



Natural Area
CONSULTING MANAGEMENT SERVICES

Shire of Dowerin

Bailey East West Road

Flora and Vegetation Survey and Black Cockatoo Habitat Assessment

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Ngala kaaditj Noongar moort keyen kaadak nidja boodja.

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Executive Summary

Natural Area Consulting Management Services (Natural Area) was commissioned by the Shire of Dowerin (the Shire) to conduct a basic flora and vegetation survey, and targeted black cockatoo habitat assessment. Information gathered during these studies will be used to inform the Shire of the environmental values within the area to support environmental approval applications in relation to proposed future development, which includes the widening of an existing road intersection.

The survey aimed to determine:

- flora species present (native and non-native)
- the extent and boundaries of vegetation type and condition
- the location of declared rare or priority flora, fauna and/or ecological communities
- habitat assessment for threatened black cockatoo habitat with a diameter at breast height (DBH) of greater than 500 mm or 300 mm for Wandoo (*Eucalyptus wandoo*) and Salmon Gum (*Eucalyptus salmonophloia*).

The surveys within the survey area confirmed:

- the presence of one vegetation type, Mixed Open Shrubland
- a total of 21 flora species from 12 families
 - a total of 17 native species and 4 weed species
- no conservation significant flora species were identified during the survey. Four species were unable to be identified to species level due to the lack of diagnostic characteristics present at the time of the survey
- no declared pests and weeds of national significance (WoNS) were recorded
- vegetation condition ranged from completely degraded to good across the survey area
- no threatened and priority ecological communities (TEC/PEC) were present
- no suitable black cockatoo trees that satisfied the Commonwealth guidelines for black cockatoo habitat trees were present
- no sightings or evidence of presence (foraging, scats, feathers, etc) were recorded for black cockatoos.

An assessment of the proposed clearing of the survey area against the ten native vegetation clearing principles suggests that this action is likely to be at variance with three principles (Principle A, C and E).

The Shire is committed to minimising and mitigating environmental impacts as part of the road upgrades and will consider seed and topsoil salvage for revegetation and rehabilitation of suitable sites. A copy of the survey plans relating to the intersection upgrade, as proposed revegetation area is provided in Appendix 5.

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1.0 Introduction

The Shire of Dowerin (Shire) is proposing to undertake road upgrades to the intersection of Bailey East West Road and Dowerin-Kalannie Road within Manmanning. Natural Area Consulting Management Services (Natural Area) has been commissioned to undertake a flora and vegetation survey and a black cockatoo habitat assessment. Results from these survey activities will inform environmental stakeholders of the values of the site and provide supporting information for a clearing permit application to the Department of Water and Environmental Regulation (DWER).

1.1 Location

The survey area is located within the Shire of Dowerin at the intersection of Bailey East West Road and Dowerin-Kalannie Road, Manmanning and is approximately 28 km north of the Dowerin town centre (Figure 1). The survey area is approximately 0.046 ha and is not located within any environmentally sensitive areas (Department of Water and Environmental Regulation (DWER), 2021). The closest environmentally sensitive area is located 750 m northwest of the survey area.

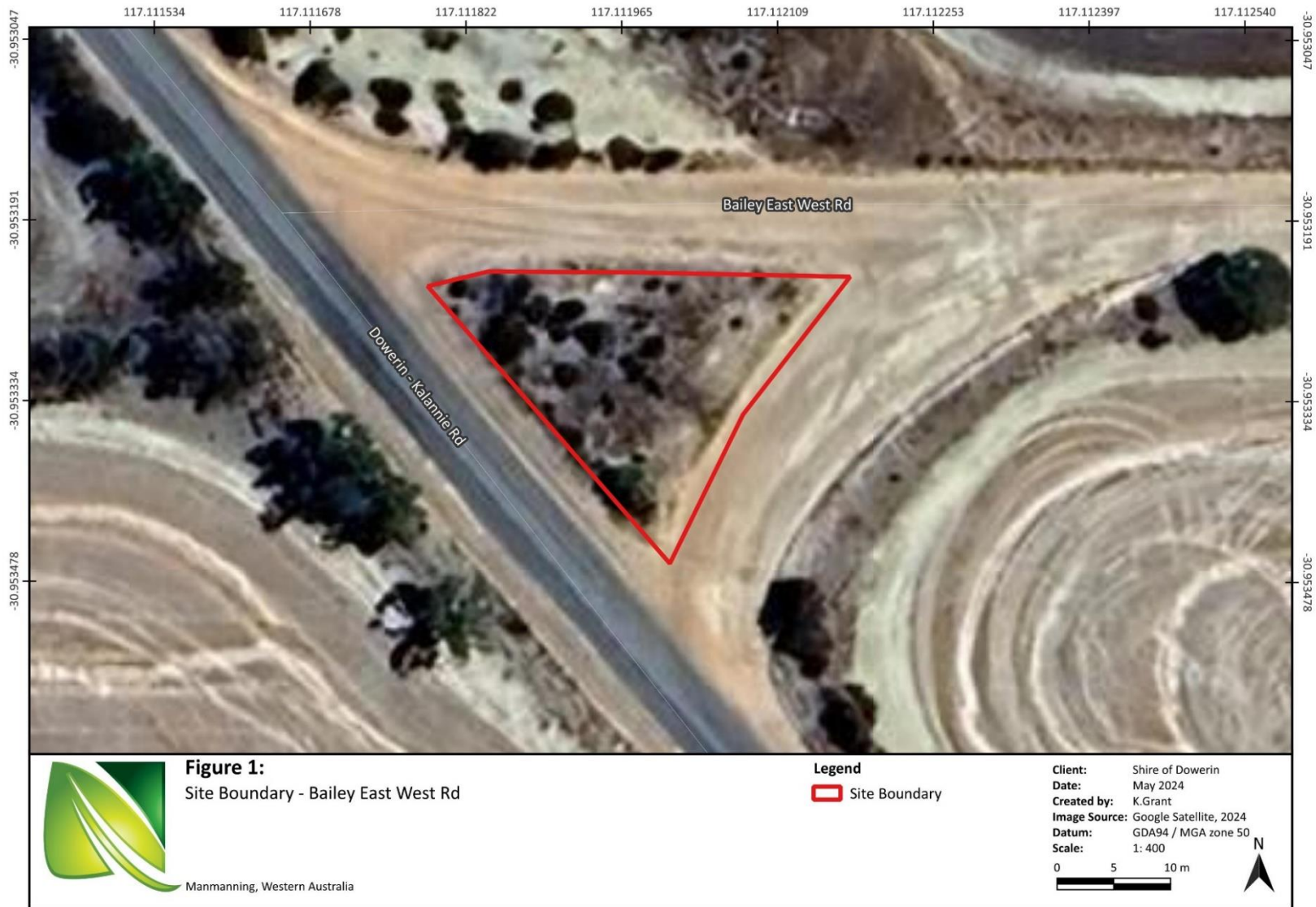
1.2 Scope

Activities undertaken by Natural Area included:

- desktop assessment activities to determine flora species, declared rare and priority listed species (DRF) and ecological communities with the potential to be present within the nominated area, including requests for Department of Biodiversity, Conservation and Attractions (DBCA) database searches for flora and ecological communities
- basic flora and vegetation survey in accordance with Environmental Protection Authority (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- mapping of vegetation type and condition
- assessment of black cockatoo habitat in accordance with the '*Referral guideline for 3 WA threatened black cockatoo species*' (Department of Agriculture, Water, and the Environment (DAWE), 2022)
- presentation of findings in a formal report, including assessment against the clearing principles
- preparation of GIS shapefiles in IBSA format.

1.3 Objectives

The main objective of the survey was to collect sufficient data to adequately inform a project design and a clearing permit application to DWER, as required by clearing provisions under the *Environmental Protection Act 1986 (WA) (EP Act 1986)* and *Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA) (Regulations)*.



2.0 Site Characteristics

The characteristics of a site have a strong bearing on the flora, vegetation, and ecological communities present. The key characteristics of the Bailey East West Rd survey area are outlined in this section.

2.1 Regional Context

The survey area is located within the northern portion of the Avon Wheatbelt 1 (AW1) IBRA region and the Merredin subregion (Department of Primary Industries and Regional Development (DPIRD), 2024). The Avon Wheatbelt 1 region is characterised by shrub and heathland dominated by Proteaceous species on upland and sandplain areas, mixed Eucalypt species, *Allocasuarina huegeliana* and Jam-York Gum Woodlands on alluvial/eluvial soils (Beecham, 2001).

2.2 Climate

The climate experienced in the area is Mediterranean, with dry, hot summers and cool, wet winters. According to the Bureau of Meteorology (2024); Wongan Hills WA, site number 008137, 2024, the region has an average:

- rainfall of 386.3 mm pa, with rain falling predominantly between May and August
- maximum temperature ranging from 17.1 °C in winter to 34.7 °C in summer, with a maximum recorded temperature of 47.4 °C
- minimum temperatures ranging from 6.6 °C in winter to 18.2 °C in summer, with a minimum recorded temperature of -0.9 °C
- predominant wind directions include morning easterlies from September to April and northerlies from May to August. Afternoon wind directions are predominantly westerly from April to December. Annual monthly wind speeds average of 12.7 km/h with gusts of more than 100 km/h.

2.3 Topography and Soils

Using the NRInfo Portal, one soil type was identified in the survey area, being the Tandegin, Yeelbeni subsystem (259Ta). The survey area lies flat at approximately 337 m Australian Height Datum (AHD) across the entire area (DPIRD, 2024).

2.4 Vegetation Complex

One pre-European vegetation complex exists within the survey area, Guangan_1024, which is described as an Acacia-Casuarina-Melaleuca mix (DPIRD, 2019). The pre-European extent of this vegetation complex remaining is:

- 7.01% within the Avon Wheatbelt
- 7.97% within the Shire of Dowerin (Government of Western Australia, 2019).

2.5 Black Cockatoo Habitat

There is the potential for the Carnaby's Cockatoo (*Zanda latirostris*) and their habitat to occur in the survey area. Carnaby's Cockatoo (*Zanda latirostris*) is listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) and Threatened under the *Biodiversity Conservation Act 2016* (WA) (BC Act). The survey area occurs within an area classified as:

- Carnaby's Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions DBCA-054 (DBCA, 2018a)

3.0 Methodology

3.1 Desktop and Literature Review

The desktop survey included reviewing online databases to gather contextual knowledge and determine preliminary site characteristics including:

- likely native and non-native flora and fauna species present
- current extent of native vegetation
- general floristic community types
- likely presence of threatened or priority flora and fauna species
- likely presence of any threatened or priority ecological communities.

The following databases were accessed to obtain relevant information:

- NatureMap (DBCA, 2024)
- Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water (DCCEEW)), 2024) (Appendix 1)
- FloraBase (WA Herbarium, 2024)
- Threatened and priority flora and ecological community database searches (DBCA, 2018 and DBCA, 2024a)

Information relating to conservation significant species from database searches were summarised into field reference guides to aid with on-ground flora which is provided in Appendix 2. Conservation code definitions for the State and Commonwealth are provided in Appendix 3.

3.2 On-ground Flora Survey

The flora and vegetation survey was conducted in accordance with *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). Samples were collected, or photographs taken of unfamiliar species to enable later identification.

Natural Area environmental scientists undertook the survey on 8 January 2024, with key data recorded using Mappt software on a handheld tablet. Survey activities included:

- traversing the entirety of the site and recording all species present, including native and invasive species
- marking locations of any conservation significant flora, Declared Pests (DP) and/or Weeds of National Significance (WoNS) identified
- recording vegetation type including dominant over, middle and understorey species (Table 1) and condition using the scale attributed to Keighery (Table 2) (Government of Western Australia, 2000)
- the use of GPS to map significant species and boundaries of differing vegetation type and condition
- recording evidence of disturbance, such as fire.

3.2.1 Vegetation Type

The vegetation type was determined using the structural classes outlined in NVIS Level 5 (Executive Steering Committee for Australian Vegetation Information (ESCAVI), 2003), and records dominant over, middle and understorey species.

3.2.2 Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) (Table 2). Table 2 provides a description of the rating scale.

Table 2: Vegetation condition ratings

Category	Description
1 Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
2 Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
3 Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4 Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.
5 Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
6 Completely Degraded	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.

Source: EPA, 2016

3.3 Black Cockatoo Habitat Assessment

A black cockatoo habitat assessment was conducted in accordance with *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo* (DAWE, 2022).

Natural Area environmental scientists undertook the survey on 8 January 2024, with key data recorded using Mappt software on a handheld tablet. Survey activities included:

- traversing the whole site in a systematic grid search

- recording the location and evidence of breeding, roosting and foraging activities (e.g. chew marks, feathers, scats)
- marking the GPS locations of each habitat tree with a diameter at breast height (DBH) \geq 300 mm
- recording the height, DBH, health, and species of each habitat tree
- recording evidence of hollows, including size, type, and location within the tree
- recording foraging habitat, vegetation type, and condition.

3.4 Limitations

Limitations associated with the survey undertaken are detailed in Table 3.

Table 3: Survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	None	Government data on regional and local contextual information are readily available for the survey area.
Competency/ experience of team	None	Survey activities were undertaken by experienced environmental scientists who have extensive experience undertaking basic flora and vegetation surveys and black cockatoo habitat assessments within the Swan Coastal Plain, Jarrah Forrest and Avon Wheatbelt bioregions.
Proportion of flora recorded/collected, any identification issues	Minor	<p>A total of 21 flora species (taxa) were recorded from 12 families). The total comprised of 4 introduced (weed) species and 17 native species. Of these, 4 species (19.05%) were unable to be identified to species level due to a lack of diagnostic characteristics present at the time of surveys. Three of these species were able to be identified to genus level and one to family level:</p> <ul style="list-style-type: none"> ▪ <i>Acacia</i> sp. ▪ <i>Eucalyptus</i> sp. ▪ <i>Lepidosperma</i> sp. ▪ Poaceae sp. <p>The <i>Acacia</i> sp. and <i>Eucalyptus</i> sp. has the potential to be a conservation significant species. Limited diagnostic features were present during the January 2024 survey to confirm identification, further field surveys in the flowering period, would be required to confirm. These samples were submitted to the herbarium for identification.</p> <p>The remaining other unidentified species (<i>Lepidosperma</i> sp. and Poaceae sp.) are not considered to be threatened or priority flora following comparison with desktop data.</p>

Potential Limitation	Degree of Limitation	Comments
Survey effort and extent	None	<p>A basic flora and vegetation survey was undertaken over a period of one day in January. The entire survey area was traversed and all flora species and vegetation types/condition within the survey area were adequately surveyed.</p> <p>A targeted black cockatoo habitat survey was undertaken involving the marking of trees with a DBH \geq 300 mm and recording significant characteristics.</p>
Access restrictions	None	<p>Ecologist were able to traverse throughout the survey area with no restrictions.</p>
Survey timing (weather/season)	Minor	<p>The survey was undertaken in January and outside of the optimal time to survey flora in the Avon Wheatbelt Region, which is spring. Of the 39 conservation significant flora species identified in the desktop survey as being likely to occur within the survey area, 38 species have flowering periods outside of the survey period.</p> <p>All of these conservation significant species are perennial shrub, herbs and tree species for which identification is often possible outside of their flowering periods due to distinct morphological characteristics including growth habit and leaf structure.</p> <p>A total of four (19.05%) species were unable to be identified to species level due to the lack of diagnostic characteristics exhibited at the time of survey. All unknown samples were submitted to the Western Australian herbarium for identification. Three of these species were identified to genus level and one to family level:</p> <ul style="list-style-type: none"> ▪ <i>Acacia</i> sp. ▪ <i>Eucalyptus</i> sp. ▪ <i>Lepidosperma</i> sp. ▪ Poaceae sp. <p>The <i>Acacia</i> sp. and <i>Eucalyptus</i> sp. have the potential to be a conservation significant species. Further field surveys in the flowering period, would be required to confirm their identification.</p>
Disturbances	None	<p>No recent disturbances which may have had an impact on survey results (e.g. fire, recent clearing or floods) were identified during the survey.</p>

4.0 Flora Survey Results

4.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 87 conservation significant species to occur within 30 km of the survey area (Table 4). NatureMap indicated 73 conservation significant flora species listed under the *Biodiversity Conservation Act 2016* (WA) or by the Western Australian Herbarium (1998-), as potentially occurring within 30 km radius of the survey area (DBCA, 2024). A review of the Protected Matters Search Tool (PMST) (DCCEEW, 2024) indicated 31 significant flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 30 km radius of the survey area (Appendix 1).

A review of the DBCA (2018) threatened and priority flora database indicated 72 threatened or priority species have been recorded within 30 km of the survey area. Of the conservation significant species potentially found in the area, it was determined that the site conditions (soil type, drainage, location) may be suitable for 39 of these species (highlighted green) (Table 4). Conservation code descriptions are provided in Appendix 3.

Table 4: Threatened and Priority flora species listed by NatureMap, PMST and DBCA

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Acacia ataxiphylla</i> subsp. <i>magna</i>	EN		X	
<i>Acacia campylophylla</i>	3	X		X
<i>Acacia cochlocarpa</i> subsp. <i>cochlocarpa</i>	EN		X	
<i>Acacia cochlocarpa</i> subsp. <i>velutinos</i>	T	X	X	X
<i>Acacia deflexa</i>	3	X		X
<i>Acacia dissona</i> var. <i>indoloria</i>	3	X		X
<i>Acacia drewiana</i> subsp. <i>minor</i>	2	X		X
<i>Acacia leptoneura</i>	T	X	X	X
<i>Acacia lirellata</i> subsp. <i>lirellata</i>	3	X		X
<i>Acacia phaeocalyx</i>	3	X		X
<i>Acacia scalena</i>	3	X		X
<i>Acacia</i> sp. Manmanning (B.R. Maslin 7711)	1	X		X
<i>Acacia vassalii</i>	T	X	X	X
<i>Acacia volubilis</i>	EN		X	
<i>Andersonia gracilis</i>	EN		X	
<i>Angianthus micropodioides</i>	3	X		X
<i>Austrostipa frankliniae</i>	2	X		X
<i>Austrostipa koordana</i>	1	X		X

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Balaustion baiocalyx</i>	1	X		X
<i>Banksia horrida</i>	3	X		X
<i>Banksia shanklandiorum</i>	4	X		X
<i>Beyeria constellata</i>	1	X		X
<i>Boronia ericifolia</i>	2	X		X
<i>Bossiaea atrata</i>	3	X		X
<i>Caladenia drakeoides</i>	T	X	X	
<i>Calytrix parvivalis</i>	2	X		X
<i>Calytrix plumulosa</i>	3	X		X
<i>Chorizema humile</i>	T	X	X	X
<i>Conostephium wonganense</i>	1	X		X
<i>Conostylis caricina</i> subsp. <i>elachys</i>	1	X		X
<i>Conostylis wonganensis</i>	T	X	X	X
<i>Cryptandra dielsii</i>	3	X		X
<i>Dampiera glabrescens</i>	1	X		X
<i>Dasymalla axillaris</i>	CR		X	
<i>Daviesia euphorbioides</i>	T	X	X	X
<i>Daviesia nudiflora</i> subsp. <i>amplectens</i>	1	X		X
<i>Daviesia nudiflora</i> subsp. <i>drummondii</i>	3	X		X
<i>Daviesia smithiorum</i>	2	X		X
<i>Dicrastylis reticulata</i>	3	X		X
<i>Eremophila resinosa</i>	T	X	X	X
<i>Eremophila viscida</i>	EN		X	
<i>Eucalyptus caesia</i> subsp. <i>caesia</i>	4	X		X
<i>Eucalyptus caesia</i> subsp. <i>magna</i>	4	X		X
<i>Eucalyptus recta</i>	T	X	X	X
<i>Eucalyptus subangusta</i> subsp. <i>virescens</i>	3	X		X
<i>Eucalyptus synandra</i>	VU		X	
<i>Fitzwillia axilliflora</i>	2	X		X
<i>Frankenia conferta</i>	T	X	X	X
<i>Frankenia glomerata</i>	4	X		X
<i>Gastrolobium appressum</i>	T	X	X	X

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Gastrolobium glaucum</i>	T	X	X	X
<i>Gastrolobium hamulosum</i>	EN		X	
<i>Grammosolen odgersii</i> subsp. <i>occidentalis</i>	EN		X	
<i>Grevillea dryandroides</i> subsp. <i>hirsuta</i>	T	X	X	X
<i>Grevillea endlicheriana</i> subsp. Wongan Hills (G.J. Keighery 15351)	2	X		X
<i>Grevillea haplantha</i> subsp. <i>recedens</i>	3	X		X
<i>Grevillea minutiflora</i>	1	X		X
<i>Grevillea pythara</i>	EN		X	
<i>Grevillea rosieri</i>	2	X		X
<i>Guichenotia glandulosa</i>	2	X		X
<i>Gyrostemon reticulatus</i>	CR		X	
<i>Haloragis platycarpa</i>	T	X		X
<i>Hypocalymma polyandrum</i>	1	X		X
<i>Lechenaultia galactites</i>	3	X		X
<i>Lysiosepalum abollatum</i>	CR		X	
<i>Melaleuca sciotostyla</i>	T	X	X	X
<i>Melaleuca sclerophylla</i>	3	X		X
<i>Microcorys eremophiloides</i>	T	X	X	X
<i>Persoonia chapmaniana</i>	3	X		X
<i>Persoonia pungens</i>	3	X		X
<i>Phebalium drummondii</i>	3	X		X
<i>Philothea wonganensis</i>	EN		X	
<i>Pityrodia scabra</i> subsp. <i>scabra</i>	T	X	X	X
<i>Prostanthera nanophylla</i>	3	X		X
<i>Roycea pycnophylloides</i>	EN		X	
<i>Scaevola tortuosa</i>	1	X		X
<i>Schoenus capillifolius</i>	3	X		X
<i>Styphelia caudata</i>	3	X		X
<i>Styphelia tamminensis</i>	2	X		X
<i>Synaphea constricta</i>	3	X		X
<i>Thomasia tenuivestita</i>	3	X		X
<i>Urodon capitatus</i>	3	X		X

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Verticordia hughanii</i>	T	X		X
<i>Verticordia mitchelliana</i> subsp. <i>mitchelliana</i>	3	X		X
<i>Verticordia staminosa</i> subsp. <i>staminosa</i>	T	X	X	X
<i>Verticordia venusta</i>	3	X		X
<i>Verticordia wonganensis</i>	2	X		X

4.1.1 Threatened and Priority Ecological Communities

A review of the PMST report and DBCA'S Threatened Communities database identified five listed ecological communities that could potentially occur within 30 km of the survey area (Table 5).

Table 5: Potential Threatened Ecological Communities within the Bailey East West Rd

Name	Status	Presence
Eucalypt Woodlands of the Western Australian Wheatbelt	Critically Endangered	Community likely to occur within the area
Perched Wetlands of the Wheatbelt region with extensive stands of living swamp sheoak (<i>Casuarina obesa</i>) and paperbark (<i>Melaleuca strobophylla</i>) across the lake floor	Endangered	Community likely to occur within the area
Gimlet Woodlands of the Wheatbelt	Critically Endangered	Community likely to occur within the area
Salmon Gum Woodlands of the Wheatbelt	Critically Endangered	Community likely to occur within the area
York Gum Woodlands of the Wheatbelt	Critically Endangered	Community likely to occur within the area


Source: DCCEEW, 2024 and DBCA, 2024a

4.2 Flora Survey Results

4.2.1 Vegetation Types

One vegetation type was recorded within the Bailey East West Rd survey area, Mixed Open Shrubland. The remaining vegetation within the survey area was cleared and no native vegetation was present. Vegetation types are described in Table 6 and shown in Figure 2.

Table 6: Vegetation type within Bailey East West Rd survey area

Vegetation Type	Description	Photograph
Mixed Open Shrubland	A mixed open shrubland consisting of <i>Santalum acuminatum</i> (Quandong) and <i>Melaleuca hamata</i> over mixed sedges, and grasses.	

4.2.2 Vegetation Condition

Vegetation condition within the survey area ranged from good to completely degraded (Table 7, Figure 3).

Table 7: Vegetation condition within Bailey East West Rd survey area

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	0	0	0	0.027	0	0.019	0.046
Area (%)	0	0	0	58.7	0	41.3	100





4.2.3 Flora

A total of 21 flora species (taxa) were recorded from 12 families during the field survey. This was comprised of 4 introduced (weeds) and 17 native species. Examples of native flora species and weed species are shown in Figure 4. A complete flora species list is provided in Appendix 4. No declared pests or weed of national significance (WoNS) were identified within the survey area.

No conservation significant flora species were identified within the survey area at the time of the survey. However, as the survey was not conducted in the optimum season (spring) for flora species in the Avon-Wheatbelt region, the likelihood of detection is low for some species. The likely presence and likelihood of detection of conservation significant flora species is discussed in more detail in Section 6.2.

A total of four species were unable to be identified to species level due to the lack of diagnostic characteristics exhibited at the time of survey:

- *Acacia* sp.
- *Eucalyptus* sp.
- *Lepidosperma* sp.
- Poaceae sp.



Melaleuca hamata



Ecdeiocola monostachya

Figure 4: Examples of native flora species recorded.

4.2.4 Threatened and Priority Communities

All five of the threatened and priority ecological communities that were identified as occurring within a 30 km radius of the survey area during the desktop assessment were not identified in the survey area. The species composition identified within the survey area was inconsistent with those associated with these TECs.

It should be noted that as this survey was conducted out-of-season, not all species may have been visible at the time of the survey.

5.0 Black Cockatoo Habitat Assessment Results

5.1 Desktop Survey

A desktop survey of online databases indicated the potential for the Carnaby's Cockatoo (*Zanda latirostris*) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) to occur within 30 km of the survey area (Table 8) (DBCA, 2024b; DCCEEW, 2024). DBCA fauna database search identified two confirmed breeding sites for 'white-tailed black cockatoos' were within a 20 km search buffer of the survey boundary. The closest known breeding site is 11 km north of the survey area (DBCA, 2024b).

Table 8: Black cockatoo species listed by NatureMap, PMST and DBCA

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Zanda latirostris</i>	EN	X	X	X
<i>Calyptorhynchus banksii naso</i>	VU			X

5.2 Field Survey

No potential black cockatoo habitat trees (DBH > 300 mm) which satisfy the Commonwealth requirements were recorded within the survey area.

5.2.1 Foraging Habitat

The survey area contained one plant, *Grevillea petrophiloides* subsp. *petrophiloides* that is a known feeding resources for Carnaby's Cockatoo (Department of Environment and Conservation, 2011). No evidence of foraging was recorded within the survey area. The black cockatoo foraging quality scoring tool (DAWE, 2022) was not applied as the survey area is less than 1 ha.

6.0 Implications of Results

6.1 Flora and Vegetation

One vegetation type was recorded during the 2024 January survey, Mixed Open Shrubland with vegetation condition within the survey area ranging from good to completely degraded. A total of 21 flora species (taxa) were recorded from 12 families during the field survey. This was comprised of 17 (80.95 %) native species and 4 (19.05 %) introduced (weed) species.

A total of four (19.05 %) species were unable to be identified to species level due to the lack of diagnostic characteristics exhibited at the time of survey. All unknown samples were submitted to the Western Australian herbarium for identification. Three of these species were identified to genus level and one to family level:

- *Acacia* sp.
- *Eucalyptus* sp.
- *Lepidosperma* sp.
- Poaceae sp.

6.2 Significant Flora

No conservation significant flora species were identified during the January 2024 survey. Of the 39 conservation significant flora species identified in the desktop survey as being likely to occur within the survey area, 38 species have flowering periods outside of the survey period. However, all species are perennial shrubs and herb species for which identification is often possible outside of their flowering periods due to distinct morphological characteristics including growth habit and leaf structure.

The *Acacia* sp. and *Eucalyptus* sp. have the potential to be a conservation significant species. Limited diagnostic features were present during the January 2024 survey to confirm species identification. These samples were submitted to the herbarium for identification and were only identified to genus level. Further field surveys within the flowering period would be required to confirm.

6.3 Threatened Ecological Communities

No threatened and priority ecological communities were identified within the survey area. The species composition identified within the survey area was inconsistent with those associated with the TECs identified in the desktop survey.

It should be noted however, that as this survey was conducted out-of-season not all species may have been visible at the time of the survey. Although the survey area was classified as a Mixed Open Shrubland, and no upper canopy layer was present, there is potential that the vegetation within the survey area is a degraded portion of a broader vegetation type. The understorey of Eucalypt woodland ecological communities can vary significantly in species diversity and structure, and can be shrubby, herbaceous, grassy, chenopod, samphire dominated, or almost bare. A detailed spring flora survey and statistical analysis, including an assessment of the surrounding vegetation would be required to confirm whether the species composition within the survey area is consistent with the Floristic Community Type's associated with any potential surrounding ecological community.

6.4 Assessment Against Clearing Principles

An assessment of information obtained during the 2024 survey has been made against the Western Australian 10 clearing principles. It is suggested that the clearing application may be at variance with three (A, C and E) of the ten clearing principles (Table 9).

Table 9: Native vegetation clearing principles and assessment

Clearing Principle	Comment
A Native vegetation should not be cleared if it comprises a high level of biological diversity.	The proposed site to be cleared may be at variance with this principle: <ul style="list-style-type: none"> ▪ the survey area was very small (0.046 ha), and a total of 21 flora species (taxa) from 12 families were recorded, including 4 introduced (weeds) and 17 native species ▪ vegetation condition was in predominantly good (58.6 %) condition, with the exception of the completely degraded edges of the vegetation patch (41.3 %).
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 proposed site to be cleared is not likely to be at variance with this principle: <ul style="list-style-type: none"> ▪ no black cockatoos individuals, habitat trees or evidence of foraging was observed. Only one plant (<i>Grevillea petrophiloides</i> subsp. <i>petrophiloides</i>) was identified that is a known feeding resources for Carnaby's Cockatoo ▪ the vegetation within the survey area is likely to provide habitat for other fauna species due to the high percentage of native understorey, midstory, leaf litter and dead wood cover. The potential to provide habitat may be restricted by some species due to the isolation of this patch and being entirely surrounded by a road intersection. However, roadside verges and small patches of vegetation in the Wheatbelt region can provide high value fauna habitat.
C Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	The proposed site to be cleared may be at variance with this principle: <ul style="list-style-type: none"> ▪ the desktop survey identified the potential for 39 conservation significant flora to potentially reside within the survey area ▪ no conservation significant flora were identified during the field survey ▪ all species were perennial herb, shrub, or sedge species for which other characteristics are often present to enable identification to a minimum of genus level ▪ four species were unable to be identified to species level due to the lack of diagnostic characteristics: <ul style="list-style-type: none"> – <i>Acacia</i> sp. – <i>Eucalyptus</i> sp. – <i>Lepidosperma</i> sp. – Poaceae sp.

Clearing Principle	Comment
	<ul style="list-style-type: none"> ▪ the <i>Acacia</i> sp. and <i>Eucalyptus</i> sp. have the potential to be a conservation significant species. Further field surveys in the flowering period, would be required to confirm identification.
<p>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.</p>	<p>The proposed site to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> ▪ all five of the threatened and priority ecological communities that were identified during the desktop assessment were not identified during the field survey. The species composition identified within the survey area was inconsistent with those associated with these TECs.
<p>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.</p>	<p>The proposed site to be cleared may be at variance with this principle:</p> <ul style="list-style-type: none"> ▪ the proposed clearing occurs within the Wheatbelt which has been extensively cleared historically for farming practices ▪ there is 7.97 % of the Guangan_1024 vegetation complex remaining in the Shire of Dowerin, and 7.01 % in the Avon Wheatbelt ▪ the area surrounding the site includes vegetated areas and cleared agricultural land ▪ several areas of remnant bushland are present adjacent to and in proximity to the proposed clearing footprint.
<p>F Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<p>The proposed site to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> ▪ there are no known geomorphic wetlands or drainage systems within or in proximity to the survey area.
<p>G Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p>The proposed site to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> ▪ the realignment of the Bailey East West Road is unlikely to result in an increased level of land degradation as the clearing will occur within the gazetted road reserve and constructed in accordance with Shire’s engineering standards for roads.
<p>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.</p>	<p>The area to be cleared is not likely to be at variance with this principle</p> <ul style="list-style-type: none"> ▪ the proposed clearing is not expected to impact adjacent or nearby conservation areas as the site is not located in close proximity to any conservation areas and is predominantly bordered by agricultural land-uses.

Clearing Principle	Comment
<p>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.</p>	<p>The area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> ▪ the Bailey East West Road is an existing road, which is not in proximity to any wetlands or drainage channels. As a result, the road construction is not expected to have an impact on water quality.
<p>J Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.</p>	<p>The area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> ▪ the Bailey East West Road is an existing road, and the proposed widening of the road is not expected to have an impact on surface water flows in the area.

7.0 References

Beecham B. (2001). Avon Wheatbelt 1 (AW1 – Ancient Drainage subregion), accessed February 2023. Retrieved from: <https://www.dpaw.wa.gov.au/about-us/science-and-research/biological-surveys/117-a-biodiversity-audit-of-wa>

Biodiversity Conservation Act 2016 (WA). Retrieved from https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_13811_homepage.html

Bureau of Meteorology. (2024). *Climate and Weather Statistics – Wongan Hills ID 8137*, retrieved May 2024 via: http://www.bom.gov.au/climate/averages/tables/cw_008137_All.shtml.

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

Department of Biodiversity, Conservation and Attractions (DBCA). (2018). *Threatened and Priority Flora Database Search for Shire of Dowerin retrieved 08/01/2024*. Prepared by the Species and Communities program for Karri Grant and Natural Area for Bailey East West Rd.

Department of Biodiversity Conservation and Attractions. (2018a). Carnabys Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054) [Data set].

Department of Biodiversity, Conservation and Attractions (DBCA). (2019). *Threatened and Priority Fauna List*. Retrieved from <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals>

Department of Biodiversity, Conservation and Attractions. (2020). *Conservation Codes*. Retrieved from <https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation%20code%20definitions.pdf>.

Department of Biodiversity, Conservation and Attractions. (2024). *NatureMap*. Prepared by the Species and Communities program for Shire of Dowerin and Natural Area for Bailey East West Rd.

Department of Biodiversity, Conservation and Attractions. (2024a). *Threatened and Priority Ecological Communities Database Search for Shire of Dowerin retrieved 08/01/2024*. Prepared by the Species and Communities program for Karri Grant and Natural Area for Bailey East West Rd.

Department of Biodiversity, Conservation and Attractions. (2024b). *Threatened and Priority Fauna Database Search for Shire of Dowerin retrieved 08/01/2024*. Prepared by the Species and Communities program for Karri Grant and Natural Area for Bailey East West Rd.

- Department of Climate Change, Energy and the Environment (DCCEEW). (2015). *Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt*. Retrieved from <https://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=128>
- Department of Climate Change, Energy and the Environment (DCCEEW). (2024). *Protected Matters Search Tool*. Retrieved from <http://www.environment.gov.au/epbc/pmst/>.
- Department of Environment and Conservation. (2011). *Plants Used by Carnaby's Black Cockatoo*. Retrieved from <https://www.dpaw.wa.gov.au/apps/plantsforcarnabys/index.html>.
- Department of Primary Industries and Regional Development. (2019). *Pre-European Vegetation (DPIRD-006)*.
- Department of Primary Industries and Regional Development. (2024). *NRInfo for Western Australia: map application*. Retrieved from <https://www.agric.wa.gov.au/resource-assessment/nrinfo-western-australia>.
- Department of Water and Environmental Regulation. (2021). *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*
- Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). Retrieved from <https://www.legislation.gov.au/Details/C2016C00777>
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (WA). Retrieved from https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1384_homepage.html
- Environmental Protection Act 1986* (WA). Retrieved from https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_304_homepage.html
- Environmental Protection Authority. (2016). *Technical Guidance: Flora and Vegetation survey for Environmental Impact Assessment*. Retrieved from http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Government of Western Australia. (2000). *Bush Forever (Vol. 2)*. Department of Environmental Protection, Perth, Western Australia.
- Government of Western Australia. (2019). *2018 South West Vegetation Complex Statistics. Current as of March 2019*. Perth, W.A.: Department of Biodiversity, Conservation and Attractions. Retrieved from <https://catalogue.data.wa.gov.au/dataset/dbca>
- Western Australian (WA) Herbarium. (1998-). *FloraBase – The Western Australian Flora*. Retrieved from <https://florabase.dpaw.wa.gov.au/>.

Appendix 1: PMST Report 10 km



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 31-Jan-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	44
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	10
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	21
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	1
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Eucalypt Woodlands of the Western Australian Wheatbelt	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding likely to occur within area	In feature area
MAMMAL			
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area	In feature area
Myrmecobius fasciatus Numbat [294]	Endangered	Species or species habitat may occur within area	In buffer area only
Phascogale calura Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
PLANT			
Acacia ataxiphylla subsp. magna Large-fruited Tammin Wattle [64823]	Endangered	Species or species habitat may occur within area	In buffer area only
Acacia cochlocarpa subsp. cochlocarpa Spiral-fruited Wattle [23877]	Endangered	Species or species habitat may occur within area	In buffer area only
Acacia cochlocarpa subsp. velutinos Velvety Spiral Pod Wattle [65112]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Acacia leptoneura [15610]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Acacia vassalii Vassal's Wattle [6144]	Endangered	Species or species habitat known to occur within area	In buffer area only
Acacia volubilis Tangled Wattle, Tangle Wattle [6476]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia drakeoides Hinged Dragon Orchid [68687]	Endangered	Species or species habitat may occur within area	In feature area
Chorizema humile Prostrate Flame Pea [32573]	Endangered	Species or species habitat may occur within area	In buffer area only
Conostylis wonganensis Wongan Conostylis [10906]	Endangered	Species or species habitat known to occur within area	In buffer area only
Dasymalla axillaris Native Foxglove [38829]	Critically Endangered	Species or species habitat may occur within area	In feature area
Daviesia euphorbioides Wongan Cactus [3477]	Endangered	Species or species habitat known to occur within area	In feature area
Eremophila resinosa Resinous Eremophila [11735]	Endangered	Species or species habitat likely to occur within area	In feature area
Eremophila viscida Varnish Bush [2394]	Endangered	Species or species habitat likely to occur within area	In feature area
Eucalyptus recta Silver Mallet [56430]	Endangered	Species or species habitat known to occur within area	In feature area
Eucalyptus synandra Jingymia Mallee [3753]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Frankenia conferta Silky Frankenia [6074]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gastrolobium appressum Scale-leaf Poison [7358]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gastrolobium glaucum Spike Poison, Wongan Poison [7428]	Endangered	Species or species habitat known to occur within area	In buffer area only
Gastrolobium hamulosum Hook-point Poison [9212]	Endangered	Species or species habitat may occur within area	In buffer area only
Grammosolen odgersii subsp. occidentalis Western Woolly Cyphanthera, Western Cyphanthera [92779]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea dryandroides subsp. hirsuta Hairy Phalanx Grevillea [64577]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea pythara Pythara Grevillea [64525]	Endangered	Species or species habitat likely to occur within area	In feature area
Gyrostemon reticulatus Net-veined Gyrostemon [8491]	Critically Endangered	Species or species habitat may occur within area	In feature area
Lysiosepalum abollatum Woolly Lysiosepalum [83216]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Melaleuca sciotostyla Wongan Melaleuca [24324]	Endangered	Species or species habitat known to occur within area	In feature area
Microcorys eremophiloides Wongan Microcorys [3498]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Philothea wonganensis Wongan Eriostemon [64945]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pityrodia scabra subsp. scabra [86454]	Endangered	Species or species habitat known to occur within area	In buffer area only
Roycea pycnophylloides Saltmat [21161]	Endangered	Species or species habitat likely to occur within area	In feature area
Verticordia staminosa subsp. staminosa Wongan Featherflower [55825]	Endangered	Species or species habitat likely to occur within area	In feature area

REPTILE

Egernia stokesii badia Western Spiny-tailed Skink, Baudin Island Spiny-tailed Skink [64483]	Endangered	Species or species habitat known to occur within area	In feature area
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SPIDER

Idiosoma nigrum Shield-backed Trapdoor Spider, Black Rugose Trapdoor Spider [66798]	Vulnerable	Species or species habitat known to occur within area	In feature area
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Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species

Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
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Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [51612]	WA	In buffer area only
Commonwealth Land - [52206]	WA	In buffer area only
Commonwealth Land - [51606]	WA	In buffer area only
Commonwealth Land - [52221]	WA	In buffer area only
Commonwealth Land - [52049]	WA	In buffer area only
Commonwealth Land - [52031]	WA	In buffer area only
Commonwealth Land - [52036]	WA	In buffer area only
Commonwealth Land - [52135]	WA	In buffer area only
Commonwealth Land - [50987]	WA	In buffer area only
Commonwealth Land - [51938]	WA	In buffer area only

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Amery	Nature Reserve	WA	In buffer area only
Dingo Rock	Nature Reserve	WA	In buffer area only
Dukin	Nature Reserve	WA	In buffer area only
Manmanning	Nature Reserve	WA	In buffer area only
Manmanning Dam	Nature Reserve	WA	In buffer area only
Minnivale	Nature Reserve	WA	In buffer area only
Moonijin	Nature Reserve	WA	In buffer area only
Namelcatchem	Nature Reserve	WA	In buffer area only
Noorajin Soak	Nature Reserve	WA	In buffer area only
Unnamed WA12154	Nature Reserve	WA	In buffer area only
Unnamed WA15461	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA17710	Nature Reserve	WA	In buffer area only
Unnamed WA21475	Nature Reserve	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA22176	5(1)(g) Reserve	WA	In buffer area only
Unnamed WA22363	Nature Reserve	WA	In buffer area only
Unnamed WA23008	Nature Reserve	WA	In buffer area only
Unnamed WA23665	Nature Reserve	WA	In buffer area only
Unnamed WA24060	Nature Reserve	WA	In buffer area only
Unnamed WA25984	Nature Reserve	WA	In buffer area only
Walk Walkin	Nature Reserve	WA	In buffer area only
Walyormouring	Nature Reserve	WA	In buffer area only

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
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- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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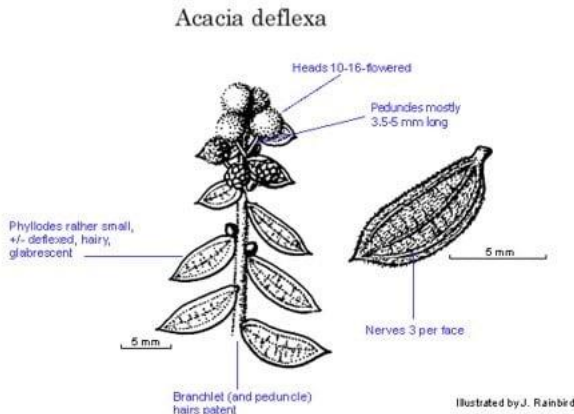

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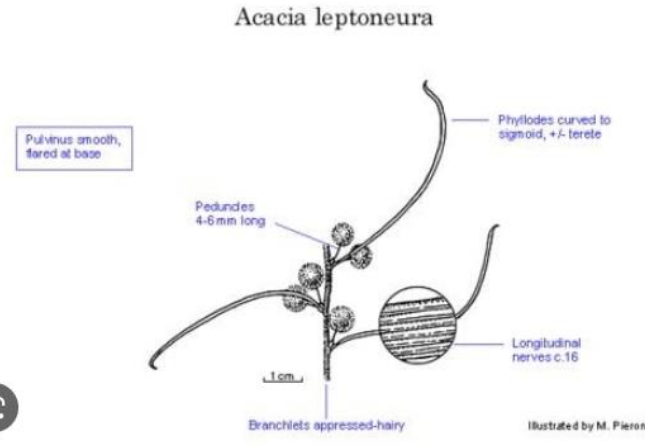
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Appendix 2: Significant Species



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="197 826 488 852"><i>Acacia ataxiphylla</i> subsp. <i>magna</i></p> <p data-bbox="663 831 788 852">Photos: J.M. Collins</p>		<p data-bbox="1003 576 1279 644">Spreading to ascending shrub, 0.3-0.6 m high.</p>	<p data-bbox="1317 600 1442 663">Fl. yellow, Jun to Jul.</p>	<p data-bbox="1480 560 1671 703">Sandy soils. Lateritic ironstone rises, flats.</p>	<p data-bbox="1720 619 1749 639">T</p>	<p data-bbox="1845 619 1874 639">N</p>	<p data-bbox="1951 544 2085 719">Not, previously recorded at geographic location</p>
 <p data-bbox="302 1362 517 1388"><i>Acacia campylophylla</i></p> <p data-bbox="562 1369 685 1388">Photo: S.D. Hopper</p>		<p data-bbox="1003 1094 1279 1163">Dense, rigid, spreading shrub, 0.1-0.6 m high.</p>	<p data-bbox="1317 1094 1442 1163">Fl. yellow, Jul to Aug.</p>	<p data-bbox="1480 1094 1671 1163">Lateritic gravelly soils.</p>	<p data-bbox="1720 1118 1749 1139">P3</p>	<p data-bbox="1845 1118 1874 1139">Y</p>	<p data-bbox="1966 1094 2063 1163">Habitat suitable</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 772 831 799"><i>Acacia cochlocarpa</i> subsp. <i>cochlocarpa</i> Photos: B.R. Maslin & D. Papenfus</p>		<p data-bbox="1003 504 1301 611">Glabrous, sprawling shrub, 0.3-0.7(-1.5) m high.</p>	<p data-bbox="1301 544 1473 571">Fl. yellow.</p>	<p data-bbox="1473 504 1697 611">Clayey, sandy, often gravelly soils.</p>	<p data-bbox="1697 544 1787 571">T</p>	<p data-bbox="1787 544 1944 571">N</p>	<p data-bbox="1944 464 2094 651">Not, previously recorded at geographic location</p>
 <p data-bbox="152 1299 831 1326"><i>Acacia cochlocarpa</i> subsp. <i>velutinoso</i> Photos: S.J. Patrick</p>		<p data-bbox="1003 1015 1301 1121">Velutinous, sprawling shrub, 0.3-0.7(-1.5) m high.</p>	<p data-bbox="1301 1054 1473 1082">Fl. yellow.</p>	<p data-bbox="1473 1031 1697 1106">Sandy clay or laterite.</p>	<p data-bbox="1697 1054 1787 1082">T</p>	<p data-bbox="1787 1054 1944 1082">Y</p>	<p data-bbox="1944 1031 2094 1106">Habitat suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
		<p>Prostrate to straggling or erect shrub, 0.15-2 m high.</p>	<p>Fl. yellow, Aug to Sep.</p>	<p>Yellow & gravelly lateritic sand, gravelly sandy loam. Plains.</p>	<p>P3</p>	<p>Y</p>	<p>Habitat suitable</p>
		<p>Domed or rounded, dense, pungent shrub, 0.5-2 m high.</p>	<p>Fl. yellow, Aug to Sep.</p>	<p>Sand, sandy loam. Undulating plains.</p>	<p>P3</p>	<p>Y</p>	<p>Habitat suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Acacia drewiana</i> subsp. <i>minor</i> Photos: S.J. Patrick</p>		<p>Spreading shrub, 0.15-0.5 m high.</p>	<p>Fl. yellow, May to Jul.</p>	<p>Sandy & gravelly soils.</p>	<p>P2</p>	<p>Y</p>	<p>Habitat suitable</p>
 <p><i>Acacia leptoneura</i></p>		<p>Domed shrub with globular flowering heads which are simple and 1 or 2 per axil.</p>		<p>a grey/white sandy loam over laterite, Associated species include <i>Hakea scoparia</i> and <i>Santalum acuminatum</i></p>	<p>T</p>	<p>Y</p>	<p>Habitat suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 788 504 815"><i>Acacia lirellata</i> subsp. <i>compressa</i></p> <p data-bbox="667 788 831 815">Photos: A.D. Crawford</p>		<p data-bbox="1003 523 1279 628">Bushy procumbent, spreading shrub, ca 0.5 m high, to 1.2 m wide.</p>	<p data-bbox="1317 560 1435 587">Fl. yellow.</p>	<p data-bbox="1496 523 1653 628">Yellow sand, clayey loam. Sandplains.</p>	<p data-bbox="1720 560 1749 587">P2</p>	<p data-bbox="1845 560 1861 587">Y</p>	<p data-bbox="1966 539 2063 608">Habitat suitable</p>
 <p data-bbox="152 1321 353 1348"><i>Acacia phaeocalyx</i></p> <p data-bbox="680 1321 831 1348">Photos: S.D. Hopper</p>		<p data-bbox="1010 1034 1272 1171">Intricately branched, sprawling or compact, pungent shrub, 0.3-0.6(-0.8) m high.</p>	<p data-bbox="1317 1070 1435 1134">Fl. yellow, Apr to Jun.</p>	<p data-bbox="1480 1034 1675 1171">Yellow or white sand, often over laterite. Flats, hillsides.</p>	<p data-bbox="1720 1086 1749 1114">P3</p>	<p data-bbox="1845 1086 1861 1114">Y</p>	<p data-bbox="1951 1070 2085 1134">Geographic location</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Acacia scalena</i> Photos: B.R. Maslin</p>		<p>Intricately branched, rigid, often straggly, prickly shrub, 0.5-1.5 m high.</p>	<p>Fl. yellow, Jun to Sep.</p>	<p>Yellow or yellow gravelly sand, loam.</p>	<p>P3</p>	<p>Y</p>	<p>Habitat suitable</p>
 <p><i>Acacia</i> sp. Manmanning (B.R. Maslin 7711) Photos: J.M. Collins</p>		<p>Domed shrub, 0.5-1 m high, phyllodes smooth, rather widely spreading, tips blunt; spikes 10-12 x 6-7mm, prolific.</p>	<p>Fl. yellow, Sep.</p>	<p>Yellow gravelly sand towards base of low rise. Disturbed land near road verges, gravel pits.</p>	<p>P1</p>	<p>Y</p>	<p>Habitat suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Acacia vassalii</i> Photos: P. Roberts & R. Evans</p>		Semi-prostrate, spreading, rounded shrub, 0.15-0.3 m high.	Fl. yellow, Jun to Jul.	Grey/brown or yellow sand, sandy loam.	T	Y	Geographic location
 <p><i>Acacia volubilis</i> Photos: K. Bettink, A.D. Crawford & B.R. Maslin</p>		Dense, compact, domed, wiry, entangled shrub, 0.3-0.4 m high, to 1 m wide.	Fl. yellow, Jun.	Gravelly sand, sandy clay.	T	N	Not, previously recorded at geographic location


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Andersonia gracilis</i> Photos: K. Atkins & M. Hislop</p>		Slender erect or open straggly shrub, 0.1-0.5(-1) m high.	Fl. white-pink-purple, Sep to Nov.	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	T	N	Habitat unsuitable
<i>Angianthus micropodioides</i>		Erect or decumbent annual, herb, 0.03-0.15 m high	Fl. yellow-white, Nov to Dec or Jan to Feb.	Saline sandy soils. River edges, saline depressions, claypans.	P3	N	Habitat unsuitable
<i>Austrostipa frankliniae</i> (syn. <i>Austrostipa</i> sp. Dowerin)		Perennial tussock grass, 250–400 mm tall with a basal tuft of leaves. Seed: Falcate awns with brown lemma hairs (all other members of this subgenus have white lemma hairs). (Williams, 2022)	Spring, fruiting late spring to early summer. (Williams, 2022)		P2	N	Not, previously recorded at geographic location

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Austrostipa koordana</i>		No Info					
<i>Balaustion baiocalyx</i>							
 <p><i>Banksia horrida</i></p> <p>Photos: M. Pieroni</p>		Upright, lignotuberous shrub, 0.6-1.6 m high.	Fl. yellow-orange, Apr to Jun or Aug.	Sand, sometimes with gravel.	P3	Y	Habitat suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Banksia shanklandiorum</i></p> <p><small>Photos: H. Adamson & M. Pieroni</small></p>		Upright, non-lignotuberous shrub, 0.4-2.5 m high, to 3 m wide.	Fl. Jun to Aug.	White/yellow sand with lateritic gravel.	P4	Y	Habitat suitable
<i>Beyeria constellata</i>		No Info				Y	Geographic location
<i>Boronia ericifolia</i>		Erect shrub, 0.3-1.2 m high.	Fl. white/cream-yellow, Apr or Jun or Aug to Sep.	Sandy loam, clay, laterite. Low-lying spots.		Y	Habitat suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Bossiaea atrata</i></p> <p>Photos: J.M. Collins</p>		<p>Compact, dense, intricately-branched, rigid, spinescent herb, to 1.2 m high.</p>	<p>Fl. orange-yellow-red-brown, May to Aug</p>	<p>White sand or sandy loam over laterite or clay, quartzite sand, clay.</p>	<p>P3</p>	<p>Y</p>	<p>Habitat suitable</p>
 <p><i>Caladenia drakeoides</i></p> <p>Photos: I & M Greeve, A.P. Brown & S.D. Hopper</p>	<p>Hinged Dragon Orchid</p>	<p>Tuberous, perennial, herb, 0.12-0.3 m high.</p>	<p>Fl. green, Sep to Oct.</p>	<p>Grey clayey sand, red sandy loam, in damp situations. Margins of salt lakes.</p>	<p>T</p>	<p>N</p>	<p>Habitat unsuitable</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Calytrix parvivalis</i></p> <p>Photos: A.D. Crawford</p>		Shrub, 0.25-0.5 m high.	Fl. purple, Oct.	Sand, loam.	P2	N	Not, previously recorded at geographic location
<i>Calytrix plumulosa</i>		Shrub, 0.15-0.4 m high.	Fl. pink-violet, Oct to Nov.	Yellow sand with lateritic gravel, red loam.	P3	N	Not, previously recorded at geographic location


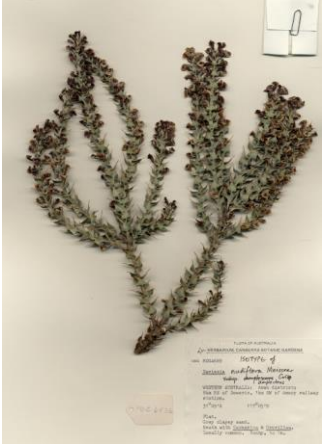
Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Chorizema humile</i> Photos: A. Doley & D. Papenfus</p>		<p>Sprawling, prostrate or decumbent shrub.</p>	<p>Fl. yellow & red/brown, Jul to Sep.</p>	<p>Sandy clay or loam. Plains.</p>	<p>T</p>	<p>Y</p>	<p>Habitat suitable</p>
<p><i>Conostephium wonganense</i></p>		<p>inflorescence axis 2.2–3.0 mm long; upper corolla tube dark purple; internal corolla tube densely hairy</p>		<p>yellow sandy loam in open mallee over medium density shrubs</p>	<p>P1</p>	<p>Y</p>	<p>Habitat suitable</p>

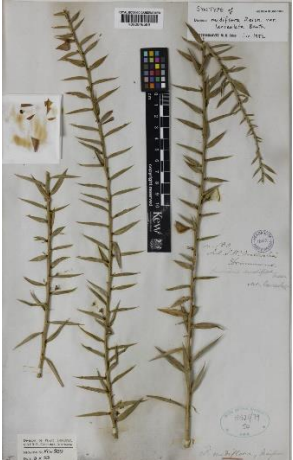
Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Conostylis caricina</i> subsp. <i>elachys</i>		Rhizomatous, tufted perennial, grass-like or herb, 0.05-0.1 m high.	Fl. cream-yellow, Jul to Aug.	Gravel, clayey loam, sand.	P1	N	Not, previously recorded at geographic location



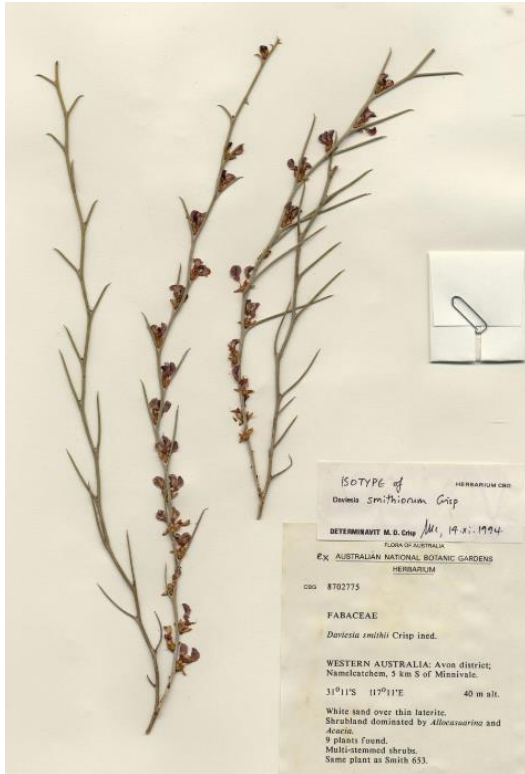
Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Conostylis wonganensis</i></p> <p>Photos: S.D. Hopper</p>	Wongan Conostylis	Rhizomatous, tufted perennial, grass-like or herb, 0.08-0.17 m high.	Fl. cream-yellow, Jul to Sep.	Yellow sand, sandy clay.	T	Y	Habitat suitable
 <p><i>Cryptandra dielsii</i></p> <p>Photos: S.J. Patrick</p>		Intricately branched, spreading shrub, 0.2-0.6 m high.	Fl. white, Jul to Sep.	Sand, often over laterite. Sandplains.	P3	Y	Habitat suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Dampiera glabrescens</i></p> <p>Photos: K. Bettink</p>		Erect perennial, herb, 0.2-0.5(-0.9) m high	Fl. purple-blue, Sep.	White or grey/yellow sand. Gravel pits, roadsides		Y	Habitat suitable
<p><i>Dasymalla axillaris</i></p> 	Native Foxglove	low, diffuse shrub that can grow to 0.3 m high.	The flowers are red to yellowish-scarlet, vivid in appearance, and the flowering period is from July to December,	Native Foxglove grows in sandy soils	T	Y	Habitat suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Daviesia euphorbioides</i></p> <p>Photos: S.D. Hopper</p>	Wongan Cactus	Shrub, 0.4-0.8 m high.	Fl. yellow & red, Jul to Sep..	Clayey sand, sandy gravel. Flats, sandplains	T	Y	Habitat suitable
<p><i>Daviesia nudiflora</i> subsp. <i>amplectens</i></p> 		Bushy shrub, 0.3-1.5 m high.	Fl. orange/yellow & red, Jul to Aug.	Clayey sand, laterite. Flats.	P1	N	Not, previously recorded at geographic location

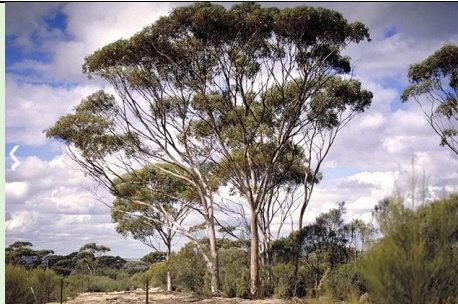
Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<p><i>Daviesia nudiflora</i> subsp. <i>drummondii</i></p> 		<p>Bushy shrub, 0.3-1.5 m high.</p>	<p>Fl. orange/yellow & red, Jul to Aug.</p>	<p>White or grey sand. Undulating low rises.</p>	<p>P3</p>	<p>N</p>	<p>Not, previously recorded at geographic location</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Daviesia smithiorum</i>		Many-stemmed shrub, to 0.5 m high.			P2	N	Not, previously recorded at geographic location
<i>Dicrastylis reticulata</i>		Woolly shrub, (0.15-0.6-1.2(-1.5) m high.	Fl. white, Sep to Dec.	Sandy soils, often over granite. Amongst granite rock, hills, flats.	P3	N	Habitat unsuitable






Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 791 360 815"><i>Eremophila resinosa</i></p> <p data-bbox="584 791 831 815">Photos: A.P. Brown & L. Sweedman</p>	Resinous Eremophila	Spreading shrub, 0.4-0.8 m high, to 1 m wide.	Fl. blue-purple-white, Apr or Oct to Nov.	Clay loam, gravelly sandy clay. Road verges.	T	Y	Habitat suitable
 <p data-bbox="152 1315 349 1339"><i>Eremophila viscida</i></p> <p data-bbox="521 1315 831 1339">Photos: A.P. Brown, B. Lullfitz & S.J. Patrick</p>	Varnish Bush	Shrub, 1.2-4 m high.	Fl. green-white-yellow, Sep to Nov.	Granitic soils, sandy loam. Stony gullies, sandplains.	T	N	Habitat unsuitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Eucalyptus caesia subsp. caesia</i>	Gungurru	(Mallee), 1.8-14 m high, bark 'minni-ritchi'	Fl. pink-red, May to Sep.	Loam. Granite outcrops.	P4	N	Habitat unsuitable
<i>Eucalyptus caesia subsp. magna</i>	Silver Princess	(Mallee), 3-10 m high, bark 'minni-ritchi', fruits campanulate, buds to 40 mm long.	Fl. pink-red, May to Sep.	Loam. Granite outcrops.	P4	N	Habitat unsuitable
<i>Eucalyptus recta</i>	Mt Yule Silver Mallet	Tree, to 15 m high, bark smooth.		Sandy laterite.	T	Y	Habitat suitable
<i>Eucalyptus subangusta subsp. virescens</i>	Narembeen Mallee	(Mallee), 2-5 m high, bark smooth.	Fl. white-cream, Apr.	Yellow sand, white clay.	P3	N	Not, previously recorded at geographic location




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Eucalyptus synandra</i> Photos: B. Lullfitz, S.J. Patrick & P. Roberts</p>	Jingymia Mallee	(Mallee), 3.5-10 m high, bark smooth.	Fl. cream & pink, Aug or Dec or Jan to Mar.	Sandy & lateritic soils.	T	N	Not, previously recorded at geographic location
<i>Fitzwillia axilliflora</i>		Ascending to erect annual, herb, 0.03-0.135 m high.	Fl. white, Sep to Nov.	Sand, clay loam. Margins of salt lakes, saline flats.		N	Habitat unsuitable
<i>Frankenia conferta</i>		Small shrub. Leaves and calyx covered with short, soft hairs. The stalkless, linear leaves are clustered at the nodes of the stem (DEC 2009).	October	Clayey soils on the edge of salt lakes (DEC 2009)	T	N	Habitat unsuitable
	Silky Frankenia						

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Frankenia glomerata</i>	Cluster Head Frankenia	Prostrate shrub.	Fl. pink-white, Nov.	White sand.	P4	Y	Habitat suitable
 <p><i>Gastrolobium appressum</i></p> <p>Photos: S.J. Patrick</p>	Scaleleaf Poison	Erect shrub, to 0.3 m high.	Fl. Yellow & orange & red & purple, Aug to Dec.	White/yellow sand with quartz gravel. Sandplains, low rises.	T	Y	Habitat suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="161 769 392 794"><i>Gastrolobium glaucum</i></p> <p data-bbox="548 769 817 794">Photos: P. Roberts & WA Herbarium</p>	Spike Poison	Low shrub, to 1.2 m high	Fl. Yellow & orange & red, Aug to Oct.	Sandy, often gravelly soils over laterite. Slopes, breakaways.	T	Y	Habitat suitable
 <p data-bbox="152 1284 414 1310"><i>Gastrolobium hamulosum</i></p> <p data-bbox="459 1284 817 1310">Photos: J.A. Cochrane, A.D. Crawford & S.D. Hopper</p>	Hookpoint Poison	Low shrub, 0.2-0.45 m high.	Fl. Yellow & orange & red & purple, Aug to Oct.	Sandy, often gravelly soils or clay. Flats, slopes, ridges.	T	N	Not, previously recorded at geographic location



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Grammosolen odgersii</i> subsp. <i>occidentalis</i>		greyish shrub to 2.5 m tall. Branches are covered in dense woolly hair that is mainly branched and non-glandular		grows in orange sandy soils and red-brown sandy and clayey loams in open mallee-heath.	T	N	Not, previously recorded at geographic location
 <p><i>Grevillea dryandroides</i> subsp. <i>hirsuta</i> Photos: A.P. Brown, S. Harper & S.J. Patrick</p>		Prostrate, vigorously suckering shrub, 0.05-0.3 m high.	Fl. red/pink-red, May or Sep to Nov.	White or yellow sand, laterite.	T	Y	Habitat may be suitable
<i>Grevillea endlicheriana</i> subsp. Wongan Hills (G.J. Keighery 15351)		No Info			P2		



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 794 517 817"><i>Grevillea haplantha</i> subsp. <i>recedens</i></p> <p data-bbox="689 799 831 817">Photos: J.M. Collins</p>		Erect or spreading shrub, 0.6-1 m high.	Fl. red, Jun to Aug.	Sand, sandy loam.	P3	Y	Habitat suitable
 <p data-bbox="152 1315 367 1337"><i>Grevillea minutiflora</i></p> <p data-bbox="712 1319 831 1337">Photo: B. Lullfitz</p>		Dense, much-branched shrub, ca 1.2 m high.	Fl. cream, Jun or Oct.	Clay, sandy loam over granite.	P1	N	Not, previously recorded at geographic location



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Grevillea pythara</i></p> <p><small>Photos: S. Patrick & L. Sweedman</small></p>		Suckering shrub, 0.06-0.3 m high.	Fl. orange & red & blue, May to Oct (possibly all year).	Sand or sandy loam with gravel.	T	Y	Habitat suitable
<i>Grevillea roycei</i>		Erect to spreading shrub, 1.2-2.1 m high.	Fl. white, Aug to Oct.	White or yellow sand.	P3	N	Not, previously recorded at geographic location
<i>Guichenotia glandulosa</i>		Lax, multi-stemmed shrub, to 0.4 m high. Littered soil.		Creek lines	P2	N	Not, previously recorded at geographic location
<i>Gyrostemon reticulatus</i>		Shrub, ca 1 m high. It has crowded, linear leaves that are 11-35mm long.		grows in dense shrubland in brown/yellow loamy sand on	T	Y	Habitat suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
				sloping topography			
<i>Haloragis platycarpa</i>		Perennial, herb, ca 0.3 m high.		flat areas in low woodland growing in brown loam soils in association with <i>Acacia acuminata</i> , <i>Grevillea levis</i> , <i>Pimelea avonensis</i> and numerous native	T	Y	Habitat suitable
<i>Hypocalymma polyandrum</i>	Cadoux Pink Myrtle	No Info					


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 791 392 815"><i>Lechenaultia galactites</i></p> <p data-bbox="712 794 831 815">Photos: R. Davis</p>		<p data-bbox="1016 512 1272 619">Erect, robust shrub (sub-shrub), to 0.6 m high.</p>	<p data-bbox="1301 512 1458 619">Fl. blue-white, Jun to Oct.</p>	<p data-bbox="1473 512 1675 619">Yellow sand, clay, gravel, laterite. Sandplains.</p>	<p data-bbox="1720 552 1756 576">P3</p>	<p data-bbox="1850 552 1872 576">Y</p>	<p data-bbox="1966 528 2069 600">Habitat suitable</p>
 <p data-bbox="152 1315 392 1339"><i>Lysiosepalum abollatum</i></p> <p data-bbox="674 1318 831 1339">Photos: J.A. Cochrane</p>		<p data-bbox="1016 1046 1272 1118">Dense, erect shrub, to 1.5 m high.</p>	<p data-bbox="1301 1031 1458 1134">Fl. pink-blue-purple, Aug to Sep.</p>	<p data-bbox="1518 1070 1621 1094">Red clay.</p>	<p data-bbox="1720 1070 1742 1094">T</p>	<p data-bbox="1850 1070 1872 1094">N</p>	<p data-bbox="1966 1046 2069 1118">Habitat unsuitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 783 376 810"><i>Melaleuca sciotostyla</i></p> <p data-bbox="703 783 831 810">Photo: P. Brown</p>	<p data-bbox="853 507 981 571">Wongan Melaleuca</p>	<p data-bbox="1014 523 1279 592">Spreading shrub, 0.6-1.5 m high.</p>	<p data-bbox="1328 544 1429 571">Fl. Aug.</p>	<p data-bbox="1485 491 1675 635">Orange clayey sand with lateritic pebbles. Scree slopes.</p>	<p data-bbox="1727 544 1749 571">T</p>	<p data-bbox="1850 544 1872 571">N</p>	<p data-bbox="1955 523 2078 592">Habitat unsuitable</p>
 <p data-bbox="152 1303 389 1331"><i>Melaleuca sclerophylla</i></p> <p data-bbox="680 1303 831 1331">Photos: J.A. Cochrane</p>		<p data-bbox="1014 1023 1279 1129">Erect-spreading to prostrate shrub, 0.15-0.9 m high.</p>	<p data-bbox="1312 1023 1451 1129">Fl. purple-pink, Jun to Sep.</p>	<p data-bbox="1485 1007 1682 1150">Gravelly sand, clayey sand. Granite outcrops, rises.</p>	<p data-bbox="1720 1066 1753 1093">P3</p>	<p data-bbox="1850 1066 1872 1093">N</p>	<p data-bbox="1955 1038 2078 1107">Habitat unsuitable</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 790 430 813"><i>Microcorys eremophiloides</i></p> <p data-bbox="571 790 831 813">Photos: J.A. Cochrane & S.D. Hopper</p>		Erect shrub, to 2 m high.	Fl. pink-red, Jul or Sep to Nov.	Shallow soils over massive laterite, granite.	T	N	Habitat requirements not suitable
 <p data-bbox="152 1300 430 1332"><i>Persoonia chapmaniana</i></p> <p data-bbox="712 1300 831 1332">Photos: A. Doley</p>		Erect, spreading shrub, 1-2 m high.	Fl. yellow, Sep to Nov.	White sandy clay, yellow sand. Vicinity of salt lakes	P3	N	Habitat unsuitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Persoonia pungens</i></p> <p>Photos: K. Atkins</p>		<p>Erect to decumbent or almost prostrate, lignotuberous shrub, 0.2-0.8 m high.</p>	<p>Fl. yellow, Sep to Dec.</p>	<p>White or yellow sand, often over laterite.</p>	<p>P3</p>	<p>N</p>	<p>Not, previously recorded at geographic location</p>
 <p><i>Phebalium drummondii</i></p> <p>Photos: S.J. Patrick</p>		<p>Upright shrub, 0.6-1.5 m high.</p>	<p>Fl. yellow, Jul to Sep.</p>	<p>Gravelly sandy or clayey soils. Flats, roadsides.</p>	<p>P3</p>	<p>N</p>	<p>Not, previously recorded at geographic location</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Philothea wonganensis</i> Photos: K. Bettink & K. Dixon</p>		Erect shrub, 0.3-1 m high.	Fl. white & pink, Aug to Oct.	Red sandy soils.	T	N	Not, previously recorded at geographic location
<i>Pityrodia scabra subsp. scabra</i>		a shrub to 1 m tall that is covered with sticky, branched hairs		native vegetation on a flat, lateritic substrate with brown to white loamy/sandy soils	T	N	Habitat unsuitable
<i>Prostanthera nanophylla</i>		Shrub, 0.1-1 m high.	Fl. blue-purple-white, Aug to Nov.	Yellow sand over laterite, rocky loam. Sandplains.	P3	N	Not, previously recorded at geographic location


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Roycea pycnophylloides</i></p> <p>Photos: P. Roberts & L. Sweedman</p>	Saltmat	Perennial, herb, forming densely branched, silvery mats to 1 m wide.	Fl. Sep. Sandy soils, clay.	Saline flats.	T	N	Habitat unsuitable
<i>Scaevola tortuosa</i>	Tortuous-stem Scaevola	Ascending perennial, herb, 0.1-0.2 m high.	Fl. blue-purple/pink, Oct.	Sandy clay. Margins of salt lakes.	P1	N	Habitat unsuitable
<i>Schoenus capillifolius</i>		Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 m high.	Fl. green, Oct to Nov.	Brown mud. Claypans.	P3	N	Habitat unsuitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Styphelia caudata</i> (syn. <i>Leucopogon</i> sp. Bungulla)							
 <p><i>Leucopogon</i> sp. Bungulla (R.D. Royce 3435) Photos: M. Hislop</p>		Erect shrub, 0.3-1 m high, to 1 m wide.	Fl. white, Apr to Jun.	White-yellow sand, brown-yellow loam over clay, laterite. Hills, plains, summits, disturbed sites	P3	Y	Habitat suitable
<i>Styphelia tamminensis</i>		No Info			P2		

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 791 360 815"><i>Synaphea constricta</i></p> <p data-bbox="703 796 831 815">Photos: R. Butcher</p>		<p data-bbox="1003 528 1272 600">Compact, tufted shrub, 0.2-0.5 m high.</p>	<p data-bbox="1312 528 1442 600">Fl. yellow, Jun to Sep.</p>	<p data-bbox="1491 512 1666 616">Sand or sandy clay-loam over laterite.</p>	<p data-bbox="1715 552 1749 576">P3</p>	<p data-bbox="1850 552 1872 576">Y</p>	<p data-bbox="1962 528 2069 600">Habitat suitable</p>
 <p data-bbox="152 1311 371 1335"><i>Thomasia tenuivestita</i></p> <p data-bbox="680 1316 831 1335">Photos: J.A. Cochrane</p>		<p data-bbox="1010 1070 1272 1094">Shrub, 0.6-2.5 m high.</p>	<p data-bbox="1312 1031 1442 1134">Fl. purple-pink, Jul to Oct.</p>	<p data-bbox="1491 1070 1666 1094">Granite, loam.</p>	<p data-bbox="1715 1070 1749 1094">P3</p>	<p data-bbox="1850 1070 1872 1094">N</p>	<p data-bbox="1962 1046 2069 1118">Habitat unsuitable</p>

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
<i>Urodon capitatus</i>		Low spreading or upright shrub, (0.12-1.2 m high, to 1 m wide.	Fl. yellow-orange-red, Sep to Oct.	Sandy gravelly soils. Plains.	P3	Y	Habitat suitable
 <p><i>Verticordia hughanii</i> Photos: F.A George, M. Hancock & S.F. Patrick</p>	Hughan's Featherflower	Low shrub, to 0.3 m high.	Fl. red, Dec.	Yellow sand. Near salt lakes.	T	N	Habitat unsuitable
<i>Verticordia mitchelliana</i> subsp. <i>mitchelliana</i>		No Info			P3		

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p><i>Verticordia staminosa</i> subsp. <i>staminosa</i> Photos: S.D. Hopper, E.A. George & B. & B. Wells</p>		Spreading shrub, 0.15-0.6 m high.	Fl. green-yellow/yellow-brown, Jul to Oct.	Soil pockets. Granite outcrops.	T	N	Habitat unsuitable
 <p><i>Verticordia venusta</i> Photos: E.A. George</p>		Erect, spreading shrub, 0.2-2 m high.	Fl. pink-purple/red-brown, Sep to Dec or Jan.	Yellow sand, sandy gravel. Sandplains.	P3	Y	Habitat suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons. code	Likelihood (Y/N)	Comment
 <p data-bbox="152 790 398 815"><i>Verticordia wonganensis</i></p> <p data-bbox="689 794 833 815">Photos: E.A. George</p>		Shrub, 0.2-0.6 m high.	Fl. pink, Nov to Dec.	Yellow or white sand.	P2	Y	Habitat suitable

Appendix 3: Conservation Codes

Western Australia

Conservation Code	Name	Description
T	Threatened	Flora or fauna that is rare or likely to become extinct, ranked according to their level of threat using IUCN Red List criteria (Schedules 1-3 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild in the immediate future
EN	Endangered	Species considered to be facing a very high risk of extinction in the wild in the near future
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild in the medium-term future
EX	Extinct Species	Species where 'there is no reasonable doubt that the last member of the species has died (Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
EW	Extinct in the Wild	Species that are known to only survive in cultivation, in captivity, or as a naturalised population well outside its past range; and it has not been recorded in its known or expected habitat at appropriate seasons anywhere in its past range, despite surveys over a timeframe appropriate to its life cycle and form
MI	Migratory Species	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth (Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice)
CD	Conservation Dependent	Species of special conservation interest (conservation dependent fauna), being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened (Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice)
OS	Specially Protected	Fauna otherwise in need of special protection to ensure their conservation (Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice)
P	Priority Species	Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or

Conservation Code	Name	Description
		flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
P1	Priority One	Poorly known species – Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either very small or on lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
2	Priority Two	Poorly known species – Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
3	Priority Three	Poorly known species – Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat
4	Priority Four	Rare or near threatened and other species in need of monitoring.

(Source: DBCA, 2020)

Commonwealth

Category	Description
Critically Endangered	Species facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Species facing a very high risk of extinction in the wild in the near future
Vulnerable	Species facing a high risk of extinction in the wild in the medium term

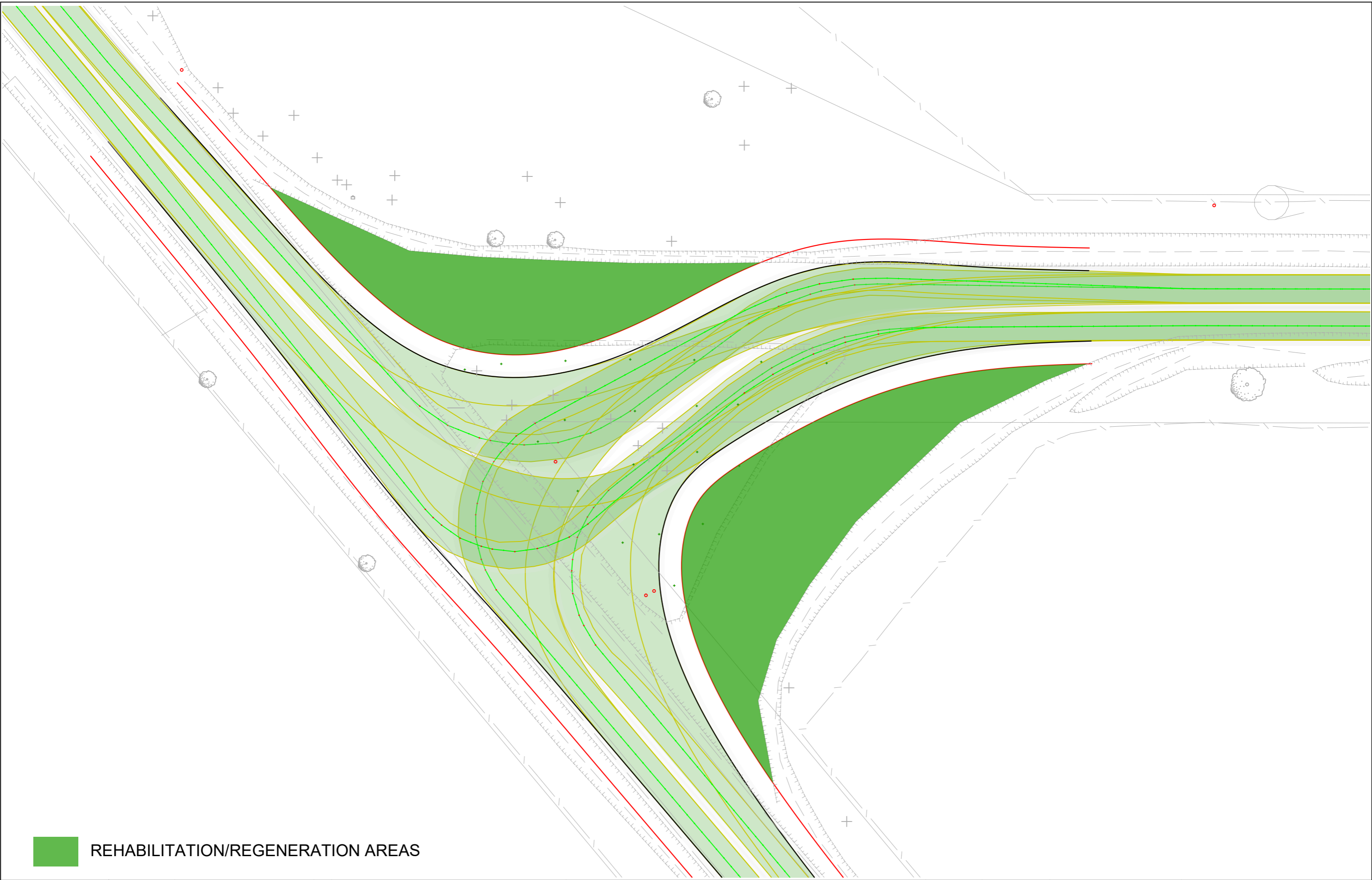
(Source: DBCA, 2020)


Appendix 4: Species List


The complete flora list for the survey area is provided in the table below with flora listed by species, and vegetation type they occurred within indicated. *Denotes introduced species.

Family	Species Name	Common Name
Poaceae	* <i>Avena barbata</i>	Bearded Oat
Brassicaceae	* <i>Brassica tournefortii</i>	Mediterranean Turnip
Poaceae	* <i>Eragrostis curvula</i>	African Lovegrass
Asteraceae	* <i>Ursinia anthemoides</i>	Ursinia
Fabaceae	<i>Acacia multispicata</i>	
Fabaceae	<i>Acacia sp.</i>	
Loranthaceae	<i>Amyema preissii</i>	Wireleaf Mistletoe
Poaceae	<i>Aristida contorta</i>	Bunched Kerosene Grass
Myrtaceae	<i>Baeckea muricata</i>	
Sapindaceae	<i>Dodonaea bursariifolia</i>	
Sapindaceae	<i>Dodonaea divaricata</i>	
Ecdeiocoleaceae	<i>Ecdeiocolea monostachya</i>	
Myrtaceae	<i>Ericomyrtus serpyllifolia</i>	
Myrtaceae	<i>Eucalyptus sp.</i>	
Proteaceae	<i>Grevillea petrophiloides</i> subsp. <i>petrophiloides</i>	
Cyperaceae	<i>Lepidosperma sp.</i>	
Chenopodiaceae	<i>Maireana trichoptera</i>	Downy Bluebush
Myrtaceae	<i>Melaleuca hamata</i>	
Poaceae	<i>Poaceae sp. (Dead)</i>	
Santalaceae	<i>Santalum acuminatum</i>	Quandong
Asteraceae	<i>Waitzia acuminata</i>	Orange Immortelle

Appendix 5: Survey Plans of the Intersection



 REHABILITATION/REGENERATION AREAS

USE OF DATA <small>THIS PLAN AND ANY ASSOCIATED DATA HAS BEEN PREPARED FOR AN INTENDED PURPOSE AND/OR PROJECT</small> <small>USE OF THIS DATA FOR PURPOSES OTHER THAN INTENDED IS AT THE RISK OF THOSE WHO MAKE COPIES OR MODIFY THIS PLAN OR ANY ASSOCIATED DATA</small>	<table border="1"> <tr> <th>DRAWING No.</th> <th>REFERENCE DRAWINGS TITLE</th> <th>REV</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	DRAWING No.	REFERENCE DRAWINGS TITLE	REV													<p>ZONE 50 ENGINEERING SURVEYS</p> <p>CIVIL-STRUCTURAL-MECHANICAL-RAIL</p> <p>Phone: 0419 903 702 Email: office@zone50.com.au Web: www.zone50.com.au Post: PO Box 3086 Belmont WA 6104</p> 	<p>PROJECT TITLE</p> <p>DOWERIN KALANIE RD - BAILEY RD</p>	<table border="1"> <tr> <th colspan="4">QUALITY RECORD</th> </tr> <tr> <th>REVIEW</th> <th>NAME</th> <th>SIGNATURE</th> <th>DATE</th> </tr> <tr> <td>SURVEYED</td> <td>B/NT</td> <td></td> <td>22/08/2023</td> </tr> <tr> <td>DRAWN</td> <td>NT/TF</td> <td></td> <td>17/09/2023</td> </tr> <tr> <td>APPROVED</td> <td></td> <td></td> <td></td> </tr> </table>				QUALITY RECORD				REVIEW	NAME	SIGNATURE	DATE	SURVEYED	B/NT		22/08/2023	DRAWN	NT/TF		17/09/2023	APPROVED				<p>SCALE</p> <p>1 : 300</p>	<p>SURVEY METHOD</p> <p>TS/RTK</p>	<p>CLIENT REF</p>	<p>CLIENT NAME</p> <p>SHIRE OF DOWERIN</p>	<p>PLAN TITLE</p> <p>INTERSECTION DESIGN CONCEPT PLAN ONLY</p> <p>Sheet 1 of 1</p>	<p>PLAN No.</p> <p>1072-5-B-001</p>
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