

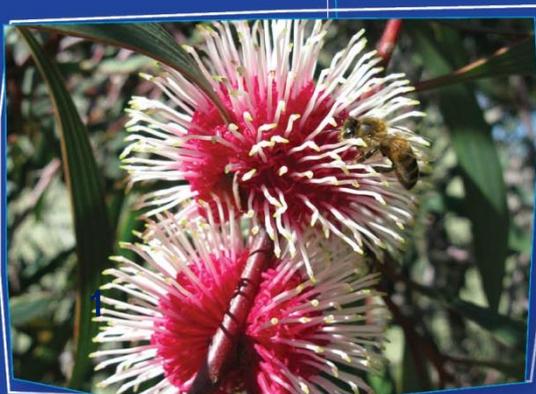
# Vegetation, Flora, Fauna and Environmental Considerations Report

Shire of Esperance 2022-23 Strategic Purpose Permit  
Site E – Fuss Road, SLK 0 - 4.2



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March 2023



## **Acknowledgement of country**

The Shire of Esperance acknowledges the Kapa Kurl Wudjari people of the Nyungar nation and Ngadju people who are the traditional custodians of this land and their continuing connection to land, waters and community. We pay our respect to their Elders past, present and emerging and we extend that respect to other Aboriginal Australians today.

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## LIST OF ABBREVIATIONS

**BAM Act:** Biosecurity and Agriculture Management Act 2007 (WA)  
**BC Act:** Biodiversity Conservation Act 2016 (WA)  
**BOM:** Bureau of Meteorology  
**DBCA:** Department of Biodiversity, Conservation and Attractions  
**EP Act:** Environmental Protection Act 1986 (WA)  
**EPA:** Environmental Protection Authority  
**EPBC Act:** Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)  
**IBRA:** Interim Biogeographical Regionalisation for Australia  
**IUCN:** International Union of Conservation Nature  
**LGA:** Local Government Area  
**NVIS:** National Vegetation Information System  
**PEC:** Priority Ecological Community  
**PF:** Priority Flora (Under BC Act)  
**SOE:** Shire of Esperance  
**SLK:** Straight Line Kilometres (Main Roads WA)  
**TEC:** Threatened Ecological Community  
**TF:** Threatened Flora (Under BC Act)  
**TPFL:** Threatened and Priority Flora Database (DBCA)  
**TPRF:** Threatened and Priority Flora Report Form  
**WAH:** Western Australian Herbarium (PERTH)  
**WAOL:** Western Australian Organism List  
**UCL:** Unallocated Crown Land

## 1 Executive Summary

The Shire of Esperance Environmental Team was commissioned by the Shire of Esperance Asset Management department to undertake a review of the flora, vegetation and fauna values on the proposed 'Fuss Road, SLK 0 - 4.2' project in 2022-23 as part of their 2022-23 Strategic Purpose Permit application.

The Shire of Esperance endeavours to maintain a high level of road safety, being proactive in identifying high risk road designs and progressively upgrading them. The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4 593 km of road. The Shire of Esperance is submitting 'Fuss Road SLK 0 - 4.20' project as Site C under the '2023 Strategic Purpose Permit' (Figure 1), for the purpose of road widening during a road reconstruction.

Fuss Road is particularly narrow resulting in safety issues during harvest season and also with caravans accessing the coastal campground and caravan park at Munglinup Beach. Fuss Road requires widening to maintain the safety of road users. This road is classified as a rural access road, providing vital link to properties and other access roads in south west region of Esperance. Traffic counts show a significant impact of heavy vehicles occupied during harvesting season and it is an approved RAV route.

To complete these works, native vegetation up to 2m from the current road footprint on both sides of the road is required to be cleared, increasing the active road footprint to 17m. This requires clearing of 0.911 ha of native vegetation. To mitigate impact of clearing vegetation, where feasible clearing will not occur to the full permitted width, conserving vegetation.

The proposed works are located 88 km west of Esperance, within the Shire of Esperance managed road reserve of Fuss Rd. Specifically, it is starting from South Coast Hwy at straight line kilometre (SLK) 374.86 (Main Roads, 2022). A point within the proposed clearing permit area is 6265436.36m N, 305970.74m E (UTM Zone 51 H, GDA94).

The Shire of Esperance's two Environmental Scientists completed the site assessment on Fuss Road, SLK 0 - 4.2 on the 28-29 September 2022.

A total of 228 vascular plant taxa from 133 plant genera and 49 plant families were recorded within the 'Fuss Road, SLK 0 - 4.2' survey area during the 2022 survey. The majority of taxa was recorded within the Myrtaceae (38 taxa), Fabaceae (31 taxa), Proteaceae (28 taxa), and Asteraceae (12 taxa) families (Appendix 1). This total included 198 native species and 30 introduced (weed) species.

Two priority flora species pursuant to the Biodiversity Conservation Act (2016) and as listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded within the 'Fuss Road, SLK 0 - 4.2' survey area. No plant taxa listed as Threatened pursuant to Schedule 1 of the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 were recorded during the survey within the proposed Fuss Road, SLK 0 - 4.2 survey area.

**Table 1:** Summary of Priority flora species recorded in 'Site E – Fuss Road, SLK 0 - 4.2' project area.

| Species                    | Conservation Code | Total Plants | Plants to be taken |
|----------------------------|-------------------|--------------|--------------------|
| <i>Daviesia pauciflora</i> | P3                | 4            | 0                  |

|                            |    |     |    |
|----------------------------|----|-----|----|
| <i>Dampiera sericantha</i> | P3 | 161 | 15 |
|----------------------------|----|-----|----|

A total of 0.496 ha of the EPBC listed 'Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongan)' Threatened Ecological Community (TEC) was present within 'Site E - Fuss Road, SLK 0 - 4.2'. There was also one vegetation unit that was consistent with the State Listed Priority Ecological Community (PEC) "Swamp Yate (*Eucalyptus occidentalis*) woodland in seasonally-inundated basins". No other TECs or PECs were located within 'Site E - Fuss Road, SLK 0 - 4.2'.

The site contains 0.496 ha of high quality native foraging habitat suitable for the EPBC listed Carnaby's cockatoo (*Calyptorhynchus latirostris*). Another nine conservation listed fauna species will potentially be impacted by the project due to habitat suitability.

Should the development of 'Fuss Road, SLK 0 - 4.2' project go ahead, the following recommendations are made as a means of minimizing the impacts of infrastructure activities on the flora, vegetation and fauna values in the area:

- Minimise clearing to the minimum amount required
- Avoid larger habitat trees (larger trees and trees with hollows) wherever possible;
- Maintain existing drainage systems, spoon drains and ensuring tracks and other infrastructure areas do not disrupt or divert historic water flow patterns;
- Minimise soil disturbance during clearing and practice standard vehicle hygiene to ensure introduced (exotic) species do not become established within the 'Fuss Road, SLK 0 - 4.2' survey area; and
- Minimize all threatening processes to native vegetation.

These have been addressed in the attached Weed and Dieback plan and/or Rehabilitation Plan, and provided these measures are implemented, there should be no impediments to the widening of Fuss Road, between SLK 0 - 4.2.

# 1 Introduction

The Shire of Esperance endeavors to maintain a high level of road safety, being proactive in identifying high risk road designs and progressively upgrading them. The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4,593 km of road. The Shire of Esperance is submitting 'Fuss Road, SLK 0 - 4.2' project as Site E under the '2022-23 Strategic Purpose Permit' (Figure 1), for the purpose of road widening.

## 1.1 Location and Scope of Project

The proposed works are located 88 km west of Esperance, within the Shire of Esperance managed road reserve of Fuss Rd. Specifically, it is located along Fuss road at straight line kilometre (SLK) 0 to 4.2 (Main Roads 2022). A point within the proposed clearing permit area is 6265272m N, 305996m E (UTM Zone 51 H, GDA94).

Fuss Road is particularly narrow resulting in safety issues during grain harvest season. Fuss Road is also the eastern access route into the Shire of Esperance managed Munglingup Beach coastal campground and privately operated Munglinup Beach Holiday Park. Fuss Road requires widening to maintain the safety of road users. To complete these works, native vegetation up to 2m from the current road footprint on both sides of the road is required to be cleared, increasing the active road footprint to 17m. The widening involves the clearing of 0.911 ha of native vegetation. To mitigate impact of clearing vegetation, where feasible clearing will not occur to the full permitted width, conserving vegetation.



Figure 1. Location of 'Site E – Fuss Road, SLK 0 - 4.2'.

## 1.2 Environmental Legislation and Guidelines

The Commonwealth (federal) legislation relevant to this survey is the:

- Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The following Western Australian (state) legislation relevant to this survey include the:

- Biodiversity Conservation Act 2016 (BC Act);
- Biodiversity Conservation Act 2016 Biodiversity Conservation (Listing of Native Species) (Flora) Order 2022
- Biodiversity Conservation Act 2016 Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2022
- Biosecurity and Agriculture Management Act 2007 (BAM Act);
- Environmental Protection Act 1986 (EP Act);

Western Australian guidelines relevant to this survey are the:

- Environmental Factor Guideline: Flora and Vegetation (Environmental Protection Authority [EPA] 2016);
- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016);
- A guide to the assessment of applications to clear native vegetation, Under Part V Division 2 of the Environmental Protection Act 1986 (DWER, 2014)
- Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA, 2020)

International Agreements relevant to this survey are the:

- Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment 1974 (Japan-Australia Migratory Bird Agreement – JAMBA)
- Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment 1986 (China-Australia Migratory Bird Agreement – CAMBA)
- Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds 2007 (Republic of Korea-Australia Migratory Bird Agreement – ROKAMBA)
- Convention on Wetlands of International Importance 1971 (Ramsar Convention)

## 2 OBJECTIVES

The objective of this survey was to undertake a flora, fauna and vegetation assessment of the 'Fuss Road, SLK 0 - 4.2' survey area including:

- Undertake a desktop study of the flora, fauna and vegetation of the 'Fuss Road, SLK 0 - 4.2' survey area, with an emphasis on threatened and priority flora, threatened and priority ecological communities (TECs and PECs) and threatened and priority fauna;
- Review the historical literature of the 'Fuss Road, SLK 0 - 4.2' survey area;
- Undertake a detailed survey of the 'Fuss Road, SLK 0 - 4.2' survey area, and collect and identify the vascular plant species present;
- Review the conservation status of the vascular plant species recorded by reference to current

literature and listings by the Department of Biodiversity, Conservation and Attractions (DBCA) and plant collections held at the Western Australian State Herbarium (WAH), and listed by the Department of Climate Change, Energy, the Environment and Water under the EPBC Act;

- Define and map the vegetation communities in the 'Fuss Road, SLK 0 - 4.2' survey area;
- Define and map the location of any threatened and priority flora located within the 'Fuss Road, SLK 0 - 4.2' survey area;
- Define any management issues related to flora, fauna and vegetation values;
- Provide recommendations on the local and regional significance of the vegetation communities; and
- Prepare a report summarising the findings.

### 3 METHODS

#### 3.1 Desktop Assessment

A desktop assessment with a 20km buffer zone was conducted using DBCA datasets sourced under agreement for:

- WA Herbarium data (WAH) (DBCA, 2022d)
- Threatened and Priority Flora Database (TPFL) (DBCA, 2022c)
- DBCA's Esperance District Threatened Flora spatial dataset (DBCA, 2022a)
- Threatened and Priority Ecological Communities (DBCA, 2021)
- Threatened, specially protected and priority fauna (DBCA, 2022e)
- Black cockatoo roost and breeding sites (DBCA, 2022f)

In addition, the EPBC Act Protected Matters Search Tool, was also checked to identify the possible occurrence of threatened and priority flora, fauna and threatened and priority ecological communities within the 'Fuss Road, SLK 0 - 4.2' area. Search parameters were 'by polygon' and a 20 km buffer was applied to the search area; standard used in this IBRA subregion.

In addition, historical documentation and state datasets including:

- Vegetation mapping of the region, principally that of Beard (1976)
- 2020 Vegetation Extent by State-wide Pre-European mapping statistics
- Soil landscape mapping (DAFWA)
- Dieback Information Data Management System (DIDMS) (Gaia Resources)
- Shire of Esperance Weed Mapping Data
- Existing site digital orthophotos (Oldfield 2018)
- Atlas of Living Australia database
- Hydrographic Catchments (DWER)
- Crown Reserves (Landgate)

## 3.2 Field Survey

The site was initially inspected on 27 September, by Julie Waters and Katherine Walkerden the Shire of Esperance's Environmental Coordinator and Environmental Officer. A general assessment of possible ecological impacts included historical clearing, impact of fire regimes, regeneration from disturbance, waterlogging, senescence, weeds, erosion, sedimentation, invasive fauna, *Phytophthora* Dieback, and illegal dumping of rubbish.

A detailed field assessment of the flora and vegetation of the 'Fuss Road, SLK 0 - 4.2' survey area was undertaken by Shire of Esperance botanists on the 27- 28 September 2022 in accordance with methods outlined in Technical Guidance – Flora and vegetation surveys for environmental impact assessment (EPA 2016). All botanists held valid collection licences to collect flora for scientific purposes, issued under the BC Act.

The methodology for assessing threatened and priority flora consisted of traversing by foot the entire 'Fuss Road, SLK 0 - 4.2' survey area. The road was used as a continuous transect. Vegetation up to 5 meters from the edge of the existing road's back-slope was assessed to accurately cover the 2 m width proposed clearing permit area, recording all species, and collecting all but the very common, well known species.

For PF or TF species identified in the desktop survey as possible to occur, scans of pressed specimens from either the WAH or local Esperance District Herbarium were taken into the field. Suitable associated habitat for TF or PF identified in the desktop study were particularly focused on, and extensively searched. If suspected or known conservation significant flora species were encountered, a specimen was collected for subsequent identification with GPS coordinates and plant numbers recorded for the population. During the survey, a field herbarium for 'Fuss Road, SLK 0 - 4.2' was also constructed.

All species unknown in the field were collected, pressed and dress in accordance with WAH instructions, and later identified by SOE's three Botanists, using keys, WA Herbarium's Florabase, literature and Esperance District Herbarium. Any species that were unable to be identified were submitted to the WAH for identification (and NSW Herbarium for *Lepidosperma*). Nomenclature of the species recorded is in accordance with the WAH.

A follow up survey was conducted on 2 March 2023 by Katherine Walkerden to specifically target the counting of the Priority 3 species, *Dampiera sericantha*.

The vegetation communities of 'Site E – Fuss Road, SLK 0 - 4.2' was assessed for the presence a TEC or PEC (DBCA 2022b, 2021) comparing that to descriptions in approved conservation advice for these communities.

Specifically, the site was assessed for the Environmental Protection and Biodiversity Conservation Act 1999 listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' TEC. The presence of Kwongkan was identified using diagnostic characteristics defined in the 'Approved Conservation Advice for Kwongkan (Commonwealth of Australia, 2014)' as;

- 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).
- And/or

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

PEC's do not have published approved conservation advice. Comparison of the vegetation community occurred using 'Priority Ecological Communities for Western Australia, Version 33 (DBCA 2022)' definitions.

As Site E – Fuss Road, SLK 0 - 4.2 is a long linear site, quadrant-based data was not used to determine if the site meet the TEC definitions, this was due to the inability to site an appropriately sized quadrant (As per Table 1, Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016) within the narrow road verge area.

Only a basic fauna survey was conducted as per EPA (2020) guidelines. Observations of fauna presence, such as call sounds, footprints and scats were noted, and the area assessed for suitability of habitat within 'Site E – Fuss Road, SLK 0 - 4.2' for fauna species identified in the desktop survey. Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) feeding, roosting and nesting habitat was also assessed using EPBC Act referral guidelines (2022).

### 3.3 Survey Timing

According to Table 3 in the Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016), the primary survey timing for the South-west and Interzone Botanical Province is Spring (September-November). As all surveys at 'Fuss Road, SLK 0 - 4.2' were conducted in September, it falls within this period. The surveys were timed, where possible, to align with peak flowering periods of conservation significant flora with the potential to occur in the 'Fuss Road, SLK 0 - 4.2' survey area.

The 2022 spring rainfall was above average, and hence spring flowering continued for an extended period in 2022.

### 3.4 Vegetation Descriptions

Vegetation community was assessed during the field survey. Broad vegetation types defined by structure and composition were recorded and described using the National Vegetation Information System (NVIS) (ESCAVI 2003) classification system.

Condition of vegetation was assessed using Table 2 of the Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016) categories, as 'Excellent', 'Very Good', 'Good', 'Degraded' or 'Completely Degraded'. This illustrates how healthy vegetation is, determined by vegetation structure, weed cover, presence of dieback, historical clearing, grazing and other signs of disturbance.

Additionally, possible environmentally sensitive areas, such as wetlands or granite, were noted. Overall, an assessment of environmental impacts to Department of Water and Environmental Regulation's (DWER) biodiversity values were inspected and valued.

### 3.5 Survey Limitations

A general assessment was made of the survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 2). Based on this assessment, the present survey has

not been subject to constraints which would affect the thoroughness of the survey, and the conclusions which have been formed.

**Table 2:** Potential limitations affecting the conclusions made in this report

| Potential Survey Limitation   | Impact on Current Survey   |
|---|--|
| Availability of contextual information at a regional and local scale                            | <b>Not a limitation:</b> Reference resources such as Beard's mapping, together with online flora and vegetation information, have provided an appropriate level of information for the current survey. The vegetation of the Esperance shire has previously been mapped by Beard (1976).   |
| Resources (i.e. were there adequate resources to complete the survey to the required standard). | <b>Not a constraint:</b> Adequate resources were made available by Shire of Esperance to complete the surveys.   |
| Competency/experience of team carrying out survey; experience in the bioregion surveyed         | <b>Not a limitation:</b> Botanists had extensive experience working within the Shire of Esperance and wider areas. Two of the botanists have consistently worked within this bioregion for more than 15 years. Botanists were familiar with flora in the area. Any unknown or potential threatened or priority flora species were collected and identified, utilising resources available at the Western Australian Herbarium and consultation with expert taxonomists.  |
| Proportion of flora collected and identification issues   | <b>Potential limitation:</b> While many plants were in flower during the survey, a proportion of plants encountered during the survey were sterile and may impact the chance of identification of some specimens to species level. Orchid species may not emerge each year if conditions are not favourable. Although these may affect the completeness of the species list, it is not expected to have a significant effect on mapping reliability, nor on the identification of threatened and priority species in the area as the majority were perennial species. Surveys were only undertaken in one year |
| Effort and extent of survey   | <b>Potential limitation:</b> The survey area was thoroughly covered. The threatened and priority flora search undertaken by botanists by means of foot-traverse along the edge of the road and into roadside vegetation ensured thorough coverage of the survey area. Flora that was unknown or resembled threatened or priority flora were collected, the location and habitat noted, and the number of plants estimated.   |
| Mapping reliability   | <b>Not a constraint.</b> Handheld GPS units were used for the survey, which for a majority of field conditions have an accuracy level of $\pm 5$ m.  |
| Survey timing, rainfall, season of survey   | <b>Not a limitation:</b> The EPA (2016a) recommends that flora and vegetation surveys in the South – West Botanical Province be conducted in Spring (September-November). All surveys have been conducted in September which falls within this period. Rainfall in 2022 was above average,   |

|                                    |  |
|------------------------------------|--|
|                                    | and continued well into December.  |
| Disturbances (fire/flood/clearing) | <b>Not a limitation:</b> The 'Fuss Road, SLK 0 - 4.2' survey does not contain any recent fire or flooding disturbance. |

## 4 DESKTOP ASSESSMENT RESULTS

### 4.1 Climate

The Munglinup climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2022). The area receives an average annual rainfall of 449 mm. The Shire of Esperance received an unusually high level of rainfall in 2022 resulting in an extended flowering period.

### 4.2 Catchment

'Site E – Fuss Road, SLK 0 - 4.2' is present within the Oldfield River catchment area and the Munglinup River sub-catchment. It is located approximately 12km from the coast.

### 4.3 Geology, Soils and Topography

Two geological units were identified within 'Site E – Fuss Road, SLK 0 - 4.2, by Schoknecht et al. (2004) described as:

- Thin tertiary sediments over Proterozoic granite; and
- Tertiary marine sediments of the Pallinup formation and small outcrops of Archean granite.

Within the area, there has been two soil types recorded. These include:

- Grey deep and shallow sandy duplex soils (gravelly) with minor pale deep sands and gravelly duplex soils and deep sandy gravels; and
- Duplex sandy gravels and associated grey deep sandy (gravelly) duplex soils and minor pale deep sands.

During the field survey, topography was observed to be dominated by shallow valleys and rises. Using Schnoknect et al. (2004), the project topography is mapped at a fine scale, traversing two topographic areas. These include:

- Externally drained plains and rises with gently inclined slopes some small level plains on upper slopes and catchment divides; and
- Gently sloping rises consisting of broad crests in upper landscape positions.

### 4.4 Regional Vegetation

The site is located within the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell, 1995) Esperance Plains region (Esp2) and Recherche sub-region. The Esp2 region is described as: "Proteaceae Scrub and Mallee heaths on sandplain overlying Eocene sediments, rich in endemics. Herbfields and heaths (rich in endemics) on abrupt granite and quartzite ranges that rise from the plan. Eucalyptus woodlands occur in gullies and alluvial foot-slopes".

Beard (1973) mapped a single vegetation association (VA) within the 'Site E – Fuss Road, SLK 0 - 4.2' area, Eperance\_47 (Table 3). The vegetation association has been highly cleared, with 15% of its pre-European extent remaining within the Recherche IBRA subregion and only 13% remaining within the Shire of Esperance.

**Table 3.** Vegetation association 47 mapped by Beard (1973) within the ‘Site E – Fuss Road, SLK 0 - 4.2’, and statistics on its pre-European extent.

| <b>Vegetation Association</b>                  | <b>ESPERANCE_47</b>                |
|--|------------------------------------|
| Description                                    | Shrublands; tallerack mallee-heath |
| Pre-European extent remaining (%)              | 35.86                              |
| Pre-European extent in IBRA subregion ESP2 (%) | 15.06                              |
| Pre-European extent in LGA (%)                 | 13.43                              |
| Current extent conserved in IUCN area (%)      | 49.30                              |

#### **4.5 Surrounding Land Use**

The area directly included in the clearing permit application ‘Site E – Fuss Road, SLK 0 - 4.2’ is currently intact and vegetated 60m wide road reserve, managed by the Shire of Esperance. The road footprint is currently 15m. The surrounding land use is mostly agricultural with a neighbouring nature reserve. The area is within rural zoning.

The site neighbours Reserve 26410, a nature reserve vested for protection of flora and fauna, with clearing occurring 20m from the reserve. No other conservation vested reserves were within 5km of the site.

#### **4.6 Potential Threatened and Priority Flora**

Two threatened flora (TF) and 26 priority flora (PF) were recorded within a 20 km radius of the proposed impact site (Appendix 3). Of these, one TF species and 11 PF species had suitable known associated habitat that corresponded with vegetation communities and soil type of ‘Site E – Fuss Road, SLK 0 - 4.2’ project.

#### **4.7 Potential Threatened and Priority Ecological Communities**

The desktop study identified the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 listed threatened ecological community (TEC) ‘Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)’ within ‘Site E – Fuss Road, SLK 0 - 4.2’ project area. No other TEC’s or priority ecological communities (PEC’s) were identified by the desktop study as being within ‘Site E – Fuss Road, SLK 0 - 4.2’ or within a 20 km buffer of the site.

#### **4.8 Potential Threatened and Priority Fauna**

13 conservation listed fauna were recorded within a 20 km radius of the proposed impact site (Appendix 4). Of these, 6 species were residents (not migratory).

## 4.9 *Phytophthora* Dieback

Dieback Information Delivery and Management System (DIDMS; GAIA Resources, SCNRM & State NRM 2022) data shows positive *Phytophthora multivora* samples 1km from the project area on South Coast Highway and positive *Phytophthora cinnamomi* samples 4.5km from the project area on Farmers Road.



**Figure 2.** Listed *Phytophthora* dieback infested areas surrounding 'Site E – Fuss Road, SLK 0 - 4.2'.

## 5 FIELD SURVEY RESULTS AND DISCUSSION

### 5.1 Flora

A total of 229 vascular plant taxa from 133 plant genera and 49 plant families were recorded within the 'Fuss Road, SLK 0 - 4.2' survey area during the 2022 survey. The majority of taxa was recorded within the Proteaceae (28 taxa), Myrtaceae (38 taxa), Fabaceae (31 taxa), and Asteraceae (12 taxa) families (Appendix 1). This total included 199 native species and 30 introduced (weed) species. (see Appendix 1 for the complete incidental species list).

A number of plant specimens collected could not be identified accurately to species level due to the absence of sufficient taxonomic characters to enable accurate identification. The principal reasons for not being able to fully identify some of the collected specimens to species level were:

- Plant material was sterile or lacked sufficient taxonomic features to permit accurate identification to genus or species level. In these cases, the species is identified as, for example, Cyperaceae sp. and *Eucalyptus* sp.

### 5.2 Threatened and Priority Flora

The targeted flora survey identified two PF species, *Daviesia pauciflora* (P3) and *Dampiera sericantha* (P3), within the proposed clearing permit footprint (Section 5.2.1, 5.2.2). Queries of spatial datasets were requested specifically for these species, to interrogate impact of proposed works on species sustainability (DBCA 2022a; DBCA 2022c; DBCA 2022d). DBCA do not actively manage or monitor the majority of low priority species, due to their prevalence in the landscape relative to TF. There are 137 species recorded as priority three or four conservation status within the Shire of Esperance boundaries (DBCA 2023b). It was noted that additional information on *Daviesia pauciflora* and *Dampiera sericantha* was located on file.

**Table 4:** Summary of Priority flora species recorded in 'Site E – Fuss Road, SLK 0 - 4.2' project area.

| Species                    | Conservation Code | Total Plants | Plants to be taken |
|----------------------------|-------------------|--------------|--------------------|
| <i>Daviesia pauciflora</i> | P3                | 4            | 0                  |
| <i>Dampiera sericantha</i> | P3                | 161          | 15                 |

### 5.2.1 *Dampiera sericantha*, Priority 3

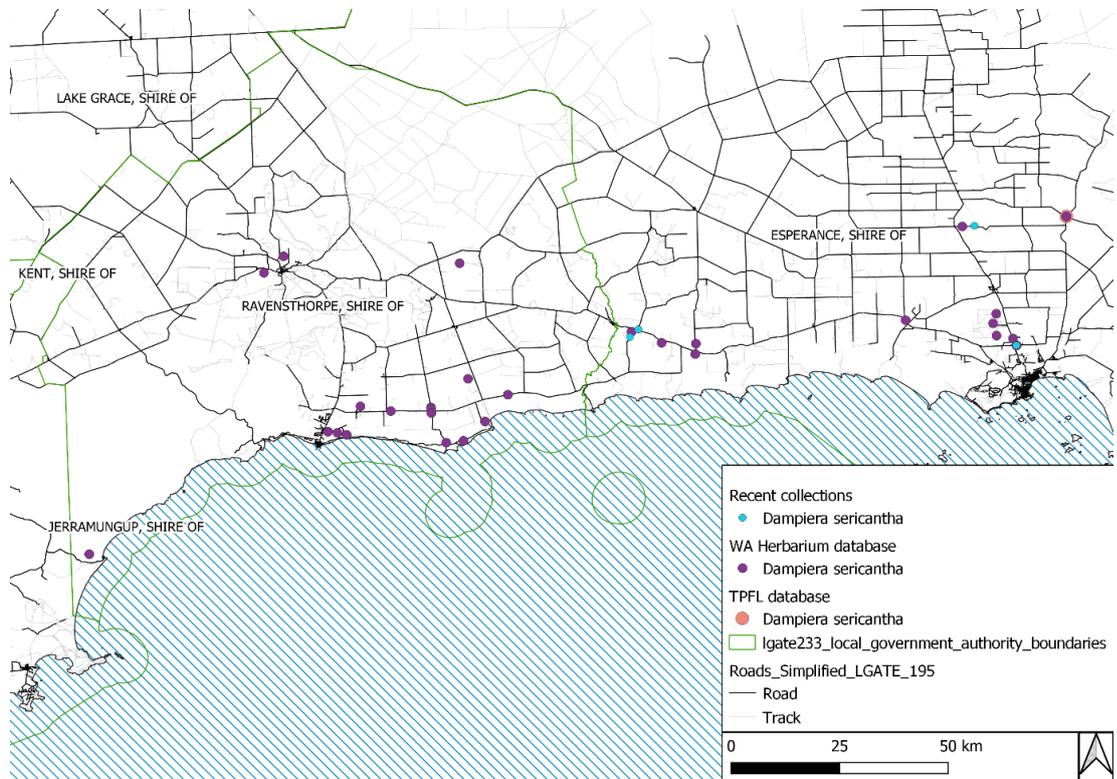
A specimen of *Dampiera sericantha* was sent to the WA Herbarium for identification confirmation (KSW15122; Accession 9783 with specimen retained). It was confirmed as *Dampiera sericantha* by Michael Hislop on 27 September 2022. A Threatened and Priority Reporting Form (TPRF) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 2 March 2023 (Appendix 2). If proposed works occur, 15 plants will be impacted upon, from a population total of 161. 55 plants were located within the Fuss Road reserve between SLK 2.91 and 2.25, on the 2<sup>nd</sup> of March 2023 an additional 106 plants were located within Shire Reserve 35808, the additional plants were counted over the span of 10 minutes and Reserve 35808 was not extensively searched, no search was conducted within Munglinup nature reserve (Reserve 26410).

*D. sericantha* has a distribution range over 250km. It is only identifiable during spring and summer, the remainder of the time it is a non-descript herb similar to many other non-threatened species. This has likely contributed to lack of records, being a small window to identify, and the low priority to collect during a time frame when the majority of the south-west is flowering.

Only a single record was available on *D. sericantha* from the TPFL database, so all records refer to the WA Herbarium database. *D. sericantha* has been recorded 31 times across 23 different locations. Tenure is poorly described with five locations being uninterpretable of conservation security. Three recorded locations are described as being in mining tenements are possibly been lost. Three locations are present in nature reserves and are likely to still be intact populations. The remaining 15 populations are present in road reserves, fence lines, pipe lines or coastal 4WD tracks, and have possibly been lost via road developments or maintenance. Nine records of *D. sericantha* were prior to 2000, with two locations in nature reserves been verified as existing since then. The Shire of Esperance also collected *D. sericantha* on Farmers Road in spring 2022. This confirmed new population of 40 plants (KSW15722, Acc 9841) has yet to be databased. Katherine Walkerden had also collected *D. sericantha* in Speddingup Nature Reserve, with 30 plants in total, this new population (KSW171-p, Acc 9784) is yet to be databased.



**Figure 3.** Location of Priority 3 species *Dampiera sericantha* within the 'Site E – Fuss Road, SLK 0 - 4.2' project.



**Figure 4.** Known records of Priority 3 species *Dampiera sericantha* across a 250 km geographic range (DBCA 2022) including recently discovered populations by the Shire of Esperance.

### 5.2.2 *Daviesia pauciflora*, Priority 3

A specimen of *Daviesia pauciflora* was sent to the WA Herbarium for identification confirmation (KSW13722, Accession 9783 with specimen retained). It was confirmed as *D. pauciflora* by Michael Hislop on 23 November 2022. A Threatened and Priority Reporting Form (TPRF) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 2<sup>nd</sup> of March 2023 (Appendix 10.1.2). If proposed works occur, no plants will be taken.

*D. pauciflora* has a wide geographic distribution with a 197km east to west and 54km north to south range. There exist 29 herbarium records and 8 TPFL records, 6 of TPFL records correspond with Herbarium records. Analysing tenure of these records, there was 1 population in a nature reserve, 2 populations within Helms Forestry Reserve, 3 records in unallocated crown land, 8 records were within shire road reserves, the remaining records had unclear tenure or were on freehold land. The species has a large number of populations but most of these are restricted to only a handful of plants as seen in recent collections.



Figure 5. Location of Priority 3 *Daviesia pauciflora* within the 'Site E – Fuss Road, SLK 0 - 4.2' project.

### 5.3 Weeds

Significant invasion of the site by agricultural weeds had occurred, with historically cleared areas being heavily invaded by agricultural weeds, a majority of the weed species present were herbaceous, only 3 woody weed species were present within the road reserve. Overall, 30 invasive species were identified within the project area (Appendix 1).

Of these, the most extensive and of serious concern were *Leptospermum laevigatum*. This species was present along most of the project area, and well established at this site. Also, of concern was *Acacia baileyana* an invasive eastern state acacia which 4 large plants were present at SLK 3.72. Both are priority environmental weeds in the Shire of Esperance's Environmental Weed Strategy 2009-2018.

Weed specimen's that resulted in a range extension were sent to the WAH. A single weed range extension was present at Fuss Road. *Acacia baileyana* (Accession 9783; KSW15222, Specimen retained). The specimen was new to the Shire of Esperance and Esperance Plains IBRA region and a 350km eastern range extension.

### 5.4 *Phytophthora* Dieback

There were large sections of the road reserve with high proportions of proteaceous species that were healthy and appeared unaffected by *Phytophthora* dieback.

Proposed works will be conducted using appropriate hygiene measures to limit spreading of disease, including clearing in dry conditions and clean down of vehicles and machinery before entering the site.

Due to the high proportion of proteaceous, myrtaceous and ericaceous species within Fuss Road the vegetation is highly vulnerable to *Phytophthora* infection.

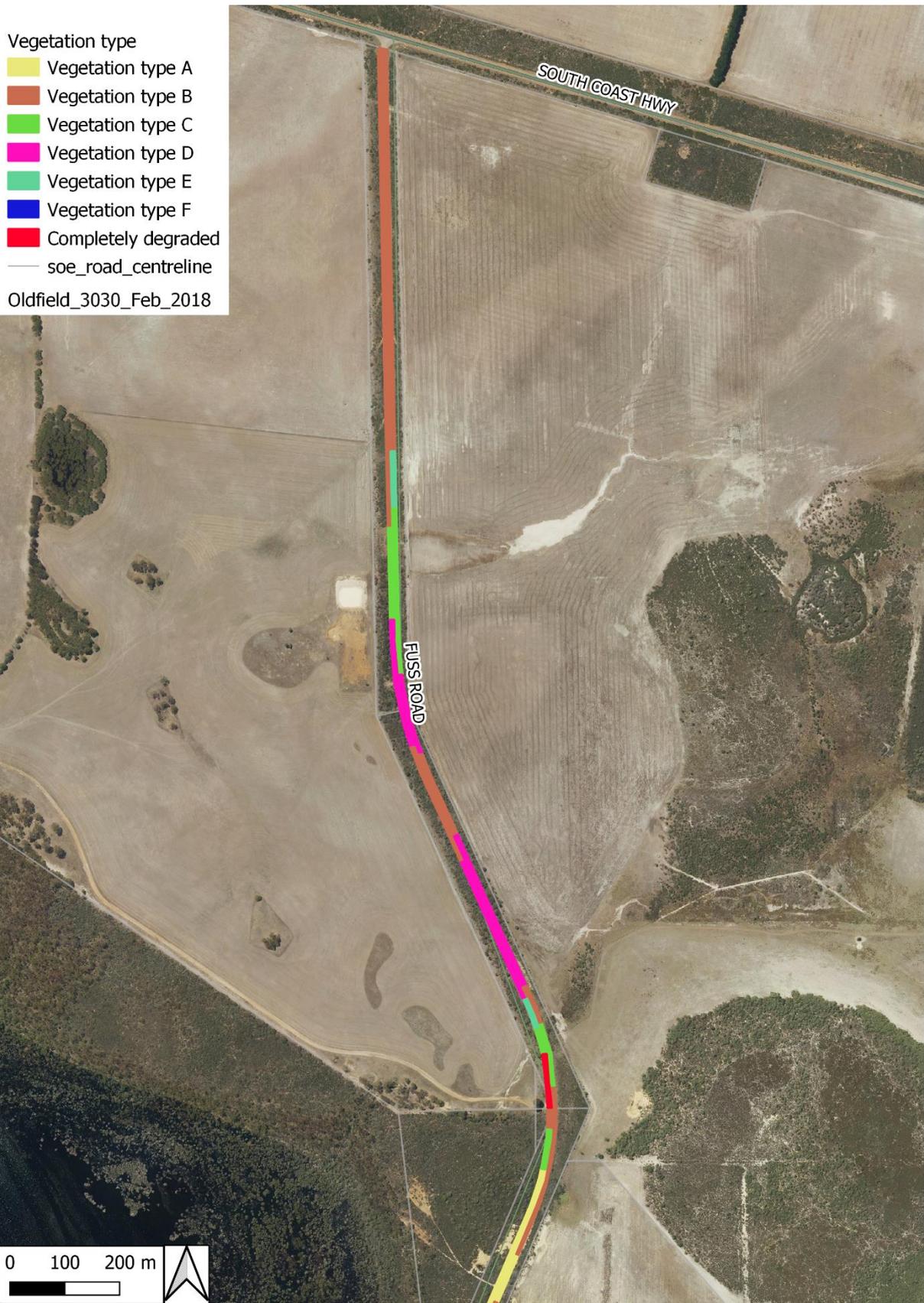
### 5.7 Vegetation Communities

Six vegetation communities were identified within the 'Site E – Fuss Road, SLK 0 - 4.2', as defined by structure and composition (Table 5). It is believed that the Beard (1973) vegetation associations identified in Section 4.4 are an appropriate match for three of the vegetation types observed. The mapped Beard vegetation association of Esperance\_47 matched vegetation type A, B and E, Beard vegetation association Esperance\_41 was mapped within several hundred meters of the site and matched vegetation types C and F. No nearby vegetation associations matched Vegetation type D.

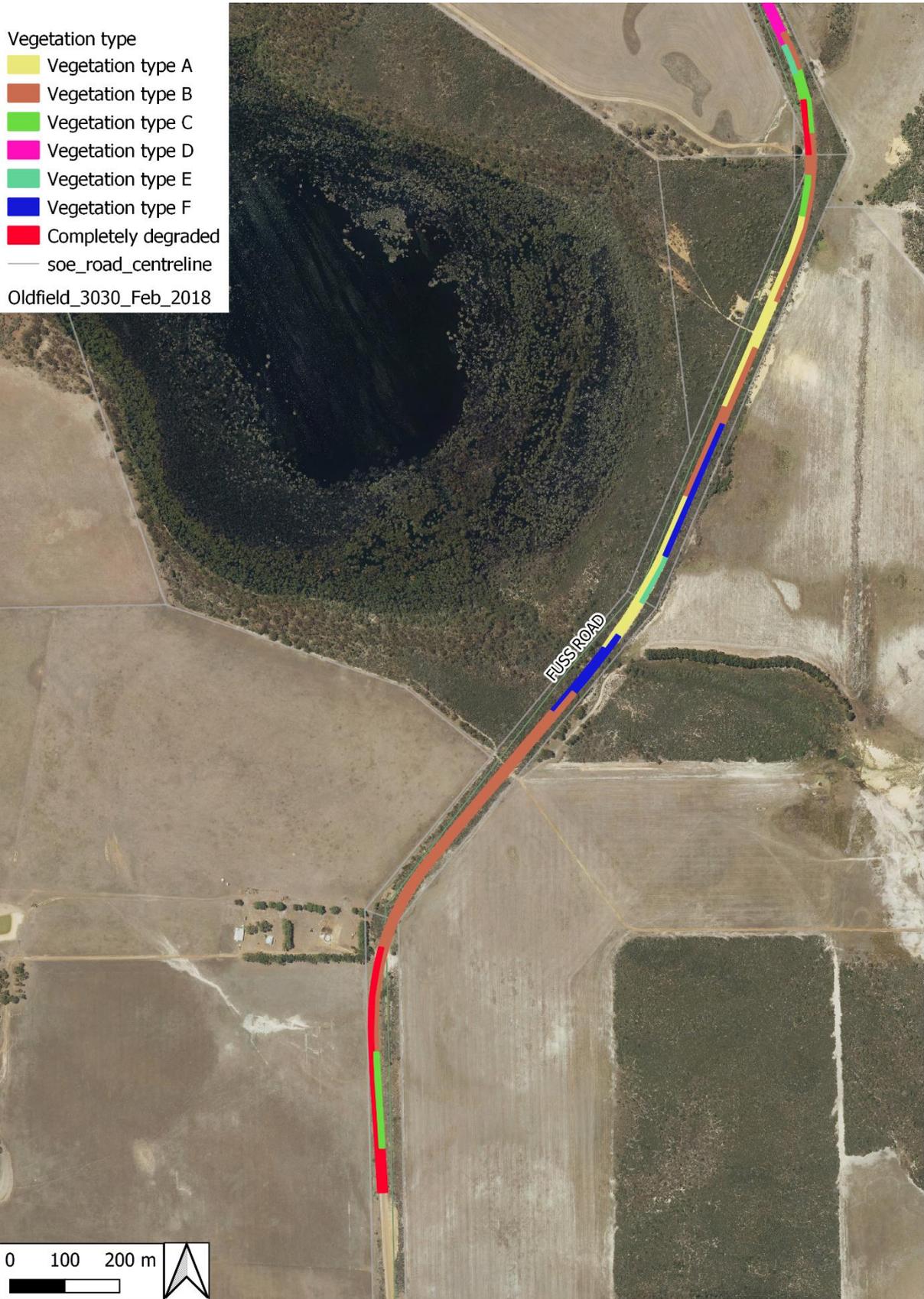
**Table 5.** Vegetation communities identified within proposed 'Site E – Fuss Road, SLK 0 - 4.2' project area.

| Type | Description   | Figure | Closest Matching Beard Vegetation Association | Area (ha) |
|------|---|--------|---|-----------|
| A    | <i>Banksia speciosa</i> with scattered <i>Nuytsia floribunda</i> , over mixed heath with <i>Melaleuca thyoides</i> , <i>Melaleuca striata</i> , <i>Adenanthos cuneatus</i> and <i>Lambertia inermis</i> | 8      | Esperance_47                                  | 0.018     |
| B    | <i>Lambertia inermis</i> , <i>Eucalyptus pleurocarpa</i> and <i>E. tetraptera</i> over mixed heath with <i>Melaleuca</i>  | 9      | Esperance_47                                  | 0.465     |

|   |  |    |   |       |
|---|--|----|---|-------|
|   | <i>striata</i> , <i>Acacia cyclops</i>   |    |   |       |
| C | <i>Melaleuca cuticularis</i> dominated wetland with <i>Juncus</i> rushes.  | 10 | Esperance_41                                      | 0.075 |
| D | Dense <i>Allocasuarina huegeliana</i> dominated woodland with <i>Hakea laurina</i> , <i>Leptospermum spp.</i> , <i>Acacia glaucoptera</i> and <i>Hakea lissocarpha</i> | 11 | Does not match any nearby vegetation associations | 0.093 |
| E | Scattered <i>Nuytsia floribunda</i> over low <i>Melaleuca striata</i> and <i>Adenanthos cuneatus</i> dominated shrubland   | 12 | Esperance_47                                      | 0.062 |
| F | <i>Eucalyptus occidentalis</i> over <i>Melaleuca cuticularis</i> dominated winter wet area   | 13 | Esperance_41                                      | 0.080 |



**Figure 6.** Vegetation types within the 'Site E – Fuss Road, SLK 0 - 4.2' area. Between SLK 0 to 2.37.



**Figure 7.** Vegetation types within the 'Site E – Fuss Road, SLK 0 - 4.2' area. Between SLK 1.79 to 4.2.



**Figure 8.** Vegetation type A identified in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as *Banksia speciosa* with scattered *Nuytsia floribunda*, over mixed heath with *Melaleuca thyoides*, *Melaleuca striata*, *Adenanthos cuneatus* and *Lambertia inermis*.



**Figure 9.** Vegetation type B identified in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as *Lambertia inermis*, *Eucalyptus pleurocarpa* and *E. tetraptera* over mixed heath with *Melaleuca striata*, *Acacia cyclops*.



**Figure 10.** Vegetation type C identified in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as *Melaleuca cuticularis* dominated wetland with *Juncus* rushes.



**Figure 11.** Vegetation type D identified in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as *Allocasuarina huegeliana* dominated woodland with *Hakea laurina*, *Leptospermum* spp., *Acacia glaucoptera* and *Hakea lissocarpha*.



**Figure 12.** Vegetation type E identified in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as Scattered *Nuytsia floribunda* over low *Melaleuca striata* and *Adenanthos cuneatus* dominated shrubland.



**Figure 13.** Vegetation type F identified in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as *Eucalyptus occidentalis* over *Melaleuca cuticularis* dominated winter wet area.



**Figure 14.** Vegetation assigned no vegetation type in 'Site E – Fuss Road, SLK 0 - 4.2' project, described as completely degraded.

## 5.8 Vegetation Condition

Vegetation condition varies dramatically throughout the project area (Figure 15). Vegetation condition was best in the section bordering Reserves 26410 & 35808, where there was significantly less weed invasion and historical clearing. Other sections of the project area had seen significant weed invasion, historical clearing (for crossovers and fence lines) and planting of non-natives species into the road reserve (*Pinus pinaster*).

**Table 6.** Quantifying vegetation to be cleared by vegetation type and condition

| Vegetation Type | Excellent    | Very Good    | Good         | Degraded     | Completely Degraded | Total        |
|-----------------|--------------|--------------|--------------|--------------|---------------------|--------------|
| A               | 0.018        | -            | -            | -            | -                   | <b>0.018</b> |
| B               | 0.104        | 0.342        | 0.019        | -            | -                   | <b>0.465</b> |
| C               | 0.014        | 0.037        | 0.032        | 0.035        | -                   | <b>0.115</b> |
| D               | 0.041        | 0.053        | -            | -            | -                   | <b>0.093</b> |
| E               |              | 0.013        | -            | -            | -                   | <b>0.013</b> |
| F               | 0.064        | 0.026        | -            | -            | -                   | <b>0.089</b> |
| -               |              |              |              |              | 0.116               | <b>0.116</b> |
| <b>Total</b>    | <b>0.240</b> | <b>0.468</b> | <b>0.051</b> | <b>0.035</b> | <b>0.116</b>        | <b>0.911</b> |



**Figure 15.** Vegetation condition across 'Site E – Fuss Road, SLK 0 - 4.2' project, ranging from excellent to a completely degraded condition.

## 5.9 Threatened Ecological Communities

Vegetation communities A, B and E met criteria to be considered as the EPBC listed TEC 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia. (Figure 16). In total, 0.496 ha of vegetation was considered as Kwongkan TEC present within 'Site E – Fuss Road, SLK 0 - 4.2' area. All of the vegetation in these vegetation types had >30% proteaceous cover and was all in good or better condition.

The vegetation community described as 'Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins in the South Coast of Western Australia' is listed as a PEC (DBCA 2018). Within the 'Site E –Fuss Road, SLK 0 - 4.2' project area, vegetation type F was described as *Eucalyptus occidentalis* over *Melaleuca cuticularis* dominated winter wet area. This vegetation type was assessed against the original description given during the nomination of the Swamp Yate PEC (Table 7), the two occurrences of the swamp yate were mostly consistent with the PEC's original description. The occurrences both had intact understoreys and were mostly in excellent condition, a total of 0.089ha of clearing will occur within this vegetation type.

**Table 7.** Comparison between potential occurrences of the Swamp Yate PEC and listing documentation criteria "Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins in the South Coast of Western Australia" (Appendix 14) within vegetation type F

| <b>Swamp Yate (<i>Eucalyptus occidentalis</i>) woodlands in seasonally inundated clay basins with intact understorey and fringing vegetation</b> | <b>Criterion 1:</b><br>Abiotic Factors<br>i) Occurs on valley floor;<br>ii) Basin is more or less circular;<br>iii) Seasonally inundated. | <b>Criterion 2:</b><br>Centre of basin inhabited by <i>Eucalyptus occidentalis</i> low woodland (often with an understorey of <i>Melaleuca cuticularis</i> ). | <b>Criterion 4:</b><br>Fringing the wetland is <i>dense rushes and sedges</i> . | <b>Criterion 3:</b><br>Peripheral to the central basin is a waterlogged zone of <i>E. occidentalis</i> associated with heath to open scrub and/or small trees.<br><i>Melaleuca calycina</i> ,<br><i>M. glaberrima</i> , <i>M. incana</i> , <i>M. pulchella</i> ,<br><i>Taxandria callistachys</i> ; | <b>Swamp Yate PEC determination</b><br><br><b>Area (ha) within Site</b> |
|--|---|---|---|---|---|
| Occurrence 1, Vegetation type F (SLK 2.56-2.82, Eastern side of road)  | i) Occurs on floor of shallow valley<br>ii) Occurs in roughly circular basin<br>iii) is seasonally inundated                              | Centre of basin was inhabited by <i>Eucalyptus occidentalis</i> with a <i>Melaleuca cuticularis</i> understorey   | Vegetation type had a dense rush understorey with some fringing sedges          | None of the listed <i>Melaleucas</i> were in the fringing vegetation.   | Consistent (0.049 ha)   |
| Occurrence 2, Vegetation type F (SLK 3-3.19)   | i) Occurs on floor of shallow valley<br>ii) Occurs in roughly circular basin<br>iii) is seasonally inundated                              | Centre of basin was inhabited by <i>Eucalyptus occidentalis</i> with a <i>Melaleuca cuticularis</i> understorey   | Vegetation type had a dense rush and sedge understorey                          | Northern edge of vegetation type was fringed by mixed shrubland with <i>Gahnia trifida</i> , <i>Melaleuca pulchella</i> and <i>Melaleuca suberosa</i> .   | Consistent (0.039)  |

PECs & TECs

 Kwongkan Shrublands - TEC

 Swamp Yate - PEC

 soe\_road\_centrelines

Oldfield\_3030\_Feb\_2018



**Figure 16.** Vegetation types A, B & E met EBPC listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)'. Vegetation type F was consistent with the BC listed (PEC) 'Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins in the South Coast of Western Australia'.

## 5.10 Fauna

Of the species identified within the desktop survey, ten had potentially suitable habitat within the site.

During the field survey various bird calls were present, several birds were visually observed including a Magpie (*Gymnorhina tibicen*), Mudlark (*Grallina cyanoleuca*), New Holland Honeyeater (*Phylidonyris novae-hollandiae*) and Red Wattlebird (*Anthochaera carunculata*). Rabbit burrows were present at the site. No other evidence of invasive fauna was present. However, it is highly likely that foxes and feral cats are extensive throughout the area.

### 5.10.1 Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, threatened fauna

The closest record was 1.55km from the project area.

The Shire of Esperance Black Cockatoo assessment was conducted in accordance with the EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's Cockatoo *Calyptorhynchus latirostris* (Endangered), Baudin's Cockatoo *Calyptorhynchus baudinii* (Endangered) and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* (Vulnerable) (Department of Agriculture, Water and the Environment, 2022).

Vegetation types A, B and E contained potential foraging habitat due to a high proportion of proteaceous species and presence of *Pinus pinaster* in the southern section of the project area. The foraging quality scoring tool was not undertaken due to the total clearing of 0.496ha of vegetation within these vegetation types being lower than the 1ha threshold for use of the tool.

Given that the site did not:

- contain any nesting sites or large trees with hollows;
- contain night roosting areas;
- the amount of high-quality foraging habitat was less than 1 ha;
- had low quality (1-4) habitat under 10ha

a referral for assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is unlikely to be required.

### 5.10.2 Australasian Bittern, *Botaurus poiciloptilus*, EN

The Australian Bittern was listed on the EPBC protected matter search tool, there were no known records of this species within 20km of the survey area. All Esperance records for this species were located in east of the Esperance townsite.

The Australasian Bittern inhabits shallow (less than 30cm deep), permanent freshwater and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum). They also inhabit bore drains with tussocky vegetation and occasionally saltmarsh. They use temporary pools when population densities are high and deep swamps when breeding.

Vegetation type C had potentially suitable habitat for this species, however, given the small size of the area, distance from other known suitable wetlands and the non-permanent nature of this wetland area, it is highly unlikely that the species will utilise this area.

### 5.10.3 Sharp-tailed Sandpiper, *Calidris acuminata*, MI

There was records of this species 1.56km from the project area.

The Sharp tailed Sandpiper inhabits muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgeland and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs.

As there were no wetlands with shorelines, there is unlikely to be any suitable habitat within 'Site E – Fuss Road, SLK 0 - 4.2' project area.

### 5.10.4 Red-necked Stint, *Calidris ruficollis*, MI

There was a record of this species 13.39km from the project area. Examining nearby records the species has been recorded in nearby wetlands similar in size to the lake within the neighbouring Munghlinup Nature Reserve (Reserve 26410) which would provide suitable habitat for this species.

The Red-necked Stint was known to inhabit coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation.

Vegetation types C and F had potentially suitable habitat for this species constituting a total of 0.204 ha of vegetation to be cleared.

### 5.10.5 Recherche Cape Barren Goose, *Cereopsis novaehollandiae grisea*, EN

The Recherche Cape Barren Goose was listed on the EPBC protected matter search tool. There were no known records of this species within 20km of the survey area. The closest record to the project area was 29km from the survey site.

The Recherche Cape Barren Goose occurs on offshore islands and rocks, and at adjacent sites on the mainland. The closest Island to the project area is Red Island which is 43km from the project area, given this distance it is highly unlikely that this species would travel to the project area from Red Island.

#### Chuditch, *Dasyurus geoffroii*, VU

There was a 2001 record of this species 10.60km from the project area.

The Chuditch uses a range of habitats including forests, Mallee shrublands, woodlands and deserts. The densest populations have been found in riparian jarrah forest. Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) and sufficient prey biomass (large invertebrates, reptiles and small mammals) to survive.

All of the good or better-quality vegetation within this project area provides potentially suitable habitat for this species, this includes a total of 0.759 ha of vegetation. In addition, the vegetation within this project likely provides important habitat connectivity to Munglinup Nature Reserve (Reserve 26410) and the Munglinup River corridor, which also contains large sections of suitable habitat.

#### 5.10.6 Quenda, *Isoodon fusciventer*, P4

There was a 2014 record of this species 5.94km from the project area, there were several other nearby records of this species along the Oldfield River.

The species habitat is described as scrubby, often swampy, vegetation with dense cover up to 1 m high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quenda will thrive in more open habitat subject to introduced predator control.

All of the good or better-quality vegetation within this project area provides potentially suitable habitat for this species, this includes a total of 0.759 ha of vegetation. In addition, the vegetation within this project likely provides important habitat connectivity to Munglinup Nature Reserve (Reserve 26410) and the Oldfield River corridor.

#### 5.10.7 Wood Sandpiper, *Tringa glareola*, MI

There was record of this species 16.64km from the project area.

The species habitat is described as well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially *Melaleuca* and River Red Gums *Eucalyptus camaldulensis* and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops.

Vegetation types C and F had potentially suitable habitat for this species constituting a total of 0.204 ha of vegetation to be cleared. The entire site is likely providing important habitat connectivity to Munglinup Nature Reserve which would provide suitable habitat for this species.

#### 5.10.8 Common Greenshank, *Tringa nebularia*, MI

The closest record of this species was 1.56km from the project area. There was a total of 19 records of this species within 5 kilometres of the project areas.

The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores.

The species has well recorded history of utilising wetlands nearby the survey area and is highly likely to be utilising wetland areas within the project areas. Vegetation types C and F had potentially suitable habitat for this species constituting a total of 0.204ha of vegetation to be cleared. The entire site is likely providing important habitat connectivity to Munglinup Nature Reserve, the Oldfield river and other nearby wetlands.

#### 5.10.9 Marsh Sandpiper, *Tringa stagnatilis*, MI

The closest record of this species was 15.93km from the project area.

The Marsh Sandpiper is found on permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In Western Australia they prefer freshwater to marine environments.

As there were no wetlands with shorelines, there is unlikely to be any suitable habitat within 'Site E – Fuss Road, SLK 0 - 4.2' project area.

## 6 REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION

The 'Site E – Fuss Road, SLK 0 - 4.2' project may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations (DWER) assess applications, as listed under Schedule 5 of the Environmental Protection Act 1986 (DWER 2019).

### 6.1 Principle (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Biodiversity at this site is high with 199 native species recorded over six vegetation communities.

### 6.2 Principle (b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

The vegetation contains foraging habitat for Carnaby's Black Cockatoo due to the presence of

vegetation high in Proteaceous species. There was a total 0.496ha of potential foraging habitat being cleared.

The Chuditch and Quenda had likely suitable habitat throughout a large section of the good or better condition vegetation within the project area this included a total of 0.759 ha of vegetation to be cleared.

There were five wetland bird species on the desktop fauna list with potentially suitable habitat in the wetland areas of the project, these species were also likely to have suitable habitat in the neighbouring Munghlinup Nature Reserve and Munglingup River.

### **6.3 Principle (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

*Dampiera sericantha* (P3) and *Daviesia pauciflora* (P3) were both present at the site, impacts on these species will be minimal, both species have a wide distribution with numerous populations.

### **6.4 Principle (d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

0.496ha hectares of vegetation met the definition of the EPBC listed Kwongkan TEC. No other TEC's or PEC's within the Shire of Esperance were relevant to the study area.

Vegetation type F was consistent with the state listed Swamp Yate PEC. The occurrences both had intact understories and were mostly in excellent condition, a total of 0.089ha of clearing will occur within this vegetation type.

### **6.5 Principle (e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

The immediate surroundings of the site were mostly highly cleared agricultural land. Over 1.2km of the site was adjacent to the large remnants of Reserves 35808 and 26410, with the intact vegetation within the site likely playing contributing to ecological linkages in the area. However, given the relatively small amount of clearing within the 60m wide road reserve area and the presence of a large remnant (Reserves 35808 and 26410) along a large portion of the site this principle is unlikely to be at variance.

### **6.6 Principle (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

Vegetation type C and F were both wetland associated vegetation that included a total clearing of 0.204 ha of vegetation.

### **6.7 Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

Vegetation within this area will be providing limited function as windbreaks and erosion control for the agricultural areas surrounding it. The neighbouring landholders have retained some vegetation as windbreaks and surrounding wetland areas, as result the road reserve does not contain the only vegetation functioning as windbreaks.

**6.8 Principle (h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

The project is neighbouring Munglinup Nature Reserve (Reserve 26410) and Shire of Esperance vested Reserve 35808 (Zoned for Environmental Conservation). Clearing of vegetation along Fuss Road from SLK 0 - 4.2 is likely to impact habitat connectivity to these reserves.

**6.9 Principle (i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

Given the small amount of clearing occurring there is unlikely to be any significant impact to water quality.

**6.10 Principle (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

Given the small amount of clearing occurring there is unlikely to be any significant impact to flood risk.

## **7 RECOMMENDATIONS**

As Shire Environmental Coordinator signs off on project work packs the following recommendation will be included within the internal SOE approval process for the road project:

- Minimise clearing to minimum amount required;
- Avoid larger habitat trees (larger trees and trees with hollows) wherever possible;
- Maintain existing drainage systems, spoon drains and ensuring tracks and other infrastructure areas do not disrupt or divert historic water flow patterns;
- Minimise soil disturbance during clearing and practice standard vehicle hygiene to ensure introduced (exotic) species do not become established within the 'Fuss Road, SLK 0 - 4.2' project area; and
- Minimize all threatening processes to native vegetation.

## 8 LIST OF PERSONNEL

The following Shire of Esperance Staff were involved in this project.

|                            |  |
|----------------------------|--|
| <b>Name</b>                | Julie Waters   |
| <b>Position</b>            | Environmental Coordinator  |
| <b>Project Involvement</b> | Desktop and Field Survey, Specimen Identification, GIS Mapping<br>Data Interpretation and Report writing   |
| <b>Qualifications</b>      | BEnvSc (Hons)  |
| <b>Experience</b>          | 20 years working in environmental field including Flora<br>Conservation Officer for previous DBCA, and 15 years' experience<br>as a botanist in the region |
| <b>Scientific Licence</b>  | FT61000787   |

|                            |   |
|----------------------------|---|
| <b>Name</b>                | Katherine Walkerden   |
| <b>Position</b>            | Environmental Officer   |
| <b>Project Involvement</b> | Desktop and Field Survey, Specimen Identification, GIS Mapping,<br>Data Interpretation and Report writing |
| <b>Qualifications</b>      | BSc, MEnvSc   |
| <b>Experience</b>          | Two years' experience as a Botanist in the region (as of April 2023)                                      |
| <b>Scientific Licence</b>  | FT61000788  |

|                                      |   |
|--------------------------------------|---|
| <b>Name</b>                          | Rosamund Mary Hoggart   |
| <b>Position</b>                      | Environmental Assistant   |
| <b>Project Involvement</b>           | Specimen Identification   |
| <b>Qualifications and Experience</b> | BSc (Hons)Ag<br>15 years' experience as a botanist in the region and is highly<br>regarded by Esperance Wildflower Society and her peers in<br>Esperance as one of the best botanists in Esperance. |
| <b>Scientific Licence</b>            | N/A   |

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## 10 APPENDICES

### Appendix 1: Incidental species list

| Family           | Genus                   | Species                                    | Weed | WA Cons Status | Herbarium Reference |
|------------------|-------------------------|--|------|----------------|---------------------|
| Apiaceae         | <i>Trachymene</i>       | <i>pilosa</i>                              |      |                |                     |
| Asparagaceae     | <i>Asparagus</i>        | <i>asparagoides</i>                        | x    |                |                     |
| Asparagaceae     | <i>Laxmannia</i>        | <i>minor</i>                               |      |                |                     |
| Asparagaceae     | <i>Laxmannia</i>        | <i>paleacea</i>                            |      |                |                     |
| Asparagaceae     | <i>Thysanotus</i>       | <i>patersonii</i>                          |      |                |                     |
| Asteraceae       | <i>Actinobole</i>       | <i>uliginosum</i>                          |      |                |                     |
| Asteraceae       | <i>Arctotheca</i>       | <i>calendula</i>                           | x    |                |                     |
| Asteraceae       | <i>Carduus</i>          | <i>pycnocephalus</i>                       | x    |                |                     |
| Asteraceae       | <i>Cotula</i>           | <i>coronopifolia</i>                       | x    |                |                     |
| Asteraceae       | <i>Cotula</i>           | <i>sp.</i>                                 |      |                |                     |
| Asteraceae       | <i>Cotula</i>           | <i>turbinata</i>                           | x    |                |                     |
| Asteraceae       | <i>Millotia</i>         | <i>tenuifolia</i> var. <i>tenuifolia</i>   |      |                |                     |
| Asteraceae       | <i>Osteospermum</i>     | <i>ecklonis</i>                            | x    |                |                     |
| Asteraceae       | <i>Pseudognaphalium</i> | <i>luteoalbum</i>                          |      |                |                     |
| Asteraceae       | <i>Sonchus</i>          | <i>oleraceus</i>                           | x    |                |                     |
| Asteraceae       | <i>Ursinia</i>          | <i>anthemoides</i>                         | x    |                |                     |
| Asteraceae       | <i>Vellereophyton</i>   | <i>dealbatum</i>                           | x    |                |                     |
| Brassicaceae     | <i>Rapistrum</i>        | <i>rugosum</i>                             | x    |                |                     |
| Campanulaceae    | <i>Monopsis</i>         | <i>debilis</i> var. <i>Depressa</i>        | x    |                |                     |
| Campanulaceae    | <i>Petrorhagia</i>      | <i>dubia</i>                               | x    |                |                     |
| Campanulaceae    | <i>Wahlenbergia</i>     | <i>capensis</i>                            | x    |                |                     |
| Caryophyllaceae  | <i>Spergularia</i>      | <i>diandra</i>                             | x    |                |                     |
| Casuarinaceae    | <i>Allocasuarina</i>    | <i>huegeliana</i>                          |      |                |                     |
| Casuarinaceae    | <i>Allocasuarina</i>    | <i>humilis</i>                             |      |                |                     |
| Casuarinaceae    | <i>Allocasuarina</i>    | <i>lehmanniana</i> subsp. <i>Ecarinata</i> |      |                |                     |
| Casuarinaceae    | <i>Allocasuarina</i>    | <i>thuyoides</i>                           |      |                |                     |
| Centrolepidaceae | <i>Centrolepis</i>      | <i>aristata</i>                            |      |                |                     |
| Centrolepidaceae | <i>Centrolepis</i>      | <i>polygyna</i>                            |      |                |                     |
| Crassulaceae     | <i>Crassula</i>         | <i>decumbens</i>                           |      |                |                     |
| Crassulaceae     | <i>Crassula</i>         | <i>exserta</i>                             |      |                |                     |
| Crassulaceae     | <i>Crassula</i>         | <i>natans</i>                              | x    |                |                     |
| Cupressaceae     | <i>Callitris</i>        | <i>roei</i>                                |      |                |                     |
| Cyperaceae       |                         | <i>sp.</i>                                 |      |                |                     |
| Cyperaceae       | <i>Caustis</i>          | <i>dioica</i>                              |      |                |                     |
| Cyperaceae       | <i>Gahnia</i>           | <i>trifida</i>                             |      |                |                     |
| Cyperaceae       | <i>Isolepis</i>         | <i>marginata</i>                           |      |                |                     |
| Cyperaceae       | <i>Lepidosperma</i>     | <i>gracile</i>                             |      |                |                     |

|               |                      |   |   |    |                       |
|---------------|----------------------|---|---|----|-----------------------|
| Cyperaceae    | <i>Lepidosperma</i>  | <i>leptostachyum</i>                                    |   |    |                       |
| Cyperaceae    | <i>Mesomelaena</i>   | <i>tetragona</i>  |   |    |                       |
| Cyperaceae    | <i>Netrostylis</i>   | <i>sp. Mt Madden</i>                                    |   |    |                       |
| Cyperaceae    | <i>Schoenus</i>      | <i>breviculmis</i>                                      |   |    |                       |
| Cyperaceae    | <i>Schoenus</i>      | <i>brevisetis</i>                                       |   |    |                       |
| Cyperaceae    | <i>Schoenus</i>      | <i>nanus</i>  |   |    |                       |
| Cyperaceae    | <i>Tricostularia</i> | <i>compressa</i>  |   |    |                       |
| Dilleniaceae  | <i>Hibbertia</i>     | <i>acerosa</i>  |   |    |                       |
| Dilleniaceae  | <i>Hibbertia</i>     | <i>diamesogenos</i>                                     |   |    |                       |
| Dilleniaceae  | <i>Hibbertia</i>     | <i>gracilipes</i>                                       |   |    |                       |
| Droseraceae   | <i>Drosera</i>       | <i>australis</i>  |   |    |                       |
| Droseraceae   | <i>Drosera</i>       | <i>drummondii</i>                                       |   |    |                       |
| Droseraceae   | <i>Drosera</i>       | <i>glandulifera</i>                                     |   |    |                       |
| Droseraceae   | <i>Drosera</i>       | <i>leucoblata</i>                                       |   |    |                       |
| Droseraceae   | <i>Drosera</i>       | <i>neesii</i>   |   |    |                       |
| Ericaceae     | <i>Acrotriche</i>    | <i>cordata</i>  |   |    |                       |
| Ericaceae     | <i>Andersonia</i>    | <i>parvifolia</i>                                       |   |    |                       |
| Ericaceae     | <i>Leucopogon</i>    | <i>sp. Coujinup</i>                                     |   |    |                       |
| Ericaceae     | <i>Lysinema</i>      | <i>pentapetalum</i>                                     |   |    |                       |
| Ericaceae     | <i>Lysinema</i>      | <i>sp.</i>  |   |    |                       |
| Ericaceae     | <i>Styphelia</i>     | <i>epacridis</i>  |   |    |                       |
| Euphorbiaceae | <i>Stachystemon</i>  | <i>virgatus</i>   |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>aemula</i>   |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>baileyana</i>  | x |    | KSW15222<br>Acc 9783  |
| Fabaceae      | <i>Acacia</i>        | <i>biflora</i>  |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>cyclops</i>  |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>glaucoptera</i>                                      |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>gonophylla</i>                                       |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>ingrata</i>  |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>mutabilis</i> ssp.<br><i>angustifolia</i>            |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>patagiata</i>  |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>pulchella</i>  |   |    |                       |
| Fabaceae      | <i>Acacia</i>        | <i>saligna</i>  |   |    |                       |
| Fabaceae      | <i>Daviesia</i>      | <i>incrassata</i> subsp. <i>reversi</i><br><i>folia</i> |   |    |                       |
| Fabaceae      | <i>Daviesia</i>      | <i>lancifolia</i>                                       |   |    |                       |
| Fabaceae      | <i>Daviesia</i>      | <i>pauciflora</i>                                       |   | P3 | KSW13722,<br>ACC 9783 |
| Fabaceae      | <i>Daviesia</i>      | <i>teretifolia</i>                                      |   |    |                       |
| Fabaceae      | <i>Eutaxia</i>       | <i>cuneata</i>  |   |    |                       |
| Fabaceae      | <i>Eutaxia</i>       | <i>inuncta</i>  |   |    |                       |
| Fabaceae      | <i>Gastrolobium</i>  | <i>spinosum</i>   |   |    |                       |
| Fabaceae      | <i>Gompholobium</i>  | <i>knightianum</i>                                      |   |    |                       |

|                   |                      |  |   |    |                      |
|-------------------|----------------------|--|---|----|----------------------|
| Fabaceae          | <i>Gompholobium</i>  | <i>marginatum</i>                            |   |    |                      |
| Fabaceae          | <i>Gompholobium</i>  | <i>tomentosum</i>                            |   |    |                      |
| Fabaceae          | <i>Hovea</i>         | <i>pungens</i>                               |   |    |                      |
| Fabaceae          | <i>Hovea</i>         | <i>trisperma</i>                             |   |    |                      |
| Fabaceae          | <i>Isotropis</i>     | <i>juncea</i>                                |   |    |                      |
| Fabaceae          | <i>Jacksonia</i>     | <i>capitata</i>                              |   |    |                      |
| Fabaceae          | <i>Jacksonia</i>     | <i>condensata</i>                            |   |    |                      |
| Fabaceae          | <i>Jacksonia</i>     | <i>viscosa</i>                               |   |    |                      |
| Fabaceae          | <i>Kennedia</i>      | <i>sp. South Coast</i>                       |   |    |                      |
| Fabaceae          | <i>Ornithopus</i>    | <i>compressus</i>                            | x |    |                      |
| Fabaceae          | <i>Ornithopus</i>    | <i>sativus</i>                               | x |    |                      |
| Fabaceae          | <i>Pultenaea</i>     | <i>indira</i> subsp. <i>Indira</i>           |   |    |                      |
| Geraniaceae       | <i>Pelargonium</i>   | <i>crinitum</i>                              |   |    |                      |
| Goodeniaceae      | <i>Dampiera</i>      | <i>angulata</i>                              |   |    |                      |
| Goodeniaceae      | <i>Dampiera</i>      | <i>fasciculata</i>                           |   |    |                      |
| Goodeniaceae      | <i>Dampiera</i>      | <i>lavandulacea</i>                          |   |    |                      |
| Goodeniaceae      | <i>Dampiera</i>      | <i>sacculata</i>                             |   |    |                      |
| Goodeniaceae      | <i>Dampiera</i>      | <i>sericantha</i>                            |   | P3 | KSW15122<br>Acc 7983 |
| Goodeniaceae      | <i>Goodenia</i>      | <i>incana</i>                                |   |    |                      |
| Goodeniaceae      | <i>Goodenia</i>      | <i>trinervis</i>                             |   |    |                      |
| Haemodoraceae     | <i>Anigozanthos</i>  | <i>rufus</i>                                 |   |    |                      |
| Haemodoraceae     | <i>Conostylis</i>    | <i>seorsifolia</i> subsp. <i>Seorsifolia</i> |   |    |                      |
| Haemodoraceae     | <i>Conostylis</i>    | <i>vaginata</i>                              |   |    |                      |
| Haemodoraceae     | <i>Haemodorum</i>    | <i>discolor</i>                              |   |    |                      |
| Hemerocallidaceae | <i>Agrostocrinum</i> | <i>scabrum</i>                               |   |    |                      |
| Hemerocallidaceae | <i>Chamaescilla</i>  | <i>corymbosa</i>                             |   |    |                      |
| Hemerocallidaceae | <i>Dianella</i>      | <i>brevicaulis</i>                           |   |    |                      |
| Hemerocallidaceae | <i>Johnsonia</i>     | <i>acaulis</i>                               |   |    |                      |
| Iridaceae         | <i>Moraea</i>        | <i>flaccida</i>                              | x |    |                      |
| Iridaceae         | <i>Patersonia</i>    | <i>lanata</i>                                |   |    |                      |
| Iridaceae         | <i>Patersonia</i>    | <i>occidentalis</i>                          |   |    |                      |
| Iridaceae         | <i>Romulea</i>       | <i>rosea</i>                                 |   |    |                      |
| Juncaceae         | <i>Juncus</i>        | <i>articulatus</i>                           | x |    |                      |
| Juncaceae         | <i>Juncus</i>        | <i>pallidus</i>                              |   |    |                      |
| Lauraceae         | <i>Cassytha</i>      | <i>racemosa</i>                              |   |    |                      |
| Loganiaceae       | <i>Logania</i>       | <i>micrantha</i>                             |   |    |                      |
| Loganiaceae       | <i>Phyllangium</i>   | <i>divergens</i>                             |   |    |                      |
| Loranthaceae      | <i>Nuytsia</i>       | <i>floribunda</i>                            |   |    |                      |
| Lythraceae        | <i>Lythrum</i>       | <i>hyssopifolia</i>                          |   |    |                      |
| Malvaceae         | <i>Lasiopetalum</i>  | <i>rosmarinifolium</i>                       |   |    |                      |
| Malvaceae         | <i>Thomasia</i>      | <i>angustifolia</i>                          |   |    |                      |
| Myrtaceae         | <i>Astartea</i>      | <i>astarteoides</i>                          |   |    |                      |

|               |                      |                      |   |  |
|---------------|----------------------|----------------------|---|--|
| Myrtaceae     | <i>Austrobaeckea</i> | <i>latens</i>        |   |  |
| Myrtaceae     | <i>Beaufortia</i>    | <i>empetrifolia</i>  |   |  |
| Myrtaceae     | <i>Calothamnus</i>   | <i>gracilis</i>      |   |  |
| Myrtaceae     | <i>Calothamnus</i>   | <i>quadrifidus</i>   |   |  |
| Myrtaceae     | <i>Calytrix</i>      | <i>tetragona</i>     |   |  |
| Myrtaceae     | <i>Chamelaucium</i>  | <i>megalopetalum</i> |   |  |
| Myrtaceae     | <i>Conothamnus</i>   | <i>aureus</i>        |   |  |
| Myrtaceae     | <i>Darwinia</i>      | <i>vestita</i>       |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>calycogona</i>    |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>conglobata</i>    |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>eremophila</i>    |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>litorea</i>       |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>micranthera</i>   |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>occidentalis</i>  |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>phenax</i>        |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>pleurocarpa</i>   |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>sp.</i>           |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>tetraptera</i>    |   |  |
| Myrtaceae     | <i>Eucalyptus</i>    | <i>uncinata</i>      |   |  |
| Myrtaceae     | <i>Leptospermum</i>  | <i>erubescens</i>    |   |  |
| Myrtaceae     | <i>Leptospermum</i>  | <i>incanum</i>       |   |  |
| Myrtaceae     | <i>Leptospermum</i>  | <i>laevigatum</i>    | x |  |
| Myrtaceae     | <i>Leptospermum</i>  | <i>spinescens</i>    |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>acuminata</i>     |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>brevifolia</i>    |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>cuticularis</i>   |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>glaberrima</i>    |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>hamata</i>        |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>pentagona</i>     |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>pulchella</i>     |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>rigidifolia</i>   |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>striata</i>       |   |  |
| Myrtaceae     | <i>Melaleuca</i>     | <i>thymoides</i>     |   |  |
| Myrtaceae     | <i>Phymatocarpus</i> | <i>maxwellii</i>     |   |  |
| Myrtaceae     | <i>Rinzia</i>        | <i>communis</i>      |   |  |
| Myrtaceae     | <i>Taxandria</i>     | <i>spathulata</i>    |   |  |
| Myrtaceae     | <i>Verticordia</i>   | <i>chrysanthella</i> |   |  |
| Onagraceae    | <i>Oenothera</i>     | <i>stricta</i>       | x |  |
| Orchidaceae   | <i>Caladenia</i>     | <i>flava</i>         |   |  |
| Orchidaceae   | <i>Elythranthera</i> | <i>brunonis</i>      |   |  |
| Orchidaceae   | <i>Microtus</i>      | <i>media</i>         |   |  |
| Orchidaceae   | <i>Thelymitra</i>    | <i>antennifera</i>   |   |  |
| Orobanchaceae | <i>Orobanche</i>     | <i>minor</i>         | x |  |
| Pinaceae      | <i>Pinus</i>         | <i>pinaster</i>      | x |  |

|                |                    |   |   |  |  |
|----------------|--------------------|---|---|--|--|
| Pittosporaceae | <i>Billardiera</i> | <i>fusiformis</i>                             |   |  |  |
| Pittosporaceae | <i>Marianthus</i>  | <i>bicolor</i>                                |   |  |  |
| Poaceae        | <i>Austrostipa</i> | <i>hemipogon</i>                              |   |  |  |
| Poaceae        | <i>Avellinia</i>   | <i>festucoides</i>                            |   |  |  |
| Poaceae        | <i>Briza</i>       | <i>maxima</i>                                 |   |  |  |
| Poaceae        | <i>Bromus</i>      | <i>sp.</i>                                    |   |  |  |
| Poaceae        | <i>Ehrharta</i>    | <i>calycina</i>                               | x |  |  |
| Poaceae        | <i>Eragrostis</i>  | <i>curvula</i>                                |   |  |  |
| Poaceae        | <i>Neurachne</i>   | <i>alopecuroidea</i>                          |   |  |  |
| Poaceae        | <i>Vulpia</i>      | <i>myuros</i>                                 | x |  |  |
| Polygalaceae   | <i>Comesperma</i>  | <i>ciliatum</i>                               |   |  |  |
| Polygalaceae   | <i>Comesperma</i>  | <i>confertum</i>                              |   |  |  |
| Polygalaceae   | <i>Comesperma</i>  | <i>drummondii</i>                             |   |  |  |
| Polygonaceae   | <i>Rumex</i>       | <i>acetosella</i>                             | x |  |  |
| Polygonaceae   | <i>Rumex</i>       | <i>crispus</i>                                | x |  |  |
| Primulaceae    | <i>Lysimachia</i>  | <i>arvensis</i>                               | x |  |  |
| Proteaceae     | <i>Adenanthos</i>  | <i>cuneatus</i>                               |   |  |  |
| Proteaceae     | <i>Banksia</i>     | <i>armata</i>                                 |   |  |  |
| Proteaceae     | <i>Banksia</i>     | <i>coccinea</i>                               |   |  |  |
| Proteaceae     | <i>Banksia</i>     | <i>obovata</i>                                |   |  |  |
| Proteaceae     | <i>Banksia</i>     | <i>speciosa</i>                               |   |  |  |
| Proteaceae     | <i>Chordifex</i>   | <i>sphacelatus</i>                            |   |  |  |
| Proteaceae     | <i>Conospermum</i> | <i>leianthum</i>                              |   |  |  |
| Proteaceae     | <i>Conospermum</i> | <i>teretifolium</i>                           |   |  |  |
| Proteaceae     | <i>Grevillea</i>   | <i>concinna</i> subsp.<br><i>lemanniana</i>   |   |  |  |
| Proteaceae     | <i>Grevillea</i>   | <i>nudiflora</i>                              |   |  |  |
| Proteaceae     | <i>Grevillea</i>   | <i>oligantha</i>                              |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>corymbosa</i>                              |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>denticulata</i>                            |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>ferruginea</i>                             |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>laurina</i>                                |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>lissocarpha</i>                            |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>nitida</i>                                 |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>prostrata</i>                              |   |  |  |
| Proteaceae     | <i>Hakea</i>       | <i>trifurcata</i>                             |   |  |  |
| Proteaceae     | <i>Lambertia</i>   | <i>inermis</i> var. <i>drummondii</i>         |   |  |  |
| Proteaceae     | <i>Lambertia</i>   | <i>inermis</i> var. <i>inermis</i>            |   |  |  |
| Proteaceae     | <i>Petrophile</i>  | <i>fastigiata</i>                             |   |  |  |
| Proteaceae     | <i>Petrophile</i>  | <i>seminuda</i>                               |   |  |  |
| Proteaceae     | <i>Petrophile</i>  | <i>squamata</i> subsp.<br><i>Ravensthorpe</i> |   |  |  |
| Proteaceae     | <i>Synaphea</i>    | <i>divaricata</i>                             |   |  |  |
| Proteaceae     | <i>Synaphea</i>    | <i>oligantha</i>                              |   |  |  |

|                  |                     |                       |   |  |
|------------------|---------------------|-----------------------|---|--|
| Proteaceae       | <i>Synaphea</i>     | <i>petiolaris</i>     |   |  |
| Proteaceae       | <i>Synaphea</i>     | <i>petiolaris</i>     |   |  |
| Restionaceae     | <i>Chordifex</i>    | <i>crispatus</i>      |   |  |
| Restionaceae     | <i>Hypolaena</i>    | <i>exsulca</i>        |   |  |
| Restionaceae     | <i>Hypolaena</i>    | <i>humilis</i>        |   |  |
| Restionaceae     | <i>Lepidobolus</i>  | <i>chaetocephalus</i> |   |  |
| Restionaceae     | <i>Lepyrodia</i>    | <i>macra</i>          |   |  |
| Rhamnaceae       | <i>Cryptandra</i>   | <i>myriantha</i>      |   |  |
| Rhamnaceae       | <i>Cryptandra</i>   | <i>pungens</i>        |   |  |
| Rhamnaceae       | <i>Spyridium</i>    | <i>microcephalum</i>  |   |  |
| Rhamnaceae       | <i>Stenanthemum</i> | <i>notiale</i>        |   |  |
| Rubiaceae        | <i>Opercularia</i>  | <i>vaginata</i>       |   |  |
| Rutaceae         | <i>Boronia</i>      | <i>spathulata</i>     |   |  |
| Rutaceae         | <i>Cyanothmus</i>   | <i>ramosus</i>        |   |  |
| Sapindaceae      | <i>Dodonaea</i>     | <i>caespitosa</i>     |   |  |
| Scrophulariaceae | <i>Zaluzianskya</i> | <i>divaricata</i>     |   |  |
| Solanaceae       | <i>Solanum</i>      | <i>nigricans</i>      | x |  |
| Stylidiaceae     | <i>Stylidium</i>    | <i>rupestre</i>       |   |  |
| Thymelaeaceae    | <i>Pimelea</i>      | <i>brachyphylla</i>   |   |  |
| Xanthorrhoeaceae | <i>Xanthorrhoea</i> | <i>platyphylla</i>    |   |  |

## Appendix 2: Threatened and Priority Report Forms

### *Dampiera sericantha* – Priority 3



Department of Biodiversity,  
Conservation and Attractions

## Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 [www.dbca.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants](http://www.dbca.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants)

|   |   |
|---|---|
| TAXON: <u>Dampiera sericantha</u>                     | TPFL Pop. No: <input type="text"/>      |
| OBSERVATION DATE: <u>02/03/03</u>                     | CONSERVATION STATUS: <u>P3</u>          |
| OBSERVER/S: <u>Katherine Walkerden</u>                | PHONE: <u>0416558774</u>                |
| ROLE: <u>Environmental Officer</u>                    | ORGANISATION: <u>Shire of Esperance</u> |
| EMAIL: <u>Katherine.Walkerden@esperance.wa.gov.au</u> |   |

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):   
Fuss Road Reserve between SLK 2.91 and 2.25.

Reserve 35808 along track heading into historic sandpit & Munglinup Nature Reserve.

Reserve No: 35808

DBC DISTRICT: Esperance LGA: Esperance Land manager present:

|  |   |   |
|--|---|---|
| DATUM:                                 | COORDINATES: (If UTM coords provided, Zone is also required)  | METHOD USED:  |
| GDA94 / MGA94 <input type="checkbox"/> | DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input type="checkbox"/> | GPS <input type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/> |
| AGD84 / AMG84 <input type="checkbox"/> | Lat / Northing: <u>305840.7</u>   | No. satellites: <input type="text"/> Map used: <input type="text"/>                                 |
| WGS84 <input type="checkbox"/>         | Long / Easting: <u>6264984.3</u>  | Boundary polygon captured: <input type="checkbox"/> Map scale: <input type="text"/>                 |
| Unknown <input type="checkbox"/>       | ZONE: <u>51</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 checked="" type="checkbox"/> |
|              | Conservation park <input type="checkbox"/> | Water reserve <input type="checkbox"/>  | UCL <input type="checkbox"/>              | SLK/Pole <input type="text"/> to <input type="text"/> | Specify other: <u>Shire reserve</u>                     |

|                       |  |  |                                      |   |
|-----------------------|--|--|--------------------------------------|---|
| AREA ASSESSMENT:      | Edge survey <input checked="" type="checkbox"/>      | Partial survey <input checked="" type="checkbox"/>               | Full survey <input type="checkbox"/> | Area observed (m <sup>2</sup> ): <input type="text"/> |
| EFFORT:               | Time spent surveying (minutes): <input type="text"/> | No. of minutes spent / 100 m <sup>2</sup> : <input type="text"/> |                                      |   |
| POP'N COUNT ACCURACY: | Actual <input type="checkbox"/>                      | Extrapolation <input type="checkbox"/>                           | Estimate <input type="checkbox"/>    | Count method: <input type="text"/>                    |

(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>161</u>                                 | <input type="text"/>                | <input type="text"/>                    | <input type="text"/>   |
| Dead                        | <input type="text"/>                       | <input type="text"/>                | <input type="text"/>                    | <input type="text"/>   |
| QUADRATS PRESENT:           | No. <input type="text"/>                   | Size <input type="text"/>           | Data attached <input type="checkbox"/>  | Total area of quadrats (m <sup>2</sup> ): <input type="text"/> |
| Summary Quad. Totals: Alive | <input type="text"/>                       | <input type="text"/>                | <input type="text"/>                    | <input type="text"/>   |
| REPRODUCTIVE STATE:         | Clonal <input type="checkbox"/>            | Vegetative <input type="checkbox"/> | Flowerbud <input type="checkbox"/>      | Flower <input checked="" type="checkbox"/>                     |
|                             | Immature fruit <input type="checkbox"/>    | Fruit <input type="checkbox"/>      | Dehisced fruit <input type="checkbox"/> | Percentage in flower: <u>50%</u>                               |

CONDITION OF PLANTS: Healthy  Moderate  Poor  Senescent

COMMENT:

| THREATS - type, agent and supporting information:<br>Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant.<br>Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme<br>Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+) | Current impact (N-E) | Potential Impact (L-E) | Potential Threat Onset (S-L) |
|--|----------------------|------------------------|------------------------------|
| • Road widening  | <u>N</u>             | <u>L</u>               | <u>M</u>                     |
| • <input type="text"/>   | <input type="text"/> | <input type="text"/>   | <input type="text"/>         |
| • <input type="text"/>   | <input type="text"/> | <input type="text"/>   | <input type="text"/>         |



## Threatened and Priority Flora Report Form

Version 1.4 March 2021

### HABITAT INFORMATION:

|  |   |  |  |  |   |
|--|---|--|--|--|---|
| <b>LANDFORM:</b>                           | <b>ROCK TYPE:</b>   | <b>LOOSE ROCK:</b>                             | <b>SOIL TYPE:</b>                        | <b>SOIL COLOUR:</b>                        | <b>DRAINAGE:</b>                                  |
| Crest <input type="checkbox"/>             | Granite <input type="checkbox"/>  | (on soil surface: eg<br>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<br>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<br>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 checked="" 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: _____<br>(Refer to field manual for additional values) |  |  |  |   |
| <b>CONDITION OF SOIL:</b>                  | Dry <input checked="" type="checkbox"/>   | Moist <input type="checkbox"/>                 | Waterlogged <input type="checkbox"/>     | Inundated <input type="checkbox"/>         |   |

**VEGETATION CLASSIFICATION\*:** 1. Scattered *Banksia speciosa* and *Nuytsia floribunda* over mixed heath. Associated species includes: *Melaleuca thymoides*, *Melaleuca striata*, *Adenanthos cuneatus*, *Caustis dioica*, *Lambertia inermis*

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

2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_

### 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

**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.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**FLORA AUTHORISATION / LICENCE No:** \_\_\_\_\_ Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**LODGE MENT:** WA Herb Lodgement No: KSW15122 ACC9783, specimen retained

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: \_\_\_\_\_ Date: 02/03/2023

Daviesia pauciflora – Priority 3



Department of Biodiversity,  
Conservation and Attractions

## Threatened and Priority Flora Report Form

Version 1.4 March 2021

**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 [www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants](http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants)

|  |  |   |
|--|--|---|
| <b>TAXON:</b> <u>Daviesia pauciflora</u>                         |  | <b>TPFL Pop. No.:</b> <input type="text"/>                |
| <b>OBSERVATION DATE:</b> <u>27/09/2022</u>                       | <b>CONSERVATION STATUS:</b> <u>P3</u>          | <b>New population</b> <input checked="" type="checkbox"/> |
| <b>OBSERVER/S:</b> <u>Katherine Walkerden, Julie waters</u>      |  | <b>PHONE</b> <u>0416558774</u>                            |
| <b>ROLE:</b> <u>Environment Officer, Environment Coordinator</u> | <b>ORGANISATION:</b> <u>Shire of Esperance</u> |   |
| <b>EMAIL:</b> <u>Katherine.Walkerden@esperance.wa.gov.au</u>     |  |   |

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):   
Fuss road Reserve at SLK 2.99, 2.34, 2.26

|   |   |  |  |
|---|---|--|--|
| <b>DBC DISTRICT:</b> <u>Esperance</u>   |   | <b>LGA:</b> <u>Esperance</u>                           | <b>Reserve No.:</b> <input type="text"/>                                       |
| <b>DATUM:</b> <input checked="" type="checkbox"/> GDA94 / MGA94 <input type="checkbox"/> AGD84 / AMG84 <input type="checkbox"/> WGS84 <input type="checkbox"/> Unknown  |   |  |  |
| <b>COORDINATES:</b> (If UTM coords provided, Zone is also required)<br>DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input checked="" type="checkbox"/> Lat / Northing: <u>305976</u><br>Long / Easting: <u>6265052</u><br>ZONE: <u>51</u>              |   |  |  |
| <b>METHOD USED:</b> GPS <input type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/><br>No. satellites: <input type="text"/> Map used: <input type="text"/><br>Boundary polygon captured: <input type="checkbox"/> Map scale: <input type="text"/> |   |  |  |
| <b>LAND TENURE:</b>   |   |  |  |
| <input type="checkbox"/> Nature reserve   | <input type="checkbox"/> Timber reserve | <input type="checkbox"/> Private property              | <input type="checkbox"/> Rail reserve  |
| <input type="checkbox"/> National park  | <input type="checkbox"/> State forest   | <input type="checkbox"/> Pastoral lease                | <input type="checkbox"/> MRWA road reserve                                     |
| <input type="checkbox"/> Conservation park  | <input type="checkbox"/> Water reserve  | <input type="checkbox"/> UCL                           | <input type="checkbox"/> SLK/Pole <input type="text"/> to <input type="text"/> |
|   |   | <input checked="" type="checkbox"/> Shire road reserve | <input type="checkbox"/> Other Crown reserve                                   |
| Specify other: <input type="text"/>   |   |  |  |

|  |                                     |  |
|--|-------------------------------------|--|
| <b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input type="checkbox"/> Full survey <input checked="" type="checkbox"/> |                                     | <b>Area observed (m²):</b> <input type="text"/>            |
| <b>EFFORT:</b> Time spent surveying (minutes): <input type="text"/>  |                                     | <b>No. of minutes spent / 100 m²:</b> <input type="text"/> |
| <b>POP'N COUNT ACCURACY:</b> Actual <input type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>                |                                     | <b>Count method:</b> <input type="text"/>                  |
| <small>(Refer to field manual for list)</small>  |                                     |  |
| <b>WHAT COUNTED:</b> Plants <input type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>                           |                                     |  |
| <b>TOTAL POP'N STRUCTURE:</b>  | <b>Mature:</b>                      | <b>Juveniles:</b>  |
| Alive  | <u>4</u>                            | <input type="text"/>                                       |
| Dead   | <input type="text"/>                | <input type="text"/>                                       |
|  | <b>Seedlings:</b>                   | <b>Totals:</b>   |
|  | <input type="text"/>                | <input type="text"/>                                       |
|  |                                     | <b>Area of pop (m²):</b> <input type="text"/>              |
| <small>Note: Pls record count as numbers (not percentages) for database.</small>   |                                     |  |
| <b>QUADRATS PRESENT:</b>   |                                     | <b>Total area of quadrats (m²):</b> <input type="text"/>   |
| No. <input type="text"/>   | Size <input type="text"/>           | Data attached <input type="checkbox"/>                     |
| <b>Summary Quad. Totals: Alive</b>   |                                     |  |
| <input type="text"/>   |                                     |  |
| <b>REPRODUCTIVE STATE:</b>   |                                     | <b>Percentage in flower:</b> <u>100%</u>                   |
| <input type="checkbox"/> Clonal  | <input type="checkbox"/> Vegetative | <input type="checkbox"/> Flowerbud                         |
| <input type="checkbox"/> Immature fruit  | <input type="checkbox"/> Fruit      | <input type="checkbox"/> Dehisced fruit                    |

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:**

| THREATS - type, agent and supporting information:  | Current impact (N-E) | Potential Impact (L-E) | Potential Threat Onset (S-L) |
|--|----------------------|------------------------|------------------------------|
| <small>Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats &amp; agents. Specify agent where relevant.<br/>Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme<br/>Estimate time to potential impact: S=Short (&lt;12mths), M=Medium (&lt;5yrs), L=Long (5yrs+)</small> |                      |                        |                              |
| • <input type="text"/>   | <input type="text"/> | <input type="text"/>   | <input type="text"/>         |
| • <input type="text"/>   | <input type="text"/> | <input type="text"/>   | <input type="text"/>         |
| • <input type="text"/>   | <input type="text"/> | <input type="text"/>   | <input type="text"/>         |



# Threatened and Priority Flora Report Form

### HABITAT INFORMATION:

|  |  |   |  |  |  |
|--|--|---|--|--|--|
| <b>LANDFORM:</b>                           | <b>ROCK TYPE:</b>  | <b>LOOSE ROCK:</b>                          | <b>SOIL TYPE:</b>                        | <b>SOIL COLOUR:</b>                        | <b>DRAINAGE:</b>                                 |
| 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 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 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: _____<br><small>(Refer to field manual for additional values)</small> |   |  |  |  |
| <b>CONDITION OF SOIL:</b>                  | Dry <input type="checkbox"/>   | Moist <input type="checkbox"/>              | Waterlogged <input type="checkbox"/>     | Inundated <input type="checkbox"/>         |  |

**VEGETATION CLASSIFICATION\*:** 1. Scattered Banksia speciosa and Nuytsia floribunda over mixed heath. Associated species includes: Melaleuca thymoides, Melaleuca striata, Adenanthos cuneatus, Caustis dioica, Lambertia inermis

- Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (M.tetragona)
2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**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

**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.)  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**FLORA AUTHORISATION / LICENCE No:** FT61000787\_FT61000788-1a Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**LODGEMENT:** WA Herb \_\_\_\_\_  
Lodgement No: KSW13722  
ACC9783

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: \_\_\_\_\_ Date: 02/03/2023

### Appendix 3: Description of Threatened and Priority Flora Species with the Potential to occur within the Fuss Road, SLK 0 - 4.2 Survey Area

Threatened or priority flora identified by the desktop study to be present within a 20 km radius of 'Site E – Fuss Road, SLK 0 - 4.2' project area, using Threatened and Priority Flora Reporting (TPFL; DBCA 2022c), WA Herbarium (DBCA 2022d) and Esperance District Threatened Flora (DBCA 2022a).

Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2018, Environmental Protection and Biodiversity Conservation (EPBC) Act 1999, critically endangered (CN) and endangered (EN).

| Species  | Cons Status | Associated Habitat  | Likely to Occur | Distance from site (km) |
|--|-------------|---|-----------------|-------------------------|
| <i>Lepidosperma</i> sp.<br><i>Mt Chester</i> (S. Kern et al. LCH 16596)      | P1          | Grey-brown clay loam with 50-90 % sandstone surface. Low open mallee woodland of <i>Eucalyptus flocktoniae</i> subsp. <i>flocktoniae</i> , <i>Eucalyptus leptocalyx</i> subsp. <i>leptocalyx</i> and <i>Eucalyptus phaenophylla</i> subsp. <i>interjacens</i> over tall sparse shrubland of <i>Banksia media</i> over mid shrubland of <i>Melaleuca rigidifolia</i> over low shrubland of <i>Daviesia articulata</i> and <i>Hibbertia pungens</i> . | No              | 7.47                    |
| <i>Leucopogon</i> sp.<br><i>Cascades</i> (M. Hislop 3693)                    | P1          | Lower slopes of valleys. Dry, brown, sandy loam. Mallee woodland with associated vegetation: <i>Eucalyptus pleurocarpa</i> , <i>Taxandria spathulata</i> , <i>Beaufortia schaueri</i> .   | Yes             | 8.08                    |
| <i>Synaphea</i> sp.<br><i>Jilakin Flat Rocks Rd</i> (R. Butcher et al RB200) | P1          | Red-brown clayey sand, sandy loam, gravel, laterite. Slopes, road verges, regrowth areas  | No              | 7.90                    |
| <i>Amanita inculata</i>  | P2          | Damp, clayey soil.  | No              | 18.32                   |
| <i>Astartea reticulata</i>   | P3          | Restricted to damp areas/seasonal wetlands – including road fitters   | Yes             | 10.16                   |
| <i>Boronia oxyantha</i><br><i>var brevicalyx</i>                             | P3          | Slight slope. Moist with leaf litter. Grey-brown sandy clay. Shrub Mallee, Scrub, Low Heath D. <i>Eucalyptus</i> sp., Cupressaceae, <i>Baekkea</i> sp., <i>Melaleuca</i> sp.  | Yes             | 12.06                   |
| <i>Commersonia rotundifolia</i>  | P3          | <i>Eucalyptus platypus</i> woodland over <i>Acacia</i> shrubland. Clay Loam Soil.   | No              | 6.45                    |
| <i>Dampiera sericantha</i>   | P3          | Recorded across a variety of soil types on plans, including sand or gravel.   | Yes             | 0.55                    |
| <i>Dampiera</i> sp.<br><i>Ravensthorpe</i> (G.F. Craig 8277)                 | P3          | Steep sandstone breakaway, brown sand. Burned areas. Low open woodland of <i>Eucalyptus densa</i> subsp. <i>densa</i> over tall sparse shrubland of <i>Acacia harveyi</i> and <i>Hakea laurina</i> over mid closed shrubland of <i>Gastrolobium parviflorum</i> and <i>Melaleuca thapsina</i> over low closed shrubland of <i>Dampiera</i> sp. <i>Ravensthorpe</i>  | No              | 5.47                    |
| <i>Daviesia pauciflora</i>   | P3          | Associated with Proteaceae-dominated Kwongan sandplain.   | Yes             | 2.79                    |
| <i>Eucalyptus famelica</i>   | P3          | Associated with coastal dunes on low ground, saline waterlogged soils. Associated vegetation is open Mallee community.  | No              | 17.94                   |
| <i>Hopkinsia adscendens</i>  | P3          | Sand. Dry or seasonally damp habitats along streams.  | Yes             | 16.44                   |

|   |    |  |     |       |
|---|----|--|-----|-------|
| <i>Persoonia brevirhachis</i>                     | P3 | White or yellow sand, gravelly sandy soils. Loose thickets. Munghlinup record geographically inaccurate.   | No  | 11.07 |
| <i>Thomasia pygmaea</i>                           | P3 | Brown clayey sand over laterite. Eucalyptus woodland with myrtaceous shrubs.   | No  | 14.81 |
| <i>Allocasuarina hystricosa</i>                   | P4 | Occuring on plains, lower slopes and hilltops in orange, red or brown loam with limestone or granite outcropping. Recorded from mallee shrubland or heathland, shrubland with <i>Acacia ophiolithica</i> and <i>Hakea verrucosa</i> , and heathland with <i>Allocasuarina campestris</i> . | No  | 11.39 |
| <i>Caladenia arrecta</i>                          | P4 | Grows on loam, gravel, and laterite. Associated with moist conditions.   | No  | 7.42  |
| <i>Corybas limpidus</i>                           | P4 | Sand. Coastal dunes.   | No  | 17.23 |
| <i>Eucalyptus missilis</i> x                      | P4 | Sand over limestone or granite. Coastal sites.   | Yes | 13.20 |
| <i>Eucalyptus preissiana</i> subsp. <i>lobata</i> | P4 | Coastal limestone rises and sand dunes   | No  | 11.77 |
| <i>Grevillea fastigiata</i>                       | P4 | Red clay, granite. Munghlinup record geographically inaccurate.  | No  | 5.76  |
| <i>Lepidium pseudotasmanicum</i>                  | P4 | Loam, sand. Edge of creek.   | Yes | 17.38 |
| <i>Pultenaea calycina</i> subsp. <i>proxena</i>   | P4 | Sand, clay, sandy clay or loam, with gravel, over magnesite. Moderate slopes, adjacent to creek beds.  | Yes | 7.78  |
| <i>Stachystemon vinosus</i>                       | P4 | Fine loamy sand, stony soils. Sandplains, rock crevices on breakaways.   | Yes | 5.26  |
| <i>Styphelia blepharolepis</i>                    | P4 | Low lying seasonal swamp. Grey sand.   | Yes | 15.69 |
| <i>Conostylis lepidospermoides</i>                | T  | Deep sand plains with diverse shrubland, often with Kwongkan.  | Yes | 1.83  |
| <i>Rhizanthella johnstonii</i>                    | T  | Sandy clay soil or deep sandy soil. Growing under <i>Melaleuca uncinata</i> in dense shrubland.  | No  | 4.95  |

## Appendix 4: Description of Threatened and Priority Fauna Species with the Potential to occur within the Fuss Road, SLK 0 - 4.2 Survey Area

| Scientific Name               | Common Name             | WA Cons Status | EPBC Status | Distance (km) | EPBC protected matters tool | Habitat   | Likely to occur |
|-------------------------------|-------------------------|----------------|-------------|---------------|-----------------------------|---|-----------------|
| <i>Actitis hypoleucos</i>     | Common Sandpiper        | MI             | MI          | 12.79         |                             | Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats  | No              |
| <i>Apus pacificus</i>         | Fork-tailed swift       | MI             | MI          | 13.38         |                             | Almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher  |                 |
| <i>Ardenna tenuirostris</i>   | Short-tailed shearwater | MI             | MI          | 17.78         |                             | Headlands and islands covered with tussocks and succulent vegetation.   | No              |
| <i>Balaenoptera borealis</i>  | Sei Whale               | EN             | VU          |               | X                           | Marine  | No              |
| <i>Balaenoptera musculus</i>  | Blue Whale              | EN             | EN          |               | X                           | Marine  | No              |
| <i>Balaenoptera physalus</i>  | Fin Whale               | EN             | VU          |               | X                           | Marine  | No              |
| <i>Botaurus poiciloptilus</i> | Australasian Bittern    | EN             | EN          |               | X                           | The Australasian bittern inhabits shallow (less than 30cm deep), permanent freshwater and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum). They also inhabit bore drains with tussocky vegetation and occasionally saltmarsh. They use temporary pools when population densities are high and deep swamps when breeding | Potentially     |

|                            |                        |    |    |       |   |   |             |
|----------------------------|------------------------|----|----|-------|---|---|-------------|
| <i>Calidris acuminata</i>  | Sharp-tailed sandpiper | MI | MI | 1.56  |   | Muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, salt pans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgeland and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs | Potentially |
| <i>Calidris canutus</i>    | Red Knot, Knot         | EN | EN |       | X | Intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.  | No          |
| <i>Calidris ferruginea</i> | curlew sandpiper       | CR | MI | 15.01 | X | Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters.   | No          |

|   |                    |    |    |       |   |   |             |
|---|--------------------|----|----|-------|---|---|-------------|
| <i>Calidris melanotos</i>                           | pectoral sandpiper | MI | MI | 16.64 |   | Shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.   | No          |
| <i>Calidris ruficollis</i>                          | Red-necked stint   | MI | MI | 13.39 |   | Coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation. | Potentially |
| <i>Calidris tenuirostris</i>                        | Great Knot         | CR | VU |       | X | sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps   | No          |
| <i>Calyptorhynchus baudinii</i>                     | Baudin's cockatoo  | EN | EN | 4.04  |   | Southern eucalypt forests of mainly Jarrah, Marri and Karri. Feeds on seeds of eucalypts, Banksia, Hakea and fruit<br>Questionable record.  | No          |
| <i>Calyptorhynchus latirostris</i>                  | Carnaby's cockatoo | EN | EN | 1.55  | X | Uncleared and remnant areas of woodland, shrubland and kwongan heath dominated by proteaceous species. They breed in the semiarid and subhumid interior eucalypt woodlands, principally dominated by Salmon Gum Eucalyptus salmonophloia or Wandoo Eucalyptus wandoo"   | Potentially |
| <i>Carcharias taurus</i><br>(west coast population) | Grey Nurse Shark   | VU | EN |       | X | Marine  | No          |

|   |  |    |    |       |   |  |             |
|---|--|----|----|-------|---|--|-------------|
| <i>Carcharodon carcharias</i>           | White Shark, Great White Shark                                 | VU | VU |       | X | Marine   | No          |
| <i>Caretta caretta</i>                  | Loggerhead Turtle  | EN | CR |       | X | Marine   | No          |
| <i>Cereopsis novaehollandiae grisea</i> | Cape Barren Goose (south-western), Recherche Cape Barren Goose | VU | EN |       | X | During breeding season (May-June), found in grassy areas, tussock grass of bushes. During rest of year, found on beaches, coastal pastures and on the shores of brackish lakes.  | Potentially |
| <i>Charadrius leschenaultii</i>         | Greater Sand Plover  | VU | VU |       | X | They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps. | No          |
| <i>Chelonia mydas</i>                   | Green Turtle   | VU | EN |       | X | Marine   | No          |
| <i>Daphnia jollyi</i>                   | a water flea (inland south west)                               | P1 |    | 1.14  |   | Shallow freshwater pools over granite bedrock  | No          |
| <i>Dasyurus geoffroii</i>               | chuditch, western quoll  | VU | VU | 10.60 | X | Jarrah Eucalyptus marginata forests and woodlands, Mallee shrublands and heathlands  | Potentially |
| <i>Dermochelys coriacea</i>             | Leatherback Turtle, Leathery Turtle, Luth                      | VU | VU |       | X | Marine   | No          |
| <i>Diomedea antipodensis</i>            | Antipodean Albatross   | MI | EN |       | X | Marine   | No          |
| <i>Diomedea dabbenena</i>               | Tristan Albatross  | CR | VU |       | X | Marine   | No          |
| <i>Diomedea epomophora</i>              | Southern Royal Albatross                                       | VU | VU |       | X | Marine   | No          |

|                            |                          |    |                        |       |   |   |     |
|----------------------------|--------------------------|----|------------------------|-------|---|---|-----|
| <i>Diomedea exulans</i>    | Wandering Albatross      | VU | EN                     |       | X | Marine  | No  |
| <i>Diomedea sanfordi</i>   | Northern Royal Albatross | EN | VU                     |       | X | Marine  | No  |
| <i>Eubalaena australis</i> | Southern Right Whale     | VU | VU                     |       | X | Marine  | No  |
| <i>Falco hypoleucos</i>    | Grey Falcon              | VU | VU                     |       | X | <p>The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Marchant and Higgins 1993). The species is mainly found where annual rainfall is less than 500 mm.</p> <p>The species appears to be absent from Cape York Peninsula, areas east of the Great Dividing Range in Queensland and New South Wales, south of the Great Dividing Range in Victoria, and south of latitude 26°S in Western Australia</p> | No  |
| <i>Falco peregrinus</i>    | Peregrine falcon         | OS |                        | 2.61  |   | Most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas   | Yes |
| <i>Galeorhinus galeus</i>  | Eastern School Shark     |    | VU                     |       | X | Marine  | No  |
| <i>Halobaena caerulea</i>  | Blue Petrel              |    | Conservation Dependent |       | X | Marine  | No  |
| <i>Hydroprogne caspia</i>  | Caspian Tern             | MI | MI                     | 12.79 |   | Sheltered coastal embayment's (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred.  | No  |

|                                       |                                      |    |    |       |   |  |             |
|---------------------------------------|--------------------------------------|----|----|-------|---|--|-------------|
| <i>Isoodon fusciventer</i>            | Quenda, southwestern brown bandicoot | P4 |    | 5.94  |   | Scrubby, often swampy, vegetation with dense cover up to 1 m high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quenda will thrive in more open habitat subject to introduced predator control.  | Potentially |
| <i>Leipoa ocellata</i>                | malleefowl                           | VU | VU | 0.48  | X | Shrublands and low woodlands dominated by mallee and are associated with Broombush, <i>Melaleuca uncinata</i>  | No          |
| <i>Limosa lapponica</i>               | Bar-tailed godwit                    | MI | MI | 16.64 | X | Coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas | No          |
| <i>Macronectes giganteus</i>          | Southern Giant-Petrel                | MI | EN |       | X | Marine   | No          |
| <i>Macronectes halli</i>              | Northern Giant Petrel                | MI | VU |       | X | Marine   | No          |
| <i>Neophoca cinerea</i>               | Australian Sealion                   | EN | VU |       | X | Marine   | No          |
| <i>Notamacropus eugenii derbianus</i> | Tammar wallaby                       | P4 |    | 12.34 |   | Dense, low vegetation for daytime shelter and open grassy areas for feeding. This species inhabits coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland.   | No          |
| <i>Notamacropus irma</i>              | western brush wallaby                | P4 |    | 10.84 |   | Areas of Mallee and heathland and are uncommon in wet sclerophyll forests. They prefer tall open forests that supply good grazing. They particularly favour open, seasonally damp flat areas with low grasses and open scrubby brushes   | No          |

|                                       |                       |    |    |       |   |   |    |
|---------------------------------------|-----------------------|----|----|-------|---|---|----|
| <i>Numenius madagascariensis</i>      | Eastern curlew        | CR | CR | 16.64 | X | Intertidal mudflats   | No |
| <i>Numenius phaeopus</i>              | Whimbrel              | MI | MI | 12.79 |   | Intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It has been infrequently recorded using saline or brackish lakes near coastal areas. It also used saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields (Higgins & Davies 1996). There are a small number of inland records from saline lakes and canegrass swamps. It has also been recorded in coastal dunes and on a football field | No |
| <i>Oxyura australis</i>               | Blue-billed duck      | P4 |    | 12.04 |   | Fresh to saline, deep permanent open wetlands and deep, densely vegetated lakes.  | No |
| <i>Pachytila turtur subantarctica</i> | Fairy Prion           |    | VU |       | X | Marine  | No |
| <i>Pandion haliaetus</i>              | Osprey                | MI | MI | 16.64 |   | Fresh to saline, deep permanent open wetlands and deep, densely vegetated lakes.  | No |
| <i>Parantechnus apicalis</i>          | Dibbler               | EN | EN |       | X | There was a single Esperance single record for this species on Gunton island within the Recherche Archipelago Nature Reserve. The single record was the result of a translocation, there is no naturally occurring records of this species within the Shire of Esperance.   | No |
| <i>Pluvialis fulva</i>                | Pacific golden plover | MI | MI | 12.79 |   | Coastal regions, though there are also a number of inland records (in all states), sometimes far inland and usually along major river systems. In Western Australia, the species is seldom recorded along the southern or south-western coasts, but is more widespread along the Pilbara and Kimberley coasts between North-West Cape and the Northern Territory border.  | No |

|                                 |                               |    |    |       |   |  |    |
|---------------------------------|-------------------------------|----|----|-------|---|--|----|
| <i>Pluvialis squatarola</i>     | Grey plover                   | MI | MI | 16.64 |   | Coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. The species is also very occasionally recorded further inland, where they occur around wetlands or salt-lakes | No |
| <i>Psophodes nigrogularis</i>   | western whipbird              | EN |    | 17.40 |   | Dense heath-like shrubby thickets on coastal dunes, and mallee woodland or shrubland with an open upperstorey above a dense shrubby understorey. Single questionable Esperance record from 1984.   | No |
| <i>Pterodroma mollis</i>        | Soft-plumaged Petrel          |    | VU |       | X | Marine   | No |
| <i>Rhincodon typus</i>          | Whale Shark                   | MI | CR |       | X | Marine   | No |
| <i>Sternula nereis nereis</i>   | Australian Fairy Tern         | VU | VU |       | X | The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline (Higgins & Davies 1996; Lindsey 1986a). The bird roosts on beaches at night (Higgins & Davies 1996).  | No |
| <i>Thalassarche carteri</i>     | Indian Yellow-nosed Albatross | EN | EN |       | X | Marine   | No |
| <i>Thalassarche cauta</i>       | Shy Albatross                 | VU | CR |       | X | Marine   | No |
| <i>Thalassarche impavida</i>    | Campbell Albatross            | VU | VU |       | X | Marine   | No |
| <i>Thalassarche melanophris</i> | Black-browed albatross        | EN | MI | 17.78 | X | Marine species that inhabits Antarctic, subantarctic and temperate waters and occasionally enters the tropics  | No |
| <i>Thalassarche steadi</i>      | White-capped Albatross        |    | VU |       | X | Marine   | No |
| <i>Thalasseus bergii</i>        | Crested tern                  | MI | MI | 12.79 |   | Coastal areas throughout Australia. They are seldom seen on inland waterways, preferring islands, beaches, lakes and inlets  | No |

|                              |                       |    |    |       |   |  |             |
|------------------------------|-----------------------|----|----|-------|---|--|-------------|
| <i>Thinornis rubricollis</i> | Hooded plover         | P4 |    | 1.55  |   | Predominantly on ocean beaches; at times on adjacent reef platforms, coastal inlets and lakes  | No          |
| <i>Thunnus maccoyii</i>      | Southern Bluefin Tuna |    | VU |       | X | Marine   | No          |
| <i>Tringa glareola</i>       | Wood sandpiper        | MI | MI | 16.64 |   | Well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums Eucalyptus camaldulensis and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. They are also found at some small wetlands only when they are drying. They are rarely found using brackish wetlands, or dry stunted saltmarsh. Typically they do not use coastal flats, but are occasionally recorded in stony wetlands. This species uses artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains | Potentially |
| <i>Tringa nebularia</i>      | Common greenshank     | MI | MI | 1.56  |   | Occurs in all types of coastal and inland wetlands.  | Potentially |
| <i>Tringa stagnatilis</i>    | Marsh sandpiper       | MI | MI | 15.93 |   | Permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In north Australia they prefer intertidal mudflats. Elsewhere they said to avoid, or rarely occur in, tidal habitats, and rarely occur on beaches. In Western Australia they prefer freshwater to marine environments. In south-east Australia they prefer inland saline lakes and coastal saltworks. They are found infrequently around mangroves.   | Potentially |

## Appendix 5: State Threatened and Priority Flora and Fauna Definitions

| Category   | Definition  |
|--|---|
| <b>T – Threatened</b>  | <p>Taxa that 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 (Schedules 1 to 4 of the Wildlife Conservation (Rare Flora) Notice under the WC Act). Threatened flora are further ranked by the DBCA to align with IUCN Red List categories and criteria:</p> <p><b>CR:</b> Critically Endangered – considered to be facing an extremely high risk of extinction in the wild (Schedule 1);</p> <p><b>EN:</b> Endangered – considered to be facing a very high risk of extinction in the wild (Schedule 2); or</p> <p><b>VU:</b> Vulnerable – considered to be facing a high risk of extinction in the wild (Schedule 3).</p> <p><b>EX:</b> Presumed Extinct – taxa that have been adequately searched for and there is no reasonable doubt that the last individual has died (Schedule 4)</p> |
| <b>P1 – Priority 1</b><br>(Poorly known taxa)  | <p>Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation.</p> <p>Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.</p>   |
| <b>P2 – Priority 2</b><br>(Poorly known taxa)  | <p>Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc.</p> <p>Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.</p>   |
| <b>P3 – Priority 3</b><br>(Poorly known taxa)  | <p>Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.</p> <p>Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.</p>   |
| <b>P4 – Priority 4</b><br>(Rare, Near Threatened and other taxa in need of monitoring) | <p><b>1. Rare</b> - Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p><b>2. Near Threatened</b> - Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</p> <p><b>3.</b> Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy</p>  |

## Appendix 6: Commonwealth Definition of Threatened Flora and Fauna Species (Environment Protection and Biodiversity Conservation, EPBC Act 1999)

| Category Code | Category  |
|---------------|---|
| Ex            | <b>Extinct</b><br>Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.  |
| ExW           | <b>Extinct in the Wild</b><br>Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form. |
| CE            | <b>Critically Endangered</b><br>Taxa which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.  |
| E             | <b>Endangered</b><br>Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.   |
| V             | <b>Vulnerable</b><br>Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.   |
| CD            | <b>Conservation Dependent</b><br>Taxa which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.   |

## Appendix 7: State Definition of Threatened Ecological Communities

| Category Code | Category  |
|---------------|---|
| <b>PTD</b>    | <p><b>Presumed Totally Destroyed</b></p> <p>An ecological community will be listed as Presumed Totally Destroyed if there are no recent records of the community being extant and either of the following applies:</p> <ul style="list-style-type: none"> <li>(i) records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;</li> <li>(ii) all occurrences recorded within the last 50 years have since been destroyed.</li> </ul>   |
| <b>CE</b>     | <p><b>Critically Endangered</b></p> <p>An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting any one of the following criteria:</p> <ul style="list-style-type: none"> <li>(i) The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;</li> <li>(ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area;</li> <li>(iii) The ecological community is highly modified with potential of being rehabilitated in the immediate future.</li> </ul>   |
| <b>E</b>      | <p><b>Endangered</b></p> <p>An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. The ecological community must meet any one of the following criteria:</p> <ul style="list-style-type: none"> <li>(i) The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short term future, or is unlikely to be substantially rehabilitated in the short term future due to modification;</li> <li>(ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area;</li> <li>(iii) The ecological community is highly modified with potential of being rehabilitated in the short term future.</li> </ul> |
| <b>V</b>      | <p><b>Vulnerable</b></p> <p>An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria:</p> <ul style="list-style-type: none"> <li>(i) The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;</li> <li>(ii) The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution;</li> <li>(iii) The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.</li> </ul>  |

## Appendix 8: State Definition of Priority Ecological Communities

| Category Code | Category  |
|---------------|---|
| P1            | <b>Poorly-known ecological communities</b><br>Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist.  |
| P2            | <b>Poorly-known ecological communities</b><br>Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation.  |
| P3            | <b>Poorly known ecological communities</b><br>(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:<br>(ii) Communities known from a few widespread occurrences, which are either large or within Significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;<br>(iii) Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes. |
| P4            | Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.  |
| P5            | <b>Conservation Dependent ecological communities</b><br>Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.  |

## Appendix 9: Commonwealth Definition of Threatened Ecological Communities

Three categories exist for listing threatened ecological communities under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

| Listing Category Code        | Explanation of Category   |
|------------------------------|---|
| <b>Critically endangered</b> | If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.  |
| <b>Endangered</b>            | If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.                  |
| <b>Vulnerable</b>            | If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium term future. |

## Appendix 10: Categories and Control of Declared (Plant) Pests in Western Australia

| Control Category   | Control Measures  |
|--|---|
| <p><b>C1 (Exclusion)</b><br/>           '(a) Category 1 (C1) — Exclusion: if in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented'<br/>           Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.</p>  | <p>In relation to a category 1 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.</p>   |
| <p><b>C2 (Eradication)</b><br/>           '(b) Category 2 (C2) — Eradication: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible'.<br/>           Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.</p>  | <p>In relation to a category 2 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.</p>   |
| <p><b>C3 (Management)</b><br/>           '(c) Category 3 (C3) — Management: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to —<br/>           (i) alleviate the harmful impact of the declared pest in the area; or<br/>           (ii) reduce the number or distribution of the declared pest in the area; or<br/>           (iii) prevent or contain the spread of the declared pest in the area.'<br/>           Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.</p> | <p>In relation to a category 3 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to —<br/>           (a) alleviate the harmful impact of the declared pest in the area for which it is declared; or<br/>           (b) reduce the number or distribution of the declared pest in the area for which it is declared; or<br/>           (c) prevent or contain the spread of the declared pest in the area for which it is declared.</p> |

## Appendix 11: Definition of Vegetation Condition Scale

For the south west and interzone botanical provinces

| Condition Rating        | Description   |
|-------------------------|---|
| Pristine (1)            | Pristine or nearly so, no obvious signs of disturbance  |
| Excellent (2)           | Vegetation structure intact; disturbance affecting individual species; weeds are non-aggressive species.  |
| Very Good (3)           | Vegetation structure altered; obvious signs of disturbance For example, disturbance to vegetation structure caused by repeated fires; the presence of some more aggressive weeds; dieback; logging; & grazing.  |
| Good (4)                | 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; & grazing |
| Degraded (5)            | Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; & grazing.                |
| Completely Degraded (6) | 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.  |

## Appendix 12: Carnaby's Cockatoo foraging habitat scoring template

Adapted from Tables A1 and A2 of Department of Agriculture, Water and the Environment (2022)

| Starting score   | Carnaby's Cockatoo   |   |
|--|--|---|
| 10   | <p><b>Start at a score of 10</b> if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation.</p> <p><b>*This tool only applies to sites equal to or larger than 1 hectare in size.</b></p>   |   |
| Attribute  | Subtractions   | Context adjustor (attributes reducing functionality of foraging habitat)  |
| Foraging potential   | -2   | <b>Subtract 2</b> from your score if there is no evidence of feeding debris on your site.   |
| Connectivity   | -2   | <b>Subtract 2</b> from your score if you have evidence to conclude that there is no other foraging habitat within 1km of your site.                 |
| Proximity to breeding  | -2   | <b>Subtract 2</b> if you have evidence to conclude that your site is more than 12km from breeding habitat.  |
| Proximity to roosting  | -1   | <b>Subtract 1</b> if you have evidence to conclude that your site is more than 20km from a known night roosting habitat.                            |
| Impact from significant plant disease                          | -1   | <b>Subtract 1</b> if your site has disease present (e.g. <i>Phytophthora</i> spp. or Mari canker) and the disease is preferred food plants present. |
| Total score  | <b>Enter score</b>   |   |
| <b>Other considerations for assessment of foraging habitat</b> | <ul style="list-style-type: none"> <li>- The presence, extent and density (including foliage cover and flowering density) of all plant species that provide foraging, including non-native food sources used</li> <li>- The distribution and size of foraging habitat in proximity (e.g. up to 12 km) to the impact site.</li> <li>- Site degradation (such as cleared, disturbed or degraded areas).</li> <li>- The fire history of the impact site.</li> <li>- Landscape characteristics around the impact site, including details of roosting and breeding habitat in proximity (e.g. up to 20km for roosting and 12km for breeding); and</li> <li>- The location and details of watering points that could support the use of the foraging habitat.</li> </ul> |   |
| <b>Appraisal</b>   | <p>To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.</p>   |   |

## Appendix 13: EPBC Act Protected Matters Report

| Listed Threatened Ecological Communities   |                     |        |                                       |                 |
|--|---------------------|--------|---------------------------------------|-----------------|
|  |                     |        | Presence                              |                 |
| Community Name   | Threatened Category | Rank   | Text                                  | Buffer Status   |
| Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia | Endangered          | Likely | Community likely to occur within area | In feature area |

| Listed Threatened Species          |  |        |                        |                  |                     |
|------------------------------------|--|--------|------------------------|------------------|---------------------|
| Scientific Name                    | Common Name  | Class  | Threatened Category    | Migratory Status | Buffer Status       |
| <i>Thunnus maccoyii</i>            | Southern Bluefin Tuna  | Fish   | Conservation Dependent |                  | In buffer area only |
| <i>Galeorhinus galeus</i>          | School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark | Shark  | Conservation Dependent |                  | In buffer area only |
| <i>Limosa lapponica menzbieri</i>  | Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit        | Bird   | Critically Endangered  |                  | In buffer area only |
| <i>Calidris ferruginea</i>         | Curlew Sandpiper   | Bird   | Critically Endangered  | Migratory        | In feature area     |
| <i>Numenius madagascariensis</i>   | Eastern Curlew, Far Eastern Curlew                                     | Bird   | Critically Endangered  | Migratory        | In feature area     |
| <i>Rhizanthella johnstonii</i>     | South Coast Underground Orchid   | Plant  | Critically Endangered  |                  | In buffer area only |
| <i>Balaenoptera musculus</i>       | Blue Whale   | Mammal | Endangered             | Migratory        | In buffer area only |
| <i>Diomedea sanfordi</i>           | Northern Royal Albatross   | Bird   | Endangered             | Migratory        | In buffer area only |
| <i>Conostylis lepidospermoides</i> | Sedge Conostylis   | Plant  | Endangered             |                  | In feature area     |
| <i>Neophoca cinerea</i>            | Australian Sea-lion, Australian Sea Lion                               | Mammal | Endangered             |                  | In buffer area only |
| <i>Macronectes giganteus</i>       | Southern Giant-Petrel, Southern Giant Petrel                           | Bird   | Endangered             | Migratory        | In buffer area only |
| <i>Diomedea dabbenena</i>          | Tristan Albatross  | Bird   | Endangered             | Migratory        | In buffer area only |

|  |   |         |  |  |                     |
|--|---|---------|--|--|---------------------|
| <i>Caretta caretta</i>                   | Loggerhead Turtle   | Reptile | Endangered   | Migratory  | In buffer area only |
| <i>Dermochelys coriacea</i>              | Leatherback Turtle, Leathery Turtle, Luth                                     | Reptile | Endangered   | Migratory  | In buffer area only |
| <i>Pseudomys shortridgei</i>             | Heath Mouse, Dayang, Heath Rat  | Mammal  | Endangered   |  | In buffer area only |
| <i>Anigozanthos bicolor subsp. minor</i> | Little Kangaroo Paw, Two-coloured Kangaroo Paw, Small Two-colour Kangaroo Paw | Plant   | Endangered   |  | In feature area     |
| <i>Eubalaena australis</i>               | Southern Right Whale  | Mammal  | Endangered   | Migratory (as <i>Balaena glacialis australis</i> ) | In buffer area only |
| <i>Pezoporus occidentalis</i>            | Night Parrot  | Bird    | Endangered   |  | In buffer area only |
| <i>Thalassarche cauta</i>                | Shy Albatross   | Bird    | Endangered   | Migratory  | In buffer area only |
| <i>Ricinocarpos trichophorus</i>         | Barrens Wedding Bush  | Plant   | Endangered   |  | In feature area     |
| <i>Calidris canutus</i>                  | Red Knot, Knot  | Bird    | Endangered   | Migratory  | In buffer area only |
| <i>Botaurus poiciloptilus</i>            | Australasian Bittern  | Bird    | Endangered   |  | In feature area     |
| <i>Zanda latirostris</i>                 | Carnaby's Black Cockatoo, Short-billed Black-cockatoo                         | Bird    | Endangered (listed as <i>Calyptorhynchus latirostris</i> ) |  | In feature area     |
| <i>Balaenoptera physalus</i>             | Fin Whale   | Mammal  | Vulnerable   | Migratory  | In buffer area only |
| <i>Balaenoptera borealis</i>             | Sei Whale   | Mammal  | Vulnerable   | Migratory  | In buffer area only |
| <i>Thalassarche impavida</i>             | Campbell Albatross, Campbell Black-browed Albatross                           | Bird    | Vulnerable   | Migratory  | In buffer area only |
| <i>Diomedea antipodensis</i>             | Antipodean Albatross  | Bird    | Vulnerable   | Migratory  | In buffer area only |
| <i>Pachyptila turtur subantarctica</i>   | Fairy Prion (southern)  | Bird    | Vulnerable   |  | In buffer area only |
| <i>Carcharodon carcharias</i>            | White Shark, Great White Shark  | Shark   | Vulnerable   | Migratory  | In buffer area only |
| <i>Phoebetria fusca</i>                  | Sooty Albatross   | Bird    | Vulnerable   | Migratory  | In buffer area only |
| <i>Falco hypoleucos</i>                  | Grey Falcon   | Bird    | Vulnerable   |  | In feature area     |

|  |  |         |            |           |                     |
|--|--|---------|------------|-----------|---------------------|
| <i>Macronectes halli</i>                         | Northern Giant Petrel                    | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Thalassarche melanophris</i>                  | Black-browed Albatross                   | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Chelonia mydas</i>                            | Green Turtle                             | Reptile | Vulnerable | Migratory | In buffer area only |
| <i>Halobaena caerulea</i>                        | Blue Petrel                              | Bird    | Vulnerable |           | In buffer area only |
| <i>Leipoa ocellata</i>                           | Malleefowl                               | Bird    | Vulnerable |           | In feature area     |
| <i>Charadrius leschenaultii</i>                  | Greater Sand Plover, Large Sand Plover   | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Thalassarche carteri</i>                      | Indian Yellow-nosed Albatross            | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Thalassarche steadi</i>                       | White-capped Albatross                   | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Rhincodon typus</i>                           | Whale Shark                              | Shark   | Vulnerable | Migratory | In buffer area only |
| <i>Diomedea exulans</i>                          | Wandering Albatross                      | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Diomedea epomophora</i>                       | Southern Royal Albatross                 | Bird    | Vulnerable | Migratory | In buffer area only |
| <i>Diuris drummondii</i>                         | Tall Donkey Orchid                       | Plant   | Vulnerable |           | In buffer area only |
| <i>Pterodroma mollis</i>                         | Soft-plumaged Petrel                     | Bird    | Vulnerable |           | In buffer area only |
| <i>Sternula nereis nereis</i>                    | Australian Fairy Tern                    | Bird    | Vulnerable |           | In buffer area only |
| <i>Carcharias taurus (west coast population)</i> | Grey Nurse Shark (west coast population) | Shark   | Vulnerable |           | In buffer area only |
| <i>Dasyurus geoffroii</i>                        | Chuditch, Western Quoll                  | Mammal  | Vulnerable |           | In feature area     |

## Appendix 14: Swamp Yate (*Eucalyptus occidentalis*) woodland in seasonally-inundated basins - Community Description

Description obtained from: Ecologia for Grange Resources Limited (2008) Southdown Magnetite Proposal. Regional Flora and vegetation assessment. Unpublished Report

### Swamp Yate (*Eucalyptus occidentalis*) woodland in seasonally-inundated basins

#### Community Description

The centre of these sumplands was usually inhabited by Swamp Yate (*Eucalyptus occidentalis*) low woodland often with an understorey of the Saltwater Paperbark (*Melaleuca cuticularis*). Peripheral to the central seasonally-inundated basin of these wetlands there was often a waterlogged zone of *E. occidentalis* associated with *Kunzea recurva* heath to open scrub and/or the small trees *Melaleuca preissiana* and *Banksia littoralis* and a number of mallees (primarily *Eucalyptus decipiens* subsp. *adesmophloia*). Fringing the wetland there was usually an *Anarthria laevis* sedgeland. However in the wetlands where there was shallow laterite, the sedgeland was usually replaced with a *Pericalymma ellipticum* heath.

The understorey shrubs of this vegetation were typically very open. *Melaleuca cuticularis*, *Kunzea recurva* and *Hakea nitida* generally formed an open tall shrub layer. *Hakea denticulata*, *Hakea laurina*, *Hakea varia*, *Exocarpos sparteus*, *Agonis theiformis*, *Lambertia inermis* and *Nuytsia floribunda* were also sometimes present in the seasonally waterlogged areas fringing the sumplands. Other common shrub taxa, recorded at low density across the sampled sites were *Isopogon trilobus*, *Acacia pulchella* var. *glaberrima*, *Taxandria spathulata*, *Astartea glomerata*, *Astartea aspera*, *Beaufortia empetrifolia*, *Melaleuca concinna* and *Conothamnus aureus*. Other mid and low shrub species recorded at lower abundance included *Acacia biflora*, *Acacia luteola*, *A. subcaerulea*, *Adenanthos cuneatus*, *Banksia baueri*, *Banksia dryandroides*, *Bossiaea praetermissa*, *Daviesia inflata*, *Dryandra falcata*, *Dryandra mucronulata* subsp. *mucronulata*, *Dryandra tenuifolia* var. *tenuifolia*, *Gompholobium confertum*, *Hibbertia lineata*, *Leucopogon conostephioides*, *Melaleuca subtrigona*, *Petrophile squamata* subsp. *squamata*, *Petrophile media*, *Spyridium majoranifolium*, *Stirlingia anethifolia* and *Thomasia stelligera*. The perennial herbs *Villarsia parnassifolia*, *Anthotium humile*, *Stylidium corymbosum*, *Goodenia filiformis* and *Velleia trinervis* were abundant in the wetlands in good condition. These herbs inhabited the shallowly-inundated zone of the wetland and were most apparent when the water receded and the herbs were in flower in late summer. A dense ground layer was generally present in the seasonally waterlogged fringe of the sumplands and this was dominated by rushes and sedges including *Anarthria laevis*, *Baumea juncea*, *Gahnia ancistrophylla*, *Lepidosperma striatum*, *Schoenus laevigatus*, *Schoenus subfascicularis* and *Tricostularia compressa*. A suite of native grasses was also recorded including *Amphipogon amphipogonoides*, *Austrostipa hemipogon*, *Cyperochloa hirsuta*, *Deyeuxia quadriseta* and *Neurachne alopecuroidea*. Naturalised alien grasses and herbs were prevalent in the more disturbed wetlands and these included \**Aira caryophyllea*, \**Cirsium vulgare*, \**Conyza parva*, \**Conyza sumatrensis*, \**Hordeum leporinum*, \**Hypochaeris glabra*, *Juncus pallidus*, \**Lagurus ovatus*, \**Pennisetum clandestinum*, \**Pseudognaphalium luteoalbum*, \**Rumex crispus*, \**Solanum nigrum* and \**Vulpia myuros* var. *megalura*

## Appendix 15: Traffic Count Data – Fuss Road

### MetroCount Traffic Executive Daily Classes

#### DailyClass-179 -- English (ENA)

##### Datasets:

**Site:** [604\_000009\_000200] Fuss Road South of South Coast Highway  
**Attribute:** Rural  
**Direction:** 7 - North bound A>B, South bound B>A. Lane: 2  
**Survey Duration:** 0:00 Thursday, 6 December 2018 => 10:08 Wednesday, 9 January 2019,  
**Zone:**  
**File:** 604\_000009\_000200 0 2019-01-09 1008.EC2 (Plus )  
**Identifier:** KB930V6G MC56-L5 [MC55] (c)Microcom 19Oct04  
**Algorithm:** Factory default axle (v5.02)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

##### Profile:

**Filter time:** 0:00 Thursday, 6 December 2018 => 10:08 Wednesday, 9 January 2019  
 (34.4227)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = North, Lane = 0-16  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 2485 / 2494 (99.64%)

### Daily Classes

**DailyClass-179**

**Site:** 604\_000009\_000200.2.3NS  
**Description:** Fuss Road South of South Coast Highway  
**Filter time:** 0:00 Thursday, 6 December 2018 => 10:08 Wednesday, 9 January 2019  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Monday, 10 December 2018**

|                  | 1    | 2    | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11   | 12  |
|------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| <b>Total</b>     |      |      |     |     |     |     |     |     |     |     |      |     |
| <b>Mon</b><br>82 | 52   | 13   | 3   | 3   | 0   | 0   | 0   | 2   | 1   | 0   | 8    | 0   |
| (%)              | 63.4 | 15.9 | 3.7 | 3.7 | 0.0 | 0.0 | 0.0 | 2.4 | 1.2 | 0.0 | 9.8  | 0.0 |
| <b>Tue</b><br>77 | 63   | 7    | 1   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 5    | 0   |
| (%)              | 81.8 | 9.1  | 1.3 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5  | 0.0 |
| <b>Wed</b><br>82 | 60   | 8    | 5   | 2   | 0   | 0   | 2   | 0   | 0   | 0   | 5    | 0   |
| (%)              | 73.2 | 9.8  | 6.1 | 2.4 | 0.0 | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 | 6.1  | 0.0 |
| <b>Thu</b><br>72 | 49   | 4    | 3   | 2   | 2   | 0   | 0   | 0   | 0   | 0   | 12   | 0   |
| (%)              | 68.1 | 5.6  | 4.2 | 2.8 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.7 | 0.0 |
| <b>Fri</b><br>78 | 52   | 2    | 2   | 0   | 0   | 0   | 1   | 0   | 0   | 2   | 19   | 0   |
| (%)              | 66.7 | 2.6  | 2.6 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 2.6 | 24.4 | 0.0 |
| <b>Sat</b><br>75 | 43   | 6    | 3   | 0   | 0   | 0   | 1   | 0   | 2   | 0   | 20   | 0   |
| (%)              | 57.3 | 8.0  | 4.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 2.7 | 0.0 | 26.7 | 0.0 |
| <b>Sun</b><br>69 | 43   | 4    | 3   | 0   | 2   | 0   | 0   | 0   | 1   | 1   | 15   | 0   |
| (%)              | 62.3 | 5.8  | 4.3 | 0.0 | 2.9 | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 21.7 | 0.0 |

**Average daily volume**

|                    |      |     |     |     |     |     |     |     |     |     |      |     |
|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| <b>Entire week</b> | 52   | 6   | 3   | 1   | 1   | 0   | 1   | 0   | 1   | 0   | 12   | 0   |
| 76                 |      |     |     |     |     |     |     |     |     |     |      |     |
| (%)                | 67.7 | 8.2 | 3.7 | 1.5 | 0.7 | 0.0 | 0.7 | 0.4 | 0.7 | 0.6 | 15.7 | 0.0 |
| <b>Weekdays</b>    | 55   | 7   | 3   | 2   | 0   | 0   | 1   | 0   | 0   | 0   | 10   | 0   |
| 78                 |      |     |     |     |     |     |     |     |     |     |      |     |
| (%)                | 70.6 | 8.7 | 3.6 | 2.0 | 0.5 | 0.0 | 0.8 | 0.5 | 0.3 | 0.5 | 12.5 | 0.0 |
| <b>Weekend</b>     | 43   | 5   | 3   | 0   | 1   | 0   | 1   | 0   | 2   | 1   | 18   | 0   |
| 72                 |      |     |     |     |     |     |     |     |     |     |      |     |
| (%)                | 59.7 | 6.9 | 4.2 | 0.0 | 1.4 | 0.0 | 0.7 | 0.0 | 2.1 | 0.7 | 24.3 | 0.0 |

\* - Incomplete