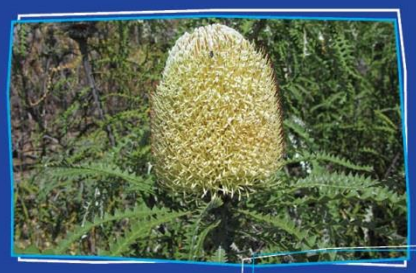
Vegetation, Flora, Fauna and Environmental Considerations Report

Shire of Esperance 2023 Strategic Purpose Permit
Site F – Ridgeland Road, SLK 0-5.69



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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 respect to their Elders past, present and emerging and we extend that respect to other Aboriginal Australians today.

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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

1 Executive Summary

The Shire of Esperance Environmental Team was commissioned by the Shire of Esperance Asset Management department to undertake a review of the flora, vegetation and fauna values on the proposed 'Ridgeland Road, SLK 0-5.69' project in 2022-23 as part of their 2023 Strategic Purpose Permit application.

The Shire of Esperance endeavours to maintain a high level of road safety, being proactive in identifying high risk road designs and progressively upgrading them. The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4 593 km of road. The Shire of Esperance is submitting 'Ridgeland Road SLK 0.00 to SLK 5.69' project as Site F under the '2023 Strategic Purpose Permit' (Figure 1), for the purpose of road widening during a road reconstruction.

Ridgeland Road is particularly narrow resulting in safety issues during harvest season. Ridgeland Road requires widening to maintain the safety of road users during harvest. This road is classified as a rural access road on Shire road network providing vital link to properties and other access roads in east region of Esperance. Traffic counts showing a major impact of heavy vehicle occupied during harvesting season and it is an approved RAV route ang a school bus route.

To complete these works, native vegetation up to 2m from the current road footprint on both sides of the road is required to be cleared, increasing the active road footprint to 17m. This requires clearing of 0.586 ha of native vegetation. To mitigate impact of clearing vegetation, where feasible clearing will not occur to the full permitted width, conserving vegetation.

The proposed works are located 70 km east of Esperance, within the Shire of Esperance managed road reserve of Ridgeland road. Specifically, it is starting from Fisheries road, at straight line kilometre (SLK) 63.00 (Main Roads, 2022). A point within the proposed clearing permit area is 6267170.90m N, 454458.16m E (UTM Zone 51 H, GDA94).

The Shire of Esperance's two Environmental Scientists completed the site assessment on 'Ridgeland Road, SLK 0-5.69' on the 13th of October and the 13th of December.

A total of 249 vascular plant taxa from 145 plant genera and 50 plant families were recorded within the 'Ridgeland Road, SLK 0-5.69' survey area during the 2022 survey. The majority of taxa was recorded within the Poaceae (13 taxa), Proteaceae (23 taxa), Myrtaceae (41 taxa), Fabaceae (32 taxa), and Asteraceae (12 taxa) families (Appendix 1). This total included 216 native species and 33 introduced (weed) species.

Two priority flora species pursuant to the Biodiversity Conservation Act (2016) and as listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded within the 'Ridgeland Road, SLK 0-5.69' survey area. No plant taxa listed as Threatened pursuant to Schedule 1 of the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 were recorded during the survey within the proposed Ridgeland Road, SLK 0-5.69 survey area.

Table 1: Summary of Priority flora species recorded in 'Site F – Ridgeland Road, SLK 0-5.69' project area.

Species	Conservation Code	Total Plants	Total patches	Total taking
Conostylis seorsiflora subsp. longissima	P2	1		1
Bentleya diminuta	P2	1000s	9	7 (patches)

A total of 0.390 ha of the EBPC listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' Threatened Ecological Community (TEC) was present within Site F - Ridgeland Road, SLK 0-5.69.

Two vegetation types potentially met the State listed 'Swamp Yate (*Eucalyptus occidentalis*) woodland in seasonally-inundated basins' PEC. Both of these vegetation types were assessed against the description of this vegetation community given during its listing, one was somewhat consistent with the PEC and the other was inconsistent with most of the vegetation communities description.

The site contains suitable foraging habitat for the EPBC listed Carnaby's Cockatoo. Approximately 0.390 ha of high quality native foraging habitat. Several other conservation listed fauna species had potentially suitable habitat within the site these included the sharp-tailed sandpiper, chudditch, grey falcon and quenda.

Should the development of Ridgeland Road, SLK 0-5.69 go ahead the following recommendations are made as a means of minimizing the impacts of infrastructure activities on the flora, vegetation and fauna values in the area:

- Minimise clearing to minimum amount required
- Avoid larger habitat trees (larger trees and trees with hollows) wherever possible;
- Maintain existing drainage systems, spoon drains and ensuring tracks and other infrastructure areas do not disrupt or divert historic water flow patterns;
- Remove and stockpile topsoil, log debris and leaf litter where possible for use in future rehabilitation programs. If possible, stockpiled topsoil should be directly replaced on disturbed areas;
- Minimise soil disturbance during clearing and practice standard vehicle hygiene to ensure introduced (exotic) species do not become established within the 'Ridgeland Road, SLK 0-5.69' project area;
- Minimize all threatening processes to native vegetation.

These have been addressed in the attached Weed and Dieback plan, and provided these measures are implemented, there should be no impediments to the widening of Ridgeland Road, SLK 0-5.69.

1 Introduction

The Shire of Esperance endeavors to maintain a high level of road safety, being proactive in identifying high risk road designs and progressively upgrading them. The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4,593 km of road. The Shire of Esperance is submitting 'Ridgeland Road, SLK 0-5.69' project as Site F under the '2023 Strategic Purpose Permit' (Figure 1), for the purpose of road widening.

1.1 Location and Scope of Project

The proposed works are located 70 km east of Esperance, within the Shire of Esperance managed road reserve of Ridgeland Rd. Specifically, it is starting from Fisheries Road, Esperance at straight line kilometre (SLK) 63.00 (Main Roads, 2022). A point within the proposed clearing permit area is 6267170.90m N, 454458.16m E (UTM Zone 51 H, GDA94).

Figure 1. Location of Site F – Ridgeland Road, SLK 0-5.69.

Ridgeland Road is particularly narrow resulting in safety issues during harvest season. Ridgeland Road requires widening to maintain the safety of road users during harvest. This road is classified as a rural access road on Shire road network providing vital link to properties and other access roads in east region of Esperance. Traffic counts showing a major impact of heavy vehicle occupied during harvesting season and it is an approved RAV route ang a school bus route.

To complete these works, native vegetation up to 2m from the current road footprint on both sides of

the road is required to be cleared, increasing the active road footprint to 17m. This requires clearing of 0.586 ha of native vegetation. To mitigate impact of clearing vegetation, where feasible clearing will not occur to the full permitted width, conserving vegetation.

1.2 Environmental Legislation and Guidelines

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

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

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

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

Western Australian guidelines relevant to this survey are the:

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

International Agreements relevant to this survey are the:

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

2 OBJECTIVES

The objective of this survey was to undertake a flora, fauna and vegetation assessment of the Ridgeland Road, SLK 0-5.69survey area including:

- Undertake a desktop study of the flora, fauna and vegetation of the Ridgeland Road, SLK 0-

5.69 survey area, with an emphasis on threatened and priority flora, threatened and priority ecological communities (TECs and PECs) and Threatened and Priority fauna;
- Review the historical literature of the Ridgeland Road, SLK 0-5.69 survey area;
- Undertake a detailed survey of the Ridgeland Road, SLK 0-5.69 survey area, and collect and identify the vascular plant species present;
- Review the conservation status of the vascular plant species recorded by reference to current literature and listings by the Department of Biodiversity, Conservation and Attractions (DBCA) and plant collections held at the Western Australian State Herbarium (WAH), and listed by the Department of Climate Change, Energy, the Environment and Water under the EPBC Act;
- Define and map the vegetation communities in the Ridgeland Road, SLK 0-5.69 survey area;
- Define and map the location of any threatened and priority flora located within the Ridgeland Road, SLK 0-5.69 survey area;
- Define any management issues related to flora, fauna and vegetation values;
- Provide recommendations on the local and regional significance of the vegetation communities; and
- Prepare a report summarising the findings.

3 METHODS

3.1 Desktop Assessment

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

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

In addition, the EPBC Act Protected Matters Search Tool, was also checked to identify the possible occurrence of threatened and priority flora, fauna and threatened and priority ecological communities within the Ridgeland Road, SLK 0-5.69area. Search parameters were 'by polygon' and a 20 km buffer was applied to the search area; standard used in this IBRA subregion.

In addition, historical documentation and state datasets including:

- Vegetation mapping of the region, principally that of Beard (1976)
- 2020 Vegetation Extent by Statewide Pre-European mapping statistics
- Soil landscape mapping (DAFWA)
- Dieback Information Data Management System (DIDMS) (Gaia Resources)
- Shire of Esperance Weed Mapping Data

- Existing site digital orthophotos (Merivale 2018)
- Atlas of Living Australia database
- Hydrographic Catchments (DWER)
- Crown Reserves (Landgate)

3.2 Field Survey

The site was initially inspected on 13/10/2022, by Julie Waters and Katherine Walkerden the SOE's Environmental Coordinator and Environmental Officer. A general assessment of possible ecological impacts included historical clearing, impact of fire regimes, regeneration from disturbance, waterlogging, senescence, weeds, erosion, sedimentation, invasive fauna, *Phytophthora* Dieback, and illegal dumping of rubbish.

A detailed field assessment of the flora and vegetation of the Ridgeland Road, SLK 0-5.69 survey area was undertaken by Shire of Esperance botanists between the 13th of October 2023 to the 18th of October 2023 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 Ridgeland Road, SLK 0-5.69 survey area. The road was used as a continuous transect. Vegetation up to 5 meters from the edge of the existing road's back-slope was assessed to accurately cover the 2 m width proposed clearing permit area. recording all species, and collecting all but the very common, well known species.

For PF or TF species identified in the desktop survey as possible to occur, scans of pressed specimens from either the WAH or local Esperance District Herbarium were taken into the field. Suitable associated habitat for TF or PF identified in the desktop study were particularly focused on, and extensively searched. If suspected or known conservation significant flora species were encountered, a specimen was collected for subsequent identification with GPS coordinates and plant numbers recorded for the population. During the survey, a field herbarium for Ridgeland Road, SLK 0-5.69 was also constructed.

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

A follow up survey was conducted on the 13th of December 2022 by Julie Waters and Katherine Walkerden to specifically target the identification and counting of Priority 2 *Conostylis seorsifolia* subsp. *longissima*. Flowering specimens of *Bentleya diminuta* were also collected on the 13th of December 2022 due to the plants being sterile during the initial survey.

The vegetation communities of 'Site F – Ridgeland Road, SLK 0-5.69' was assessed for the presence a TEC or PEC (DBCA 2018, 2022b) comparing that to descriptions in approved conservation advice for

these communities.

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

> 2a) Characterised by Proteaceae species having 30% or greater cover of Proteaceae species across all layers where these shrubs occur (crowns measured as if they are opaque).
> And/or
> 2b) Two or more diagnostic Proteaceae species are present that are likely to form a significant vegetative component when regenerated.

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

As Site F – Ridgeland Road, SLK 0-5.69 is a long linear site, quadrant-based data was not used to determine if the site meet the TEC definitions, this was due to the inability to site an appropriately sized quadrant (As per Table 1, Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016) within the narrow road verge area.

Only a basic fauna survey was conducted as per EPA (2020) guidelines. Observations of fauna presence, such as call sounds, footprints and scats were noted, and the area assessed for suitability of habitat within 'Site F – Ridgeland Road, SLK 0-5.69' for fauna species identified in the desktop survey. Carnaby's Black Cockatoo (*Calyptorhynchus latirostris)* feeding, roosting and nesting habitat was also assessed using EPBC Act referral guidelines (2022).

3.3 Survey Timing

According to Table 3 in the Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016), the primary survey timing for the South-west and Interzone Botanical Province is Spring (September-November). As all surveys at Ridgeland Road, SLK 0-5.69 were conducted in October, it falls within this period. The surveys were timed, where possible, to align with peak flowering periods of conservation significant flora with the potential to occur in the Ridgeland Road, SLK 0-5.69 survey area.

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

3.4 Vegetation Descriptions

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

Condition of vegetation was assessed using Table 2 of the Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016) categories, as 'Excellent', 'Very Good',

'Good', 'Degraded' or 'Completely Degraded'. This illustrates how healthy vegetation is, determined by vegetation structure, weed cover, presence of dieback, historical clearing, grazing and other signs of disturbance.

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

3.5 Survey Limitations

A general assessment was made of the survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 2). Based on this assessment, the present survey has not been subject to constraints which would affect the thoroughness of the survey, and the conclusions which have been formed.

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

Potential Survey Limitation	Impact on Current Survey
Availability of contextual information at a regional and local scale	**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 (1976).
Resources (i.e. were there adequate resources to complete the survey to the required standard).	**Not a constraint:** Adequate resources were made available by Shire of Esperance to complete the surveys.
Competency/experience of team carrying out survey; experience in the bioregion surveyed	**Not a limitation:** Botanists had extensive experience working within the Shire of Esperance and wider areas. Two of the botanists have consistently worked within this bioregion for more than 15 years. Botanists were familiar with flora in the area. Any unknown or potential threatened or priority flora species were collected and identified, utilising resources available at the Western Australian Herbarium and consultation with expert taxonomists.
Proportion of flora collected and identification issues	**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 along the edge of the road and into roadside vegetation ensured thorough coverage of the survey area. Flora that was unknown or resembled threatened or priority flora were collected, the location and habitat noted, and the number of plants estimated.
Mapping reliability	**Not a constraint.** Handheld GPS units were used for the survey, which for a majority of field conditions have an accuracy level of ± 5 m.
Survey timing, rainfall, season of survey	**Not a limitation:** The EPA (2016a) recommends that flora and vegetation surveys in the South – West Botanical Province be conducted in Spring (September-November). The detailed flora survey was conducted in October. Rainfall in 2022 was above average, and continued well into December.
Disturbances (fire/flood/clearing)	**Not a limitation:** The Ridgeland Road, SLK 0-5.69 survey has not experienced any flooding or fire events.

4 DESKTOP ASSESSMENT RESULTS

4.1 Climate

The Condingup climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2022). The area receives an average annual rainfall of 616 mm (1996-2020). The Shire of Esperance received an unusually high level of rainfall in 2022 resulting in an extended flowering period.

4.2 Catchment

Site F – Ridgeland Road, SLK 0-5.69 is present within two catchment areas, the Dailey River Catchment and the Mungliginup River Catchment. It is located approximately 18km from the coast.

4.3 Geology, Soils and Topography

Two geological unit was identified within 'Site F – Ridgeland Road, SLK 0-5.69, by Schoknecht et al. (2004). It is described as:

- Tertiary marine sediment of the Pallinup formation over Proterozoic granite and gneiss
- Quaternary Aeolian sands over Tertiary Sediments of the Pallinup formation

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

- Dominantly grey deep sandy duplex (gravelly) soils and grey shallow sandy duplex soils. Minor pale deep sands and other soils
- Grey deep sandy duplex soils (some gravelly) with associated pale deep sands
- Pale deep sands and associated grey deep sandy duplex soils (some gravelly)

Within the area, there has been three landform types recorded. These include:

- Level plain with numerous internally drained swamps

- Gently undulating plain with minor swales and wet depressions
- Gently undulating plain with subdued sandsheets and dunes

4.4 Regional Vegetation

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

Beard (1973) mapped three vegetation associations (VA) within the 'Site F – Ridgeland Road, SLK 0-5.69' (Table 3). Esperance_125 was well represented with 90% of the vegetation association remaining intact, Esperance_47 has 35% of its original extent remaining and only 13% remaining within its Esperance extent. Esperance_6048 had only 14% of its original extent remaining.

Table 3. Vegetation associations mapped by Beard (1973) within the 'Site F – Ridgeland Road, SLK 0-5.69', and statistics on pre-European remaining areas.

Vegetation Association			
Name	Esperance_47	Esperance_125	Esperance_6048
Description	Shrublands; tallerack mallee-heath	Bare areas; salt lakes	Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region
Pre-European extent %	35.86	90.27	14.21
Pre-European extent in IBRA region ESP2 (%)	15.06	77.25	14.16
Pre-European extent in LGA (%)	13.43	95.46	14.21
Current extent conserved in IUCN area (%)	17.68	5.41	0.89

4.5 Surrounding Land Use

The area directly included in the clearing permit application 'Site F – Ridgeland Road, SLK 0-5.69' is currently intact and vegetated 100 m wide road reserve, managed by the Shire of Esperance. The current road footprint occupies 15 m. The surrounding land use is agricultural, with a golf course also neighbouring the road reserve. The area is within rural zoning.

The site was 10.94 km from Reserve 22795, Cape Le Grand National Park. No Conservation vested reserves were within 10km of the site.

4.6 Potential Threatened and Priority Flora

Four threatened flora (TF) and 40 priority flora (PF) were recorded within a 20 km radius of the proposed impact site (Appendix 3)). Of these, no TF species and 11 PF species had suitable known associated habitat that corresponded with vegetation communities and soil type of 'Site F – Ridgeland Road, SLK 0-5.69' project.

4.7 Potential Threatened and Priority Ecological Communities

The desktop study identified the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' within 'Site F – Ridgeland Road, SLK 0-5.69' project area. No other TEC's or priority ecological communities (PEC) were identified by the desktop study as being within "Site F – Ridgeland Road, SLK 0-5.69" or within a 20 km buffer of the site.

4.8 Potential Threatened and Priority Fauna

12 conservation listed fauna were recorded within a 20 km radius of the proposed impact site, an additional 38 species were listed by the EPBC Protected Matters Tool (Appendix 4)).

4.9 *Phytophthora* Dieback

Dieback Information Delivery and Management System (DIDMS; GAIA Resources, SCNRM & State NRM 2022) data shows no *Phytophthora cinnamomi* or other *Phytophthora* sp. sampling in the immediate area, with the closest positive *P. cinnamomi* sample on Fisheries road 5.2km east of the site.

The 2016 dieback hazard dispersal model had dieback dispersion risk listed within 200 metres of the project area.

5 FIELD SURVEY RESULTS AND DISCUSSION

5.1 Flora

A total of 249 vascular plant taxa from 145 plant genera and 50 plant families were recorded within the 'Ridgeland Road, SLK 0-5.69' survey area during the 2022 survey. The majority of taxa was recorded within the Myrtaceae (41 taxa), Fabaceae (32 taxa), Proteaceae (23 taxa), Poaceae (13 taxa) and Asteraceae (12 taxa) families. This total included 216 native species and 33 introduced (weed) species. (see Appendix 1 for the complete incidental species list).

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

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

5.2 Threatened and Priority Flora

Two PF species, *Bentleya diminuta* (P2) (Section 5.2.1) *and Conostylis seorsifolia* subsp. *longissima (P2)* (Section 5.2.2), were identified within the clearing footprint. Queries of spatial datasets were requested specifically for these species, to interrogate impact of proposed works on species sustainability (DBCA 2022a; DBCA 2022c; DBCA 2022d). *Conostylis seorsifolia* subsp. *longissima* was not recorded on the TPFL database. It was noted that additional information on *Bentleya diminuta* was located on file.

Table 4: Summary of Priority flora species recorded in 'Site F – Ridgeland Road, SLK 0-5.69' project area.

Species	Conservation Code	Total Plants	Total patches	Total taking
Conostylis seorsiflora subsp. *longissima*	P2	1		1
Bentleya diminuta	P2	1000s	9	7 (patches)

5.2.1 *Bentleya diminuta,* Priority 2

A specimen of *Bentleya diminuta* was sent to the WA Herbarium for identification confirmation (KSW22222; Accession #10048 with specimen retained). It was confirmed as *Bentleya diminuta* by Mike Hislop on 14/02/2023. A Threatened and Priority Reporting Form (TPRF) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 15/03/2023 (Appendix 2). If proposed works occur, 7 patches will be impacted upon, from a total of 9, with each patch containing hundreds of individual plants.

Bentleya diminuta is a species with a wide distribution, having a 356km east to west and 150km north to south distribution. The species occurs within the Shire of Esperance, Lake Grace and Kondinin. There was a total of 11 herbarium records, 4 TPFL records and an additional 4 populations recently found by the Shire of Esperance. 6 of the herbarium records represent a single population within the Shire of Lake Grace.

The species is known for growing along road shoulders and the known populations are regularly graded. The species likely benefits from the regular disturbance and the patches proposed to be cleared will likely be replaced by new recruits after the roadworks are complete.

Table 5. Confirmed records of Priority 2 species, *Bentleya diminuta* found by Julie Waters and Katherine Walkerden during 2022.

Herbarium reference	Location	Disturbance	Frequency	Tenure	Record date	Confirmative
KSW1321 ACC 9116 Not retained	On Parmango Rd, SLK 22.63. 4.08km north east of the Heywood rd, Parmango Rd intersection	Road verge	1000s	Road Reserve	30/08/2021	Mike Hislop

KSW14122 ACC 9783	Heywood road at SLK 3.4	Road verge	4 small colonies, 1000+ individual herbs.	Road Reserve	11/10/2022	Mike Hislop
KSW22122 ACC 10048	Kettle road reserve. 1.69km South East of Kettle road and Meyer road intersection.	Road verge	Several hundred in patch.	Road Reserve	13/12/2022	Mike Hislop
KSW22222 ACC 10048	Ridgeland road reserve. 2.5km North of Ridgeland Road and Fisheries road Intersection.	Road verge	6 patches over 250 metre section of road	Road Reserve	13/12/2022	Mike Hislop

Table 6. Known Herbarium records of Priority 2 species, *Bentleya diminuta,* detailing location details, frequency, tenure and collection date.

Sheet number/ TPFL population	Location	Frequency	Tenure	Record date
1590901	Cape Arid National Park, c.4 km W of Mount Ragged, along Mount Ragged- Balladonia road		National Park	28/09/1983
3370879	0.6 km N of junction of Beatty, Fitzgerald and Ravensthorpe-Lake King roads towards Lake King (ca 37 km from Ravensthorpe), Roe district	Abundant in graded area.	Freehold	5/11/1990
3211703/ Population 1	6.2 km SW of Mount Ragged along Balladonia Rd (3.1 km from Gora Rd turnoff), Cape Arid National Park	Very common along verge of track and to N and S of track particularly under or near mallee; 2000+ plants.	National Park	24/04/1993
5304415/ Population 2	To the SE of mine site, c. 700m SE of of Hatter Hill. [Plot - HHILL03]		UCL	3/09/1996
6453724/ Population 3	Mount Madden CBH bins proposed new truck exit, ca 530 m N of Beatty Road intersection with Lake King - Ravensthorpe Road	Very common in patches, 500+ in mallee/shrubs; 1000s on disturbed road verge.	Road Reserve	8/10/2000
7113579	36.7 km from Ravensthorpe on Lake King Road (approximately 600 m N of Fitzgerald/Beatty Road) on both road verges	Widespread in the locality.	Freehold	20/10/2004

7820100	Lake King - Ravensthorpe Road. Just NW of the intersection with Fitzgerald Road. Boundary of Lake Grace Shire and Ravensthorpe Shire		Road Reserve	20/10/2004
7184980/ Population 3	Mt Madden wheatbin - along road verge and into farmland from Fitzgerald Road for 600 m N towards Lake King	100+ plants.	Road Reserve	25/11/2004
7291612/ Population 4	ca 2.7 km NNE of North Ironcap, 6.2 km W of Forrestania Crossroads turn N on airstrip track for 8.6 km to T intersection, walk N for 50-150 m	Localised patch, 100 + growing beneath Westringia rigida.	UCL	20/06/2005
8667047	Corner of Clare and Cascades Road, Cascade	Total cover of population approx 10 m2 (one location), probably all one plant.	Road reserve	6/09/2012
8882193	Ravensthorpe to Lake King Road, just N of Beatty Road, near the Mount Madden wheat bins	Common.	Road reserve	26/08/2016

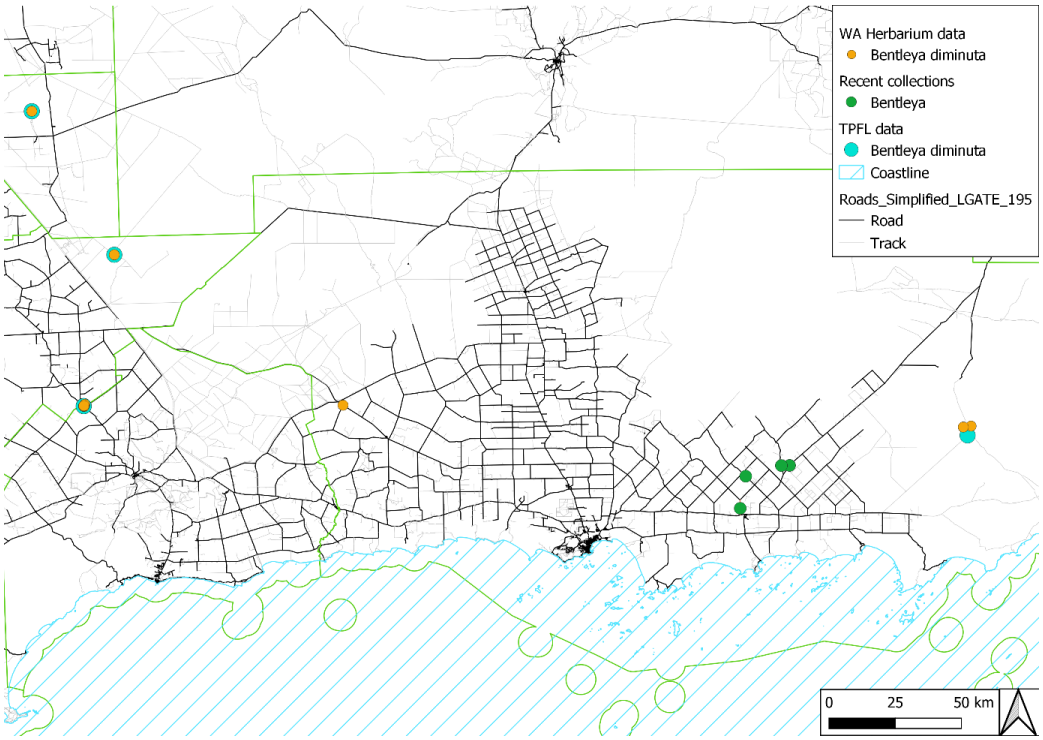

Figure 2. Known records of Priority 2 *Bentleya diminuta* across an 356km east to west and 150km north to south distribution (DBCA 2022) including recently discovered populations by the Shire of Esperance.

Figure 3. Photograph of *Bentley diminuta* taken by Katherine Walkerden on the 13/12/2022.

5.2.2 *Conostylis seorsifolia subsp. longissima,* Priority 2

A specimen of *Conostylis seorsifolia* subsp. *longissima* was sent to the WA Herbarium for identification confirmation (KSW21822; Accession 9874, with specimen retained). It was confirmed as *Conostylis seorsifolia* subsp. *longissima* by Mike Hislop on 23/01/2023. A Threatened and Priority Reporting Form (TPRF) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 15/03/2023 (Appendix 2). If proposed works occur, 1 plant will be impacted upon, from a population total of 1. The single plant was present at Ridgelands Road at SLK 0.12 on the eastern side of the road, growing on the road shoulder.

C. seorsifolia subsp. *longissima* is a taxon with an extremely disjunct populating, with a total of two previously known populations, one population within Cape Le Grande National Park and another within Fitzgerald River National Park, there is a 204km gap between these two confirmed records. These records were collected in 1960 and 1971. This new record represents the third confirmed population of this taxon and a 35km eastern rage extension and a 19km northern range extension.

This subspecies is easily distinguishable from the common *C. seorsifolia subsp. seorsifolia* based on leaf length with *C.* subsp. *seorsifolia* having 2-9cm long leaves and *C.* subsp. *longissima* having 8-16cm long leaves.

Figure 4. Scan of specimen KSW21822 ACC 9874, *Conostylis seorsifolia* subsp. *longissima.*

5.3 Weeds

There was significant weed invasion along large sections of the site, with large proportions of herbaceous weeds such as *Ornithopus compressus, Disa bractea, Rumex vesicarius*. Overall, 33 invasive species were identified within the project area (Appendix 8.1). Of these, the most extensive and of serious concern was *Leptospermum laevigatum,* which was present throughout a majority of the site. This is a priority environmental weed in the Shire of Esperance's Environmental Weed Strategy 2009-2018. *Eucalyptus cladocalyx* was present at the site, this species had been planted as a windbreak and had spread into nearby bushland.

Weed specimen's that resulted in a range extension were sent to the WAH. One species was collected that resulted in a range extension:

Eucalyptus cladocalyx (KSW122322, Accession 10048, Specimen retained). The weed was new to the Shire of Esperance and Esperance Plains IBRA region and a 350km eastern range extension.

Weed management strategies are currently being discussed operationally, such as spraying material stockpiles in agricultural private property prior to use and periodic spraying of road verges for a 12-month period after road construction.

5.4 Dieback

Vegetation types A and F are highly susceptible to the disease having a high proportion of proteaceous species present. The project area contained a series minor hills and valleys, the local hydrology and

topography will accelerate the spread of dieback if introduced. Whilst no qualified dieback interpreters visited the site, it was noted that SLK 0-0.82 contained mixed heath which would typically have been expected to be have numerous proteaceous species, however proteaceous species were conspicuously absent from this section of road reserve and were present from SLK 0.82 onwards. SLK 0-0.82 was along a moderate decline with the possibility that dieback may have been spread downhill by water runoff after an initial introductory event.

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.

5.7 Vegetation Communities

Six vegetation communities were identified within the 'Site F – Ridgeland Road, SLK 0-5.69', as defined by structure and composition (Table 6). It is believed that the Beard (1973) vegetation associations identified in Section 3.6 are an appropriate match for three vegetation types observed. Esperance_47 and Esperance_6048 both matched several of the vegetation types, some of the woodland and winter wet area vegetation types were to fine scaled to have been mapped in the Beard Vegetation Associations.

Table 7. Vegetation communities identified within proposed 'Site F – Ridgeland Road, SLK 0-5.69' project area.

Type	Description	Figure	Closest Matching Beard Vegetation Association	Area (ha)
A - typical	*Nuytsia floribunda* over mixed proteaceous and myrtaceous heath with restiads.	7	Esperance_47	0.188
A – possibly dieback affected	Proteaceous species absent.	7	Esperance_47	0.010
B	*Eucalyptus occidentalis* and *Melaleuca cuticularis* dominated winter wet area with *Melaleuca incana, Phymatocarpus maxwellii, Melaleuca pulchella*	8		0.021
C	Mallee and *Eucalyptus pleurocarpa* over mixed shrubland with *Acacia cyclops, Coopernookia strophiolata, Templetonia retusa*	9	Esperance_47	0.032
D	*Eucalyptus occidentalis* and *Hakea laurina* over *Melaleucas* and Fabaceae shrubs.	10	-	0.029
E	*Melaleuca pulchella*, *Hakea cinerea, Melaleuca scabra*, over dense *Juncus* rushes.	11	-	0.072
F	*Banksia speciosa* dominated mixed shrubland with *Adenanthos cuneatus* and *Allocasuarina sp.*	12	Esperance_6048	0.233

Figure 5. Vegetation types within the 'Site F – Ridgeland Road, SLK 0-5.69' area, from SLK 2.98 to 5.69

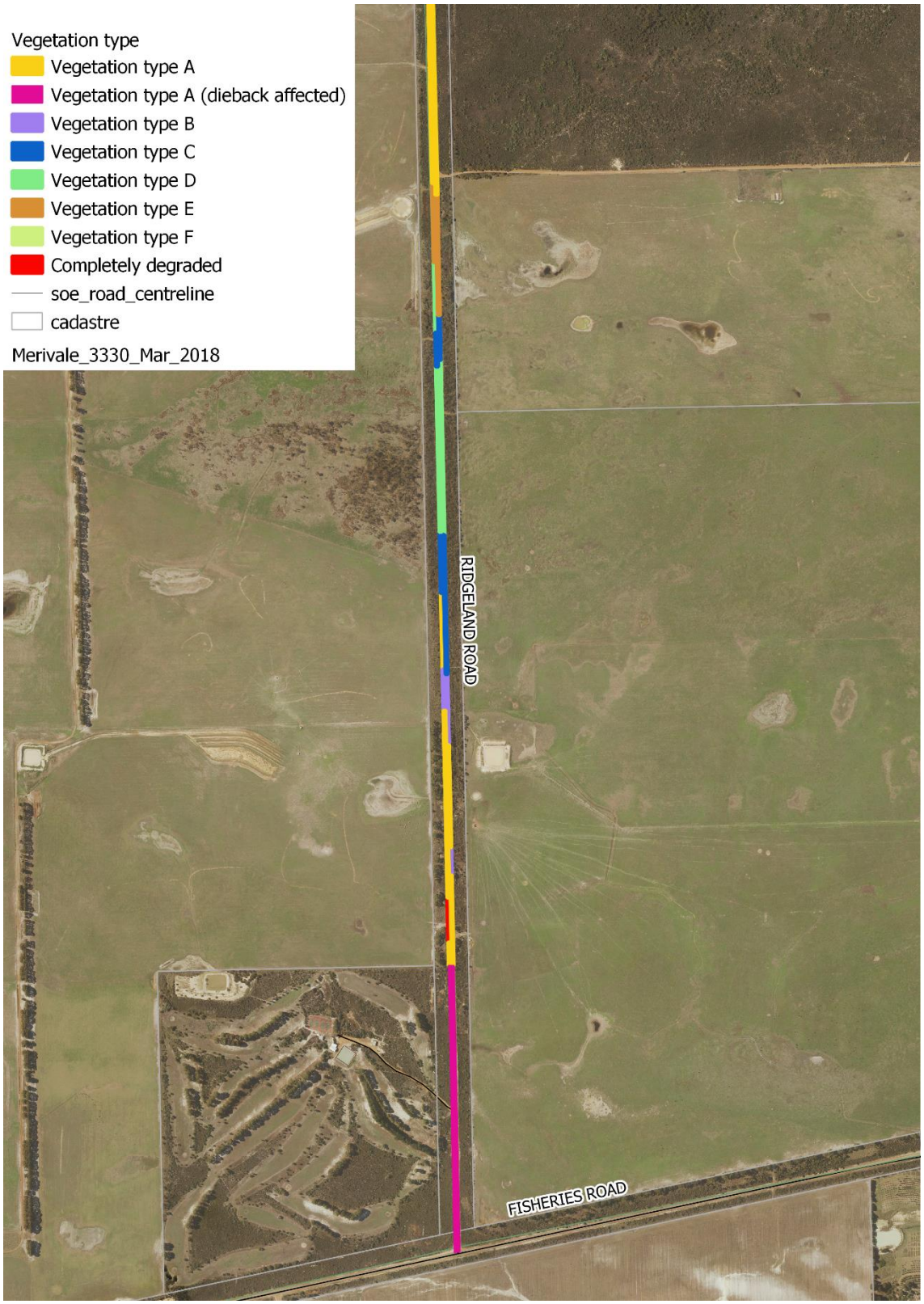

Figure 6. Vegetation types within the 'Site F – Ridgeland Road, SLK 0-5.69' area, from SLK 0 to 3.58.

Figure 7. Vegetation type A identified in 'Site F – Ridgeland Road, SLK 0-5.69' project, described as *Nuytsia floribunda* over mixed proteaceous and myrtaceous heath with restiads.

Figure 8. Vegetation type B identified in 'Site F – Ridgeland Road, SLK 0-5.69' project, described as *Eucalyptus occidentalis* and *Melaleuca cuticularis* dominated winter wet area with *Melaleuca incana, Phymatocarpus maxwellii, Melaleuca pulchella.*

Figure 9. Vegetation type C identified in 'Site F – Ridgeland Road, SLK 0-5.69' project, described as Mallee and *Eucalyptus pleurocarpa* over mixed shrubland with *Acacia cyclops, Coopernookia strophiolata, Templetonia retusa.*

Figure 10. Vegetation type D identified in 'Site F – Ridgeland Road, SLK 0-5.69' project, described as *Eucalyptus occidentalis* and *Hakea laurina* over *Melaleucas* and Fabaceae shrubs.

Figure 11. Vegetation type E identified in 'Site F – Ridgeland Road, SLK 0-5.69' project, described as *Melaleuca pulchella, Hakea cinerea, Melaleuca scabra,* over dense Juncus rushes.

Figure 12. Vegetation type F identified in 'Site F – Ridgeland Road, SLK 0-5.69' project, described as *Banksia speciosa* dominated mixed shrubland with *Adenanthos cuneatus* and *Allocasuarina sp.*

5.8 Vegetation Condition

The vegetation condition varied dramatically varying from excellent to completely degraded (Table 8). Vegetation condition was better alongside the large area of intact vegetation within Lot 190 on Plan 208400. Vegetation condition was worst between SLK 0.84 and 1.92 where significant historical clearing has occurred and non-native species such as *Eucalyptus cladocalyx* and *Pinus pinaster* had been planted by neighbouring landholders.

Table 8. Quantifying vegetation to be cleared by vegetation type and condition.

Vegetation Type	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
A – typical	0.101	0.051	0.031	0.005	-	**0.188**
A - dieback affected	0.002	0.007	-	-	-	**0.010**
B	-	-	0.021	-	-	**0.021**
C	-	0.031	0.001	-	-	**0.032**
D	-	0.029	-	-	-	**0.029**
E	-	-	0.072	-	-	**0.072**
F	0.134	0.070	-	0.029	-	**0.233**
Total	**0.237**	**0.189**	**0.126**	**0.034**	**-**	**0.586**

Figure 13. Vegetation condition across 'Site F –Ridgeland Road, SLK 0-5.69' project, ranging from SLK 2.98 to 5.69

Figure 14. Vegetation condition across 'Site F –Ridgeland Road, SLK 0-5.69' project, ranging from SLK 0 to 3.32.

5.9 Threatened Ecological Communities

Vegetation community A (typical) and F, described as 'Nuytsia floribunda over mixed proteaceous and myrtaceous heath with restiads.' And 'Banksia speciosa dominated mixed shrubland with Adenanthos cuneatus and Allocasuarina sp.' met criteria to be considered Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan). However only areas within these vegetation communities in good condition or better were considered as Kwongkan TEC (Figure 11). Vegetation community A (dieback infested) was not included as Kwongkan as that area lacked the presence of proteaceous species. In total, 0.390 ha of vegetation was considered as Kwongkan TEC present within 'Site F – Ridgeland Road, SLK 0-5.69' 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 2022b). Vegetation types B and D potentially met this PEC, Vegetation type B has a total clearing of 0.021ha of clearing occurring and 0.029ha was set to occur within Vegetation type D. Both of these vegetation types were assessed against the description of this vegetation community given during its listing (table 9), vegetation type B was mostly consistent with the PEC and Vegetation type D was inconsistent with the PEC.

Figure 15. Vegetation communities of vegetation type 'A (typical)' and 'F' in good or better condition met threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' within 'Site F – Ridgeland Road, SLK 0-5.69' project.

Table 9. Comparison between potential occurrences of the Swamp Yate PEC and listing documentation criteria "Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins in the South Coast of Western Australia" (Appendix 14) within vegetation types B and D 'Site F – Ridgeland Road, SLK 0 - 5.69'

Swamp Yate (*Eucalyptus occidentalis*) woodlands in seasonally inundated clay basins with intact understorey and fringing vegetation	**Criterion 1:** Abiotic Factors i) Occurs on valley floor; ii) Basin is more or less circular; iii) Seasonally inundated.	**Criterion 2:** Centre of basin inhabited by *Eucalyptus occidentalis* low woodland (often with an understory of *Melaleuca cuticularis*).	**Criterion 4:** Fringing the wetland is dense rushes and sedges.	**Criterion 3:** Peripheral to the central basin is a waterlogged zone of *E. occidentalis* associated with heath to open scrub and/or small trees. *Melaleuca calycina*, *M. glaberrima, M. incana, M. pulchella*, *Taxandria callistachys*;	**Swamp Yate PEC (Yes / No)** **Area (ha) within Site**
Occurrence 1 (SLK 1.47-1.69) northern section Vegetation type: B	i) seasonally inundated. ii) not within a circular basin.	*Eucalyptus occidentalis* was the dominant species. Understorey was dominated by small *Melaleuca cuticularis* trees.	Wetland fringe had been heavily invaded by non-native grasses. Various sedges were present around wetland fringe.	*Melaleuca incana, Phymatocarpus maxwellii* and *Melaleuca pulchella* made up a significant understorey component of this vegetation type.	Yes (0.007)
Occurrence 2 (SLK 1.09 – 1.16 Eastern side of road) Vegetation type: B	i) seasonally inundated. ii) within a roughly circular basin.	*Eucalyptus occidentalis* was the dominant species. Understorey was dominated by small *Melaleuca cuticularis* trees.	Wetland fringe had been heavily invaded by non-native grasses. Various sedges were present around wetland fringe.	*Melaleuca incana, Phymatocarpus maxwellii* and *Melaleuca pulchella* made up a significant understorey component of this vegetation type.	Yes (0.022)
Vegetation type: D	i) not seasonally inundated ii) did not occur on a circular basin	*Eucalyptus occidentalis* was the dominant species.	Vegetation type was not a wetland	Vegetation type was not a wetland	No (0.029)

5.10 Fauna

Of the 50 conservation listed species identified within the desktop survey, five species may have suitable habitat within the proposed clearing permit area.

During the field survey numerous bird and frog calls were heard. Several species including the yellow-throated miner, bronzewing pigeon and willy wagtail were visually identified. Numerous other bird calls were also noted during the survey. A fox den was seen and rabbit diggings were also noted. It is highly likely that foxes, rabbits and feral cats are extensive throughout the area.

Figure 16. Fox den seen within 'Site F – Ridgeland Road, SLK 0-5.69'. Photo taken by Julie Waters on 13/1212022.

5.10.1 Sharp-tailed sandpiper, *Calidris acuminata,* Migratory

There was a record of this species 8.74 km from the project area.

The Sharp-tailed Sandpipers' habitat is listed as 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.

Vegetation types B and E may provide some limited habitat for this species during winter, clearing for these vegetation types totals to 0.093 ha of vegetation.

5.10.2 Carnaby's black cockatoo, *Calyptorhynchus latirostris*, threatened fauna

The closest known record for this species was 0.17ha from the project area.

The Shire of Esperance black cockatoo assessment was conducted in accordance with the EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo *Calyptorhynchus latirostris* (Endangered), Baudin's cockatoo *Calyptorhynchus baudinii* (Endangered) and forest red-tailed black cockatoo *Calyptorhynchus banksii naso* (Vulnerable) (Department of Agriculture, Water and the Environment, 2022). Vegetation type A and F contained a potential foraging habitat, however the foraging quality scoring tool was not undertaken due to the potential habitat being cleared being lower than the 1ha threshold for the tool (Appendix 13). A total of 0.390 ha of foraging habitat will be cleared for this project.

Given that the site did not:

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

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

5.10.3 Chuditch, *Dasyurus geoffroii,* Vulnerable

The Chuditch was listed on the EPBC protected matter search tool, there were no known records of this species within 20km of the survey area. The closest known record to the project area was 61 km from the survey site.

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

All of the good or better-quality vegetation within this project area provides potentially suitable hunting habitat for this species, this includes a total of 0.552 ha of vegetation. In addition, the vegetation within this project likely provides important habitat connectivity to nearby remnant vegetation. However, given the large distance from the closest known record for this species it is probably unlikely to occur.

5.10.4 Grey falcon, *Falco hypoleucos,* Vulnerable

The Grey falcon was listed on the EPBC protected matter search tool, there were no known records of this species within 20 km of the survey area. The closest known record to the project area was 48 km from the survey site.

The Grey falcon is listed as occurring in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water. It is likely that the entire project area has potentially suitable hunting grounds for this species.

The Grey falcon is listed as nesting in recesses of cliff faces, tree hollows or in the large abandoned nests of other birds. The site provides potentially suitable nesting habitat in Vegetation types C and D both of which have Eucalyptus trees suitable for nesting, though no nests were observed within during the survey. Clearing in Vegetation types B and D includes a total of 0.05 ha of clearing.

5.10.5 Quenda, *Isoodon fusciventer,* P4

The closest confirmed record of this species was 14.50 km from the project area.

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 hunting habitat for this species, this includes a total of 0.552 ha of vegetation. In addition, the vegetation within this project likely provides important habitat connectivity to nearby remnant vegetation.

6 REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION

The ‘Site F – Ridgeland Road, SLK 0-5.69’ project may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations (DWER) assess applications, as listed under Schedule 5 of the Environmental Protection Act 1986 (DWER 2019).

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

Biodiversity at this site is high with 216 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.

The vegetation contains foraging habitat for Carnaby's Black Cockatoo due to the presence of vegetation high in Proteaceous species, this included a total of 0.390 ha.

The project will also involve clearing potential habitat for sharp-tailed sandpiper, chuditch, grey falcon, quenda.

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

Bentleya diminuta (P2) and *Conostylis seorsifolia* subsp. *longissima* (P2) were both present within the project area. 7 of the 9 patches of *Bentleya diminuta* will be mostly cleared and the single *Conostylis seorsifolia* subsp. *seorsifolia* plant will also be cleared.

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

0.390 hectares of vegetation met the definition of EPBC listed Kwongkan TEC, other areas within the site failed to meet the definition of Kwongkan TEC.

Two vegetation types potentially met the State listed Swamp Yate PEC. Both of these vegetation types were assessed against the description of this vegetation community given during its listing, one was mostly consistent with the PEC and the other was inconsistent with most of the vegetation communities description.

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

The immediate surroundings of the site were highly cleared agricultural land, with the intact vegetation within the site likely playing contributing to ecological linkages in the area. However, given the minimal amount of vegetation being cleared and the fact that this is a 100m wide road reserve which will still exist as a wildlife corridor after road widening does not constitute being a significant impact.

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

Vegetation types B and E were both seasonally inundated, this constitutes clearing a total of 0.093 ha of seasonally inundated areas being cleared.

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

Vegetation within this area will be providing limited function as windbreaks and erosion control for the agricultural areas surrounding it. However, given the relatively small amount of clearing the project is

unlikely to have any significant impact.

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

The site was 10.94 km from Reserve 22795 Cape Le Grand National Park. No other Conservation vested reserves were within 10km of the site. The proposed clearing in unlikely to effect this conservation area.

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

Given the relatively small amount of clearing the project is unlikely to have any significant impact on water quality.

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

Given the relatively small amount of clearing the project is unlikely to have any significant impact on flood risk.

7 RECOMMENDATIONS

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

- All vehicles and construction equipment to be cleaned prior to start of the project.
- Works to be carried out in the dry(summer) months to minimise spread of dieback.
- Follow up spraying of emergent roadside weeds where gravel has been sourced from farmland to prevent weeds coming into the weed free areas.

8 LIST OF PERSONNEL

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

Name	Julie Waters
Position	Environmental Coordinator
Project Involvement	Desktop and Field Survey, Specimen Identification, GIS Mapping Data Interpretation and Report writing
Qualifications	BEnvSc (Hons)
Experience	20 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

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	Two years' experience as a Botanist in the region (as of April 2023)
Scientific Licence	FT61000788

Name	Rosamund Mary Hoggart
Position	Environmental Assistant
Project Involvement	Specimen Identification
Qualifications and Experience	BSc (Hons)Ag
	15 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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10 APPENDICES

Appendix 1: Incidental species list

Family	Genus	Species	Weed	WA Conservation Status	Herbarium Reference
Anarthriaceae	*Anarthria*	*humilis*			
Anarthriaceae	*Anarthria*	*scabra*			
Anarthriaceae	*Lyginia*	*imberbis*			
Apiaceae	*Trachymene*	*pilosa*			
Apiaceae	*Xanthosia*	*huegelii*			
Asparagaceae	*Laxmannia*	*brachyphylla*			
Asparagaceae	*Laxmannia*	*minor*			
Asparagaceae	*Laxmannia*	*omnifertilis*			
Asparagaceae	*Lomandra*	*hastilis*			
Asparagaceae	*Thysanotus*	*patersonii*			
Asteraceae	*Arctotheca*	*calendula*	x		
Asteraceae	*Carduus*	*pycnocephalus*	x		
Asteraceae	*Erigeron*	*bonariensis*	x		
Asteraceae	*Gnephosis*	*drummondii*			
Asteraceae	*Hyalosperma*	*demissum*			
Asteraceae	*Millotia*	*tenuifolia var. tenuifolia*			
Asteraceae	*Pseudognaphalium*	*luteoalbum*	x		
Asteraceae	*Pterochaeta*	*paniculata*			
Asteraceae	*Siloxerus*	*filifolius*			
Asteraceae	*Sonchus*	*oleraceus*	x		
Asteraceae	*Ursina*	*anthemoides*	x		
Asteraceae	*Vellereophyton*	*dealbatum*	x		
Brassicaceae	*Rapistrum*	*raphanistrum*	x		
Campanulaceae	*Lobelia*	*rhombifolia*			
Campanulaceae	*Monopsis*	*debilis var depressa*			
Campanulaceae	*Wahlenbergia*	*capensis*	x		
Casuarinaceae	*Allocasuarina*	*humilis*			
Casuarinaceae	*Allocasuarina*	*thuyoides*			
Centrolepidaceae	*Aphelia*	*sp. Albany*			
Centrolepidaceae	*Centrolepis*	*aristata*			
Centrolepidaceae	*Centrolepis*	*polygyna*			
Convolvulaceae	*Wilsonia*	*humilis*			
Crassulaceae	*Crassula*	*exserta*			
Cyperaceae	*Caustis*	*dioica*			
Cyperaceae	*Chorizandra*	*enodis*			

Cyperaceae	*Cyperus*	*congestus*	X		
Cyperaceae	*Cyperus*	*tenellus*	X		
Cyperaceae	*Gahnia*	*sp. South West*			
Cyperaceae	*Lepidosperma*	*leptostachyum*			
Cyperaceae	*Lepidosperma*	*squamatum*			
Cyperaceae	*Leptocarpus*	*crebriculmis*			
Cyperaceae	*Mesomelaena*	*tetragona*			
Cyperaceae	*Schoenus*	*caespititius*			
Cyperaceae	*Schoenus*	*laevigatus*			
Cyperaceae	*Schoenus*	*breviculmis*			
Cyperaceae	*Tricostularia*	*aphylla*			
Cyperaceae	*Tricostularia*	*compressa*			
Dilleniaceae	*Hibbertia*	*andrewsiana*			
Dilleniaceae	*Hibbertia*	*exasperata*			
Dilleniaceae	*Hibbertia*	*gracilipes*			
Dilleniaceae	*Hibbertia*	*psilocarpa*			
Dilleniaceae	*Hibbertia*	*verrucosa*			
Droseraceae	*Drosera*	*drummondii*			
Droseraceae	*Drosera*	*glanduligera*			
Droseraceae	*Drosera*	*neesii ssp. neesii*			
Droseraceae	*Drosera*	*scorpioides*			
Droseraceae	*Drosera*	*trichocaulis*			
Ericaceae	*Acrotriche*	*cordata s. lat*			
Ericaceae	*Andersonia*	*parvifolia*			
Ericaceae	*Leucopogon*	*carinatus*			
Ericaceae	*Leucopogon*	*sp. Coujinup*			
Ericaceae	*Lysinema*	*ciliatum*			
Ericaceae	*Styphelia*	*epacridis*			
Ericaceae	*Styphelia*	*sp. South Coast*			
Fabaceae	*Acacia*	*aemula*			
Fabaceae	*Acacia*	*cyclops*			
Fabaceae	*Acacia*	*glaucoptera*			
Fabaceae	*Acacia*	*gonophylla*			
Fabaceae	*Acacia*	*lasiocarpa var bracteolata*			
Fabaceae	*Acacia*	*mutabilis ssp angustifolia*			
Fabaceae	*Acacia*	*myrtifolia*			
Fabaceae	*Acacia*	*saligna*			
Fabaceae	*Aotus*	*sp. Esperance*			
Fabaceae	*Bossiaea*	*preissii*			
Fabaceae	*Chorizema*	*aciculare*			

Fabaceae	*Chorizema*	*obtusifolia*			
Fabaceae	*Daviesia*	*aphylla*			
Fabaceae	*Daviesia*	*dilatata*			
Fabaceae	*Daviesia*	*lanceolata*			
Fabaceae	*Daviesia*	*teretifolia*			
Fabaceae	*Dillwynia*	*uncinata*			
Fabaceae	*Gastrolobium*	*latifolium*			
Fabaceae	*Gompholobium*	*baxteri*			
Fabaceae	*Gompholobium*	*knightianum*			
Fabaceae	*Jacksonia*	*capitata*			
Fabaceae	*Jacksonia*	*venosa*			
Fabaceae	*Jacksonia*	*viscosa*			
Fabaceae	*Kennedia*	*sp. South Coast*			
Fabaceae	*Medicago*	*polymorpha*	x		
Fabaceae	*Ornithopus*	*compressus*	x		
Fabaceae	*Ornithopus*	*pinnatus*	x		
Fabaceae	*Ornithopus*	*sativus*	x		
Fabaceae	*Pultenaea*	*heterochila*			
Fabaceae	*Templetonia*	*retusa*			
Fabaceae	*Trifolium*	*arvense*			
Fabaceae	*Trifolium*	*glomeratum*			
Geraniaceae	*Erodium*	*cicutarium*	x		
Goodeniaceae	*Coopernookia*	*strophiolata*			
Goodeniaceae	*Dampiera*	*lavandulacea*			
Goodeniaceae	*Dampiera*	*parvifolia*			
Goodeniaceae	*Dampiera*	*sacculata*			
Goodeniaceae	*Goodenia*	*concinna*			
Goodeniaceae	*Goodenia*	*pterigosperma*			
Goodeniaceae	*Goodenia*	*trinervis*			
Goodeniaceae	*Lechenaultia*	*tubiflora*			
Goodeniaceae	*Scaevola*	*thesioides var. filifolia*			
Gyrostemonaceae	*Cypselocarpus*	*haloragoides*			
Haemodoraceae	*Anigozanthos*	*rufus*			
Haemodoraceae	*Conostylis*	*phathyrantha*			
Haemodoraceae	*Conostylis*	*seorsifolia subsp. Longissima*		P2	KSW21822 Acc 9874
Haemodoraceae	*Haemodorum*	*spicatum*			
Haloragaceae	*Glischrocaryon*	*angustifolium*			
Hemerocallidaceae	*Agrostocrinum*	*scabrum*			
Hemerocallidaceae	*Chamaescilla*	*corymbosa*			
Hemerocallidaceae	*Dianella*	*revoluta*			
Hemerocallidaceae	*Johnsonia*	*acaulis*			

Iridaceae	*Patersonia*	*lantana*			
Iridaceae	*Patersonia*	*occidentalis*			
Iridaceae	*Romulea*	*rosea*			
Juncaceae	*Juncus*	*capitatus*	X		
Juncaceae	*Juncus*	*microcephalus*	X		
Juncaceae	*Juncus*	*pallidus*			
Juncaginaceae	*Cycnogeton*	*lineare*			
Lamiaceae	*Microcorys*	*glabra*			
Lauraceae	*Cassytha*	*glabella*			
Lauraceae	*Cassytha*	*racemosa*			
Lentibulariaceae	*Utricularia*	*tenella*			
Loganiaceae	*Logania*	*micranthera*			
Loranthaceae	*Nuytsia*	*floribunda*			
Lythraceae	*Lythrum*	*hyssopifolia*	x		
Myrtaceae	*Beaufortia*	*empetrifolia*			
Myrtaceae	*Callistemon*	*phoeniceus*			
Myrtaceae	*Calothamnus*	*gracilis*			
Myrtaceae	*Calothamnus*	*quadrifidus*			
Myrtaceae	*Calytrix*	*decandra*			
Myrtaceae	*Calytrix*	*lechenaultii*			
Myrtaceae	*Chamelaucium*	*axillare*			
Myrtaceae	*Conothamnus*	*aureus*			
Myrtaceae	*Cyathostemon*	*ambiguus*			
Myrtaceae	*Darwinia*	*sp. Karonie*			
Myrtaceae	*Darwinia*	*vestita*			
Myrtaceae	*Eucalyptus*	*conglobata ssp conglobata*			
Myrtaceae	*Eucalyptus*	*leptocalyx*			
Myrtaceae	*Eucalyptus*	*micranthera*			
Myrtaceae	*Eucalyptus*	*occidentalis*			
Myrtaceae	*Eucalyptus*	*pleurocarpa*			
Myrtaceae	*Eucalyptus*	*tumida*			
Myrtaceae	*Eucalyptus*	*undulata*			
Myrtaceae	*Eucalyptus*	*varia*			
Myrtaceae	*Eucalyptus*	*cladocalyx*	x		KSW22322 Acc 10048
Myrtaceae	*Lechenaultia*	*formosa*			
Myrtaceae	*Leptospermum*	*incanum*			
Myrtaceae	*Leptospermum*	*laevigatum*	x		
Myrtaceae	*Leptospermum*	*sericeum*			
Myrtaceae	*Leptospermum*	*spinosa*			
Myrtaceae	*Melaleuca*	*brevifolia*			

Myrtaceae	*Melaleuca*	*calycina*			
Myrtaceae	*Melaleuca*	*cuticularis*			
Myrtaceae	*Melaleuca*	*hamata*			
Myrtaceae	*Melaleuca*	*pulchella*			
Myrtaceae	*Melaleuca*	*scabra*			
Myrtaceae	*Melaleuca*	*striata*			
Myrtaceae	*Melaleuca*	*suberosa*			
Myrtaceae	*Melaleuca*	*thymoides*			
Myrtaceae	*Melaleuca*	*tuberculata var. macrophylla*			
Myrtaceae	*Micromyrtus*	*elobata*			
Myrtaceae	*Phymatocarpus*	*maxwellii*			
Myrtaceae	*Taxandria*	*spathulata*			
Myrtaceae	*Verticordia*	*inclusa*			
Myrtaceae	*Verticordia*	*minutiflora*			
Myrtaceae	*Verticordia*	*vicinella*			
Orchidaceae	*Caladenia*	*flava*			
Orchidaceae	*Caladenia*	*marginata*			
Orchidaceae	*Disa*	*bracteata*	x		
Orchidaceae	*Diuris*	*concinna*			
Orchidaceae	*Diuris*	*laxiflora*			
Orchidaceae	*Elythranthera*	*brunonis*			
Orchidaceae	*Microtus*	*media*			
Orchidaceae	*Pterostylis*	*recurva*			
Orchidaceae	*Pterostylis*	*sp.*			
Orchidaceae	*Thelymitra*	*antennifera*			
Orchidaceae	*Thelymitra*	*crinita*			
Orobanchaceae	*Orobanche*	*minor*			
Phyllanthaceae	*Poranthera*	*microphylla*			
Pinaceae	*Pinus*	*pinaster*	x		
Pittosporaceae	*Bentleya*	*diminuta*		P2	KSW22222 Acc 10048
Pittosporaceae	*Billardiera*	*coriacea*			
Pittosporaceae	*Billardiera*	*fusiformis*			
Poaceae	*Austrostipa*	*mollis*			
Poaceae	*Austrostipa*	*scabra*			
Poaceae	*Briza*	*maxima*	x		
Poaceae	*Briza*	*minor*	x		
Poaceae	*Dactylis*	*glomerata*	x		
Poaceae	*Ehrharta*	*calycina*	x		
Poaceae	*Eragrostis*	*curvula*	x		
Poaceae	*Lagurus*	*ovatus*	x		

Poaceae	*Lolium*	*sp.*	x		
Poaceae	*Neurachne*	*alopecuroidea*			
Poaceae	*Rytidosperma*	*caespitosa*			
Poaceae	*Rytidosperma*	*setacea*			
Poaceae	*Vulpia*	*myuros forma myuros*	X		
Polygonaceae	*Persicaria*	*prostrata*			
Polygonaceae	*Rumex*	*vesicarius*	x		
Primulaceae	*Lysimachia*	*arvensis*	X		
Proteaceae	*Adenanthos*	*cuneatus*			
Proteaceae	*Banksia*	*armata*			
Proteaceae	*Banksia*	*nivea*			
Proteaceae	*Banksia*	*obovata*			
Proteaceae	*Banksia*	*pulchella*			
Proteaceae	*Banksia*	*speciosa*			
Proteaceae	*Grevillea*	*oligantha*			
Proteaceae	*Hakea*	*cinerea*			
Proteaceae	*Hakea*	*corymbosa*			
Proteaceae	*Hakea*	*laurina*			
Proteaceae	*Hakea*	*lissocarpha*			
Proteaceae	*Hakea*	*marginata*			
Proteaceae	*Hakea*	*nitida*			
Proteaceae	*Hakea*	*obliqua ssp. obliqua*			
Proteaceae	*Hakea*	*prostrata*			
Proteaceae	*Hakea*	*trifurcata*			
Proteaceae	*Hakea*	*varia*			
Proteaceae	*Isopogon*	*polycephalus*			
Proteaceae	*Petrophile*	*fastigiata*			
Proteaceae	*Petrophile*	*squamata*			
Proteaceae	*Synaphea*	*favosa*			
Proteaceae	*Synaphea*	*media*			
Proteaceae	*Synaphea*	*oligantha*			
Restionaceae	*Chordifex*	*crispatus*			
Restionaceae	*Chordifex*	*laxus*			
Restionaceae	*Chordifex*	*sphacelatus*			
Restionaceae	*Desmocladus*	*castaneus*		KSW21722 Acc 9874	
Restionaceae	*Leptocarpus*	*crebriculmis*			
Restionaceae	*Lepyrodia*	*macra*			
Restionaceae	*Loxocarya*	*striata*			
Rubiaceae	*Opercularia*	*vaginata*			
Rutaceae	*Boronia*	*crassifolia*			
Rutaceae	*Boronia*	*spathulata*			

Rutaceae	*Cyanothamnus*	*ramosus*			
Santalaceae	*Exocarpos*	*sparteus*			
Sapindaceae	*Dodonaea*	*caespitosa*			
Solanaceae	*Solanum*	*nigricans*	x		
Stylidiaceae	*Levenhookia*	*dubia*			
Stylidiaceae	*Levenhookia*	*pusilla*			
Stylidiaceae	*Levenhookia*	*stipitata*			
Stylidiaceae	*Stylidium*	*macranthum*			
Stylidiaceae	*Stylidium*	*preissii*			
Thymelaeaceae	*Pimelea*	*brachyphylla*			
Violaceae	*Hybanthus*	*epacroides*			
Violaceae	*Hybanthus*	*floribundus ssp floribundus*			

Appendix 2: Threatened and priority flora report Forms

Bentleya diminuta, Priority 2

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Bentleya diminuta **TPFL Pop. No:**

OBSERVATION DATE: 13/12/2022 **CONSERVATION STATUS:** P2 **New population** ☒

OBSERVER/S: Katherine Walkerden, Julie Waters **PHONE** 0416558774

ROLE: Environmental Officer, Environmental Coordinator **ORGANISATION:** Shire of Esperance

EMAIL: Katherine.Walkerden@esperance.wa.gov.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):

Ridgeland road reserve (SLK 2.54). 2.5km North of Ridgeland Road and Fisheries road Intersection.

Growing on gravel road shoulder.

Reserve No:

DBCA DISTRICT: Esperance **LGA:** Esperance Land manager present: ☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 6267992.17

Long / Easting: 454438.41

ZONE: 51

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured: ☐ Map scale:

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☒
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole ____ to ____	Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☐ Area observed (m²):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m²:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☒ Count method: (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☒ Clonal stems ☐

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	9			
Dead				

Area of pop (m²):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m²):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 15%

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT: 9 dense colonie were found each containing several hundred plants

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

Please return completed form to **Species And Communities Program** DBCA,

Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Program.

Record entered by:_____ Sheet No.:_____ Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK: (on soil surface; eg gravel, quartz fields)	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	0-10% ☐	Sand ☐	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐	10-30% ☐	Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	30-50% ☐	Loam ☐	Yellow ☐	Permanently inundated ☐
Outcrop ☐	Ironstone ☐	50-100% ☐	Clay loam ☐	White ☐	Tidal ☐
Slope ☐	Limestone ☐		Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐		Peat ☐	Black ☐	
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐					
Wetland ☐					

Specific **Landform** Element: ☐
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

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

1. Eucalyptus occidentalis woodland over mixed Melaleuca shruland with Cyperaceae sedges, Rytidosperma sp., and invasive grasses. Associated species include: Sonchus oleraecous, Gahnia p., Templetonia retusa, Hakea lissocarpa, Acacia glaucoptera
2. ☐
3. ☐
4. ☐

ASSOCIATED SPECIES: ☐
Other (non-dominant) spp ☐

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT: ☐

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☒ Present ☐ Replace / repair ☐ Required ☐ Length req'd: ☐

ROADSIDE MARKERS: Not required ☒ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: ☐

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) ☐

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

SPECIMEN: Collectors No: ☐ WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other: ☐

LODGEMENT: WA Herb Lodgement No: KSW22222 ACC 10048

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☒ Field notes ☐ Other: ☐

COPY SENT TO: Regional Office ☐ District Office ☒ Other: ☐

Submitter of Record: Katherine Walkerden Role: Environmental officer Signed: ☐ Date: 15/03/2023

Please return completed form to **Species And Communities Program** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au
RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Program.
Record entered by:_____ Sheet No.:_____ Record Entered In Database ☐

Conostylis seorsifolia subsp. *longissima*, Priority 2

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at www.dbca.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Conostylis seorsifolia subsp. longissima **TPFL Pop. No:**

OBSERVATION DATE: 13/12/2022 **CONSERVATION STATUS:** P2 **New population** ☒

OBSERVER/S: Katherine Walkerden, Julie Waters **PHONE** 0416558774

ROLE: Environmental Officer **ORGANISATION:** Shire of Esperance

EMAIL: Katherine.Walkerden@esperance.wa.gov.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):

Ridgeland road, Eastern side of road. 140m north of Ridgeland road and Fisheries road intersection. 1.2km West of Condingup townsite.

Reserve No:

DBCA DISTRICT: Esperance **LGA:** Esperance Land manager present: ☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 6265590.5

Long / Easting: 454501.8

ZONE: 51

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured: ☐ Map scale:

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☒
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole ____ to ____	Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☐ Area observed (m²):

EFFORT: Time spent surveying (minutes): No. of minutes spent / 100 m²:

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count method: (Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	1			
Dead				

Area of pop (m²):

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. Size Data attached ☐ Total area of quadrats (m²):

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☐

Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 0%

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

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

Please return completed form to **Species And Communities Program** DBCA,

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Record entered by:_____ Sheet No.:_____ Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK: (on soil surface; eg gravel, quartz fields)	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	0-10% ☐	Sand ☒	Red ☐	Well drained ☐
Hill ☐	Dolerite ☐	10-30% ☐	Sandy loam ☐	Brown ☐	Seasonally inundated ☐
Ridge ☐	Laterite ☐	30-50% ☐	Loam ☐	Yellow ☐	Permanently inundated ☐
Outcrop ☐	Ironstone ☐	50-100% ☐	Clay loam ☐	White ☐	Tidal ☐
Slope ☒	Limestone ☐		Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐		Peat ☐	Black ☐	
Open depression ☐	Specify other:		Specify other:	Specify other:	
Drainage line ☐					
Closed depression ☐					
Wetland ☐					

Specific **Landform** Element: _____
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐

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

1. Nuytsia floribunda over mixed heath with dense restiads. Associated species includes: Hakea trifurcata, Acacia myrtifolia, Synaphea sp., Caustis dioica, Hypolaena sp., Boronia spathulata.
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☒ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

FLORA AUTHORISATION / LICENCE No: FT61000788-1a, FT61000787 Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

LODGEMENT: WA Herb Lodgement No: KSW 21822 ACC10048

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☒ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☒ Other: _____

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: _____ Date: 15/03/2023

Please return completed form to **Species And Communities Program** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Program.
Record entered by:_____ Sheet No.:_____ Record Entered in Database ☐

Appendix 3: Description of Threatened and Priority Flora Species with the Potential to occur within the Ridgeland Road, SLK 0-5.69 Survey Area

Threatened or priority flora identified by the desktop study to be present within a 20 km radius of 'Site F – Ridgeland Road, SLK 0-5.69' project area, using Threatened and Priority Flora Reporting (TPFL; DBCA 2022c), WA Herbarium (DBCA 2022d) and Esperance District Threatened Flora (DBCA 2022a). Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2018, Environmental Protection and Biodiversity Conservation (EPBC) Act 1999, critically endangered (CN) and endangered (EN).

Species	Cons Status	Associated Habitat	Likely to occur	Distance from site (km)
Scaevola archeriana	P1	Associated with wide variety of soil types including yellow sand, limestone, plains near salt lakes, dry grey sand, sand-clay loam, and sandy soil after fire. Associated with Mallee shrubland.	Yes	18.24
Comesperma lanceolatum	P2	White sand. Marine plains, sand dunes, quartzite ridges. Specimen known in Duke of Orleans Bay.	No	18.95
Eucalyptus sweedmaniana	P2	Grows in association with granite boulders and granitic gravel.	No	18.07
Lasiopetalum maxwellii	P2	Grows in association with granite boulders and granitic gravel. Coastal.	No	14.03
Melaleuca eximia	P2	Deep gravel, gravelly sand or gravelly clay. Recorded on granite outcrops.	No	12.84
Utricularia helix	P2	In shallow water 5-15 cm deep. Seasonal swamps. Cape Le Grande	No	13.50
Utricularia westonii	P2	Only known in Cape Le Grand. Excellent condition sandy peat swamps. Associated with lots of sedges and Juncaceae sp.	No	12.84
Acacia nitidula	P2	Granitic sandy gravelly soils and amongst granite boulders. Associated species include *Hakea trifurcata, Beaufortia micrantha, Conostylis bealiana*, and *Isopogon formosus*.	No	1.94
Calectasia jubilaea	P2	Low Shrubland, including Proteaceous-rich low heathland with *Eucalyptus angulosa*.	Yes	19.49
Platysace haplosciadia	P2	Sandy clay over ironstone. Seasonally wet areas. Cape Le Grande, Duke of Orleans Bay.	No	12.82
Rumicastrum chamaecladum	P2	Associated with clay loam, on winter-wet creek edges.	No	15.36
Astartea eobalta	P2	Low shrubland. Grey, grey brown sand. Seasonally inundated depression and on embankments of depressions.	No	15.99
Bentleya diminuta	P2	Mostly recorded on disturbed road edges. Associated with Mallee of mixed composition. Recorded on various soil types, including sandy clay loam, gravel and limestone.	Yes	15.94

Leucopogon corymbiformis	P2	Mixed Myrtaceous and Proteaceous heath. Sandy soil	No	19.95
Patersonia inaequalis	P2	Sandy clay, lateritic or granitic sand. Cape Le Grande, Helms Arboretum, Tjaltjraak Boodja Park.	No	19.74
Acacia bartlei	P3	Flat or gently undulating landscapes, waterlogged depression in brown/grey sandy loam or clay loam. Commonly associated with Eucalyptus occidentalis.	Yes	18.64
Acacia euthyphylla	P3	Grey/white clay loam, in seasonal swamps or periphery of salt lakes and marshes, in tall myrtaceous shrubland and mallee woodland.	Yes	1.49
Alyogyne sp. Great Victoria Desert (D.J. Edinger 6212)	P3	Variety of habitats, including recently burnt red sand in Great Victoria Desert, black soil fresh-water swamp at Condingup, and gravel at Tarrin Rock.	Yes	1.49
Comesperma calcicola	P3	Calcareous or semi-saline clay loams, limestone. Areas around saline water.	No	12.62
Daviesia pauciflora	P3	White or grey sand over laterite or limestone on flats	Yes	0.45
Eucalyptus semiglobosa	P3	White sand over laterite, silty sand on edge of granite shelf, limestone, hillslope, gully and cliffs. Mostly quite close to coast.	No	16.20
Gonocarpus pycnostachyus	P3	Grows in a variety of habitats including disturbed firebreaks, wet depressions and on granite rocks. Prefers deep sand or clay soils.	No	19.24
Hibbertia hamata	P3	Recorded in a variety of habitats including hillsides, inland granite outcrops, low shrubland, bare areas and heath. Grows in grey sand over granite.	No	3.85
Lasiopetalum parvuliflorum	P3	Grows along creeks and seasonal swamps in sand and gravelly loam. Mostly recorded in the Wellstead/Bremer region, with only one record in Esperance, on granite, between Howick Hill and Howick Rd.	No	16.52
Pterostylis faceta	P3	Various habitats – Melaleuca Mallee scrubland, Granite, sandy loam	Yes	12.94
Styphelia rotundifolia	P3	Eucalyptus mallee with mixed Myrtaceous and Fabaceae shrubland. Wide variety of habitats. Often associated with gravel.	Yes	19.72
Utricularia oppositifolia	P3	Shallow seasonal swamps and depressions, and creek lines in heathlands. Cape Le Grande	No	13.50
Eucalyptus famelica	P3	Across coastal and subcoastal Hopetoun and Esperance area. Tolerates saline waterlogged soils in open Mallee community	No	7.50
Leucopogon florulentus	P3	White/grey or yellow sands, sandy clay, gravelly lateritic soils. Mostly recorded west of Hopetoun, likely error in database	No	1.62
Persoonia scabra	P3	White sand or sandy loam, granite or limestone. Shrubland.	Yes	12.94

Verticordia verticordina	P3	Associated with heathlands. Prefers low lying sites, granite/sand and clay soils.	No	11.70
Leucopogon apiculatus	P3	Skeletal sandy or stony soils over quartzite or granite. Granite outcrops and hills, quartzite ridges, rocky slopes.	No	19.20
Eucalyptus x missilis	P4	Coastal distribution, across all of Esperance. Sand over limestone.	No	13.50
Lepidium pseudotasmanicum	P4	Various habitats including creeks and sites with loam, granite or sandy soils. Distribution scattered across WA.	No	17.33
Microtis quadrata	P4	Grows in seasonally wet depressions and in swampy mounds in near-coastal areas.	No	12.79
Myriophyllum petraeum	P4	Strictly confined to ephemeral rock pools on granite outcrops.	No	19.98
Acrotriche parviflora	P4	Inaccurate record on Esperance District Threatened and Priority Flora spatial dataset.	No	19.72
Caladenia exstans	P4	Brown or red loam, granite. Yate flats, shallow soil pockets on coastal granite outcrops.	No	14.08
Darwinia sp. Mt Burdett (NG Marchant 80/42)	P4	Open shrub on mallee and sandy loams. Salt Lake embankments. Associated species include: Melaleuca pulchella, Phymatocarpus maxwellii, Micromyrtus elobata, Beaufortia micrantha, and Banksia spp..	No	19.39
Grevillea baxteri	P4	Prefers shrubby heathland with an acid sandy soil usually overlaying heavier soils. Associated with highly diverse Proteaceous shrublands.	Yes	5.57
Lambertia echinata subsp. echinata	T	Below and between rock outcrops, slopes, hill crests. Grows in gravelly sandy loam, brown sandy loam, white-grey sand, granite, laterite. Only associated with Cape Arid National Park.	No	18.43
Anigozanthos bicolor subsp. minor	T	Moist sandy soil in heath communities. Has been found in shallow soils near granite outcrops.	No	3.72
Eucalyptus insularis subsp. continentalis	T	Only known populations occur on islands in Recherche Archipelago and in Cape Le Grand National Park.	No	13.52
Myoporum velutinum	T	Sandy soils. Creek banks. Condingup, Cape Le Grande & Nuytsland Nature Reserve	No	15.98

Appendix 4: Description of Threatened and Priority Fauna Species with the Potential to occur within the Ridgeland Road, SLK 0-5.69 Survey Area

Conservation listed fauna identified by the desktop study to be present within a 20 km radius of 'Site F – Ridgeland Road, SLK 0-5.69' project area, using Threatened and Priority Fauna Database (TPFL; DBCA 2022e) and species listed on the EPBC Act Protected Matters Report (DCCEEW 2022).

Scientific Name	Common Name	WA cons. status	EPBC status	Dist (km)	EPBC protected matters tool	Habitat	Likely to occur
Actitis hypoleucos	Common sandpiper	MI	MI	19.47		Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats	No
Balaenoptera borealis	Sei whale	EN	VU		X	Marine	No
Balaenoptera musculus	Blue whale	EN	EN		X	Marine	No
Balaenoptera physalus	Fin whale	EN	VU		X	Marine	No
Botaurus poiciloptilus	Australasian bittern	EN	VU		X	The Australasian bittern inhabits shallow (less than 30cm deep), permanent freshwater and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum). They also inhabit bore drains with tussocky vegetation and occasionally saltmarsh. They use temporary pools when population densities are high and deep swamps when breeding.	No

Calidris acuminata	Sharp-tailed sandpiper	MI	MI	8.74		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	Yes
Calidris canutus	Red knot	EN	EN		X	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps.	No
Calidris ferruginea	Curlew sandpiper	CR	MI	18.16	X	Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters.	No

Calidris ruficollis	Red-necked stint	MI	MI	18.16		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.	No
Calidris tenuirostris	Great knot	CR	CR		X	sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps.	No
Calyptorhynchus latirostris	Carnaby's cockatoo	EN	EN	0.17	X	Kwongkan shrub or heathland. Presence of Hakea, Banksia and Pine species indicate potential feeding habitat.	Yes
Carcharias taurus (west coast population)	Grey nurse shark (west coast population)	VU	VU		X	Marine	No
Carcharodon carcharias	White shark	VU	VU		X	Marine	No
Caretta caretta	Loggerhead turtle	EN	EN		X	Marine	No

Cereopsis novaehollandiae grisea	Recherche cape barren goose	VU	VU	18.30	X	Mainland areas near islands. During breeding season (May-June), found in grassy areas, tussock grass of bushes. During rest of year, found on beaches, coastal pastures and on the shores of brackish lakes.	No
Charadrius leschenaultii	Greater sand plover	EN	VU		X	In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps	No
Chelonia mydas	Green turtle	VU	VU		X	Marine	No
Dasyurus geoffroii	Chuditch	VU	VU		X	Jarrah Eucalyptus marginata forests and woodlands, Mallee shrublands and heathlands	Yes
Dermochelys coriacea	Leatherback turtle	VU	VU		X	Marine	No
Diomedea antipodensis	Antipodean albatross	EN	VU		X	Marine	No
Diomedea dabbenena	Tristan albatross	CR	EN		X	Marine	No
Diomedea epomophora	Southern royal albatross	VU	VU		X	Marine	No
Diomedea exulans	Wandering albatross	VU	VU		X	Marine	No

Diomedea sanfordi	Northern royal albatross	EN	EN		X	Marine	No
Eubalaena australis	Southern right whale	VU	EN		X	Marine	No
Falco hypoleucos	Grey falcon	VU	VU		X	Most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas	Yes
Galeorhinus galeus	School shark		Conservation Dependent		X	Marine	No
Halobaena caerulea	Blue petrel		VU		X	Marine	No
Hydroprogne caspia	Caspian tern	MI	MI	19.32		Sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks. In offshore areas the species prefers sheltered situations, particularly near islands, and is rarely seen beyond reefs	No
Isoodon fusciventer	Quenda, southwestern brown bandicoot	P4		14.50		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	Yes
Leipoa ocellata	Malleefowl	VU	VU		X	Shrublands and low woodlands dominated by mallee and are associated with Broombush, Melaleuca uncinata	No
Limosa lapponica	Bar-tailed godwit	MI	MI	19.64	X	Coastal mudflats and estuaries	No

Macronectes giganteus	Southern giant-petrel	MI	EN		X	Marine	No
Macronectes halli	Northern giant petrel	MI	VU		X	Marine	No
Neophoca cinerea	Australian sea-lion	EN	EN		X	Marine	No
Numenius madagascariensis	Eastern curlew	CR	CR		X	Intertidal mudflats	No
Pachyptila turtur subantarctica	Fairy prion (southern)		VU		X	Marine	No
Parantechinus apicalis	Dibbler	EN	EN		X	There was a single Esperance single record for this species on Gunton island within the Recherche Archipelago Nature Reserve. The single record was the result of a translocation, there is no naturally occurring records of this species within the Shire of Esperance.	No
Pluvialis fulva	Pacific golden plover	MI	MI	18.16		Coastal regions, though there are also a number of inland records (in all states), sometimes far inland and usually along major river systems. In Western Australia, the species is seldom recorded along the southern or south-western coasts, but is more widespread along the Pilbara and Kimberley coasts between North-West Cape and the Northern Territory border.	No
Pterodroma mollis	Soft-plumaged petrel		VU		X	Marine	No
Rhincodon typus	Whale shark	MI	VU		X	Marine	No

Sternula nereis nereis	Australian fairy tern	MI	VU		X	Marine	No
Thalassarche carteri	Indian yellow-nosed albatross	EN	VU		X	Marine	No
Thalassarche cauta	Shy albatross	VU	EN		X	Marine	No
Thalassarche impavida	Campbell albatross	VU	VU		X	Marine	No
Thalassarche melanophris	Black-browed albatross	VU	VU		X	Marine	No
Thalassarche steadi	White-capped albatross	VU	VU		X	Marine	No
Thalasseus bergii	Crested tern	MI	MI	19.32		Coastal areas throughout Australia. They are seldom seen on inland waterways, preferring islands, beaches, lakes and inlets	No
Thunnus maccoyii	Southern bluefin tuna		Conservation Dependent		X	Marine	No
Tringa nebularia	Common greenshank	MI	MI	19.13		Occurs in all types of coastal and inland wetlands.	No

Appendix 5: State 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: Commonwealth Definition of Threatened Flora and Fauna Species (Environment Protection and Biodiversity Conservation, EPBC Act 1999)

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: State 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: State 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: Commonwealth Definition of Threatened Ecological Communities

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

Listing Category Code	Explanation of Category
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: 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 Rating Description	Condition Rating Description
Pristine (1)	Pristine or nearly so, no obvious signs of disturbance
Excellent (2)	Vegetation structure intact; disturbance affecting individual species; weeds are non-aggressive species.
Very Good (3)	Vegetation structure altered; obvious signs of disturbance For example, disturbance to vegetation structure caused by repeated fires; the presence of some more aggressive weeds; dieback; logging; & grazing.
Good (4)	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; & grazing
Degraded (5)	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; &grazing.
Completely Degraded (6)	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 12: Carnaby's Cockatoo foraging habitat scoring template

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

Starting score	**Carnaby's Cockatoo**	
10	**Start at a score of 10** if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp. (including *Dryandra* spp.), *Hakea* spp. and *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. ***This tool only applies to sites equal to or larger than 1 hectare in size.**	
Attribute	**Subtractions**	**Context adjustor (attributes reducing functionality of foraging habitat)**
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 1km of your site.
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12km from breeding habitat.
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20km from a known night roosting habitat.
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is preferred food plants present.
Total score	**Enter score**	
Other considerations for assessment of foraging habitat	- The presence, extent and density (including foliage cover and flowering density) of all plant species that provide foraging, including non-native food sources used - The distribution and size of foraging habitat in proximity (e.g. up to 12 km) to the impact site. - Site degradation (such as cleared, disturbed or degraded areas). - The fire history of the impact site. - Landscape characteristics around the impact site, including details of roosting and breeding habitat in proximity (e.g. up to 20km for roosting and 12km for breeding); and - The location and details of watering points that could support the use of the foraging habitat.	
Appraisal	To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.	

Appendix 13: EPBC Act Protected Matters Report

Listed Threatened Ecological Communities

		Presence	
Community Name	**Threatened Category**	**Text**	**Buffer Status**
Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species

Scientific Name	Common Name	Threatened Category	Migratory Status	Buffer Status
Thunnus maccoyii	Southern Bluefin Tuna	Conservation Dependent		In buffer area only
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered	Migratory	In feature area
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit	Critically Endangered		In buffer area only
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Migratory	In feature area
Balaenoptera musculus	Blue Whale	Endangered	Migratory	In buffer area only
Diomedea sanfordi	Northern Royal Albatross	Endangered	Migratory	In buffer area only
Diomedea dabbenena	Tristan Albatross	Endangered	Migratory	In buffer area only
Parantechinus apicalis	Dibbler	Endangered		In feature area
Neophoca cinerea	Australian Sea-lion, Australian Sea Lion	Endangered		In buffer area only
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	Endangered	Migratory	In buffer area only
Caretta caretta	Loggerhead Turtle	Endangered	Migratory	In buffer area only
Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	Endangered	Migratory	In buffer area only
Lambertia echinata subsp. echinata	Prickly Honeysuckle	Endangered		In feature area

Petrogale lateralis lateralis	Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby	Endangered		In buffer area only
Eubalaena australis	Southern Right Whale	Endangered	Migratory (as Balaena glacialis australis)	In buffer area only
Anigozanthos bicolor subsp. minor	Little Kangaroo Paw, Two-coloured Kangaroo Paw, Small Two-colour Kangaroo Paw	Endangered		In feature area
Thalassarche cauta	Shy Albatross	Endangered	Migratory	In buffer area only
Ricinocarpos trichophorus	Barrens Wedding Bush	Endangered		In feature area
Calidris canutus	Red Knot, Knot	Endangered	Migratory	In buffer area only
Botaurus poiciloptilus	Australasian Bittern	Endangered		In feature area
Zanda latirostris	Carnaby's Black Cockatoo, Short-billed Black-cockatoo	Endangered		In feature area
Diomedea antipodensis	Antipodean Albatross	Vulnerable	Migratory	In buffer area only
Thalassarche melanophris	Black-browed Albatross	Vulnerable	Migratory	In buffer area only
Carcharodon carcharias	White Shark, Great White Shark	Vulnerable	Migratory	In buffer area only
Pachyptila turtur subantarctica	Fairy Prion (southern)	Vulnerable		In buffer area only
Macronectes halli	Northern Giant Petrel	Vulnerable	Migratory	In buffer area only
Leipoa ocellata	Malleefowl	Vulnerable		In feature area
Falco hypoleucos	Grey Falcon	Vulnerable		In feature area
Chelonia mydas	Green Turtle	Vulnerable	Migratory	In buffer area only
Halobaena caerulea	Blue Petrel	Vulnerable		In buffer area only
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	Vulnerable	Migratory	In buffer area only
Thalassarche steadi	White-capped Albatross	Vulnerable	Migratory	In buffer area only
Thalassarche carteri	Indian Yellow-nosed Albatross	Vulnerable	Migratory	In buffer area only
Rhincodon typus	Whale Shark	Vulnerable	Migratory	In buffer area only

Diomedea exulans	Wandering Albatross	Vulnerable	Migratory	In buffer area only
Diomedea epomophora	Southern Royal Albatross	Vulnerable	Migratory	In buffer area only
Cereopsis novaehollandiae grisea	Recherche Cape Barren Goose	Vulnerable		In feature area
Pterodroma mollis	Soft-plumaged Petrel	Vulnerable		In buffer area only
Sternula nereis nereis	Australian Fairy Tern	Vulnerable		In buffer area only
Thalassarche impavida	Campbell Black-browed Albatross	Vulnerable	Migratory	In buffer area only
Dasyurus geoffroii	Chuditch, Western Quoll	Vulnerable		In feature area

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

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

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

Community Description

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

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

Appendix 15: Traffic Count Data – Ridgeland Road

MetroCount Traffic Executive
Daily Classes

DailyClass-183 -- English (ENA)

Datasets:

Site:	**[604_000010_000200] Riglands Road North of Fisheries Road**
Attribute:	RURAL
Direction:	5 - South bound A>B, North bound B>A. **Lane:** 0
Survey Duration:	0:00 Thursday, 1 October 2015 => 10:36 Tuesday, 13 October 2015,
Zone:	
File:	604_000010_000200 0 2015-10-13 1038.EC0 (Plus)
Identifier:	KB930V6G MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default axle (v5.02)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**0:00 Thursday, 1 October 2015 => 10:36 Tuesday, 13 October 2015 (12.442)**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound), P = North, Lane = 0-16
Separation:	Headway > 0 sec, Span 0 - 100 metre
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile:	Vehicles = 646 / 647 (99.85%)

Daily Classes

DailyClass-183
Site: 604_000010_000200.0.1SN
Description: **Riglands Road North of Fisheries Road**
Filter time: **0:00 Thursday, 1 October 2015 => 10:36 Tuesday, 13 October 2015**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Monday, 5 October 2015

	1	2	3	4	5	6	7	8	9	10	11	12
Total												
Mon	19	0	3	0	0	0	0	0	0	0	0	0
22												
(%)	86.4	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tue	39	3	4	2	0	0	1	0	0	0	4	0
53												
(%)	73.6	5.7	7.5	3.8	0.0	0.0	1.9	0.0	0.0	0.0	7.5	0.0
Wed	34	2	3	0	0	0	0	0	0	0	0	0
39												
(%)	87.2	5.1	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thu	38	3	8	1	0	0	0	0	1	0	0	0
51												
(%)	74.5	5.9	15.7	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Fri	55	7	2	1	0	0	0	0	2	0	0	0
67												
(%)	82.1	10.4	3.0	1.5	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Sat	29	10	1	0	0	0	0	0	3	2	0	0
45												
(%)	64.4	22.2	2.2	0.0	0.0	0.0	0.0	0.0	6.7	4.4	0.0	0.0
Sun	49	6	1	0	0	0	0	0	0	0	0	0
56												
(%)	87.5	10.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average daily volume

Entire week												
	38	4	3	1	0	0	0	0	1	0	1	0
48												
(%)	79.0	9.3	6.6	1.2	0.0	0.0	0.3	0.0	1.8	0.6	1.2	0.0
Weekdays												
	37	3	4	1	0	0	0	0	1	0	1	0
46												
(%)	79.7	6.5	8.6	1.7	0.0	0.0	0.4	0.0	1.3	0.0	1.7	0.0
Weekend												
	39	8	1	0	0	0	0	0	2	1	0	0
51												
(%)	77.2	15.8	2.0	0.0	0.0	0.0	0.0	0.0	3.0	2.0	0.0	0.0

*** - Incomplete**