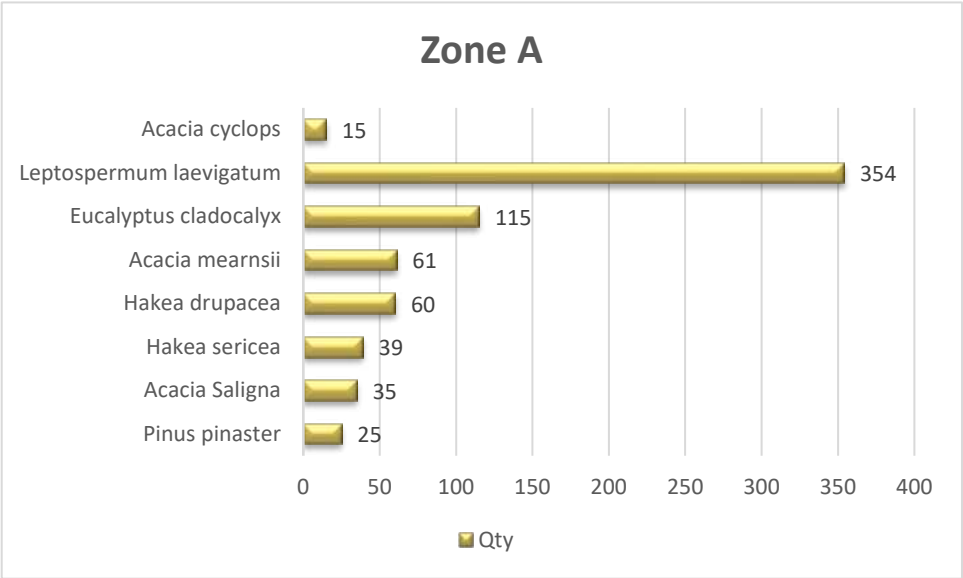
Invasive Status:

CARA 2002 - Category 1 Proposed legislation: NEMBA - Category 1b KwaZulu-Natal, Mpumalanga, Limpopo and Eastern Cape, 3 in rest of South Africa

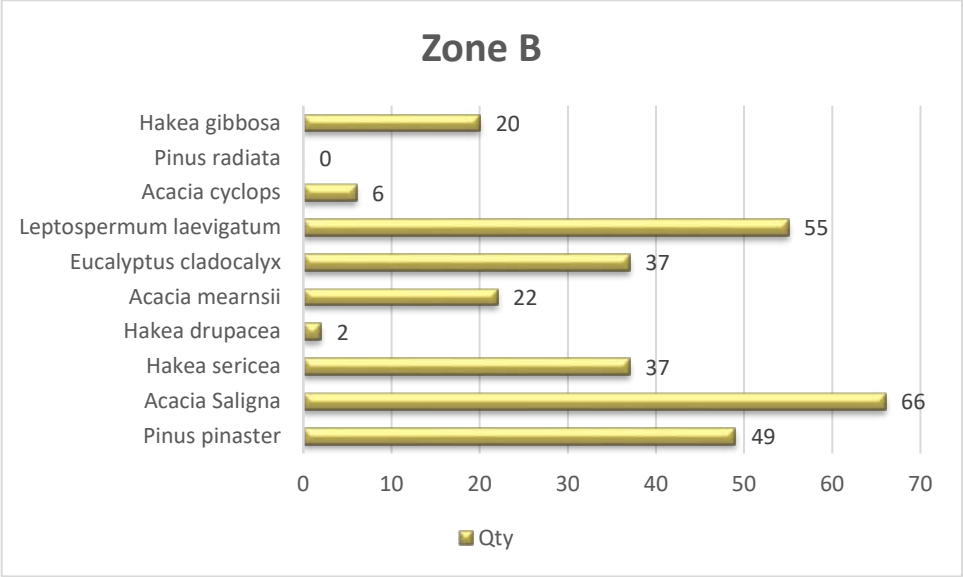
Alien Plant material removed during the 2023/24 project:

Herewith are the totals in respect of the vegetation species removed for the respective zones as per the attached Dia.1 in this document. The graphs reflect the accumulative totals only, for more detail on the plant sizes removed please see attached document **Annexure "A"**.

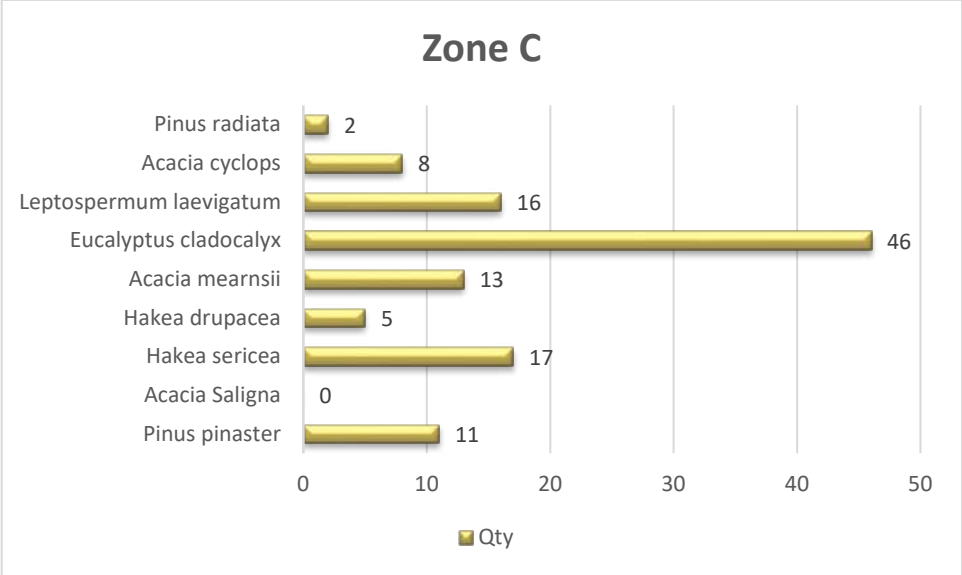
Zone "A"



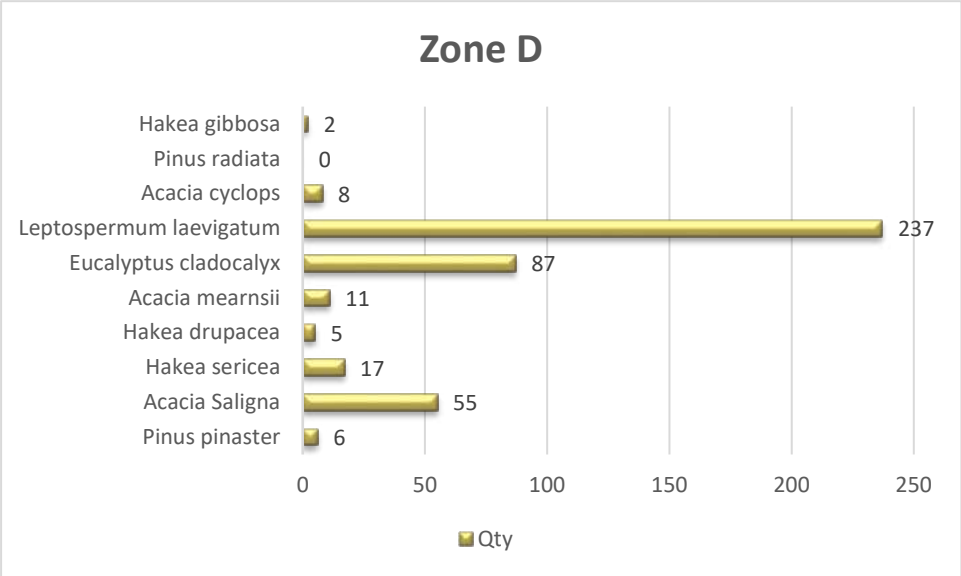
Zone "B"



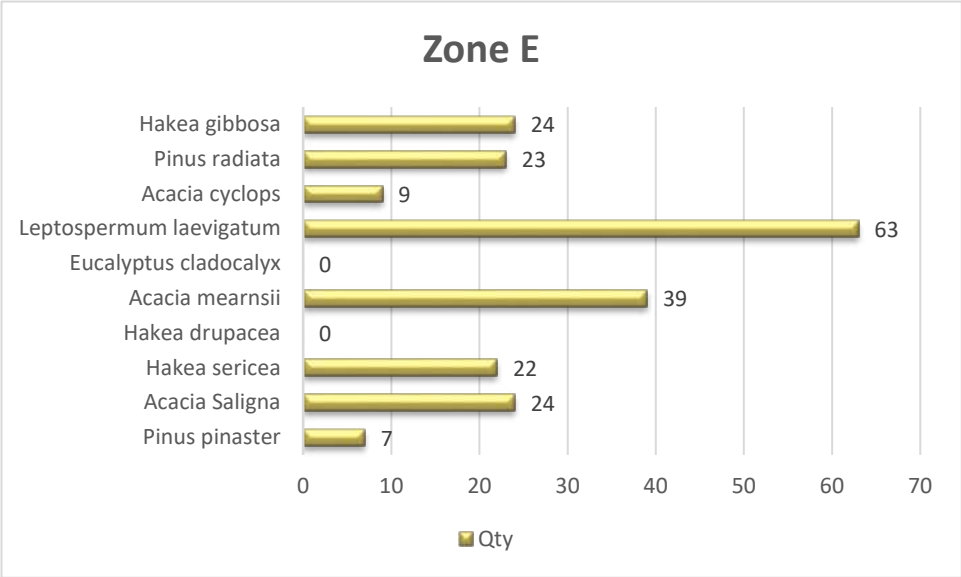
Zone "C"


Zone C
Pinus radiata
Acacia cyclops
Leptospermum laevigatum
Eucalyptus cladocalyx
Acacia mearnsii
Hakea drupacea
Hakea sericea
Acacia Saligna
Pinus pinaster
2
8
16
46
13
5
17
0
11
0
10
20
30
40
50
Qty

Zone "D"


Zone D
Hakea gibbosa
Pinus radiata
Acacia cyclops
Leptospermum laevigatum
Eucalyptus cladocalyx
Acacia mearnsii
Hakea drupacea
Hakea sericea
Acacia Saligna
Pinus pinaster
2
0
8
237
87
11
5
17
55
6
0
50
100
150
200
250
Qty

Zone “E”


Zone E
Hakea gibbosa
Pinus radiata
Acacia cyclops
Leptospermum laevigatum
Eucalyptus cladocalyx
Acacia mearnsii
Hakea drupacea
Hakea sericea
Acacia Saligna
Pinus pinaster
24
23
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63
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39
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22
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7
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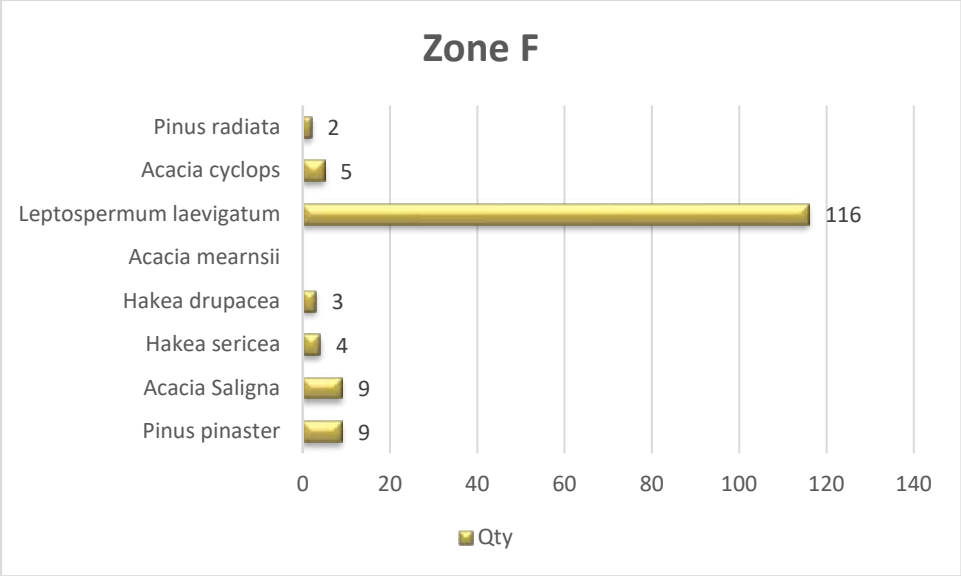
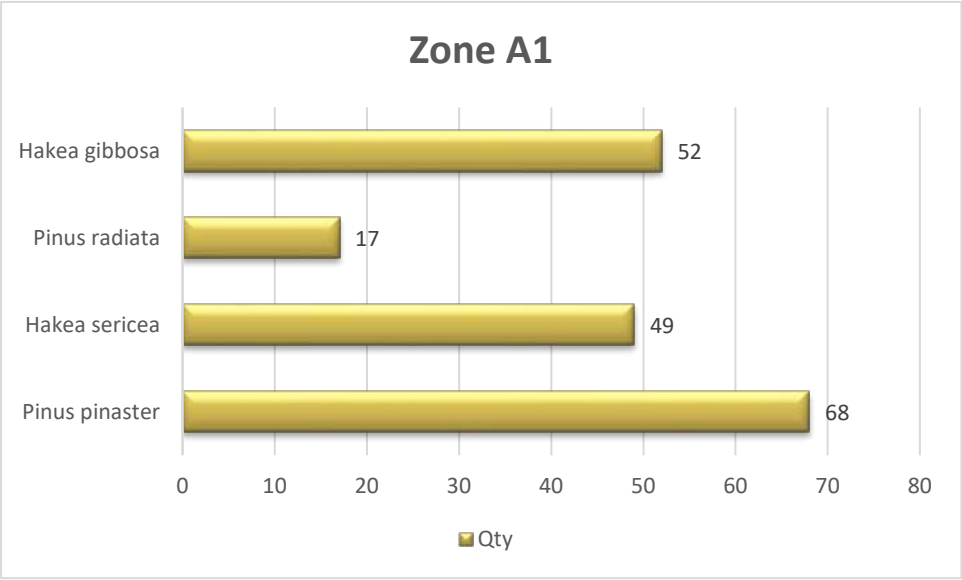
10
20
30
40
50
60
70
Qty

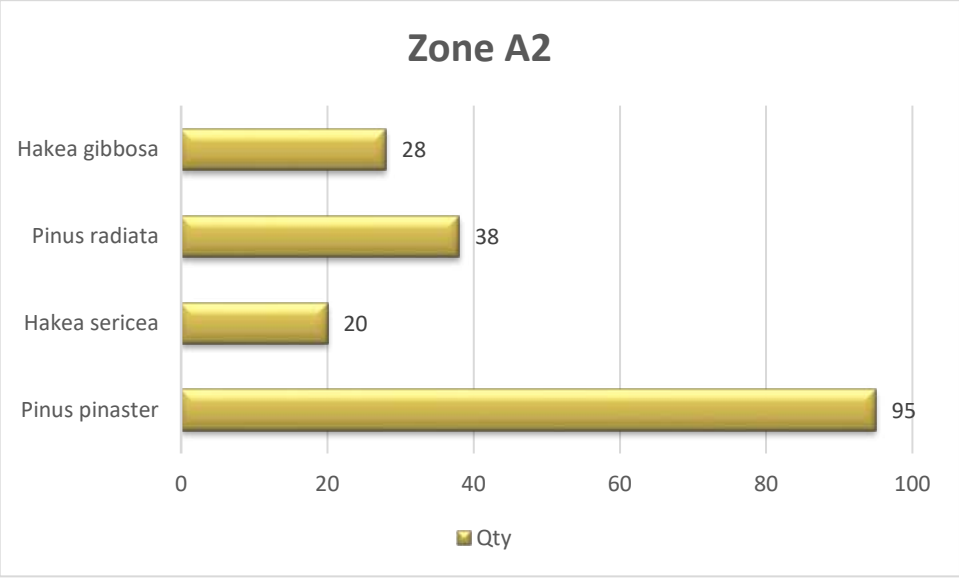
Zone “F”


Zone F
Pinus radiata
Acacia cyclops
Leptospermum laevigatum
Acacia mearnsii
Hakea drupacea
Hakea sericea
Acacia Saligna
Pinus pinaster
2
5
116
3
4
9
9
0
20
40
60
80
100
120
140
Qty

Zone "A1"

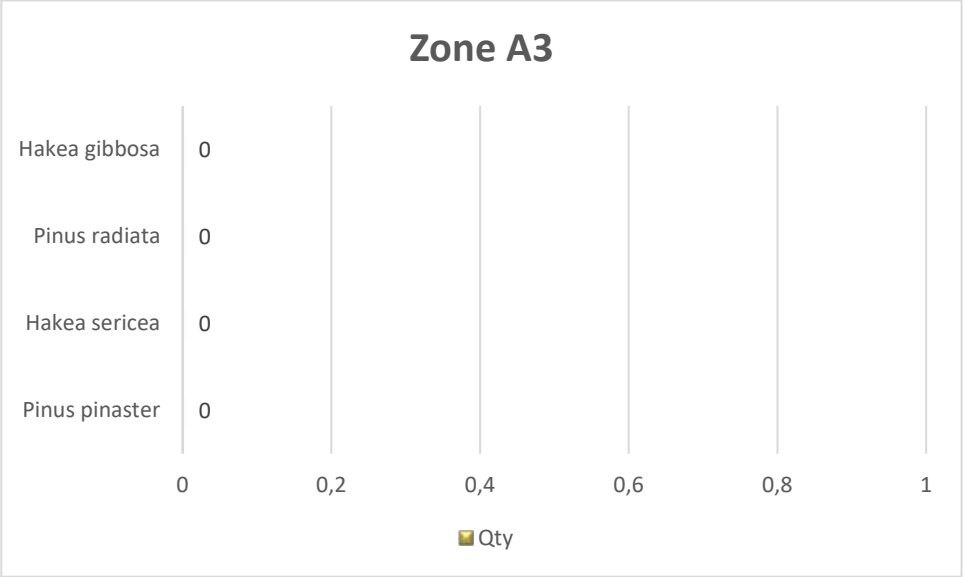


Zone "A2"

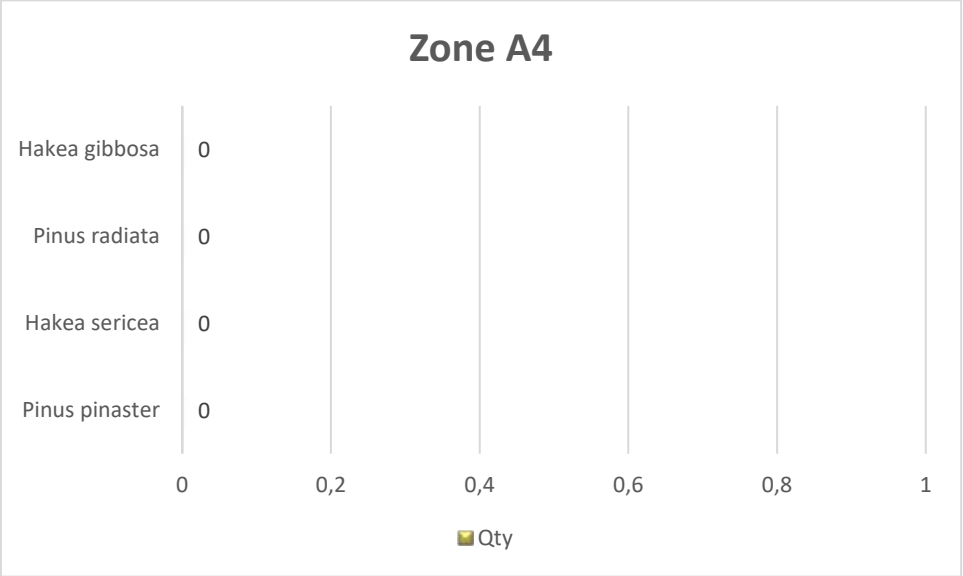


***NB**: Due the extremely high temperatures during the latter part of December and in January the alien vegetation clearing programme for the Zones A3 – A4 will be postponed until the weather allows for the clearing team to complete the last 2 (two) areas. The altitude and precarious nature of the terrain makes the clearing activity very difficult if the conditions are not optimal.*

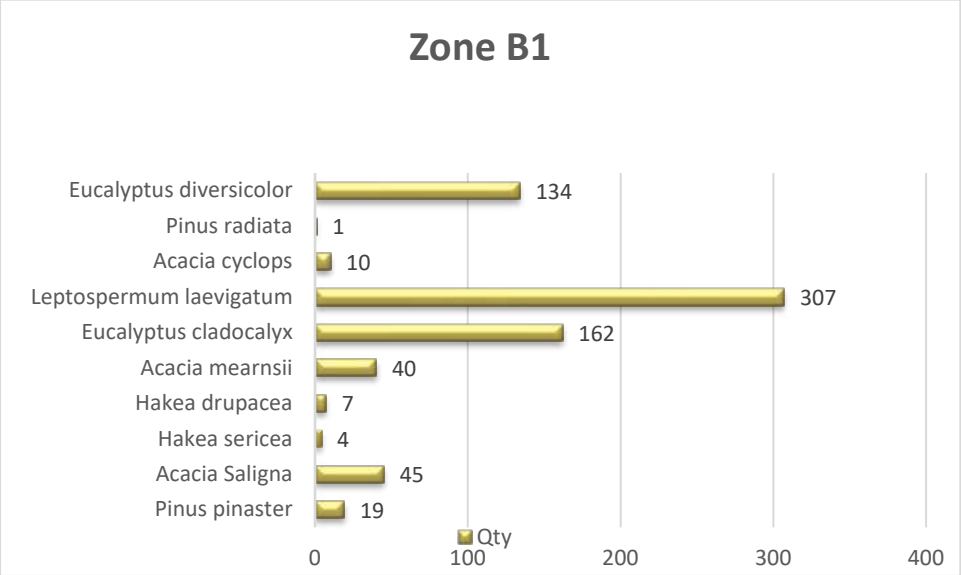
Zone "A3" **(To be completed)**



Zone "A4" **(To be completed)**



Zone "B1"



Follow-up cycle recommendations.

To assess the impact of clearing activities, follow-ups and rehabilitation efforts, monitoring must be undertaken. The monitoring programme will allow for the assessment of the alien plant regrowth/invasion on the farm and will also assist in monitor the efficacy of the management programme for Highlands as implemented.

Now that a full survey has been done and with the completion of the 2nd clean-up schedule it is recommended that regular follow-up regimes are implemented. This must be done in bi-annual cycles that co-inside with seasonal growth and seed dispersal of the alien vegetation species.

Threat from neighbouring properties.

Whilst the control and management of alien vegetation on the farm can be controlled through proactive measures, regular interventions, and bi-annual clearing initiatives the treat of further infestation and spread of alien species from neighbouring properties will always remain a concern. To negate this the additional intervention as undertaken by the owners of Highlands Estate on the Zones A1 – A4 and B1 must be continued to minimise the spread from neighbouring properties.

Despite these measures being costly and time consuming it will always pay off huge dividends in respect to the rehabilitation and improvement of the biodiversity on the estate and immediate areas surrounding the farm.

The single largest infestation threat will however always be from the 2 (two) eucalyptus plantations south-west and south-east of the property as well as the ESKOM servitude on the southern boundary of the farm.

During the 2nd clean-up schedule of the farm undertaken a new alien vegetation plant has been identified as a threat, although not as aggressive as others the spread of **Schinus terebinthifolius** is a concern. The plant was found mainly in Zone "A" and to a lesser extent in Zone "B" as well. As the vector for the spread of this alien are birds it will be difficult to control the spread other than removing the seed source itself.

Concerns

The moribund state of some of the natural vegetation in sections of the property does raise a concern with the rapid, dense, and tall growth of specifically *Aulax umbellata*.

Comment & Feedback

Having been involved with the alien vegetation irradiation initiative on Highlands Estate since 2020 and doing a basic environmental assessment of the property it is clear that there is a definite and dramatic improvement of the biodiversity on the property. The diverse fauna of the farm is particularly impressive specifically considering the extent of the previous alien vegetation infestation and the 3 major natural disasters that have ravaged the property over the last 15 years.

A list of the fauna recorded on the farm has been compiled and served as part of the initial assessment of the habitat to determine the current state of the biodiversity. This should be compared with the biodiversity of conserved areas in the district to establish the status of the farm as a whole.

It is encouraging to see the enthusiasm and extent to which the current property owners have committed themselves to this project, the proactive implementation of alien vegetation control and biodiversity management of the estate serves a s a testament to that.

Whilst much works remains to be done to maintain the momentum of the biodiversity improvement it is encouraging to note that the achievements of the initial phase has ensured that alien vegetation control now becomes a general maintenance function of the farm and not a special project anymore.