MetCONNX

RSR Tower

Detailed and Targeted Flora Survey

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Acknowledgement of Country

Ngala kaaditj Noongar moort keyen kaadak nidja boodja.
Natural Area acknowledges the Traditional Owners of the lands on which we operate, and recognises their continuing connection to lands, waters and communities.

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Environmental management system registered to ISO 14001:2015
Quality management system registered to ISO 9001:2015
Occupational health and safety management system registered to ISO 45001:2018

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Draft	Feb 2025	New Document	JW	ZS/LI	Draft for client comment
V1	Mar 2025	Changes to address comments	JW	ZS	Released

Executive Summary

Natural Area Consulting Management Services (Natural Area) was commissioned by MetCONNX to undertake additional flora surveys within a proposed Radio Systems Replacement (RSR) tower site. The additional flora surveys included a detailed and targeted flora survey. Results from this survey will provide site-specific information to supplement previous environmental surveys of the broader area conducted by Focused Vision Consulting (FVC) (FVC, 2022). This survey will identify conservation significant values within the proposed RSR tower site to inform land use planning and provide supporting documentation for environmental assessment and approval.

The flora survey determined the following:

- A total of 59 flora species comprised of 21 (36 %) native and 38 (64 %) introduced species.
- No threatened flora, as listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) or *Biodiversity Conservation Act 2016* (WA) (BC Act) were recorded on site.
- One declared pest (DP), One- leaf Cape Tulip (**Moraea flaccida*) was present across the site in low densities (<5 %).
- One vegetation type, *Corymbia calophylla* woodland across the site.
- Vegetation condition assessed to be in a degraded (47.6 %) or completely degraded (52.4 %).
- The survey site is not considered an extant occurrence of a threatened or priority ecological community (TEC/PEC) due to the current degraded to completely degraded vegetation condition.

Contents

1.0 Introduction

MetCONNX has commissioned Natural Area Consulting Management Services (Natural Area) to undertake additional flora surveys within a proposed Radio Systems Replacement (RSR) tower site. Along with the Byford Rail Extension (BRE) project, the proposed upgrades to the existing rail network's radio system will ensure a more efficient, reliable and railway network. Focused Vision Consulting (FVC) has previously completed a detailed flora and vegetation assessment of the broader area (FVC,2022). The results from this survey provides supplementary, site-specific information for the proposed RSR tower site.

1.1 Location

The site resides in the suburb of Cardup, within the Shire of Serpentine-Jarrahdale, 50 km south-east of the Perth Central Business District. The survey extent spans approximately 0.37 ha and is located between Soldiers Road and the existing South-Western Railway corridor (Figure 1).

1.2 Scope

The main objective of the flora survey is to provide additional information on the environment values of the proposed site to inform land use planning and provide supporting documentation for environmental assessment and approval. Scope of works included:

- Desktop assessment of previous environmental surveys and relevant environmental databases.
- Targeted flora survey to identify and record populations and presence of conservation significant flora species.
- Detailed flora survey to identify vegetation type, condition and compiling a comprehensive flora species list of both native and non-native flora species.
- Determination of the presence of any threatened or priority ecological communities (TEC/PEC).

Figure 1:
Site Location

Cardup, Western Australia

Legend

Site Location

Client:	MetCONNX
Date:	04/02/2025
Created by:	J. Wei
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 1000

0 15 30 m

N

1.3 Legislative Context

State and federal environment-related laws impact how environmental values are governed in Western Australia. The following legislation and policies are relevant to this report.

***Biosecurity and Agriculture Management Act 2007* (WA)**

The *Biosecurity and Agriculture Management Act 2007* (WA) (BAM Act) regulates the framework for plant and animal pest and disease biosecurity in Western Australia. The framework provides for the control of declared flora and fauna species (declared organisms) that are known to be a significant environmental threat and the management, control and prevention of these declared plants and animals.

***Biodiversity Conservation Act 2016* (WA)**

The *Biodiversity Conservation Act 2016* (WA) (BC Act) aims to protect and conserve biodiversity as well as to promote the ecologically sustainable use of biodiversity components in the State. The BC Act provides the statute relating to conservation and legal protection of flora, fauna, and ecological communities. The BC Act follows the principles of ecologically sustainable development, detailing that decision-making processes should effectively integrate long-term and short-term economic, environmental, social, and equity considerations.

***Environmental Protection Act 1986* (WA)**

The *Environmental Protection Act 1986* (WA) (EP Act) provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment connected with the foregoing. The Environmental Protection Authority (EPA) is established under this act and provides a structured policy framework that is consistent with the EP Act. The EPA produces the guidelines and procedures associated with conducting environmental assessments in line with the EP Act.

***Environment Protection and Biodiversity Conservation Act 1999* (Cth)**

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) serves to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places. The primary objective of the EPBC Act is to promote the conservation of biodiversity and the sustainable use of natural resources while allowing for ecologically sustainable development. The EPBC Act allows for the creation of conservation agreements between the Australian government and individuals, communities, or organisations to support the conservation of biodiversity.

2.0 Site Characteristics

2.1 Regional Context

The site is located within the Swan Coastal Plain (SWA02) Interim Biogeographic Regionalisation for Australia (IBRA) subregion (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2024a). This region is a low-lying coastal plain with woodlands dominated by *Banksia* or Tuart on sandy soils, *Casuarina obesa* on outwash plains, and paperback in swamp areas (Mitchell *et al*., 2002).

2.2 Climate

The survey site has a Mediterranean climate, characterised by dry, hot summers and cool, wet winters. According to the Bureau of Meteorology (BoM) (2025); Jandakot Aero WA, site number 009172, 2025, the region has an average:

- Rainfall of 807.5mm annually, with rain falling predominantly between May and August, peaking in July.
- Maximum temperature ranging from 18.1 °C in winter to 31.7 °C in summer, with a maximum recorded temperature of 46.6 °C.
- Minimum temperatures ranging from 7.2 °C in winter to 17.2 °C in summer, with a minimum recorded temperature of -3.4 °C.

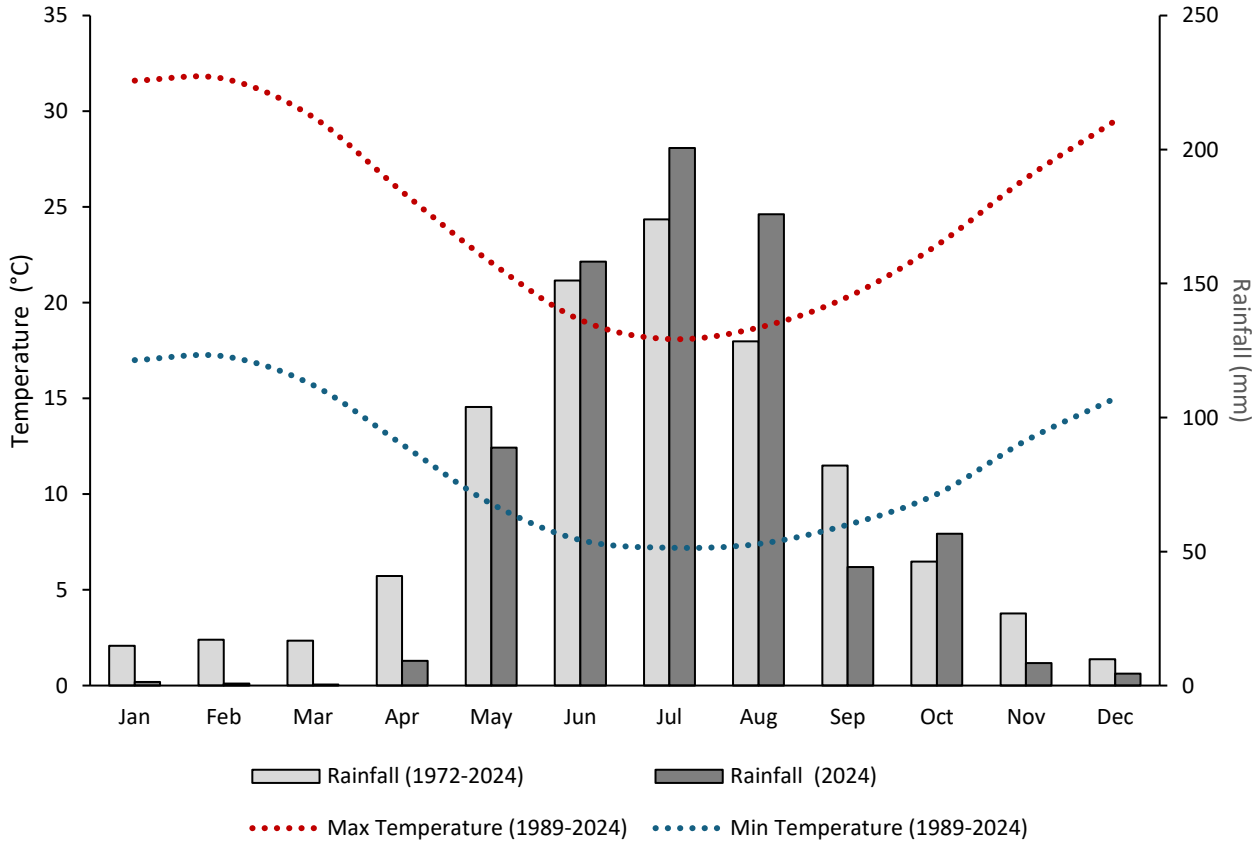

Figure 2: Temperature and rainfall data for the Jandakot Aero WA, site number 009172. Source: BoM, 2025.

2.3 Topography and Soils

One soil type was identified to occur with the site, namely the Forrestfield F2b phase (Department of Primary Industries and Regional Development (DPIRD), 2022). This soil type typically consists of well drained, gravelly acidic yellow duplex soils of varying depths, occurring on low slopes and foot slopes. The site is flat and sits at 54 m Australian Height Datum (AHD) (DPIRD, 2019).

2.4 Vegetation Complex

One vegetation complex exists within the site boundary, the Guildford Complex. It is described by Heddle *et al.* (1980) by a mixture of Marri-Wandoo-Jarrah woodland with minor components including the fringing woodland of *Eucalyptus rudis* and *Melaleuca rhaphiophylla* along the streams with the rare occurrence of *Eucalyptus lane-poolei*. The other remnant plant species in the complex includes *Banksia grandis*, *Kingia australis*, *Xanthorrhoea preissii* and species of *Hardenbergia* spp. and *Hibbertia* spp. The pre-European extent of this vegetation complex remaining is:

- 5.09 % within the Swan Coastal Plain
- 4.25 % within the Shire of Serpentine-Jarrahdale (Government of Western Australia, 2019).

2.5 Geomorphic Wetlands

The site resides within a multiple use flat palusplain (Armadale Palusplain, UFI 15383). Several other geomorphic wetlands are also recorded in close proximity (Table 1, Figure 3).

Table 1: Geomorphic wetlands

Wetland Name	Wetland Classification	Management Category	Location
Armadale Palusplain UFI 15383	Palusplain	Multiple Use	Site resides within this geomorphic wetland
Unknown UFI 15382	Palusplain	Multiple Use	Resides immediately east of site
Byford Rail Reserve UFI 14505	Palusplain	Conservation	Occurs within 100 m south of site
Cardup Brook UFI 14542	Palusplain	Resource Enhancement	Occurs 200 m northeast of the site
Unknown UFI 15384	Creek	Resource Enhancement	Occurs 200 m northwest of the site
Unknown UFI 13010	Palusplain	Conservation	Occurs 300 m north of the site

2.6 Environmental Sensitive Area

The survey area is located within a listed as a Bush Forever site (site number 350; Serpentine Rail/Road Reserves and Adjacent Bushland) and is therefore classified as an Environmentally Sensitive Area (ESA) (Department of Water Environment and Regulations (DWER), 2021)

Figure 3:
Geomorphic Wetlands

Cardup, Western Australia

Legend

- Conservation
- Multiple Use
- Resource Enhancement
- Site Location

Client:	MetCONNX
Date:	12/02/2025
Created by:	J. Wei
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4000

0 50 100 m

N

3.0 Methodology

3.1 Desktop and Literature Review

The desktop survey included reviewing online databases and previous environmental surveys 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 and reports were accessed to obtain relevant information:

- NatureMap (Department of Biodiversity, Conservation and Attractions (DBCA), 2024a)
- Protected Matters Search Tool (DCCEEW), 2024b) (Appendix 2)
- FloraBase (WA Herbarium, 1998-)
- Threatened and priority flora database search (DBCA, 2024b)
- Threatened and priority ecological community database search (DBCA, 2024c).

Conservation code definitions for the State and Commonwealth are provided in Appendix 2.

3.2 On-ground Flora Survey

3.2.1 Targeted Flora Survey

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

Natural Area undertook the survey on 15 November 2024, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the entirety of the site and conducting a search for conservation significant flora species with the potential to occur in the area.
- Marking locations of any conservation significant flora identified and determining population size and extent.
- Recording vegetation type including dominant over, middle and understorey species to describe vegetation type in line with the National Vegetation Information System (NVIS) Level V – Association (Executive Steering Committee for Australian Vegetation Information (ESCAVI), 2003).
- Condition using the scale attributed to Keighery (Table 2) (EPA, 2016).
- The use of GPS to map significant species and boundaries of differing vegetation type and condition.
- Recording evidence of disturbance, such as fire.

3.2.2 Detailed 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 undertook the survey on 15 November 2024, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Setting out a total of three 100 m^2 quadrats comprised of two 20 x 5m and one 10 x 10 m quadrat across the one vegetation type present.
- Photographing each quadrat in the north-west corner and recording GPS coordinates using GDA2020 Zone 50 datum.
- Recording landscape characteristics including soil types/colour, aspect, slope, surface rock, topography and drainage using Natural Area's modified recording sheets based on the NAIA templates developed for the Perth Biodiversity Project.
- Determining leaf litter depth, percentage cover, and percentage of bare ground.
- Recording percentage cover, height, number alive/dead stems and life form for each flora species in the quadrats.
- 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 to describe vegetation type in line with the National Vegetation Information System (NVIS) Level V – Association (Executive Steering Committee for Australian Vegetation Information (ESCAVI), 2003).
- Vegetation condition was assessed using the rating scale attributed to Keighery (Table 2) (EPA, 2016).
- The use of GPS to map significant species and boundaries of differing vegetation type and condition
- Recording evidence of disturbance, such as fire.

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.

Category		Description
		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 Limitations

The limitations associated with the flora survey undertaken are outlined in Table 3 below.

Table 3: Flora survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	None	Local and regional context information was readily available.
Competency/ experience of team	None	Survey activities were undertaken by experienced environmental scientists who have extensive experience undertaking flora surveys within the Swan Coastal Plain bioregion.
Proportion of flora recorded/ collected, any identification issues	None	A total of 59 flora species (taxa) were recorded across 17 families, comprising of 21 native and 38 introduced (weeds) species. All species were identified to species level.
Survey effort and extent	None	The entirety of the site (0.37 ha) was surveyed in one day.
Access restrictions	None	Site was accessible with no access restrictions.
Survey timing	Minor	Detailed and targeted survey was undertaken in late spring (November 2024). While this is still within the optimal season for flora surveys within the Swan Coastal Plain, early spring flowering annuals may have undergone seasonal senescence and may not present during the survey. A two-phase, detailed flora survey was carried out by FVC in 2021 (FVC, 2022). Survey areas included the current RSR tower site. By interrogating and including the results collected by FVC, the area has been sufficiently surveyed to account for seasonal and annual variation.
Disturbances	None	No recent disturbances which may have had an impact on survey results (e.g. fire, recent clearing or floods) were identified during the survey.

4.0 Flora Survey Results

4.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 55 conservation significant species to occur within 10 km of the survey area (Table 4). NatureMap indicated 38 conservation significant flora species listed under the BC Act or by the Western Australian Herbarium (1998-), as potentially occurring within 10 km of the site (DBCA, 2024a). A review of the Protected Matters Search Tool (PMST) (DCCEEW, 2024) indicated 20 significant flora species listed under the EPBC Act as potentially occurring within a 10 km radius of the site (Appendix 2). A review of the DBCA (2024b) threatened and priority flora database indicated 45 threatened or priority species have been recorded within 10 km of the site.

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 12 (highlighted green) of these species (Table 4). Conservation code descriptions are provided in Appendix 2.

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

Species Name	Cons Code (WA)	Cons Code (Cth)	NatureMap	PMST	DBCA
Acacia horridula	P3		X		X
Acacia lasiocarpa var. bracteolata long peduncle variant	P1		X		X
Acacia oncinophylla subsp. *oncinophylla*	P3		X		X
Acacia oncinophylla subsp. *patulifolia*	P4				X
Andersonia gracilis	T/EN	EN		X	
Angianthus drummondii	P3		X		X
Anthocercis gracilis	T/VU	VU		X	
Aponogeton hexatepalus	P4		X		X
Babingtonia urbana	P3		X		X
Banksia kippistiana var. *paenepeccata*	P3				X
Banksia mimica	T/VU	EN		X	
Caladenia huegelii	T/CR	EN	X	X	X
Calectasia cyanea	CR		X		
Calectasia grandiflora	P2		X		X
Carex tereticaulis	P2		X		X
Dillwynia dillwynioides	P2		X		X
Diuris drummondii	T/EN	VU		X	
Diuris micrantha	T/VU	VU		X	

Species Name	Cons Code (WA)	Cons Code (Cth)	NatureMap	PMST	DBCA
Diuris purdiei	T/EN	EN	X	X	X
Drakaea elastica	T/CR	EN	X	X	X
Drosera occidentalis	P4		X		X
Drosera oreopodion	T/CR		X		X
Eleocharis keigheryi	T/VU	VU		X	
Eryngium pinnatifidum subsp. *palustre*	P3		X		X
Eucalyptus rudis subsp. *cratyantha*	P4		X		X
Eucalyptus x balanites	T/EN	EN		X	X
Grevillea crowleyae	P2		X		
Grevillea curviloba	T/CR	EN		X	X
Isopogon autumnalis	P3				X
Jacksonia gracillima	P3		X		X
Johnsonia pubescens subsp. *cygnorum*	P2		X		X
Lasiopetalum glutinosum subsp. *glutinosum*	P3				X
Lasiopetalum pterocarpum	T/CR	EN	X	X	X
Lepidosperma rostratum	T/EN	EN	X	X	X
Leucopogon sp. Busselton	P2				X
Levenhookia pulcherrima	P3		X		
Millotia tenuifolia var. *laevis*	P2		X		X
Morelotia australiensis	T/VU	VU	X	X	X
Parsonsia diaphanophleba	P4		X		X
Pithocarpa corymbulosa	P3		X		X
Ptilotus sericostachyus subsp. *roseus*	Ex				X
Schoenus capillifolius	P3		X		X
Schoenus pennisetis	P3		X		X
Schoenus sp. Waroona	P3		X		X
Senecio leucoglossus	P4		X		X
Stylidium aceratum	P3		X		X
Synaphea odocoileops	P1		X		X
Synaphea sp. Fairbridge Farm	T/CR	CR	X	X	X
Synaphea sp. Pinjarra Plain	T/EN	EN	X	X	X

Species Name	Cons Code (WA)	Cons Code (Cth)	NatureMap	PMST	DBCA
Synaphea sp. Serpentine	T/CR	CR	X	X	X
Thelymitra magnifica	T/CR				X
Thelymitra stellata	T/EN	EN		X	X
Verticordia lindleyi subsp*. lindleyi*	P4		X		X
Verticordia plumosa var*. ananeotes*	T/CR	EN	X	X	X

4.1.1 Threatened and Priority Ecological Communities

A review of the PMST report and DBCA database for ecological communities identified several TECs and PECs that could potentially occur within 10 km of the site. They include 7 TECs listed under the EPBC Act, and 14 TEC/PECs listed under the BC Act. Ecological community names and their corresponding State and Commonwealth conservation status are outlined in Table 5.

Table 5: Potential TEC/PECs within 10 km of the site

Community Name		Conservation Code	
EPBC Act	**BC Act**	**EPBC Act**	**BC Act**
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	*Corymbia calophylla -Kingia Australia* woodlands on heavy soils (FCT 3a as originally described in Gibson *et al.* 1994)	EN	CR
-	*Corymbia calophylla- Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (FCT 3b as originally described in Gibson *et al.* 1994)	-	EN
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	*Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (FCT3c as originally described in Gibson *et al.* 1994)	EN	EN
Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community	Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain	CR	P3
Banksia Woodlands of the Swan Coastal Plain ecological community	*Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (FCT 20b as originally described in Gibson *et al.* 1994)	EN	CR
	Banksia ilicifolia woodlands (FCT 22 as originally described in Gibson *et al.* 1994)		P3

Community Name		Conservation Code	
EPBC Act	**BC Act**	**EPBC Act**	**BC Act**
	Banksia Woodlands of the Swan Coastal Plain ecological community		P3
	Low lying *Banksia attenuata* woodlands or shrublands (FCT 21c as originally described in Gibson *et al.* 1994)		P3
Empodisma peatlands of southwestern Australia	-	EN	-
Clay Pans of the Swan Coastal Plain	Herb rich saline shrublands in clay pans (FCT 7 as originally described in Gibson *et al.* 1994)	CR	EN
	Dense shrublands on clay flats (FCT 9 as originally described in Gibson *et al.* 1994)		EN
	Herb rich shrublands in clay pans (FCT 8 as originally described in *G*ibson *et al.* 1994)		EN
	Shrublands on dry clay flats (FCT 10a as originally described in Gibson *et al.* 1994)		EN
-	*Casuarina obesa* Association	-	P1
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	EN	CR

4.2 Flora Survey Results

4.2.1 Flora

A total of 59 flora species (taxa) were recorded from 17 families during the field survey, comprising of 21 (36 %) native species and 38 (64 %) introduced weeds. Examples of native flora species are shown in Figure 4 and weed species in Figure 5. A complete flora species list is provided in Appendix 4.

No conservation significant flora listed under the EPBC Act or the BC Act were identified on site. One DP was identified within the survey site, namely the One-leaf Cape Tulip (**Moraea flaccida*). This DP was found in low densities (<5 %) and spread across the site. DPs are listed on the Western Australian Organism List (WAOL) under the BAM Act (DPIRD, 2025a). This classification requires the landowner/land manager to control the population to limit damage as a result of the presence of these species (DPIRD, 2025b).

Corymbia calophylla (Marri)

Mesomelaena tetragona (Semaphore Sedge)

Banksia dallanneyi (Couch Honeypot)

Kingia australis (Kingia)

Figure 4: Examples of native flora species recorded.

Bugle Lily (**Watsonia meriana* var. *bulbillifera*)

One-leaf Cape Tulip (**Moraea flaccida*; DP)

Figure 5: Examples of introduced flora species recorded.

4.2.2 Vegetation Types

One vegetation type, *Corymbia calophylla* open woodland was recorded within the site. This vegetation type consists of *Corymbia calophylla* open woodland over *Xanthorrhoea preissii* shrubland over closed introduced grassland. Introduced grasses including the African Lovegrass (**Eragrostis curvula*) and Perennial Veldt Grass (**Ehrharta calycina*) dominate the understorey. Vegetation type is shown in Figure 6.

4.2.3 Vegetation Condition

Vegetation condition on site ranged from degraded to completely degraded (Table 6). The majority of the site has lost its basic vegetation structure with the understorey dominated by aggressive weed species (Figure 6 and 7).

Table 6: Vegetation condition within RSR tower site

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	0	0	0	0	0.176	0.194	0.37
Area (%)	0	0	0	0	47.6	52.4	100

Figure 6: *Corymbia calophylla* open woodland.

Figure 7:
Vegetation Condition

Cardup, Western Australia

Legend

- Degraded
- Completely Degraded
- Cleared
- Site Location

Client:	MetCONNX
Date:	13/02/2025
Created by:	J. Wei
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 1000

0 15 30 m

N

4.2.4 Threatened and Priority Communities

The desktop assessment identified 7 TECs listed under the EPBC Act, and 14 TEC/PECs listed under the BC Act to potentially occur within the survey site. However, when considering the locality, soil type, landform, species composition and general site conditions, possible alignment with three *Corymbia calophylla* (Marri) TECs on heavy soils is more likely. The three Marri TECs and their corresponding conservation listing are presented in Table 7 below.

Table 7: TECs likely to occur on site

Community Name		Conservation Code	
EPBC Act	**BC Act**	**EPBC Act**	**BC Act**
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	*Corymbia calophylla -Kingia Australia* woodlands on heavy soils (FCT 3a as originally described in Gibson *et al.* 1994)	EN	CR
-	*Corymbia calophylla- Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (FCT 3b as originally described in Gibson *et al.* 1994)	-	EN
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	*Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (FCT3c as originally described in Gibson *et al.* 1994)	EN	EN

Due to the degraded (47.6 %) and completely degraded (52.4 %) vegetation condition of the RSR tower site, quadrat analysis against Gibson *et al*. 1994 and Keighery *et al*. 2012 is not suitable even with the exclusion of weed species. The loss of basic vegetation strata and low native species richness, as recorded on site, provides inadequate data and skew FCT assignments, resulting in inconclusive results. In order to determine presence of the potential TECs, inference to soil, landform, general species composition and other field observations were utilised.

All three TECs can be found within the Swan Coastal Plain and have been recorded on the Forrestfield complex within the Ridge Hill Shelf landform. As such, the RSR tower site meets the general site locality and habitat condition for the three Marri TECs to be present. Both DBCA ecological community database (DBCA, 2024c) and FVC (2022) indicates the presence of FCT 3b on site. FVC (2022), through floristic analysis, determined greatest similarity for FCT 3b. Sample quadrats from FVC were established in vegetation assessed to be in good or better condition, further south of the RSR tower site. Species recorded within the RSR tower site were compared against the suite of taxa associated with potential TECs to determine proportion of species overlap and alignment with the FCTs. Of the 21 native species recorded within the RSR tower site, there is a low proportion of overlap with species commonly in any of the three FCTs (3a, 3b, 3c) (Appendix 5). A community is required to be in a good or better condition to be considered as part of a TEC (DBCA, 2024d), as there are no areas of vegetation in good or better condition within the RSR tower site, it is not considered to be an extant occurrence of the TEC.

5.0 Implications of Results

5.1 Flora and Vegetation

A total of 59 flora species were recorded during the field survey, comprising of a higher proportion of introduced weed species (64 %). Due to the presence of aggressive weeds in high densities, including the presence of one DP; One-leaf Cape Tulip (**Moraea flaccida*), native ground storey species were impacted and not well represented across site. Vegetation has been subjected to historical and recent disturbance from adjacent land use, likely contributing to its current degraded to completely degraded condition.

5.2 Conservation Significant Flora

No conservation significant flora listed under the EPBC Act or the BC Act were recorded on site.

5.3 Threatened Ecological Communities

No TEC listed under the EPBC Act is likely to occur on site. Desktop assessment and previous environmental surveys indicates a high likelihood for FCT 3b (Endangered under BC Act) to occur on site. However, it is not considered an extant TEC occurrence due to the current degraded to completely degraded vegetation condition and does not meet the minimum good condition criteria. Basic vegetation structure has been lost with the understorey dominated by aggressive grass weeds. Native species richness is low (21 species) with evidence of clearing and anthropogenic disturbance within or directly adjacent to the site.

6.0 References

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Appendix 1: PMST Report 10 km

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: 16-May-2024

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	2
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	40
Listed Migratory Species:	10

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:	7
Commonwealth Heritage Places:	None
Listed Marine Species:	15
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:	15
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	35
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Forrestdale and thomsons lakes	Within 10km of Ramsar site	In buffer area only
Peel-yalgorup system	20 - 30km upstream from Ramsar site	In feature area

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
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In buffer area only
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Empodisma peatlands of southwestern Australia	Endangered	Community may occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
INSECT			
Leioproctus douglasiellus			
a short-tongued bee [66756]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Neopasiphae simplicior			
A native bee [66821]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Myrmecobius fasciatus			
Numbat [294]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Pseudocheirus occidentalis			
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Setonix brachyurus			
Quokka [229]	Vulnerable	Species or species habitat known to occur within area	In feature area
OTHER			
Westralunio carteri			
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
PLANT			
Andersonia gracilis			
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
Anthocercis gracilis			
Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat known to occur within area	In buffer area only
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat known to occur within area	In feature area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area	In buffer area only
Lasiopetalum pterocarpum Wing-fruited Lasiopetalum [64922]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat known to occur within area	In feature area
Morelotia australiensis listed as Tetraria australiensis Southern Tetraria [92784]	Vulnerable	Species or species habitat known to occur within area	In feature area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Synaphea sp. Pinjarra Plain (A.S.George 17182) [86878]	Endangered	Species or species habitat known to occur within area	In feature area
Synaphea sp. Serpentine (G.R.Brand 103) [86879]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat known to occur within area	In feature area
Verticordia plumosa var. ananeotes Tufted Plumed Featherflower [23871]	Endangered	Species or species habitat may occur within area	In buffer area only

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
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii			
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to 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 - [51919]	WA	In buffer area only
Commonwealth Land - [50876]	WA	In buffer area only
Commonwealth Land - [50854]	WA	In buffer area only
Commonwealth Land - [51524]	WA	In buffer area only
Commonwealth Land - [51976]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51517]	WA	In buffer area only
Commonwealth Land - [51380]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to 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 likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to 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
Banksia	Nature Reserve	WA	In buffer area only
Cardup	Nature Reserve	WA	In buffer area only
Gooralong	Conservation Park	WA	In buffer area only
Karnet	Nature Reserve	WA	In buffer area only
Lambkin	Nature Reserve	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Modong	Nature Reserve	WA	In buffer area only
NTWA Bushland covenant (0011)	Conservation Covenant	WA	In buffer area only
NTWA Bushland covenant (0076)	Conservation Covenant	WA	In buffer area only
Serpentine	National Park	WA	In buffer area only
Unnamed WA42044	Nature Reserve	WA	In buffer area only
Unnamed WA46587	Nature Reserve	WA	In buffer area only
Unnamed WA46818	Nature Reserve	WA	In feature area
Unnamed WA51784	Nature Reserve	WA	In buffer area only
Unnamed WA51963	Conservation Park	WA	In buffer area only
Watkins Road	Nature Reserve	WA	In buffer area only

Regional Forest Agreements

[Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Huntly Bauxite Mine Transition	2022/09204		Assessment	In buffer area only
Keirnan Park Recreation Precinct	2023/09573		Referral Decision	In buffer area only
Orton Road Upgrade Project	2023/09680		Completed	In buffer area only
Controlled action				
Alcoa Pinjarra Refinery Production Increase and Bauxite Export	2020/8743	Controlled Action	Completed	In buffer area only
Byford Rail Extension, Byford, WA	2020/8764	Controlled Action	Post-Approval	In buffer area only
Byford Whitby Quarry, portion of Mining Lease M701240	2021/9045	Controlled Action	Further Information Request	In buffer area only
Clearing, mining and rehabilitation Scrivener Road	2015/7577	Controlled Action	Further Information	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Gravel reserves			Request	
Construction of Road and Extension of Utilities on Turner Street, Serpentine	2008/4670	Controlled Action	Post-Approval	In buffer area only
Extraction of sand from Lot 6 Banksia Road & lots 300 & 301 Boomerang Road, WA	2010/5622	Controlled Action	Post-Approval	In buffer area only
Tonkin Highway Extension ??? Thomas Road to South Western Highway	2019/8608	Controlled Action	Post-Approval	In feature area
Not controlled action				
'Looping 10' gas transmission pipeline from Kwinana to Hopelands	2005/2212	Not Controlled Action	Completed	In buffer area only
Abernethy Road upgrade (Kardan, Tourmaline & Soldiers) Byford, WA	2015/7441	Not Controlled Action	Completed	In buffer area only
BaptistCare Byford Aged Care Facility	2021/9111	Not Controlled Action	Completed	In buffer area only
Bristile Holdings Pty Ltd, Cardup Brickworks, South of Byford	2020/8834	Not Controlled Action	Completed	In buffer area only
Construction of international rowing course and commercial/residential areas	2003/1034	Not Controlled Action	Completed	In buffer area only
Development of a wholesale nursery	2012/6622	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In buffer area only
Gold Fusion Pty Ltd /Residential development/South Western Highway 40km southeast of Perth /WA/Devel	2014/7185	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Oakford Village development, Shire of Serpentine-Jarrahdale, WA	2018/8157	Not Controlled Action	Completed	In buffer area only
Residential Development, Hilbert	2020/8675	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Residential Development, Lots 3, 5 and 900 Taylor Rd Mundijong, WA	2019/8457	Not Controlled Action	Completed	In feature area
Residential development at Lot 54 Cockram Street and Lot 119 Sparkman Road, Mundijong	2020/8618	Not Controlled Action	Completed	In buffer area only
Residential development at Taylor Road and Adams Street, Mundijong, WA	2020/8780	Not Controlled Action	Completed	In buffer area only
Residential Development Various Lots Doley Road, Orton Road and Lawrence Way, Beenyup Grove Byford,	2020/8779	Not Controlled Action	Completed	In buffer area only
Sand quarry, Lot 102 King Road, Oldbury, WA	2015/7439	Not Controlled Action	Completed	In buffer area only
Serpentine Sports Reserve, Protection of Dieback Free Area	2008/4337	Not Controlled Action	Completed	In buffer area only
Tonkin Highway Extension	2001/470	Not Controlled Action	Completed	In buffer area only
Undertake a Controlled Fuel Reduction Burn	2008/4262	Not Controlled Action	Completed	In buffer area only
Urban development of Lots 9049 and 9063, The Glades, Byford, WA	2015/7607	Not Controlled Action	Completed	In buffer area only
Wungong Transfer Mains Project	2007/3532	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Residential Subdivision on Abernethy Road, Byford	2009/4767	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Residential Development Doley Road, Orton Road and Lawrence Way	2020/8679	Referral Decision	Completed	In buffer area only

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
-Western Australian Herbarium
-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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Appendix 2: 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.
P2	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.
P3	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
P4	Priority Four	Rare or near threatened and other species in need of monitoring.

Source: DBCA, 2023.

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, 2023.

Appendix 3: Quadrat Data

Quadrat No.:	Q1
Date:	15/11/2024
Personnel:	JW, TC
Northing:	6432187
Easting:	405897
Topography:	Lower slope
Aspect:	West
Slope:	1-3 %
Soil:	Sandy loam
Colour:	Brown
Gravel:	0 %
Rock:	0 %
Leaf Litter:	2 %
Bare Ground:	1 %
Drainage:	Well
Condition:	Degraded

Notes: *Corymbia calophylla* open woodland (5 x 20 m due to linear corridor)

Native Species	Cover (%)	Height (m)	Weed Species	Cover (%)	Height (m)
Corymbia calophylla	60.00	7.00	**Acacia longifolia*	0.10	0.30
Gompholobium marginatum	0.10	0.10	**Albuca flaccida*	0.20	0.30
Melaleuca lateritia	0.20	0.30	**Babiana angustifolia*	5.00	0.20
Xanthorrhoea brunonis	0.10	0.30	**Briza maxima*	2.00	2.00
Xanthorrhoea preissii	4.00	1.50	**Chamaecytisus palmensis*	1.50	1.50
Corymbia calophylla	60.00	7.00	**Ehrharta calycina*	4.00	0.60
			**Eragrostis curvula*	40.00	1.00
			**Freesia leichtlinii* subsp. *alba × leichtlinii subsp. leichtlinii*	1.00	0.20
			**Ixia fuscocitrina*	30.00	0.20
			**Lotus subbiflorus*	0.20	0.10
			**Lysimachia arvensis*	0.10	0.10
			**Romulea rosea*	1.00	0.10

Native Species	Cover (%)	Height (m)	Weed Species	Cover (%)	Height (m)
			**Trifolium campestre*	0.20	0.10
			**Vulpia myuros*	0. 5	0.20

Note: *denotes introduced species.

Quadrat No.:	Q2
Date:	15/11/2024
Personnel:	JW, TC
Northing:	6432118
Easting:	405889
Topography:	Upper slope
Aspect:	Southeast
Slope:	1-3 %
Soil:	Sandy loam
Colour:	Brown
Gravel:	0 %
Rock:	0 %
Leaf Litter:	5 %
Bare Ground:	1.5 %
Drainage:	Well
Condition:	Degraded

Notes: *Corymbia calophylla* open woodland

Native Species	Cover (%)	Height (m)	Weed Species	Cover (%)	Height (m)
Acacia saligna	5	3.0	**Aira caryophyllea*	1	0.1
Aristida contorta	0.3	0.3	**Avena barbata*	0.5	1.0
Borya sphaerocephala	3	0.1	**Brachypodium distachyon*	2	0.2
Corymbia calophylla	55	8.0	**Briza maxima*	10	0.3
Haemodorum laxum	0.1	0.3	**Briza minor*	0.1	0.1
Lomandra caespitosa	0.2	0.3	**Disa bracteata*	0.1	0.2
Microtis media	0.2	0.2	**Dittrichia graveolens*	0.1	0.1
Xanthorrhoea preissii	3	1.2	**Ehrharta calycina*	1	0.8
			**Eragrostis curvula*	10	1.0
			**Freesia leichtlinii* subsp. *alba* × *leichtlinii* subsp. *leichtlinii*	3	0.1
			**Gaudium laevigatum*	0.2	0.3
			**Lysimachia arvensis*	0.2	0.1
			**Melinis repens*	0.2	0.2

Native Species	Cover (%)	Height (m)	Weed Species	Cover (%)	Height (m)
			**Romulea rosea*	1	0.1
			**Trifolium angustifolium*	0.3	0.2
			**Ursinia anthemoides*	0.2	0.2
			**Vicia hirsuta*	0.2	0.2

Note: *denotes introduced species.

Quadrat No.:	**Q3**
Date:	15/11/2024
Personnel:	JW, TC
Northing:	6432107
Easting:	405878
Topography:	Flat
Aspect:	NA
Slope:	0%
Soil:	Sandy loam
Colour:	Brown
Gravel:	0 %
Rock:	0 %
Leaf Litter:	2 %
Bare Ground:	3 %
Drainage:	Well
Condition:	Degraded

Notes: *Corymbia calophylla* open woodland (5 x 20 m due to linear corridor)

Native Species	**Cover (%)**	**Height (m)**	**Weed Species**	**Cover (%)**	**Height (m)**
Corymbia calophylla	70	8.0	**Briza maxima*	0.1	0.2
Grevillea wilsonii	1	0.5	**Cenchrus clandestinus*	0.2	0.1
Lepidosperma pubisquameum	1	0.5	**Ehrharta calycina*	2	0.8
Stirlingia latifolia	4	0.6	**Ehrharta longiflora*	0.5	0.3
Xanthorrhoea preissii	8	3.0	**Eragrostis curvula*	8	1.0
			**Freesia leichtlinii* subsp. *alba × leichtlinii* subsp. *leichtlinii*	10	0.1

Note: *denotes introduced species.

Appendix 4: Species List

The complete flora list for the site is provided in the table below with flora listed by family, and vegetation type they occurred within indicated. *Denotes introduced species and # denotes species that are native to Western Australia but not to this local region.

Family	Species Name	Common Name
Fabaceae	**Acacia iteaphylla*	
Fabaceae	**Acacia longifolia*	
Poaceae	**Aira caryophyllea*	Silvery Hairgrass
Asparagaceae	**Albuca flaccida*	
Poaceae	**Avena barbata*	Bearded Oat
Iridaceae	**Babiana angustifolia*	
Poaceae	**Brachypodium distachyon*	False Brome
Brassicaceae	**Brassica tournefortii*	Mediterranean Turnip
Brassicaceae	**Brassica barrelieri* subsp. *oxyrrhina*	Smooth-stem Turnip
Poaceae	**Briza maxima*	Blowfly Grass
Poaceae	**Briza minor*	Shivery Grass
Poaceae	**Cenchrus clandestinus*	Kikuyu Grass
Fabaceae	**Chamaecytisus palmensis*	Tagasaste
Poaceae	**Cynodon dactylon*	Couch
Orchidaceae	**Disa bracteata*	South African Orchid
Asteraceae	**Dittrichia graveolens*	Stinkwort
Poaceae	**Ehrharta calycina*	Perennial Veldt Grass
Poaceae	**Ehrharta longiflora*	Annual Veldt Grass
Poaceae	**Eragrostis curvula*	African Lovegrass
Geraniaceae	**Erodium botrys*	Long Storksbill
Iridaceae	**Freesia leichtlinii* subsp. *alba* × *leichtlinii* subsp. *leichtlinii*	
Myrtaceae	*Gaudium laevigatum	Coast Teatree
Asteraceae	**Hypochaeris glabra*	Smooth Cats-ear
Iridaceae	**Ixia fuscocitrina*	
Fabaceae	**Lotus subbiflorus*	
Primulaceae	**Lysimachia arvensis*	Pimpernel

Family	Species Name	Common Name
Poaceae	**Melinis repens*	
Iridaceae	**Moraea flaccida*	One-leaf Cape Tulip
Oxalidaceae	**Oxalis purpurea*	Largeflower Wood Sorrel
Iridaceae	**Romulea rosea*	Guildford Grass
Asteraceae	**Sonchus oleraceus*	Common Sowthistle
Proteaceae	**Stirlingia latifolia*	Blueboy
Fabaceae	**Trifolium angustifolium*	Narrowleaf Clover
Fabaceae	**Trifolium campestre*	Hop Clover
Asteraceae	**Ursinia anthemoides*	
Fabaceae	**Vicia hirsuta*	Hairy Vetch
Poaceae	**Vulpia myuros*	Rat's Tail Fescue
Iridaceae	**Watsonia meriana* var. *bulbillifera*	Bugle Lily
Fabaceae	*Acacia saligna*	Orange Wattle
Poaceae	*Aristida contorta*	Bunched Kerosene Grass
Myrtaceae	*Babingtonia camphorosmae*	Camphor Myrtle
Proteaceae	*Banksia dallanneyi*	Couch Honeypot
Boryaceae	*Borya sphaerocephala*	Pincushions
Myrtaceae	*Corymbia calophylla*	Marri
Myrtaceae	*Eucalyptus drummondii*	Drummond's Gum
Fabaceae	*Gompholobium marginatum*	
Proteaceae	*Grevillea wilsonii*	Native Fuchsia
Haemodoraceae	*Haemodorum laxum*	Bloodroot
Dasypogonaceae	*Kingia australis*	Kingia
Cyperaceae	*Lepidosperma pubisquameum*	
Asparagaceae	*Lomandra caespitosa*	Tufted Mat Rush
Myrtaceae	*Melaleuca holosericea*	Melaleuca holosericea?
Myrtaceae	*Melaleuca lateritia*	Robin Redbreast Bush
Cyperaceae	*Mesomelaena tetragona*	Semaphore Sedge
Orchidaceae	*Microtis media*	Tall Mignonette Orchid
Asteraceae	*Quinetia urvillei*	
Proteaceae	*Stirlingia latifolia*	Blueboy
Xanthorrhoeaceae	*Xanthorrhoea brunonis*	

Family	Species Name	Common Name
Xanthorrhoeaceae	*Xanthorrhoea preissii*	Grass tree

Appendix 5: FCT Species Comparison

Family	Taxon	FCT			RSR Tower Site
		3a	3b	3c	
Fabaceae	*Acacia barbinervis*		1		
Fabaceae	*Acacia drewiana*	1	1		
Fabaceae	*Acacia latericola*		1		
Fabaceae	*Acacia saligna*				1
Fabaceae	*Acacia teretifolia*		1		
Hemerocallidaceae	*Agrostocrinum scabrum*	1	1	1	
Casuarinaceae	*Allocasuarina microstachya*	1			
Poaceae	*Aristida contorta*				1
Myrtaceae	*Babingtonia camphorosmae*	1	1	1	1
Proteaceae	*Banksia armata*		1	1	
Proteaceae	*Banksia dallanneyi*				1
Myrtaceae	*Beaufortia macrostemon*	1	1		
Myrtaceae	*Beaufortia purpurea*			1	
Boryaceae	*Borya sphaerocephala*	1	1	1	1
Fabaceae	*Bossiaea angustifolia*		1		
Colchicaceae	*Burchardia multiflora*	1		1	
Myrtaceae	*Calothamnus hirsutus*	1			
Myrtaceae	*Calothamnus quadrifidus*		1		
Myrtaceae	*Calothamnus sanguineus*			1	
Myrtaceae	*Calytrix aurea*	1			
Hemerocallidaceae	*Chamaescilla versicolor*	1			
Haemodoraceae	*Conostylis caricina*	1		1	
Haemodoraceae	*Conostylis setosa*		1		
Myrtaceae	*Corymbia calophylla*				1
Fabaceae	*Cristonia biloba*	1	1	1	
Myrtaceae	*Darwinia thymoides* subsp. *thymoides*	1			
Restionaceae	*Desmocladus lateriflorus*			1	
Droseraceae	*Drosera bulbigena*	1			
Droseraceae	*Drosera bulbosa*	1	1	1	

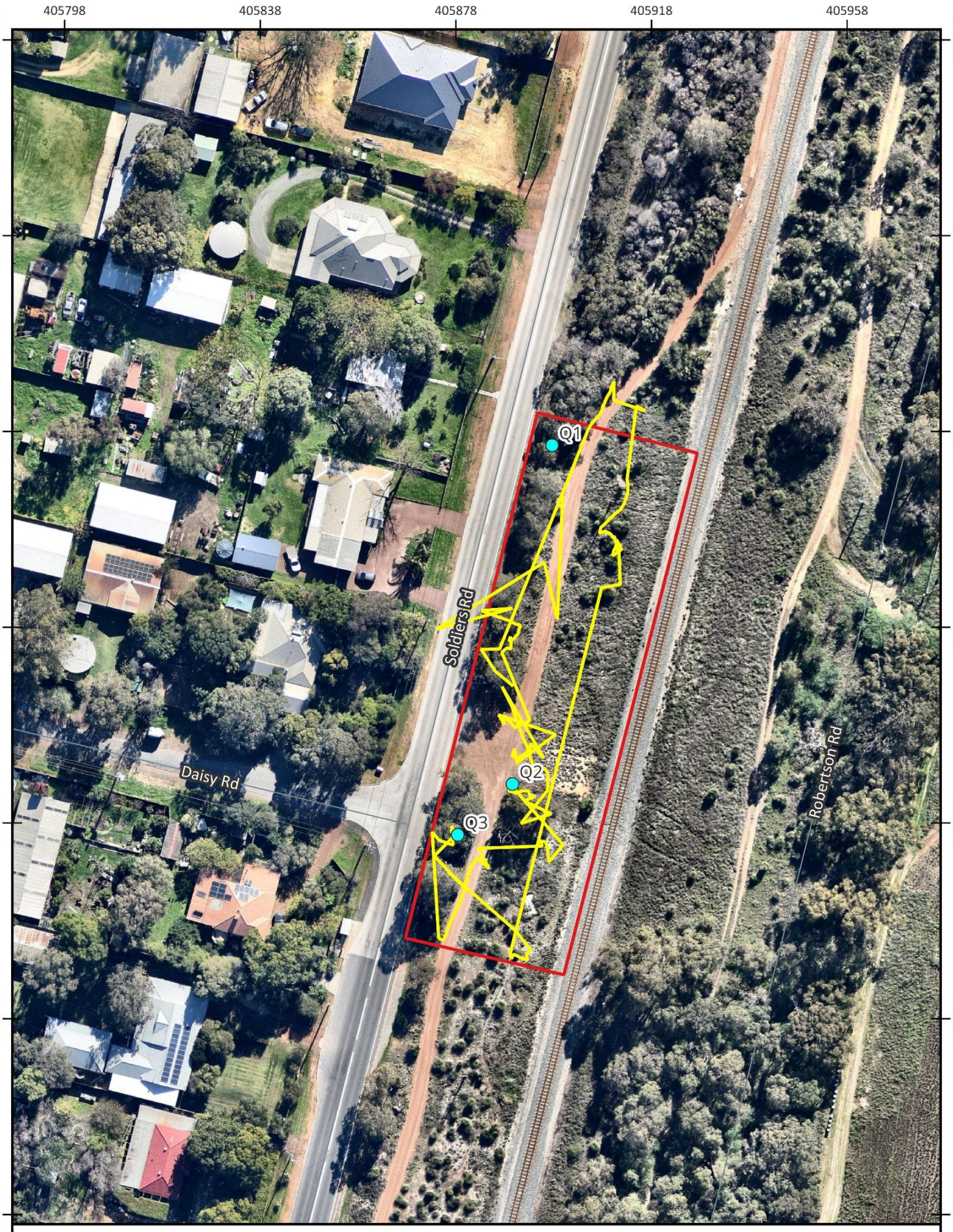
Family	Taxon	FCT			RSR Tower Site
		3a	3b	3c	
Droseraceae	*Drosera erythrorhiza*	1	1	1	
Droseraceae	*Drosera heterophylla*	1		1	
Myrtaceae	*Eucalyptus drummondii*				1
Myrtaceae	*Eucalyptus lane-poolei*	1	1		
Myrtaceae	*Eucalyptus wandoo*			1	
Fabaceae	*Gompholobium aristatum*	1	1		
Fabaceae	*Gompholobium knightianum*	1	1	1	
Fabaceae	*Gompholobium marginatum*	1	1	1	1
Fabaceae	*Gompholobium polymorphum*	1	1	1	
Proteaceae	*Grevillea bipinnatifida*	1	1	1	
Proteaceae	*Grevillea obtusifolia*	1			
Proteaceae	*Grevillea pilulifera*			1	
Proteaceae	*Grevillea wilsonii*	1	1		1
Haemodoraceae	*Haemodorum laxum*				1
Haemodoraceae	*Haemodorum simplex*	1		1	
Proteaceae	*Hakea auriculata*	1	1		
Proteaceae	*Hakea ceratophylla*	1	1		
Proteaceae	*Hakea conchifolia*		1		
Proteaceae	*Hakea cyclocarpa*		1		
Proteaceae	*Hakea erinacea*			1	
Proteaceae	*Hakea marginata*	1			
Proteaceae	*Hakea myrtoides*			1	
Proteaceae	*Hakea stenocarpa*		1		
Proteaceae	*Hakea undulata*		1	1	
Dilleniaceae	*Hibbertia commutata*		1	1	
Proteaceae	*Isopogon asper*	1	1		
Proteaceae	*Isopogon dubius*		1		
Campanulaceae	*Isotropis cuneifolia* subsp. *glabra*	1			
Fabaceae	*Jacksonia alata*			1	
Fabaceae	*Jacksonia restioides*	1			

Family	Taxon	FCT			RSR Tower Site
		3a	3b	3c	
Fabaceae	*Kennedia stirlingii*			1	
Dasypogonaceae	*Kingia australis*	1	1	1	1
Myrtaceae	*Kunzea micrantha*	1			
Myrtaceae	*Kunzea recurva*	1		1	
Proteaceae	*Lambertia multiflora* var. *darlingensis*	1	1		
Malvaceae	*Lasiopetalum glutinosa*	1			
Asparagaceae	*Laxmannia grandiflora*			1	
Cyperaceae	*Lepidosperma pubisquameum*				1
Dasypogonaceae	*Lomandra brittanii*	1	1		
Asparagaceae	*Lomandra caespitosa*				1
Asparagaceae	*Lomandra odora*	1	1		
Myrtaceae	*Melaleuca holosericea*				1
Myrtaceae	*Melaleuca lateritia*				1
Myrtaceae	*Melaleuca osullivanii*	1			
Myrtaceae	*Melaleuca radula*		1		
Cyperaceae	*Mesomelaena graciliceps*		1		
Cyperaceae	*Mesomelaena tetragona*	1	1	1	1
Orchidaceae	*Microtis media*				1
Asteraceae	*Millotia tenuifolia*	1	1		
Poaceae	*Neurachne alopecuroidea*	1	1	1	
Rubiaceae	*Opercularia apiciflora*		1	1	
Iridaceae	*Patersonia juncea*	1	1	1	
Apiaceae	*Pentapeltis peltigera*		1		
Proteaceae	*Persoonia elliptica*				
Proteaceae	*Petrophile biloba*		1		
Proteaceae	*Petrophile seminuda*	1	1		
Proteaceae	*Petrophile squamata*	1			
Philydraceae	*Philydrella drummondii*	1			
Philydraceae	*Philydrella pygmaea*	1	1	1	
Thymelaeaceae	*Pimelea imbricata* var. *major*	1	1	1	

Family	Taxon	FCT			RSR Tower Site
		3a	3b	3c	
Asteraceae	*Podolepis gracilis*	1	?		
Orchidaceae	*Prasophyllum drummondii*	1	1		
Amaranthaceae	*Ptilotus declinatus*			1	
Asteraceae	*Quinetia urvillei*				1
Goodeniaceae	*Scaevola calliptera*		1		
Goodeniaceae	*Scaevola lanceolata*	1			
Apiaceae	*Schoenolaena juncea*	1			
Proteaceae	*Stirlingia latifolia*				1
Stylidiaceae	*Stylidium affine*	1		1	
Stylidiaceae	*Stylidium breviscapum*		1	1	
Stylidiaceae	*Stylidium dichotomum*	1	1	1	
Stylidiaceae	*Stylidium ecorne*	1			
Hemerocallidaceae	*Stypandra glauca*			1	
Proteaceae	*Synaphea acutiloba*	1	1	1	
Malvaceae	*Thomasia foliosa*		1		
Malvaceae	*Thomasia macrocarpa*	1			
Asparagaceae	*Thysanotus dichotomus*			1	
Haemodoraceae	*Tribonanthes australis*	1			
Haemodoraceae	*Tribonanthes brachypetala*			1	
Haemodoraceae	*Tribonanthes longipetala*	1		1	
Rhamnaceae	*Trymalium ledifolium*	1			
Rhamnaceae	*Trymalium odoratissimum*		1		
Myrtaceae	*Verticordia huegelii*	1			
Myrtaceae	*Verticordia pennigera*	1			
Xanthorrhoeaceae	*Xanthorrhoea acanthostachya*		1		
Xanthorrhoeaceae	*Xanthorrhoea brunonis*				1
Xanthorrhoeaceae	*Xanthorrhoea gracilis*		1		
Xanthorrhoeaceae	*Xanthorrhoea preissii*				1
Apiaceae	*Xanthosia candida*	1	1	1	

Source: DBCA, 2024d.

Appendix 6: Sampling Effort



Sampling Effort

Cardup, Western Australia

Legend

- Tracklog
- Quadrat Location
- Site Location

Client:	MetCONNX
Date:	13/02/2025
Created by:	J. Wei
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 1000

0 15 30 m

N