

Howick Road South Construction Project (Muntz Rd to Fisheries Rd)



Vegetation, Flora, Fauna and Environmental Considerations Report

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Julie Waters (BEnvSci)
Senior Environmental Officer

EXECUTIVE SUMMARY

The survey has been undertaken in accordance with the Environmental Protection Authority (EPA) Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016) as part of the application to Clear Native Vegetation for a 9.6 km section of road upgrades. Total area of 24 hectares, 6.72 hectares of which is native vegetation. The permit area is along S Howick Road Reserve (between Muntz Road and Henkes Road) and Henkes Road Reserve (between Howick Road and Fisheries road). The existing road is a gravel road within a 100 metres wide road reserve. The total cleared road width is currently ranges from 18 metres. The Shire is applying to clear 25m wide along the 9.6km section of road to allow for drains to be located anywhere within the clearing footprint area. The entire 25m will not be cleared along the whole length of the permit.

Introduction

The Shire of Esperance plans to upgrade Howick Road from the Fisheries to Coolinup road over a 3 year period. One section has already been done CPS7185. This is a major transport route to the Beaumont CBH grain receival facility and thus gets a high amount of trucks and other traffic.

The survey is part of our compliance obligations for the purpose of clearing native vegetation to construct the road. Howick road and Henke Road are approximately 85km east of Esperance, on the south coast of Western Australia. The Shire of Esperance has applied for a 25m wide clearing footprint area. The current road is 18m wide and the gazetted road reserve is 100m. The survey is restricted to an area 5m either side of the existing road alignment.

The survey has been undertaken in accordance with the Environmental Protection Authority (EPA) Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016).



Figure 1: Location of Project area

BACKGROUND

The road construction project has the potential to affect a number of possible environmental factors. These include;

- Threatened Flora (TF) and Priority Flora (PF) within a twenty kilometre radius.
- Threatened Ecological communities (TEC) specifically the EPBC listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia'
- Carnaby's Cockatoo

Scope

The flora survey is in two parts being;

1. A desktop study for the purposes of gathering background information on the target area, and;
2. Reconnaissance survey to understand the likely presence of vegetation communities and flora species identified from the background study, define flora and vegetation units, their condition and potential impacts.

The survey involves low intensity sampling of flora to produce a species list (Appendix 1), and maps of vegetation types and condition.

Catchment landscape context

Climate

The climate is Mediterranean with cool wet winters and dry warm summers. The site receives an average annual rainfall of about 400 mm (DAFWA 2002).

Geology

The site consists of deep tertiary sediments of the Pallinup formation overlying proterozoic granite and gneiss and Quaternary aeolian sand overlying Tertiary sediments of the Pallinup formation.

Soils

Soils consist of six individual subsystems;

Esperance 6 Subsystem (245Es_6): Red-brown to grey brown alluvial sands.

Esperance 2 Subsystem (245Es_2): Gravelly yellow mottled duplex soils, (30-80 cm sand over gravel).

Esperance 5 Subsystem (245Es_5): Shallow grey-brown duplex soils developed over spongelite. - 5.97 ha

Condingup 1 Subsystem (245Co_1): Gently undulating plain with subdued sandsheets and dunes. Aeolian sands / Pallinup formation. Pale deep sands and associated grey deep sandy duplex soils (some gravelly).

Ney 2 Subsystem (245Ne_2): Gently inclined to moderately inclined hillslopes. Proterozoic granite and gneiss and associated colluvium. Grey deep sandy duplex soils and pale deep sands with minor shallow gravel and grey non-cracking clays.

Ney 1 Subsystem (245Ne_1): Moderately inclined to steeply inclined crests and slopes of hills. Proterozoic granite and gneiss and associated colluvium. Bare rock and associated shallow sands.

Vegetation

The site consists of the following Beard vegetation associations:

IBRA Subregion	Association	Description	Rarity %
Recherche	516	Shrublands; mallee scrub, black marlock	36.79
Recherche	47	Shrublands; tallerack mallee-heath	15.06
Recherche	4801	Shrublands; heath with scattered <i>Nuytsia floribunda</i> on sand	11.17
Recherche	128	Bare areas; rock outcrops	84.01

Land Use

The site is located within the Howick and Henke Road Shire Road Reserves. It is surrounded by mixed cropping and grazing land as well as an unallocated Crown Land Reserve R4755.

METHODOLOGY

Desktop study

A desktop study of existing geospatial information was undertaken prior to the site visit as part of the level 1 survey. This included using a Geographical Information System (GIS) to review existing site digital orthophotos, geology, morphology, wetlands, native and planted vegetation, IBRA classification, Threatened Flora (TF), Priority Flora (PF) and Threatened Ecological Communities (TEC's). WALGA's Environment Planning Tool was also used and this report has been added as an Appendix.

State and Commonwealth database searches for potential DRF, PF, and Threatened Ecological Communities (TEC), within a twenty kilometre buffer of the survey sites was undertaken as part of the desktop study. Additional liaison with the Esperance DPaW

District Flora Officer was conducted to further refine conservation values of interest and to define the twenty kilometre buffer due a lack of DRF and PF data across the District.

Field investigation

The preliminary field survey was conducted on 6 December 2017. It was a late spring in 2017 and east of Esperance had received considerable late rains so there was a still plenty of species flowering in early December (see cover page photograph). The survey effort comprised of driving slowly down Howick and Henke Roads with frequent stops and transects by foot into the roadside vegetation. Each time there was a visible change in vegetation structure, condition or composition it was noted and a foot traverse was undertaken noting species present at the site and taking herbarium specimens. A portable field herbarium was established and a preliminary species list developed.

The Esperance Shire provided coordinates for each site which were uploaded from GIS into a Garmin GPSmap64 unit and a field aerial photo map was used to navigate to different habitat areas.

A list of TF and PF within a ten kilometre radius of each site was used in the field along with a Threatened and Priority Flora field manual provided by the Esperance DPaW District Flora Officer. A combination of local botanical knowledge, botanical field guides, the DPaW Esperance District Herbarium and Florabase were used to prepare a plant species lists for each site (Appendix 1). Specific habitats that were likely to contain Priority flora species were extensively searched.

Ecological impacts were listed as being present or absent, and take into account both negative and positive impacts on the vegetation. They included clearing, artificial water way construction, fire, regeneration, waterlogging, senescence, weeds, erosion, sedimentation, rabbits, dieback, and illegal dumping of rubbish.

The condition of vegetation is a subjective assessment of how healthy the vegetation is at the time of the survey. This was based on the amount of dead or dying plants throughout the stratum compared to the amount of living plants and weed cover. This was categorized as "Excellent," "Very Good," "Good," "Degraded," or "Completely Degraded." The categories are derived from Keighery 1994, and outlined in further detail in Appendix 2.

The survey determined which areas were potentially the nationally listed threatened ecological community (TEC) Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia by using the key diagnostic characteristics as defined in the Approved Conservation Advice for the TEC. According to this document;

A patch must include the following key diagnostic characteristics to be considered the ecological community:

1) Occurs within the Southeast Coastal Floristic Province (*sensu* Hopper and Gioia, 2004; relating to south west Australian phytogeographic boundaries. Includes the islands of the Recherche Archipelago).

AND

2a) Characterised by Proteaceae species having 30% or greater cover of Proteaceae species across all layers where these shrubs occur (crowns measured as if they are opaque),

OR

2b) Two or more diagnostic Proteaceae species are present that are likely to form a significant vegetative component when regenerated.

This shapefile data has been forwarded to Department of Biodiversity Conservation and Attractions, Species and Communities branch and Esperance District.

All field data collected relating to vegetation type, condition, transect coverage, and photo points have been collated into GIS shapefiles and used as part of the analysis. Mapping of site area vegetation type and condition were collated and recorded as polygon shapefiles and attributed with area and perimeter parameters.

Findings from the desktop study and field survey were reviewed against whether each site would affect any of the following environmental values:

- The presence or absence of TF, PF and TEC's and
- The area and condition of remnant vegetation.

RESULTS

Desktop study

The Declared and endangered flora list (DEFL) database search and liaison with the Esperance DPaW District Flora Officer resulted in several known Priority Flora species and sites within a twenty kilometre radius of each site (Table 1). Appendix 3 provides a description of each priority conservation status. The site had 15 Priority Flora species and 3 Threatened Flora species recorded within a twenty kilometre radius of the survey area.

Taxon	TF	P1	P2	P3	P4
<i>Acacia nitidula</i>			3		
<i>Andersonia carinata</i>			1		
<i>Anigozanthus bicolor ssp. minor</i>	2				
<i>Davesia pauciflora</i>			1		
<i>Grevillea baxteri</i>					3
<i>Hibbertia hamata</i>				3	
<i>Isopogon alpicornis</i>				1	
<i>Kennedia beckxiana</i>					2
<i>Lambertia echinata ssp. echinata</i>	1				
<i>Lasiopetalum parviflorum</i>			1		
<i>Lepidium pseudotasmanicum</i>					
<i>Myoporum turbinatum</i>					4
<i>Myoporum velutinum</i>	11				
<i>Myriophyllum petraeum</i>					1
<i>Rumic astrum chamaecladum</i>			1		
<i>Spyridium mucronatum ssp. multiflorum</i>			1		
<i>Trithuria australis</i>					1
<i>Verticordia verticordina</i>				3	

Table 1: Priority and Declared Rare flora sites within a 20 km radius

RESULTS

Threatened Ecological Communities

The site intersected the EPBC listed Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia Threatened Ecological Community Likely to occur shapefile and Beard vegetation units also confirm this.

Field Flora Survey (TF and PF)

Rare and Priority Flora

Two species of Priority two flora was found during the survey. The Priority two flora *Eucalyptus sweedmannii* was located near the granite outcrop. This population consisted of at least 50 individual plants and at least 10 of these would be impacted upon by the project. Impacted individuals are currently growing in grader spoil; and reshooting from mallee roots. A specimen has been lodged with WAHerb (JW15). The Priority four flora *Grevillea baxterii* was found at the same location although only one individual was noted. This individual is likely to be impacted upon by the project. A specimen was not lodged at WAHerb due to confirmed identification in the field, however after liaison with DBCA's Esperance District Flora Conservation Officer a specimen will be lodged after next visit to the site. Rare Flora report forms have also been sent to DBCA Esperance for lodgement.



Figure 2: *Grevillea baxterii*

Threatened Ecological Communities

66% of the project area (4.42 ha) met the EPBC 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

Sensitive Environmental Areas

Granite

The current road alignment is extremely close to the granite outcrop. This area contains two species of priority flora as well as a Registered Aboriginal Heritage site. It was not sampled for short range endemics and was too late for orchids which would have been common in early winter.

This area should be avoided and any road widening will only occur on the north east side of the road to prevent further disturbance to the granite outcrop.

Liasion with Esperance Tjaltjraak Native Title Aboriginal Copoperation has yet to begin regarding potential impacts to the registered hertitage site.

Swamps

Both the paperbark swamp (5.5km) Yate Swamps (2.2km and 3km) already have a road passing straight through them. In an ideal world these areas would be avoided entirely, however widening the road by 1m either side isn't going to make much difference to these already disturbed areas.

Kilometres South from Muntz Rd	Notes	Photo Number	Vegetation Condition (Kieghery Scale)	Meets Kwongkan TEC definition (Y/N)	Vegetation Description	Species Present
0.1-2.1		20,22	Very Good	Yes	Open Eucalyptus woodland over mixed <i>Hakea cinera</i> dominated shrubland	<i>Banksia repens, Beaufortia empetrifolia, Calothamnus gracillis, Hakea cinerea, Isopogon polycephalus, Hakea oblique ssp. oblique, Petrophile teretifolia, Davesia apiculata, Banksia media, Acacia myrtifolia, Nuytsia floribunda</i>
2.2-2.5			Very Good	No	Yate swamp	
2.6-2.9		25	Very Good	Yes	Eucalyptus open woodland over <i>Banksia media</i> and <i>Hakea cinera</i> dominated shrubland	
2.9-3.1		29	Very good		Yate Swamp	
3.2-3.6		31			Tallerack mallee heath	<i>Banksia armata, Eucalyptus pluerocarpa,</i>
3.7-4	Old rehabilitated	33, 34	Good	Yes	Tallerack mallee heath	

	gravel pits					
4.1-4.7	Granite	35	Excellent	No	Closed mixed shrubland	<i>Eucalyptus sweedmannii</i> (P2), <i>Grevillea baxterii</i> (P4), <i>Acacia subcarulea</i> , <i>Calothamnus quadrifidus</i> , <i>Melaleuca striata</i> , <i>Acacia nigricans</i> , <i>Leucopogon</i> sp. <i>Leptospermum incanum</i>
4.9-5.4		36	Excellent	Yes	<i>Banksia armata</i> low heath	
5.5-5.6	Paperbark swamp	37	Very good	No	<i>Melaleuca cuticularis</i> woodland	
5.7 – Heinke rd Corner		39	Excellent	Yes	Nuytsia over low mixed heath	<i>Adenanthos cunneatus</i> , <i>Melaleuca striata</i> , <i>Allocasurina humilis</i> , <i>Beaufortia empetrifolia</i> , <i>Isopogon polycephalus</i> , <i>Leschenautia tubiflora</i> , <i>Hakea pandanocarpa</i> , <i>Calothamnus gracillius</i>
Heinke Howick intersection – 0.6km		41	Very Good	Yes	Nuytsia over low mixed heath	
0.6-2.6	May have once been Nuytsia over low mixed heath but very degraded now	42, 43, 44	Degraded	No	Scatter pines and introduced eucalypts over grasses with an occasional shrub	<i>Pinus pinister</i> , Love grass, <i>Eucalyptus</i> sp. <i>Acacia cyclops</i> , <i>Hakea corymbosa</i>

Table 1. Notes taken in the field

Photos from Field work



Hakea cinerea, Banksia media mixed shrublands



Yate swamp



Banksia armata low heath



Granite area



Meleuca cuticularis



Heath with scattered Nuytsia



Degraded vegetation on Heinke's Road section