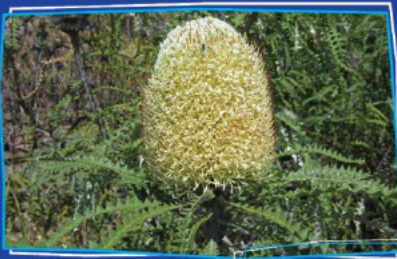


# Vegetation, Flora, Fauna and Environmental Considerations Report

Myrup Waste Facility



Report compiled by Shire of Esperance Environmental Team:  
Katherine Walkerden– BSc, MEnvSc, Environmental Officer  
Julie Waters – BEnvSc (Hons), Environmental Coordinator

March 2023



## **Acknowledgement of country**

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

## **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.

## TABLE OF CONTENTS

<b>1</b>	<b>Executive Summary</b> .....	<b>7</b>
<b>1</b>	<b>Introduction</b> .....	<b>8</b>
1.1	Location and Scope of Project.....	8
1.2	Environmental Legislation and Guidelines.....	9
<b>2</b>	<b>OBJECTIVES</b> .....	<b>10</b>
<b>3</b>	<b>METHODS</b> .....	<b>11</b>
3.1	Desktop Assessment.....	11
3.2	Field Survey.....	11
3.3	Survey Timing.....	13
3.4	Vegetation Descriptions.....	13
3.5	Survey Limitations.....	13
<b>4</b>	<b>DESKTOP ASSESSMENT RESULTS</b> .....	<b>15</b>
4.1	Climate.....	15
4.2	Catchment.....	15
4.3	Geology, Soils and Topography.....	15
4.4	Regional Vegetation.....	15
4.5	Surrounding Land Use.....	16
4.6	Potential Threatened and Priority Flora.....	16
4.7	Potential Threatened and Priority Ecological Communities.....	16
4.8	Potential Threatened and Priority Fauna.....	16
4.9	<i>Phytophthora</i> Dieback.....	16
<b>5</b>	<b>FIELD SURVEY RESULTS AND DISCUSSION</b> .....	<b>17</b>
5.1	Flora.....	17
5.2	Threatened and Priority Flora.....	17
5.2.1	<i>Dampiera sericantha</i> , Priority 3.....	17
5.3	Weeds.....	20
5.4	Dieback.....	20
5.7	Vegetation Communities.....	20
5.8	Vegetation Condition.....	23
5.9	Threatened Ecological Communities.....	24
5.10	Fauna.....	25
5.10.1	Southern Death Adder, <i>Acanthophis antarcticus</i> , Priority Three.....	25
5.10.2	Recherche Cape Barren goose, <i>Cereopsis novaehollandiae grisea</i> , VU.....	25
5.10.3	Double-banded Plover, <i>Charadrius bicinctus</i> , MI.....	25
5.10.4	Southwestern Brown Bandicoot, <i>Isodon fusciventer</i> , Priority Four.....	25

5.10.5	Peregrine Falcon, <i>Falco peregrinus</i> , Other Specially Protected Fauna .....	26
5.10.6	Western brush wallaby, <i>Notamacropus Irma</i> , P4.....	26
5.10.7	Glossy ibis, <i>Plegadis falcinellus</i> , M1 .....	26
5.10.8	Carnaby's Black Cockatoo, <i>Calyptorhynchus latirostris</i> , threatened fauna .....	27
<b>6</b>	<b>REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION.....</b>	<b>27</b>
<b>7</b>	<b>RECOMMENDATIONS .....</b>	<b>29</b>
<b>8</b>	<b>LIST OF PERSONNEL.....</b>	<b>30</b>
<b>9</b>	<b>REFERENCES .....</b>	<b>31</b>

## LIST OF TABLES

- Table 1.** Summary of Priority flora species recorded in Myrup Waste Facility project area.
- Table 2.** Potential limitations affecting the conclusions made in this report.
- Table 3.** Vegetation associations mapped by Beard (1973) within the 'Myrup Waste Facility', and statistics on pre-European remaining areas.
- Table 4.** Land uses surrounding Myrup Waste Facility.
- Table 5.** Vegetation communities identified within the proposed Myrup Waste Facility project area.
- Table 6.** Quantifying vegetation to be cleared by vegetation type and condition.

## LIST OF FIGURES

- Figure 1.** Location of Myrup Waste Facility.
- Figure 2.** 3D Lidar map of Myrup Waste Management Facility. Produced via drone aerials performed by Stanley Halls, Shire of Esperance Trainee Surveying Technician and Robert Andrews, Shire of Esperance Engineering Surveyor in September 2021.
- Figure 3.** Location of *Dampiera sericantha* within and surrounding 'Myrup Waste Facility'.
- Figure 4.** Screenshot of 2022 *Dampiera sericantha* specimen details.
- Figure 5.** Known records of priority 3 species *Dampiera sericantha* across a 250 km geographic range (DBCA 2022) including recently discovered populations by the Shire of Esperance.
- Figure 6.** Evidence of historic dieback, likely branches of dead *Lambertia inermis*, a species highly susceptible to dieback.
- Figure 7.** Map of vegetation types within Myrup Waste Facility.
- Figure 8.** Vegetation type B identified in 'Myrup Waste Management Facility' project, described as 'Scattered *Nuytsia floribunda* and *Eucalyptus pleurocarpa* over mixed shrubland with Restionaceae and Cyperaceae sedges'.
- Figure 9.** Vegetation type C identified in 'Myrup Waste Management Facility' project, described as 'Failed revegetation and scattered remnant trees.'
- Figure 10.** Vegetation condition across 'Myrup Waste Facility' project.
- Figure 11.** Areas that met the threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' within 'Myrup Waste Facility' project.

## APPENDICES

1. Incidental Species List
2. Threatened and Priority Flora Report Forms
3. Threatened and Priority Flora Species with the Potential to occur within the Myrup Waste Facility Survey Area
4. Threatened and Priority Fauna Species with the Potential to occur within the Myrup Waste Facility Survey Area
5. State Threatened and Priority Flora and Fauna definitions
6. Commonwealth Definition of Threatened Flora and Fauna Species
7. State Threatened Ecological Community definitions
8. State Definition of Priority Ecological Communities
9. Commonwealth Definition of Threatened Ecological Communities
10. Categories and Control measures of Declared Pest (Plant) Organisms in Western Australia
11. Definitions of Vegetation Condition Scale
12. Cockatoo foraging habitat scoring template
13. EPBC Act Protected Matters Report
14. Kwongkan quadrats

## 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

## 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 Myrup Waste Facility project.

The proposed development involves the clearing of 6.216 ha of native vegetation for the purpose of constructing a community drop off and waste transfer station. The Shire of Esperance is seeking to construct a new Community Drop off and Waste Transfer Station following the closure of the Wylie Bay Landfill site, which is due to close on 09/07/2025.

The Myrup site was chosen out of three other Shire of Esperance managed sites as the best location due to proximity to town, zoning, mostly cleared land and because it is already in use as a Liquid Waste Facility (L8793/2013/1 Prescribed Premises Category 61: Liquid Waste). This last factor saves on additional clearing footprint size for composting drainage evaporation ponds.

Waste from Esperance townsite, and the satellite towns within the Shire of Esperance, will be sorted at Myrup Community Drop off and Waste Transfer Station to be either composted (FOGO), sorted/baled and transported to recycling facilities, or trucked to Coolgardie for landfill. The Shire of Esperance's two Environmental Scientists completed the site assessment on Myrup Waste Facility on the 4th and 8th November 2021 and 27th October 2022.

A total of 171 vascular plant taxa, representative of 124 genera and 46 families, were recorded within Myrup Waste Management Facility survey area. Of these 138 were native species and 32 were introduced. The majority of taxa recorded were representative of the Myrtaceae (22 taxa), Proteaceae (15 taxa) and Fabaceae (13 taxa) families (Appendix 1).

One priority flora species pursuant to the Biodiversity Conservation Act (2016) and as listed by the Department of Biodiversity, Conservation and Attractions (DBCA) was recorded within the Myrup Waste Facility 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 Myrup Waste Facility survey area.

**Table 1:** Summary of Priority flora species recorded in Myrup Waste Facility project area.

Species	Conservation Code	Total plants	Total taking
<i>Dampiera sericantha</i>	P3	167	35

A total of 0.816ha of the EBPC listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' Threatened Ecological Community (TEC) in a moderate condition was present within Myrup Waste Facility. No other TECs or PECs were located within Myrup Waste Facility.

The site did not contain suitable foraging habitat for the EPBC listed Carnaby's cockatoo (*Calyptorhynchus latirostris*). The vegetation contains potential night roosting habitat for Carnaby's Black Cockatoo due to the presence of large Tuarts which may be used as roost sites. There was seven other conservation listed fauna with potentially suitable habitat within the project area.

## 1 Introduction

The Shire of Esperance is seeking to construct a new Community Drop off and Waste Transfer Station following the closure of the Wylie Bay Landfill site, which is due to close on 09/08/2025. The Myrup site was chosen out of three other Shire of Esperance managed sites as the best location due to proximity to town, zoning, mostly cleared land and because it is already in use as a Liquid Waste Facility (L8793/2013/1 Prescribed Premises Category 61: Liquid Waste). This last factor saves on additional clearing footprint size for composting drainage evaporation ponds.

### 1.1 Location and Scope of Project

The proposed works are located ~11 km North of Esperance, within the Shire of Esperance managed Reserve 51287 zoned for Government purposes / infrastructure serves and a truck access way within Myrup Road reserve. The project is located within Lot 1885 on Plan: 171656. A point within the proposed clearing permit area is 6262969mN, 395353mE (UTM Zone 51 H, GDA94).

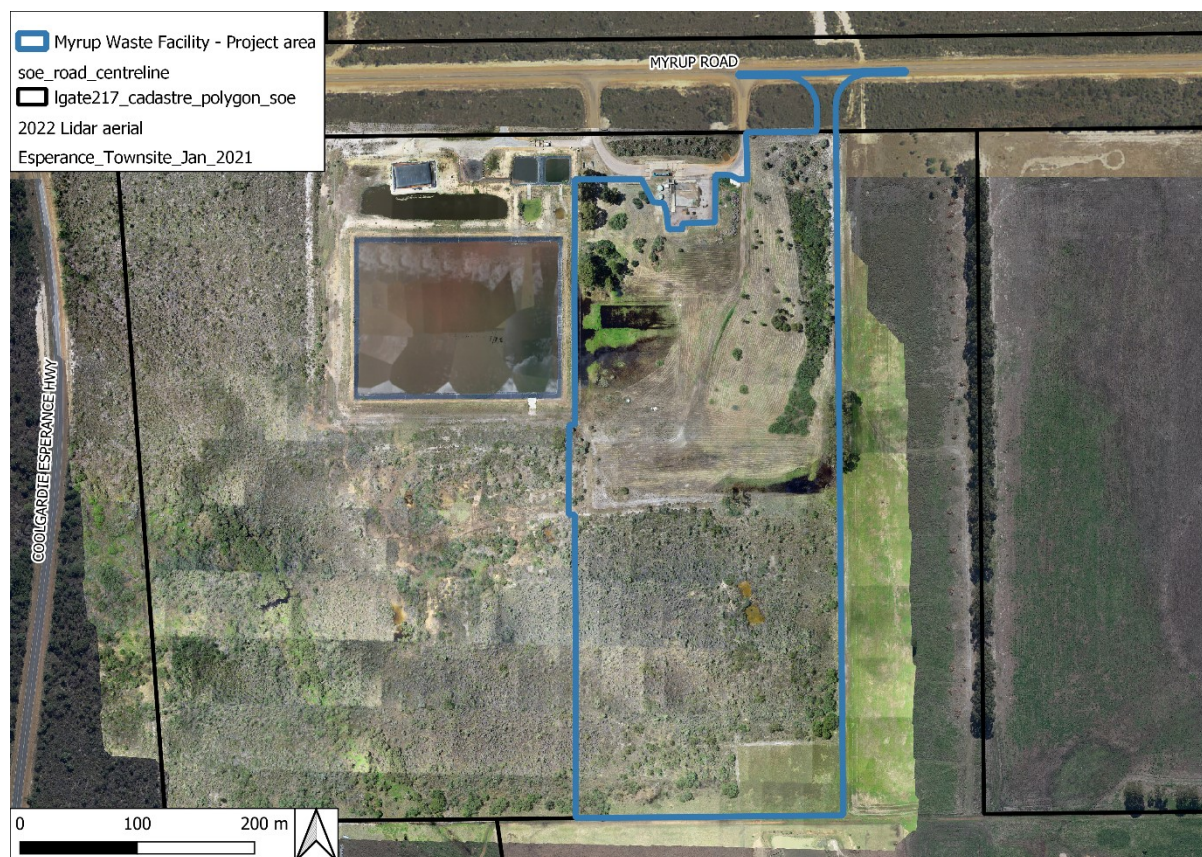
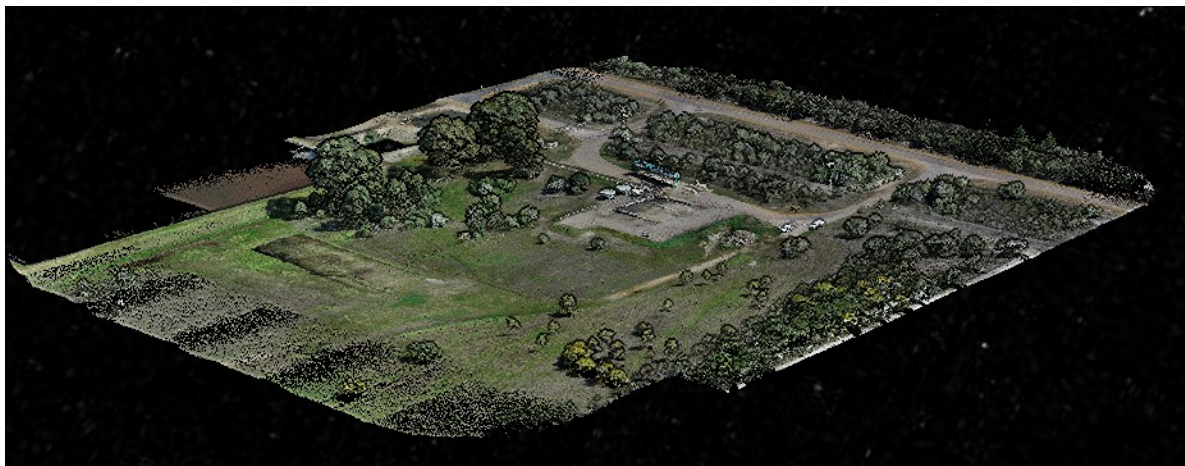


Figure 1. Location of Myrup Waste Facility.





**Figure 2.** 3D Lidar map of Myrup Waste Facility. Produced via drone aeriels performed by Stanley Halls, Shire of Esperance Trainee Surveying Technician and Robert Andrews, Shire of Esperance Engineering Surveyor in September 2021.

Waste from Esperance townsite, and the satellite towns within the Shire of Esperance, will be sorted at Myrup Community Drop off and Waste Transfer Station to be either composted (FOGO), sorted/baled and transported to recycling facilities, or trucked to Coolgardie for landfill. The formalised Myrup waste management facility is intended to comprise:

- Gatehouse and weighbridge
- Administration area
- Car parking
- Tip shop and education facility
- Recycling Materials Recovery Facility (MRF)
- Community Drop Off
- Green waste, metal and construction and demolition (C&D) processing
- Food and green waste organics (FOGO) processing
- Biosecurity and medical waste incineration
- Vehicle washdown bays
- Liquid waste facility

## 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 Myrup Waste Facility survey area including:

- Undertake a desktop study of the flora, fauna and vegetation of the Myrup Waste Facility 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 Myrup Waste Facility survey area;
- Undertake a detailed survey of the Myrup Waste Facility 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 Myrup Waste Facility survey area;
- Define and map the location of any threatened and priority flora located within the MYRUP Myrup Waste Facility 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)
- Threatened and Priority Flora Database (TPFL)
- DBCA's Esperance District Threatened Flora spatial dataset
- Threatened and Priority Ecological Communities
- Threatened, specially protected and priority fauna
- Black cockatoo roost and breeding sites

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 Myrup Waste Facility area. Search parameters were 'by polygon' and a 20 km buffer was applied to the search area; standard used in this IBRA subregion.

In addition, historical documentation and state datasets including:

- Vegetation mapping of the region, principally that of Beard (1976)
- 2020 Vegetation Extent by 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 (SOE Orthomosaic Myrup 2021, SOE Orthomosaic Myrup 2022, Esperance Townsite May 2022)
- Atlas of Living Australia database
- Hydrographic Catchments (DWER)
- Crown Reserves (Landgate)
- Clearing Permit Application CPS 5330 "Myrup Road Truck Wash Flora Survey Report Esperance, Western Australia May 2010".
- Shark Lake Flora Survey September 2000, Esperance Wildflower Society, Esperance, Western Australia.

### 3.2 Field Survey

The site was initially inspected in November 2021, 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. In 2022 the project area was expanded and additional areas in the south were inspected.

A detailed field assessment of the flora and vegetation of the Myrup Waste Facility survey area was undertaken by Shire of Esperance botanists on the 4<sup>th</sup> and 8<sup>th</sup> November 2021 and 27<sup>th</sup> October 2022 in accordance with methods outlined in Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016). All botanists held valid collection licences to collect flora for scientific purposes, issued under the BC Act.

The methodology for assessing threatened and priority flora consisted of traversing by foot the entire Myrup Waste Facility survey area. Botanists used handheld Garmin GPS units loaded with the Myrup Waste Facility survey area boundary, botanists walked in a zig-zag fashion over survey site (at approximately at 50m intervals) 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 Myrup Waste Facility was also constructed.

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

The vegetation communities of Myrup Waste Facility were assessed for the presence a TEC or PEC (DBCA 2018, 2021) comparing that to descriptions in approved conservation advice for these communities.

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

2a) Characterised by Proteaceae species having 30% or greater cover of Proteaceae species across all layers where these shrubs occur (crowns measured as if they are opaque).

And/or

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

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

A follow up survey was conducted on 31<sup>th</sup> March 2023 by Julie Waters and Katherine Walkerden to identify the presence of the Kwongkan TEC.

Quadrat based data was used to determine if the site meet the TEC definitions (As per Table 1, Technical Guidance – Flora and vegetation surveys for Environmental Impact Assessment (EPA 2016)

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 the Myrup Waste Facility the 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 Myrup Waste Facility were conducted in October and November, 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 Myrup Waste Facility survey area.

### **3.4 Vegetation Descriptions**

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

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

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

### **3.5 Survey Limitations**

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

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

Potential Survey Limitation	Impact on Current Survey
Availability of contextual information at a regional and local scale	<b>Not a limitation:</b> Reference resources such as Beard's mapping, together with online flora and vegetation information, have provided an appropriate level of information for the current survey. The vegetation of the Esperance shire has previously been mapped by Beard (1976).
Resources (i.e. were there adequate resources to complete the survey to the required standard).	<b>Not a constraint:</b> Adequate resources were made available by Shire of Esperance to complete the surveys.
Competency/experience of team carrying out survey; experience in the bioregion surveyed	<b>Not a limitation:</b> Botanists had extensive experience working within the Shire of Esperance and wider areas. Two of the botanists have consistently worked within this bioregion for more than 15 years. Botanists were familiar with flora in the area. Any unknown or potential threatened or priority flora species were collected and identified, utilising resources available at the Western Australian Herbarium and consultation with expert taxonomists.
Proportion of flora collected and identification issues	<b>Potential limitation:</b> While many plants were in flower during the survey, a proportion of plants encountered during the survey were sterile and may impact the chance of identification of some specimens to species level. Orchid species may not emerge each year if conditions are not favourable. Although these may affect the completeness of the species list, it is not expected to have a significant effect on mapping reliability, nor on the identification of threatened and priority species in the area as the majority were perennial species. Surveys were undertaken over two years.
Effort and extent of survey	<b>Potential limitation:</b> The survey area was thoroughly covered. The threatened and priority flora search undertaken by botanists by means of foot-traverse over the entire site ensured thorough coverage of the survey area. Flora that was unknown or resembled threatened or priority flora were collected, the location and habitat noted, and the number of plants estimated.
Mapping reliability	<b>Not a constraint.</b> Handheld GPS units were used for the survey, which for a majority of field conditions have an accuracy level of $\pm 5$ m.
Survey timing, rainfall, season of survey	<b>Not a limitation:</b> The EPA (2016a) recommends that flora and vegetation surveys in the South – West Botanical Province be conducted in Spring (September-November). All surveys have been conducted in October and November which falls within this period. Rainfall in 2022 was above average, and continued well into December.
Disturbances (fire/flood/clearing)	<b>Not a limitation:</b> The Myrup Waste Facility survey area has no known history of fire or flooding.

## 4 DESKTOP ASSESSMENT RESULTS

### 4.1 Climate

The Esperance climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2022). The area receives an average annual rainfall of 618 mm. The Shire of Esperance received an unusually high level of rainfall in 2022 resulting in an extended flowering period.

### 4.2 Catchment

The Myrup Waste Facility is present within the Bandy creek catchment area. It is located approximately 10km from the coast.

### 4.3 Geology, Soils and Topography

A single geological unit was identified within 'Myrup Waste Facility, by Schoknecht et al. (2004). It is described as: "Tertiary marine sediments of the Pallinup formation." Within the area, there has been a single soil type recorded. This was defined as: "Grey deep sandy duplex (gravelly) soils with associated duplex sandy gravels and minor pale deep sands and shallow gravels. On gently undulating plain". During the field survey, topography was observed to be dominated by a plain. Using Schnoknecht et al. (2004), the project topography is mapped at a fine scale, traversing a single topographic area defined as: "Gently undulating plain, 1-3% slope".

### 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 plain. Eucalyptus woodlands occur in gullies and alluvial foot-slopes".

Beard (1973) mapped a single vegetation associations (VA) within the Myrup Waste Facility area - Esperance\_6048 (Table 3). This vegetation association has been extensively cleared with only 14% of its pre-European extent remaining, the vegetation association has also been poorly conserved with only 0.89% of its current extent present within formal conservation areas.

**Table 3.** Vegetation associations mapped by Beard (1973) within the 'Myrup Waste Facility', and statistics on pre-European remaining areas.

Vegetation Association	
Name	Esperance_6048
Description	Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region
Pre-European extent in IBRA region ESP2 (%)	14.16%
Pre-European extent in LGA (%)	14.21%
Current extent conserved in IUCN area (%)	0.89%

## 4.5 Surrounding Land Use

There was a diverse range of land uses surrounding the project (Table 4.)

**Table 4.** Land uses surrounding Myrup Waste Facility.

Direction from site	Adjacent land uses
North	- Myrup Road is aligned in an east-west direction, along the northern boundary - Reserves 27158 (gravel procurement site), 26813 (rubbish disposal site) and 35037 (recreational site) are located on the north side of Myrup Road, to the north of the site.
East	- Cleared lands are located to the east of the property. Currently zoned as Rural.
South	- An abattoir (Esperance Meat Exports) is located immediately south of the site boundary.
West	- Coolgardie - Esperance Highway runs parallel to the western boundary - Reserves 31197 (Shark Lake Nature Reserve - Conservation area for flora and fauna) and 27681 (Water Corporation waste water disposal site) are located on the west side of Coolgardie - Esperance Highway, to the west of the property - Shark Lake is located approximately 200 m west of the property boundary - Uncleared land and a groundwater recharge sump are also located in the west.

## 4.6 Potential Threatened and Priority Flora

43 priority flora (PF) were recorded within a 20 km radius of the proposed impact site (Appendix 3)). Of these, 14 PF species had suitable known associated habitat that corresponded with vegetation communities and soil type of Myrup Waste Facility project. Confirmed records, indicating known populations, of *Dampiera sericantha* P3 were directly located within the works approval / licence area.

## 4.7 Potential Threatened and Priority Ecological Communities

The desktop study did not identify 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 Myrup Waste Management Facility project area. However, the site was within the buffer of Kwongkan TEC. No other TEC's or priority ecological communities (PEC) were identified by the desktop study as being within 'Myrup Waste Management Facility' or within a 20 km buffer of the site.

## 4.8 Potential Threatened and Priority Fauna

47 conservation listed fauna were recorded within a 20 km radius of the proposed impact site (Appendix 4)). An additional 4 species were identified by the EPBC protected matters tool.

## 4.9 *Phytophthora* Dieback

Dieback Information Delivery and Management System (DIDMS; GAIA Resources, SCNRM & State NRM 2022) data shows Positive *Phytophthora cinnamomi* Dieback sample results within Reserve 51287 and multiple positive samples neighbouring the Reserve.



## 5 FIELD SURVEY RESULTS AND DISCUSSION

### 5.1 Flora

A total of 170 vascular plant taxa, representative of 124 genera and 46 families, were recorded within Myrup Waste Management Facility survey area. Of these 138 were native species and 32 were introduced. The majority of taxa recorded were representative of the Myrtaceae (22 taxa), Proteaceae (15 taxa) and Fabaceae (13 taxa) families (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, Myrtaceae sp. and *Lolium* sp.

### 5.2 Threatened and Priority Flora

No TF species were identified within the clearing footprint. In addition, the targeted flora survey identified *Dampiera sericantha* (P3) within the proposed clearing permit footprint (Figure 9). 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).

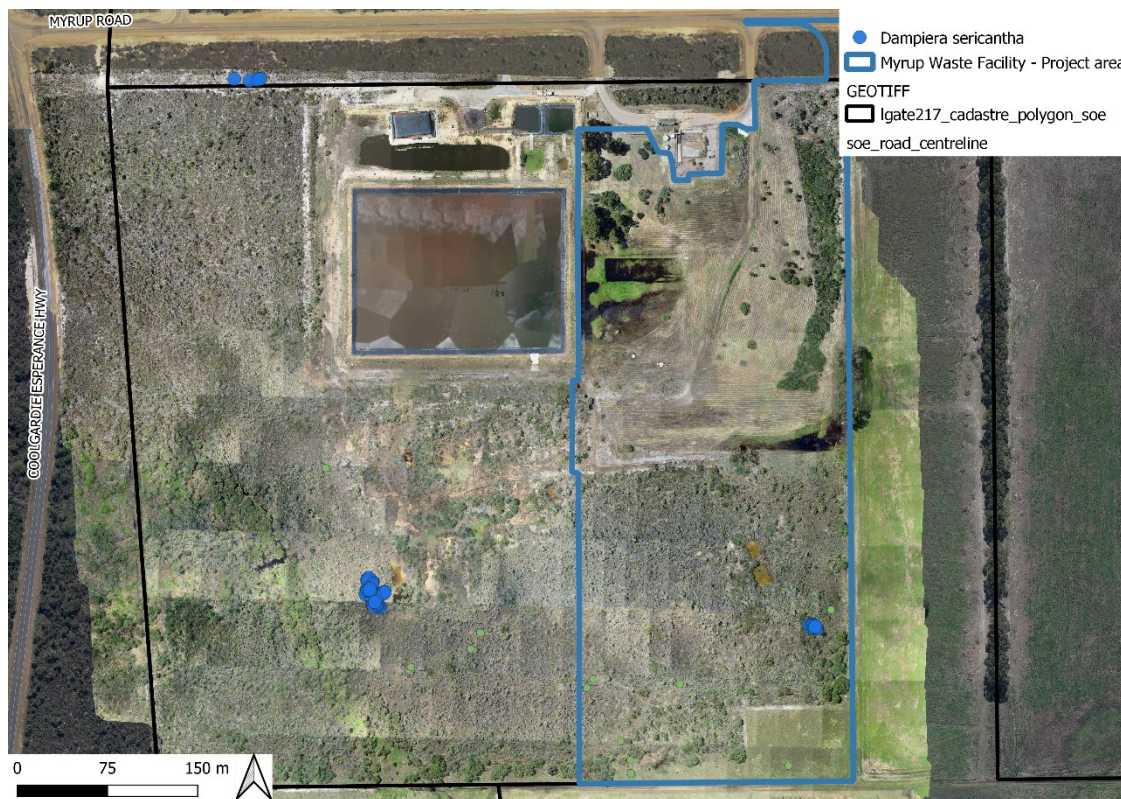
#### 5.2.1 *Dampiera sericantha*, Priority 3

There was a listed population of *Dampiera sericantha* 200 meters from the site on the edge of Myrup Road Reserve. The specimen was collected in 1969 and lacked accurate location details with only a mention of Shark Lake (Figure 4). The GPS location and the general area was inspected by Katherine Walkerden on 1<sup>st</sup> March 2022 and a population of *Dampiera sericantha* was found. Specimens were collected and submitted to the WA Herbarium for formal identification (KSW4022, Accession 9441) the population was confirmed to be *Dampiera sericantha* by Michael Hislop on 28/03/2022 with the specimen retained by the WA Herbarium (PERTH 09475842). An additional two patches were seen during the 2022 survey, 35 plants were seen within the project area, and 108 plants were seen 160 metres west of the project area. There was a total of 167 plants within the population, with 35 plants being cleared by the project.

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

Only a single record was available on *D. sericantha* from the TPFL database, so all records refer to the WA Herbarium database. *D. sericantha* has been recorded 31 times across 23 different locations. Tenure is poorly described with five locations being uninterpretable of conservation security. Three recorded locations are described as being in mining tenements are possibly been lost. Three locations are present in nature reserves and are likely to still be intact populations. The remaining 15 populations are present in road reserves, fence lines, pipe lines or coastal 4WD tracks, and have possibly been lost via road developments or maintenance. Nine records of *D. sericantha* were prior to 2000, with two locations in nature reserves been verified as existing since then. The Shire of Esperance also collected

*D. sericantha* on Farmers Road (KSW15722, Accession 9841) and Fuss Road (KSW15122, Accession 9783) in spring 2022. Katherine Walkerden had also collected *D. sericantha* in Speddingup Nature Reserve 25958 (KSW171-p –Accession 9784) is yet to be databased.



**Figure 3.** Location of *Dampiera sericantha* within and surrounding 'Myrup Waste Facility'.

**PERTH O9475842**

[Dampiera sericantha](#)  
Goodeniaceae

**Plant Description, Notes:** Herb to 35 cm. Was at location of a 1969 specimen, PERTH sheet number 1017608. Tallest specimen was growing from under a shrub and was clearly competing for light, exposed plants grew to 25 cm.

**Vegetation:** *Nuytsia floribunda* and *Leptospermum laevigatum* dominated shrubland with mixed Myrtaceae, Proteaceae shrubs and Restionaceae sedges. With *Adenanthos cuneatus*, *Hypolaena humilis*, *Ficinia nodosa*, *Mesomelaena tetragona*, *Chordifex sphacelatus*, *Conothamnus aureus* and *Melaleuca striata*.

**Site Description:** Sand Plain, Mulched firebreak. White grey sand.

**Frequency:** 24 plants seen, 3 patches of plants.

**Locality:** Myrup Road reserve SLK 0.19 along Horizon Power Firebreak, E of Esperance

**Location:** [-33.767°, 121.866°](#) (GDA94)

**Location (DMS):** 33° 45' 59.9" S 121° 51' 56.7" E (GDA94)

**State:** WA

**Collector:** Walkerden, K. **Coll No:** KSW4022

**Collection Date:** 1 March 2022

**Conservation Code:** 3

**Determinavit:** M. Hislop **Date:** 28 March 2022

**Origin:** PERTH

**Duplicates to:** ESP.

**Record Basis:** PreservedSpecimen

Figure 4. Screenshot of 2022 *Dampiera sericantha* specimen details.

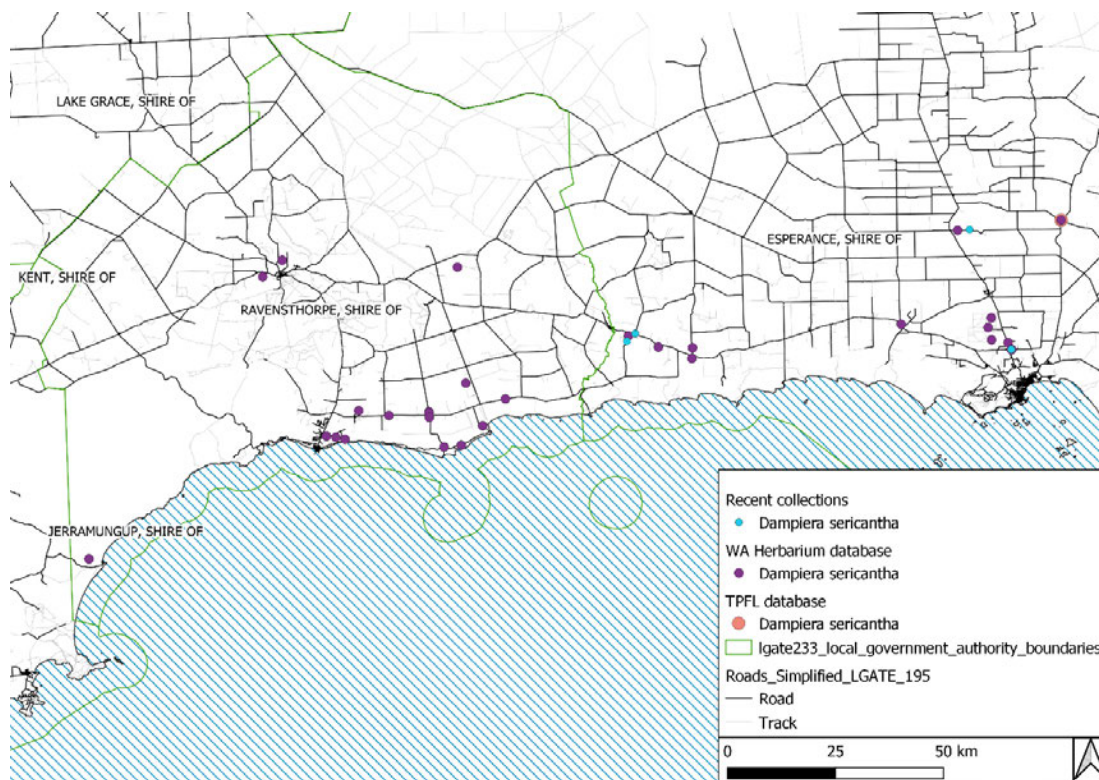


Figure 5. Known records of Priority 3 species *Dampiera sericantha* across a 250 km geographic range (DBCA 2022) including recently discovered populations by the Shire of Esperance.

### 5.3 Weeds

Large sections of the site were completely degraded lacking any remnant native vegetation. Invasive grasses had heavily dominated the pasture areas of the site. Overall, 18 invasive species were identified within the project area (Appendix 8.1). Of these, the most extensive and of serious concern were *Leptospermum laevigatum*. This is a priority environmental weed in the Shire of Esperance's Environmental Weed Strategy 2009-2018.

### 5.4 Dieback

Dieback Information Delivery and Management System (DIDMS; GAIA Resources, SCNRM & State NRM 2021) data shows Positive *Phytophthora cinnamomi* Dieback sample results within Reserve 51287 and multiple positive samples neighbouring the Reserve.

Dieback was obvious in Myrup Road Reserve with numerous dead proteaceous shrubs. The southern section of 'Myrup Waste Management Facility' had various dead shrubs and trees potentially as a result of dieback infection and significant areas lacked *Lambertia inermis* and *Banksia repens*, a majority of the site appears to be infected with dieback with only small sections lacking symptoms of dieback.



**Figure 6.** Evidence of historic dieback, likely branches of dead *Lambertia inermis*, a species highly susceptible to dieback.

### 5.7 Vegetation Communities

Two vegetation communities were identified within the 'Myrup Waste Management Facility', as defined by structure and composition (Table 3). The incidental flora list identified a total of 138 native species and 18 non-native species across all vegetation communities. It is believed that the Beard (1973)

vegetation associations identified in Section 4.4 are an appropriate match for the vegetation types observed. VA\_6048 matched the vegetation types, however the vegetation structure has been significantly altered by clearance and dieback.

**Table 5.** Vegetation communities identified within the proposed Myrup Waste Facility project area.

Type	Description	Figure	Closest Matching Beard Vegetation Association	Area (ha)
A	Scattered <i>Nuytsia floribunda</i> and <i>Eucalyptus pleurocarpa</i> over mixed shrubland with Restionaceae and Cyperaceae sedges	5	VA_6048: Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region	5.33 ha
B	Failed revegetation and scattered remnant trees.	6	VA_6048: Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region	0.88 ha



**Figure 7.** Map of vegetation types within Myrup Waste Facility.



**Figure 8.** Vegetation type B identified in 'Myrup Waste Management Facility' project, described as 'Scattered *Nuytsia floribunda* and *Eucalyptus pleurocarpa* over mixed shrubland with Restionaceae and Cyperaceae sedges'.



**Figure 9.** Vegetation type C identified in 'Myrup Waste Management Facility' project, described as 'Failed revegetation and scattered remnant trees'.

## 5.8 Vegetation Condition

Vegetation condition within the site was highly variable varying from a Very Good to Completely degraded condition. A large section of the site is pasture exclusively dominated by non-native grasses and sedges with a handful of trees scattered throughout. A failed revegetation area (originally an offset for CPS 5330 which was later removed), was also present within the main pasture area which had high weed burden, low species richness and little understorey. The southern section of the reserve is uncleared bushland, this bushland has clear signs of dieback presence and vegetation structure has been significantly altered, with proteaceous species appearing to be significantly reduced and trees and small shrubs were missing from some sections.



**Figure 10.** Vegetation condition across 'Myrup Waste Facility' project.

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

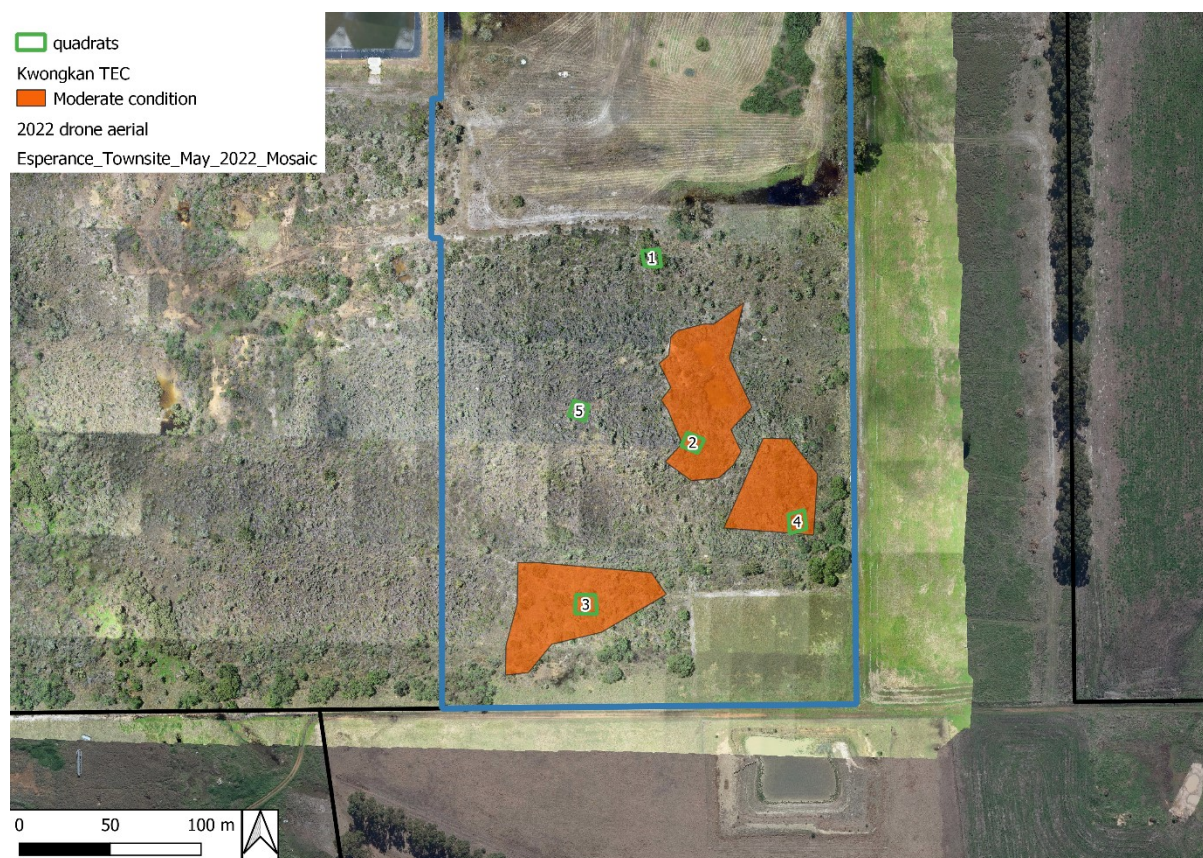
Vegetation Type	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
A	-	4.987	0.270	0.039	0.037	5.333
B	-	-	0.605	0.278	-	0.883
<b>Total</b>	-	<b>4.987</b>	<b>0.875</b>	<b>0.317</b>	<b>0.037</b>	<b>6.216</b>

## 5.9 Threatened Ecological Communities

Portions of Vegetation type A, described as: 'Scattered *Nuytsia floribunda* and *Eucalyptus pleurocarpa* over mixed shrubland with Restionaceae and Cyperaceae sedges' met criteria to be considered the EPBC listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' TEC. The entire area likely met the 30% proteaceous cover threshold prior to the introduction of *Phytophthora cinnamomi* to the site, however only small pockets of the site retain any proteaceous overstorey.

Four patches of the site larger than 0.05ha had an intact *Lambertia inermis* overstorey. Several 10m x 10m quadrats were established in these sections of vegetation along with a fifth quadrat in the typical dieback affected vegetation. Each of these quadrats was accessed using the key diagnostic characteristics as per the conservation advice for this TEC.

Quadrants 1,2,3 and 4 all had 30% or greater cover of proteaceous species in their overstorey. Quadrant 1 lacked any midstorey and understorey proteaceous species, quadrats 2, 3 and 4 each had around 30% midstorey proteaceous cover but had 5% or less proteaceous understorey cover. Due to the patch sizes and presence of dieback in the immediate vicinity, the patches containing quadrat 2, 3 and 4 could only be considered a moderate condition Kwongkan TEC. The quadrat within the typical dieback impacted vegetation lacked any diagnostic species and lacked any midstorey and overstorey proteaceous species and contained 2% understorey proteaceous cover. In total, 0.816 ha of moderate condition Kwongkan TEC will be cleared as part of this proposed clearing.



**Figure 11.** Areas that met the EPBC listed threatened ecological community (TEC) 'Proteaceae



Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' within 'Myrup Waste Facility' project.

## 5.10 Fauna

Of the species identified within the Desktop survey, eight species have potentially suitable habitat within the proposed clearing permit area, the most likely being the Quenda (*Isoodon fusciventer*). No evidence of any these species were seen during the survey. However there is a photo of a burrow that is probably a bandicoot burrow in Appendix 5 of the 2010 Myrup Flora survey report.

### 5.10.1 Southern Death Adder, *Acanthophis antarcticus*, Priority Three

This species is found in a wide variety of well-drained habitats, including rainforests and wet sclerophyll forests, woodland, shrublands, grasslands and coastal heathlands, preferring sites with deep fixed leaf litter. The snake is an ambush predator which hides under leaf litter or burrows in sand while waiting for prey. The site had suitable vegetation with dense shrubland though lacked significant leaf litter. The sandy soil at the site is potentially suitable for burrowing. The site also contained a range of suitable prey items including small birds. No evidence of the species was seen during the survey.

### 5.10.2 Recherche Cape Barren goose, *Cereopsis novaehollandiae grisea*, Vulnerable

A confirmed record of the Cape barren goose was 2.54 km from the project area. 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.

Cape barren geese are known for feeding on grasses and herbs and some seeds, the pasture area and some of the degraded sections of the project likely provides suitable foraging habitat for this species.

### 5.10.3 Double-banded Plover, *Charadrius bicinctus*, Migratory

A confirmed record of the Double-banded Plover was 19.11 km from the project area.

The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture and found on open grassy areas including short pasture, ploughed or newly cropped paddocks, swards, airstrips, and sports grounds such as golf courses or race-tracks near the coast and further inland

The pasture area and some of the degraded sections of the project likely provides suitable habitat for this species.

### 5.10.4 Quenda, *Isoodon fusciventer*, Priority Four

A confirmed record of the Quenda was 1.56 km from the project area.

Quenda otherwise known as Southwestern Brown Bandicoots are known to inhabit a range of habitats including heathland, shrubland, sedgeland, heathy open forest and woodland and are usually

associated with infertile, sandy and well drained soils, but can be found in a range of soil types. The sandy soil within the site was suitable for the species.

Quenda prefer native or exotic vegetation, within their distribution, which contains understorey vegetation structure with 50–80% average foliage density in the 0.2–1 m height range, sections of the site met this criterion having low shrubs and high portions of sedges. The site is somewhat suitable for the species. Feral cats and foxes are however known to inhabit the general area and are a major contributor to the decline of the species. No signs of quenda such as runs were seen during the surveys, however runs have been seen at the nearby Shark Lake Nature Reserve (Julie Waters pers. comm) and a photo of a burrow that appears to be a quenda burrow was included in Appendix 5 of the 2010 Myrup Flora survey Report and it is likely they inhabit this site also.

#### 5.10.5 Peregrine Falcon, *Falco peregrinus*, Other Specially Protected Fauna

Peregrine Falcons are found in most habitats across Australia, from rainforests to arid zones, however is not common anywhere. Peregrine Falcons nest in old woodland trees, in large abandoned nests or tree hollows. The vegetation within proposed clearing permit 'Myrup Waste Management Facility is not suitable for nesting habitat for this species. The large Tuarts within the site lacked hollows and would not be suitable for nesting. The proposed clearing area is likely suitable hunting ground for the Peregrine Falcon, however, due to the Peregrine Falcon's low population density and large range it would likely be unaffected by clearing at the proposed site.

#### 5.10.6 Western brush wallaby, *Notamacropus Irma*, P4

An occurrence record of the Western Brush Wallaby was 10.02 km from the project area, however this record was from 1954 and had a listed geographical uncertainty of 50 km with the record being derived from historical written sources. No additional records surrounding the Esperance townsite have been recorded. All other Esperance occurrence records for this species are within Cape Arid National Park, Lake Shaster Nature Reserve and R2788 (Moir Rock). Due to being a large mammal this species is unlikely to go unnoticed in rural residential areas of Myrup.

Due to the current occurrence records it is highly unlikely that the Western Brush Wallaby is utilising the site.

The habitat for the species is described as "areas of Mallee and heathland and are uncommon in wet sclerophyll forests. They prefer tall open forests that supply good grazing. They particularly favour open, seasonally damp flat areas with low grasses and open scrubby brushes." Vegetation type A may have been suitable habitat for these species if they occurred within the region.

#### 5.10.7 Glossy ibis, *Plegadis falcinellus*, Migratory

There was an occurrence record for this species 3.61 km from the project area.

The habitat for the species is described as fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated

areas under irrigation. Some sections of the pasture area experience seasonal inundation and may provide suitable habitat for this species.

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

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 within this site did not contain a significant portion of proteaceous species, the Kwongan areas within the site was mainly dominated by *Lambertia inermis* and *Adenanthos cuneatus* which have small fruit that are unlikely to provide foraging recourses for this species. There are several large tuarts at the site which were inspected and contained no hollows for breeding, but these trees may be used as roosting sites.

Given that the site did not:

- contain any nesting sites or large trees with hollows;
- did not contain 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.

## 6 REVIEW OF 10 CLEARING PRINCIPLES FOR NATIVE VEGETATION

The 'Myrup Waste Facility' project may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations 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 moderate with 138 native species recorded over three 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 potential night roosting habitat for Carnaby's Black Cockatoo due to the presence of large Tuarts which may be used as roost sites.

There was seven other conservation listed fauna with potentially suitable habitat within the project area.

### 6.3 Principle (c) Native vegetation should not be cleared if it includes, or is necessary for

**the continued existence of, rare flora.**

*Dampiera sericantha* (P3) was observed within the project area 35 plants from total population of 167 plants will be taken. However, this species has a wide distribution and the removal of these plants is unlikely to affect the existence of these species.

**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.**

The site contains some of the EPBC listed TEC 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)'. In total 0.816ha of vegetation met the criteria for moderate condition Kwongkan TEC, other areas within the site failed to meet the definition of Kwongkan TEC due patch sizes being below 0.05ha.

This small area of Kwongkan TEC will continue to be degraded regardless of clearing activities due to the presence of dieback in the immediate vicinity.

No other TEC's or PEC's within the Shire of Esperance were relevant to the study area.

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

The immediate surroundings of the site were highly cleared agricultural land and some large areas of intact vegetation, with the intact vegetation within the site likely playing being an important contributor to ecological linkages in the area and provide habitat to local fauna.

**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 in this area was not growing in association with watercourses or wetlands. The closest water body was Shark lake 700 metres away, which this project will not significantly impact.

**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.

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

The project is 588 metres away from Reserve 31197, Shark Lake Nature Reserve. The relatively low amount of native vegetation cleared will have little effect on the ecological linkages to this reserve.

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

Unlikely to have any significant impacts. The Waste Management Facility's composting area will be

designed to Department of Water and Environmental Regulation's Guideline: Better Practice Composting.

**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.**

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.
- Works to be carried out in the dry (summer) months to minimise spread of dieback.

## 8 LIST OF PERSONNEL

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



## 9 REFERENCES

Atlas of Living Australia database < <https://www.ala.org.au/>>

Adams E. (2012), *Shire of Esperance Threatened and Priority Flora: Field guide*, unpublished for the Department of Environment and Conservation

*Australian flora and fauna, Government of Western Australia.* <<https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities>>

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

Biosecurity and Agriculture Management Regulations 2013,  
<[https://www.legislation.wa.gov.au/legislation/statutes.nsf/main\\_mrtitle\\_13043\\_homepage.html](https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_13043_homepage.html)>

Bureau of Meteorology 2022, *Climate statistics for Australian sites.*[http://www.bom.gov.au/climate/averages/tables/ca\\_wa\\_names.shtml](http://www.bom.gov.au/climate/averages/tables/ca_wa_names.shtml)

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

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

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 (2018) *List of Threatened Ecological Communities Endorsed by the Western Australian Minister for Environment*  
<[https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/threatened\\_ecological\\_communities\\_endorsed\\_by\\_the\\_minister\\_for\\_the\\_environment\\_june\\_2018.pdf](https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/threatened_ecological_communities_endorsed_by_the_minister_for_the_environment_june_2018.pdf)>

Department of Biodiversity, Conservation and Attractions (2020), *Conservation codes for Western*

Department of Biodiversity, Conservation and Attractions (2021), *Threatened Ecological Communities and Priority Ecological Communities Search Results, for Boundaries and Buffers, 15\_1121EC*, Government of Western Australia. [11/11/2021].

Department of Biodiversity, Conservation and Attractions (2022a), *Esperance District Threatened and Priority Flora spatial dataset*, Government of Western Australia [11/11/2021]

Department of Biodiversity, Conservation and Attractions (2022b), *Priority Ecological Communities for Western Australia Version 33*, Government of Western Australia

Department of Biodiversity, Conservation and Attractions (2022c), *Threatened and Priority Flora Database (TPFL) spatial dataset, 45-0522FL*, Government of Western Australia. [26/5/2022]

Department of Biodiversity, Conservation and Attractions (2022d), *Western Australia Herbarium spatial dataset, 45-0522FL*, Government of Western Australia. [30/11/2022]

Department of Biodiversity, Conservation and Attractions (2022e), *Threatened and Priority Fauna Database, FAUNA#7454*, Government of Western Australia. [26/5/2022]

Department of Biodiversity, Conservation and Attractions (2022f), *Carnaby's Roosting site database, FAUNA#7454*, Government of Western Australia. [26/5/2022]

Department of Biodiversity, Conservation and Attractions (2023a), *Western Australian Herbarium and Threatened and Priority Reporting (TPFL) spatial extracts, 45-0522FL*, Government of Western Australia. [07/02/2023]

Department of Biodiversity, Conservation and Attractions (2023b) *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 (2022), *EPBC Act Protected Matters Search Tool* <<https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>> [December 2022]

Department of Climate Change, Energy, the Environment and Water (2022), *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 (2022), *EPBC Act List of threatened fauna*, Commonwealth of Australia. <<https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fau>>

Department of Climate Change, Energy, the Environment and Water (2022), *EPBC Act List of Threatened Flora*. <<https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora>>

Department of Climate Change, Energy, the Environment and Water, (2022), *EPBC Act: Protected Matters Search Tool*, Commonwealth of Australia.  
<<https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool/>>

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

Department of Primary Industries and Regional Development 2022, *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.

Department of Water and Environmental Regulations (2022), *Procedure: Native vegetation clearing permits*, <<https://dwer.wa.gov.au/procedure/native-vegetation-clearing-permit>> [December 2022]

Ecoscope (2015), *State Barrier Fence biological surveys: Conservation significant flora*, <[https://www.epa.wa.gov.au/sites/default/files/Referral\\_Documentation/Attachment%207.zip](https://www.epa.wa.gov.au/sites/default/files/Referral_Documentation/Attachment%207.zip)>

Environmental Protection Authority (EPA) (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](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 (2018), *Dieback Information Delivery and Management Service, DIDMS*. <<https://didms.gaiaresources.com.au/>> [December 2022]

Keighery, B.J. (1994). *Bushland plant survey. A guide to plant community survey for the community*. Wildflower Society of WA (Inc.). Nedlands, Western Australia.

Main Roads of Western Australia (2022), *Standard Line Kilometres online application*, Government of Western Australia. <<https://mrapps.mainroads.wa.gov.au/gpsslk>>

Overhue, T.D., Snell, L.J., Johnston, D.A.W. (1993), *Esperance Land Resource Survey, Western Australia*, Department of Agriculture

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, Thackway R, 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/libra-framework-setting-priorities-nrs-cooperative-program.pdf>>

Western Australian Government, *Biodiversity Conservation Act 2016*  
[https://www.legislation.wa.gov.au/legislation/statutes.nsf/law\\_a147120.html](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](https://www.legislation.wa.gov.au/legislation/statutes.nsf/law_s50938.html)>

Western Australian Government, *Biosecurity and Agriculture Management Act 2007*,  
<[https://www.legislation.wa.gov.au/legislation/statutes.nsf/main\\_mrtitle\\_2736\\_homepage.html](https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_2736_homepage.html)>

Western Australian Government, Landgate, < <https://www0.landgate.wa.gov.au/>>

## 10 APPENDICES

## Appendix 1: Incidental species list

Family	Genus	Species	Weed	WA Conservation Status	Herbarium Reference
Aizoaceae	<i>Carpobrotus</i>	<i>virescens</i>			
Anarthriaceae	<i>Lyginia</i>	<i>imberbis</i>			
Apiaceae	<i>Xanthosia</i>	<i>huegelii</i>			
Araliaceae	<i>Trachymene</i>	<i>pilosa</i>			
Asparagaceae	<i>Asparagus</i>	<i>asparagoides</i>	x		
Asparagaceae	<i>Chamaescilla</i>	<i>corymbosa</i>			
Asparagaceae	<i>Laxmannia</i>	<i>ramosa</i>			
Asparagaceae	<i>Lomandra</i>	<i>collina</i>			
Asparagaceae	<i>Lomandra</i>	<i>hastilis</i>			
Asparagaceae	<i>Thysanotus</i>	<i>sparteus</i>			
Asteraceae	<i>Arctotheca</i>	<i>calendula</i>	x		
Asteraceae	<i>Gazania</i>	<i>linearis</i>			
Asteraceae	<i>Hyalosperma</i>	<i>demissum</i>			
Asteraceae	<i>Hypochaeris</i>	<i>radicata</i>	x		
Asteraceae	<i>Pseudognaphalium</i>	<i>luteoalbum</i>	x		
Asteraceae	<i>Sonchus</i>	<i>oleraceus</i>	x		
Asteraceae	<i>Ursinia</i>	<i>anthemoides</i>	x		
Campanulaceae	<i>Monopsis</i>	<i>debilis var depressa</i>	x		
Campanulaceae	<i>Wahlenbergia</i>	<i>capensis</i>	x		
Casuarinaceae	<i>Allocasuarina</i>	<i>humilis</i>			
Casuarinaceae	<i>Allocasuarina</i>	<i>thuyoides</i>			
Casuarinaceae	<i>Allocasuarina</i>	<i>lehmanniana</i>			
Centrolepidaceae	<i>Centrolepis</i>	<i>aristata</i>			
Crassulaceae	<i>Crassula</i>	<i>decumbens</i>			
Cyperaceae	<i>Machaerina</i>	<i>juncea</i>			
Cyperaceae	<i>Caustis</i>	<i>dioica</i>			
Cyperaceae	<i>Cyathochaeta</i>	<i>equitans</i>			
Cyperaceae	<i>Ficinia</i>	<i>nodosa</i>			
Cyperaceae	<i>Isolepis</i>	<i>marginata</i>			
Cyperaceae	<i>Lepidosperma</i>	<i>carphoides</i>			
Cyperaceae	<i>Lepidosperma</i>	<i>squamatum</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>stygia</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>tetragona</i>			
Cyperaceae	<i>Schoenus</i>	<i>subflavus</i>			
Cyperaceae	<i>Tricostularia</i>	<i>compressa</i>			
Dilleniaceae	<i>Hibbertia</i>	<i>gracilipes</i>			

Dilleniaceae	<i>Hibbertia</i>	<i>acerosa</i>			
Dilleniaceae	<i>Hibbertia</i>	<i>cuneiformis</i>			
Droseraceae	<i>Drosera</i>	<i>neesii</i>			
Droseraceae	<i>Drosera</i>	<i>trichocaulis or nitidula</i>			
Ericaceae	<i>Leucopogon</i>	<i>obovatus</i>			
Ericaceae	<i>Leucopogon</i>	<i>sp.Coujinup</i>			
Ericaceae	<i>Leucopogon</i>	<i>Carinatus</i>			
Ericaceae	<i>Lysinema</i>	<i>ciliatum</i>			
Ericaceae	<i>Oligarrhena</i>	<i>micrantha</i>			
Euphorbiaceae	<i>Euphorbia</i>	<i>terracina</i>	x		
Fabaceae	<i>Acacia</i>	<i>cyclops</i>			
Fabaceae	<i>Acacia</i>	<i>pycnantha</i>			
Fabaceae	<i>Acacia</i>	<i>saligna</i>			
Fabaceae	<i>Bossiaea</i>	<i>preissii</i>			
Fabaceae	<i>Chorizema</i>	<i>aciculare</i>			
Fabaceae	<i>Daviesia</i>	<i>dilatata</i>			
Fabaceae	<i>Daviesia</i>	<i>teretifolia</i>			
Fabaceae	<i>Gastrolobium</i>	<i>spinosum</i>			
Fabaceae	<i>Gompholobium</i>	<i>baxteri</i>			
Fabaceae	<i>Jacksonia</i>	<i>capitata</i>			
Fabaceae	<i>Jacksonia</i>	<i>spinosa</i>			
Fabaceae	<i>Medicago</i>	<i>polymorpha</i>			
Fabaceae	<i>Ornithopus</i>	<i>compressus</i>	x		
Fabaceae	<i>Trifolium</i>	<i>campestre</i>			
Fabaceae	<i>Vicia</i>	<i>villosa</i>	x		
Geraniaceae	<i>Pelargonium</i>	<i>capitatum</i>	x		
Goodeniaceae	<i>Dampiera</i>	<i>sericantha</i>		P3	PERTH 09475842
Goodeniaceae	<i>Goodenia</i>	<i>pterigosperma</i>			
Goodeniaceae	<i>Goodenia</i>	<i>trinervis</i>			
Goodeniaceae	<i>Lechenaultia</i>	<i>formosa</i>			
Haemodoraceae	<i>Anigozanthos</i>	<i>rufus</i>			
Haemodoraceae	<i>Conostylis</i>	<i>seorsiflora</i>			
Haemodoraceae	<i>Haemodorum</i>	<i>spicatum</i>			
Hemerocallidaceae	<i>Dianella</i>	<i>brevicaulis</i>			
Hemerocallidaceae	<i>Stawellia</i>	<i>gymnocephala</i>			
Hemerocallidaceae	<i>Tricoryne</i>	<i>elatior</i>			
Iridaceae	<i>Patersonia</i>	<i>lanata</i>			
Iridaceae	<i>Patersonia</i>	<i>occidentalis</i>			
Juncaceae	<i>Juncus</i>	<i>aridicola</i>			
Juncaceae	<i>Juncus</i>	<i>bufonis</i>			
Juncaceae	<i>Juncus</i>	<i>capitatus</i>	x		
Juncaceae	<i>Juncus</i>	<i>microcephalus</i>	x		

Juncaceae	<i>Juncus</i>	<i>pallidus</i>			
Lauraceae	<i>Cassytha</i>	<i>racemosa</i>			
Loganiaceae	<i>Logania</i>	<i>micrantha</i>			
Loranthaceae	<i>Nuytsia</i>	<i>floribunda</i>			
Lythrum	<i>Lythrum</i>	<i>hyssopifolia</i>	x		
Malvaceae	<i>Thomasia</i>	<i>angustifolia</i>			
Myrtaceae	<i>Baeckea</i>	<i>sp. Esperance</i>			
Myrtaceae	<i>Beaufortia</i>	<i>empetrifolia</i>			
Myrtaceae	<i>Calothamnus</i>	<i>gracilis</i>			
Myrtaceae	<i>Calothamnus</i>	<i>quadrifidus</i>			
Myrtaceae	<i>Calytrix</i>	<i>decandra</i>			
Myrtaceae	<i>Calytrix</i>	<i>Leschenaultii</i>			
Myrtaceae	<i>Conothamnus</i>	<i>aureus</i>			
Myrtaceae	<i>Darwinia</i>	<i>vestita</i>			
Myrtaceae	<i>Eucalyptus</i>	<i>indurata</i>			
Myrtaceae	<i>Eucalyptus</i>	<i>occidentalis</i>			
Myrtaceae	<i>Eucalyptus</i>	<i>pleurocarpa</i>			
Myrtaceae	<i>Eucalyptus</i>	<i>gomphocephala</i>	x		
Myrtaceae	<i>Leptospermum</i>	<i>laevigatum</i>	x		
Myrtaceae	<i>Leptospermum</i>	<i>spinescens</i>			
Myrtaceae	<i>Melaleuca</i>	<i>cuticularis</i>			
Myrtaceae	<i>Melaleuca</i>	<i>scabra</i>			
Myrtaceae	<i>Melaleuca</i>	<i>striata</i>			
Myrtaceae	<i>Melaleuca</i>	<i>tuberculata</i>			
Myrtaceae	<i>Micromyrtus</i>	<i>elobata subsp. elobata</i>			
Myrtaceae	<i>Oxymyrrhine</i>	<i>gracilis</i>			
Myrtaceae	<i>Phymatocarpus</i>	<i>maxwellii</i>			
Myrtaceae	<i>Taxandria</i>	<i>spathulata</i>			
Myrtaceae	<i>Taxandria</i>	<i>callistachys</i>			
Myrtaceae	<i>Verticordia</i>	<i>minutiflora</i>			
Myrtaceae		<i>sp.</i>			
Orobanchaceae	<i>Orobanche</i>	<i>minor</i>			
Orchidaceae	<i>Disa</i>	<i>bracteata</i>	x		
Orchidaceae	<i>Microtis</i>	<i>media</i>			
Orchidaceae	<i>Thelymitra</i>	<i>graminea</i>			
Orobanchaceae	<i>Orobanche</i>	<i>minor</i>	x		
Phyllanthaceae	<i>Phyllanthus</i>	<i>calycinus</i>			
Pittosporaceae	<i>Billardiera</i>	<i>fusiformis</i>			
Plantagaceae	<i>Plantago</i>	<i>lanceolata</i>	x		
Poaceae	<i>Austrostipa</i>	<i>elegantissima</i>			
Poaceae	<i>Austrostipa</i>	<i>hemipogon</i>			
Poaceae	<i>Austrostipa</i>	<i>mollis</i>			

Poaceae	<i>Briza</i>	<i>maxima</i>	x		
Poaceae	<i>Briza</i>	<i>minor</i>	x		
Poaceae	<i>Bromus</i>	<i>diandrus</i>	x		
Poaceae	<i>Bromus</i>	<i>hordeaceus</i>	x		
Poaceae	<i>Ehrharta</i>	<i>calycina</i>	x		
Poaceae	<i>Ehrharta</i>	<i>longiflora</i>	x		
Poaceae	<i>Eragrostis</i>	<i>curvula</i>	x		
Poaceae	<i>Lagurus</i>	<i>ovatus</i>	x		
Poaceae	<i>Lolium</i>	<i>sp.</i>	x		
Poaceae	<i>Neurachne</i>	<i>alopecuroidea</i>			
Poaceae	<i>Pennisetum</i>	<i>clandestinum</i>	x		
Polygalaceae	<i>Comesperma</i>	<i>virgatum</i>			
Polygonaceae	<i>Persicaria</i>	<i>prostrata</i>			
Polygonaceae	<i>Rumex</i>	<i>vesicarius</i>	x		
Primulaceae	<i>Lysimachia</i>	<i>arvensis</i>			
Proteaceae	<i>Adenanthos</i>	<i>cuneatus</i>			
Proteaceae	<i>Banksia</i>	<i>nutans</i>			
Proteaceae	<i>Banksia</i>	<i>obovata</i>			
Proteaceae	<i>Banksia</i>	<i>repens</i>			
Proteaceae	<i>Banksia</i>	<i>nivea</i>			
Proteaceae	<i>Hakea</i>	<i>cinerea</i>			
Proteaceae	<i>Hakea</i>	<i>corymbosa</i>			
Proteaceae	<i>Hakea</i>	<i>nitida</i>			
Proteaceae	<i>Hakea</i>	<i>ruscifolia</i>			
Proteaceae	<i>Hakea</i>	<i>trifurcata</i>			
Proteaceae	<i>Isopogon</i>	<i>polycephalus</i>			
Proteaceae	<i>Lambertia</i>	<i>inermis</i> var. <i>drummondii</i>			
Proteaceae	<i>Lambertia</i>	<i>inermis</i> var. <i>inermis</i>			
Proteaceae	<i>Stirlingia</i>	<i>anethifolia</i>			
Proteaceae	<i>Synaphea</i>	<i>oligantha</i>			
Restionaceae	<i>Chordifex</i>	<i>crispatus</i>			
Restionaceae	<i>Chordifex</i>	<i>laxus</i>			
Restionaceae	<i>Hypolaena</i>	<i>exsulca</i>			
Restionaceae	<i>Hypolaena</i>	<i>humilis</i>			
Restionaceae	<i>Leptocarpus</i>	<i>crebriculmis</i>			
Restionaceae	<i>Lepyrodia</i>	<i>macra</i>			KSW22822 ACC10048
Restionaceae	<i>Loxocarya</i>	<i>striata</i>			
Restionaceae	<i>Hypolaena</i>	<i>fastigiata</i>			
Rhamnaceae	<i>Spyridium</i>	<i>globulosum</i>			
Rhamnaceae	<i>Stenanthemum</i>	<i>notiale</i>			
Rubiaceae	<i>Opercularia</i>	<i>vaginata</i>			

Rutaceae	<i>Boronia</i>	<i>spathulata</i>			
Rutaceae	<i>Philotheca</i>	<i>nodiflora</i> ssp. <i>lasiocalyx</i>			
Solanaceae	<i>Lycium</i>	<i>ferocissimum</i>	x		
Stylidiaceae	<i>Levenhookia</i>	<i>pusilla</i>			
Stylidiaceae	<i>Stylidium</i>	<i>corymbosum</i>			
Stylidiaceae	<i>Stylidium</i>	<i>repens</i>			
Stylidiaceae	<i>Stylidium</i>	<i>repens</i>			
Stylidiaceae	<i>Stylidium</i>	<i>turleyae</i>			
Thymelaeaceae	<i>Pimelea</i>	<i>ferruginea</i>			
Xanthorrhoeaceae	<i>Xanthorrhoea</i>	<i>platyphylla</i>			

## Appendix 2: Threatened and Priority Flora Report Form



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

TAXON: <u>Dampiera sericantha</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>27/10/2022</u>	CONSERVATION STATUS: <u>P3</u> <input type="checkbox"/> New population <input type="checkbox"/>
OBSERVER/S: <u>Katherine Walkerden</u>	PHONE: _____
ROLE: <u>Environmental officer</u>	ORGANISATION: <u>Shire of Esperance</u>
EMAIL: <u>Katherine.Walkerden@esperance.wa.gov.au</u>	

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): \_\_\_\_\_  
Mulched Horizon power firebreak, within Myrup Road Reserve SLK 0.19  
 Remnant vegetation within reserve 51287

DBCA DISTRICT: <u>Esperance</u>	LGA: <u>Esperance</u>	Land manager present: <input type="checkbox"/>
DATUM:	COORDINATE S: (If UTM coords provided, Zone is also required)	METHOD USED:
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input checked="" type="checkbox"/>	GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	Lat / Northing: <u>6283141</u>	No. satellites: _____ Map used: _____
WGS84 <input type="checkbox"/>	Long / Easting: <u>394986</u>	Boundary polygon captured: <input type="checkbox"/> Map scale: _____
Unknown <input type="checkbox"/>	ZONE: <u>51</u>	
LAND TENURE:		
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/>	Private property <input type="checkbox"/>
National park <input type="checkbox"/>	State forest <input type="checkbox"/>	Pastoral lease <input type="checkbox"/>
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/>	UCL <input type="checkbox"/>
		Rail reserve <input type="checkbox"/>
		MRWA road reserve <input type="checkbox"/>
		Shire road reserve <input checked="" type="checkbox"/>
		Other Crown reserve <input type="checkbox"/>
		SLK/Pole <u>0.19</u> to _____ Specify other: _____

AREA ASSESSMENT: <input type="checkbox"/> Edge survey <input checked="" type="checkbox"/> Partial survey <input type="checkbox"/> Full survey <input type="checkbox"/>	Area observed (m <sup>2</sup> ): _____
EFFORT: Time spent surveying (minutes): _____	No. of minutes spent / 100 m <sup>2</sup> : _____
POP'N COUNT ACCURACY: <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>	Count method: _____
(Refer to field manual for list)	
WHAT COUNTED: <input checked="" type="checkbox"/> Plants <input type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>	
TOTAL POP'N STRUCTURE:	Area of pop (m <sup>2</sup> ): _____
Alive	Note: Pls record count as numbers (not percentages) for database.
Dead	
QUADRAT S PRESENT: No. _____ Size _____ Data attached <input type="checkbox"/>	Total area of quadrats (m <sup>2</sup> ): _____
Summary Quad. Totals: Alive	
REPRODUCTIVE STATE: <input type="checkbox"/> Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>	Percentage in flower: <u>90%</u>
<input type="checkbox"/> Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehiscent fruit <input type="checkbox"/>	
CONDITION OF PLANTS: <input type="checkbox"/> Healthy <input type="checkbox"/> Moderate <input type="checkbox"/> Poor <input type="checkbox"/> Senescent <input type="checkbox"/>	
COMMENT: <u>3 patches of plants</u>	

THREATS - type, agent and supporting information:	Current Impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
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=None, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Waste facility construction	<u>N</u>	<u>M</u>	<u>M</u>

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](mailto:flora.data@dbca.wa.gov.au)  
 RECORD S: Please forward to Flora Administrative Officer, Species and Communities Program.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered In Database





## Threatened and Priority Flora Report Form

Version 1.4 March 2021

### HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input checked="" type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>		Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	0-10% <input checked="" type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input checked="" type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input checked="" type="checkbox"/>	
Flat <input checked="" type="checkbox"/>	Quartz <input type="checkbox"/>	30-50% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____	50-100% <input type="checkbox"/>	Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>	_____		_____	_____	
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>	Specific Landform Element: _____ (Refer to field manual for additional values)				
CONDITION OF SOIL:	Dry <input type="checkbox"/>	Moist <input checked="" type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

### VEGETATION

#### CLASSIFICATION\*:

Eg. 1. Banksia woodland (B. attenuata, B. illidifolia);  
2. Open shrubland (Hibbertia sp., Acacia spp.);  
3. Isolated clumps of sedges (Mitregrana)

1. *Nuytsia floribunda* and *Leptospermum laevigatum* dominated shrubland with mixed Myrtaceae and Proteaceae shrubs with Restionaceae sedges

2. Scattered *Nuytsia floribunda* and *Eucalyptus pleurocarpa* over mixed shrubland with Restionaceae and Cyperaceae sedges

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: None 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: FT6100788 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: \_\_\_\_\_  
KSW4022

LODGE MENT: WA Herb Lodgement No: ACC# 9441 PERTH 09475842

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: 4/4/2022

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 Myrup Waste Facility Survey Area

Threatened or priority flora identified by the desktop study to be present within a 20 km radius of 'Myrup Waste Facility' 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	Conservation Status	Associated Habitat	Likely to occur	Distance from site (km)
<i>Cyathostemon</i> sp. Esperance (A. Fairall 2431)	P1	Only two records – salt lake and sandy gravel. One of the records was from a 1967 record.	Unlikely	10.05
<i>Darwinia</i> sp. Gibson (R.D. Royce 3569)	P1	Margins of salt lakes and road verges on grey-brown sandy loam and white sand, with <i>M. cuticularis</i> , <i>M. brevifolia</i> , <i>leucopogon</i> and <i>samphire</i>	Unlikely	13.81
<i>Eucalyptus foliosa</i>	P1	Sandy clay, sand	Possible	6.41
<i>Hibbertia carinata</i>	P1	Small area in Gibson/Scaddan. Grey/white sandy clay flats adjacent to salt lakes	Unlikely	4.86
<i>Schoenus</i> sp. Grey Rhizome (K.L. Wilson 2922)	P1	Well drained gravelly sand, yellow sand with gravel.	Possible	7.85
<i>Stenanthera lacsalaria</i>	P1	Grey-white fine sand over clay on the margins of salt lakes, associated with Myrtaceous shrubs and halophytes.	No	16.63
<i>Comesperma griffinii</i>	P2	Yellow or grey sand on plains. Scattered across WA. Associated vegetation: <i>Verticordia</i> , <i>Fabaceae</i> sp.	Possible	8.82
<i>Goodenia exigua</i>	P2	Salt lake. White/grey soil. Associated with <i>Melaleuca cuticularis</i> , <i>Centrolepis humillima</i> , <i>Baumea juncea</i> , <i>Wilsonia humilis</i> .	No	8.16
<i>Hibbertia turleyana</i>	P2	Sandy soil maybe seasonally inundated in banksia heathland or mallee shrubland (recorded at Helms Arboretum and Gibson, Speddingup East Rd)	Possible	1.77
<i>Leucopogon corymbiformis</i>	P2	Grows on deep sand. Known populations in Cape Arid, Helms Forestry Reserve and recently discovered at the Duke of Orleans Bay	Possible	3.35
<i>Myriophyllum muelleri</i>	P2	Ephemeral rock pools	No	5.78

<i>Paracaleana parvula</i>	P2	Known to grow in UCL North of Cape Arid National Park & in Cape Arid National Park. Single specimen with no location details listed as being near Gibson on the WA Herbarium database, unlikely to be correct.	No	6.39
<i>Patersonia inaequalis</i>	P2	Sandy clay, lateritic or granitic sand. Cape Le Grand, Helms Arboretum. Recently discovered at the Duke of Orleans Bay.	Possible	14.27
<i>Tecticornia indefessa</i>	P2	White to brown-grey sand near the edge of a salt lake (in one conservation reserve north of Esperance in the mallee region)	No	8.55
<i>Adelphacme minima</i>	P3	Bare dry grey sand on ridge crest. Associated with dead <i>Banksia speciosa</i> post intense bushfire.	Unlikely	7.23
<i>Astartea reticulata</i>	P3	Restricted to damp areas/seasonal wetlands – including road swales.	Unlikely	13.37
<i>Austrobaeckea uncinella</i>	P3	Sat lakes, saline watercourses	No	7.26
<i>Austrostipa mundula</i>	P3	Plain. Dry, grey sand. road verge.	Possible	15.55
<i>Brachyloma mogin</i>	P3	Various soil types including brown sand loam, grey clayey sand and swamp flats. Mostly recorded outside of Esperance Area.	No	11.06
<i>Comesperma calcicola</i>	P3	Calcareous or semi-saline clay loams, limestone – areas around saline waters	No	8.51
<i>Commersonia rotundifolia</i>	P3	Eucalyptus platypus woodland over Acacia shrubland. Clay Loam Soil. Esperance region specimens are geographically inaccurate.	Possible	13.81
<i>Dampiera sericantha</i>	P3	Sand sometimes with gravel. Plains. Kwongkan Shrublands.	Yes	0.19
<i>Dampiera triloba</i>	P3	Low woodlands with <i>Banksia</i> and <i>Melaleuca</i> . Mixed shrublands	Possible	7.74
<i>Daviesia pauciflora</i>	P3	Various habitats including flats. Associated with deep sands, white or grey sand over laterite or limestone.	Yes	1.75
<i>Eucalyptus famelica</i>	P3			9.19
<i>Eucalyptus semiglobosa</i>	P3	Mallee species, that grows up to 6 m high. Grows on white sand over laterite, silty sand on edge of granite shelf, and limestone. Recorded on hillslopes, gullies, and cliffs.	Unlikely	4.60
<i>Galium leptogonium</i>	P3			17.94
<i>Gonocarpus pycnostachyus</i>	P3	Grows on wet depressions near granite. Disturbance opportunist after fire.	No	8.46

<i>Hopkinsia adscendens</i>	P3	Sand. Dry or seasonally damp habitats along streams.	No	10.05
<i>Kunzea salina</i>	P3	Scaddan area and east to Mt Heywood. White sand over clay at margins of salt playa lakes on sand dune rises (these marginal dune rises are not common in Esperance)	No	7.63
<i>Lepidium fasciculatum</i>	P3	Scattered distribution all over Australia. Semi-arid areas	Unlikely	10.05
<i>Persoonia scabra</i>	P3	White sand or sandy loam, granite or limestone. Shrubland.	Possible	8.83
<i>Pityrodia chrysocalyx</i>	P3	Salmon Gums area. Sandplains with yellow sands. Associated with Eucalyptus Mallee woodlands with <i>Banksia media</i> and <i>Hakea</i> sp.	Unlikely	10.84
<i>Pterostylis faceta</i>	P3	Various habitats – Melaleuca Mallee scrubland, Granite, sandy loam	Unlikely	10.44
<i>Styphelia rotundifolia</i>	P3	Skeletal soils around granite outcrops.	No	9.01
<i>Banksia prolata</i> subsp. <i>calcicola</i>	P4	Limestone or granite directly on the coast.	No	10.05
<i>Caladenia arrecta</i>	P4	Only known in and around Cape Arid. Associated with granite.	No	13.81
<i>Eucalyptus dolichorhyncha</i>	P4	Common on flats or slightly rising ground with whitish to yellowish sandy clay soil.	Possible	13.81
<i>Eucalyptus missilis</i> x	P4	Sand over limestone or granite. Coastal sites.	No	10.75
<i>Eucalyptus preissiana</i> subsp. <i>lobata</i>	P4	Coastal limestone rises and sand dunes	No	9.20
<i>Frankenia glomerata</i>	P4	Woodland with Melaleuca shrubland. Prefers limestone or white clay loam. Associated with disturbance	No	7.18
<i>Grevillea baxteri</i>	P4	Prefers shrubby heathland with an acid sandy soil usually overlaying heavier soils. Associated with highly diverse Proteaceous shrublands.	Possible	6.90
<i>Kennedia beckxiana</i>	P4	Described as course woody prostrate or twining climber. Only recorded from granite outcrops in Cape Arid National Park.	No	16.44

## Appendix 4: Description of Threatened and Priority Fauna Species with the Potential to occur within the Myrup Waste Facility Survey Area

Threatened or priority Fauna identified by the desktop study to be present within a 20 km radius of 'Myrup Waste Facility' project area using the DBCA Threatened and Priority Fauna dataset (DBCA, 2022f) and using the EPBC Act Protected Matters Report.

Nt. Acronyms used in the table include critically endangered (CR) and endangered (EN), Vulnerable (VU), other specially protected (OS), Priority (P), Migratory (MI).

Scientific Name	Common Name	WA Cons Status	EPBC Status	Distance (km)	EPBC protected matters tool	Habitat	Likely to occur
<i>Acanthophis antarcticus</i>	Southern death adder	P3		10.56			Yes
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	4.71		Coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats	No
<i>Apus pacificus</i>	Fork-tailed swift	MI	MI	8.01		Mostly occur over inland plains but sometimes above foothills or in coastal areas. Also over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh.	No
<i>Arctocephalus forsteri</i>	New Zealand fur-seal, long-nosed fur-seal	OS		10.57		Marine	No
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	VU	MI	4.71		Marine and occasionally inshore waters	No
<i>Ardenna tenuirostris</i>	Short-tailed shearwater	MI	MI	16.49		Marine	No

<i>Arenaria interpres</i>	Ruddy turnstone	MI	MI	6.80		Coastal regions with exposed rock coast lines or coral reefs. They also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches	No
<i>Botaurus poiciloptilus</i>	Australasian Bittern		EN		X	Shallow vegetated freshwater or brackish swamps	No
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	MI	4.30		Grassy edges of shallow inland freshwater wetlands. They are also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches.	No
<i>Calidris alba</i>	Sanderling	MI	MI	4.71		Forages at sandy beaches at the edge of the waves, on sandbars and spits. They roost on bare sand in the dunes or behind piles of kelp.	No
<i>Calidris canutus</i>	Red knot	EN	EN	5.67	X	On the coast in sandy estuaries with tidal mudflats.	No
<i>Calidris ferruginea</i>	Curlew sandpiper	CR	MI	3.90	X	Intertidal mudflats of estuaries, lagoons, mangroves, beaches, rocky shores and around lakes, dams and floodwaters.	No
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	5.31		Coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire.	No
<i>Calidris ruficollis</i>	Red-necked stint	MI	MI	3.25		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.	No
<i>Calidris tenuirostris</i>	Great knot	CR	MI	6.80		Intertidal mudflats and sandflats in sheltered coasts, including bays harbours and estuaries	No
<i>Calyptorhynchus latirostris</i>	Carnaby's cockatoo	EN	EN	0.46	X	Kwongkan shrub or heathland. Presence of Hakea, Banksia and Pine species indicate potential feeding habitat.	yes
<i>Cereopsis novaehollandiae grisea</i>	Recherche Cape Barren goose	VU	VU	2.54	X	During breeding season (May-June), found in grassy areas, tussock grass of bushes. During rest of year, found on beaches, coastal pastures and on the shores of brackish lakes.	Yes

<i>Charadrius bicinctus</i>	Double-banded Plover	MI	MI	19.11		Littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture	Yes
<i>Charadrius leschenaultii</i>	Greater sand plover, large sand plover	VU	MI	6.18		Intertidal flats of sheltered embayments, lagoons or estuaries.	No
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	MI	19.21		Intertidal sandflats and mudflats in estuaries or beaches, or in shallow ponds in saltworks	No
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll				X	Open forest, low open forest, woodland, and open shrub	Yes
<i>Dermochelys coriacea</i>	Leatherback turtle	VU	EN	7.96		Marine	No
<i>Diomedea exulans</i>	Wandering albatross	VU	VU	12.89		Marine	No
<i>Elanus scriptus</i>	Letter-winged kite	P4		4.71		Arid and semi-arid open, shrubby or grassy country	No
<i>Eubalaena australis</i>	Southern right whale	VU	EN	8.73		Marine	No
<i>Falco hypoleucos</i>	Grey Falcon		VU		X	Arid and semi-arid zones where rainfall is less than 500mm. Timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses	No
<i>Falco peregrinus</i>	Peregrine falcon	OS		6.56		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	Yes
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	4.18		Usually forages in open wetlands, including lakes and rivers.	No
<i>Isodon fusciventer</i>	Quenda, southwestern brown bandicoot	P4		1.56		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

<i>Leipoa ocellata</i>	Malleefowl	VU	VU	6.51	X	Semi-arid shrub lands and low woodlands dominated by mallee and/or acacia.	No
<i>Limosa lapponica</i>	Bar-tailed godwit	MI	MI	4.71		Coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays	No
<i>Neophoca cinerea</i>	Australian sea-lion	EN	EN	8.73		Marine	No
<i>Notamacropus irma</i>	Western brush wallaby	P4		10.02		Found in some areas of Mallee and heathland and are uncommon in wet sclerophyll forests. They prefer tall open forests that supply good grazing. They particularly favour open, seasonally damp flat areas with low grasses and open scrubby brushes.	Yes
<i>Numenius phaeopus</i>	Whimbrel	MI	MI	16.49		Found mainly on the coast, on tidal and estuarine mudflats, especially near mangroves.	No
<i>Oceanites oceanicus</i>	Wilson's storm-petrel	MI	MI	16.49		Marine	No
<i>Oxyura australis</i>	Blue-billed duck	P4		3.72		Prefers freshwater swamps, with dense vegetation including Typha; although it has appeared in lignum swamps in more coastal areas	No
<i>Plegadis falcinellus</i>	Glossy ibis	MI	MI	3.61		Fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation	Yes
<i>Pluvialis fulva</i>	Pacific golden plover	MI	MI	19.21		Beaches, mudflats and sandflats and in sheltered areas including harbours, estuaries and lagoons.	No
<i>Pluvialis squatarola</i>	Grey plover	MI	MI	8.68		Inhabit sheltered embayment's, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons.	No
<i>Puffinus huttoni</i>	Hutton's shearwater	EN		16.49		Marine	No



<i>Stercorarius antarcticus lonnbergi</i>	Brown Skua, Subantarctic skua	P4		8.73		Marine	No
<i>Sternula nereis nereis</i>	Australian Fairy Tern		VU		X	Nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline. The bird roosts on beaches at night.	No
<i>Thalassarche cauta cauta</i>	Shy albatross	VU	MI	16.49		Marine	No
<i>Thalassarche chlororhynchos</i>	Atlantic yellow-nosed albatross	VU	MI	7.46		Marine	No
<i>Thalasseus bergii</i>	Crested tern	MI	MI	4.71		Marine	No
<i>Thinornis rubricollis</i>	Hooded plover, hooded dotterel	P4		3.25		Inhabits ocean beaches and the edges of near-coastal and inland salt-lakes.	No
<i>Tringa brevipes</i>	Grey-tailed tattler	MI and P4	MI	5.67		Common in large tidal flat systems.	No
<i>Tringa glareola</i>	Wood sandpiper	MI	MI	2.60		Inland shallow freshwater wetlands	No
<i>Tringa nebularia</i>	Common greenshank	MI	MI	3.97		Coastal and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops.	No
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	MI	4.30		Commonly seen singly, or in small to large flocks in fresh or brackish (slightly salty) wetlands.	No
<i>Westralunio carteri</i>	Carter's freshwater mussel	VU	VU	8.73		Found in slower flowing fresh water where sediments are stable and soft enough to allow the species to burrow	No

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

Category	Definition
<b>T – Threatened</b>	<p>Taxa that have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such (Schedules 1 to 4 of the Wildlife Conservation (Rare Flora) Notice under the WC Act). Threatened flora are further ranked by the DBCA to align with IUCN Red List categories and criteria:</p> <p><b>CR:</b> Critically Endangered – considered to be facing an extremely high risk of extinction in the wild (Schedule 1);</p> <p><b>EN:</b> Endangered – considered to be facing a very high risk of extinction in the wild (Schedule 2); or</p> <p><b>VU:</b> Vulnerable – considered to be facing a high risk of extinction in the wild (Schedule 3).</p> <p><b>EX:</b> Presumed Extinct – taxa that have been adequately searched for and there is no reasonable doubt that the last individual has died (Schedule 4)</p>
<b>P1 – Priority 1</b> (Poorly known taxa)	<p>Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation.</p> <p>Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.</p>
<b>P2 – Priority 2</b> (Poorly known taxa)	<p>Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc.</p> <p>Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.</p>
<b>P3 – Priority 3</b> (Poorly known taxa)	<p>Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.</p> <p>Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.</p>
<b>P4 – Priority 4</b> (Rare, Near Threatened and other taxa in need of monitoring)	<ol style="list-style-type: none"> <li><b>1. Rare</b> - Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</li> <li><b>2. Near Threatened</b> - Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</li> <li><b>3.</b> Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy</li> </ol>

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

Category Code	Category
Ex	<b>Extinct</b> Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	<b>Extinct in the Wild</b> Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	<b>Critically Endangered</b> Taxa which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	<b>Endangered</b> Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	<b>Vulnerable</b> Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	<b>Conservation Dependent</b> 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	<p><b>Presumed Totally Destroyed</b></p> <p>An ecological community will be listed as Presumed Totally Destroyed if there are no recent records of the community being extant and either of the following applies:</p> <ul style="list-style-type: none"> <li>(i) records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;</li> <li>(ii) all occurrences recorded within the last 50 years have since been destroyed.</li> </ul>
CE	<p><b>Critically Endangered</b></p> <p>An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting any one of the following criteria:</p> <ul style="list-style-type: none"> <li>(i) The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;</li> <li>(ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area;</li> <li>(iii) The ecological community is highly modified with potential of being rehabilitated in the immediate future.</li> </ul>
E	<p><b>Endangered</b></p> <p>An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. The ecological community must meet any one of the following criteria:</p> <ul style="list-style-type: none"> <li>(i) The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short term future, or is unlikely to be substantially rehabilitated in the short term future due to modification;</li> <li>(ii) The current distribution is limited ie. highly restricted, having very few small or isolated occurrences, or covering a small area;</li> <li>(iii) The ecological community is highly modified with potential of being rehabilitated in the short term future.</li> </ul>
V	<p><b>Vulnerable</b></p> <p>An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria:</p> <ul style="list-style-type: none"> <li>(i) The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;</li> <li>(ii) The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution;</li> <li>(iii) The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.</li> </ul>

## Appendix 8: State Definition of Priority Ecological Communities

Category Code	Category
P1	<b>Poorly-known ecological communities</b> Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist.
P2	<b>Poorly-known ecological communities</b> Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation.
P3	<b>Poorly known ecological communities</b> (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	<b>Conservation Dependent ecological communities</b> Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

## Appendix 9: Commonwealth Definition of Threatened Ecological Communities

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

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

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

Control Category	Control Measures
<p><b>C1 (Exclusion)</b>            '(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.</p>	<p>In relation to a category 1 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.</p>
<p><b>C2 (Eradication)</b>            '(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.</p>	<p>In relation to a category 2 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.</p>
<p><b>C3 (Management)</b>            '(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.</p>	<p>In relation to a category 3 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to —            (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.</p>

## Appendix 11: Definition of Vegetation Condition Scale

For the south west and interzone botanical provinces

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

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

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

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



## Appendix 13: EPBC Act Protected Matters Report

### Listed Threatened Ecological Communities

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

### Listed Threatened Species

Scientific Name	Common Name	Threatened Category	Migratory Status
<i>Numenius madagascariensis</i>	Eastern Curlew, Far Eastern Curlew	Critically Endangered	Migratory
<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered	Migratory
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	
<i>Calidris canutus</i>	Red Knot, Knot	Endangered	Migratory
<i>Zanda latirostris</i>	Carnaby's Black Cockatoo, Short-billed Black-cockatoo	Endangered (listed as <i>Calyptorhynchus latirostris</i> )	
<i>Falco hypoleucos</i>	Grey Falcon	Vulnerable	
<i>Cereopsis novaehollandiae grisea</i>	Cape Barren Goose (south-western), Recherche Cape Barren Goose	Vulnerable	
<i>Leipoa ocellata</i>	Malleefowl	Vulnerable	
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	Vulnerable	
<i>Sternula nereis nereis</i>	Australian Fairy Tern	Vulnerable	

## Appendix 14: Kwongkan TEC Sample Site Quadrats

Quadrat 1: Northern *Lambertia inermis* dominated area

**Proteaceae species Overstorey cover:** 85% (*Lambertia inermis*)

**Proteaceae species Midstorey cover:** 0%

**Proteaceae species Understorey cover:** 0%

**Total Patch size:** 0.064 ha

Species within Quadrat 1:

Family	Genus	Species	Weed	Kwongkan Diagnostic species (Table 1. Cons. Advice)	Species known to occur in Kwongkan TEC (Table A1. Cons. Advice)
Asteraceae	<i>Hypochoeris</i>	<i>radicata</i>	X		
Cyperaceae	<i>Mesomelaena</i>	<i>tetragona</i>			
Poaceae	<i>Briza</i>	<i>Maxima</i>	X		
Poaceae		<i>Sp.</i>	X		
Proteaceae	<i>Lambertia</i>	<i>Inermis var inermis</i>		X	X
Restionaceae	<i>Hypolaena</i>	<i>fastigiata</i>			
Xanthorrhoeaceae	<i>Xanthorrhoea</i>	<i>platyphylla</i>			X

Quadrat 2: Central *Lambertia inermis* dominated area

**Proteaceae species Overstorey cover:** 50% (*Lambertia inermis*)

**Proteaceae species Midstorey cover:** 30% (*Banksia obovata*, *Adenanthos cuneatus*)

**Proteaceae species Understorey cover:** 0%

**Patch size:** 0.315ha

Species within Quadrat 2:

Family	Genus	Species	Weed	Kwongkan Diagnostic species (Table 1. Cons. Advice)	Species known to occur in Kwongkan TEC (Table A1. Cons. Advice)
Casuarinaceae	<i>Allocasuarina</i>	<i>humilis</i>			X
Cyperaceae	<i>Cyathochaeta</i>	<i>equitans</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>stygia</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>tetragona</i>			
Dilleniaceae	<i>Hibbertia</i>	<i>gracilipes</i>			
Ericaceae	<i>Leucopogon</i>	<i>carinatus</i>			
Fabaceae	<i>Acacia</i>	<i>cyclops</i>			
Loranthaceae	<i>Nuytsia</i>	<i>floribunda</i>			X
Myrtaceae	<i>Eucalyptus</i>	<i>pleurocarpa</i>			X
Myrtaceae	<i>Melaleuca</i>	<i>striata</i>			X
Myrtaceae	<i>Micromyrtus</i>	<i>elobata</i>			
Myrtaceae	<i>Phymatocarpus</i>	<i>maxwellii</i>			X
Myrtaceae	<i>Taxandria</i>	<i>spathulata</i>			X
Proteaceae	<i>Adenanthos</i>	<i>cuneatus</i>		X	X
Proteaceae	<i>Banksia</i>	<i>obovata</i>		X	X
Proteaceae	<i>Lambertia</i>	<i>Inermis var inermis</i>		X	X
Restionaceae	<i>Hypolaena</i>	<i>fastigiata</i>			
Rhamnaceae	<i>Spyridium</i>	<i>globulosum</i>			
Rutaceae	<i>Boronia</i>	<i>spathulata</i>			
Xanthorrhoeaceae	<i>Xanthorrhoea</i>	<i>platyphylla</i>			X

Quadrat 3: Southern *Lambertia inermis* dominated area

**Proteaceae species Overstorey cover:** 45% (*Lambertia inermis*)

**Proteaceae species Midstorey cover:** 30% (*Banksia nutans*, *Adenanthos cuneatus*)

**Proteaceae species Understorey cover:** 0%

**Patch size:** 0.309 ha

Species within Quadrat 3:

Family	Genus	Species	Weed	Kwongkan Diagnostic species (Table 1. Cons. Advice)	Species known to occur in Kwongkan TEC (Table A1. Cons. Advice)
Asteraceae	<i>Hypochaeris</i>	<i>radicata</i>	X		
Cyperaceae	<i>Cyathochaeta</i>	<i>equitans</i>			
Cyperaceae	<i>Lepidosperma</i>	<i>squamatum</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>stygia</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>tetragona</i>			
Ericaceae	<i>Leucopogon</i>	<i>obovata</i>			
Fabaceae	<i>Acacia</i>	<i>cyclops</i>			
Myrtaceae	<i>Leptospermum</i>	<i>laevigatum</i>	X		
Myrtaceae	<i>Micromyrtus</i>	<i>elobata</i>			
Orchidaceae	<i>Disa</i>	<i>bracteata</i>	X		
Poaceae	<i>Neurachne</i>	<i>alopeкуроidea</i>			
Proteaceae	<i>Adenanthos</i>	<i>cuneatus</i>		X	X
Proteaceae	<i>Banksia</i>	<i>nutans</i>		X	X
Proteaceae	<i>Lambertia</i>	<i>Inermis var inermis</i>		X	X
Restionaceae	<i>Hypolaena</i>	<i>fastigiata</i>			
Rhamnaceae	<i>Spyridium</i>	<i>globulosum</i>			
Xanthorrhoeaceae	<i>Xanthorrhoea</i>	<i>platyphylla</i>			X

Quadrat 4: Eastern *Lambertia inermis* dominated area

**Proteaceae species Overstorey cover:** 30% (*Lambertia inermis*)

**Proteaceae species Midstorey cover:** 30% (*Adenanthos cuneatus*)

**Proteaceae species Understorey cover:** 5% (*banksia repens*)

**Patch size:** 0.192ha

Species within Quadrat 4:

Family	Genus	Species	Weed	Kwongkan Diagnostic species (Table 1. Cons. Advice)	Species known to occur in Kwongkan TEC (Table A1. Cons. Advice)
Asteraceae	<i>Hypochaeris</i>	<i>radicata</i>	X		
Cyperaceae	<i>Caustis</i>	<i>dioica</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>tetragona</i>			
Fabaceae	<i>Acacia</i>	<i>cyclops</i>			
Myrtaceae	<i>Conothamnus</i>	<i>aureus</i>			X
Myrtaceae	<i>Melaleuca</i>	<i>tuberculata</i>			X
Myrtaceae	<i>Phymatocarpus</i>	<i>maxwellii</i>			X
Myrtaceae	<i>Taxandria</i>	<i>Spathulata</i>			X
Orchidaceae	<i>Disa</i>	<i>bracteata</i>	X		
Poaceae	<i>Briza</i>	<i>Maxima</i>	X		
Proteaceae	<i>Adenanthos</i>	<i>cuneatus</i>		X	X
Proteaceae	<i>Banksia</i>	<i>repens</i>			X
Proteaceae	<i>Lambertia</i>	<i>Inermis var inermis</i>		X	X
Xanthorrhoeaceae	<i>Xanthorrhoea</i>	<i>platyphylla</i>			X

Quadrat 5: Control area

**Proteaceae Overstorey cover: 0%**

**Proteaceae Midstorey cover: 0%**

**Proteaceae Understorey cover: 2% (*Banksia repens*)**

Species within Quadrat 5:

Family	Genus	Species	Weed	Kwongkan Diagnostic species (Table 1. Cons. Advice)	Species known to occur in Kwongkan TEC (Table A1. Cons. Advice)
Cyperaceae	<i>Cyathochaeta</i>	<i>equitans</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>stygia</i>			
Cyperaceae	<i>Mesomelaena</i>	<i>tetragona</i>			
Ericaceae	<i>Leucopogon</i>	<i>carinatus</i>			
Fabaceae	<i>Acacia</i>	<i>cyclops</i>			
Lauraceae	<i>Cassytha</i>	<i>racemosa</i>			
Myrtaceae	<i>Phymatocarpus</i>	<i>maxwellii</i>			X
Myrtaceae	<i>Taxandria</i>	<i>Spathulata</i>			X
Orchidaceae	<i>Disa</i>	<i>bracteata</i>	X		
Poaceae	<i>Briza</i>	<i>maxima</i>	X		
Poaceae	<i>Neurachne</i>	<i>alopecuroidea</i>			
Proteaceae	<i>Banksia</i>	<i>repens</i>			X
Rhamnaceae	<i>Spyridium</i>	<i>globulosum</i>			
Xanthorrhoeaceae	<i>Xanthorrhoea</i>	<i>platyphylla</i>			X