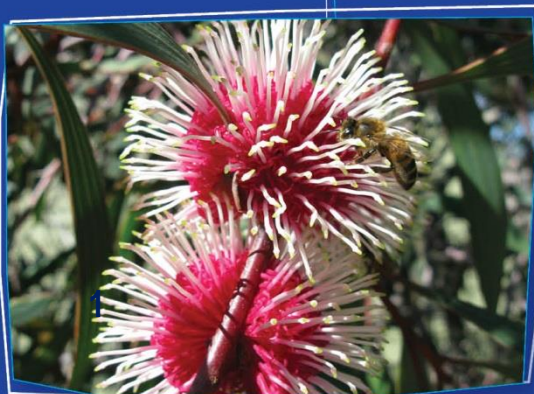


Targeted Flora Survey Report

Howick Road North Construction Project CPS 7889/1
(Ridgeland Road to Parmango Road)



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Environmental Officers



1 Executive Summary

In November 2018, the Shire of Esperance applied for Purpose Permit CPS 7889/1 to clear 4.3 hectares for the northern portion of Howick road, between Ridgелands road intersection and Parmango Road intersection (Howick Road reserve - PIN 11644423). Shortly after (January 2018), the Shire of Esperance submitted 'Vegetation, Flora, Fauna and Environmental Considerations report' for the Howick Road North Construction Project (Parmango Rd to Ridgелands Rd). On 2 July 2018, the Shire of Esperance received a response 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 the Fisheries to Coolinup road over a three-year period. One section has already been completed under CPS 7185/1. This 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 road 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; 6.19 km along Howick Rd from Ridgeland to Parmango rd, approximately 80 km north-east of Esperance town site.

3 Methods

The 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 2/10/18 to 10/10/18, by Shire of 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 timing, 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 8/11/18. **An incidental recording of a priority species occurred on 01/10/2019.**

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 three species of Declared Rare Flora (DRF) and 21 priority flora species 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 Howick Rd (Parmango to Ridgeland Rd).

Species	Conservation Status
<i>Acacia nitidula</i>	P 2
<i>Anigozanthos bicolour ssp minor</i>	DRF - Endangered
<i>Baeckea sp Gibson</i>	P1
<i>Calectasia jubilea</i>	P 2
<i>Darwinia sp Mt Burdett</i>	P 4
<i>Daviesia pauciflora</i>	P 3
<i>Eucalyptus sweedmaniana</i>	P 2
<i>Goodenia laevis laevis</i>	P3
<i>Grevillea baxteri</i>	P 4
<i>Hibbertia hamata</i>	P 3
<i>Isopogon alpicornis</i>	P 3
<i>Kennedia beckxiana</i>	P 4
<i>Lambertia echinata subsp. echinata</i>	DRF – Critically Endangered
<i>Lasiopetalum parvuliflorum</i>	P 3
<i>Lepidium pseudotasmanicum</i>	P 4
<i>Leucopogon florentus</i>	P 3
<i>Leucopogon remotus</i>	P1
<i>Meleleuca eximia</i>	P 2
<i>Myoporum turbinatum</i>	P4
<i>Myoporum velutinum</i>	DRF - Endangered
<i>Persoonia scabra</i>	P 3
<i>Spyridium mucronatum subsp. 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 bicolour* subsp *minor* (DRF)
- *Scaevola archeriana* (P1)
- *Calectasia julaea* (P2)
- *Eucalyptus sweedmaniana* (P2)
- *Acacia nitidula* (P3),
- *Grevillea baxteri* (P4)

In total, **202** species were identified within the clearing permit area, see attached incidental species list (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). **Three** priority species were collected within the clearing permit area; *Grevillea baxteri* (Priority Four), *Bentleya diminuta* (Priority Two), and ***Daviesia pauciflora* (Priority Three)**. Threatened priority forms completed and sent to local DBCA Conservation Officer's, Emma Massenbauer and Wayne Gill. *Bentleya diminuta* was present within a 500 m stretch of road in the NW area of the survey area. Scattered *Grevillea baxteri* was present in the SE portion of the survey across 1 km of roadside (Figure 2). **Up to three plants of *D. pauciflora* were located ~520 m north-west of Howick-Parmango Rd intersection, on Howick Rd. They were only present on the south-west road reserve.**



Figure 2. Location of Priority flora, *Bentleya diminuta*, *Grevillea Baxteri*, and *Daviesia pauciflora* on Howick Road North project area (Parmango to Ridgelands Rd), CPS 7889/1.

Bentleya diminuta (Priority Two) was collected by Environmental Officers at the Shire of Esperance (Katie White – KW006; Appendix 7.3). The new population caused some excitement amongst the local Esperance Wildflower Society resulting in a field excursion confirming identification (Figure 3). It was collected by Ken Mills for WA Herbarium (KR Mills). Plants were located 600 m SE of Ridgeland Rd and Howick Rd intersection, over a 500 m section of road on both sides of the road reserve. It was growing directly on the road shoulder, along back slopes. No plants were present in undisturbed bushland behind road shoulders. The population contained up to 1000 ramets, however it is impossible to tell how many individual genetic individuals are present without genetic analysis. All plants discovered were located within clearing footprint area.



Figure 3. Confirmation of new population *Bentleya diminuta* (Priority 2) by local Esperance Wildflower Society.

Two separate clusters of *Grevillea baxteri* (Priority Four) were located within CPS 7889/1 footprint, in the south east area of the permit (Figure 4). As these clusters were separated by 500 m, they have been treated as two separate populations. Two collections and priority forms therefore occurred. 'Population One' was located five km SE of Ridgeland/Howick Rd intersection on Howick Rd, with 11 plants present within a 350 m stretch of road. A specimen was collected by Katie White (KW005, Appendix 7.3). Six of the 11 plants will be removed if road widening occurs.

'Population two' had nine plants recorded within 150 m stretch of road. They were located one km NE of Parmango/Howick Rd intersection on Howick Rd. A specimen was collected by Katie White (KW004; Appendix 7.3). Four of the nine plants will be removed if road widening occurs. In total across the clearing permit area, 10 of the 20 *G. baxteri* plants identified if road widening under CPS 7889/1 occurs.



Figure 4. *Grevillea baxteri*, a Priority Four species, was identified in the Howick Road North project

targeted flora survey.

A priority three species *D. pauciflora*, was identified after the Spring 2018 flora survey, incidentally in October 2019. A specimen was collected (KW029, Accession 8178), and was confirmed by the WA Herbarium on 13/11/2019. No previous record was present from the spatial data from WA Herbarium, Esperance Threatened Flora and TPFL, meaning it was a new population discovered. One to three plants were present, which are all within the active clearing permit area and will be impacted upon.

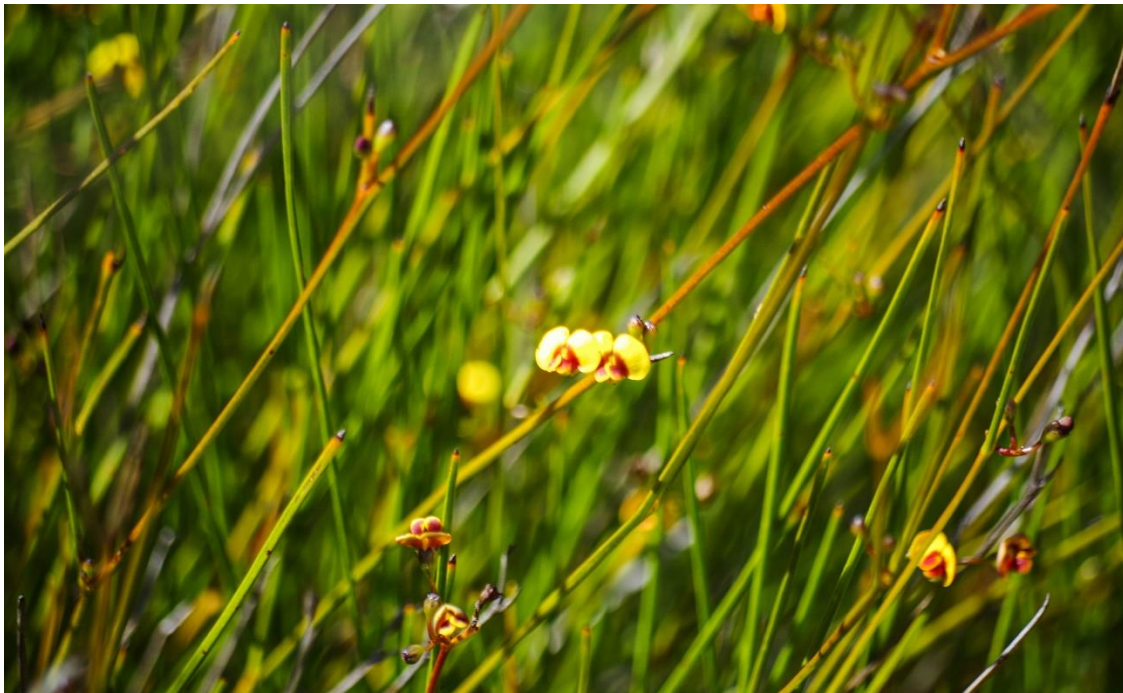


Figure 5. *Daviesia pauciflora*, a priority three species, present within the CPS 7889/1 (now CPS 8608/1) application area. Image demonstrates the indistinguishable characteristics of the species, showing how its identification is cryptic outside of spring.

Other species listed as likely to occur in letter from DBCA advice, *Anigozanthos bicolour* ssp. *minor*, *Scaevola archeriana*, *Acacia nitidula*, *Calectasia juliaea* were not discovered. No similar species of these were present and likely to have been misidentified.

5 Discussion

Bentleya diminuta has been collected from three populations in the Esperance region, and 12 populations from the Hyden and Lake King region to Cape Arid National Park. All populations occur on disturbed roadside areas. An inference could therefore be made that the species require disturbance for regeneration. The *B. diminuta* plants that will be removed in the road reconstruction process are observed to be flowering and fruiting. Therefore, when this project occurs in a few years, there is a high possibility sufficient seed bank will have developed and the species will naturally regenerate. Regardless of approval of CPS 7889/1, these plants will be removed as part of routine road maintenance due to their presence on road shoulder. They have likely been graded several times in the past and regenerated naturally.

Grevillea baxteri is extensive in the local landscape. There are numerous populations, although none

have large numbers of individuals. 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. 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.

An extract on population dynamics of *Daviesia pauciflora* from 'Threatened and Priority Reporting (TPFL)' and 'WA Herbarium' databases were requested from Department of Biodiversity, Conservation and Attractions (DBCA) in November 2019, and used to determine impact across the entire population. It was noted in correspondence with DBCA that additional information was on file at DBCA that was not been entered these databases. Information is therefore likely to be under-representative and not comprehensive. DBCA does not prioritise monitoring or management of species with low priority rankings due to their prevalence in the landscape relative to threatened flora or priority one's and two's. There are 145 species recorded as priority three or four within the Shire of Esperance's boundaries.

***D. pauciflora* was recorded 31 times across 18 locations, as determined across the two spatial sources. The vast majority of records these have poor descriptions of tenure, with 5 locations having unknown tenure. Of the remaining locations recorded, 2 locations were on private property and 6 locations on Unallocated Crown Land or Nature Reserves, likely to be secure from development or adverse impacts. 5 were recorded on road reserves, and may have been lost through road developments or maintenance. 17 records from 10 sites were prior to 2000, and have not been reported or known to be monitored since. It is unknown whether these populations remain. Population numbers are not well recorded in the spatial database, ranging from descriptions of 2-5 plants to likely to be 100s present. A total of 243 plants were listed across all records. It was noted for many populations to be frequently present.**

It is believed that this species is under-represented in total known populations in the spatial databases. As DBCA does not actively manage low priority species, it is highly likely many records have not been prioritized being entered into the database or have simply never been reported. Additionally, *D. pauciflora* is cryptic in identification, looking extremely non-descript and similar to many other common species outside of flowering time in spring. It is therefore likely that many populations remain undiscovered due to being unidentifiable for 11 months of the year. It is described as growing over a vast array of sandplain habitats and vegetation communities. This is supportive by personal experience, where plants have been observed in mallee shrubland to thick Banksia coastal shrubland. Lastly, it covers a large distribution and is not geographically restricted. It has been recorded across 230 km latitude and 70 km longitude area of the Esperance Shire (Figure 6).

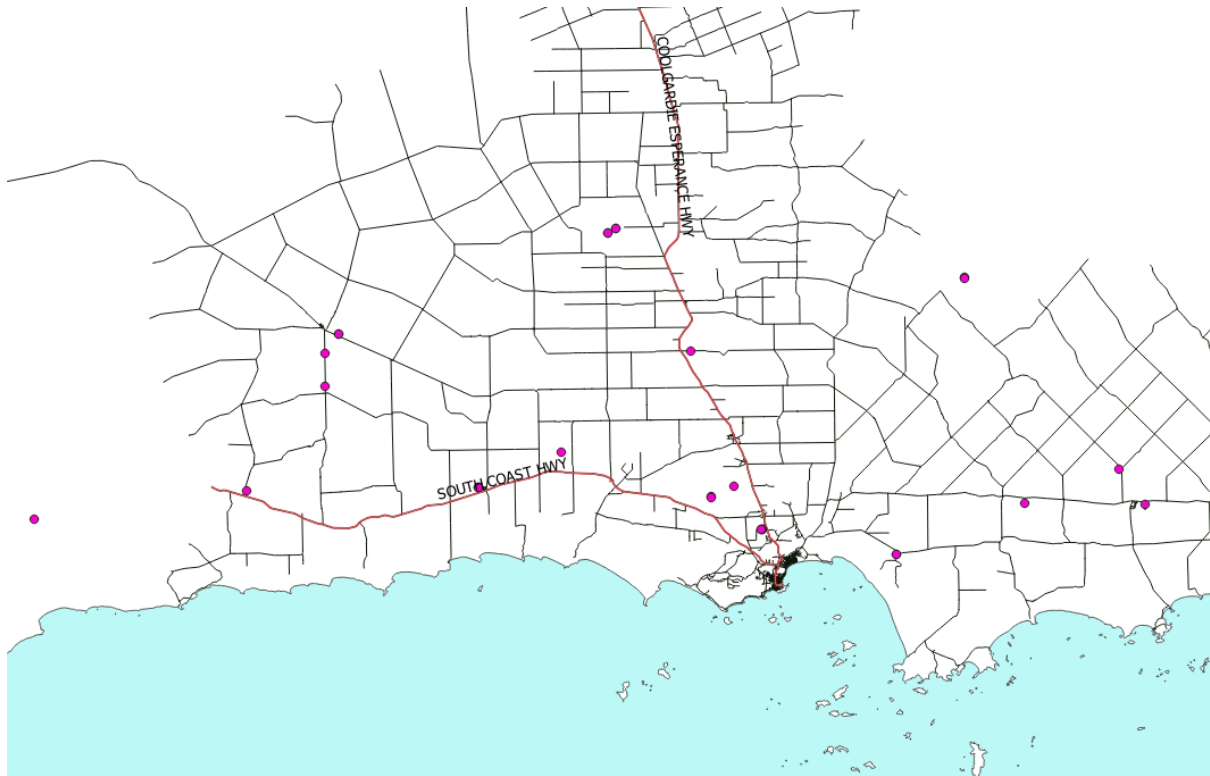


Figure 6. Map of all recorded locations of *Daviesia pauciflora* across the Esperance Shire, as obtained from Department of Biodiversity, Conservation and Attraction's WA Herbarium and Threatened and Priority Reporting spatial databases.

The vegetation mapping conducted in January 2018 for 'Vegetation, Flora, Fauna and Environmental Considerations report' was confirmed during the targeted flora surveys. 37% of the project area meets the Environment Protection and Biodiversity Conservation Act (1999) listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' Threatened Ecological Community (TEC) diagnostic characteristics and condition thresholds. This was mostly located in the southern half of the 7889/1 project area. 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.



Figure 7: Yellow indicates location of 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' TEC within project area (Pink). This consists of 37% of the project area.

Given the wide gazette road reserve and excellent condition of the road reserve vegetation and good quality nature corridor will still remain for fauna movement. The existing road reserve is 100 m, with a total of 75 m remaining at the conclusion of the road widening, with 37.5 m on either side of road.

6 References

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

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

7 Appendix

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

Family	Genus	Species	Common name	Priority	1	2	3	4	5	6	7	8	9
Anarthriaceae	Anarthria	laevis			X								
Anarthriaceae	Anarthria	scabra			X	X							X
Asparagaceae	Laxmannia	brachyphylla	Stilted paper lilly		X				X	X			
Asparagaceae	Thysanotus	patersonii	Twining fringe lilly			X		X	X	X	X		X
Aspleniaceae	Pleurosorus	rutifolius	Blanket fern		X								
Asteraceae	Argentipallium	niveum											X
Asteraceae	Vittadinia	gracilis											X
Boraginaceae	Halgania	anagalloides var Southern					X		X	X	X	X	X
Casuarinaceae	Allocasuarina	campestris											X
Casuarinaceae	Allocasuarina	huegeliana	Rock sheok		X	X			X		X	X	
Casuarinaceae	Allocasuarina	humilis	Dwarf sheok		X	X						X	
Casuarinaceae	Allocasuarina	thuyoides	Horned sheok		X	X							
Convolvulaceae	Wilsonia	humilis	Silky wilsonia										X
Cupressaceae	Callitris	roei subsp roei	Cypress Pine							X		X	X
Cyperaceae	Baumea	articulata			X					X			
Cyperaceae	Caustis	dioica	Puzzle grass		X	X	X		X				
Cyperaceae	Ficina	nodosa			X					X			X
Cyperaceae	Gahnia	ancistrophylla	Hooked-leaf saw sedge							X	X		
Cyperaceae	Gahnia	sp. Headland					X						X
Cyperaceae	Gahnia	trifida	Saw-sedge grass			X				X			
Cyperaceae	Lepidosperma	carphoides	Black rapier sedge				X			X			
Cyperaceae	Lepidosperma	costales								X			
Cyperaceae	Lepidosperma	leptostachyum							X	X	X	X	
Cyperaceae	Lepidosperma	longitudinale			X	X	X	X	X	X	X		X

Cyperaceae	Lepidosperma	rigidulum										X		
Cyperaceae	Mesomelaena	sp									X			
Cyperaceae	Mesomelaena	stygia									X			X
Cyperaceae	Mesomelaena	tetragona	Semaphore sedge			X						X		
Cyperaceae	Schoenus	caespititius								X				X
Cyperaceae	Schoenus	sp									X	X		
Cyperaceae	Schoenus	submicrostachyus			X		X							
Cyperaceae	Tricostularia	aphylla	Curly grass				X		X			X	X	
Dilleniaceae	Hibbertia	gracilipes			X	X	X	X	X	X	X	X	X	X
Dilleniaceae	Hibbertia	hamulosa									X		X	
Dilleniaceae	Hibbertia	psilocarpa									X			X
Dilleniaceae	Hibbertia	sp												X
Droseraceae	Drosera	menziesii	Pink rainbow dew			X								
Ericaceae	Conostephium	drummondii								X				
Ericaceae	Conostephium													X
Ericaceae	Leucopogon	carinatus					X							
Ericaceae	Leucopogon	fimbriatus										X		
Ericaceae	Lysinema	pentapetalum			X	X		X	X				X	
Fabaceae	Acacia	aemula				X				X				
Fabaceae	Acacia	bidentata												X
Fabaceae	Acacia	binata												X
Fabaceae	Acacia	chrysocephala					X							X
Fabaceae	Acacia	crispula										X		X
Fabaceae	Acacia	cyclops			X	X	X	X		X	X			X
Fabaceae	Acacia	glaucocarpa									X			X
Fabaceae	Acacia	gonophylla	Small cream head acacia			X	X	X	X	X	X			X
Fabaceae	Acacia	lasiocarpa var bracteolata			X						X			X
Fabaceae	Acacia	pinguiculosa subsp teretifolia												X
Fabaceae	Acacia	pritzeliana									X	X		X
Fabaceae	Acacia	saligna			X									
Fabaceae	Aotus	Sp. Esperance			X	X							X	
Fabaceae	Bossiaea	preissii			X	X		X	X	X				X
Fabaceae	Chorizema	aciculare	Needle leaf chorizema			X	X	X	X			X	X	X

Fabaceae	Chorizema	ilicifolium	Holly Flame Pea										X	
Fabaceae	Chorizema	nervosum								X	X			X
Fabaceae	Chorizema	obtusifolium	Flame pea		X	X	X	X			X			
Fabaceae	Daviesia	incrassata subsp reversifolia				X								X
Fabaceae	Daviesia	lancifolia							X	X	X	X	X	
Fabaceae	Daviesia	major			X									
Fabaceae	Daviesia	pauciflora		3	X									
Fabaceae	Daviesia	teretifolia				X	X	X	X	X	X	X	X	X
Fabaceae	Dillwynia	uncinata	Silky parrot pea			X								X
Fabaceae	Eutaxia	major												X
Fabaceae	Gastrolobium	discolor												X
Fabaceae	Gastrolobium	parviflorum								X				X
Fabaceae	Gompholobium	baxterii					X	X		X		X	X	
Fabaceae	Gompholobium	knightianum			X	X	X	X	X				X	
Fabaceae	Gompholobium	marginatum												
Fabaceae	Isotropis	drummondii	Lamb Poison; granny bonnet											X
Fabaceae	Jacksonia	venosa				X	X	X	X				X	
Fabaceae	Kennedia	prostrata	scarlet runner; postman											X
Fabaceae	Pultenaea	indira subsp indira												X
Fabaceae	Pultenaea	purpurea								X		X		
Fabaceae	Pultenaea	spinulosa												X
Fabaceae	Pultenaea	verruculosa										X	X	
Fabaceae	Templetonia	retusa	Cockies tongue											X
Fabaceae	Templetonia	sulcata	Centipede bush; Skeleton				X			X	X	X	X	
Goodeniaceae	Dampiera	fasciculata			X	X								
Goodeniaceae	Dampiera	lavandulacea				X	X	X	X	X	X	X	X	X
Goodeniaceae	Dampiera	sacculata			X	X		X	X	X	X	X	X	X
Goodeniaceae	Goodenia	berardiana								X	X	X	X	
Goodeniaceae	Goodenia	scapigera	White goodenia							X	X	X	X	
Goodeniaceae	Lechenaultia	formosa					X	X	X			X	X	
Haemodoraceae	Anigozanthos	rufus			X									

Haemodoraceae	Haemodorum	spicatum	Blood root										X
Haloragaceae	Glischrocaryon	aureum	Globular pop flower		X		X	X	X	X	X	X	X
Hemerocallidaceae	Agrostocrinum	scabrum	Blue grass lilly				X						X
Hemerocallidaceae	Dianella	revoluta	Blueberry lilly		X		X		X	X			X
Iridaceae	Moraea	setifloia		*									X
Iridaceae	Patersonia	lanata	Wooly purple Iris		X	X			X				
Iridaceae	Patersonia	occidentalis	Smooth purple iris		X								
Lamiaceae	Microcorys	glabra								X	X	X	X
Lamiaceae	Westringia	rigida	Stiff Westringia							X			X
Lauraceae	Cassytha	micrantha										X	X
Lauraceae	Cassytha	racemosa	Dodder Laurel										X
Lauraceae	Cassytha	sp			X	X	X		X	X	X	X	X
Loranthaceae	Nuytsia	floribunda	Christmas tree		X							X	
Malvaceae	Guichenotia	ledifolia								X		X	X
Malvaceae	Thomasia	macrocalyx								X			
Myrtaceae	Beaufortia	empetrifolia							X				
Myrtaceae	Beaufortia	micrantha			X	X	X	X					
Myrtaceae	Beaufortia	schaueri				X		X					
Myrtaceae	Calytrix	leschenaultii			X	X						X	
Myrtaceae	Chamelaucium	axillare	Esperance wax			X			X				
Myrtaceae	Conothamnus	aureus			X								
Myrtaceae	Cyathostemon	ambiguus				X		X	X	X	X	X	X
Myrtaceae	Darwinia	vestita	Pom-pom darwinia		X	X	X	X	X		X	X	
Myrtaceae	Eucalyptus	angulosa			X	X	X	X		X	X	X	X
Myrtaceae	Eucalyptus	conglobata								X			X
Myrtaceae	Eucalyptus	extrica			X								
Myrtaceae	Eucalyptus	incrassata											X
Myrtaceae	Eucalyptus	leptocalyx	Hopetoun Mallee										X
Myrtaceae	Eucalyptus	occidentalis	Yates paperbak				X	X	X	X	X	X	X
Myrtaceae	Eucalyptus	tumida											X
Myrtaceae	Eucalyptus	uncinata				X			X		X	X	X

Myrtaceae	Leptospermum	erubescens	Roadside tea tree			X													
Myrtaceae	Leptospermum	incanum																	X
Myrtaceae	Melaleuca	brevifolia				X													
Myrtaceae	Melaleuca	brophyi																	X
Myrtaceae	Melaleuca	calycina					X	X		X									X
Myrtaceae	Melaleuca	carrii																	X
Myrtaceae	Melaleuca	glaberrima																X	
Myrtaceae	Melaleuca	hamata					X			X	X	X	X	X	X				X
Myrtaceae	Melaleuca	hamulosa																	X
Myrtaceae	Melaleuca	incana subsp tenella																	X
Myrtaceae	Melaleuca	pulchella																	X
Myrtaceae	Melaleuca	rigidifolia					X			X	X			X	X				X
Myrtaceae	Melaleuca	scabra					X	X	X	X			X	X	X				X
Myrtaceae	Melaleuca	societatis											X						
Myrtaceae	Melaleuca	striata				X	X												
Myrtaceae	Melaleuca	uncinata																	X
Myrtaceae	Melaleuca	undulata	Hidden Honey myrtle																X
Myrtaceae	Micromyrtus	imbricata								X									
Myrtaceae	Phymatocarpus	maxwellii						X		X	X	X							
Myrtaceae	Taxandria	spathulata				X													
Myrtaceae	Verticordia	roei subsp roei					X	X		X								X	
Orchidaceae	Caladenia	flava	Cowslip orchid			X													
Orchidaceae	Elythranthera	brunonis	Purple enamel orchid			X	X												
Orchidaceae	Thelymitra	graminea	Shy Sun orchid																X
Pinaceae	Pinus	pinaster	Invasive Pine	*		X													
Pittosporaceae	Bentleya	diminuta		P1															X
Pittosporaceae	Billardiera	coriacea																	X
Pittosporaceae	Billardiera	fusiformis	Australian bluebell vine				X	X	X		X	X	X	X	X				X
Pittosporaceae	Cheiranthra	filifolia	Finger flower																X
Poaceae	Austrostipa	drummondii																	X

Poaceae	Neurachne	alopeкуроidea	Fox tail mulga grass		X	X	X	X	X	X	X	X	X	X
Polygalaceae	Comesperma	ciliatum	lovers twine										X	
Polygonaceae	Muehlenbeckia	adpressa	Climbing lignum		X				X					
Proteaceae	Adenanthos	cuneatus			X									
Proteaceae	Banksia	armata	Prickly dryandra		X	X			X		X	X	X	
Proteaceae	Banksia	media							X	X	X	X	X	
Proteaceae	Banksia	nivea	Honeypot Dryandra		X						X			
Proteaceae	Banksia	obovata			X								X	
Proteaceae	Banksia	puchella			X									
Proteaceae	Banksia	repens			X	X								
Proteaceae	Banksia	speciosa			X									
Proteaceae	Calothamnus	gracilis			X	X								
Proteaceae	Calothamnus	quadrifidus			X			X						X
Proteaceae	Conospermum	teretifolium	Spider smokebush											X
Proteaceae	Grevillea	baxterii	Toothbrush grevillea	P4	X	X								
Proteaceae	Grevillea	nudiflora				X	X	X	X	X	X	X	X	X
Proteaceae	Grevillea	oligantha				X		X	X	X	X	X	X	X
Proteaceae	Grevillea	pectinata	Comb-leaf grevillea				X			X	X			X
Proteaceae	Hakea	cinera			X	X		X						X
Proteaceae	Hakea	corymbosa	Cauliflower hakea		X	X			X					
Proteaceae	Hakea	denticulata	Stinking roger		X	X								
Proteaceae	Hakea	laurina	Pin cushion hakea		X	X	X	X	X	X	X	X	X	X
Proteaceae	Hakea	lissocarpha				X			X					X
Proteaceae	Hakea	marginata			X	X				X				
Proteaceae	Hakea	obliqua	needles and cork		X									
Proteaceae	Hakea	pandanocarpa	Donkey-kong balls hakea		X	X		X	X					X
Proteaceae	Hakea	trifurcata	Two-leaf Hakea		X	X								
Proteaceae	Hakea	varia	Variable leaf hakea; mean							X	X			

Proteaceae	Isopogon	polycephalus	Clustered coneflower		X	X		X	X	X	X		
Proteaceae	Petrophile	fastigiata			X	X		X	X	X	X	X	X
Proteaceae	Petrophile	linearis	Pixie mops		X								
Proteaceae	Petrophile	teretifolia				X							
Proteaceae	Stirlingia	anethifolia			X								
Proteaceae	Synaphea	favosa			X	X							
Proteaceae	Synaphea	media				X		X	X				
Proteaceae	Synaphea	petiolaris				X							
Proteaceae	Synaphea	sp.					X						
Restionaceae	Desmocladus	flexuosus			X			X					
Rhamanaceae	Cryptandra	myriantha			X							X	
Rhamanaceae	Cryptandra	pungens					X						X
Rhamanaceae	Pomaderris	myrtilloides											X
Rhamanaceae	Spyridium	microcephalum										X	X
Rhamanaceae	Trymalium	myrtillus subsp myrtillus							X				
Rubiaceae	Opercularia	vaginata	Dog weed		X	X	X		X	X	X	X	X
Rutaceae	Boronia	crassifolia								X			
Rutaceae	Boronia	inornata	Desert Boronia										X
Rutaceae	Boronia	ramosa subsp anethifolia				X					X	X	X
Santalaceae	Exocarpus	sparteus	Native cherry		X	X		X				X	X
Sapindaceae	Dodonaea	caespitosa								X			X
Stylidiaceae	Stylidium	turleyae								X			X
Thymelaeaceae	Pimelea	aeruginosa					X					X	
Thymelaeaceae	Pimelea	brachyphylla								X		X	X
Thymelaeaceae	Pimelea	imbricata var pilgera									X		

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

Kilometres SE from Ridgeland Road	Section number	Notes	Vegetation Condition (Kieghery Scale)	Meets TEC definition (Y/N)	Vegetation Description
0-3km	9		Very Good	No	Eucalyptus woodland over mixed melaleuca shrubland, with scattered <i>Banksia media</i> and <i>Hakea</i>

					<i>laurina</i>
3-3.2km	8		Very Good	Yes – east side only	<i>Banksia armata</i> dominated shrubland
3.2-3.4	7		Very Good	No – not 30% proteaceae cover	<i>Hakea laurina</i> over <i>Melaleuca shrubland</i>
3.4-3.9	6		Very Good		Eucalypt over melaleuca shrubland
3.9-4	5	Old gravel pits	Good - degraded		
4.4km	3 and 4	Saline creek	Poor		Yate woodland
4.5-4.8	2			Yes	Hakea shrubland
4.8-5.2	1	Pinus pinaster on south side of road – Carnabys feeding habitat	Good	Yes	<i>Banksia speciosa</i> woodland
5.3-6.1	1		Very Good	Yes	<i>Nuytsia floribunda</i> and tallerack over mixed heath

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://dpcw.wa.gov.au> under Standard Report Forms

TAXON: <u>Bentleya diminuta</u>	OBSERVATION DATE: <u>10/8/18</u>	CONSERVATION STATUS: <u>P2</u>	TPFL Pop. No: <u>New</u>
OBSERVER/S: <u>Kate White, Julie Waters</u>	PHONE: <u>09088 1518</u>	New population <input checked="" type="checkbox"/>	
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): Northern roadside reserve of Howick Rd, Landings, 500 metres SE of Ridgeland Rd intersection. 19km NNE Landings townsite

DBCA DISTRICT:	LGA: <u>Esperance</u>	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 checked="" type="checkbox"/> UTM <input type="checkbox"/>	GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	Lat / Northing: <u>33° 35' 32.55.0 S</u>	No. satellites: _____ Map used: _____
WGS84 <input type="checkbox"/>	Long / Easting: <u>122° 37' 54.0 E</u>	Boundary polygon captured: <input type="checkbox"/> Map scale: _____
Unknown <input type="checkbox"/>	ZONE: _____	
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 checked="" type="checkbox"/> Full survey <input type="checkbox"/>	Area observed (m ²): <u>1km</u>
EFFORT: Time spent surveying (minutes): <u>1hr</u>	No. of minutes spent / 100 m ² : <u>1hr</u>
POP'N COUNT ACCURACY: Actual <input type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input checked="" type="checkbox"/>	Count method: _____
(Refer to field manual for list)	
WHAT COUNTED: Plants <input type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input checked="" type="checkbox"/>	
TOTAL POP'N STRUCTURE:	Area of pop (m ²): <u>500</u>
Alive	Mature: <u>up to 1000 frames</u> Juveniles: <u>possible single genet</u> Seedlings: _____ Totals: _____
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	<u>locally common in scattered colonies.</u>
REPRODUCTIVE STATE:	Percentage in flower: _____ %
Clonal <input checked="" type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>	
Immature fruit <input 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>Confined to road shoulders - highly vulnerable to being over disturbed + loss of seeds/plants/population.</u>	---	H.	S
•	---	---	---
•	---	---	---

Please return completed form to **Species And Communities Branch DBCA**,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to Flora Administrative Officer, Species and Communities Branch.

Record entered by:

Sheet No.:

Record Entered in Database



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 type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input checked="" type="checkbox"/>
Hill <input 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 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 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 checked="" 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: <u>Sandy Clay</u>	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. attenuata, B. icifolia);
 2. Open shrubland (Hibbertia sp., Acacia spp.);
 3. Isolated clumps of sedges (Mesometeana tetragona)

1. Open roadside/bare ground. Present on roadside shoulder. Adjacent to low shrubland adjoining Mallee
 2. Woodland
 3. Clycocarpus aurem, Goodenia beaudiana, Thylenandra
 4. Very sparse Goodenia locina, Copernicia strophilata, Atanella revoluta, Wilsonia humilis

ASSOCIATED SPECIES:

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 Disturbed x

COMMENT: add weed free road reserve

FIRE HISTORY: Last Fire: Season/Month: Logan 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.)

Other populations all on roadside reserve - likely disturbance regime correct to promote growth or germinate seeds. Grading only occurs at sparse intervals.

DRF PERMIT/ LICENCE No: SW019315 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: KW006 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: 22/01/18

Please return completed form to **Species And Communities Branch DBCA**,
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
 Record entered by: _____ Sheet No: _____ Record Entered in Database



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://dpcaw.wa.gov.au/> under Standard Report Forms

TAXON: <u><i>Arenaria baxteri</i></u>		TPFL Pop. No: _____
OBSERVATION DATE: <u>8 / 11 / 2018</u>	CONSERVATION STATUS: <u>P4</u>	New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>Julie Waters & Kathe White</u>		PHONE: <u>90831518</u>
ROLE: <u>Enviro 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):
5km SE of Ridglands/Howick Rd intersection, on Howick Rd
plants extend 300m on both sides of road.

Reserve No: _____

DBC DISTRICT: ESP. LGA: ESP. Land manager present:

DATUM: _____ COORDINATES: (If UTM coords provided, Zone is also required):
 DecDegrees DegMinSec UTM METHOD USED:
 GDA94 / MGA94 Lat / Northing: 468856 GPS Differential GPS Map
 AGD84 / AMG84 Long / Easting: 62 79259 No. satellites: _____ Map used: _____
 WGS84 ZONE: 51 H Boundary polygon captured: Map scale: _____
 Unknown

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): _____ 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:	Area of pop (m ²): <u>350</u> Note: Pls record count as numbers (not percentages) for database.
Alive	11			11	
Dead					

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: 90 %

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 maintenance / widening</u>	<u>H</u>	<u>E</u>	<u>S</u>
• _____	_____	_____	_____
• _____	_____	_____	_____



Threatened and Priority Flora Report Form

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input checked="" 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 type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input 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 checked="" 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 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 checked="" type="checkbox"/>	Moist <input type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

VEGETATION CLASSIFICATION*:

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

1. Mixed shrubland

2. _____

3. Jacksonia venosa, Caustis dioica

4. Melicope strata, Eucalyptus angulosus, Dampiera saculata

ASSOCIATED SPECIES:

Other (non-dominant) spp

Acacia cyclops, Banksia speciosa, Dianella revoluta, Hakea corymbosa, Banksia repens, Isopogon polyccephalus

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2006 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 out of 11 plants will be taken if road widening occurs.

Prevention 6 plants present in proposed clearing area by Shire of Esperance for purpose of widening road.

DRF PERMIT/ LICENCE No: SW01313 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: KW005 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://dpaw.wa.gov.au> under Standard Report Forms

TAXON:	Grevillea baxteri	TPFL Pop. No:	
OBSERVATION DATE:	8/11/2018	CONSERVATION STATUS:	P4 <input checked="" type="checkbox"/> New population <input type="checkbox"/>
OBSERVER/S:	J. Waters + K. White	PHONE:	90831519
ROLE:	Enviro Officers	ORGANISATION:	Shine of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):
 0.7 km NE of ~~Ridgeland~~ / Parmango / Howick Rd intersection on Howick Rd. Plants extend m on both sides of road.

DBC DISTRICT:	Esperance	LGA:	Esperance	Land manager present:	<input checked="" 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"/>	UTMs <input checked="" type="checkbox"/>	GPS <input checked="" type="checkbox"/>	Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	Lat / Northing:	46937.9		No. satellites:	Map used:
WGS84 <input type="checkbox"/>	Long / Easting:	6278720.6		Boundary polygon captured:	Map scale:
Unknown <input type="checkbox"/>	ZONE:	51 H			
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 checked="" type="checkbox"/>	Clumps <input type="checkbox"/>	Clonal stems <input type="checkbox"/>		
TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:	
Alive	9			9	Area of pop (m ²): 150
Dead					Note: Ple 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: 100%
	Immature fruit <input type="checkbox"/>	Fruit <input type="checkbox"/>	Dehiscent 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=None, 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)
• Road maintenance / widening	M	E	S
•	---	---	---
•	---	---	---



Threatened and Priority Flora Report Form

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input checked="" 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 type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>		Loam <input type="checkbox"/>	Yellow <input checked="" type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	0-10% <input checked="" type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	30-50% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	50-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

CONDITION OF SOIL: Dry Moist Waterlogged Inundated

VEGETATION CLASSIFICATION*: 1. Shrubland
 2. _____
 3. _____
 4. _____

ASSOCIATED SPECIES: Hakea corymbosa, Melaleuca striata, Adenanthos cuneatus, Banksia speciosa, Eucalyptus angulosa

* 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.)

4 out of 9 plants will be impacted as part of proposed project by Shire of Esperance to widen Howick Rd.

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: KW004 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

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://dps.wa.gov.au/> under Standard Report Forms

TAXON: <u>Dawsonia pauciflora</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>01/10/2019</u>	CONSERVATION STATUS: <u>P3</u> New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>Kate White + Julie Waters</u>	PHONE: _____
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>8.1km NE of Esperance townsite 18.6km NE of Cardingup 520m NW of Parmango Ridge/land intersection, on Howick Rd on SW road reserve only</u>			
DBC DISTRICT: <u>South Coast</u>		LGA: <u>Esperance</u>	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 <input checked="" type="checkbox"/>	GPS <input type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input checked="" type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>	Lat / Northing: <u>6278725.4</u>	No. satellites: _____	Map used: <u>OGIS</u>
WGS84 <input type="checkbox"/>	Long / Easting: <u>469372.9</u>	Boundary polygon captured: <input type="checkbox"/>	Map scale: <u>1:2741</u>
Unknown <input type="checkbox"/>	ZONE: <u>514</u>		
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): _____	No. of minutes spent / 100 m ² : _____
POP'N COUNT ACCURACY: Actual <input type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input checked="" 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>1-3</u>	Area of pop (m ²): _____
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>100</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. CPS 8608. likely to take 1x on edge of road reserve</u>	<u>N-L</u>	<u>M-H</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 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 type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input checked="" type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input checked="" 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 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:

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

1. Banksia speciosa dense shrubland
 2. _____
 3. _____
 4. _____

ASSOCIATED SPECIES:

Other (non-dominant) spp

Banksia speciosa, Melaleuca striata, Adenanthe cuneata
Halea cernuola

* 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.)
Confirmed by Michael Hislop at WA Herbarium, 13/11/19

DRF PERMIT/ LICENCE No: 7110029 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: KW1029 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: 10/10/2019