

# **River Road Gravel Extraction Site**



## **Level 1 Flora and Vegetation Survey**

**October 2017**

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## ***EXECUTIVE SUMMARY***

The Esperance Shire wishes to create a gravel pit on River Road and in doing so requires the clearing of native vegetation in order to extract road material. The 2.3 hectare River Road site is located 100 km north west of Esperance on the south coast of Western Australia.

A level 1 flora survey was undertaken during October 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.

The site is part of a Shire roadside reserve and the surrounding area has traditionally been used for gravel extraction.

## ***INTRODUCTION***

The 2.3 hectare River Road site is located 100 km north west of Esperance on the south coast of Western Australia (Figure 1). A level 1 flora survey has been undertaken of the site 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 River Road survey site**

## **BACKGROUND**

The proposed limestone extraction site has the potential to affect a number of possible environmental factors which have been outlined by DPaW. These include;

- Threatened Flora (TF) and Priority Flora (PF) within a ten kilometre radius.
- Threatened Ecological Communities

The focus of this report will be on the TF, PF, TEC and level 1 flora survey.

### **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, and maps of vegetation types and condition.

### **Land use**

The site is within a Shire roadside reserve, 65 meters in width. The site falls opposite a 2,956 ha Crown Reserve, as well as mixed cropland. The immediate area surrounding the site has historically been used for gravel extraction.

## ***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 vegetation, IBRA classification, TF, PF and 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 TF and PF data across the District.

### **Field investigation**

The preliminary field survey was during spring in October 2017. The Esperance Shire provided coordinates for the site which were uploaded from GIS into a Garmin GPSmap 60CSX unit and a field aerial photo map was used to navigate to different habitat areas. A portable field herbarium was established and a preliminary species list developed.

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).

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.

### **Analysis methodology**

Findings from the desktop study and field survey were reviewed against whether the 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

#### Vegetation

The site comprises the Oldfield\_47 subsystem. Shrublands; tallerack mallee-heath containing *Eucalyptus tetragona*, *Eucalyptus sp*, *Banksia sp*, *Calothamnus sp*, *Lambertia inermis*, *Andersonia sp*, *Conospermum sp*, *Conostylis sp*.

#### Flora

The Declared and Endangered flora list (DEFL) database search and liaison with the Esperance DPaW District Flora Officer resulted in 3 known PF species and no known DRF species sites within a ten kilometre radius of the survey area (Table 1). Appendix 3 provides a description of each priority conservation status.

**Table 1 Priority Flora sites within a 10km radius of the survey area**

Taxon	Number PF Sites					Total
	DRF - Vuln	P 1	P 2	P 3	P 4	
<i>Dampiera orchardii</i>			1			1
<i>Eucalyptus stoatei</i>					2	2
<i>Grevillea aneura</i>					1	1
			<b>1</b>		<b>3</b>	<b>4</b>

*Dampiera orchardii*: Erect perennial, herb, 0.2-0.4 m high. Sand.

*Eucalyptus stoatei*: Slender tree, 2-7.5 m high, bark smooth. Flowers yellow, Jul to Aug or Oct to Dec or Jan to Feb. Gravelly sand or clay, sandy loam. Flats, rises.

*Grevillea aneura*: Dense, prickly shrub, 0.5-2.8 m high. Flowers red, Jun or Aug to Dec or Jan. Sand, sandy clay, gravel.

#### TEC/PEC

The database search resulted in one known occurrences of TEC that being the *Proteaceae dominated kwongan shrublands of the southeast coastal floristic province of Western Australia* falling within most of the proposed clearing area.

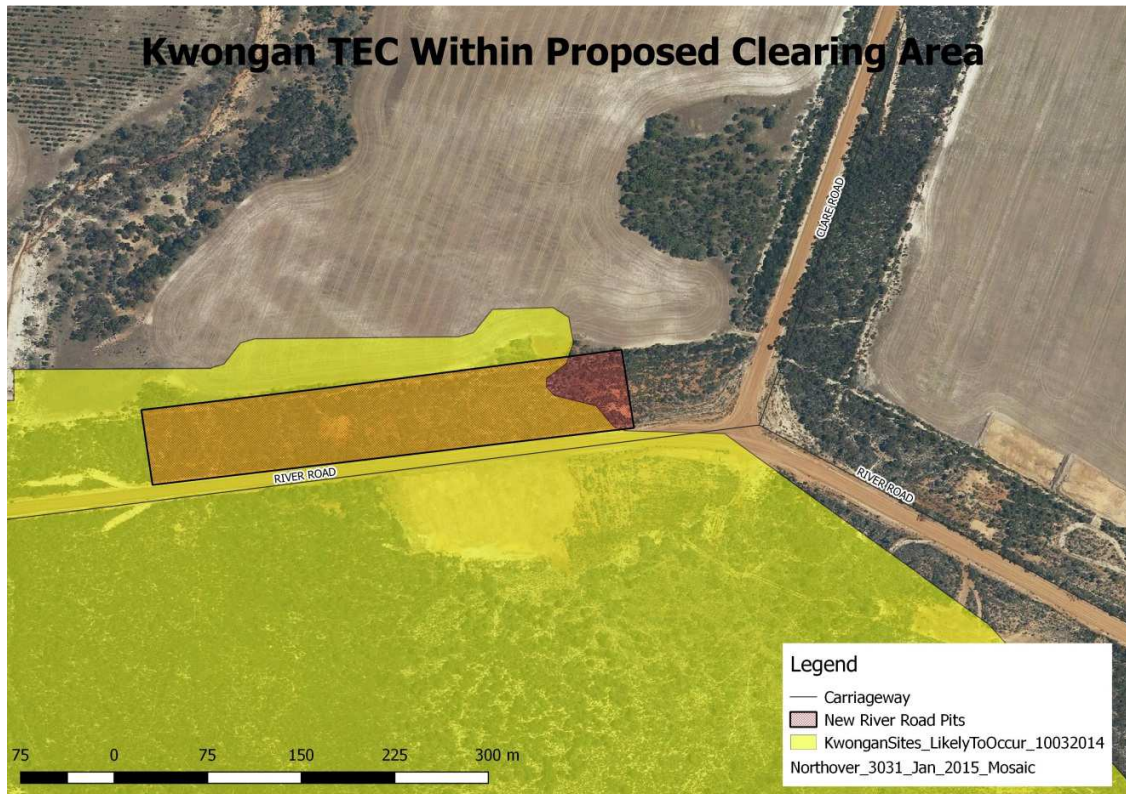


Figure 2. Occurrence of *Proteaceae* dominated kwongan shrublands of the southeast coastal floristic province of Western Australia highlighted in yellow.

### Field survey

A wandering transect throughout the entire area was undertaken collecting specimens and noting flora species.

The vegetation at the site was open *Eucalyptus tetragona* mallee over mixed heath. Species list for the site is included in Appendix 1. No DRF or Priority species were found during this survey.

Photos of the site are shown below.





### **Vegetation condition rating**

Vegetation was in excellent condition. There was no evidence of dieback in the area and no weed were collected or noted during the survey. .



## **Threatened Ecological Community**

The database search resulted in one known occurrences of TEC that being the *Proteaceae dominated kwongkan shrublands of the southeast coastal floristic province of Western Australia*. During the field study it was confirmed that the area was part of the TEC due to the presence of two or more diagnostic Proteaceae species as well as >30% cover of Proteaceae species across all layers.

*Banksia armata* and *Hakea lissocarpa* are dominant species, *Isopogon* sp. Fitzgerald, *Petrophile seminuda*, *Petrophile squamata* ssp. Northern and a *Synaphea* sp. were also present at the site.

## **CONCLUSION**

The River Road gravel extraction site contains excellent vegetation as well as *Proteaceae dominated kwongkan shrublands of the southeast coastal floristic province of Western Australia* Threatened Ecological Community. It is likely that Environmental Offsets for this project will be required.

## **REFERENCES**

Department of Environment and Conservation (2007a) Florabase. The Flora of Western Australia Online (and collections housed at the WA Herbarium).  
[www.florabase.calm.wa.gov.au](http://www.florabase.calm.wa.gov.au)

Environmental Protection Authority (2016) Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment

*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*

Keighery, B. (1994) *Bushland plant survey : a guide to plant community survey for the community*, Wildflower Society of WA

## **APPENDICES**

<u>Appendix 1: Species list for surveyed study area</u> .....	
<u>Appendix 2: Bushland Condition Ratings</u> .....	
<u>Appendix 3 Conservation status descriptions</u> .....	

## Appendix 1: Species list for surveyed study area

### Legend

- Status refers to conservation status
- \* refers an introduced weed species

Family	Taxon	Status
<i>Asteraceae</i>	<i>Argentipallium niveum</i>	
<i>Boraginaceae</i>	<i>Halgania</i> sp.	
<i>Dasygongonaceae</i>	<i>Calectasia valida</i>	
<i>Dilleniaceae</i>	<i>Hibbertia</i> sp.	
<i>Ericaceae</i>	<i>Lysinema pentapetalum</i>	
<i>Fabaceae</i>	<i>Acacia aneura</i>	
<i>Fabaceae</i>	<i>Davesia</i> sp.	
<i>Fabaceae</i>	<i>Eutaxia lutea</i>	
<i>Goodeniaceae</i>	<i>Dampiera juncea</i>	
<i>Myrtaceae</i>	<i>Beaufortia schaueri</i>	
<i>Myrtaceae</i>	<i>Calytrix duplistipulata</i>	
<i>Myrtaceae</i>	<i>Eucalyptus pleurocarpa</i>	
<i>Myrtaceae</i>	<i>Leptospermum erubescens</i>	
<i>Myrtaceae</i>	<i>Leptospermum spinescens</i>	
<i>Myrtaceae</i>	<i>Melaleuca tuberculata</i> var. <i>tuberculata</i>	
<i>Myrtaceae</i>	<i>Verticordia chrysantha</i>	
<i>Myrtaceae</i>	<i>Verticordia roei</i>	
<i>Poaceae</i>	<i>Neurachne alopecuroidea</i>	
<i>Proteaceae</i>	<i>Banksia armata</i>	
<i>Proteaceae</i>	<i>Hakea lissocarpha</i>	
<i>Proteaceae</i>	<i>Isopogon</i> sp. <i>Fitzgerald</i>	
<i>Proteaceae</i>	<i>Petrophile squamata</i> ssp. <i>Northern</i>	
<i>Proteaceae</i>	<i>Petrophile seminuda</i>	
<i>Proteaceae</i>	<i>Synaphea</i> sp.	
<i>Restinoaceae</i>	<i>Lepidobolus chaetocephalus</i>	
<i>Stylidiaceae</i>	<i>Stylidium</i> sp.	

## Appendix 2: Bushland Condition Ratings<sup>1</sup>

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
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

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<sup>1</sup> Adapted from Keighery, 1994

### **Appendix 3 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

#### **R: Declared Rare 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.