Invasive Species Monitoring, Control and Eradication Plan

Erf 65, Hoekwil

June 2018

Figure 1: Showing Erf 65 accessed via Bitou Street in Hoekwil (image courtesy of Google Earth dated 2016/04/24).

o.b.o.

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Wilderness Properties

(1) **Executive Summary**

The authors were commissioned to compile a Control Plan for the above mentioned property. Site visits were made to evaluate the density and composition of the vegetation.

The Alien Invasive Species found there mainly consist of *Acacia mearnsii* (Black Wattle) and *Acacia cyclops* (Rooikrans).

After a thorough evaluation of the property the Control Plan hereunder was completed.

Fire recently destroyed (2016 and 2017) the original infestation at the property and consequently the current invasion consists of a dense cohort of juvenile Black Wattle plants between 2 and 4 meters high, with a stem density of between 10 plants per square meters and 30 plants per square meters. There are some large individuals of up to 8 meters in height.

The map image below places the extent of the infestation in context.

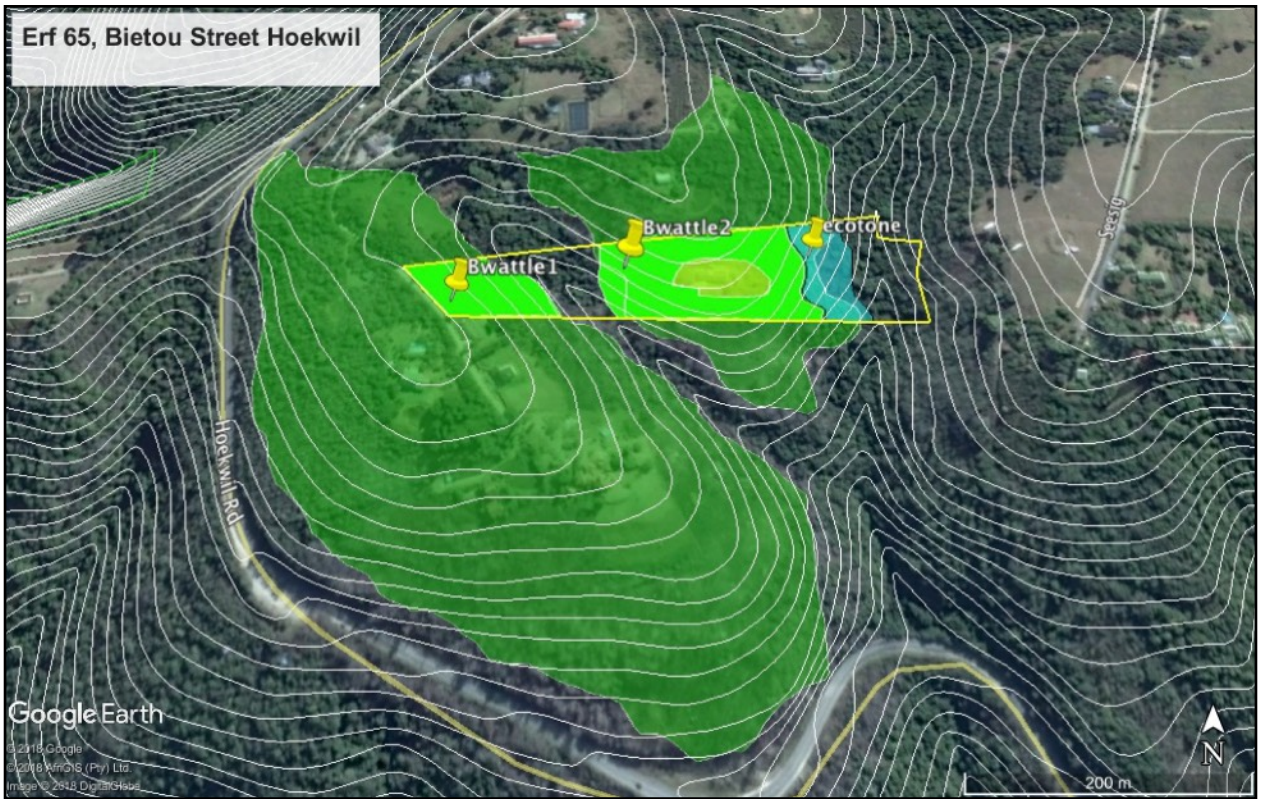

Figure 2: showing the general area of Black Wattle infestation (shaded green polygons) in comparison to the area infested at Erf 65 (bright green polygons), (image courtesy of Google Earth).

Appendix 1 contains provisions of other Acts related to vegetation clearing activities, and sensitivity attributes and features of biodiversity at the property.

Appendix 2 has a list of indigenous plant species observed during the survey.

(2) **Introduction**

Erf 65 (3.84112 ha; hereinafter referred to as the "property") is zoned Agriculture Zone I and situated on generally south-dipping land (see Figs. 1 and 2) intersected by two watercourses flowing down towards the Serpentine river. The east facing slope at the entrance of the property is heavily infested with Black Wattle (*Acacia mearnsii*). Similarly the south-dipping slope and area surrounding the dwelling unit is heavily infested with Black Wattle. There is a mixture of Garden Route Keurboom (*Virgilia divaricata*) and Black Wattle at the upper slope above the dwelling unit. Further east over the property the ecotonal area is lightly infested and otherwise dominated by grooved-bark tree *Erica canaliculata*.

The property manager (Wilderness Properties) o.b.o. the landowner of Erf 65 Hoekwil was issued with a Pre-Directive dated 22 March 2018, for failure to declare and report listed Alien Invasive Species. In terms of the Alien and Invasive Species Regulations, 2014[1], Section 76 of the Act requires, in this instance, that the applicant compile an "Invasive Species Monitoring, Control and Eradication Plan (Control Plan) for land under their control", and include all Listed Invasive Species in terms of Section 70(1) of said Act.

Application for an exemption from the requirements of listed activities will be made from the relevant state departments. See Appendix 1 for provisions of other Acts related to clearing activities.

[1] National Environmental Management: Biodiversity Act (Act No. 10 of 2004)

(3) **Map of the Management Unit Compartments in land under the control of the land owner:**

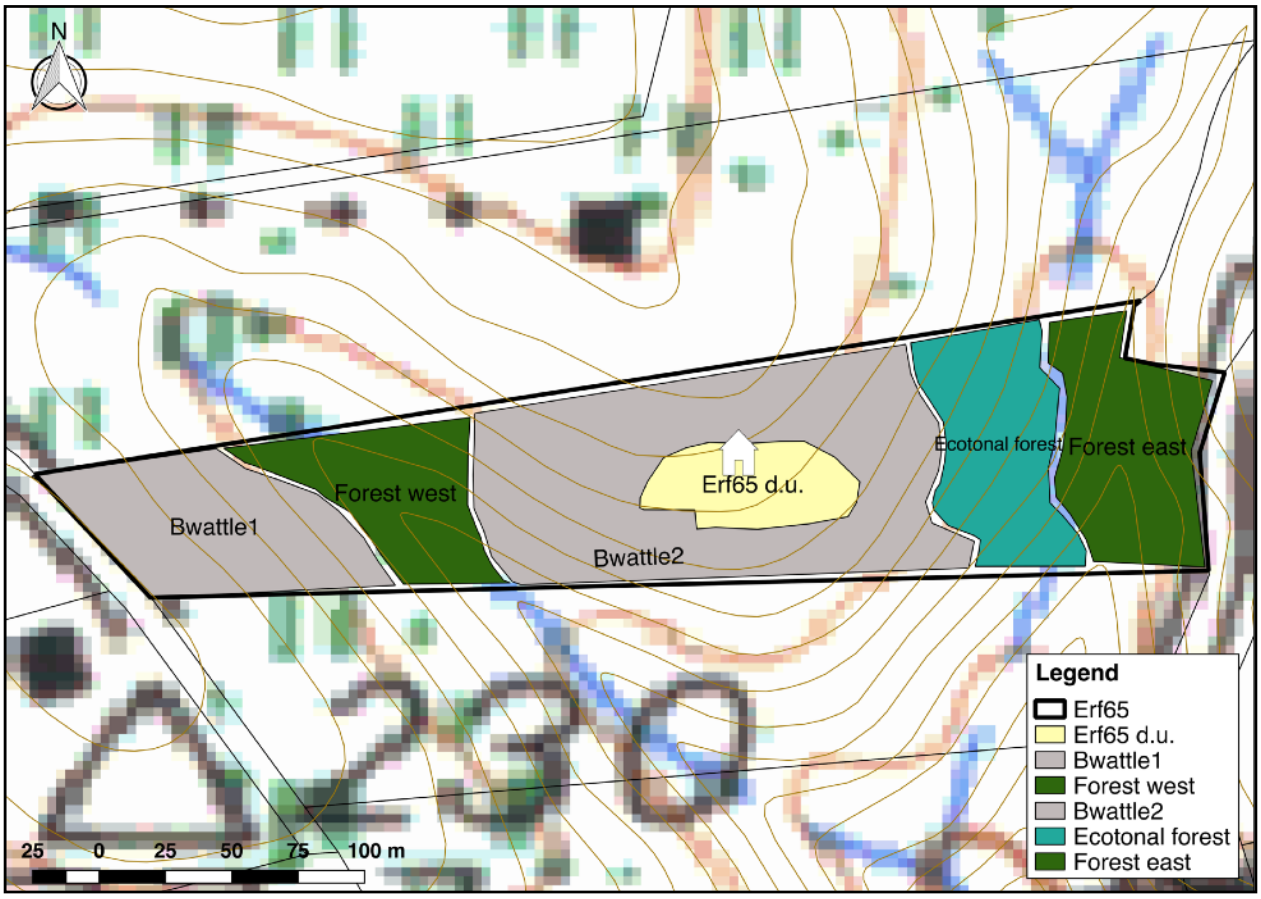

Figure 2: showing the dense stands of wattle at the property (Bwattle_1 and Bwattle_2) and encircling the house (Erf65 d.u.) with forest belts along watercourses. The blue-green polygon indicates ecotonal forest which has a light infestation only.

Management Unit Compartments and sizes:

Bwattle_1 (grey polygon; east facing slope at entrance) are dense stands of Black Wattle over an area of **0.57 ha** (5672 m^2). Here the Black Wattles are thin juveniles with a stem size of between 2 and 25 mm, and between 1 and 2 meters in height.

Two watercourses fringed by forest traverse the property and are only very lightly infested and are otherwise pristine.

Forest west (green polygon) with an area of 0.39 ha (3910 m^2) has a very light infestation of 2 specific alien plant species (*Senna bicapsularis* and *Verbena bonariensis*);

Bwattle_2 (grey polygon; south facing slope encircling the house) are dense stands of Black Wattle mixed with Garden Route Keurboom over an area of **1.56 ha** (15 552 m^2). Here the Black Wattles are thin juveniles with a stem size of between 2 and 25 mm, and between 1 and 2 meters in height, and mixed with indigenous Garden Route Keurboom (north of the house only).

Ecotonal forest (blue-green polygon) indicates a lightly infested area with some Rooikrans and Black Wattle adjacent to Forest east covering an area of 0.47 ha (4712 m^2).

Forest East (green polygon) with an area of 0.5 ha (5040 m^2).

Total area in hectares to clear: 2.13 ha

(4) **A Table of listed Alien Invasive Species in the Management Unit Compartment**:

The property, aside from the forested watercourse areas, is heavily infested with dense cohorts of juvenile Black Wattle plants between 2 and 4 meters high, with a stem density of between 10 plants per square meters and 30 plants per square meters. There are some large individuals of up to 8 meters in height and scattered large individuals of Blackwood trees. Rooikrans is scattered across the property and low in density.

Table 1: The listed Alien and Invasive Species in both Management Unit Compartments Bwattle_1 and Bwattle 2

SPECIES	COMMON NAME	NEMBA Cat.	ESTIMATED % COVER	PRIORITY (/10)	INVASION RISK
Acacia cyclops	rooikrans	1b	Scattered 5%	10	HIGH
Acacia mearnsii	black wattle	2	Dense 60%	10	n/a
Acacia melanoxylon	blackwood	2	Scattered 10%	10	n/a
Anredera cordifolia	Madeira Vine	1b	Scattered 1%	10	HIGH
Cestrum laevigatum	Inkberry	1b	Scattered 1%	8	HIGH
Grevillea robusta	Silky Oak	3	Scattered 1%	8	LOW
Paraserianthes lophantha	Stinkbean	1b	Scattered 1%	8	HIGH
Pinus pinaster	Pine	1b	Scattered 1%	5	HIGH
Rubus cf. fruticosus	European blackberry	2	localized <1%	5	LOW
Senna bicapsularis	Senna	1b	localized 1%	5	HIGH
Verbena bonariensis	Verbena	1b	localized <1%	5	LOW

(5) **Describing the prioritization of the land parcels in the Management Unit Compartments**

First clear **Bwattle_1** at entrance and on western slope of watercourse; and proceed to remove Senna and Verbena from **Forest west.**

Secondly proceed to clear **Bwattle 2**, and proceed to investigate and clear occasional invasives from the **Ecotonal forest.**

(6) **Reporting on the efficacy of previous control or eradication measures**:

It is not known whether there was previous Alien Invasive Species clearing at the property. Two recent fires have spread new cohorts of Black Wattle.

The tenant mentioned some large trees were felled. There are signs of recently sawn off trunks - specifically *Pinus pinaster*.

(7) **Targets and timelines for the Control Plan**:

(7)(1) Target and remove all visible Alien Invasive Species from the property in six months.

(7)(2) Second term follow up after six months with physical weeding and spraying of herbicide where needed.

(7)(3) Third term of six months - check for newly emerged seedlings and resprouters and remove by hand.

(7)(4) Year 2: inspect and remove emerging plants.

(7)(5) Year 3: inspect and remove emerging plants.

For the next 5 years.

(8) **Responsibilities and reporting requirements of the Control Plan**:

The landowner is responsible to implement the Control Plan. The Control plan will be sent to the competent authority namely DEA:Biosecurity Services; and reporting thereafter will be done, with courtesy reporting to George Municipality and the Department of Environmental Affairs & Development Planning (including CapeNature).

The ECO o.b.o. of the land owner is responsible for Monitoring of the progress of implementation and pesticide use (by a registered PCO).

(9) **The Methods to be employed in the Control Plan**:

As the property is steep and generally sensitive from a biodiversity perspective it is recommended that the juvenile Black Wattle plants

are removed by hand using handsaws and bladed brush cutters, without uprooting plants. As Inkberry, Silky Oak, Stinkbean, European Blackberry and Verbena are low in numbers and density it is recommended that they are uprooted and destroyed before becoming widespread.

Plant debris should be extracted to a point to be shredded by a chipper machine. Where not practical to remove debris to an access road then the debris should be stacked in contour rows to assist with slowing down erosion by water following clearing.

Table 2: Methods to be employed for the control of listed Invasive Species in the Land Parcel

SPECIES	COMMON NAME	CONTROL METHOD	SOURCE REFERENCE
Acacia cyclops	rooikrans	Chainsaw removal of large trees with immediate arboricide treatment of cut stumps. Knapsack spraying of coppice and seedling regeneration.	Working for Water Programme's approved methods for the control of Acacia mearnsii.
Acacia mearnsii	black wattle	cut to ground level and fell, juvenile plants to be brush cut with blade	see attachment for approved methods
Acacia melanoxylon	blackwood	Fell large trees	Working for Water Programme's approved methods for the control of Acacia melanoxylon.
Anredera cordifolia	Madeira Vine	Use collection bags	
Cestrum laevigatum	Inkberry	Uproot	
Grevillea robusta	Silky Oak	Uproot	
Paraserianthes lophantha	Stinkbean	Uproot	
Pinus pinaster	Pine	Fell large trees	Working for Water Programme's approved methods for the control of pinus pinaster
Rubus cf. fruticosus	European blackberry	Uproot	

SPECIES	COMMON NAME	CONTROL METHOD	SOURCE REFERENCE
Senna bicapsularis		Uproot	
Verbena bonariensis	Verbena	Manual removal of all young plants found, ensuring all roots are removed.	

(10) **Monitoring and Evaluation of the Control Plan:**

As the area is surrounded by plant propagule sources and in conjunction with avifaunal seed dispersal, natural succession and colonization by indigenous plants is predicted to be successful following the removal of Invasive Alien Species.

Rehabilitation of the cleared areas will improve ecosystem functioning and services of the habitat and enhance ecological linkages with surrounding vegetation.

Recommendations for management:

As the entire property is generally sensitive the contracted clearing team must conduct activities carefully and be wary of exacerbating erosion and damage to existing indigenous plants in the forest and elsewhere as far as is practical.

Uprooting of plants is to occur for only species which are scattered and occasional whereas the dense stands of Black Wattle must be cut to ground level and poisoned after a follow up inspection.

The operator must manage the team and not allow for fires and littering.

(11) References

- Bromilow, Clive (2010) Problem Plants and Alien Weeds of South Africa, published by Briza Publications CC, ISBN 978-1-920217-30-3
- STELLENBOSCH MUNICIPALITY ALIEN INVASIVE PLANTS MANAGEMENT PLAN (September 2016) - Update of: Lizelle Koen (2013) A Management Plan for Alien Invasive Plants on Municipal Land in Stellenbosch Municipality. Faculty of AgriScience, Department of Entomology and Conservation, University of Stellenbosch.
- Working for Water (2002) Policy on the use of Herbicides for the Control of alien Vegetation, Department of Water Affairs and Forestry

Appendix 1

(12) **Provisions of other Acts related to clearing activities**:

(12)(1) **OSCAE**: The property is within the Outeniqua Sensitive Coastal Area Extension (OSCAE) boundary, and thus subject to the Outeniqua Sensitive Coastal Area Regulations[2] list of scheduled activities, administered by the local authority, for *inter alia,* "disturbance of vegetation" and "earthworks".

(12)(2) **NEMA**: The National Environmental Management Act (NEMA) EIA Regulations[3] of 2014, as amended, stipulates that, in terms of Listing Notice 1 activity 17, if more than 1 hectares of indigenous vegetation is cleared then a Basic Assessment application for environmental authorization is required. The clearing activity here relates to removal and control of IASs and not clearing of the soil layer.

(12)(3) **NEMBA**: The National Environmental Management Biodiversity Act (NEMBA) published the "National List of Ecosystems that are Threatened and in need of Protection", where in terms of Listing Notice 3 activity 12 (of the EIA Regulations of 2014, as amended) if more than 300 m^2 of *Endangered* or *Critically Endangered* indigenous vegetation is cleared then a Basic Assessment application for environmental authorization is required.

(12)(4) **NFA**: The National Forest Act, 1998 (Act No. 84 of 1998), as amended, stipulates that i.t.o. section 15(1), a licence is required to (a) cut, disturb, damage or destroy any protected tree, or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree.

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[2] Government Gazette No. 19493, GN No. R. 1526 (1998) Environment Conservation Act, 1998 (Act No. 73 of 1989): Identification of activities which may have a detrimental effect on the environment: Outeniqua Sensitive Coastal Area Extension Regulations

[3] Government Gazette No. 40772, GN No. R. 327 (2017) National Environmental Management Act, 1998 (Act No. 107 of 1998) Amendment of the Environmental Impact Assessment Regulations, Listing Notice 1 2014

(13) **Primary biodiversity informants:**

Vegetation description: According to the Vegetation Map of South Africa, Lesotho and Swaziland[4] the mapped vegetation units occurring at the property (see Figure 1) are: **Southern Cape Afrotemperate Forest** (FOz 1:I3), protected i.t.o. the National Forest Act, 1998 (Act No. 84 of 1998), as amended (with ecotonal vegetation alongside watercourses); ***Endangered*** Garden Route Shale Fynbos (FFh 9); and ***Critically Endangered*** Garden Route Granite Fynbos (FFg 5). The fynbos at the property is heavily infested with Alien Invasive Species, mostly black wattle (*Acacia mearnsii*).

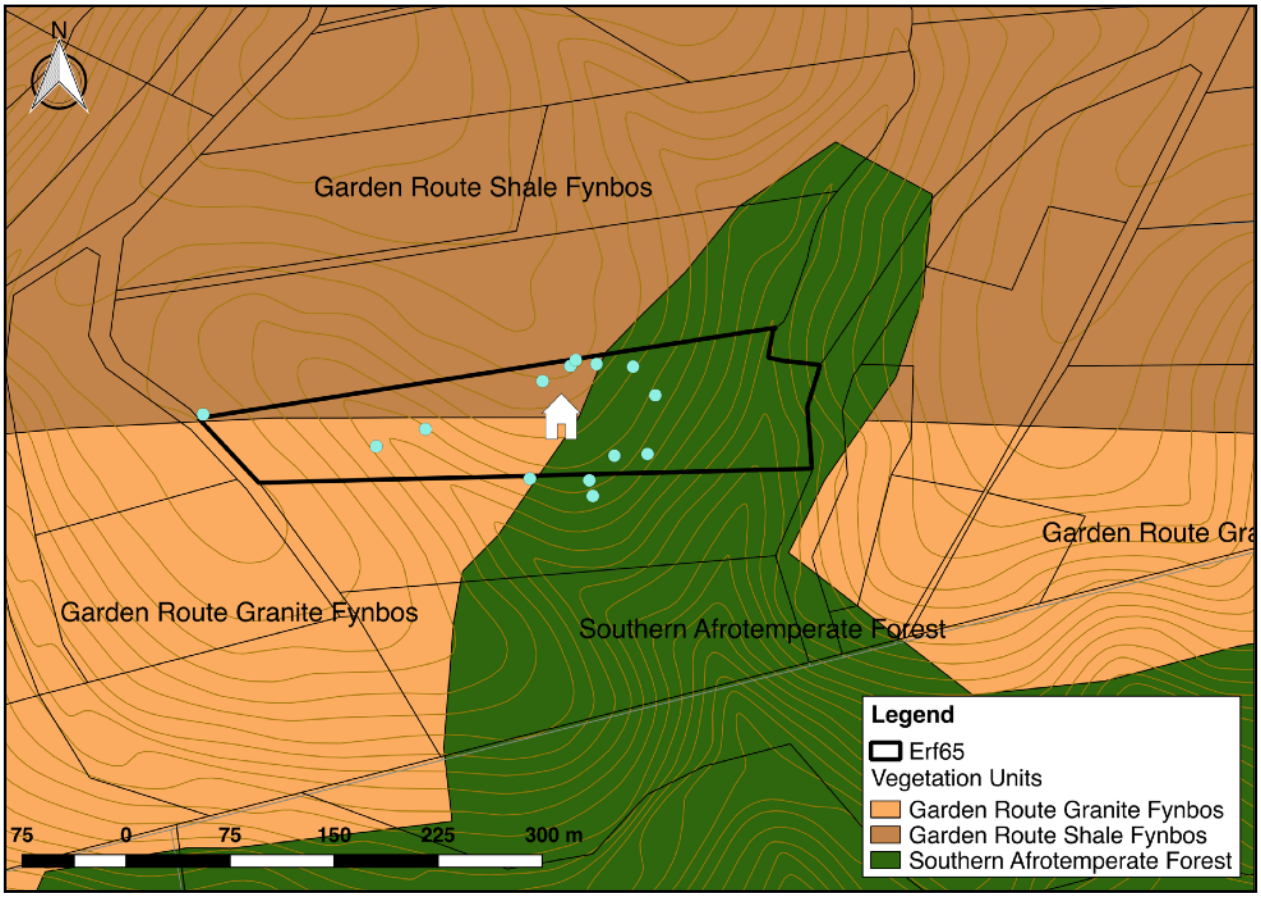

Figure 1: Showing the property in context of the National Vegetation units, mapped here as a mixture of Protected Southern Cape Afrotemperate Forest; *Endangered* Garden Route Shale Fynbos; and *Critically Endangered* Garden Route Granite Fynbos.

[4] Mucina L & Rutherford MC (eds) (2006) Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

(14) **Secondary biodiversity informants**:

The **Biodiversity Spatial Plan**[5] indicates the subject area as being within designated sensitive areas (see Figure 2), namely: mostly terrestrial Critical Biodiversity Area 2 (degraded by successive Alien Invasive Species occurrence); and some terrestrial Critical Biodiversity Area 1 (forest) adjoining Ecological Support Area 2 (watercourse), with the following features:

1. Bontebok Extended Distribution Range (bushbuck likely to occur here);

2. Water Source Protection (Touws);

3. Watercourse protection- South Eastern Coastal Belt.

The primary management objective for sensitive areas is to maintain the habitat in a natural or near-natural condition, and prevent further loss of habitat. Whereas the degraded habitat (here partially transformed due to numerous Alien Invasive Species cohorts following fire and other anthropomorphic disturbance) should be rehabilitated and thereafter have only appropriate biodiversity land use with minimal impact to the environment. Restoration and reducing impacts on ecological processes and structural functioning is key for ecosystem services provided by watercourses and indigenous vegetation, also allowing for movement of fauna. As the area is heavily infested by Alien Invasive Species and coupled with recent highly intense fire the topsoil has been oxidized in places with erosion scars visible from excessive and sustained heat (from burning roots).

Freshwater Ecosystem Priority Areas (**FEPAs**): The property is within a **River FEPA** and associated sub-quaternary catchment area draining towards the Serpentine River (PES: Class B); also a declared RAMSAR wetland complex of global importance. Two unnamed streams bisect the property and drain towards the Serpentine River and are flanked by mostly pristine forest.

[5] http://bgis.sanbi.org/Projects/Detail/194

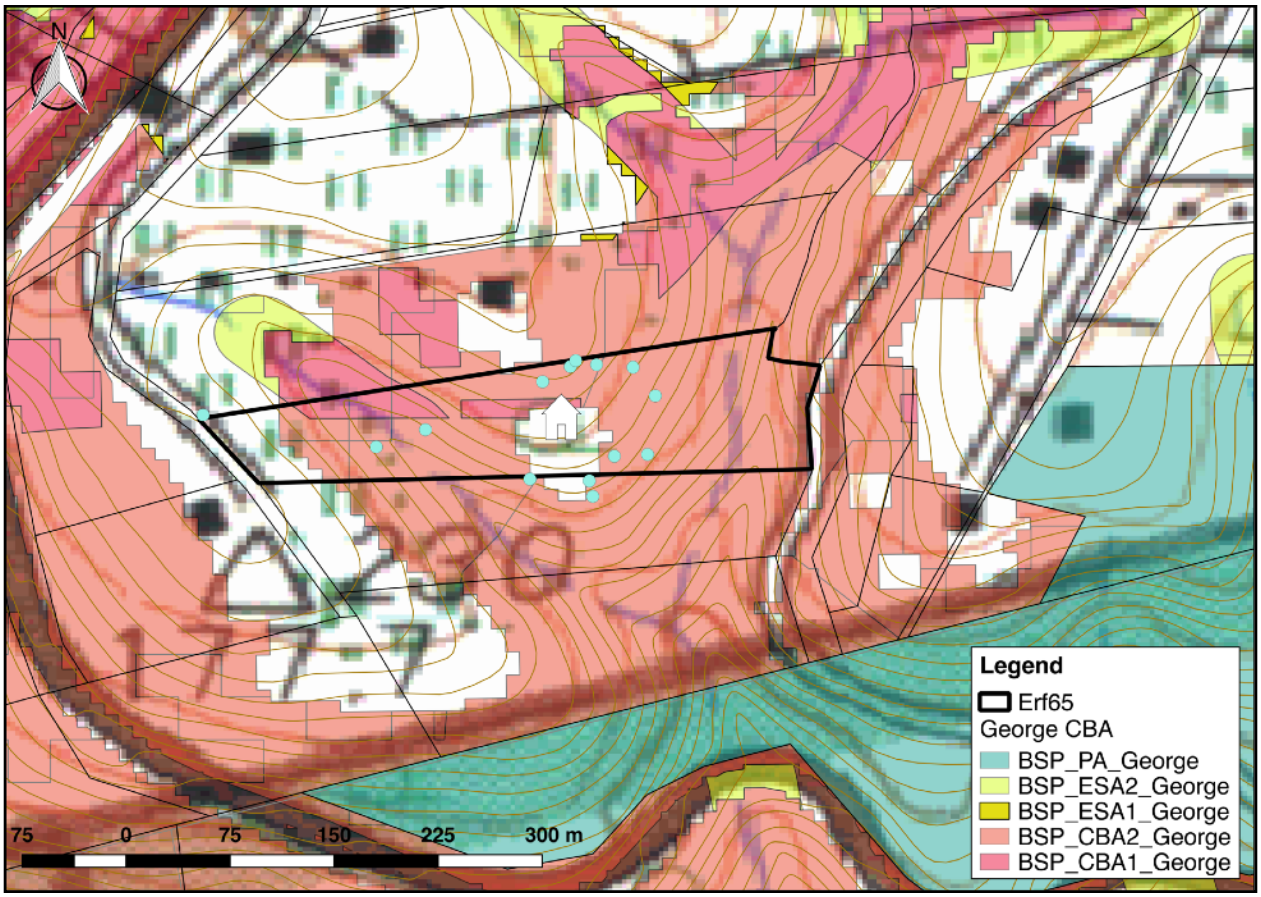

Figure 2: Showing the property within a degraded Critical Biodiversity Area.

(15) Appendix 2: **Plant species checklist (observed 2018/05/10 & 2018/04/04):**

Buddleja salviifolia;

Burchellia bubalina;

Capparis sepiaria var. citrifolia;

Cassine peragua subsp. *peragua;*

Clematis brachiata;

Crocosmia aurea subsp. *aurea;*

Cynanchum ellipticum;

Diospyros dichrophylla;

Erica canaliculata (grooved-bark tree Erica);

Ekebergia capensis (Cape Ash);

Fern sp.;

Grass spp.;

Grewia occidentalis;

Gymnanthemum capense;

Gymnosporia nemorosa;

Halleria lucida (Tree Fuschia);

Helichrysum dasyanthum; H. foetidum; H. patulum;

Hermannia hyssopifolia;

Hypoxis hemerocallidea;

Leonotis leonurus;

Lobelia neglecta;

Metalasia densa;

Monopsis unidentata;

Nuxia floribunda;

Nidorella ivifolia;

Osteospermum moniliferum;

Passerina corymbosa; *Passerina falcifolia*;

Pelargonium capitatum; Pelargonium sp.*;*

Physalis peruviana (Cape gooseberry);

Phylica ericoides;

Pterocelastrus tricuspidatus;

Pteridium aquilinum subsp. *aquilinum;*

Rapanea melanophloeos (Cape Beech);

Reed sp.;

Rhamnus prinoides;

Rubus cf. *fruticosus*;

Scutia myrtina; [not]

Searsia lucida;

Secamone alpini;

Senecio ilicifolius; Senecio elegans;

Tarchonanthus littoralis;

Trimeria grandifolia subsp. *grandifolia;*

Tritoniopsis caffra;

Virgilia divaricata (Pink Keurboom);

Unknown spindly climbing plant with yellow flowers in forest.