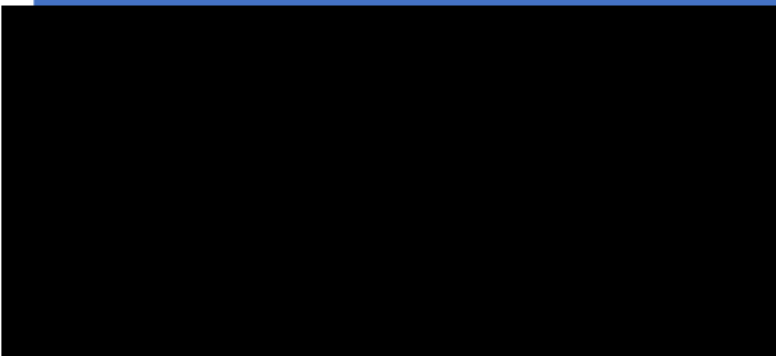




Vegetation, Flora, Fauna and Environmental Considerations Report

Munglinup Beach Road

Report compiled by:



May 2025



Acknowledgement of country

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

Copyright

The information contained in this report is the property of The Shire of Esperance. The use or copying of the whole or any part of this report without the written permission of The Shire of Esperance is not permitted.

Disclaimer

The Shire of Esperance has utilised information and data supplied sourced from government databases, literature, departments and agencies in the preparation of this report. The Shire of Esperance has compiled this report on the basis that any supplied or sourced information and data was accurate at the time of publication. The Shire of Esperance accepts no liability or responsibility whatsoever for the use of, or reliance upon, the whole or any part of this report by any third party.

Citation

Waters, J and Walkerden K (2025) Vegetation, Flora, Fauna and Environmental Considerations Report - Munglinup Beach Road Upgrades, Shire of Esperance.

Revision No.	Date	File Name
1 DRAFT	29/4/2025	\\domain\dfs\PARKS & RESERVES\Environment Services\Clearing permits\Applications\To finish\2024-25 Strategic Purpose Permit\Was Referral 10854 - Munglingup Beach Road \TEMPLATE - Project Vegetation, Flora, Fauna and Environmental Considerations Report
2 - Final	12/05/2025	\\domain\dfs\PARKS & RESERVES\Environment Services\Clearing permits\Applications\To finish\2024-25 Strategic Purpose Permit\Was Referral 10854 - Munglingup Beach Road\Munglingup Beach Road - Vegetation, Flora, Fauna and Environmental Considerations Report

Contents

LIST OF TABLES	4
LIST OF FIGURES	4
APPENDICES	5
LIST OF ABBREVIATIONS	5
Executive Summary	6
1 Introduction	6
1.1 Location and Scope of Project	6
1.2 Environmental Legislation and Guidelines	7
2 OBJECTIVES	8
3 METHODS	8
3.1 Desktop Assessment	8
3.2 Field Survey	9
3.3 Survey Timing	10
3.4 Vegetation Descriptions	10
3.5 Survey Limitations	11
4 DESKTOP ASSESSMENT RESULTS	12
4.1 Climate	12
4.2 Catchment	12
4.3 Geology, Soils and Topography	12
4.4 Regional Vegetation	12
4.5 Surrounding Land Use	13
4.6 Potential Threatened and Priority Flora	13
4.7 Potential Threatened and Priority Ecological Communities	13
4.8 Potential Threatened and Priority Fauna	14
5 FIELD SURVEY RESULTS AND DISCUSSION	14
5.7 Vegetation Communities	14
5.8 Vegetation Condition	14
5.8.1 Weeds	17
5.8.2 Phytophthora Dieback	17
5.9 Threatened Ecological Communities	17
5.10 Flora	17
5.11 Threatened and Priority Flora	17
5.11.1 <i>Corysanthes limpida</i> , Priority Four	17
5.12 Fauna	18
5.12.1 Chuditch, <i>Dasyurus geoffroii</i> , Vulnerable	19

5.12.2	Peregrine falcon, <i>Falco peregrinus</i> , Other specially protected.....	19
5.12.3	Tammar wallaby, <i>Notamacropus eugenii derbianus</i> , Priority four.....	19
5.12.4	Osprey, <i>Pandion haliaetus</i> , Migratory.....	19
6	REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION	19
7	RECOMMENDATIONS.....	20
8	LIST OF PERSONNEL	21
9	REFERENCES	21
	Appendix 1: Incidental species list.....	25
	Appendix 3: Description of Threatened and Priority Flora Species with the Potential to occur within the Munglinup Beach Road Survey Area.....	27
	Appendix 4: Description of Threatened and Priority Fauna Species with the Potential to occur within the 'Munglinup Beach Road Upgrades' Survey Area.....	28
	Appendix 5: EPBC Act Protected Matters Report.....	38
	Appendix 6: BC Act Threatened and Priority Flora and Fauna Definitions	40
	Appendix 7: EPBC Act (1999) Definition of Threatened Flora and Fauna Species.....	41
	Appendix 8: BC Act Definition of Threatened Ecological Communities	42
	Appendix 9: BC Act Definition of Priority Ecological Communities.....	43
	Appendix 10: EPBC Act Definition of Threatened Ecological Communities.....	43
	Appendix 11: BAM Act Categories and Control of Declared (Plant) Pests in Western Australia.....	44
	Appendix 12: Definition of Vegetation Condition Scale.....	45

LIST OF TABLES

Table 1: Potential limitations affecting the conclusions made in this report.

Table 2. Vegetation associations within 'Munglinup Beach Road Upgrades' by percentage of pre-European extent remaining.

LIST OF FIGURES

Figure 1. Location of Munglinup Beach Road project

Figure 2. Map of remnant vegetation within a 5 km buffer produced by DEISIP.

Figure 3. Photos of vegetation within Munglinup Beach Road project area.

Figure 4. Vegetation condition across Munglinup Beach Road project

Figure 5. Photo of known population of *Corysanthes limpida* (P4).

APPENDICES

1. Incidental Species List
2. Threatened and Priority Flora Species with the Potential to occur within the Munglinup Beach Road project area
3. Threatened and Priority Fauna Species with the Potential to occur within the Munglinup Beach Road project area
4. EPBC Act Protected Matters Report
5. BC Act Threatened and Priority Flora and Fauna definitions
6. EPBC Act Definition of Threatened Flora and Fauna Species
7. BC Act Threatened Ecological Community definitions
8. BC Act Definition of Priority Ecological Communities
9. EPBC Act Definition of Threatened Ecological Communities
10. BAM Act Categories and Control measures of Declared Pest (Plant) Organisms in Western Australia
11. Definitions of Vegetation Condition Scale

LIST OF ABBREVIATIONS

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

Executive Summary

The Shire of Esperance (SOE) Environmental Team was commissioned by the Shire of Esperance Asset Management department to undertake a review of the vegetation, flora, fauna and environmental values on the proposed Munglinup Beach Road project in 2024-25.

The proposed development involves the clearing of 0.519 ha of native vegetation for the purpose of road safety upgrades.

This report details of results from the Environmental Impact Assessment completed by Shire of Esperance Environmental Services team over spring 2024.

The site contained scattered *Melaleuca lanceolata* over *Acacia cyclops* dominated mixed shrubland.

Vegetation Condition varied between an Excellent and Good condition. With a large majority of the site in an excellent condition.

One Threatened Ecological Community occurred within the 20km buffer of the project site; however no vegetation in the survey area meets the requisite criteria for this community.

A total of 50 vascular plant taxa, representative of 31 genera and 28 families, were recorded within Munglinup Beach Road survey area. Of these 44 were native species and 6 were introduced.

Orchid leaves consistent with *Corysanthus limpidus* (P4) was found within the project area, the orchid was sterile and did not flower in Spring 2024.

Suitable habitat for five fauna species identified in the desktop survey was also present in the project area.

1 Introduction

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

This project is required for road safety upgrades, with the narrow gravel coastal road being heavily trafficked particularly in peak tourist season, where large numbers of cars and caravans traverse the road. The narrow nature and heavy usage provide significant safety issues that will be rectified by the road upgrades.

Clearing within the project has been kept to the minimum possible, however due to the undulating nature of the coastal dunes present within the project area, earthworks and associated clearing being required.

1.1 Location and Scope of Project

The proposed works are located ~20km south of the Munglinup Townsite, along Munglinup Beach Road. Specifically, it is located from 200m south of Washpool Road, at straight line kilometre (SLK) 6.04 to 6.95

(Main Roads 2024). A point within the proposed clearing permit area is 297362m N, 6248491mE (UTM Zone 51 H, GDA94).

The Shire of Esperance (SOE) has proposed to clear 0.519 ha of native vegetation located within Reserve 32337, East Munglinup for the purposes of widening and sealing Munglinup Beach Road. Munglinup Beach Road is currently a narrow gravel road providing access to Munglinup Beach and associated campgrounds. The current narrow road has significant safety issues due to the high use by caravans. Refer to Figure 1 for a map of the proposed area.



Figure 1. Location of Munglinup Beach Road project.

1.2 Environmental Legislation and Guidelines

The following legislation is relevant to this survey:

Commonwealth (Federal):

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

Western Australian (State):

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

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

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

2 OBJECTIVES

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

- Undertake a desktop study of the vegetation, flora, fauna, threatened ecological communities, soils, geology, landform, aboriginal heritage, cadastre, important wetlands, soils of the Munglinup Beach Road survey area using all available resources. This includes spatial interrogation using the Shire of Esperance's Desktop Environmental Impacts Spatial Interrogation Program (DEISIP), aerial photography interpretation and the Commonwealth Protected Matters Search Tool.
- Review available historical literature of the Munglinup Beach Road survey area;
- Undertake a field survey of the Munglinup Beach Road survey area, and collect and identify the vascular plant species present;
- Define and map the vegetation communities present and their condition in the Munglinup Beach Road survey area;
- Define and map the location of any threatened flora (TF) and priority flora (PF), TECs, fauna and priority fauna habitat located within the Munglinup Beach Road survey area;
- Provide recommendations on the local and regional significance of the vegetation communities;
- Define any management issues related to any environmental values; and
- Provide recommendations to the Shire of Esperance Asset Management department in relation to environmental management of the project.

3 METHODS

3.1 Desktop Assessment

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

- Threatened and Priority Flora Database (TPFL; DBCA 2024a);
- Western Australian Herbarium data (DBCA 2024b)
- DBCA's Esperance District Threatened Flora spatial dataset (DBCA 2024c);
- Threatened and Priority Ecological Communities (TECs & PECs; DBCA 2024d);
- Threatened, Specially Protected and Priority Fauna (DBCA 2024e); and

- Black cockatoo / Carnaby's cockatoo roost and breeding sites (DBCA 2024e).

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

Historical and State documentation and datasets consulted include:

- Vegetation mapping of the region, principally the coarse-scale vegetation associations of Beard (1976) (DDIRP-006);
- Vegetation Extent by Statewide Pre-European mapping statistics (Department of Parks and Wildlife 2018);
- Soil landscape mapping (Schoknecht, et al 2004);
- EPBC Act list of TECs; (2024)
- Priority Ecological Communities for Western Australia Version 35 (DBCA 2023c);
- Nomination or listing descriptions of TECs or PECs, where available and relevant (State and Federal);
- Recovery Plans, Approved Conservation Advices, Significant Impact Guidelines and / or other relevant reports or documentation relating to the preferred habitats / distributions of TECs / PECs, Threatened flora and fauna;
- Dieback Information Data Management System (DIDMS 2024; Gaia Resources);
- Shire of Esperance Weed Mapping Data (2024);
- Existing site digital orthophotos (Hopetoun to Esperance Coastline Dec 2019);
- Atlas of Living Australia database (2024)
- Hydrographic Catchments (DWER-028); and
- Crown Reserves (Landgate-227).
- RAMSAR sites (DBCA-010)
- Directory of Important Wetlands (DBCA-045)

3.2 Field Survey

The site was initially inspected on 28/08/2024, by Julie Waters (SOE Environmental Coordinator) and Katherine Walkerden (SOE Environmental Officer). A general assessment of possible ecological impacts included historical clearing, impact of fire regimes, regeneration from disturbance, waterlogging, senescence, weeds, erosion, sedimentation, invasive fauna, *Phytophthora* Dieback, and illegal dumping of rubbish.

A detailed field assessment of the flora and vegetation of the Munglinup Beach Road survey area was undertaken by SOE botanists on 28/08/2024 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 detailed

assessment was held slightly outside of peak flowering time to coincide surveys with the flowering period of *Corysanthes limpida* (P4) which had a known population 45m from the project area.

The methodology for assessing threatened and priority flora consisted of traversing by foot the entire Munglinup Beach Road 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 proposed clearing permit area.

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

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

A follow up survey was conducted on 26/09/2024 to target the identification of potential *Corysanthes limpida* plants.

The vegetation communities of Munglinup Beach Road were assessed for the presence a TEC or PEC (DBCA 2023, 2024d) comparing that to descriptions in approved conservation advice for these communities. PEC's do not have published approved conservation advice. Comparison of the vegetation community occurred using 'Priority Ecological Communities for Western Australia, Version 35 (DBCA 2023)' definitions, and other relevant documentation.

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

Draft conservation advice for 14 migratory birds was used in the drafting of the report (DOE, 2015).

3.3 Survey Timing

According to Table 3 in the Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016), the primary survey timing for the South-west and Interzone Botanical Province is Spring (September-November), which is the peak flowering period for this region. Surveys were conducted in late August in order to coincide the survey period with the flowering period of *Corysanthes limpida* (P4) which had a known population 45m from the project area.

3.4 Vegetation Descriptions

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

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

Additionally, possible environmentally sensitive areas, such as wetlands or granite, were noted. Overall, an assessment of environmental impacts to Department of Water and Environmental Regulation’s (DWER) 10 Clearing Principles were inspected and evaluated.

3.5 Survey Limitations

A general assessment was made of the survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 1). Based on this assessment, the present survey has not been subject to constraints which would affect the thoroughness of the survey, and the conclusions which have been formed.

Table 1: Potential limitations affecting the conclusions made in this report.

Potential Survey Limitation	Impact on Current Survey
Availability of contextual information at a regional and local scale	Not a limitation: Reference resources such as Beard’s mapping, together with online flora and vegetation information, have provided an appropriate level of information for the current survey. The vegetation of the Esperance shire has previously been mapped by Beard (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 SOE 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 between vegetation quadrat sites ensured thorough coverage of the survey area. Flora that was unknown or resembled threatened or priority flora were collected, the location and habitat noted, and the number of plants counted.
Mapping reliability	Not a constraint. Handheld GPS units were used for the survey, which for a majority of field conditions have an accuracy level of ± 5 m.
Survey timing, rainfall, season of survey	Potential limitation: The EPA (2016a) recommends that flora and vegetation surveys in the South – West Botanical Province be conducted in Spring (September–November). Surveys were conducted in late August, slightly outside of the peak flowering period.
Disturbances (fire/flood/clearing)	Not a limitation: The Munglinup Beach Road survey area exhibits minimal levels of disturbance.

4 DESKTOP ASSESSMENT RESULTS

4.1 Climate

The Munglinup climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2022). The Munglinup West Weather station receives an average annual rainfall of 426 mm (note: the project site is likely to be much higher due to its proximity to the coast).

4.2 Catchment

The project is present within Esperance Coast Basin.

4.3 Geology, Soils and Topography

A single geological unit was identified by Schoknecht et al. (2004). This was: Quaternary sand deposits usually calcareous with headlands of Archean granite and gneiss.

Within the area, there was one soil type recorded by Schoknecht et al. (2004). This was defined as: Calcareous shallow sand with associated calcareous deep sand and pale deep sand and minor bare rock.

Within the area, there was one landform unit recorded by Schoknecht et al. (2004). This was defined as: Coastal dunes to 100m in relief slopes vary from gently inclined to steep.

4.4 Regional Vegetation

The site is located within the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell 1995) Esperance Plains region and Recherche sub-region (Esp02). The Esp2 region is described as “Proteaceae Scrub and Mallee heaths on sandplain overlying Eocene sediments, rich in endemics. Herbfields and heaths (rich in endemics) on abrupt granite and quartzite ranges that rise from the plan. Eucalyptus woodlands occur in gullies and alluvial foot-slopes”.

Munglinup Beach Road project area is mapped as forming a component of a single Beard Vegetation Association, namely Fanny Cove_42. This vegetation association is lightly cleared with 95% of its original

extent remaining at all levels and is well represented in conservation estate with 45% of its pre-European extent in land protected for conservation.

Table 2. Vegetation association within Munglinup Beach Road project area by percentage of pre-European extent remaining.

Vegetation Association	Fanny Cove_42
Description	Shrublands; mallee & acacia scrub on south coastal dunes
Pre-European extent remaining within the Shire of Esperance	94.87%
Pre-European extent remaining within Eastern Mallee/ Recherche IBRA Sub-region	95.56%
Pre- European extent in land protected for conservation	44.80%

4.5 Surrounding Land Use

The area directly included in the clearing permit application Munglinup Beach Road is part of Reserve 32337, a 495 ha recreational reserve. The area is within rural zoning. The project area is in a lightly cleared area with 67.41% of vegetation within 5 km of the project remaining.

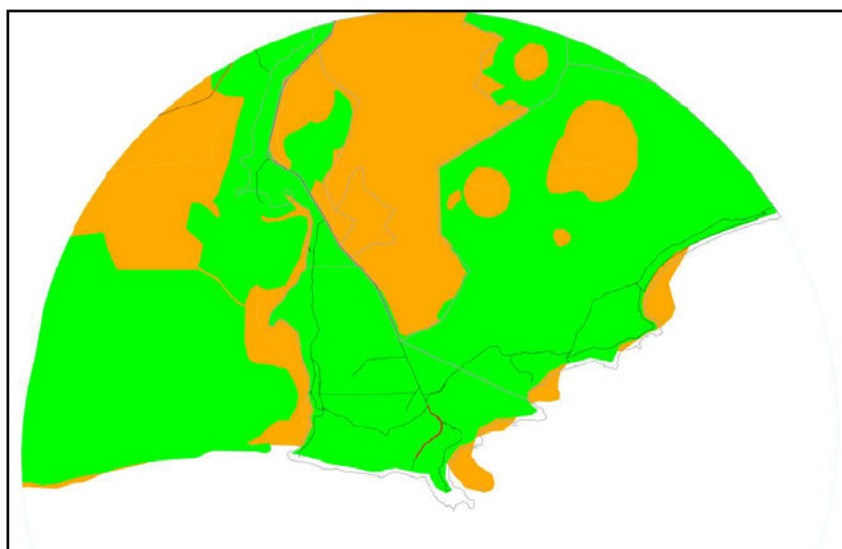


Figure 2. Map of remnant vegetation within a 5 km buffer produced by DEISIP. Project area is highlighted in red, remnant vegetation is in green and cleared vegetation is in orange, road centrelines are in black and cadastral boundaries are in grey.

The site was 590 m from Reserve 32339 Lake Shaster Nature Reserve the closest conservation reserve. No other conservation vested reserves were within 5 km of the site.

4.6 Potential Threatened and Priority Flora

Three threatened flora (TF) and eight priority flora (PF) were recorded within a 20 km radius of the proposed impact site (Appendix 2)). Of these, three PF species had suitable known associated habitat that corresponded with vegetation communities and soil type of Munglinup Beach Road project area.

4.7 Potential Threatened and Priority Ecological Communities

The desktop study identified the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' 215m from the project area.

No other TEC's or priority ecological communities (PEC) were identified by the desktop study as being within a 20 km buffer of the site.

4.8 Potential Threatened and Priority Fauna

Five threatened fauna, one other specially protected fauna, two priority fauna and 12 migratory fauna were recorded within a 20 km radius of the proposed impact site (Appendix 3). An Additional 33 conservation listed species were identified by the EPBC protected matters tool.

5 FIELD SURVEY RESULTS AND DISCUSSION

5.7 Vegetation Communities

A single vegetation community was identified within the Munglinup Beach Road project area, as defined by structure and composition. It is believed that the Beard (1973) vegetation associations identified in Section 4.4 are an appropriate match for the observed vegetation. Approximately 0.519 ha of native vegetation was present within the project site, which was described during the field survey as scattered *Melaleuca lanceolata* over *Acacia cyclops* dominated mixed shrubland.



Figure 3. Photos of vegetation within Munglinup Beach Road project area. Photo taken by Katherine Walkerden on 28/08/2024.

5.8 Vegetation Condition

Vegetation condition varied between Good and Excellent condition (Keighery 1994), with the majority (0.435 ha) in Excellent condition. The primary cause of degradation observed to be afflicting the site was weed invasion with *Ehrharta villosa* (Pyp Grass) being the primary weed within the Good areas. Originally

planted at the site to assist in dune stabilisation, this weed is particularly problematic in coastal dune ecosystems.

Quantifying vegetation condition:

- 0.453ha was in an Excellent condition
- 0.039ha was in a Very good condition
- 0.026ha was in a Good condition

Hopetoun_to_Esperance_Coastline_Dec_2019

Vegetation Condition

- Good
- Very Good
- Excellent



Figure 5. Vegetation condition across Munghinup Beach Road project, ranging from a Good to Excellent condition.

5.8.1 Weeds

There was a minor weed burden throughout a majority of the site, with small amounts of common coastal weeds such as *Arctotheca calendula*, *Hypochaeris radicata*, *Disa bracteata* and *Ehrharta calycinus* mainly limited to the edges of the road. Of the weeds present, the most extensive and of serious concern were *Ehrharta villosa* (Pyp Grass), there was several low-density infestations of the plant at the site and a single dense infestation within the project area. The species had commonly been planted within coastal dunes in the Esperance region for dune stabilisation purposes. Overall, six invasive species were identified within the project area (Appendix 1).

5.8.2 Phytophthora Dieback

Vegetation within the project area consisted of species that are not susceptible to Phytophthora dieback, with the vegetation within the project area being largely uninterpretable. Some species in the northern end such as *Hakea nitida* and

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.

5.9 Threatened Ecological Communities

The EPBC listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' was recorded as occurring 200m from the project area, however given there was only two proteaceous species present within the project area (*Hakea nitida* and *Adenanthos cuneatus*) which were only present in the northern extent of the area at a low density. Due to the low proportion and diversity of proteaceous species the vegetation within the project area could not be considered as being Kwongkan TEC.

No other TEC or PECs were relevant to the project area.

5.10 Flora

A total of 50 vascular plant taxa, representative of 31 genera and 28 families, were recorded within Munglinup Beach Road survey area. Of these 44 were native species and 6 were introduced.

5.11 Threatened and Priority Flora

The targeted flora survey identified a single probable priority flora species, within the Munglinup Beach Road survey area.

5.11.1 *Corysanthes limpida*, Priority Four

Corysanthes limpida (P4) was recorded on the desktop search as occurring 45 m from the project area. The species was recorded as flowering in August, due to this the survey for the project area was conducted in late August.

The known population (Perth 08309655) was visited on the morning of the survey with the population in flower, see Figure 4. Allowing the surveyors to familiarise themselves with the species and its habitat requirements.

During the survey a small patch of orchid leaves consistent with *Corysanthes limpida* were detected several meters outside of the project area, there was no reproductive material on these plants and the species could not be determined. The plants were revisited on the 29/09/2024 at which point there was still no reproductive material and the orchid leaves were senescing.

The plants will not be impacted during the project.



Figure 5. Photo of known population of *Corysanthes limpida* (P4). Photo taken by Katherine Walkerden on the 28/08/2024.

5.12 Fauna

A total of 54 conservation listed faunal species were identified within the desktop search. Of the species identified within the desktop survey, a large majority of the species were marine animals or shore birds which will not utilise the site. A total of 4 fauna species had potentially suitable habitat within the clearing area. These include the Chudditch, Peregrine falcon, Tammar wallaby, and Osprey.

The Carnaby's Cockatoo had a known record within the project area, though the vegetation within the project area did not provide suitable foraging habitat for this species. Some species present within the project area such as *Acacia cyclops*, *Eucalyptus angulosa* and *Pelargonium capitatum* provides some limited forage for the species. Vegetation to the north of the project area had high quality foraging habitat due to the high proportion of proteaceous species and likely passes over the project area will accessing water courses.

5.12.1 Chuditch, *Dasyurus geoffroii*, Vulnerable

The closest known record of the Chuditch was 2.04km from the project area. Vegetation within the project area provided potentially suitable habitat for the species, though there was no evidence that the area is currently inhabited by the species. The surrounding vegetation within the large (495ha) Reserve 32337 provides a large area of potentially suitable habitat.

5.12.2 Peregrine falcon, *Falco peregrinus*, Other specially protected

The closest known record of the species was 18.38km from the project area. The species has a broad habitat preference, with the vegetation within the reserve providing potentially suitable roosting habitat for the species, with the large *Melaleuca lanceolata* trees providing potential roosting habitat. Hunting habitat for this species would be limited due to the dense nature of the vegetation in the reserve.

5.12.3 Tammar wallaby, *Notamacropus eugenii derbianus*, Priority four

The closest known record of this species was 9.88km from the project area. The closest known extant populations of the Tammar Wallaby are in the nearby Fitzgerald River National Park and Middle and North Twin Peak Islands (Recherche Archipelago Nature reserve) with no known mainland populations in the Esperance region.

The dense coastal shrubland present within the clearing area provides suitable habitat for the species, though the species is no longer known to occur within the area.

5.12.4 Osprey, *Pandion haliaetus*, Migratory

The closest known record of the Osprey was 0.1km from the project area. The Osprey mainly hunts in littoral and coastal waters, with the nearby coast and estuary providing suitable foraging habitat. The large *Melaleuca lanceolata* trees present within the clearing area provides potentially suitable roosting habitat for the species. However, within Reserve 32337 there are numerous old growth *Eucalyptus occidentalis* trees occurring in swamps and floodplains providing more suitable habitat.

There was no Osprey nests present within the survey area. Given the large impact thresholds for the Osprey being 240 individuals under the draft referral guidelines (DOE, 2015) the potential habitat impacts will not require referral.

6 REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION

The Munglinup Beach Road project may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations (DWER) assess applications, as listed under Schedule 5 of the Environmental Protection Act 1986 (DWER 2019).

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

Not at Variance: Biodiversity at this site is moderate with 44 native species recorded over a single vegetation community.

7.2 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.

May be at Variance: The vegetation contains potentially suitable habitat for several conservation listed fauna species including the Chudditch, Peregrine Falcon, Osprey and Tammar Wallaby.

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

Not at Variance: *Corysanthes limpida* (P4) may be present within the survey area, but will not be impacted by the project.

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

Not at Variance: No TECs or PEC's within the Shire of Esperance were present in the study area.

7.5 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.

Not at Variance: The project was in a lightly cleared local area with 67% native vegetation within 5km of the project site remaining. The clearing is being undertaken within a large natural area, and ecological connectivity will not be hampered by the project.

7.6 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.

Not at Variance: Vegetation in this area was not growing in association with watercourses or wetlands.

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

Likely/Not at Variance: The site was entirely constructed within coastal dunes, clearing within the project area may accelerate wind erosion within the area.

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

Not at Variance: The project is 590m away from Reserve 32339 Lake Shaster Nature Reserve. The relatively low amount of native vegetation cleared will have little effect on the ecological linkages to this reserve.

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

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

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

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

7 RECOMMENDATIONS

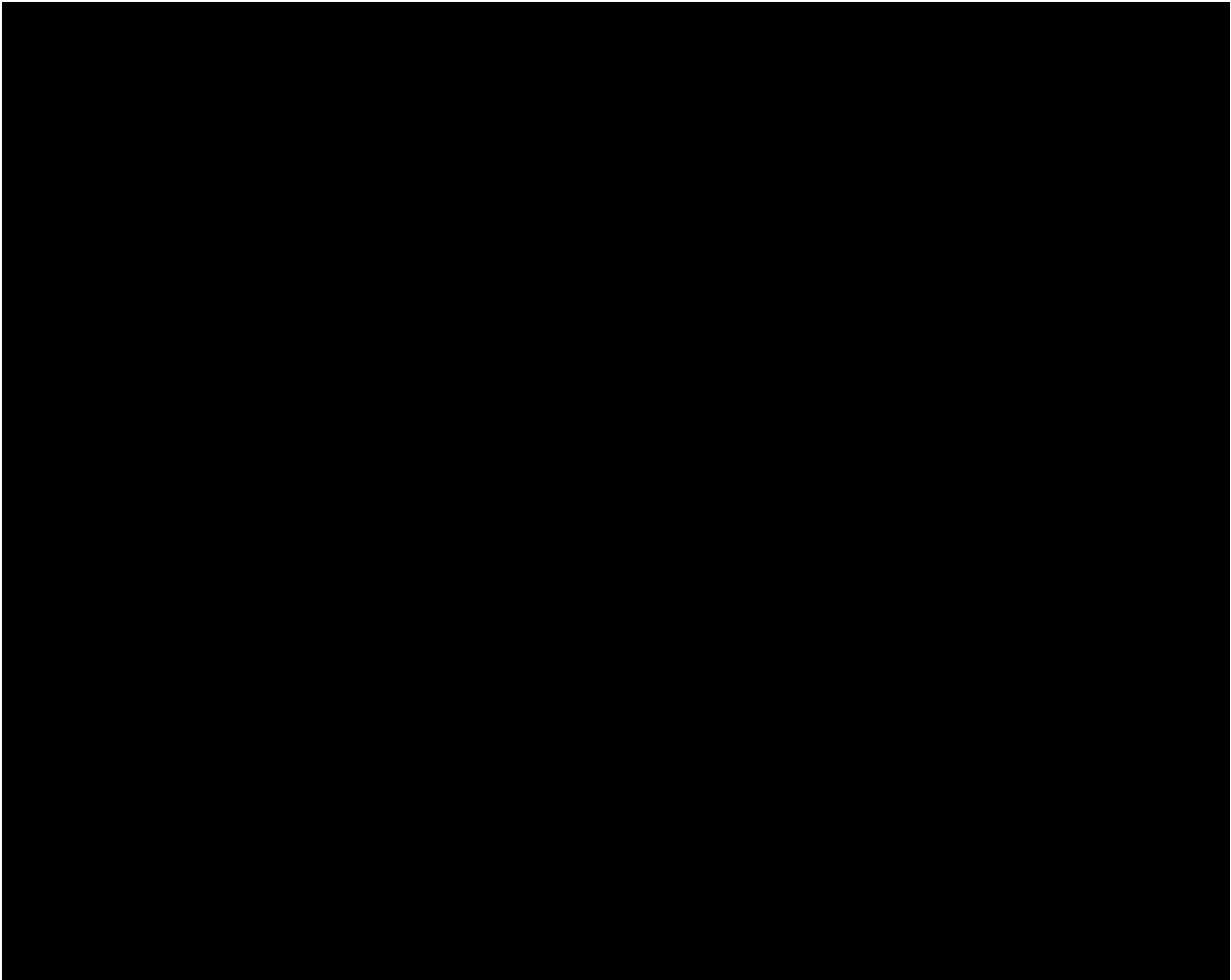
As Shire Environmental Coordinator signs off on project work packs the following recommendation will be included within the internal SOE approval process for the road project:

- All vehicles and construction equipment to be cleaned prior to start of the project
- Regular washdowns to occur during the project to reduce spread of weed and pathogens within the project area.

- Mulching of vegetation is situ, to prevent erosion.
- Use of watercarts to prevent wind erosion.

8 LIST OF PERSONNEL

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



9 REFERENCES

Atlas of Living Australia database (2024), < <https://www.ala.org.au/>>

Beard J.S. (1973), *The vegetation of the Esperance and Malcom areas, Western Australia, 1:250 000 series*, Vegmap Publications Perth

Bureau of Meteorology (2024), Climate statistics for Australian sites.http://www.bom.gov.au/climate/averages/tables/ca_wa_names.shtml

Commonwealth of Australia, *Environmental Protection and Biodiversity Conservation Act 1999* (Cth), <<https://www.legislation.gov.au/Details/C2022C00214>>

Commonwealth of Australia (2012), *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris; Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii; and Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso*. Prepared for the Australian Government by the Department of Sustainability, Environment, Water, Population and Communities, Canberra ACT.
<https://www.agriculture.gov.au/sites/default/files/documents/referral-guidelines-wa-black-cockatoo.pdf>.

Commonwealth of Australia (2014), *Approved Conservation Advice for Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia*, Department of the Environment, <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/126-conservation-advice.pdf>>

Commonwealth of Australia (2021), *Approved Conservation Advice for Subtropical and Temperate Coastal Saltmarsh*, Department of Agriculture, Water and the Environment,
<https://www.dcceew.gov.au/environment/biodiversity/threatened/conservation-advice/subtropical-temperate-coastal-saltmarsh>

Commonwealth of Australia (2024), *National Recovery Plan for the Malleefowl (Leipoa ocellata)* Department of Climate change, Energy the Environment and Water

Department of Agriculture, Water and the Environment (2022) *Referral guideline for 3 WA threatened black cockatoo species, Carnaby's Cockatoo (Zanda latirostris), Baudin's Cockatoo (Zanda baudinii) and the Forest Red-tailed Black-cockatoo (Calyptorhynchus banksii naso)*
<<https://www.dcceew.gov.au/sites/default/files/documents/referral-guideline-3-wa-threatened-black-cockatoo-species-2022.pdf>>

Department of Biodiversity, Conservation and Attractions (2023a) *List of Threatened Ecological Communities Endorsed by the Western Australian Minister for Environment*
<<https://www.dbca.wa.gov.au/wildlife-and-ecosystems/threatened-ecological-communities/list-threatened-ecological-communities>>

Department of Biodiversity, Conservation and Attractions (2023b), *Conservation codes for Western Australian flora and fauna*, Government of Western Australia.
<<https://www.dbca.wa.gov.au/media/792/download> >

Department of Biodiversity, Conservation and Attractions (2023c), *Priority Ecological Communities for Western Australia Version 35*, Government of Western Australia

Department of Biodiversity, Conservation and Attractions (2024a), *Threatened and Priority Flora Database (TPFL) spatial dataset, 36-0624FL*, Government of Western Australia. [13/6/2024]

Department of Biodiversity, Conservation and Attractions (2024b), *Western Australia Herbarium spatial dataset, 36-0624FL*, Government of Western Australia. [13/6/2024]

Department of Biodiversity, Conservation and Attractions (2024c), *Esperance District Threatened and Priority Flora spatial dataset*, Government of Western Australia [February 2024]

Department of Biodiversity, Conservation and Attractions (2024d), *Threatened Ecological Communities and Priority Ecological Communities Search Results, for Boundaries and Buffers, 12-0624EC* Government of Western Australia. [11/06/2024].

Department of Biodiversity, Conservation and Attractions (2024e), *Threatened and Priority Fauna Search Results*, 13-0624FA Government of Western Australia. [10/06/2024].

Department of Biodiversity, Conservation and Attractions (2024f) Black cockatoo / Carnaby's cockatoo roost and breeding sites [13-0624FA(BC) & 13-0624FA(WTBC)]

Department of Biodiversity, Conservation and Attractions (2024g) Florabase, The Flora of Western Australia Online (and collections housed at the WA Herbarium). <<https://florabase.dpaw.wa.gov.au/search/advanced>>

Department of Climate Change, Energy, the Environment and Water (2024), *EPBC Act Protected Matters Search Tool* <pmst.environment.gov.au> [27.03.2025]

Department of Climate Change, Energy, the Environment and Water (2024), *EPBC Act List of Threatened Ecological Communities*. < <https://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl>>

Department of Climate Change, Energy, the Environment and Water (2024), *EPBC Act List of Threatened Fauna*, < <https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna> >

Department of Climate Change, Energy, the Environment and Water (2024), *EPBC Act List of Threatened Flora*. < <https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora>>

Department of Environment (2015), Referral guideline for 14 birds listed as migratory species under the EPBC Act. <https://www.dcceew.gov.au/sites/default/files/documents/migratory-birds-draft-referral-guideline.pdf>

Department of Environment and Energy (2022), *National Recovery Plan for the Australasian Bittern, *Botaurus poiciloptilus**, Commonwealth Government of Australia < <https://www.dcceew.gov.au/sites/default/files/documents/national-recovery-plan-australasian-bittern.pdf>>

Department of Environment and Energy (2017), *Australian Vegetation Attribute Manual Version 7.0* <<https://www.dcceew.gov.au/sites/default/files/documents/australian-vegetation-attribute-manual-v70.pdf>>

Department of Parks and Wildlife (2013) *Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan*. Western Australian Wildlife Management Program No. 52. Department of Parks and Wildlife, Perth, Western Australia.

Department of Parks and Wildlife (2018), *2018 Statewide Vegetation Statistics (formerly the CAR Reserve Analysis – Full Report)*, Government of Western Australia

Department of Primary Industries and Regional Development (2024), *Western Australian Organism List*. <<https://www.agric.wa.gov.au/organisms>>

Department of Water and Environmental Regulation (2014) *A guide to the assessment of applications to clear native vegetation, Under Part V Division 2 of the Environmental Protection Act 1986.*

Environmental Protection Authority (2016), *Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*, Government of Western Australia. <<http://www.epa.wa.gov.au/policies-guidance/technical-guidance-flora-and-vegetation-surveys-environmental-impact-assessment>>

Environmental Protection Authority (2020), *Technical Guidance – Terrestrial vertebrate fauna surveys for Environmental Impact Assessment*, EPA, Western Australia. <https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf>

Environmental Protection Authority, (2016) *Environmental Factor Guideline: Flora and Vegetation*, EPA, Western Australia.

Field, C (2009) *Environmental Weed Strategy 2009-2018*, Shire of Esperance

GAIA Resources, State NRM and South Coast Natural Resource Management (2024), *Dieback Information Delivery and Management Service, DIDMS*. <<https://didms.gaiaresources.com.au/>>

Groom, C (2011) *Plants used by Carnaby's Black Cockatoo*, Department of Environment and Conservation

Main Roads of Western Australia (2024), *Standard Line Kilometres online application*, Government of Western Australia. <<https://mrapps.mainroads.wa.gov.au/gpsslk>>

Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil Landscape Mapping in south-western Australia*, Resource Management Technical Report 20, Department of Agriculture WA.

Thackway R, Cresswell ID, Shorthouse D, Ferrier S, Hagar T, Pressey T, Wilson P, Fleming M, Howe D, Morgon G, Young P, Copley P, Peters D, Wells P, Miles I, Parkes D, McKenzie N, Kitchin M & Bullen F (1995), *Interim Biogeographic Regionalisation for Australia: A framework for setting priorities in the National Reserves System Cooperative Program*, Australia Nature Conservation Agency. <<https://www.environment.gov.au/system/files/resources/4263c26f-f2a7-4a07-9a29-b1a81ac85acc/files/ibra-framework-setting-priorities-nrs-cooperative-program.pdf>>

Western Australian Government, Biosecurity and Agriculture Management Act 2007, <https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_2736_homepage.html>

Western Australian Government, *Biodiversity Conservation Act 2016* https://www.legislation.wa.gov.au/legislation/statutes.nsf/law_a147120.html

Western Australian Government, *Biodiversity Conservation Act 2016 Biodiversity Conservation (Species) Order 2022*, Government Gazette, WA, 30 September 2022, <<https://www.dpaw.wa.gov.au/images/Biodiversity%20Conservation%20Listing%20of%20Native%20Species%20Flora%20Order%202022.pdf>>

Western Australian Government, *Biodiversity Conservation Regulations 2018*. <https://www.legislation.wa.gov.au/legislation/statutes.nsf/law_s50938.html>

Appendix 1: Incidental species list

Family	Taxon	Invasive
Aizoaceae	<i>Tetragona implexicoma</i>	
Asparagaceae	<i>Thysanotus patersonii</i>	
Asteraceae	<i>Arctotheca calendula</i>	X
Asteraceae	<i>Hypochaeris radicata</i>	X
Asteraceae	<i>Olearia axillaris</i>	
Asteraceae	<i>Senecio pinnatifolius</i>	
Aizoaceae	<i>Carpobrotus virescens</i>	
Chenopodiaceae	<i>Enchylaena tomentosa</i>	
Colchicaceae	<i>Wurmbea sinora</i>	
Cyperaceae	<i>Caustis dioica</i>	
Cyperaceae	<i>Lepidosperma gladiatum</i>	
Dilleniaceae	<i>Hibbertia racemosa</i>	
Ericaceae	<i>Acrotriche cordata</i>	
Ericaceae	<i>Leucopogon parviflorus</i>	
Ericaceae	<i>Leucopogon obovatus</i>	
Euphorbiaceae	<i>Adriana quadripartita</i>	
Fabaceae	<i>Acacia cyclops</i>	
Fabaceae	<i>Acacia rostellifera</i>	
Fabaceae	<i>Jacksonia spinosa</i>	
Fabaceae	<i>Pultenaea heterochila</i>	
Fabaceae	<i>Templetonia retusa</i>	
Geraniaceae	<i>Pelargonium capitatum</i>	X
Goodeniaceae	<i>Scaevola crassifolia</i>	
Hemerocallidaceae	<i>Dianella brevicaulis</i>	
Lauraceae	<i>Cassytha racemosa</i>	
Myrtaceae	<i>Calothamnus quadrifidus</i>	
Myrtaceae	<i>Eucalyptus angulosa</i>	
Myrtaceae	<i>Eucalyptus globata</i> subsp. <i>globata</i>	
Myrtaceae	<i>Eucalyptus ecostata</i>	
Myrtaceae	<i>Eucalyptus incrassata</i>	
Myrtaceae	<i>Eucalyptus pleurocarpa</i>	
Myrtaceae	<i>Melaleuca lanceolata</i>	
Orchidaceae	<i>Caladenia latifolia</i>	
Orchidaceae	<i>Disa bracteata</i>	X
Orchidaceae	<i>Orchid</i> sp.	
Phyllanthaceae	<i>Lysiandra calycinus</i>	
Poaceae	<i>Ehrharta calycina</i>	X
Poaceae	<i>Ehrharta villosa</i>	X
Poaceae	<i>Poa poiformis</i>	
Polygonaceae	<i>Muehlenbeckia adpressa</i>	
Primulaceae	<i>Lysimachia arvensis</i>	X
Proteaceae	<i>Adenanthos cuneatus</i>	

Proteaceae	<i>Hakea nitida</i>	
Ranunculaceae	<i>Clematis pubescens</i>	
Restionaceae	<i>Desmocladius austrinus</i>	
Rhamnaceae	<i>Spyridium globulosum</i>	
Rubiaceae	<i>Opercularia spermacoea</i>	
Scrophulariaceae	<i>Myoporum insulare</i>	
Thymelaeaceae	<i>Pimelea ferruginea</i>	
Urticaceae	<i>Parietaria debilis</i>	
Zygophyllaceae	<i>Roepera billardierei</i>	

Appendix 2: Description of Threatened and Priority Flora Species with the Potential to occur within the Munglinup Beach Road Survey Area

Threatened or priority flora identified by the desktop study to be present within a 20 km radius of Munglinup Beach Road project area, using Threatened and Priority Flora Reporting (TPFL; DBCA 2024a), WA Herbarium (DBCA 2024b) and Esperance District Threatened Flora (DBCA 2024c).

Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2018, Critically Endangered (CR) endangered (EN) and Vulnerable (VU).

Taxon	BC Act (EPBC) Conservation Status	Associated Habitat	Likely to occur	Distance from site (km)
<i>Cyanicula</i> sp. Esperance (G. Brockman 735)	P1	Sandy heath, post fire.	Unlikely	10.35
<i>Carpobrotus</i> sp. Lateral Flowers (N. Gibson & M. Lyons 973)	P2	Wide variety of habitats including Eucalyptus (tree) woodland, mallee woodland, coastal dune heath.	Possible	18.69
<i>Astartea reticulata</i>	P3	Damp habitats associated with winter-wet depressions, swamps, creeklines and bases of granitic outcrops. Soils tend to be rich in organic matter. Often with <i>Melaleuca cuticularis</i> .	Unlikely	12.04
<i>Hopkinsia adscendens</i>	P3	Sand. Dry or seasonally damp habitats along streams.	Unlikely	18.44
<i>Corysanthes limpida</i>	P4	Sand. Coastal dunes. Winter damp soil.	Possible	0.05
<i>Eucalyptus preissiana</i> subsp. <i>lobata</i>	P4	Sand. Coastal limestone rises & sand dunes.	Possible	11.62
<i>Daviesia pauciflora</i>	P3	White, grey or yellow sand over limestone, laterite or deep sand. Kwongkan shrublands.	Unlikely	17.68
<i>Dampiera sericantha</i>	P3	Recorded across a variety of soil types on plains, including sand or gravel.	Unlikely	18.40
<i>Anigozanthos bicolor</i> subsp. <i>minor</i>	T	Short-lived post-seral disturbance opportunist preferring moist sandy soil in heath, and also shallow skeletal soils near granite outcrops or wet gravelly clays.	Unlikely	13.31
<i>Conostylis lepidospermoides</i>	T	Deep sand plains with diverse shrubland, often with Kwongkan.	Unlikely	16.66
<i>Rhizanthella johnstonii</i>	T	Sandy clay soil or deep sandy soil. Growing under <i>Melaleuca uncinata</i> in dense shrubland.	Unlikely	19.98

Appendix 3: Description of Threatened and Priority Fauna Species with the Potential to occur within the ‘Munglinup Beach Road Upgrades’ Survey Area

Threatened or priority fauna identified by the desktop study to be present within a 20 km radius of ‘Munglinup Beach Road Upgrades’ project area, using Threatened and Priority Fauna dataset (DBCAs 2024e) and species identified by the EPBC protected matters search tool.

Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2018, EPBC Act (1999), Extinct (EX), Critically Endangered (CR) endangered (EN) and Vulnerable (VU).

Taxon	Common Name	BC Act Status	EPBC Status	Associated Habitat	Likely to occur	Distance from site (km)	EPBC Protected Matters Tool
<i>Actitis hypoleucos</i>	Common sandpiper	MI	MI	Forages in coastal and inland wetlands in shallow water and on soft bare mud at wetland margins and mangroves, and sometimes grassy areas adjoining wetlands. Also stream deltas, lake shores, claypans, and dams. Roosts generally on rocks, or in roots or branches of vegetation. Perches on posts, jetties, moored boats and other artificial structures.	Unlikely	10.95	
<i>Aphelocephala leucopsis</i>	Southern whiteface			Single record from the Esperance record near Peak Charles from 1981. Wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by Acacias or Eucalypts on ranges, foothills and lowlands, and plains. Southern whiteface forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover. Birds mainly feed on insects, spiders, and seeds, largely gleaned from the bare ground or leaf litter.	Unlikely		May

<i>Apus pacificus</i>	Fork-tailed swift	MI	MI	Along WA South Coast, records scattered between Denmark and Eyre Bird Observatory, and some sparse inland records from the wheatbelt. Almost exclusively aerial, mostly occurring over inland plains and sometimes coastal areas, including offshore islands and cliffs. Insectivorous. Breeds in Siberia from August - September.	Unlikely	2.30	
<i>Ardenna grisea</i>	Sooty shearwater			Marine.	No		May
<i>Balaenoptera musculus</i>	Blue whale			Marine.	No		May
<i>Botaurus poiciloptilus</i>	Australasian bittern			Densely-vegetated freshwater and slightly brackish wetlands and lakes across the south coast east to Cape Arid. Beds of tall bulrush (<i>Typha</i> sp.), <i>Baumea</i> , and sedges in freshwater swamps. Nests in rough platform of bulrush and sticks placed in tea trees or other shrubs just above the waterline. Eggs laid between September to December. Threatened by swamp drainage and development, declining water qualities.	Unlikely		May
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	MI	Widespread in both inland and coastal locations of fresh and saline habitats. Widespread from Cape Arid to Carnarvon. Utilises fresh to hypersaline aquatic environments; edges of mudflats, sewage ponds, wetlands, and inundated pastures. Roosts on rocky and sandy beaches, and wetland vegetation. Omnivorous; diet of seeds, worms, molluscs, crustaceans, and insects.	Unlikely	8.45	May
<i>Calidris canutus</i>	Red knot			Sheltered bays, inlets, estuaries, intertidal mudflats and protected sandy or coralline shores. Occasionally sighted in saltworks, sewage farms, saltmarsh, shallow wetlands (incl. lakes, swamps, riverbanks, dams, soaks and flooded paddocks).	Unlikely		May

				Most frequently sighted in dense flocks feeding or roosting.			
<i>Calidris ferruginea</i>	Curlew sandpiper	CR	CR & MI	Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around 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	8.45	May
<i>Calidris ruficollis</i>	Red-necked stint	MI	MI	Sheltered inlets, bays, and estuaries with intertidal mudflats, occasionally on protected sandy shores. Sometimes on stony / rocky shores, saltworks, sewage farms, lagoons, lakes, swamps, riverbanks, flooded paddocks, and dams.	No	3.03	
<i>Carcharias taurus</i>	Grey nurse shark			Marine.	No		Likely
<i>Carcharodon carcharias</i>	Great white shark			Marine.	No		Known
<i>Caretta caretta</i>	Loggerhead turtle			Marine.	No		Likely
<i>Charadrius leschenaultii</i>	Greater sand plover			Marine.	No		May
<i>Chelonia mydas</i>	Green turtle			Marine.	No		May
<i>Daphnia jollyi</i>	Water flea	P1		Endemic to Western Australia, where it inhabits fresh shallow pools over granite rock. It is associated with the 'Granite outcrop pools with endemic aquatic fauna' PEC.	No	17.50	
<i>Dasyurus geoffroii</i>	Chuditch	VU	VU	Currently restricted to south-western WA, with population strongholds in dry sclerophyll forest and dry woodland and mallee-heath. Require hollow logs, earth burrows, and occasionally hollowed-out	Potentially	2.04	Likely

				termite mounds for daytime shelter / nesting. Hollow tree bases occasionally used. Diet is broad and consists largely of small mammals, amphibians, small reptiles, invertebrates, freshwater crustaceans, small birds. Occupies even high-quality habitats at low densities due to territorial behaviour - female habitats extend over core areas of 55-120 ha and don't overlap, whilst male territories extend over 400 ha or more and overlap. Although meso-predator, Chuditch threatened by raptor and feral fox predation, drowning in dam nets, injury in traps set-up for foxes or rabbits, and previously deliberate shooting by landholders.			
<i>Dermochelys coriacea</i>	Leatherback turtle			Marine.	No		Likely
<i>Diomedea antipodensis</i>	Antipodean albatross			Marine.	No		Likely
<i>Diomedea dabbenena</i>	Tristan albatross			Marine.	No		May
<i>Diomedea epomophora</i>	Southern royal Albatross			Marine.	No		May
<i>Diomedea exulans</i>	Wandering albatross			Marine.	No		Likely
<i>Diomedea sanfordi</i>	Northern royal albatross			Marine.	No		May
<i>Eubalaena australis</i>	Southern right whale			Marine.	No		Known
<i>Falco hypoleucos</i>	Grey falcon			The distribution of this species is restricted largely to areas of the highest annual average temperatures where there is an average annual rainfall of less than 500 mm. It favours lightly timbered and untimbered lowland plains that are crossed by tree-	Unlikely		Likely

				lined watercourses. It uses the abandoned nests of other bird species, particularly corvids.			
<i>Falco peregrinus</i>	Peregrine falcon	OS		Broad habitat range, from tropical and temperate rainforests to arid zone, and alpine areas. Requires abundant prey and secure nest sites, preferring cliffs (both inland and coastal) or open woodlands in close proximity to water. Pairs maintain a home range of approximately 20-30 sq km, laying eggs in cliff recesses, tree hollows or abandoned nests of other large birds.	Potentially	18.38	
<i>Hydroprogne caspia</i>	Caspian tern	MI	MI	Nests in open, sparsely vegetated areas with some shelter (i.e. near bushes, large sticks, driftwood, clumps of beach wrack) and consists of a shallow scape in the ground, often lined with grass, seaweed, feathers, small stones and shells. Coastal and offshore island habitats; sheltered seas, estuaries, tidal creeks, near-coastal salt lakes and brackish pools, open wetlands. Very unlikely to use fresh waters. Feeds predominantly on fish, bird eggs, carrion, aquatic invertebrates, flying insects and earthworms.	No	0.11	
<i>Leipoa ocellata</i>	Malleefowl	VU	VU	Semi-arid to arid, long-unburnt mallee-dominated areas with sandy (can be sandy gravel) substrate and abundant leaf-litter for nest mound building. Occasionally low E. wandoo or E. astringens woodlands and mulga shrublands dominated by Eucalyptus, Callitris, and Acacia sp. Diet consists of Acacia seeds, flower blossoms, buds, fruit and lerps, and soil invertebrates. Construct distinctive nest mounds that can exceed 4 m across and 1 m high. Threatened by habitat fragmentation, degradation of	No	19.76	Likely

				habitat by feral ungulates and rabbits, altered fire regimes, vehicle strike, and feral predators.			
<i>Limosa lapponica menzbieri</i>	Northern siberian bar-tailed godwit			Estuarine sand and mud flats, sandy beaches (including with beach wrack), reef flats and near-coastal salt lakes. Migrates to south coast from Arctic Circle during austral summer. Very rare visitor to Esperance region - normally south to Garden Island, but likely habitat between Stokes Inlet and Cape Arid.	Unlikely		May
<i>Limosa limosa</i>	Black-tailed godwit	MI	MI	The Black-tailed Godwit forages on wide intertidal mudflats or sandflats, in soft mud or shallow water and occasionally in shallow estuaries. They use similar habitats on shores of inland lakes and other wetlands. They are found in muddy areas often open and unvegetated, but commonly use drying marshy wetlands; sometimes they forage among mangroves. They roost and loaf on low banks of mud, sand or shell, bars, islets and beaches in sheltered areas; also on saltflats behind mangroves. They may occur in non-vegetated areas, or among low vegetation, such as samphire.	Unlikely	14.70	
<i>Macronectes giganteus</i>	Southern giant-petrel			Marine.	No		May
<i>Macronectes halli</i>	Northern giant petrel			Marine.	No		Likely
<i>Neophoca cinerea</i>	Australian sea lion	EN	EN	Marine.	No	19.24	Known
<i>Notamacropus eugenii derbianus</i>	Tammar wallaby	P4		Low dense scrub vegetation for diurnal shelter, open grassy areas for feeding. Coastal scrub, heath, dry sclerophyll forest, and mallee and woodland thickets. Crepuscular; rests in scrub during day and venture into open areas after dark. Able to drink sea water or	Potentially	9.88	

				go without fresh water for long periods. Solitary except for females with young.			
<i>Notamacropus irma</i>	Western brush wallaby	P4		Open forest or woodland, favouring open seasonally-wet flats with low grasses and open scrubby thickets. Mallee and heathland.	Unlikely	9.66	
<i>Numenius madagascariensis</i>	Eastern curlew			Within Australia, Eastern curlews have a mostly coastal distribution; they are rarely recorded inland. The species mainly forages around sheltered intertidal sandflats or mudflats that are open and without vegetation or seagrass. The species often also forages near mangroves, on saltflats or saltmarsh, around rockpools, amongst rubble on coral reefs, and on ocean beaches near the tideline.	Unlikely		May
<i>Numenius phaeopus</i>	Whimbrel	MI	MI	Feed on intertidal mudflats for worms, crustaceans and occasionally fish and nestling birds. Coastal areas on tidal and estuarine mudflats, especially near mangroves. Sometimes found on beaches and rocky shores. Breed in Artic Circle during boreal summer. Threatened by wetland destruction, altered wetland drainage, pollution and hunting.	Unlikely	0.50	
<i>Oxyura australis</i>	Blue-billed duck	P4		Deeper freshwater swamps and lakes; occasionally saltlakes and estuaries recently freshened by flood or rain waters. Recently sighted at Lake Mortijinup. Coastal areas of Esperance Shire, stretching east to Merivale. Breeds on well-vegetated freshwater lakes, nests usually made of bulrushes (<i>Typha</i> sp.) trampled over leaning fork of dense teatree or Melaleuca. Often lined with down and paperbark and screened from above with growing bulrushes.	Unlikely	7.13	
<i>Pachyptila turtur subantarctica</i>	Fairy prion			Marine.	No		May

<i>Pandion haliaetus</i>	Osprey	MI	MI	Littoral and coastal habitats and terrestrial wetlands, as well as offshore islands. Sometimes travel inland along major rivers, especially in northern Australia. Require extensive areas of open fresh, brackish or saline water for hunting. Foraging habitat include inshore waters, reefs, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs, large lakes, and waterholes. Favours fish, especially mullet, but will occasionally take molluscs, insects, reptiles and mammals. Adult ospreys often resident around breeding territories. Conspicuous nests consist of a large stack of sticks up to 2 m in diameter and 2.5 m deep, either on the ground or high in tree.	Potentially (roosting)	0.11	
<i>Phoebastria fusca</i>	Sooty albatross			Marine.	No		May
<i>Pluvialis fulva</i>	Pacific golden plover	MI	MI	Salt or brackish marshes near estuaries and coastal salt lakes, near-coastal grassy flats, tidal mudflats, beaches, sewage ponds, and soaks.	No	10.95	
<i>Rhincodon typus</i>	Whale shark			Marine.	No		May
<i>Sternula nereis nereis</i>	Australian fairy tern			Marine.	No		Known
<i>Thalassarche carteri</i>	Indian yellow-nosed albatross			Marine.	No		Likely
<i>Thalassarche cauta</i>	Shy albatross			Marine.	No		Likely
<i>Thalassarche impavida</i>	Campbell albatross			Marine.	No		May
<i>Thalassarche melanophris</i>	Black-browed albatross			Marine.	No		Likely
<i>Thalassarche steadi</i>	White-capped albatross			Marine.	No		May
<i>Thalasseus bergii</i>	Crested tern	MI	MI	Marine.	No	0.19	

<i>Thinornis cucullatus</i>	Hooded plover	P4		Open, flat sandy beaches with abundant seaweed / beach wrack, and backed by low sand dunes, avoiding steep, narrow beaches. Sometimes occur on inland salt lakes. Often sighted near water's edge and lay their eggs in shallow scrapes in the sand along the upper beach or in low dunes between August and February, sometimes to April.	No	0.40	
<i>Tringa nebularia</i>	Common greenshank	MI	MI	Wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees.	Unlikely	2.77	Likely
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	MI	Fresh or brackish wetlands such as rivers, water meadows, sewage farms, drains, lagoons and swamps.	Unlikely	14.70	
<i>Zanda latirostris</i>	Carnaby's cockatoo	EN	EN	Nomadic, breeding in old-growth (> 250 yrs old) eucalypt woodland along south coast and throughout wheatbelt to Kalbarri, nesting in deep hollows of Salmon Gum, York Gum, Red River Gum, Marri,	No	0.00	Known

				Jarrah, Karri, Red Morrell and Tuart. Feeds on proteaceous shrubs and heath and adjacent eucalypt woodland; eats seeds of Banksia, Hakea, Grevillea, Allocasuarina and introduced pines, as well as flowers of Eucalyptus, Banksia, Hakea, Melaleuca, Calothamnus, Callistemon, etc. Also known to roost in Swamp Yate (<i>E. occidentalis</i>). In non-breeding season most flocks migrate to coastal feeding territories along the south coast, midwest, and south-west; this is the period when most Carnaby's are sighted in Esperance, with numerous roosts known in Tuart, Maritime Pine, and Swamp Yate trees in the region. Not known to breed east of Cocanarup Timber Reserve.			
--	--	--	--	---	--	--	--

Appendix 4: EPBC Act Protected Matters Report

Listed Threatened Ecological Communities

Community Name	Threatened Category	Presence	
		Rank	Text
Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Endangered	Likely	Community likely to occur within area

Listed Threatened Species

Scientific Name	Common Name	Simple Presence	Threatened Category	Migratory Status
<i>Anigozanthos bicolor subsp. minor</i>	Two-coloured Kangaroo Paw	Likely	Endangered	
<i>Aphelocephala leucopsis</i>	Southern whiteface	May	Vulnerable	
<i>Ardenna grisea</i>	Sooty shearwater	May	Vulnerable	Migratory
<i>Balaenoptera musculus</i>	Blue whale	May	Endangered	Migratory
<i>Botaurus poiciloptilus</i>	Australasian bittern	May	Endangered	
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	May	Vulnerable	Migratory
<i>Calidris canutus</i>	Red knot	May	Vulnerable	Migratory
<i>Calidris ferruginea</i>	Curlew sandpiper	May	Critically Endangered	Migratory
<i>Carcharias taurus</i> (west coast population)	Grey nurse shark (west coast population)	Likely	Vulnerable	
<i>Carcharodon carcharias</i>	Great white shark	Known	Vulnerable	Migratory
<i>Caretta caretta</i>	Loggerhead turtle	Likely	Endangered	Migratory
<i>Charadrius leschenaultii</i>	Greater sand plover	May	Vulnerable	Migratory

<i>Chelonia mydas</i>	Green turtle	May	Vulnerable	Migratory
<i>Dasyurus geoffroii</i>	Chuditch	Likely	Vulnerable	
<i>Dermochelys coriacea</i>	Leatherback turtle	Likely	Endangered	Migratory
<i>Diomedea antipodensis</i>	Antipodean albatross	Likely	Vulnerable	Migratory
<i>Diomedea dabbenena</i>	Tristan albatross	May	Endangered	Migratory
<i>Diomedea epomophora</i>	Southern royal albatross	May	Vulnerable	Migratory
<i>Diomedea exulans</i>	Wandering albatross	Likely	Vulnerable	Migratory
<i>Diomedea sanfordi</i>	Northern royal albatross	May	Endangered	Migratory
<i>Eubalaena australis</i>	Southern right whale	Known	Endangered	Migratory
<i>Falco hypoleucos</i>	Grey falcon	Likely	Vulnerable	
<i>Leipoa ocellata</i>	Malleefowl	Likely	Vulnerable	
<i>Limosa lapponica menzbieri</i>	Northern siberian bar-tailed godwit	May	Endangered	
<i>Macronectes giganteus</i>	Southern giant-petrel	May	Endangered	Migratory
<i>Macronectes halli</i>	Northern giant-petrel	Likely	Vulnerable	Migratory
<i>Neophoca cinerea</i>	Australian sea-lion	Known	Endangered	
<i>Numenius madagascariensis</i>	Eastern curlew	May	Critically Endangered	Migratory
<i>Pachyptila turtur subantarctica</i>	Fairy prion (southern)	May	Vulnerable	
<i>Phoebastria fusca</i>	Sooty albatross	May	Vulnerable	Migratory
<i>Rhincodon typus</i>	Whale shark	May	Vulnerable	Migratory
<i>Ricinocarpos trichophorus</i>	Barrens Wedding Bush	May	Endangered	
<i>Sternula nereis nereis</i>	Australian fairy tern	Known	Vulnerable	
<i>Thalassarche carteri</i>	Indian yellow-nosed albatross	Likely	Vulnerable	Migratory
<i>Thalassarche cauta</i>	Shy albatross	Likely	Endangered	Migratory
<i>Thalassarche impavida</i>	Campbell Albatross	May	Vulnerable	Migratory
<i>Thalassarche melanophris</i>	Black-browed albatross	Likely	Vulnerable	Migratory
<i>Thalassarche steadi</i>	White-capped albatross	May	Vulnerable	Migratory
<i>Tringa nebularia</i>	Common greenshank	Likely	Endangered	Migratory
<i>Zanda latirostris</i>	Carnaby's black cockatoo	Known	Endangered	

Appendix 5: BC Act Threatened and Priority Flora and Fauna Definitions

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

Appendix 6: EPBC Act (1999) Definition of Threatened Flora and Fauna Species

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

Appendix 7: BC Act Definition of Threatened Ecological Communities

Category Code	Category
PTD	Presumed Totally Destroyed An ecological community will be listed as Presumed Totally Destroyed if there are no recent records of the community being extant and either of the following applies: (i) records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or; (ii) all occurrences recorded within the last 50 years have since been destroyed.
CE	Critically Endangered An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting any one of the following criteria: (i) The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification; (ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area; (iii) The ecological community is highly modified with potential of being rehabilitated in the immediate future.
E	Endangered An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. The ecological community must meet any one of the following criteria: (i) The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short term future, or is unlikely to be substantially rehabilitated in the short term future due to modification; (ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area; (iii) The ecological community is highly modified with potential of being rehabilitated in the short term future.
V	Vulnerable An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria: (i) The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated; (ii) The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution; (iii) The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.

Appendix 8: BC Act Definition of Priority Ecological Communities

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

Appendix 9: EPBC Act Definition of Threatened Ecological Communities

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

Listing Code	Category	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: BAM Act 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
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.