

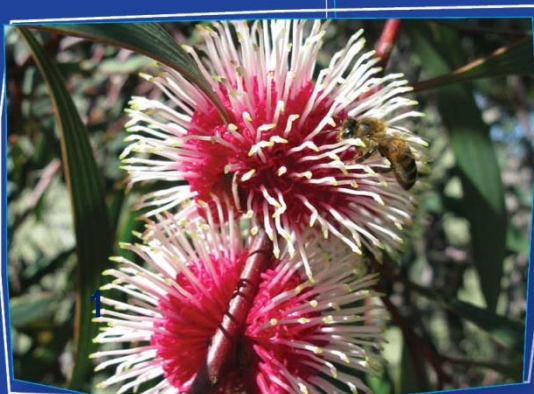
Targeted Flora Survey Report

Howick Road South Construction Project CPS 7890/1
(Muntz Road to Fisheries Road)



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December 2018



1 Executive Summary

In November 2018 the Shire of Esperance applied for Purpose Permit CPS 7890/1 to clear 3.84 ha for the southern portion of Howick Rd, between Muntz Rd and Fisheries Rd intersection. Works present on Muntz Rd Reserve (PIN 11645175), Howick Rd Reserve (PIN 11644424), and Fisheries Rd Reserve (PIN 11645708). Shortly after (December 2017), the Shire of Esperance submitted a 'Vegetation, Flora, Fauna and Environmental Considerations report' for the Howick Rd South Construction Project (Muntz Rd to Fisheries Rd). On 2 July 2018, the Shire of Esperance received a response to letter from Abbie Crawford (DWER), detailing required information regarding specific priority species in the area and likely environmental impacts. This report addresses these details. In addition to this report an offset proposal to use previously banked offsets will also be submitted.

2 Introduction

The Shire of Esperance plans to upgrade Howick Road from Fisheries Road to Coolinup Road over a three-year period. One section has already been completed under CPS 7185/1. Howick Road is a major transport route to the Beaumont CBH grain receival facility, and thus experiences high road train and truck traffic. Ensuring the safety of road users is a high priority for the Shire of Esperance. Howick Rd is approximately 85 km east of Esperance, on the south coast of Western Australia (Figure 1). The Shire of Esperance has applied for a 25 m wide clearing footprint area. The current road is 18 m wide and the gazetted road reserve is 100 m. The survey is restricted to an area 5 m either side of the existing road alignment.



Figure 1. Location of permit area in pink; along Howick Road from Muntz Road to Henke Road, approximately 80 km north-east of Esperance townsite.

3 Methodology

A targeted flora survey was undertaken following the Environmental Protection Authority (EPA) Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016). The flora survey occurred in spring, from 18/09/18 to 27/09/18, by Shire of Esperance Environmental Officer's Katie White and Julie Waters. Katie White has sound botanical knowledge recently completing a Botany degree and Julie Waters has over 15 years' experience and 12 years working in the Esperance area. Due to surveying in September, the majority of species were flowering, decreasing the likelihood of overlooking species. A follow up flora survey for later flowering species and collection of previously marked priority species occurred on the 8/11/12.

The entirety of the road area was surveyed on foot, including vegetation types that are unlikely to be habitat for threatened flora. A width of five meters on either side of the current 18 m footprint was assessed. An incidental species list was compiled of all species present.

Species were identified using local botanical knowledge, DBCA Esperance District Herbarium, Florabase and field guides. In addition, known populations of *Anigozanthos bicolor* subsp. *minor* and *Calectasia jubilaea* were visited prior to commencing survey, to re-familiarise with key identifying features of the species. For other targeted species (those identified in the desktop survey and outlined in correspondence with DBCA as likely to occur), pressed specimens at the local Esperance District Herbarium were scanned and taken into the field. Where priority species were discovered, threatened priority forms were completed, herbarium specimens were collected and marked with a GPS (Garmin GPS64).

4 Results

The desktop survey from the 'Vegetation, Flora, Fauna and Environmental Considerations report' identified two species of Declared Rare Flora (DRF) and 14 priority flora as present within in a 20 km radius of the site, and therefore possible to be present within the clearing permit area (Table 1).

Table 1. Declared rare flora and priority species identified within a 20 km radius of the Howick South (Henke to Muntz Rd) construction project.

Species	Conservation Status
<i>Acacia nitidula</i>	P 2
<i>Calectasia jubilea</i>	P 2
<i>Daviesia pauciflora</i>	P 3
<i>Eucalyptus sweetmaniana</i>	P 2
<i>Grevillea baxteri</i>	P 4
<i>Hibbertia hamata</i>	P 3
<i>Isopogon alcicornis</i>	P 3
<i>Kennedia beckxiana</i>	P 4
<i>Lambertia echinata</i> subsp. <i>echinata</i>	DRF – Critically Endangered
<i>Lasiopetalum parvuliflorum</i>	P 3
<i>Lepidium pseudotasmanicum</i>	P 4
<i>Myoporum velutinum</i>	DRF - Endangered
<i>Persoonia scabra</i>	P 3
<i>Spyridium mucronatum</i> subsp. <i>multiflorum</i>	P 2
<i>Trithuria australis</i>	P 4
<i>Verticordia verticordina</i>	P 3

Of these, DBCA identified in advice to DWER (correspondence with Abbie Crawford 2/7/2018) that species most likely to occur are:

- *Anigozanthos bicolor* subsp *minor* (DRF)
- *Scaevola archeriana* (P1)
- *Calectasia juilaea* (P2)
- *Eucalyptus sweetmaniana* (P2)
- *Acacia nitidula* (P3),

- *Grevillea baxteri* (P4)

In total, 209 species were identified within the clearing permit area (Appendix 7.1; Table 2). Species presence was recorded across the different vegetation changes as mapped in previous report, 'Vegetation, Flora, Fauna and Environmental Considerations report' (Appendix 7.2; Table 3).

Two priority flora species were located within the clearing permit area; *Grevillea baxteri* (P4) and *Eucalyptus sneedmaniana* (P2) (Figure 2). Threatened priority forms completed and sent to local DBCA Conservation Officer's, Emma Massenbauer and Wayne Gill. Additionally, specimens were collected and sent to WA herbarium.

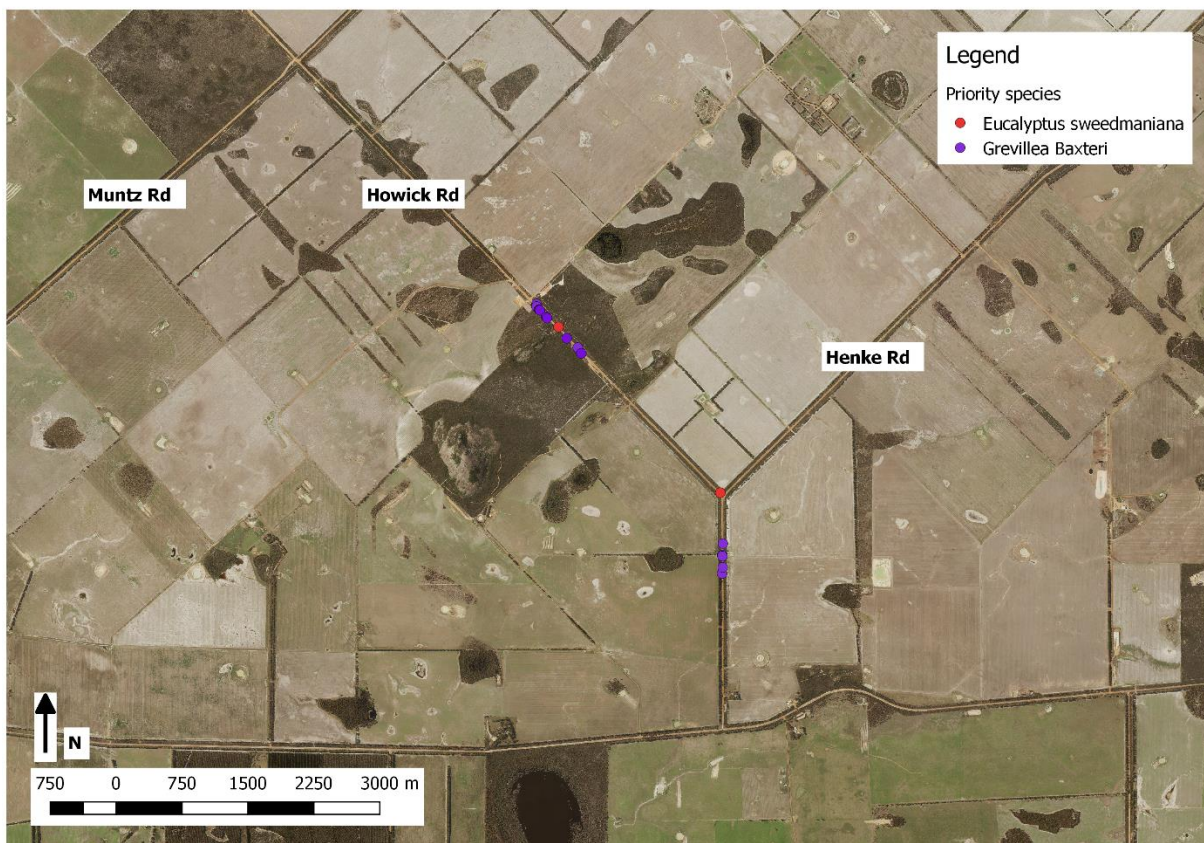


Figure 2. Location of priority flora, *Grevillea baxteri* and *Eucalyptus sneedmaniana*, on Howick Rd South project area (Henke to Muntz, CPS 7890/1).

Two spatially clustered areas of *Grevillea baxteri* were present within the clearing permit area and will be referred to as 'population one and two' (Figure 3). 'Population one' was previously identified in the December 2017 report. 'Population one' is present on slopes of granite outcrop ~ 3.3 km NW of Henke/Howick intersection on Howick Rd. A herbarium specimen was collected by Katie White (KW003, Appendix 7.3). A large number of individuals were present immediately within the road reserve boundaries along a stretch of road for approximately 750 m. The population size is estimated as 80+ individuals. There is also suitable intact vegetation that surrounds the road reserve and extends into private property. It is highly likely more plants are present, however this area was not surveyed. During the road widening project, a maximum of 15 plants will be removed. There is a possibility that road widening may not occur over the granite outcrop and thus significantly less plants removed. This is due to a registered aboriginal heritage site present across the granite outcrop, and negotiations with Esperance Tjaltjraak Native Title Corporation have not yet occurred regarding this area.

The second population of *G. baxteri* was present on Henke Rd, approximately 700 m south of the Henke/Howick Rd intersection. A full survey of this population concluded that 25 plants are present within a 320 m stretch of road. 5 plants will be removed in the process of road widening at population 2.

In conclusion, a maximum of 20 individual *G. baxteri* will be removed as part of this project. Overall *G. baxteri* is present in a large range of vegetation types as was mapped in 'Vegetation, Flora, Fauna and Environmental Considerations report' for the Howick Rd South Construction Project (Muntz Rd to Fisheries Rd); Tallerack Mallee heath over gravel, closed mixed shrubland over granite, *Banksia armata* low heath, dominant *Nuytsia* over low mixed heath, and degraded introduced pine/Eucalyptus over grass. This demonstrates that large potential for suitable habitat in the surrounding vegetation.



Figure 3. *Grevillea baxteri*, priority four species was present in two regions of the clearing permit area for Howick Rd South construction project, Muntz to Henke.

Eucalyptus sweetmaniana (P2) was also present within the survey area (Figure 4). A large number of *E. sweetmaniana* are present on and around the granite outcrop ~ 3.3 km NW of Henke/Howick intersection on Howick Rd. It was estimated approximately 100+ individuals were present. A herbarium specimen was collected by Katie White (KW002, Appendix 7.3). As previously explained, road widening may not occur over the granite outcrop due to aboriginal heritage site constraints. If it does, a maximum of 35 plants will be removed. Regardless of the proposed road widening project, a number of plants that have re-sprouted in spoon drains and on the actual road will be removed by regular maintenance grading. Surrounding the granite outcrop is suitable intact vegetation, both within the road reserve and surrounding private property to the SW of Howick Hill. The population was observed to extend into the private property, and it is highly likely continues to the second granite outcrop (Howick Hill) two kilometers away.

Additionally, a single *E. sweetmaniana* juvenile plant was present on the intersection of Henke and Howick Rd. The location on a flat, degraded, *Nuytsia* and mixed shrubland is highly unusual for *E. sweetmaniana*, which is closely associated with granite outcrops. The plant will be removed as part of

the road widening project. No collection occurred as there was one juvenile individual that was not fruiting or flowering. A threatened and priority flora report form was completed and submitted to DBCA (Appendix 7.3).



Figure 4. *Eucalyptus sweetmaniana*, (P2)

Other species listed as likely to occur in letter from DBCA advice, *Anigozanthos bicolour ssp minor*, *Scaevola archeriana*, *Acacia nitidula*, and *Calectasia juilaea* were not discovered. *Calectasia valida* was identified (Figure 5). As *Calectasia*'s are often difficult to identify and *Calectasia juilaea*, is very similar to many other local *Calectasia*'s, a sample was collected and verified by local botanists Ken Mills and Mary Hoggart at the Esperance Wildflower Society. A specimen for the district herbarium was collected by Katie White, KW007 (20/9/18).



Figure 5. *Calectasia valida* plant identified within the clearing permit area. *Calectasia jubilaea* (P2) differs to *Calectasia valida* by the following combination of characters: *plant* clonal; *rhizome* short but spreading; *perianth* tube 11.5–13.5 mm long, pilose in lower 1/4 with golden to silvery hairs; *perianth* lobes 12–14 mm long, 2.6–3.0 mm wide, becoming red with age; *anthers* 6.2–6.6 mm long, yellow. *Nuytsia* Vol. 26 (2015).

Feeding Carnabys Black Cockatoo, *Calyptorhynchus latirostris*, were observed in a stand of Eucalyptus with mixed hakea mid-storey. A flock of approximately 20 birds was present.



Figure 6. Carnabys Black Cockatoo, *Calyptorhynchus latirostris*, on Howick Rd, near Muntz road intersection.

5 Discussion

The 9.4 km stretch of Howick road is extremely diverse and contains habitat for threatened species. The existing road reserve is 100 meters wide and after the clearing has occurred, will consist of two 37.5m strips (75m total) of intact vegetation. This width of remnant vegetation provides an excellent buffer for weeds from adjacent farmland, providing adequate habitat for those threatened species, suggesting it is therefore likely this project will not impact upon conservation at a local scale. No habitat connections will be severed, with a nature corridor will still remaining for fauna movement.

Two priority flora species will be impacted upon by this project. *Grevillea baxteri* is found extensively through this landscape. It is often not collected due to its easily identifiable nature and low priority status. It is present both within and outside of the conservation estate locally. Outside it has been found on Reserve 32804, on Unallocated crown land west of Cape Arid and elsewhere along Howick Road. It has many populations within the conservation estate including; Beaumont Nature Reserve 32128, Speddingup East NR, Cape Arid National park, and Nuytsland NR.

Eucalyptus sweedmaniana is locally common in the surrounding granite outcrop and is likely to occur on Howick Hill, 2 km SW of the population within the clearing permit area. Plants growing directly on the road running surface, suggest that re-sprouting has occurred from previous grading. This demonstrates an inherent ability to regenerate after disturbance. They will also be removed when routine maintenance occurs. Given the small number of individuals being removed and that the large population that extends into private property, proposed clearing is believed to not have an impact on the longevity and sustainability of this species.

The vegetation mapping conducted in the 'Vegetation, Flora, Fauna and Environmental Considerations report' was accurate, with 66% of the project area (4.42 ha) meeting the Environmental Protection and Biodiversity Conservation Act 1999 listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' Threatened Ecological Community diagnostic characteristics and condition thresholds. The vegetation in the southern section of the project area was too degraded to meet condition thresholds for the community.



Figure 3: Location of 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' Threatened Ecological Community within project area

Feeding Black Carnaby's Cockatoo (*Calyptorhynchus latirostris*) were observed during field work at the northern part of the project area. However, given the large travel distance of cockatoos and the surrounding vegetation types being compatible for habitat, this is not considered a concern. The Shire of Esperance plan to use banked Environmental Offsets to compensate for the loss of habitat and Kwongkan TEC. A separate offset proposal will be submitted.

6 References

Environmental Protection Authority (EPA) Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016).

JL Waters (2017) 'Vegetation, Flora, Fauna and Environmental Considerations report' for the Howick Rd North Construction Project (Parmango to Ridglands Rd). Submitted to DWER 12/01/2018.

M.D.Barrett & R.L.Barrett (2015) 'Twenty-seven new species of vascular plants from Western Australia', *Nuytsia* Vol. 26

7 Appendix

7.1 Table 2. Incidental species list identified along Howick Rd (Muntz to Henke) flora survey, following vegetation sections identified in previous report.

Family	Genus	Species	Common name	Priority	1	2	3	4	5	6	7	8	9	10	11
Anarthriaceae	Anarthria	laevis			X								X		
Anarthriaceae	Anarthria	scabra												X	X
Anarthriaceae	Lyginia	imberbis													
Asparagaceae	Laxmannia	brachyphylla	Stilted paper lilly		X										
Asparagaceae	Thysanotus	patersonii	Twining fringe lilly		X	X					X	X	X	X	
Boraginaceae	Halgania	anagalloides var Southern				X	X				X			X	
Casuarinaceae	Allocasuarina	helmsii							X						
Casuarinaceae	Allocasuarina	huegeliana	Rock sheok			X			X	X	X	X		X	X
Casuarinaceae	Allocasuarina	humilis	Dwarf sheok		X				X						
Casuarinaceae	Allocasuarina	thuyoides	Horned sheok		X				X			X	X	X	X
Cyperaceae	Caustis	dioica			X			X							
Cyperaceae	Chorizandra	enodis	Black bristlerush			X		X							
Cyperaceae	Lepidosperma	longitudinale												X	
Cyperaceae	Lepidosperma	squamatum							X		X				X
Cyperaceae	Mesomelaena	tetragona	Semaphore sedge		X									X	X
Cyperaceae	Schoenus	submicrostachyus	Hair tail grass											X	
Cyperaceae	Tricostularia	aphylla	Curly grass						X		X			X	X
Dasygongonaceae	Calectasia	valida							X						
Dilleniaceae	Hibbertia	gracilipes				X			X	X	X			X	X
Dilleniaceae	Hibbertia	oligantha													
Dilleniaceae	Hibbertia	racemosa	Stalked leaf guinea flower		X										
Droseraceae	Drosera	glanduligera	Pimpernel sundew											X	X
Droseraceae	Drosera	menziesii	Pink rainbow dew		X						X		X	X	X
Droseraceae	Drosera	scorpioides	Small shaggy sundew							X					
Droseraceae	Drosera	sp				X									
Ericaceae	Acrotriche	ramiflora							X				X		
Ericaceae	Astroloma	tectum							X						

Ericaceae	Leucopogon	carinatus		X					X	X
Ericaceae	Leucopogon	cuneifolius			X				X	
Ericaceae	Leucopogon	fimbriatus						X		
Ericaceae	Leucopogon	lloydiorum		X						
Ericaceae	Leucopogon	obtusatus								X
Ericaceae	Leucopogon	sp. Coujinup							X	
Ericaceae	Lysinema	ciliatum		X						
Ericaceae	Lysinema	pentapetalum		X		X	X	X	X	X
Ericaceae	Styphelia	sp South Coast						X		
Euphorbiaceae	Monotaxis	paxii		X						
Fabaceae	Acacia	aemula		X						
Fabaceae	Acacia	crispula						X		
Fabaceae	Acacia	cupularis		X						
Fabaceae	Acacia	cyclops		X	X	X	X		X	X
Fabaceae	Acacia	glaucoarpa			X					
Fabaceae	Acacia	gonophylla	Small cream head acacia	X						
Fabaceae	Acacia	lasiocarpa var bracteolata		X	X					
Fabaceae	Acacia	maxwellii				X	X			
Fabaceae	Acacia	mimica var angusta							X	X
Fabaceae	Acacia	myrtifolia		X	X	X	X		X	
Fabaceae	Acacia	nigricans		X		X	X	X	X	X
Fabaceae	Acacia	pycnantha	Golden wattle			X				X
Fabaceae	Acacia	rostellifera		X				X		
Fabaceae	Acacia	saligna		X					X	X
Fabaceae	Acacia	sphacelata subsp recurva		X						X
Fabaceae	Acacia	subcaerulea	Cockroach acacia					X	X	
Fabaceae	Aotus	Sp. Esperance		X				X	X	X
Fabaceae	Bossiaea	preissii		X	X			X	X	X
Fabaceae	Chorizema	aciculare	Needle leaf chorizema	X	X	X	X	X	X	X
Fabaceae	Chorizema	obtusifolium	Flame pea	X				X	X	X
Fabaceae	Daviesia	incrassata subsp reversifolia		X		X			X	X
Fabaceae	Daviesia	lancifolia						X		X
Fabaceae	Daviesia	major		X		X				
Fabaceae	Daviesia	scoparia				X				
Fabaceae	Daviesia	teretifolia		X				X	X	X
Fabaceae	Dillwynia	uncinata	Silky parrot pea	X	X	X		X	X	X
Fabaceae	Gastrolobium	melanocarpum								X
Fabaceae	Gastrolobium	parviflorum		X						
Fabaceae	Gompholobium	baxterii		X					X	
Fabaceae	Gompholobium	knightianum		X		X	X	X	X	X
Fabaceae	Gompholobium	margintum				X				
Fabaceae	Hovea	trisperma				X				

Fabaceae	Jacksonia	venosa		X		X	X	X		X
Fabaceae	Kennedia	coccinea subsp esotera		X						
Fabaceae	Kennedia	prostrata	Running Postman, scarlet runner	X	X	X				
Fabaceae	Paraserianthes	lophantha		X						
Fabaceae	Pultenea	indira subsp indira			X					
Fabaceae	Senna	artemisioides		X						
Fabaceae	Templetonia	retusa	Cockies tongue	X		X	X			
Goodeniaceae	Cooperhooikia	strophiolata				X	X			
Goodeniaceae	Dampiera	lavandulacea		X	X		X		X	X
Goodeniaceae	Dampiera	sacculata		X		X	X	X	X	X
Goodeniaceae	Goodenia	affinis		X		X				
Goodeniaceae	Goodenia	concinna		X		X				
Goodeniaceae	Goodenia	incana	Hoary goodenia					X		
Goodeniaceae	Goodenia	scapigera	White goodenia						X	
Goodeniaceae	Lechenaultia	formosa		X	X		X			X
Goodeniaceae	Velleia	trinervis		X		X			X	X
Haemodoraceae	Anigozanthos	rufus		X						X
Haemodoraceae	Conostylis	bealiana	Angel trumpet conostylis		X		X	X	X	X
Haemodoraceae	Haemodorum	spicatum	Bloodroot	X						X
Haloragaceae	Glischrocaryon	aureum	Globular pop flower	X		X	X			X
Hemerocallidaceae	Agrostocrinum	scabrum	Blue grass lilly						X	X
Hemerocallidaceae	Dianella	revoluta	Blueberry lilly			X	X		X	X
Hemerocallidaceae	Johnsonia	acaulis	Red hooded ground lilly						X	X
Iridaceae	Orthrosanthus	multiflorus	Morning iris	X		X	X		X	
Iridaceae	Patersonia	lanata	Wooly purple Iris	X					X	X
Iridaceae	Patersonia	occidentalis	Smooth purple iris				X		X	X
Junceaaceae	Juncus	pallidus								X
Lamiaceae	Westringia	rigida	Stiff Westringia			X				
Lauraceae	Cassytha	sp					X		X	
Lentibulariaceae	Utricularia	tenella								X
Loganiaceae	Logania	buxifolia			X				X	
Loranthaceae	Nuytsia	floribunda	Christmas tree						X	X
Malvaceae	Alyogyne	huegelii	Lilac Hibiscus			X				
Myrtaceae	Beaufortia	empetrifolia		X						X
Myrtaceae	Beaufortia	micrantha								X
Myrtaceae	Beaufortia	schaueri		X		X		X	X	X
Myrtaceae	Calytrix	leschenaultii		X						X
Myrtaceae	Chamelaucium	axillare	Esperance wax				X	X	X	X
Myrtaceae	Conothamnus	aureus				X		X	X	X
Myrtaceae	Cyathostemon	ambiguus		X		X	X	X	X	X
Myrtaceae	Darwinia	vestita	Pom-pom darwinia	X			X		X	X

Myrtaceae	Eucalyptus	angulosa		X	X		X	X	X	X	X	X
Myrtaceae	Eucalyptus	extrica		X							X	X
Myrtaceae	Eucalyptus	incrassata					X				X	
Myrtaceae	Eucalyptus	lehmannii	Bushy yate						X			
Myrtaceae	Eucalyptus	leptocalyx			X							
Myrtaceae	Eucalyptus	micranthera	Alexander River mallee				X			X	X	
Myrtaceae	Eucalyptus	occidentalis	Yate				X	X				X
Myrtaceae	Eucalyptus	platypus										X
Myrtaceae	Eucalyptus	pleurocarpa	Tallerack				X		X			
Myrtaceae	Eucalyptus	uncinata		X								X
Myrtaceae	Kunzea	baxteri										X
Myrtaceae	Leptospermum	incanum							X			
Myrtaceae	Leptospermum	laevigatum	Victorian tea tree						X			
Myrtaceae	Melaleuca	brevifolia							X			
Myrtaceae	Melaleuca	calycina		X		X	X				X	X
Myrtaceae	Melaleuca	cuticularis									X	X
Myrtaceae	Melaleuca	fulgens	Scarlet honeymyrtle						X			
Myrtaceae	Melaleuca	pulchella		X						X		
Myrtaceae	Melaleuca	rigidifolia										X
Myrtaceae	Melaleuca	scabra		X			X		X	X	X	X
Myrtaceae	Melaleuca	societatis										X
Myrtaceae	Melaleuca	striata		X			X	X	X	X	X	X
Myrtaceae	Melaleuca	suberosa		X	X		X		X	X	X	X
Myrtaceae	Melaleuca	uncinata						X	X			
Myrtaceae	Phymatocarpus	maxwellii									X	X
Myrtaceae	Taxandria	spathulata			X		X	X	X	X	X	X
Myrtaceae	Verticordia	sp									X	X
Myrtaceae	Verticordia	vicinella		X			X					
Orchidaceae	Caladenia	discoidea	Bee spider	X								
Orchidaceae	Caladenia	flava	Cowslip orchid								X	X
Orchidaceae	Elythranthera	brunonis	Purple enamel orchid		X			X	X	X	X	X
Orchidaceae	Microtis	media subsp media	Mignonette orchid									X
Orchidaceae	Pterostylis	recurva	Jug orchid		X							
Orchidaceae	Thelymitra	antennifera	Vanilla orchid									X
Orchidaceae	Thelymitra	graminea	Shy sun orchid						X			
Pinaceae	Pinus	pinaster										X
Pittosporaceae	Billardiera	coriacea							X			
Pittosporaceae	Billardiera	fusiformis	Australian bluebell vine		X			X		X	X	X
Poaceae	Neurachne	alopecuroidea	Fox tail mulga grass		X			X		X	X	X
Poaceae	Spartochloa	scirpoidea							X			
Polygalaceae	Comesperma	ciliatum	lovers twine		X				X		X	X
Polygonaceae	Muehlenbeckia	adpressa	Climbing lignum									X

Proteaceae	Adenanthos	cuneatus						X	X	X	X
Proteaceae	Banksia	armata	Prickly dryandra			X	X	X	X		X
Proteaceae	Banksia	media		X	X						
Proteaceae	Banksia	nivea	Honeypot Dryandra		X		X		X		
Proteaceae	Banksia	nutans	Nodding Banksia	X							
Proteaceae	Banksia	obovata								X	X
Proteaceae	Banksia	puchella	Teasel banksia							X	X
Proteaceae	Banksia	repens	Creeping banksia			X	X	X			X
Proteaceae	Banksia	speciosa	Showy banksia							X	
Proteaceae	Calothamnus	gracilis						X		X	X
Proteaceae	Calothamnus	quadrifidus	One sided bottlebrush					X			
Proteaceae	Grevillea	baxterii	Toothbrush grevillea	P4		X	X	X	X		X
Proteaceae	Grevillea	nudiflora		X		X					
Proteaceae	Grevillea	oligantha			X	X	X				
Proteaceae	Grevillea	pectinata	Comb-leaf grevillea	X							
Proteaceae	Hakea	acuminata							X		
Proteaceae	Hakea	bicornata	Two horned nut					X			
Proteaceae	Hakea	cinera	Ashy leafed Hakea	X		X	X				X
Proteaceae	Hakea	clavata	Coastal hakea					X			
Proteaceae	Hakea	corymbosa	Cauliflower hakea	X			X		X	X	X
Proteaceae	Hakea	denticulata	Stinking roger	X		X		X	X	X	X
Proteaceae	Hakea	ilicifolia	Holly leaf hakea				X				
Proteaceae	Hakea	laurina	Pin cushion hakea	X	X	X		X	X	X	X
Proteaceae	Hakea	lissocarpha	Honey bush							X	
Proteaceae	Hakea	marginata		X		X				X	
Proteaceae	Hakea	nitida	Frog hakea	X	X	X		X	X	X	X
Proteaceae	Hakea	obliqua	needles and cork	X			X		X		X
Proteaceae	Hakea	pandanocarpa	Donkey-kong balls hakea	X			X	X	X		X
Proteaceae	Hakea	prostrata	Harsh Hakea				X				
Proteaceae	Hakea	trifurcata	Two-leaf Hakea	X		X	X	X		X	X
Proteaceae	Hakea	varia	Variable leaf hakea	X							X
Proteaceae	Isopogon	polycephalus	Clustered coneflower	X		X	X	X	X	X	X
Proteaceae	Petrophile	fastigiata						X			
Proteaceae	Petrophile	heterophylla		X							
Proteaceae	Petrophile	squamata subsp northern		X							X
Proteaceae	Petrophile	teretifolia					X				X
Proteaceae	Petrophile	trilobus		X					X	X	X
Proteaceae	Stirlingia	anethifolia						X			
Proteaceae	Synaphea	media		X		X		X		X	
Proteaceae	Synaphea	oligantha								X	X
Proteaceae	Synaphea	petiolaris		X	X			X	X		X

Restionaceae	Desmocladus	flexuosus			X		X	X	X
Restionaceae	Hypolaena	fastigiata						X	X
Restionaceae	Hypolaena	humilis							
Restionaceae	Leptocarpus	crebriculmis							
Rhamanaceae	Cryptandra	pungens			X		X		X
Rhamanaceae	Pomaderris	brevifolia			X				
Rubiaceae	Opercularia	vaginata	Dog weed		X		X	X	X
Rutaceae	Boronia	inornata			X				
Rutaceae	Boronia	ramosa subsp anethifolia			X		X	X	X
Santalaceae	Exocarpus	sparteus	Native cherry				X		
Sapindaceae	Dodonaea	certocarpa						X	
Thymelaeaceae	Pimelea	brachyphylla			X	X			
Thymelaeaceae	Pimelea	pendens							X
Violaceae	Hybanthus	epacroides	Spiky hybanthus		X	X	X		X
Xanthoraceae	Chamaescilla	corymbosa var corymbosa				X	X		X
Zamiaceae	Macrozamia	dyeri							X

7.2 Table 3. Vegetation changes recorded in 'Vegetation, Flora, Fauna and Environmental Considerations report' for Howick South construction project.

Kilometres South from Muntz Rd	Section number	Notes	Vegetation Condition (Kieghery Scale)	Meets Kwongkan TEC definition (Y/N)	Vegetation Description
0.1-2.1	1		Very Good	Yes	Open Eucalyptus woodland over mixed <i>Hakea cinera</i> dominated shrubland
2.2-2.5	3		Very Good	No	Yate swamp
2.6-2.9	2		Very Good	Yes	Eucalyptus open woodland over <i>Bankisia media</i> and <i>Hakea cinera</i> dominated shrubland
2.9-3.1	4		Very good		Yate Swamp

3.2-3.6	5				Tallerack mallee heath
3.7-4	6	Old rehabilitated gravel pits	Good	Yes	Tallerack mallee heath
4.1-4.7	7	Granite	Excellent	No	Closed mixed shrubland
4.9-5.4	8		Excellent	Yes	<i>Banksia armata</i> low heath
5.5-5.6	9	Paperbark swamp	Very good	No	<i>Melaleuca cuticularis</i> woodland
5.7 – Heinke rd Corner	10		Excellent	Yes	Nuytsia over low mixed heath
Heinke Howick intersection – 0.6km	11		Very Good	Yes	Nuytsia over low mixed heath
0.6-2.6	11	May have once been Nuytsia over low mixed heath but very degraded now	Degraded	No	Scatter pines and introduced eucalypts over grasses with an occasional shrub

7.3 Threatened Priority Rare Report forms



Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dcpaw.wa.gov.au> under Standard Report Forms

TAXON: <u>Grevillea baxteri</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>22/09/18</u>	CONSERVATION STATUS: <u>P4</u> New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>Kuhle + Juvateri</u>	PHONE: <u>90831518</u>
ROLE: <u>Environmental officers</u>	ORGANISATION: <u>Shire of Esperance</u>

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):
~3.3km NNW of Henke/Howick Intersection
On lower slopes of granite outcrop, 22km NNE of Gindup townsite

Reserve No: _____

DBC DISTRICT: Esperance LGA: Esperance Land manager present:

DATUM: GDA94 / MGA94 AGD84 / AMG84 WGS84 Unknown

COORDINATES: (If UTM coords provided, Zone is also required)
DecDegrees DegMinSec UTM Lat / Northing: 478022
Long / Easting: 6269823
ZONE: 51 H

METHOD USED:
GPS Differential GPS Map
No. satellites: _____ Map used: _____
Boundary polygon captured: Map scale: _____

LAND TENURE:
Nature reserve Timber reserve Private property Rail reserve Shire road reserve
National park State forest Pastoral lease MRWA road reserve Other Crown reserve
Conservation park Water reserve UCL SLK/Pole _____ to _____ Specify other: _____

AREA ASSESSMENT: Edge survey Partial survey Full survey Area observed (m²): _____

EFFORT: Time spent surveying (minutes): 1hr No. of minutes spent / 100 m²: _____

POP'N COUNT ACCURACY: Actual Extrapolation Estimate Count method: _____
(Refer to field manual for list)

WHAT COUNTED: Plants Clumps Clonal stems

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	<u>80+</u>			
Dead				

Area of pop (m²): 750m street of road
Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. _____ Size _____ Data attached Total area of quadrats (m²): _____

Summary Quad. Totals: Alive _____

REPRODUCTIVE STATE: Clonal Vegetative Flowerbud Flower
Immature fruit Fruit Dehisced fruit Percentage in flower: 85 %

CONDITION OF PLANTS: Healthy Moderate Poor Senescent

COMMENT: _____

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	Current impact (N-E)	Potential impact (L-E)	Potential Threat Onset (S-L)
• <u>Road maintenance / road widening</u>	<u>M</u>	<u>M</u>	<u>S</u>
• _____	_____	_____	_____
• _____	_____	_____	_____



Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input checked="" type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input checked="" type="checkbox"/>
Hill <input checked="" type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input checked="" type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input checked="" type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>	Specific Landform Element:				
	(Refer to field manual for additional values)				
CONDITION OF SOIL:	Dry <input type="checkbox"/>	Moist <input type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

VEGETATION CLASSIFICATION*:

1. Open Shrubland
2. _____
3. _____
4. _____

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);
 2. Open shrubland (Hibbertia sp., Acacia spp.);
 3. Isolated clumps of sedges (Mesomelaena tetragona)

ASSOCIATED SPECIES:

Allocasurina hughana, Groenkeia, Beaufortia, Scaevola, Scaevola
T. spatulata, P. polyccephalis

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine Excellent Very good Good Degraded Completely degraded

COMMENT: _____

FIRE HISTORY: Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High Medium Low No signs of fire

FENCING: Not required Present Replace / repair Required Length req'd: _____

ROADSIDE MARKERS: Not required Present Replace / reposition Required Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

Approx 15 plants will be taken with proposed road widening
Extensive habitat here & more likely habitat around granite to south on PP.

DRF PERMIT/ LICENCE No: SW09313 Note if only observing plants (i.e. no specimens or plant material is taken): then no permit/licence is required. For further information on permit and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: KW003 WA Herb. Regional Herb. District Herb. Other: _____

ATTACHED: Map Mudmap Photo GIS data Field notes Other: _____

COPY SENT TO: Regional Office District Office Other: _____

Submitter of Record: Kate White Role: Environmental Officer Signed: [Signature] Date: 12 / 11 / 18



Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpcw.wa.gov.au> under Standard Report Forms

TAXON: <u>Oreillea Baxteri</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>22/09/18</u>	CONSERVATION STATUS: <u>P4</u> New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>Julie Waters + Kate White</u>	PHONE: <u>90831518</u>
ROLE: <u>Environmental Officer</u>	ORGANISATION: <u>Shire of Esperance</u>

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):
~700 m Sof Henke/Howick Rd intersection on Henke Rd
~22km NNE of Condingup townsite

DBC DISTRICT: <u>Esperance</u>	LGA: <u>Esperance</u>	Reserve No: _____
Land manager present: <input type="checkbox"/>		
DATUM:	COORDINATES: (if UTM coords provided, Zone is also required)	METHOD USED:
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>	GPS <input type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	Lat / Northing: <u>04 79958</u>	No. satellites: _____ Map used: _____
WGS84 <input type="checkbox"/>	Long / Easting: <u>626 7325</u>	Boundary polygon captured: <input type="checkbox"/> Map scale: _____
Unknown <input type="checkbox"/>	ZONE: <u>51H</u>	
LAND TENURE:		
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/>	Private property <input type="checkbox"/>
National park <input type="checkbox"/>	State forest <input type="checkbox"/>	Pastoral lease <input type="checkbox"/>
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/>	UCL <input type="checkbox"/> SLK/Pole _____ to _____
		Rail reserve <input type="checkbox"/> Shire road reserve <input checked="" type="checkbox"/>
		MRWA road reserve <input type="checkbox"/> Other Crown reserve <input type="checkbox"/>
		Specify other: _____

AREA ASSESSMENT: Edge survey <input type="checkbox"/> Partial survey <input type="checkbox"/> Full survey <input checked="" type="checkbox"/>	Area observed (m ²): _____
EFFORT: Time spent surveying (minutes): _____	No. of minutes spent / 100 m ² : _____
POP'N COUNT ACCURACY: Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>	Count method: _____
(Refer to field manual for list)	
WHAT COUNTED: Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>	
TOTAL POP'N STRUCTURE:	
Mature: _____	Juveniles: _____
Seedlings: _____	Totals: _____
Alive: <u>25</u>	Area of pop (m ²): <u>350</u>
Dead: _____	Note: Pls record count as numbers (not percentages) for database.
QUADRATS PRESENT: No. _____ Size _____	Data attached <input type="checkbox"/> Total area of quadrats (m ²): _____
Summary Quad. Totals: Alive _____	
REPRODUCTIVE STATE: Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input checked="" type="checkbox"/>	Percentage in flower: <u>80</u> %
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/>	

CONDITION OF PLANTS: Healthy Moderate Poor Senescent

COMMENT: _____

THREATS - type, agent and supporting information: <small>Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)</small>	Current impact (N-E)	Potential impact (L-E)	Potential Threat Onset (S-L)
• <u>Road widening</u>	<u>M</u>	<u>M</u>	<u>S</u>
• _____	_____	_____	_____
• _____	_____	_____	_____



Threatened and Priority Flora Report Form

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input checked="" type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input checked="" type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input checked="" type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input checked="" type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input checked="" type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input checked="" type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input checked="" type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>	Specific Landform Element: (Refer to field manual for additional values)				
CONDITION OF SOIL:	Dry <input checked="" type="checkbox"/>	Moist <input type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

VEGETATION CLASSIFICATION:

Eg. 1. Banksia woodland (B. *astrenuata*, B. *ilicifolia*);
 2. Open shrubland (Hibbertia sp., Acacia spp.);
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. Shrubland

ASSOCIATED SPECIES:

Other (non-dominant) spp

Patersonia lanata, *Acacia cyclops*, *Hakea conynbosa*, *Kunzea baxteri*

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine Excellent Very good Good Degraded Completely degraded

COMMENT:

FIRE HISTORY: Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High Medium Low No signs of fire

FENCING: Not required Present Replace / repair Required Length req'd: _____

ROADSIDE MARKERS: Not required Present Replace / reposition Required Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

5 plants / 25 present will be removed under planned road widening plans

DRF PERMIT/ LICENCE No: 54019313 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. Regional Herb. District Herb. Other: _____

ATTACHED: Map Mudmap Photo GIS data Field notes Other: _____

COPY SENT TO: Regional Office District Office Other: _____

Submitter of Record: Katie White Role: Environmental Officer Signed: [Signature] Date: 12/11/18



Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpcw.wa.gov.au> under Standard Report Forms

TAXON: <u>Euc. Svedmanniana</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>8/11/18</u>	CONSERVATION STATUS: <u>P2</u> New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>J. Waters + K. White</u>	PHONE: <u>90831579</u>
ROLE: <u>Environmental Officer</u>	ORGANISATION: <u>Shire of Esperance</u>

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): <u>Around granite outcrop ~ 3.3 km NW of Henke/Howick Rd intersection on Howick Road</u>	
Reserve No: _____	
DBC DISTRICT: <u>Esperance</u>	LGA: <u>Esperance</u> Land manager present: <input type="checkbox"/>
DATUM: _____	COORDINATES: (if UTM coords provided, Zone is also required)
GDA94 / MGA94 <input type="checkbox"/>	DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input type="checkbox"/>
AGD84 / AMGB4 <input type="checkbox"/>	Lat / Northing: <u>478022</u>
WGS84 <input type="checkbox"/>	Long / Easting: <u>6289823</u>
Unknown <input type="checkbox"/>	ZONE: <u>SI H</u>
METHOD USED:	
GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
No. satellites: _____ Map used: _____	
Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
LAND TENURE:	
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/> Private property <input type="checkbox"/> Rail reserve <input type="checkbox"/> Shire road reserve <input checked="" type="checkbox"/>
National park <input type="checkbox"/>	State forest <input type="checkbox"/> Pastoral lease <input type="checkbox"/> MRWA road reserve <input type="checkbox"/> Other Crown reserve <input type="checkbox"/>
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/> UCL <input type="checkbox"/> SLK/Pole _____ to _____ Specify other: _____

AREA ASSESSMENT: Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>	Area observed (m ²): _____
EFFORT: Time spent surveying (minutes): <u>110</u>	No. of minutes spent / 100 m ² : _____
POP'N COUNT ACCURACY: Actual <input type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>	Count method: _____ <small>(Refer to field manual for list)</small>
WHAT COUNTED: Plants <input type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>	
TOTAL POP'N STRUCTURE:	
Mature: <u>X</u> ✓	Juveniles: <u>X</u> ✓
Seedlings: _____	Totals: <u>100+</u>
Area of pop (m ²): _____	Note: Pls record count as numbers (not percentages) for database.
QUADRATS PRESENT: No. _____ Size _____	Data attached <input type="checkbox"/> Total area of quadrats (m ²): _____
Summary Quad, Totals: Alive _____	
REPRODUCTIVE STATE: Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>	Percentage in flower: _____ %
Immature fruit <input checked="" type="checkbox"/> Fruit <input checked="" type="checkbox"/> Dehiscent fruit <input type="checkbox"/>	
CONDITION OF PLANTS: Healthy <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Poor <input type="checkbox"/> Senescent <input type="checkbox"/>	
COMMENT: _____	

THREATS - type, agent and supporting information: <small>Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)</small>	Current impact (N-E)	Potential impact (L-E)	Potential Threat Onset (S-L)
• <u>Road maintenance/road widening</u>	<u>H</u>	<u>M</u>	<u>S</u>
• _____	_____	_____	_____
• _____	_____	_____	_____



Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input checked="" type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input checked="" type="checkbox"/>
Hill <input checked="" type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input checked="" type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input checked="" type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					
	Specific Landform Element:				
	(Refer to field manual for additional values)				
CONDITION OF SOIL:	Dry <input checked="" type="checkbox"/>	Moist <input type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

VEGETATION CLASSIFICATION*: 1. Shrubland

2. _____

3. _____

4. _____

Eg: 1. Banksia woodland (B. attenuata, B. aitchisonii);
2. Open shrubland (Hibbertia sp., Acacia spp.);
3. Isolated clumps of sedges (Mesomelaena tetragona)

ASSOCIATED SPECIES: Calothamnus quadrifidus, Kunzea baxteri, Leptospermum incanum, Isopogon polycephalus

Other (non-dominant) spp: _____

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine Excellent Very good Good Degraded Completely degraded

COMMENT: _____

FIRE HISTORY: Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High Medium Low No signs of fire

FENCING: Not required Present Replace / repair Required Length req'd: _____

ROADSIDE MARKERS: Not required Present Replace / reposition Required Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

Extensive possible habitat on granite rock to immediate south on private property

Plants growing on current road running surface.

Possibly taking up to 35 plants as part of cleanup.

DRF PERMIT/ LICENCE No: 2019/313 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: KW002 WA Herb. Regional Herb. District Herb. Other: _____

ATTACHED: Map Mudmap Photo GIS data Field notes Other: _____

COPY SENT TO: Regional Office District Office Other: _____

Submitter of Record: Kate White Role: Environmental officer Signed: [Signature] Date: 12/11/18



Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpcw.wa.gov.au/> under Standard Report Forms

TAXON: <u>Euc Swardmanniana</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>8 / 11 / 18</u>	CONSERVATION STATUS: <u>P1</u> New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>J. Waters + K. White</u>	PHONE: <u>90831519</u>
ROLE: <u>Env. Officer</u>	ORGANISATION: <u>Shire of Esperance</u>

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):
corner of Henke + Howick Rd north side of road

Reserve No: _____	
DBC DISTRICT: <u>Esperance</u>	LGA: <u>Esperance</u> Land manager present: <input type="checkbox"/>
DATUM: COORDINATES: (if UTM coords provided, Zone is also required)	
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input checked="" type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	Lat / Northing: <u>479943</u>
WGS84 <input type="checkbox"/>	Long / Easting: <u>6267891</u>
Unknown <input type="checkbox"/>	ZONE: <u>51H</u>
METHOD USED: GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
No. satellites: _____ Map used: _____	
Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
LAND TENURE:	
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/> Private property <input type="checkbox"/> Rail reserve <input type="checkbox"/> Shire road reserve <input checked="" type="checkbox"/>
National park <input type="checkbox"/>	State forest <input type="checkbox"/> Pastoral lease <input type="checkbox"/> MRWA road reserve <input type="checkbox"/> Other Crown reserve <input type="checkbox"/>
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/> UCL <input type="checkbox"/> SLK/Pole _____ to _____ Specify other: _____

AREA ASSESSMENT: Edge survey <input type="checkbox"/> Partial survey <input type="checkbox"/> Full survey <input checked="" type="checkbox"/>	Area observed (m ²): _____
EFFORT: Time spent surveying (minutes): _____	No. of minutes spent / 100 m ² : _____
POP'N COUNT ACCURACY: Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>	Count method: _____
(Refer to field manual for list)	
WHAT COUNTED: Plants <input type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>	
TOTAL POP'N STRUCTURE:	
Mature: _____	Juveniles: _____
Seedlings: _____	Totals: _____
Alive) _____
Dead	_____
Area of pop (m ²): _____	
Note: PIs record count as numbers (not percentages) for database.	
QUADRATS PRESENT: No. _____ Size _____ Data attached <input type="checkbox"/>	Total area of quadrats (m ²): _____
Summary Quad. Totals: Alive	_____
REPRODUCTIVE STATE: Clonal <input type="checkbox"/> Vegetative <input checked="" type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>	Percentage in flower: _____ %
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/>	

CONDITION OF PLANTS: Healthy Moderate Poor Senescent

COMMENT: Multi stemmed

THREATS - type, agent and supporting information: <small>Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)</small>	Current impact (N-E)	Potential impact (L-E)	Potential Threat Onset (S-L)
• <u>Road maintenance / road widening</u>	<u>M</u>	<u>M</u>	<u>S</u>
• _____	_____	_____	_____
• _____	_____	_____	_____



Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input checked="" type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input checked="" type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input checked="" type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input checked="" type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					
CONDITION OF SOIL:	Dry <input type="checkbox"/>	Moist <input checked="" type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

VEGETATION CLASSIFICATION*:

Eg: 1. Banksia woodland (B. attenuata, B. hillebrandii);
 2. Open shrubland (Hibbertia sp., Acacia spp.);
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. Nutsia florabunda over low shrubland

2. _____

3. _____

4. _____

ASSOCIATED SPECIES:

Other (non-dominant) spp

Mebeuca striata, Erogratis sp. Adenanthos cuneatus, Nutsia florabunda

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine Excellent Very good Good Degraded Completely degraded

COMMENT: _____

FIRE HISTORY: Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High Medium Low No signs of fire

FENCING: Not required Present Replace / repair Required Length req'd: _____

ROADSIDE MARKERS: Not required Present Replace / reposition Required Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

Random plant possibly spread by road works
 Will be removed under proposed road widening plans by Shire of Esperance.

DRF PERMIT/ LICENCE No: 5009313 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: No WA Herb. Regional Herb. District Herb. Other: _____

ATTACHED: Map Mudmap Photo GIS data Field notes Other: _____

COPY SENT TO: Regional Office District Office Other: _____

Submitter of Record: Kate White Role: Environmental officer Signed: [Signature] Date: 12/11/18