Vegetation, Flora, Fauna and Environmental Considerations Report

Shire of Esperance 2025-26 Strategic Purpose Permit Site B – Fuss Road

[redacted]

December 2025

Shire of Esperance
Together, we make it happen!

Acknowledgement of country

The Shire of Esperance acknowledges the Kepa 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 respects to 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
WONS: Weeds of National Significance

Executive Summary

The Shire of Esperance (SOE) Environmental Team was commissioned by the Shire of Esperance Asset Management department to undertake a review of the vegetation, flora, fauna and environmental values on the proposed Fuss Road project in 2025-26 as part of their Strategic Purpose Permit application.

The proposed development involves the clearing of 0.27ha of native vegetation for the purpose of road upgrades.

This report details the results from the environmental impact assessment completed by Shire of Esperance environmental services team over spring 2025.

The survey area contained six vegetation communities. Vegetation condition varied between Completely Degraded and Excellent.

One Threatened ecological communities occurred within the 20km buffer of the project site. A small area of vegetation was consistent with this TEC.

A total of 212 vascular plant taxa, representative of 129 genera and 47 families, were recorded within Fuss Road survey area. Of these 176 were native species and 36 were introduced.

No threatened and priority flora species were recorded within the Fuss Road survey area.

Potentially suitable habitat for seven conservation listed fauna species identified in the desktop survey was also present in the project area.

1 Introduction

The Shire of Esperance endeavors to maintain a high level of road safety, aiming to be proactive in identifying high-risk roads, reviewing designs and progressively upgrading these. The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4,593km of roads.

The Shire of Esperance is submitting the Fuss Road project as Site B under the 2025-26 Strategic Purpose Permit (Figure 1). The project is required for road safety upgrades.

1.1 Location and Scope of Project

The proposed works are located ~5 km south east of the Munglinup Townsite, within the SOE managed road reserve of Fuss Road. Specifically, it is located at straight line kilometre (SLK) 4.5 to 7.2 (Main Roads 2025). A point within the proposed clearing permit area is 305289m E, 6260953m N (UTM Zone 51 H, GDA94).

The original survey area comprised of SLK 4.22 to 8.5 however parts of the road reconstruction project have been deemed to be completable within the existing maintenance zone and have been subsequently removed from this project. The environmental surveys have been completed for the original area.

Fuss Road is particularly narrow resulting in safety issues during the tourist and grain harvest season. Fuss Road is the eastern access route into the Shire of Esperance managed Munglinup Beach coastal campground and privately operated Munglinup Beach Holiday Park. Fuss Road requires widening to

maintain the safety of road users. To mitigate impact of clearing vegetation, clearing will not occur to the full permitted width to conserve native vegetation where reasonably practicable.

Figure 1. Location of Fuss Road, with project area in red and survey area in blue.

1.2 Environmental Legislation and Guidelines

The following legislation is relevant to this survey:

Commonwealth (Federal):

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

Western Australian (State):

- *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); and
- *Environmental Protection Act 1986* (EP Act).

Western Australian (State) guidelines relevant to this survey are:

- 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); and
- Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA, 2020).

The following International and Intergovernmental Agreements are relevant to this survey:

- *The Ramsar Convention on Wetlands of International Importance 1971* (Ramsar Convention);
- *Japan – Australia Migratory Bird Agreement 1974* (JAMBA) - 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;
- *China-Australia Migratory Bird Agreement 1986* (CAMBA) - 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; and
- *Republic of Korea-Australia Migratory Bird Agreement 2007* (ROKAMBA); Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds.

2 OBJECTIVES

The objective of this survey was to undertake a vegetation, flora, fauna and environmental assessment of the Fuss Road survey area to enable an informed decision to be made in respect to the potential environmental impacts of the project. This is inclusive of the following:

- Undertake a desktop study of the vegetation, flora, fauna, threatened ecological communities, soils, geology, landform, aboriginal heritage, cadastre, important wetlands, soils of the Fuss Road survey area using all available resources. This includes spatial interrogation using the Shire of Esperance's Desktop Environmental Impacts Spatial Interrogation Program (DEISIP), aerial photography interpretation and the Commonwealth Protected Matters Search Tool.

- Review available historical literature of the Fuss Road survey area;
- Undertake a field survey of the Fuss Road survey area, and collect and identify the vascular plant species present;
- Define and map the vegetation communities present and their condition in the Fuss Road survey area;
- Define and map the location of any threatened flora (TF) and priority flora (PF), TECs, fauna and priority fauna habitat located within the Fuss Road survey area;
- Provide recommendations on the local and regional significance of the vegetation communities;
- Define any management issues related to any environmental values; and
- Provide recommendations to the Shire of Esperance asset management department in relation to environmental management of the project.

3 METHODS

3.1 Desktop Assessment

Desktop information was collated for all areas within a 20km buffer zone of the site using DBCA datasets sourced under agreement. These data sources are listed below:

- Threatened and Priority Flora Database (TPFL; DBCA 2025);
- Western Australian Herbarium data (DBCA 2025)
- DBCA's Esperance District Threatened Flora spatial dataset (DBCA 2024c);
- Threatened and Priority Ecological Communities (TECs & PECs; DBCA 2025c);
- Threatened, Specially Protected and Priority Fauna (DBCA 2025d); and
- Carnaby's black-cockatoo roost and breeding sites (DBCA 2025e).

Additionally, the EPBC Act Protected Matters Search Tool (PMST), was also checked to identify the possible occurrence of Threatened and Priority flora, fauna and ecological communities within the Fuss survey area. Search parameters were 'by polygon' and a 20km buffer was applied to the search area; standard used in this IBRA subregion.

Historical and State documentation and datasets consulted include:

- Vegetation mapping of the region, principally the coarse-scale vegetation associations of Beard (1973) (DDIRP-006);
- Vegetation Extent by Statewide Pre-European mapping statistics (Department of Parks and Wildlife 2018);
- Soil landscape mapping (Schoknecht, et al 2004);
- EPBC Act list of TECs; (2025)
- Priority Ecological Communities for Western Australia Version 35 (DBCA 2023c);
- Nomination or listing descriptions of TECs or PECs, where available and relevant (State and Federal);
- Recovery Plans, Approved Conservation Advices, Significant Impact Guidelines and / or other relevant reports or documentation relating to the preferred habitats / distributions of TECs / PECs, Threatened flora and fauna;

- Shire of Esperance Weed Mapping Data (2025)
- Existing site digital orthophotos (Oldfield 2018)
- Atlas of Living Australia database (2025)
- Hydrographic Catchments (DWER-028)
- Crown Reserves (Landgate-227)
- RAMSAR sites (DBCA-010)
- Directory of Important Wetlands (DBCA-045)

3.2 Field Survey

The site was initially inspected on 11 September, by Julie Waters (SOE Environmental Coordinator) and Katherine Walkerden (SOE 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 4.22-8.5 survey area was undertaken by SOE botanists between 11-12 September 2025 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 4.22-8.5 survey area. The road was used as a continuous transect. Vegetation up to 5m from the edge of the existing road's back-slope was assessed to accurately cover the proposed clearing permit area, recording all species, and collecting all but the very common, well-known species.

For threatened or priority flora 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.

All species unknown in the field were collected, pressed and dressed in accordance with WAH instructions, and later identified by the SOE's three botanists, using keys, WA Herbarium's Florabase, literature and reference material from the Esperance district herbarium. Any species that were unable to be identified were submitted to the WAH for identification.

The vegetation communities of Site B – Fuss Road, were assessed for the presence a TEC or PEC (DBCA 2023, 2025c) comparing that to descriptions in approved conservation advice for these communities. PEC's do not have published approved conservation advice. Comparison of the vegetation community occurred using 'Priority Ecological Communities for Western Australia, Version 35 (DBCA 2023)' definitions, and other relevant documentation.

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 B – Fuss Road for any fauna species identified in the desktop survey. Carnaby's black-cockatoo (*Calyptorhynchus latirostris)* feeding, roosting and nesting habitat was also assessed using the referral guidelines (2022).

As Site B – Fuss Road 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.

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), which is the peak flowering period for this region. As all surveys at Fuss Road were conducted in September, survey timing falls within this period.

3.4 Vegetation Descriptions

Vegetation communities present within the survey area were 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) Ten Clearing Principles were inspected and evaluated.

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 1). 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 1: 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	**Not a limitation:** 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 (1973).
Resources (i.e. were there adequate resources to complete the survey to the required standard).	**Not a constraint:** Adequate resources were made available by SOE to complete the surveys.

Competency/experience of team carrying out survey; experience in the bioregion surveyed	**Not a limitation:** All botanists have good knowledge and 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	**Potential limitation:** 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	**Potential limitation:** The survey area was thoroughly covered. The threatened and priority flora search undertaken by botanists by means of foot-traverse between vegetation quadrat sites 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 counted.
Mapping reliability	**Not a constraint.** Handheld GPS units were used for the survey, which for a majority of field conditions have an accuracy level of ± 5m.
Survey timing, rainfall, season of survey	**Not a limitation:** The EPA (2016a) recommends that flora and vegetation surveys in the Southwest Botanical Province be conducted in Spring (September-November). All surveys have been conducted in September which falls within this period.
Disturbances (fire/flood/clearing)	**Not a limitation:** The Fuss Road survey area does not exhibit any recent disturbance activities.

4 DESKTOP ASSESSMENT RESULTS

The desktop assessment results are for the original SLK 4.22 to 8.5 survey area, rather than the modified 4.5-7.2 project area.

4.1 Climate

The Esperance climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2022). The Munglinup locality receives an average annual rainfall of 431mm.

4.2 Catchment

The project is present within the Oldfield River catchment area.

4.3 Geology, soils and topography

Two geological units were identified by Schoknecht et al. (2004). These include:

- Tertiary marine sediments of the Pallinup formation and small outcrops of Archean granite
- Pallinup formation sediments with extensive areas of shallow Proterozoic gneiss

Within the area, there has been two soil types recorded by Schoknecht et al. (2004). These include:

- Grey deep and shallow sandy duplex soils (gravelly) with minor pale deep sands and gravelly duplex soils and deep sandy gravels
- Grey deep and shallow sandy duplex (gravelly) soils with minor pale deep sands, duplex sandy gravels and Alkaline grey deep sandy duplex soils

Within the area, there has been two landform units recorded by Schoknecht et al. (2004). These include:

- Externally drained plains and rises with gently inclined slopes some small level plains on upper slopes and catchment divides
- Gently inclined hillslopes of a low scarp (40m), externally well drained with short ephemeral streams

The area is mapped as medium wind erosion risk DPIRD-016 (Defined as: 30-50% of map unit has a high to extreme wind erosion risk).

4.4 Regional vegetation

The site is located within the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell 1995) Esperance Plains region and Recherche sub-region (Esp02). 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 two vegetation associations (VA) within the Site B – Fuss Road area. (Table 2). Esperance 47 was highly cleared with 15% of its Pre-European extent remaining within the Recherche IBRA subregion and its remaining area was well conserved with 49% of its current extent conserved within conservation estate.

Esperance 516 was moderately cleared with 37% of its extent remaining within the Recherche IBRA subregion, and 24% of its current extent preserved within conservation estate.

Table 2. Vegetation associations mapped by Beard (1973) within the Site B – Fuss Road and statistics on pre-European remaining areas.

Vegetation association	Esperance_47	Esperance_516
Description	Shrublands; tallerack mallee-heath	Shrublands; mallee scrub, black marlock
Pre-European extent in IBRA sub-region Esp02 (%)	15.06	36.79
Pre-European extent in LGA (%)	13.43	44.92
Current extent conserved in IUCN area (%)	49.3	24

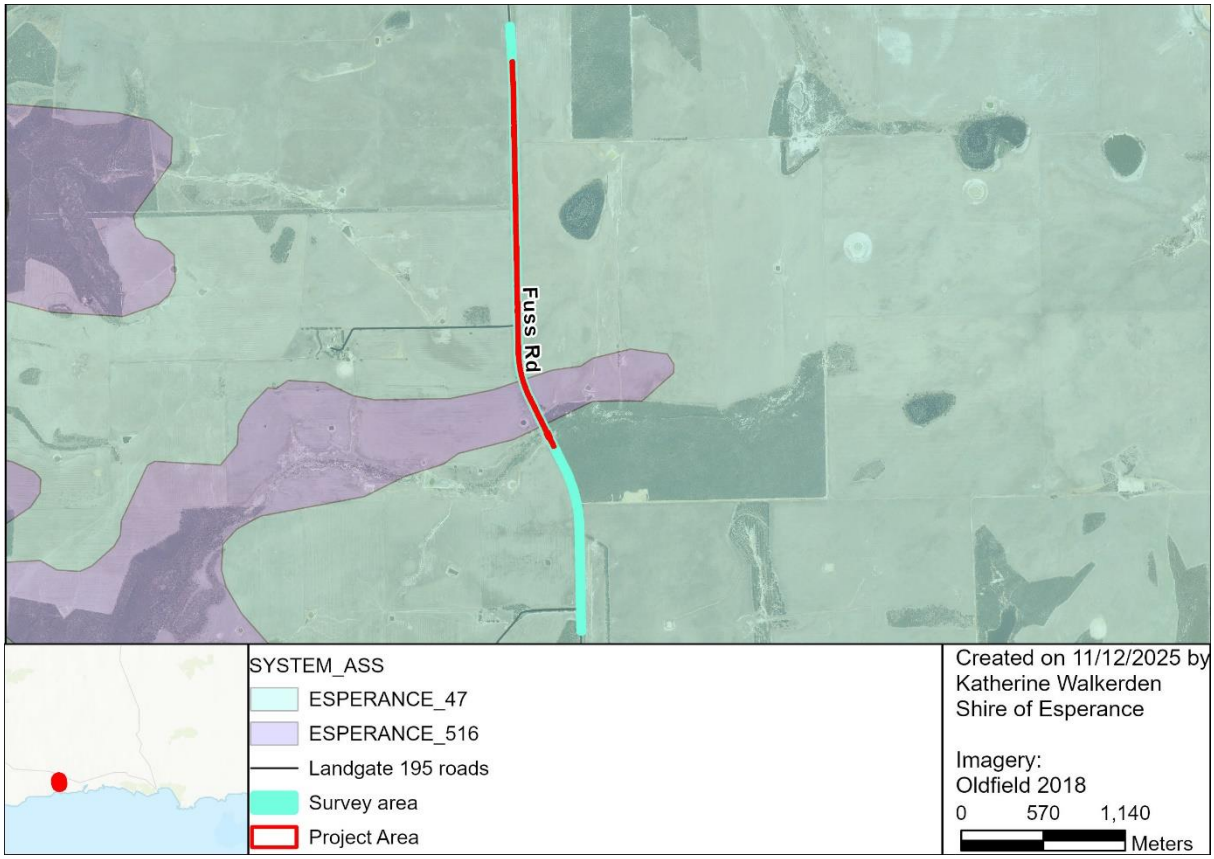

Figure 2. Map of Vegetation associations intersecting Fuss Road Area.

4.5 Surrounding land use

The area directly included in the clearing permit application Site B – Fuss Road is currently intact and vegetated 60m wide road reserve, managed by SOE. The surrounding land use is agricultural. The area is within Rural zoning. The survey area is in a highly cleared area with 20.36% of vegetation within 5km of the project remaining.

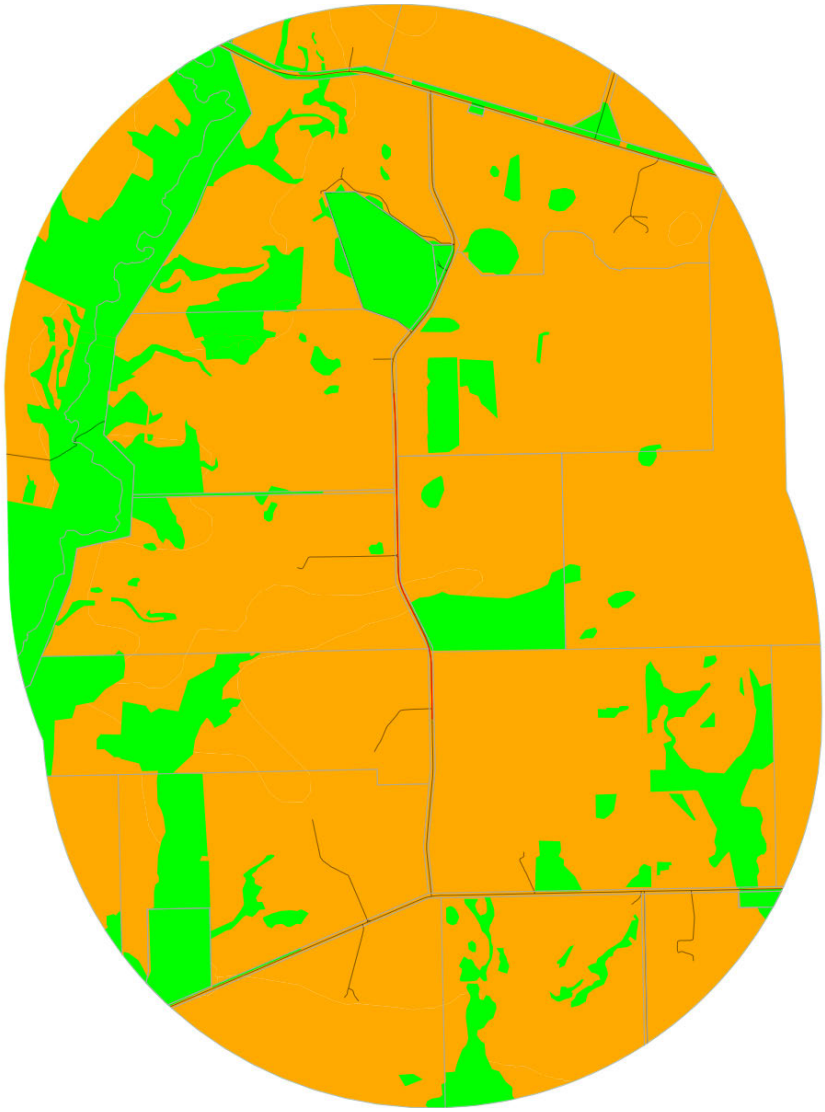

Figure 3. Map of remnant vegetation within a 5km buffer produced by DEISIP. Survey area is highlighted in red, remnant vegetation is in green and cleared vegetation is in orange, road centrelines are in black and cadastre boundaries are in grey.

The survey area was 800m from Reserve 26410 the closest conservation reserve. One other conservation vested reserves were within 5km of the site (Reserve 28168).

4.6 Potential threatened and priority flora

Two threatened flora (TF) and 27 priority flora (PF) were recorded within a 20km radius of the proposed impact site (Appendix 3)). Of these, one TF species and 18 PF species had suitable known associated habitat that corresponded with vegetation communities and soil type of Site B – Fuss Road survey area.

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 B – Fuss Road survey area. No other TEC's or priority ecological communities (PEC) were identified by the desktop study as being within Site B – Fuss Road survey area or within a 20km buffer of the survey area.

4.8 Potential threatened and priority fauna

32 conservation listed fauna were recorded within a 20km radius of the proposed survey area (Appendix 4)). Of these, 16 species were migratory. An additional five conservation listed species were identified by the Protected Matters Search Tool.

5 FIELD SURVEY RESULTS AND DISCUSSION

5.1 Vegetation communities

Five vegetation communities were identified within the Site B – Fuss Road survey area, as defined by structure and composition (Table 3). It is believed that the Beard (1973) vegetation associations identified in Section 4.4 are an appropriate match for two vegetation types observed. Esperance 47 and Esperance 516 match vegetation type A & B the remaining vegetation types were too fine scale to be mapped in Beard vegetation mapping.

Table 3. Vegetation communities identified within proposed Site B – Fuss Road survey area.

Type	Description	Figure	Closest matching Beard vegetation association	Area to be cleared (ha)
A	Scattered Nuytsia and *Eucalyptus pleurocarpa* over mixed myrtaceous and proteaceous shrubland.	6	Esperance 47	0.01
B	Mallee with *Hakea laurina* over mixed shrubland.	7	Esperance 516	0.19
C	*Melaleuca cuticularis* over *Juncus pallidus*	8	-	0.02
D	*Allocasuarina huegeliana* with *Hakea laurina* over mixed shrubland.	9	-	0.01
E	*Eucalyptus occidentalis* over *Melaleuca brevifolia* and *Melaleuca cuticularis*	10	-	0.04
F	*Melaleuca brevifolia* and *Melaleuca cuticularis* with Astartea spp., *Gahnia trifida* and *Baumea juncea*	11	-	**Outside clearing area**

Figure 4. Vegetation types within the Site B – Fuss Road area, from SLK 4.22 to 6.71 along Fuss Road.

Figure 5. Vegetation types within the Site B – Fuss Road area, from SLK 6.50 to 8.50 along Fuss Road.

Figure 6. Vegetation type A identified in Site B – Fuss Road project, described as: Scattered Nuytsia and *Eucalyptus pleurocarpa* over mixed myrtaceous and proteaceous shrubland.

Figure 7. Vegetation type B identified in Site B – Fuss Road project, described as: Mallee with *Hakea laurina* over mixed shrubland.

Figure 8. Vegetation type C identified in Site B – Fuss Road project, described as: *Melaleuca cuticularis* over *Juncus pallidus.*

Figure 9. Vegetation type D identified in Site B – Fuss Road project, described as: *Allocasuarina huegeliana* with *Hakea laurina* over mixed shrubland.

Figure 10. Vegetation type E identified in Site B – Fuss Road project, described as: *Eucalyptus occidentalis* over *Melaleuca brevifolia* and *Melaleuca cuticularis.*

Figure 11. Vegetation type F identified in Site B – Fuss Road project, described as: *Melaleuca brevifolia* and *Melaleuca cuticularis* with Astartea spp., *Gahnia trifida* and *Baumea juncea*.

5.2 Vegetation condition

Vegetation condition varied dramatically within the project area with vegetation varying between Completely degraded (lacking any native vegetation) and an Excellent condition, the areas of Excellent condition were adjacent to a large area of intact native vegetation. There were large areas of Completely degraded vegetation lacking any native. Degrading factors present included historical clearing for crossovers and basic raw material extraction, weed invasion, spray drift and habitat fragmentation.

Table 4. Quantifying vegetation to be cleared by vegetation type and condition.

Vegetation type	Excellent	Very good	Good	Degraded	Total
A	-	<0.01	<0.01	0.01	**0.01**
B	0.03	0.10	0.06	-	**0.19**
C	-	0.01	<0.01	<0.01	**0.02**
D	-	0.01	-	-	**0.01**
E	-	0.04	-	-	**0.04**
Total	**0.03**	**0.15**	**0.07**	**0.02**	**0.27**

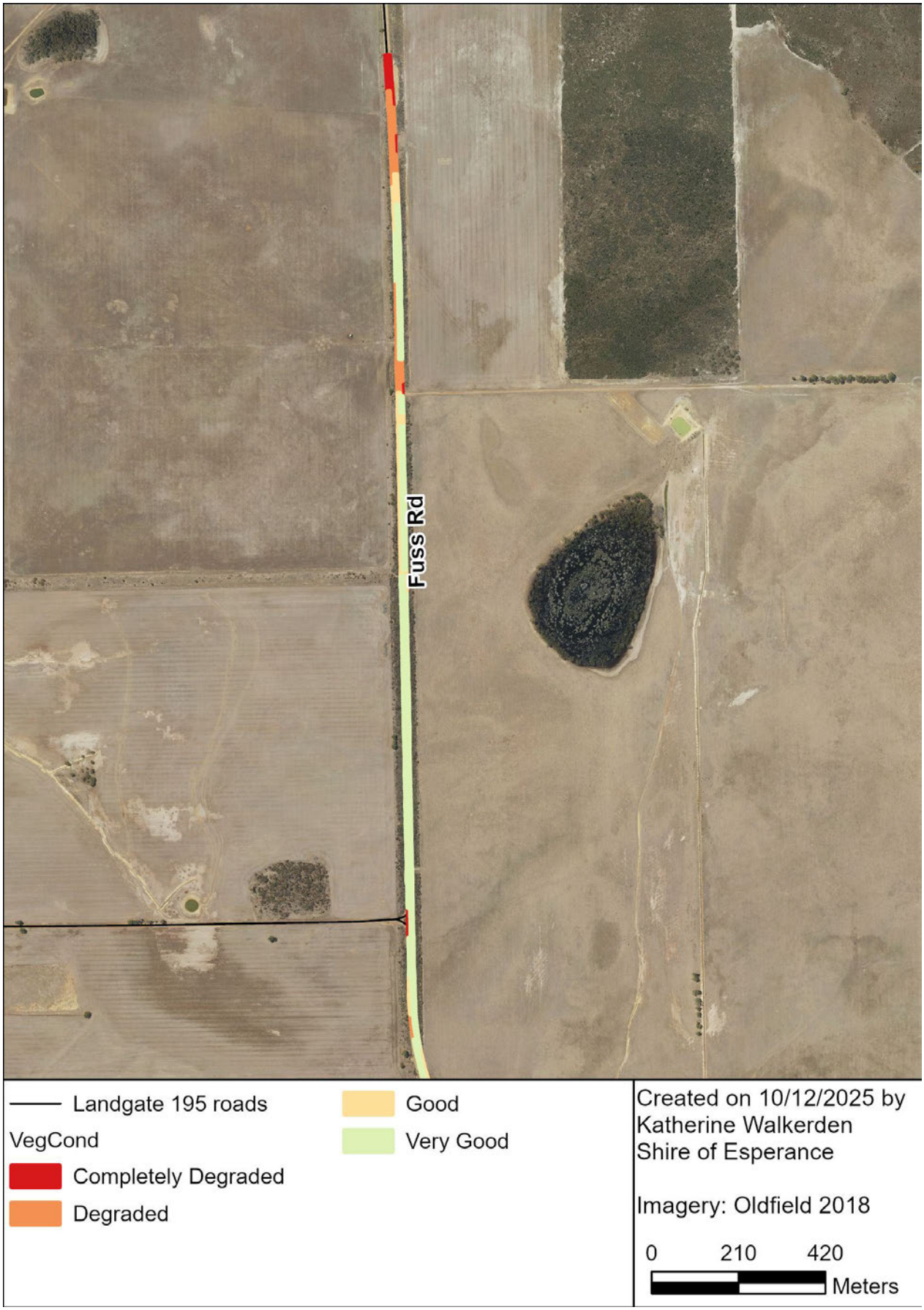

Figure 12. Vegetation condition within the Site B – Fuss Road survey area, from SLK 4.22 to 6.71 along Fuss Road.

Figure 13. Vegetation condition within the Fuss Road survey area, from SLK 6.50 to 8.50 along Fuss Road.

5.2.1 Weeds

Grass and agricultural weeds were prolific within sections of the survey area. Overall, 36 invasive species were identified within the survey area (Appendix 1). Of these, the most extensive and of serious concern were *Acacia longifolia* and *Asparagus asparagoides*. *Asparagus asparagoides* is a Weed of National Significance (WONS) and a priority environmental weed in the Shire of Esperance's Environmental Weed Strategy 2009-2018.

Non-native species had been planted by neighboring landowners, these include *Eucalyptus botryoides and Eucalyptus gomphocephala*. *Eucalyptus botryoides* was naturalizing with juveniles moving into the surrounding bushland.

5.2.2 Phytophthora dieback

The roadside vegetation contained large areas with healthy proteaceous vegetation (Figure 14) that is highly vulnerable to Phytophthora dieback. There were large, degraded areas of the survey area lacking proteaceous vegetation that could potentially harbour Phytophthora cinnamomi or Phytophthora multivora. There was no visible dieback fronts present within the survey area

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

Figure 14. Photo of healthy Proteaceous vegetation within the survey area. Photo taken by Katherine Walkerden on 12.09.2025.

5.3 Threatened ecological communities

The EPBC Act listed TEC, Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan) was recorded as occurring within the project area.

One vegetation community, described as 'Scattered Nuytsia and *Eucalyptus pleurocarpa* over mixed myrtaceous and proteaceous shrubland,' met the criteria to be considered as Kwongkan TEC. However, only areas within these vegetation communities in good condition or better were considered as Kwongkan TEC. In total, 0.01ha of vegetation proposed to be cleared was considered as Kwongkan TEC present within Site B – Fuss Road project area.

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 2023c). Within the Site B – Fuss Road area, vegetation type E was described as a '*Eucalyptus occidentalis* over *Melaleuca brevifolia* and *Melaleuca cuticularis*'. *E. occidentalis* were present but the vegetation type was present over a creekline rather than a circular basin. Thus, it is believed vegetation type E is unlikely to meet the listing criteria as a Swamp Yate PEC.

5.4 Flora

A total of 212 vascular plant taxa, representative of 129 genera and 47 families, were recorded within Fuss Road survey area. Of these 176 were native species and 36 were introduced. The plurality of taxa recorded were representative of the Myrtaceae (40 taxa), Proteaceae (26 taxa) and Fabaceae (25 taxa) families (see Appendix 1 for the complete incidental species list).

A number of plant specimens collected could not be identified accurately to the 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 species level. In these cases, the species is identified as, for example, *Verticordia* sp.

5.5 Threatened and priority flora

The targeted flora survey identified no PF or TF species, within the Fuss Road survey area.

5.6 Fauna

Of the conservation listed species identified within the Desktop survey, seven have potentially suitable habitat within the proposed clearing permit area.

5.6.1 Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, threatened fauna

The closest record was 3.42km 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). The SOE forms part of the non-breeding range of the Carnaby's black-cockatoo, with the closest breeding areas located approximately 80km west of the project area in the Ravensthorpe-Hopetoun area in pockets of suitable mature eucalypt woodland (DPAW, 2013). Several roosting sites

are known to occur within Esperance and the wider region, with tall trees such as *Eucalyptus occidentalis (*Swamp Yate), *E. gomphocephala* (Tuart), other eucalypts, and introduced pines favoured (DAWE, 2022).

Vegetation types A, and D contained potential foraging habitat due to a high proportion of proteaceous species within vegetation type A and *Allocasuarina huegeliana* within vegetation type D. The foraging quality scoring tool was not undertaken due to the total clearing of vegetation within these vegetation types being lower than the 1ha threshold for use of the tool.

Vegetation type E also contained potential night roosting habitat for the Carnaby's Cockatoo due to the presence of *Eucalyptus occidentalis* trees.

Given that the site did not:

- contain any nesting sites or large trees with hollows;
- the amount of high-quality foraging habitat was less than 1ha;
- 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.

5.6.2 Sharp-tailed Sandpiper, *Calidris acuminata*, MI

There were records of this species 2.74km from the survey 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, sedgelands 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.

Vegetation types C & F may provide some limited foraging habitat the species.

5.6.3 Red-necked Stint, *Calidris ruficollis*, MI

There was a record of this species 10.27km from the survey area. Examining nearby records the species has been recorded in nearby wetlands similar in size to the lake within the neighbouring Munglinup 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 & F may provide some limited foraging habitat the species.

5.6.4 Chuditch, *Dasyurus geoffroii*, VU

There was a 2001 record of this species 7.75km from the survey 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 the good or better-quality vegetation within this project area provides potentially suitable habitat for this species. In addition, the vegetation within this project likely provides important habitat connectivity to Munglinup Nature Reserve (Reserve 26410) and the Reserve 31759 (Munglingup River) which also contains large sections of suitable habitat.

5.6.5 Quenda, *Isoodon fusciventer*, P4

There was a 2014 record of this species 8.95km from the survey 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. In addition, the vegetation within this project likely provides important habitat connectivity to Munglinup Nature Reserve (Reserve 26410) and the Reserve 31759 (Munglingup River).

5.6.6 Wood Sandpiper, *Tringa glareola*, MI

There was record of this species 17.39km from the survey 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. The entire site is likely providing important habitat connectivity to Munglinup Nature Reserve (Reserve 26410) and Reserve 31759 (Munglingup River).

5.6.7 Tammar wallaby, Notamacropus eugenii derbianus, P4

This species was recorded 11.61km from the project area.

Vegetation within the project area provided potentially suitable habitat for the Tammar Wallaby with its habitat described as: "Low dense scrub vegetation for diurnal shelter, open grassy areas for feeding. Coastal scrub, heath, dry sclerophyll forest, and mallee and woodland thickets".

5.6.8 Western brush wallaby, Notamacropus Irma, P4

This species was recorded 6.63km from the project area.

Vegetation within the project area provided potentially suitable habitat for the Western Brush Wallaby with its habitat described as: "Open forest or woodland, favouring open seasonally-wet flats with low grasses and open scrubby thickets. Mallee and heathland".

6 REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION

The Site B – Fuss Road 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.

Likely at variance: Biodiversity within the survey area is high with 176 native species recorded over 6 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.

Likely at variance: The vegetation contains foraging habitat for Carnaby's Black Cockatoo due to the presence of vegetation high in Proteaceous species and sections of vegetation dominated by *Allocasuarina huegeliana*.

The Chuditch and Quenda had likely suitable habitat throughout a large section of the good or better condition vegetation within the project area.

There were several 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 Munglinup 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.

Not at variance: No priority or threatened flora species were observed in the area.

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.

Not at variance: Only 0.01ha of vegetation to be cleared met the definition of Kwongkan TEC, other areas within the site failed to meet the definition of Kwongkan TEC. No other TECs or PECs were relevant to the study area.

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.

May be at variance: There was 20% native vegetation within 5km of the survey area. The Fuss Road Reserve provides important ecological linkages between Munglinup Nature Reserve, Reserve 31759 (Munglinup River) and large patches of native vegetation present within private property.

Given the minimal clearing there is unlikely to be any significant impact to ecological connectivity.

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.

Likely at variance: Some vegetation (Vegetation types C and F) were growing in association with a watercourse and small ephemeral wetlands.

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

Not at variance: The area was mapped as a high wind erosion risk. Vegetation within this area will be providing limited function as windbreaks and erosion control for the agricultural areas surrounding it. Given the minimal clearing there is unlikely to be any significant increase to land degradation.

67.8 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.

Not at variance: The survey area is 822 metres away from Reserve 26410. Given the relatively low amount of native vegetation cleared will have little effect on the ecological linkages to this reserve.

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.

Not at variance: Given the minimal amount of clearing being conducted there is unlikely to be any significant impacts.

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.

Not at variance: Given the minimal amount of clearing being conducted there is unlikely to be any significant impacts.

7 RECOMMENDATIONS

As the Shire of Esperance Environmental Coordinator signs off on project work packs, the following recommendations will be included within the internal SOE approval process for the road project

- All vehicles and construction equipment to be cleaned prior to start of the project.
- Regular washdowns to occur during the project to reduce spread of weed and pathogens within the project area.
- Works to be carried out in the dry (summer) months to minimise spread of dieback.

- Onsite revegetation (Section 7.1) of historic sandpit within Fuss Road Reserve (0.06ha) and revegetation of historic sandpit within Reserve 35808 (0.07ha) will be carried out to offset this vegetation clearing.

7.1 Onsite revegetation plan

To offset the proposed clearing of 0.01ha of Kwonkgan TEC, two historic sandpits, one within the Fuss road reserve (0.06ha) and one within the Reserve 35808 (0.07ha) will be rehabilitated.

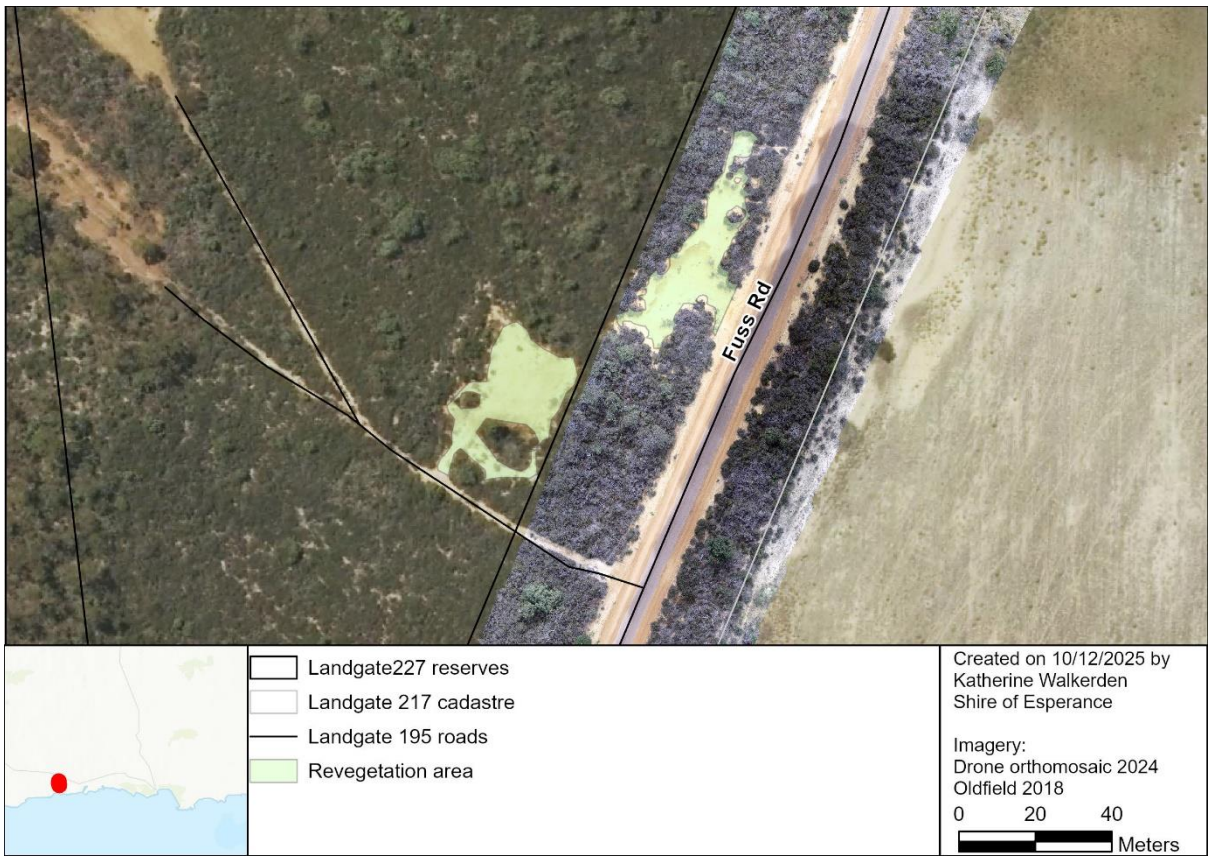

Figure 15. Map of the proposed two revegetation areas.

To meet the objectives of a successful scientific-based Revegetation Plan for the Fuss Road sandpits, numerous factors need to be considered and will be implemented, including the reference site, weed control, pest and disease hygiene practices, site preparation, species selection, completion criteria, monitoring and adaptive management practices in the need of contingency measures. These are outlined in sections 7.1.1 to .1.7,

Multispectral drone aerials will be conducted with adjacent remnant vegetation included in aerials to serve as a comparison for revegetation success. A reference quadrant has been set up in intact vegetation adjacent to the rehabilitation area.

7.1.1 Rehabilitation methodology

The revegetation will be carried out in a staged approach:

Stage 1 – Brushing will be spread at the same time clearing for the road reconstruction occurs. Only brushing from weed free areas in Very good or better condition will be deposited on the sites to minimise the risk of weed introduction.

Stage 2 - Additional planting works will be conducted if the outcome of the initial revegetation is not deemed successful. Seed will be collected within the Fuss Road Reserve and adjacent Reserve 35808 and provided to a wholesale supplier for seedling production. This work will be carried out over winter.

7.1.2 Weed control

Some Perennial Veldt grass was present within the unrehabilitated sandpit and will require control. Monitoring of weed presence will be required, and any weed issues will be addressed.

7.1.3 Disease hygiene management

There are many plant pathogens that can be spread by moving infected soil and plant material. Specifically, of focus is *Phytophthora* dieback. Hygiene measures to minimise the risk of diseases are a standard part of Shire of Esperance's practices when clearing vegetation, including –

- All machinery, plant and equipment shall be free of soil and vegetative matter prior to entering and leaving the site.
- Soil will only be moved during dry conditions.

7.1.4 Completion criteria

A high species richness was present at the site. A 10m x 10m reference quadrat survey was completed in November 2025. This survey can be used as a baseline for species richness. Multispectral drone aerials will also be used to assess vegetation density, a drone aerial will be flown prior to the rehabilitation, with neighbouring undisturbed vegetation functioning as a baseline.

Table 5. Completion criteria following the SMART (specific, measurable, achievable, relevant, time-bound) principles for the rehabilitation of the West Point Road gravel pit.

Criterion	Baseline floristic data	Completion target	Completion criteria
1	*Adenanthos cuneatus* dominant within neighbouring remnant vegetation quadrat.	*Adenanthos cuneatus* or other proteaceous species dominant within revegetation area.	*Adenanthos cuneatus* or other proteaceous dominant within revegetation quadrat.
2	5 proteaceous species present (25% of species) within neighbouring remnant vegetation quadrat.	High proteaceous species richness present within revegetation area.	5 or more proteaceous species are present within revegetation quadrat.
3	Vegetation cover in undisturbed neighbouring vegetation	A majority of vegetation cover has returned within the entire site	Drone aerial showing 60% of pre-clearing vegetative coverage throughout the revegetation area measured by NDVI.
4	Neighbouring vegetation was in excellent condition.	Vegetation condition of revegetation area is comparable to neighbouring remnant vegetation.	Revegetation area is in Excellent condition.

7.1.5 Monitoring

Monitoring of the rehabilitated area following gravel extraction will determine if completion criteria have been successful and if contingency measures are required (Section 7.1.6). The methodology for monitoring will involve onsite visual assessments to determine whether completion criteria have been

met, as outlined in Table 5. Monitoring will occur biennially by the Shire of Esperance's Environmental Team.

Baseline drone aerials will be taken prior to rehabilitation and drone aerials will begin two years after revegetation has occurred. This will continue until rehabilitation has been deemed successful.

7.1.6 Contingency measures

Where the rehabilitation is deemed unsuccessful by comparison to the completion criteria (Section 8.1.4), contingency measures will be undertaken, until the completion criteria are met sufficiently. This is an adaptive process and dependent on what completion criteria has failed. A few standard techniques are outlined below –

- If the composition of species does not meet criteria, then specific species will be infill planted and/or seeded during the next revegetation season from April to August.
- If the density of cover does not meet criteria, then the area will be infill planted and/or seeded with species from the preclearing species list (Appendix 1) during the next revegetation season from April to August.
- If listed environmental weeds exist in the site then herbicide and or manual control will be applied to affected areas.

7.1.7 Species selection

Keystone and dominant species will be selected as a contingency measure if respreading topsoil and stockpiled vegetation has unsuccessful germination and does not meet the completion criteria. The reference quadrat species data and the incidental species list from the 2025 survey (Appendix 1) will be the basis for determining species selection for seed and tubestock seedlings, based on availability and suitability to soil type. Seed can also be collected from the surrounding road reserve.

Figure 16. Sandpit present within Reserve. Photo taken by Katherine Walkerden on 04.04.2024.

Figure 17. Sandpit present within Road reserve. Photo taken by Katherine Walkerden on 19.11.2025

8 LIST OF PERSONNEL

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

Name	Julie Waters
Position	Environmental Coordinator
Project Involvement	Field Survey, Report Review
Qualifications	BEnvSc (Hons)
Experience	25 years working in environmental field including Flora Conservation Officer for previous DBCA, and 15 years' experience as a botanist in the region
Scientific Licence	FT61000787-2

Name	Katherine Walkerden
Position	Environmental Officer
Project Involvement	Desktop and Field Survey, Specimen Identification, GIS Mapping, Data Interpretation and Report writing
Qualifications	BSc, MEnvSc
Experience	Four years' experience as a botanist in the region
Scientific Licence	FT61000788-2

Name	Rosamund Mary Hoggart
Position	Environmental Assistant

Project Involvement	Specimen Identification
Qualifications and Experience	BSc (Hons)Ag
	20 years' experience as a botanist in the region and is highly regarded by Esperance Wildflower Society and her peers in Esperance as one of the best botanists in Esperance.
Scientific Licence	N/A

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Appendix 1: Incidental species list

Family	Taxon	Weed	BC Act (EPBC) conservation status	Herbarium reference
Asparagaceae	*Asparagus asparagoides*	X		
Asparagaceae	*Lomandra micrantha* ssp *teretifolia*			
Asteraceae	*Arctotheca calendula*	X		
Asteraceae	*Cirsium vulgare*	X		
Asteraceae	*Cotula turbinata*	X		
Asteraceae	*Hypochaeris radicata*	X		
Asteraceae	*Osteospermum ecklonis*	X		
Asteraceae	*Pseudognaphalium luteoalbum*	X		
Asteraceae	*Sonchus asper*	X		
Asteraceae	*Sonchus oleraceus*	X		
Asteraceae	*Ursinia anthemoides*	X		
Asteraceae	*Vellereophyton dealbatum*	X		
Brassicaceae	*Brassica napus*	X		
Brassicaceae	*Raphanus raphanistrum*	X		
Campanulaceae	*Wahlenbergia capensis*	X		
Caryophyllaceae	*Polycarpon tetraphyllum*	X		
Caryophyllaceae	*Spergularia marina*			
Casuarinaceae	*Allocasuarina huegeliana*			
Casuarinaceae	*Allocasuarina humilis*			
Casuarinaceae	*Allocasuarina lehmanniana* ssp *ecarinata*			
Centrolepidaceae	*Centrolepis aristata*			
Chenopodiaceae	*Tecticornia lylei*			
Crassulaceae	*Crassula decumbens*			

Cupressaceae	*Callitris roei*			
Cyperaceae	*Caustis dioica*			
Cyperaceae	*Chorizandra enodis*			
Cyperaceae	*Cyperus tenellus*	X		
Cyperaceae	*Ficinia marginata*	X		
Cyperaceae	*Ficinia nodosa*			
Cyperaceae	*Gahnia ancistrophylla*			
Cyperaceae	*Gahnia* sp. Headland			KSW03425
Cyperaceae	*Gahnia trifida*			
Cyperaceae	*Lepidosperma leptostachyum*			
Cyperaceae	*Lepidosperma squamatum*			
Cyperaceae	*Lepidosperma tuberculatum*			
Cyperaceae	*Machaerina juncea*			
Cyperaceae	*Mesomelaena tetragona*			
Cyperaceae	*Mesomelaena stygia*			
Cyperaceae	*Netrostylis* sp. Mt Madden			
Cyperaceae	*Schoenus brevisetis*			
Cyperaceae	*Schoenus laevigatus*			
Cyperaceae	*Schoenus subfascicularis*			
Cyperaceae	*Schoenus subflavus* ssp long leaves			
Cyperaceae	*Lepidosperma carphoides*			
Dilleniaceae	*Hibbertia gracilipes*			
Dilleniaceae	*Hibbertia acerosa*			
Dilleniaceae	*Hibbertia pungens*			
Droseraceae	*Drosera glanduligera*			
Droseraceae	*Drosera intricata*			KSW03225
Droseraceae	*Drosera leucoblasta*			
Droseraceae	*Drosera neesii*			
Droseraceae	*Drosera* sp. Branched styles			
Ericaceae	*Andersonia parviflora*			
Ericaceae	*Leucopogon* sp. Coujinup			
Ericaceae	*Lysinema ciliatum*			
Ericaceae	*Styphelia intertexta*			
Ericaceae	*Styphelia prostrata*			
Ericaceae	*Acrotriche cordata*			
Euphorbiaceae	*Stachystemon virgatus*			
Fabaceae	*Acacia aemula*			
Fabaceae	*Acacia biflora*			
Fabaceae	*Acacia crispula*			
Fabaceae	*Acacia cyclops*			
Fabaceae	*Acacia gonophylla*			
Fabaceae	*Acacia ingrata*			
Fabaceae	*Acacia longifolia*	X		
Fabaceae	*Acacia myrtifolia*			

Fabaceae	*Acacia saligna*			
Fabaceae	*Chamaecytisus palmensis*	X		
Fabaceae	*Chorizema aciculare*			
Fabaceae	*Daviesia lancifolia*			
Fabaceae	*Daviesia teretifolia*			
Fabaceae	*Dillwynia divaricata*			
Fabaceae	*Eutaxia cuneata*			
Fabaceae	*Gastrolobium latifolium*			
Fabaceae	*Gastrolobium spinosum*			
Fabaceae	*Gompholobium knightianum*			
Fabaceae	*Hovea trisperma*			
Fabaceae	*Jacksonia condensata*			
Fabaceae	*Jacksonia viscosa*			
Fabaceae	*Jennata indira* ssp *indira*			
Fabaceae	*Kennedia nigricans*			
Fabaceae	*Ornithopus compressus*	X		
Fabaceae	*Templetonia neglecta*			
Goodeniaceae	*Coopernookia polygalacea*			
Goodeniaceae	*Dampiera lavandulacea*			
Goodeniaceae	*Dampiera sacculata*			
Haemodoraceae	*Conostylis bealiana*			
Haemodoraceae	Conostylis seorsifolia ssp seorsifolia			
Haemodoraceae	*Haemodorum* sp.			
Haloragaceae	*Glischrocaryon angustifolia*			
Hemerocallidaceae	*Chamaescilla corymbosa*			
Hemerocallidaceae	*Agrostocrinum scabrum* ssp *scabrum*			
Hemerocallidaceae	*Dianella revoluta*			
Iridaceae	*Romulea rosea*	X		
Iridaceae	*Patersonia juncea*			
Iridaceae	*Patersonia occidentalis*			
Iridaceae	*Patersonia lanata*			
Juncaceae	*Juncus microcephalus*	X		
Juncaceae	*Juncus pallidus*			
Juncaginaceae	*Triglochin minutissima*			
Juncaginaceae	*Triglochin mucronata*			
Lamiaceae	*Microcorys subcanescens*			
Lauraceae	*Cassytha melantha*			
Lauraceae	*Cassytha racemosa*			
Loranthaceae	*Nuytsia floribunda*			
Lythraceae	*Lythrum hyssopifolia*	X		
Malvaceae	*Thomasia angustifolia*			
Malvaceae	*Lasiopetalum rosmarinifolium*			
Myrtaceae	*Agonis flexuosa*	X		

Myrtaceae	*Apectospermum spinescens*			
Myrtaceae	*Astartea astarteoides*			
Myrtaceae	*Astartea cicatricosa*			
Myrtaceae	*Austrobaeckea pachyphylla*			
Myrtaceae	*Beaufortia micranthera*			
Myrtaceae	*Beaufortia schaueri*			
Myrtaceae	*Calothamnus gracilis*			
Myrtaceae	*Calothamnus quadrifidus*			
Myrtaceae	*Chamelaucium ciliatum*			
Myrtaceae	*Conothamnus aureus*			
Myrtaceae	*Darwinia vestita*			
Myrtaceae	*Eucalyptus connexa*			
Myrtaceae	*Eucalyptus cylindrocarpa*			
Myrtaceae	*Eucalyptus gomphocephala*	X		
Myrtaceae	*Eucalyptus leptocalyx*			
Myrtaceae	*Eucalyptus occidentalis*			
Myrtaceae	*Eucalyptus phaenophylla*			
Myrtaceae	*Eucalyptus pleurocarpa*			
Myrtaceae	*Eucalyptus botryoides*	X		KSW03525
Myrtaceae	*Leptospermopsis erubescens*			
Myrtaceae	*Leptospermopsis oligandrum*			
Myrtaceae	*Melaleuca acuminata*			
Myrtaceae	*Melaleuca brevifolia*			
Myrtaceae	*Melaleuca brevifolia*			
Myrtaceae	*Melaleuca calycina*			
Myrtaceae	*Melaleuca carrii*			
Myrtaceae	*Melaleuca cuticularis*			
Myrtaceae	*Melaleuca fulgens*			
Myrtaceae	*Melaleuca hamata*			
Myrtaceae	*Melaleuca pulchella*			
Myrtaceae	*Melaleuca suberosa*			
Myrtaceae	*Melaleuca glaberrima*			
Myrtaceae	*Melaleuca striata*			
Myrtaceae	*Melaleuca suberosa*			
Myrtaceae	*Micromyrtus elobata* ssp *elobata*			
Myrtaceae	*Phymatocarpus maxwellii*			
Myrtaceae	*Taxandria spathulata*			
Myrtaceae	*Verticordia chrysanthella*			
Myrtaceae	*Verticordia* sp.			
Orchidaceae	*Disa bracteata*	X		
Pittosporaceae	*Billardiera fusiformis*			
Pittosporaceae	*Marianthus bicolor*			
Poaceae	*Austrostipa elegantissima*			
Poaceae	*Austrostipa hemipogon*			

Poaceae	*Avena barbata*	X		
Poaceae	*Briza maxima*	X		
Poaceae	*Ehrharta calycina*	X		
Poaceae	*Eragrostis curvula*	X		
Poaceae	*Hordeum leporinum*	X		
Poaceae	*Lolium* sp.	X		
Poaceae	*Neurachne alopecuroidea*			
Poaceae	*Triticum aestivum*	X		
Polygalaceae	*Comesperma polygaloides*			
Polygonaceae	*Rumex crispus*	X		
Proteaceae	*Adenanthos cuneatus*			
Proteaceae	*Banksia pteridifolia*			
Proteaceae	*Banksia armata*			
Proteaceae	*Banksia repens*			
Proteaceae	*Banksia repens*			
Proteaceae	*Banksia violacea*			
Proteaceae	*Grevillea concinna* ssp *lemanniana*			
Proteaceae	*Grevillea nudiflora*			
Proteaceae	*Grevillea oligantha*			
Proteaceae	*Hakea laurina*			
Proteaceae	*Hakea lissocarpha*			
Proteaceae	*Hakea marginata*			
Proteaceae	*Hakea pandanicarpa* ssp *pandanicarpa*			
Proteaceae	*Hakea prostrata*			
Proteaceae	*Hakea trifurcata*			
Proteaceae	*Hakea varia*			
Proteaceae	*Hakea corymbosa*			
Proteaceae	*Isopogon polycephalus*			
Proteaceae	*Isopogon spathulatus* ssp *elongatus*			
Proteaceae	*Lambertia inermis* var *drummondii*			
Proteaceae	*Lambertia inermis* var *inermis*			
Proteaceae	*Lambertia inermis*			
Proteaceae	*Petrophile fastigiata*			
Proteaceae	*Petrophile squamata*			
Proteaceae	*Synaphea petiolaris* ssp *petiolaris*			
Proteaceae	*Synaphea spinulosa* ssp *major*			
Ranunculaceae	*Clematis pubescens*			
Restionaceae	*Chordifex laxus*			
Restionaceae	*Chordifex sphacelatus*			
Restionaceae	*Hypolaena exsulca*			
Restionaceae	*Hypolaena humilis*			
Restionaceae	*Lepidobolus preissianus*			
Restionaceae	*Lepyrodia macra*			

Rhamnaceae	*Cryptandra myriantha*			
Rhamnaceae	*Pomaderris brevifolia*			
Rhamnaceae	*Spyridium microcephalum*			
Rhamnaceae	*Stenanthemum notiale*			
Rubiaceae	*Opercularia vaginata*			
Rutaceae	*Boronia scabra ssp scabra*			KSW03325
Rutaceae	*Boronia spathulata*			
Rutaceae	*Cyathostemon ramosus* ssp *anethifolia*			
Santalaceae	*Exocarpos sparteus*			
Sapindaceae	*Dodonaea caespitosa*			
Scrophulariaceae	*Zaluzianskya divaricata*	X		
Stylidiaceae	*Stylidium rupestre*			
Thymelaeaceae	*Pimelea brachyphylla*			
Violaceae	*Pigea floribunda*			
Xanthorrhoeaceae	*Xanthorrhoea platyphylla*			

Appendix 2: Description of threatened and priority flora species with the potential to occur within the Fuss Road survey area

Threatened or priority flora identified by the desktop study to be present within a 20km radius of Site B – Fuss Road survey area, using Threatened and Priority Flora Reporting (TPFL; DBCA 2025a), WA Herbarium (DBCA 2025b) and Esperance District Threatened Flora (DBCA 2024c).
Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), critically endangered (CR) endangered (EN) and vulnerable (VU).

Taxon	BC Act (EPBC) Conservation Status	Associated Habitat	Likely to occur	Distance from site (km)
Allocasuarina hystricosa	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 Acacia ophiolithica and Hakea verrucosa, and heathland with Allocasuarina campestris.	No	13.58
Astartea reticulata	P3	Restricted to damp areas/seasonal wetlands – including road drains.	Yes	6.08
Boronia oxyantha var brevicalyx	P3	Slight slope. Moist with leaf litter. Grey-brown sandy clay. Shrub Mallee, Scrub, Low Heath D. Eucalyptus sp., Cupressaceae, Baeckea sp., Melaleuca sp.	Yes	14.96
Caladenia arrecta	P4	Grows on loam, gravel, and laterite. Associated with moist conditions.	Yes	8.89
Caladenia x triangularis	P4	Undulating heavy loam	No	6.27
Commersonia rotundifolia	P3	Eucalyptus platypus woodland over Acacia shrubland. Clay Loam Soil.	No	9.53
Conostylis lepidospermoides	T	Deep sand plains with diverse shrubland, often with Kwongkan.	Yes	4.10
Corysanthes limpida	P4	Sand. Coastal dunes.	No	13.98
Dampiera sericantha	P3	Recorded across a variety of soil types on plans, including sand or gravel.	Yes	3.12
Dampiera sp. Ravensthorpe (G.F. Craig 8277)	P3	Steep sandstone breakaway, brown sand. Burned areas. Low open Eucalyptus woodland,	Yes	9.24
Daviesia pauciflora	P3	Associated with Proteaceae-dominated Kwongkan sandplain.	Yes	1.12
Eucalyptus famelica	P3	Associated with coastal dunes on low ground, saline waterlogged soils. Associated vegetation is open Mallee community.	No	15.97
Eucalyptus preissiana ssp. lobata	P4	Coastal limestone rises and sand dunes	No	7.64

Eucalyptus x missilis	P4	Sand over limestone or granite. Coastal sites.	No	11.08
Euchilus calycinus ssp. proxenus	P4	Reddish brown, clay loam, Silt. Slopes, and ridges. Frequently associated with Magnesite.	No	11.22
Grevillea fastigiata	P4	Red brown clay or loam. Mallee shrubland or tall heath.	Yes	7.26
Hopkinsia adscendens	P3	Sand. Dry or seasonally damp habitats along streams.	Yes	16.49
Lepidosperma sp. Mt Chester (S. Kern et al. LCH 16596)	P1	Grey-brown clay loam with 50-90 % sandstone surface. Low open mallee woodland of Eucalyptus flocktoniae subsp. flocktoniae, Eucalyptus leptocalyx subsp. leptocalyx and Eucalyptus phaenophylla subsp. interjacens over tall sparse shrubland of Banksia media over mid shrubland of Melaleuca rigidifolia over low shrubland of Daviesia articulata and Hibbertia pungens.	Yes	11.23
Leucopogon sp. Cascades (M. Hislop 3693)	P1	Dry, brown, sandy loam. Mallee woodland, Kwongkan shrublands.	Yes	7.39
Persoonia brevirhachis	P3	White or yellow sand, gravelly sandy soils. Loose thickets.	Yes	13.04
Rhizanthella johnstonii	T	Sandy clay soil or deep sandy soil. Growing under Melaleuca uncinata in dense shrubland.	No	6.68
Stachystemon vinosus	P4	Fine loamy sand, stony soils. Sandplains, rock crevices on breakaways.	Yes	7.21
Styphelia blepharolepis	P4	Sand. Myrtaceous and proteaceous shrubland.	Yes	5.49
Synaphea sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200)	P1	Red-brown clayey sand, sandy loam, gravel, laterite. Slopes, road verges, regrowth areas.	Yes	11.78
Thomasia pygmaea	P3	Brown clayey sand over laterite. Eucalyptus woodland with myrtaceous shrubs.	Yes	16.46
Thysanotus brachiatus	P2	Sand. Plain, level or gently undulating.	Yes	7.14

Appendix 3: Description of threatened and priority fauna species with the potential to occur within the Fuss Road survey area

Threatened or priority fauna identified by the desktop study to be present within a 20km radius of Site B – Fuss Road survey area, using threatened and priority fauna dataset (DBCA 2025d) and species identified by the EPBC protected matters search tool (PMST).
Nt. Acronyms used in the table include: Extinct (EX), Critically Endangered (CR) endangered (EN) and Vulnerable (VU).

Taxon	Common Name	WA Cons Status	EPBC Status	Associated Habitat	Likely to occur	Distance from site (km)	PMST
Actitis hypoleucos	Common sandpiper	MI	MI	Known from Nuytsland NR and Roebuck Bay in WA. Breeds in Europe, Asia and sometimes Africa during boreal summer, migrates to Australia during austral summer. Forages in coastal and inland wetlands in shallow water and on soft bare mud at wetland margins and mangroves, and sometimes grassy areas adjoining wetlands. Also stream deltas, lake shores, claypans, and dams. Roosts generally on rocks, or in roots or branches of vegetation. Perches on posts, jetties, moored boats and other artificial structures.	No	8.61	
Aphelocephala leucopsis	Southern whiteface		VU	Wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. Southern whiteface forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover. Birds mainly feed on insects, spiders, and seeds, largely gleaned from the bare ground or leaf litter. The only record of this species within the Esperance region was located in the Peak Charles area.	No		Likely
Apus pacificus	Fork-tailed swift	MI	MI	Along WA South Coast, records scattered between Denmark and Eyre Bird Observatory, and some sparse inland records from the wheatbelt. Almost exclusively aerial, mostly occurring over inland plains and sometimes coastal areas, including offshore islands and cliffs. Insectivorous.	No	10.33	

Ardenna tenuirostris	Short-tailed shearwater	MI	MI	Occurs throughout Recherche Archipelago and south-eastern coastline of Australia for breeding season. Adults forage in open and coastal ocean for krill, squid and fish, and feed to chicks raised in excavated tunnel burrows. Burrows ~ 1 m long. Threatened by entanglement with fishing gear / bycatch, commercial harvesting, marine plastic pollution, trampling of burrows by humans and feral animals, and predation by feral cats.	No	14.94	
Botaurus poiciloptilus	Australasian bittern	EN	EN	Densely-vegetated freshwater and slightly brackish wetlands and lakes across the south coast eat to Cape Arid. Beds of tall bulrush (Typha sp.), Baumea, and sedges in freshwater swamps. Nests in rough platform of bulrush and sticks placed in tea trees or other shrubs just above the waterline. Eggs laid between September to December. Threatened by swamp drainage and development, decling water qualities.	No		May
Calidris acuminata	Sharp-tailed sandpiper	MI	MI	Breeds in northern Siberia in June to August, before migrating to Australia and NZ for non-breeding season. Widespread in both inland and coastal locations of fresh and saline habitats. Widespread from Cape Arid to Carnarvon. Utilises fresh to hypersaline aquatic environments; edges of mudflats, sewage ponds, wetlands, and inundated pastures. Roosts on rocky and sandy beaches, and wetland vegetation. Omnivorous; diet of seeds, worms, molluscs, crustaceans, and insects.	Yes	2.74	May
Calidris canutus	Red knot, Knot	EN	EN & MI	Sheltered bays, inlets, estuaries, intertidal mudflats and protected sandy or coralline shores. Occasionally sighted in saltworks, sewage farms, saltmarsh, shallow wetlands (incl. lakes, swamps, riverbanks, dams, soaks and flooded paddocks). Most frequently sighted in dense flocks feeding or roosting.	No		May
Calidris ferruginea	Curlew sandpiper	CR	CR & MI	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	No	15.18	May

				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.			
Calidris melanotos	Pectoral sandpiper	MI	MI	Rarely recorded in WA; observed at Nullarbor Plain, Stoke's Inlet, Lake Warden, Dalyup and Yellilup Swamp, Lake Grasmere (near Albany), and up to Swan River, coastal Gascoyne, Pilbara and Kimberley.	No	17.39	
Calidris ruficollis	Red-necked stint	MI	MI	Migrates to Australia during austral summer. Sheltered inlets, bays, and estuaries with intertidal mudflats, ocasionally on protected sandy shores. Sometimes on stony / rocky shores, saltworks, sewage farms, lagoons, lakes, swamps, riverbanks, flooded paddocks, and dams.	No	10.27	
Charadrius cucullatus	Hooded plover	P4		Open, flat sandy beaches with abundant seaweed / beach wrack, and backed by low sand dunes, avoiding steep, narrow beaches. Sometimes occur on inland salt lakes. Often sighted near water's edge and lay their eggs in shallow scrapes in the sand along the upper beach or in low dunes between August and February, sometimes to April.	No	3.42	
Daphnia jollyi	Water flea	P1		Endemic to Western Australia, where it inhabits fresh shallow pools over granite rock. It is associated with the 'Granite outcrop pools with endemic aquatic fauna' PEC.	No	1.61	
Dasyurus geoffroii	Chuditch, Western quoll	VU	VU	Currently restricted to south-western WA, with population strongholds in dry sclerophyll forest and dry woodland and mallee-heath, namely in Lake Magenta NR, Southern Forests, Julimar State Forest, and Fitzgerald River NP. Require hollow logs, earth burrows, and occasionally hollowed-out termite mounds for daytime shelter / nesting. Hollow tree bases occasionally used. Diet is broad and consists largely of small mammals, amphibians, small reptiles, invertebrates, freshwater crustaceans, small birds. Occupies even high-quality habitats at low densities due to territorial behaviour - female habitats extend over core areas of 55-120 ha and don't overlap, whilst male territories extend over 400 ha or more and overlap. Although meso-predator, chuditch threatened by raptor and	Yes	7.75	Likely

				feral fox predation, drowning in dam nets, injury in traps set-up for foxes or rabbits, and previously deliberate shooting by landholders. Recently re-introduced to AWC Mt Gibson Sanctuary (2022).			
Falco hypoleucos	Grey falcon	VU	VU	The distribution of this species is restricted largely to areas of the highest annual average temperatures where there is an average annual rainfall of less than 500 mm. It favours lightly timbered and untimbered lowland plains that are crossed by tree-lined watercourses. It uses the abandoned nests of other bird species, particularly corvids.	No		Likely
Falco peregrinus	Peregrine falcon	OS		Broad habitat range, from tropical and temperate rainforests to arid zone, and alpine areas. Requires abundant prey and secure nest sites, preferring cliffs (both inland and coastal) or open woodlands in close proximity to water. Pairs maintain a home range of approximately 20-30 sq km, laying eggs in cliff recesses, tree hollows or abandoned nests of other large birds.	No	3.76	
Hydroprogne caspia	Caspian tern	MI	MI	Known to breed in the Recherche Archipelago and north to Dirk Hartog and Faure Islands in Shark Bay. Nests in open, sparsely vegetated areas with some shelter (i.e. near bushes, large sticks, driftwood, clumps of beach wrack) and consists of a shallow scape in the ground, often lined with grass, seaweed, feathers, small stones and shells. Coastal and offshore island habitats; sheltered seas, estuaries, tidal creeks, near-coastal salt lakes and brackish pools, open wetlands. Very unlikely to use fresh waters. Feeds predominantly on fish, bird eggs, carrion, aquatic invertebrates, flying insects and earthworms.	No	8.61	
Isoodon fusciventer	Quenda, Southwestern brown bandicoot	P4		Sandy soils with scrubby vegetation, open forest and woodland; crepuscular and during day sleeps on grassy nest in dense vegetation. Opportunistically utilises fresh growth in small, recently-burnt areas; prefers swamp habitats. Often habituated to urban environments where bushland present. Mycophagous, as well as eating small invertebrates and vegetative matter.	Yes	8.95	
Leipoa ocellata	Malleefowl	VU	VU	Semi-arid to arid, long-unburnt mallee-dominated areas with sandy (can be sandy gravel) substrate and abundant leaf-litter for nest	No	3.74	Likely

				mound building. Occasionally low E. wandoo or E. astringens woodlands and mulga shrublands dominated by Eucalyptus, Callitris, and Acacia sp. Diet consists of Acacia seeds, flower blossoms, buds, fruit and lerps, and soil invertebrates. Construct distinctive nest mounds that can exceed 4 m across and 1 m high. Threatened by habitat fragmentation, degradation of habitat by feral ungulates and rabbits, altered fire regimes, vehicle strike, and feral predators.			
Limosa lapponica	Bar-tailed godwit	MI	MI	Estuarine sand and mud flats, sandy beaches (including with beach wrack), reef flats and near-coastal salt lakes. Migrates to south coast from Arctic Circle during austral summer. Very rare visitor to Esperance region - normally south to Garden Island, but likely habitat between Stokes Inlet and Cape Arid.	No	17.39	
Neophoca cinerea	Australian sea-lion	EN	EN	Range extending south along the coastline and offshore islands from Houtman Albrohos Islands, WA, and east to just beyond Kangaroo Island, SA. Occasionally comes on mainland shores, particularly inaccessibly bays and isolated beaches, but most often hauls-out onto offshore rocks and islands. Breeding rookeries are on offshore islands, females breed asynchrously and return to their island of birth to breed. Feeds on fish, squid, and cephalopods.	No	13.66	
Notamacropus eugenii derbianus	Tammar wallaby	P4		Low dense scrub vegetation for diurnal shelter, open grassy areas for feeding. Coastal scrub, heath, dry sclerophyll forest, and mallee and woodland thickets. Crepuscular; rests in scrub during day and venture into open areas after dark. Able to drink sea water or go without fresh water for long periods. Solitary except for females with young.	Yes	11.61	
Notamacropus irma	Western brush wallaby	P4		Open forest or woodland, favouring open seasonally-wet flats with low grasses and open scrubby thickets. Mallee and heathland.	Yes	6.63	
Numenius madagascariensis	Eastern curlew	CR	CR & MI	Far eastern curlews are endemic to the East Asian – Australasian Flyway. The species breeds in Siberia and far eastern Russia and north-eastern China. During the austral summer non-breeding season, most (estimated at 73 percent) of the species' population occurs in Australia. Within Australia, far eastern curlews have a mostly coastal	No	17.39	Likely

				distribution; they are rarely recorded inland. The species mainly forages around sheltered intertidal sandflats or mudflats that are open and without vegetation or seagrass. The species often also forages near mangroves, on saltflats or saltmarsh, around rockpools, amongst rubble on coral reefs, and on ocean beaches near the tideline.			
Numenius phaeopus	Whimbrel	MI	MI	Feed on intertidal mudflats for worms, crustaceans and occasionally fish and nestling birds. Coastal areas on tidal and estuarine mudflats, especially near mangroves. Sometimes found on beaches and rocky shores. Breed in Artic Circle during boreal summer. Threatened by wetland destruction, altered wetland drainage, pollution and hunting.	No	8.61	
Oxyura australis	Blue-billed duck	P4		Deeper freshwater swamps and lakes; occasionally saltlakes and estuaries recently freshened by flood or rain waters. Breeds on well-vegetated freshwater lakes, nests usually made of bulrushes (*Typha* sp.) trampled over leaning fork of dense teatree or melaleuca. Often lined with down and paperbak and and screened from above with growing bulrushes.	No	10.44	
Pandion haliaetus	Osprey	MI	MI	Littoral and coastal habitats and terrestrial wetlands, as well as offshore islands. Sometimes travel inland along major rivers, especially in northern Australia. Require extensive areas of open fresh, brackish or saline water for hunting. Foraging habitat include inshore waters, reefs, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs, large lakes, and waterholes. Favours fish, especially mullet, but will occasionally take molluscs, insects, reptiles and mammals. Adult ospreys often resident around breeding territories. Conspicuous nests consist of a large stack of sticks up to 2 m in diameter and 2.5 m deep, either on the ground or high in tree.	No	14.04	
Pluvialis fulva	Pacific golden plover	MI	MI	Salt or brackish marshes near estuaries and coastal salt lakes, near-coastal grassy flats, tidal mudflats, beaches, sewage ponds, and soaks.	No	8.61	

Pluvialis squatarola	Grey plover	MI	MI	Coastal areas between September and April; sandy and beach wrack-covered beaches, tidal reef and mudflats, shores of near-coastal saltlakes, saltwork ponds, and drying freshwater lakes.	No	17.39	
Psophodes nigrogularis	Western whipbird	EN	EN	Inhabits dense heath-like shrubby thickets on coastal dunes and mallee woodland or shrubland with an open canopy and dense understorey. Prefers understorey 2-3 m tall, with Agonis marginata, Hakea elliptica, H. trifurcata, Banksia formosa, Eutaxia obovata, Acacia mityfolia, and Gastrolobium bilobum.	Yes	17.82	
Sternula nereis nereis	Australian fairy tern	VU	VU	Southern Australian coastline from Dampier Archipelago, WA to Botany Bay, NSW, with gaps across the Great Australian Bight and Victorian coastline. Migratory, dispersing south from Shark Bay to breed between the Houtman Albrolhos Islands and Recherche Archipelago between September and May. Night roosts generally on open shore features such as sandspits, away from vegetation cover and predators. Breeding areas in WA tend to be elevated, sparsely vegetated areas with shallow scrapes in the sand, occasionally lined with small shells and vegetation. Sandy islands, lakes on islands, beaches along coastal estuaries, open sandy beaches, in clear view of water. Nest in shallow scrapes, occasionally using seagrass-covered beaches. Coastal foragers, diving to hunt for fish.	No		May
Thalassarche melanophris	Black-browed albatross	EN	VU & MI	Marine species that inhabits Antarctic, sub-Antarctic and temperate waters and occasionally enters the tropics.	No	14.94	
Thalasseus bergii	Crested tern	MI	MI	Coastlines and islands, excluding the most remote islands of the Archipelago of the Recherche. Forages over coastal ocean (< 3 km of land), including southern estuaries in summer and autumn. Solitary hunters but roost communially of up to 700, such as off Seal Rock and Six Mile Is. Nests consist of a shallow scape in sand lined with twiglets or grass, often in bare areas or low-lying vegetation, especially of Carpobrotus virescens. Majority of eggs laid from August to November.	No	8.61	

Tringa glareola	Wood sandpiper	MI	MI	Coastal plains and lower reaches of large rivers, where forages in shallow fresh water lagoons, swamps and river pools, and occasionally brackish swamps. Rarely saltlakes or estuaries.	No	17.39	
Tringa nebularia	Common greenshank	MI	MI	Shallow freshwater claypans, lagoons, swamps, river pools, dams and sewage ponds; saline or brackish estuaries, mangroves, lakes, samphire flats, reef flats and saltwork ponds.	No	2.74	May
Tringa stagnatilis	Marsh sandpiper	MI	MI	Shallow fresh or brackish swamps, lakes, river pools, soaks, sewage ponds, and bore overflows. Rarely inhabits estuarine and salt lake environments.	No	15.69	
Zanda latirostris	Carnaby's cockatoo	EN	EN	Nomadic, breeding in old-growth (> 250 yrs old) eucalypt woodland along south coast and throughout wheatbelt to Kalbarri. Feeds on proteaceous shrubs and heath and adjacent eucalypt woodland; eats seeds of Banksia, Hakea, Grevillea, Allocasuarina and introduced pines, as well as flowers of Eucalyptus, Banksia, Hakea, Melaleuca, Calothamnus, Callistemon, etc. Also known to roost in Swamp Yate (E. occidentalis). In non-breeding season most flocks migrate to coastal feeding territories along the south coast, midwest, and south-west; this is the period when most Carnaby's are sighted in Esperance, with numerous roosts known in Tuart, Maritime Pine, and Swamp Yate trees in the region. Not known to breed east of Cocanarup Timber Reserve. Several sighted in Alexander Bay in January 2024.	Yes	3.42	Likely

Appendix 4: EPBC Protected matters search tool report

Listed threatened ecological communities

		Presence	
Community name	**Threatened category**	**Rank**	**Text**
Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Endangered	Likely	Community likely to occur within area

Listed Threatened Species

Scientific name	Common name	Simple presence	Threatened category	Migratory status
Anigozanthos bicolor subsp. minor	Two-coloured kangaroo paw	Likely	Endangered	
Aphelocephala leucopsis	Southern whiteface	May	Vulnerable	
Botaurus poiciloptilus	Australasian bittern	May	Endangered	
Calidris acuminata	Sharp-tailed sandpiper	May	Vulnerable	Migratory
Calidris canutus	Red knot	May	Vulnerable	Migratory
Calidris ferruginea	Curlew sandpiper	May	Critically Endangered	Migratory
Conostylis lepidospermoides	Sedge Conostylis	Likely	Endangered	
Dasyurus geoffroii	Chuditch, Western quoll	Likely	Vulnerable	
Falco hypoleucos	Grey falcon	Likely	Vulnerable	
Leipoa ocellata	Malleefowl	Likely	Vulnerable	
Numenius madagascariensis	Eastern curlew	May	Critically Endangered	Migratory
Ricinocarpos trichophorus	Barrens Wedding Bush	May	Endangered	
Sternula nereis nereis	Australian fairy tern	May	Vulnerable	
Tringa nebularia	Common greenshank, Greenshank	Likely	Endangered	Migratory
Zanda latirostris	Carnaby's black cockatoo	Likely	Endangered	

Appendix 5: BC Act (2016) Threatened and priority flora and fauna definitions

Category	Definition
T – Threatened	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: **CR:** Critically Endangered – considered to be facing an extremely high risk of extinction in the wild (Schedule 1); **EN:** Endangered – considered to be facing a very high risk of extinction in the wild (Schedule 2); or **VU:** Vulnerable – considered to be facing a high risk of extinction in the wild (Schedule 3). **EX:** Presumed Extinct – taxa that have been adequately searched for and there is no reasonable doubt that the last individual has died (Schedule 4)
P1 – Priority 1 (Poorly known taxa)	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. 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.
P2 – Priority 2 (Poorly known taxa)	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. 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.
P3 – Priority 3 (Poorly known taxa)	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. 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.
P4 – Priority 4 (Rare, Near Threatened and other taxa in need of monitoring)	**1. Rare** - 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. **2. Near Threatened** - 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. **3.** Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy

Appendix 6: EPBC Act (1999) definition of threatened flora and fauna species

Category Code	Category
Ex	**Extinct** 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	**Extinct in the Wild** 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	**Critically Endangered** 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	**Endangered** 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	**Vulnerable** 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	**Conservation Dependent** 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: BC Act (2016) Definition of threatened ecological communities

Category Code	Category
PTD	**Presumed Totally Destroyed** 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: (i) records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or; (ii) all occurrences recorded within the last 50 years have since been destroyed.
CE	**Critically Endangered** 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: (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; (ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area; (iii) The ecological community is highly modified with potential of being rehabilitated in the immediate future.
E	**Endangered** 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: (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; (ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area; (iii) The ecological community is highly modified with potential of being rehabilitated in the short term future.
V	**Vulnerable** 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: (i) The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated; (ii) The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution; (iii) The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.

Appendix 8: BC Act (2016) definition of priority ecological communities

Category Code	Category
P1	**Poorly-known ecological communities** 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	**Poorly-known ecological communities** 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	**Poorly known ecological communities** (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: (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; (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	**Conservation Dependent ecological communities** 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: EPBC Act (1999) 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
Critically endangered	If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	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.
Vulnerable	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: Biosecurity and Agriculture (BAM) Act 2007 Categories and control of Declared (plant) pests in Western Australia

Control category	Control measures
C1 (Exclusion) '(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' 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.	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.
C2 (Eradication) '(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'. 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.	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.
C3 (Management) '(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 — (i) alleviate the harmful impact of the declared pest in the area; or (ii) reduce the number or distribution of the declared pest in the area; or (iii) prevent or contain the spread of the declared pest in the area.' 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.	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 — (a) alleviate the harmful impact of the declared pest in the area for which it is declared; or (b) reduce the number or distribution of the declared pest in the area for which it is declared; or (c) prevent or contain the spread of the declared pest in the area for which it is declared.

Appendix 11: Definition of vegetation condition scale

For the south west and interzone botanical provinces

Condition	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.