A

vegetation and flora survey

of an area adjacent to Warralakin Road

proposed for extension of a gravel pit

Prepared for

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by

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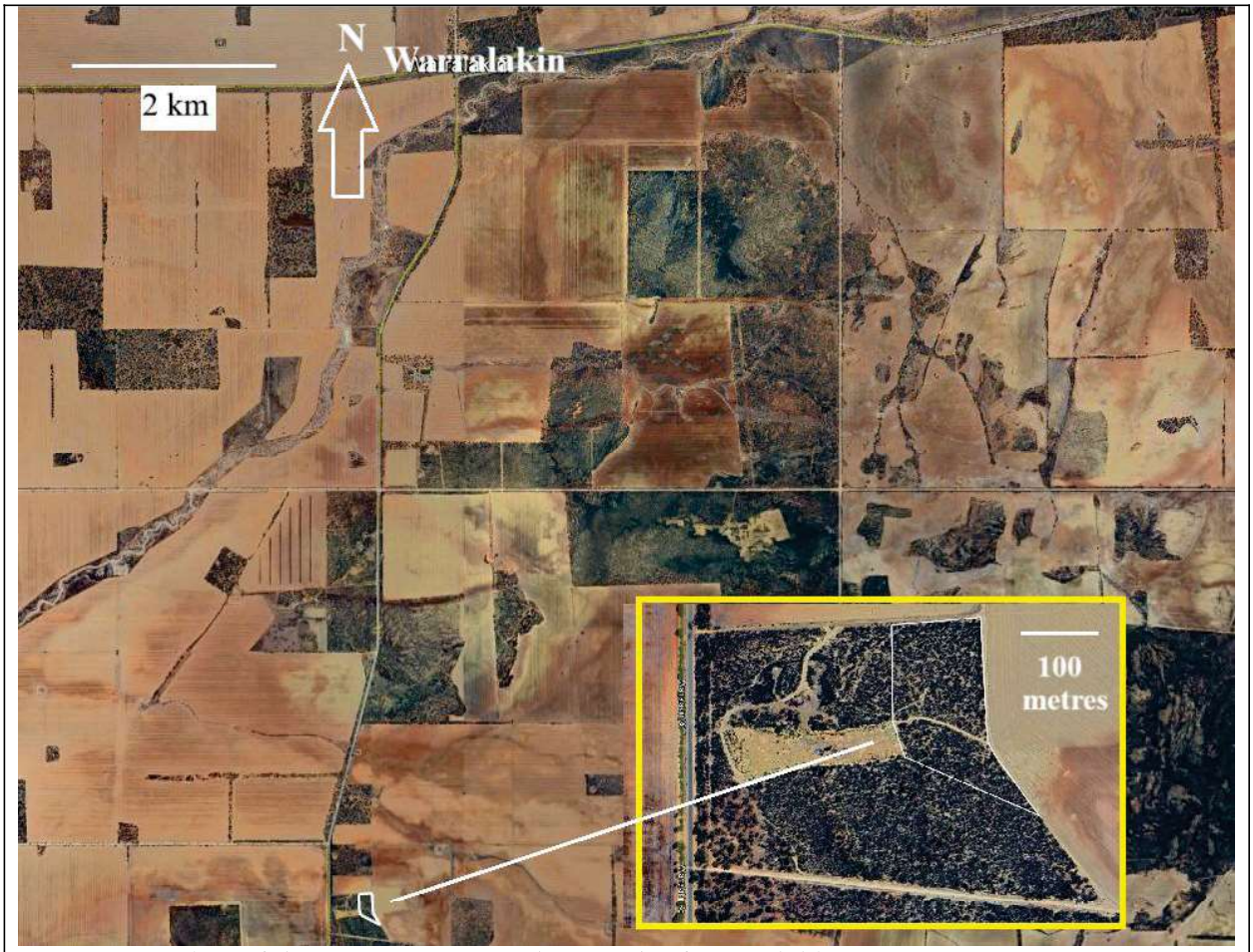
1.0 INTRODUCTION

1.1 Survey area and purpose of survey

The survey area is some 280 kilometres east-north-east of Perth and 24 kilometres north-north-west of Westonia and some nine kilometres south of Warralakin (Map 1). It is a small area of native vegetation that is part of a larger remnant adjacent to Warralakin Road. The survey area has an irregular shape with the longest axis 370 metres and the greatest width 135 metres.



Map 1. Location of the survey area ca 9 km south of Warralakin.

The purpose of the survey is to describe the vegetation of the survey area and document the flora that occurs in it, particularly, to ascertain if any declared rare or priority flora occurs in the area.

1.2 Project area physical attributes

The survey area is located on the Yilgarn Plateau (the surface expression of the Yilgarn Craton), a very large, very old land surface with limited relief. The survey area is located on a part of the Yilgarn Plateau that has very gentle undulation. In fact the survey area was almost flat, with very slight slopes. The soils were yellow gravelly, sandy loams, sometimes with a setting surface.

2.0 METHODS AND LIMITATIONS OF THE FLORA AND VEGETATION SURVEY

2.1 Vegetation and flora survey methods

Examination of Google Earth satellite imagery prior to the field survey did not show clear vegetation boundaries, some apparent variation in the satellite imagery coincided with tracks and could be caused by differential disturbance. Therefore, mapping units were identified in the field during the site visit on October 10th 2024.

Four vegetation description sites were recorded with a flora list recorded for each site and additional species recorded in the stand added at the end of the list. All flora species observed were collected. Specimens were identified using keys, comparison to previously identified specimens, reference to books and taxonomic papers and use of online resources. A database search of declared rare and priority flora for an area within 20 kilometres of the survey area was obtained to enable any such species known for the general area to be identified in the field. As the area is likely to be disturbed recording sites were not pegged. The sites recorded were larger than 10 by 10 metres. Given the low diversity of the vegetation, larger areas than 10 x 10 metres were necessary to obtain a representative list for a site. Transects were walked across the short axis of the survey area and another down its length to search for flora.

2.3 Limitations of the vegetation and flora survey

Given the size of the survey area, the four vegetation recording sites and four vegetation units indicate a detailed survey.

The level of accuracy of cover assessments made by visual assessment is somewhat notoriously limited (partly as the observer is looking across the vegetation, and not down on it). Therefore, the cover assessments should (as always) be treated as approximate. There was some variation in the cover of the *Hysterobaeckea setifera* subsp. *meridionalis* and *Baeckea elderiana* that could not be realistically assessed where these taxa co-occurred as they are similar in appearance. Consequently there is some minor inaccuracy in the cover assessments where the two occur together.

2.4 Limitations of the flora survey

All perennial species observed were recorded and it is thought that virtually all perennial flora present in the survey area was recorded (possibly a few cryptophytes may not have emerged, or had died off). Due to the timing of the survey, annual flora was available and was in flower or fruit, it is thought that all or nearly all annual flora in the survey area were recorded. One specimen could not be identified due to lack of flowers or other distinguishing features, but is thought not to be a conservation significant taxon.

3.0 FLORA SURVEY OF THE WARRALAKIN ROAD SURVEY AREA

3.1 Flora recorded

Thirty-five native angiosperm species and one angiosperm weed species were recorded in the Warralakin Road survey area, The small number of flora speceis recorded for the survey area is a reflection of the small size of the survey area and the low diversity vegetation found on the site. The flora recorded is listed in Table 1 (see below).

The family with the most species recorded was Asteraceae, with eight annual species present. Next was the Myrtaceae with four species present, two *Eucalyptus* species and two medium sized shrubs. There were only two *Acacia* species present and two grasses, the latter being two very widespread species. There were also three Rutaceae (two *Philotheca* species and one *Phebalium*), like the previous families, this family is also fairly common in the Avon Wheatbelt Bioregion. Possibly not surprisingly, there were two very widespread *Trachymene* species. The remainder of the species present is a mixture of mostly quite widespread species. The material referred to *Amphipogon caricinus* has been called var. "*caricinus*?" as the type is from South Australia, this "variety" has an enormous range and there is much material not assigned to variety in Australian herbaria. This all suggests that the taxon needs review, however it is not suggested that the Warralakin material is a restricted taxon.

It is noteworthy that only one weed species was recorded in the vegetation surveyed, although there were others on disturbed areas adjacent to the survey area.

Table 1. Flora recorded in the Warralakin Road survey area

Notes: In the table heading "# sites" means the number of sites a taxon was recorded at of the 4 sites recorded. The one introduced (weed) species recorded is given first then the native flora in alphabetical order

Taxon	**# Sites**	**Summary of occurrence at the vegetation releves.**
*Carrichtera annua	1	+
Acacia acuminata	1	+
Acacia coolgardiensis subsp. coolgardiensis	4	50-60% at 2 sites, > 65% & < 2-5% at 1 site each.
Actinobole uliginosum	1	+
Amphipogon caricinus var. caricinus?	4	2-5%, < 55, < 2% & 1-2% at 1 site each.
Austrostipa elegantissima	1	+
Baeckea elderiana	1	> 20%
Borya sphaerocephala	1	+
Crassula closeana	1	+
Crassula colorata var. acuminata	1	+
Lemooria burkittii	1	+

Dianella revoluta var. divaricata	2	+ at both sites.
Dodonaea bursariifolia	2	+ at both sites.
Drosera macrantha	2	+ at both sites.
Ecdeiocolea monostachya	2	<1-2% at 1 site and + at the other
Enchylaena tomentosa	1	+
Eremophila ionantha	2	+ at both sites.
Eucalyptus loxophleba subsp. lissophloia	1	+
Eucalyptus petraea	2	+ at the two sites.
Goodenia cycnopotamica	4	< 2% at 1 site, + at 2 sites & +-1% at 1 site.
Hyalosperma demissum	1	+
Hysterobaeckea setifera subsp. meridionalis	3	+ - < 10% at 1 site, < 10% at 1 site & > 30% at 1 site.
Phebalium canaliculatum	2	+ at 1 site and 2-15% at the other.
Philotheca grylloana	4	+ at all four sites.
Philotheca tomentella	1	+
Poranthera microphylla	1	+
Ptilotus polystachyus	1	+
Rhodanthe citrina	1	+
Rhodanthe laevis	4	+ at all four sites.
Rinzia carnosa	2	+ at both sites.
Schoenia cassiniana	2	+ at both sites.
Trachymene cyanopetala	2	+ at both sites.
Trachymene ornata	2	+ at both sites.
Unknown linear leaves	1	+
Wahlenbergia preissii	1	+
Waitzia acuminata var. acuminata	4	< 5%, 2-5%, < 2% & 2- < 10% at 1 site each.

3.2 No declared rare flora species were recorded

No declared rare flora species were recorded in the Warralakin Road survey area.

3.3 No Priority flora species were recorded

No priority flora species were recorded in the Warralakin Road Survey area.

4.0 VEGETATION OF THE WARRALAKIN ROAD SURVEY AREA

4.1 Introduction to the vegetation survey

The survey provides descriptions of the vegetation of the Warralakin Road survey area as four units based on the vegetation descriptions recorded at the four unconfined sites. The vegetation descriptions are based on the nomenclature of Aplin (1979, see Appendix 2).

Two *Eucalyptus* species were the only trees in the survey area, with one (*Eucalyptus petraea*) occurring as a scattered dominant in one unit (there was one mallee in another). The large shrub *Acacia coolgardiensis* subsp. *coolgardiensis* is the dominant in the other units. The *Acacia* units differing in the cover of the *Acacia* and of the associated species. *Acacia coolgardiensis* subsp. *coolgardiensis* was also the dominant in the shrub layer of the *Eucalyptus petraea* unit.

4.2 Description of the vegetation of the Warralakin Road survey area

The unit with a *Eucalyptus petraea* mallee overstorey is given first and then the three *Acacia coolgardiensis* subsp. *coolgardiensis* units. The photographs below the unit description ("name") are for that unit. The distribution of the units in the survey area is shown on Map 2.

Unit 1. *Eucalyptus petraea* scattered mallees over *Acacia coolgardiensis* subsp. *coolgardiensis* scattered tall shrubs to open scrub over *Phebalium canaliculatum*, *Hysterobaeckea setifera* subsp. *meridionalis* shrubland over *Ecdeiocolea monostachya* scattered tussocks to very open tussock sedgeland over *Amphipogon caricinus* var. *caricinus*? very open tussock grassland

The *Eucalyptus petraea* was 7 to eight metres tall and had very low cover, except in one small patch where it had about 10% cover. The *Acacia coolgardiensis* subsp. *coolgardiensis* was 2.5 to 4 metres tall and had 60% cover, except in a small area near the edge of the stand. The cover of *Amphipogon caricinus* var. *caricinus*? varied to 15% in one small area. (Site 02.)

Fourteen native species were recorded at the recording site and a further six in the stand.

Unit 2. *Acacia coolgardiensis* subsp. *coolgardiensis* open scrub over *Hysterobaeckea setifera* subsp. *meridionalis* scattered tall shrubs to high open shrubland over *Ecdeiocolea monostachya* scattered tussocks over *Amphipogon caricinus* var. *caricinus*? very open low tussock grassland and *Waitzia acuminata*, *Goodenia cycnopotamica* very open annual herbland

The *Acacia coolgardiensis* subsp. *coolgardiensis* was 2.5 to 3.5 metres tall and had cover of 50-60% it formed a distinctly taller layer than the *Hysterobaeckea setifera* subsp. *meridionalis*, although there was a little overlap in their heights. The *Amphipogon* had cover of 2-5%, but tended to occur in patches. (Site 01.)

Thirteen native species were recorded at the recording site and a further seven in the stand. The low diversity of the vegetation is apparent in the photograph. The weed **Carrichtera annua* (Ward's Weed) was recorded in this unit.

Unit 3. *Acacia coolgardiensis* subsp. *coolgardiensis* scattered tall shrubs to high open shrubland over *Baeckea elderiana*, *Hysterobaeckea setifera* subsp. *meridionalis* open heath over *Ecdeiocolea monostachya* scattered tussocks over *Amphipogon caricinus* var. *caricinus*? scattered low tussocks

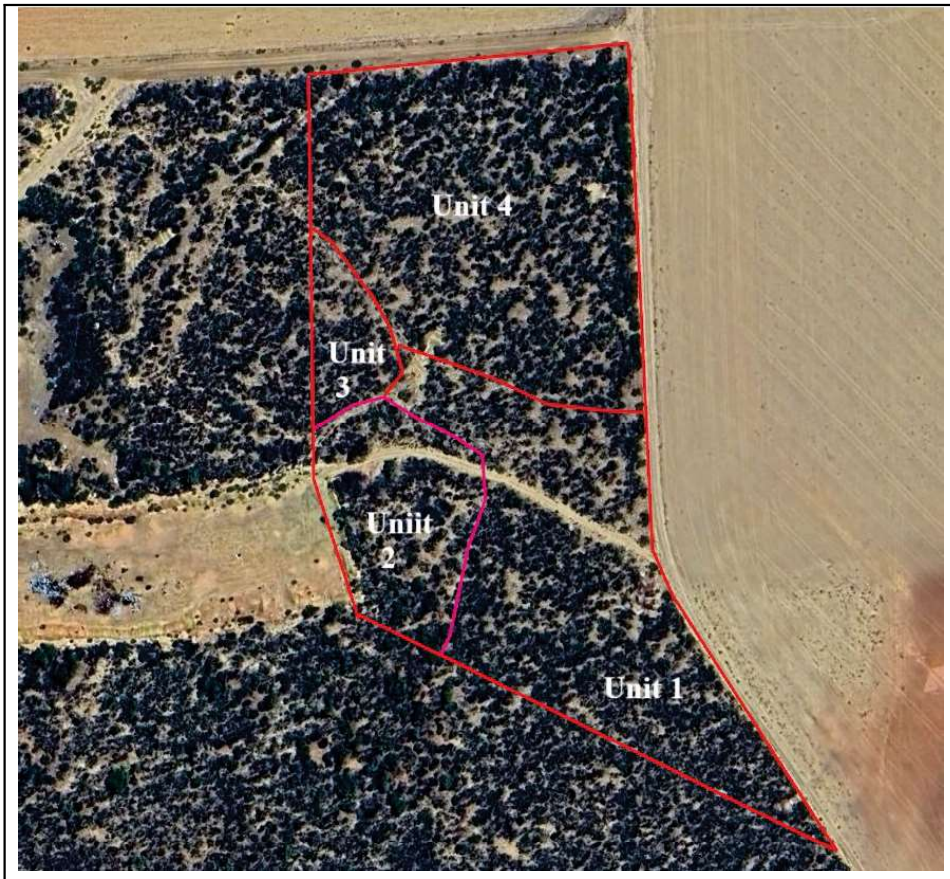
The *Acacia coolgardiensis* subsp. *coolgardiensis* was 2 to 2.3 metres tall and had cover of < 2 to 5%, much lower cover and height than in the preceding unit. While the preceding unit also had *Hysterobaeckea setifera* subsp. *meridionalis*, it had cover there of "+" to 10% while in the present unit it co-occurred with *Baeckea elderiana* and the two had combined cover of > 55%.

Only eight native species were recorded at the recording site and another one in the stand, therefore this unit has different floristics, as well as different cover and speceis of the dominants. (Site 03)

Unit 4. *Acacia coolgardiensis* subsp. *coolgardiensis* open scrub over *Amphipogon caricinus* var. *caricinus*? scattered low tussocks with *Waitzia acuminata* var. *acuminata* very open annual herbland

While this unit has the same large shrub, *Acacia coolgardiensis* subsp. *coolgardiensis* as the preceding two units it does not have the lower shrub layer of *Hysterobaeckea setifera* subsp. *meridionalis* or *Baeckea elderiana* and *Hysterobaeckea setifera* subsp. *meridionalis* that the preceding two units have. It also does not have tussocks of *Ecdeiocolea monostachya*.

There were only eleven species at the site recorded, with another five recorded in the stand, this is quite low diversity. The stand has denser *Acacia coolgardiensis* subsp. *coolgardiensis* at the edges adjacent to the tracks, this is due to higher water availability there from runoff from the tracks. (Site 04)



Map 2. The Vegetation of the Warralakin Road survey area

Notes: The units are numbered as in the text immediately above.

4.3 Condition of the vegetation of the Warralakin Road survey area

The vegetation of the Warralakin Road survey area was recorded as in excellent condition at all four recording sites and observed to be the same on traverses through the survey area. The exceptions were one track across the survey area, some small areas of disturbance and some old rabbit burrows and old rabbit dropping mounds.

The very low level of weed invasion (one species at one of the sites recorded in spite of the weeds in the surrounding farmland) was likely to be due to the soil type, vegetation type and possibly no or little grazing.

5.0 CONSERVATION ASSESSMENT

Any native vegetation in the Western Australian Wheat Belt has significant conservation value due to the high level of clearing of that area.

The vegetation of the survey area has a large population of *Hysterobaeckea setifera* subspecies *meridionalis*, which is significant in the vegetation, particularly in vegetation unit three. This broadly defined taxon is thought to actually encompass three taxa. Therefore the vegetation where "*Hysterobaeckea setifera* subspecies *meridionalis*" has significant cover is likely to be of restricted occurrence.

6.0 REFERENCES

Aplin, T.E.H. (1979) 'The Flora' In: *Environment and Science,* B.J. O'Brien (ed.). University of WA Press, Perth.

French, Malcolm (2012). Eucalypts of Western Australia's Wheatbelt. Published by Malcolm French.