

Neds Corner Road Construction Project



Shire of Esperance

Vegetation, Flora, Fauna and Environmental Considerations Report

EXECUTIVE SUMMARY

A level 1 flora survey was conducted for Neds Corner Road in February 2017 in accordance with the Environmental Protection Authority (EPA) schedule 51, Guidance for the Assessment of Environmental Factors (the Environmental Protection Act 1986) Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia, as part of the application to Clear Native Vegetation for a 10.2 km section of road upgrades. Total area of 27.0 hectares, 2.5 hectares of which is native vegetation. The permit area is along Neds Corner Road from Cascade Road to Mills Road. The existing road reserve is 125 metres, and the road width is currently 21 metres.

The desktop survey showed the site intersecting with the nationally listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia likely to occur' shapefile. This project will result in the loss of approximately 1.97ha of this ecological community. No Declared Rare Flora or priority flora was identified in field surveys. However a spring survey to determine the presence of *Conostylis lepisospermoides* at the corner of Neds Corner and Mills Road at the south of the project area is needed.

Weed and dieback control are integral to good environmental management of this project and strict hygiene practices need to be put in place to ensure these are not spread from their existing locations within the project area where the vegetation is in excellent condition.

Introduction

The Shire of Esperance plans to upgrade Neds Corner Road from Cascade Road to Mills Road in the 2017-2018 financial year. This is a major transport route to the Cascade 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. Neds Corner Road is approximately 75km north-east of Esperance, south of the Cascade townsite on the south coast of Western Australia. The Shire of Esperance has applied for a 30m wide clearing footprint area. The current road is 23m wide and the gazetted road reserve is 125m. The survey is restricted to an area 5m either side of the existing road alignment.

A level 1 flora survey has been undertaken in accordance with the Environmental Protection Authority (EPA) schedule 51, Guidance for the Assessment of Environmental Factors (the Environmental Protection Act 1986) Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.



Figure 1: Location of Neds Corner Road

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 ten kilometre radius.
- Threatened Ecological Communities (TEC).

Scope

As outlined in EPA schedule 51, the scope of the level 1 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 500 mm (DAFWA 2002).

Geology

Tertiary marine sediments of the Pallinup formation and small outcrops of Archean granite.

Soils and Topography

Soils consist of three individual subsystems;

Munglinup 1 subsystem: Grey deep and shallow sandy duplex (gravelly) minor pale deep sands and gravelly duplex soils

Esperance 1 Subsystem: Gravelly yellow mottled duplex soils (<30cm sand over gravel)

Scaddan 1 subsystem: Alkaline solonetzic duplex soils.

Vegetation

Eastern mallee IBRA sub region

The Beard (1973) vegetation mapping of the site is described as

Low forest: Acacia, Rottneet pine, Coastal moort of mixed forest *Acacia rostellifera*, *Callitris preissii*, *Eucalyptus lehmannii* and *Eucalyptus cornuta*

Mallee: Eucalypt shrubland including *E. eromophila*, *E. redunca*

Mallee-Heath: including scattered mallee e.g *Eucalyptus tetragona*

Land Use

The site is located within the Neds Corner Road Shire Road Reserve. It is surrounded by mixed cropping and grazing land.

METHODOLOGY

Desktop study

A desk top 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).

State and Commonwealth database searches for potential DRF, PF, and Threatened Ecological Communities (TEC), within a ten 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 ten kilometre buffer due a lack of DRF and PF data across the District.

Field investigation

The preliminary field survey was conducted during February 2017. The survey effort comprised of driving slowly down Neds Corner road noting vegetation and dominant species and determining if vegetation met the approved conservation advice definition for the nationally listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia'. Where a change in vegetation was noted a quick transect through the remnant vegetation was undertaken noting easily identifiable species and some herbarium specimens were taken. A detailed flora survey was not carried out due to the lack of suitable flowering specimens, and extensive mosquito populations after summer flooding in the area hindering staff.

The vegetation structure was determined by growth form, height class, dominant species, other common species, per cent cover, and health of each stratum. 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.

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 ten kilometre radius of each site (Table 1). Appendix 3 provides a description of each priority conservation status. The site had 5 Priority Flora species recorded within a ten kilometre radius of the survey area. The Declared Rare Flora species *Conostylis lepisospermoides* has an old record (1978) on the junction of Mills and Neds Corner Road.

Taxon	TF	P1	P2	P3	P4
<i>Conostephium sp. Cascade</i>		2			
<i>Conostylis lepisospermoides</i>	2				
<i>Daviesia pauciflora</i>				1	
<i>Eucalyptus stoatei</i>					1
<i>Melaleuca similis</i>		1			

Table 1: Priority flora sites within a 10 km radius

FLORABASE RECORD: PERTH 00999687

[Conostylis lepidospermoides](#)

Haemodoraceae

Vegetation: In species-rich low heath with scattered emergent mallees including *Eucalyptus tetragona* 2 - 3 m tall.

Site Description: Flat plateau, grey-brown fine sand over laterite.

Frequency: uncommon.

Locality: 24 km NE of Munglinup, at the intersection of Mills Road and Ned's Corner Road

Location: [-33.583°, 121.067°](#) (GDA94)

Location (DMS): 33° 35' 0.0" S 121° 4' 0.0" E (GDA94)

State: WA

Collector: Hopper, S.D. **Coll No:** 1149

Collection Date: 1 October 1978

Conservation Code: T

Determinavit: S.D. Hopper **Date:** 12 February 1987

Origin: PERTH

Duplicates to: AD CANB K MEL NSW

Record Basis: PreservedSpecimen

Type Status: Isotype

RESULTS

Field Flora Survey (TF and PF)

The site was traversed from south to north on 15th February 2017; this was less than ideal for flora survey however Eucalypts and acacias could be easily identified. Notes taken in the field can be found below. The site will need to be resurveyed in September 2017 to target *Conostylis lepispermoides* on the junction of Mills and Neds Corner Road, which could not be identified in February due to lack of flowers. More details will be sought from DBCA regarding surveys at this site since 1978, and if the population still exists. *Daviesia pauciflora* also occurs in similar habitat and is almost impossible to determine its existence in heathland without flowers (late spring-early summer flowering).

Kilometres from Cascade Road	Notes	Vegetation Condition (Kieghery Scale)	Meets TEC definition (Y/N)	Vegetation Description	Species Present
0-0.2	Bitumen – no widening needed here	Very good		Eucalyptus forestiana over melaleuca shrubland	
0.2-1.5		Very good	No	Eucalyptus eremophila over melaleuca shrubland	Eucalyptus eremophila, Eucalyptus forestiana, Cassytha sp. Grevillea pectinata, Personia sp., Melaleuca sp.
1.5-1.6		Very good	No not 30% cover of proteaceous species	Heath	<i>Eucalyptus pluerocarpa</i> , <i>Melaleuca sp (x2)</i> , <i>Hakea cinerea</i> , <i>Lasiopetalum rosemanium</i> , <i>Conostephium drummondii</i>
1.6-3.9		Very good	Yes	<i>Eucalyptus pluerocarpa</i> over mixed heath	<i>Eucalyptus pluerocarpa</i> , <i>Melaleuca pulchella</i> , <i>Hakea cinera</i> , <i>Hakea pandinicarpa</i> , <i>Banksia media</i> , <i>Leptidosperma sp.</i> <i>Banksia obtusa</i> , <i>Meleleuca thyoides</i> , <i>Calothamnus quadrificus</i> , <i>Hakea corymbosa</i> , <i>Banksia nutans</i> , <i>Cassytha sp.</i> <i>Desmocladius sp.</i> <i>Leptospermum spinescens</i> , <i>Isopogon heterophylla</i>

3.9-4.6	No vegetation on north side of road	Degraded	no	Very weedy	
4.6-5.8		Good	Yes	<i>Eucalyptus pluerocarpa</i> over mixed heath	Similar to 1.6-3.9km
5.8-6.1	Very narrow vegetation on south side of road		No		
6.1- 6.3	Old pit on both sides of road	Poor rehabilitation	No		<i>Acacia cyclops, Hakea laurina,</i>
6.3-6.5	90% weeds	Completely degraded	No		<i>*Chamaecytisus palmensis</i> (Tagasaste)
6.5-6.7	Old Gravel pit – was TEC once	Rehab poor	No		
6.7-6.9		Good	Yes	Mixed Heath	
6.9-7.5		Very good	Yes	Mixed Heath	<i>Banksia obovata, Hakea pandanicarpa, Synaphea sp. Hibbertia sp. Acacia sp. Hakea trifurcate, Hakea laurina, Lasiopetalum rosemarianum, Acacia myrtifolia, Calothamnus quadrifidus</i>
7.5-7.8	Old gravel pit		No		<i>Hakea laurina, Acacia glaucoptera, Eucalyptus sp.</i>
7.8-8.6		Very good	Yes	<i>Eucalyptus pluerocarpa</i> over mixed heath	<i>Eucalyptus pluerocarpa, Banksia obtusa, Calothamnus quadrifidus, Hakea sp. Isopogon heterophylla, Allocasurina humilis, Acacia cyclops</i>
8.6-9	Old Gravel pit south side				

9-10		Good. North side. Degraded south side (100% weeds)	Yes – South side only	Weeds on north side Tallerack over mixed heath south side	
10.0-10.5	Need to resurvey for <i>Conostylis lepispermoides</i> – suitable habitat	Excellent	Yes	Tallerack over mixed heath	<i>Eucalyptus pluerocarpa</i> , <i>Lambertia inermis</i> , <i>Calothamnus quadrifidus</i> , <i>Hakea corybosa</i> , <i>Xanthorea platyphylla</i> , <i>Banksia nutans</i>



Image 1: *Eucalyptus eremophila* over *melaleuca* sp.



Image 2:



Image 3:



Image 4: Weedy areas in historic gravel pits (probably once was TEC)



Image 5: *Eucalyptus plurocarpa* over mixed heath

Threats

The site is at threat from the potential introduction of *Phytophthora cinnamomi* dieback from earth moving machinery. Due to this, strict hygiene guidelines need to be in place to ensure it stays out of the area e.g working only in dry conditions and blowing down machinery prior to entering the site.

Weeds, namely African Love grass is found extensively on Neds Corner Road, particularly in historic roadside gravel pits.

CONCLUSION

The proposed road construction project on Neds Corner Road will result in the clearing of approximately 2.55 hectares of native vegetation. The roadside vegetation on Neds Corner Road is in Very Good/Excellent condition apart from some poorly rehabilitated historic gravel pits. Some of the roadside vegetation includes areas of the Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia.

1.97 hectares of the proposed clearing area are part of the Threatened Ecological Community "Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia". Whilst the proposal will slightly reduce the extent of the ecological community, it will not significantly impact on other criteria eg: fragment or increase fragmentation of the ecological community, as the road already passes through it and there is still vegetation remaining in the transport corridor. No existing fauna transport corridors will be removed entirely.

No Declared Rare Flora or priority flora was identified in field surveys.

Banksia media are highly susceptible to *Phytophthora cinnamomi* dieback and require implementation of appropriate hygiene protocols if disturbed using machinery. Weed management protocols will also need to be implanted as part of this project to ensure African love grass and other weeds are not spread.

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APPENDICES

[Appendix 1: Bushland Condition Ratings](#)

[Appendix 2: Conservation status descriptions](#)

Appendix 3: Extract from Conservation Advice for Proteaceae Dominated Kwongan Shrublands of the southeast coastal floristic province of Western Australia

Appendix 1: Bushland Condition Ratings¹

Condition	Description
Excellent	Vegetation structure intact, with disturbance affecting individual species and weeds consist of non-aggressive species. 1 – 5% weed cover
Very Good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing. 5 – 25% weed cover
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing. 25 – 50% weed cover
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance of vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing. 50 – 75% weed cover

¹ Adapted from Keighery, 1994 and the Braun-Blanquet Scale of Cover Abundance [from Mueller-Dombois and Ellenberg, 1974]

Completely Degraded The structure of the vegetation is no longer intact and the area is completely, or almost completely, without native species. These areas are often described as “parkland cleared” with the flora comprising weed or crop species with isolated native trees or shrubs. 75 – 100% weed cover

Appendix 2 Conservation status descriptions

Definitions of conservation codes given to declared rare and priority flora.

KJ Atkins, 15 July 1998, Department of Conservation and Land Management

TF: Threatened Flora – Extant Taxa

Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.

P1: Priority One – Poorly Known Taxa

Taxa that are known from one or a few (generally less than five) populations, which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, or the plants are under threat, e.g. from disease, grazing by feral animals. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.

P2: Priority Two – Poorly Known Taxa

Taxa which are known from one or a few (generally less than five) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.

P3 Priority Three – Poorly Known Taxa

Taxa that are known from several populations, and the taxa are believed to be not under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally more than five), or known populations being large, and either

widespread or protected. Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4 Priority Four – Rare Taxa

Taxa which are considered to have been adequately surveyed and which, while being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

Note: The need for further survey of poorly known taxa is prioritised into the three categories depending on the perceived urgency for determining the conservation status of those taxa, as indicated by the apparent degree of threat to the taxa on the current information.

Appendix 3 - Extract from: *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (s266B) Approved Conservation Advice for Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia

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 (see list of diagnostic species in Table 1). The use of diagnostic species is for situations in which the cover of Proteaceae species is reduced due to recent disturbance (e.g. fire).

List of diagnostic species

Esperance (east)

Adenanthos cuneatus

Banksia alliacea

Banksia armata

Banksia cirsioides

Banksia media

Banksia nivea

Banksia nutans

Banksia obovata

Banksia occidentalis

Banksia petiolaris

Banksia pilostylis

Banksia plumosa

Banksia prolata

Banksia pulchella

Banksia speciosa

Banksia tenuis

Grevillea concinna

Hakea cinerea

Hakea corymbosa

Hakea drupacea

Hakea nitida

Hakea obliqua

Hakea pandanycarpa

Hakea trifurcata

Isopogon formosus

Isopogon heterophyllus

Isopogon polycephalus

Isopogon trilobus

Lambertia inermis

