

# Appendix C

Detailed Flora and Vegetation Assessment

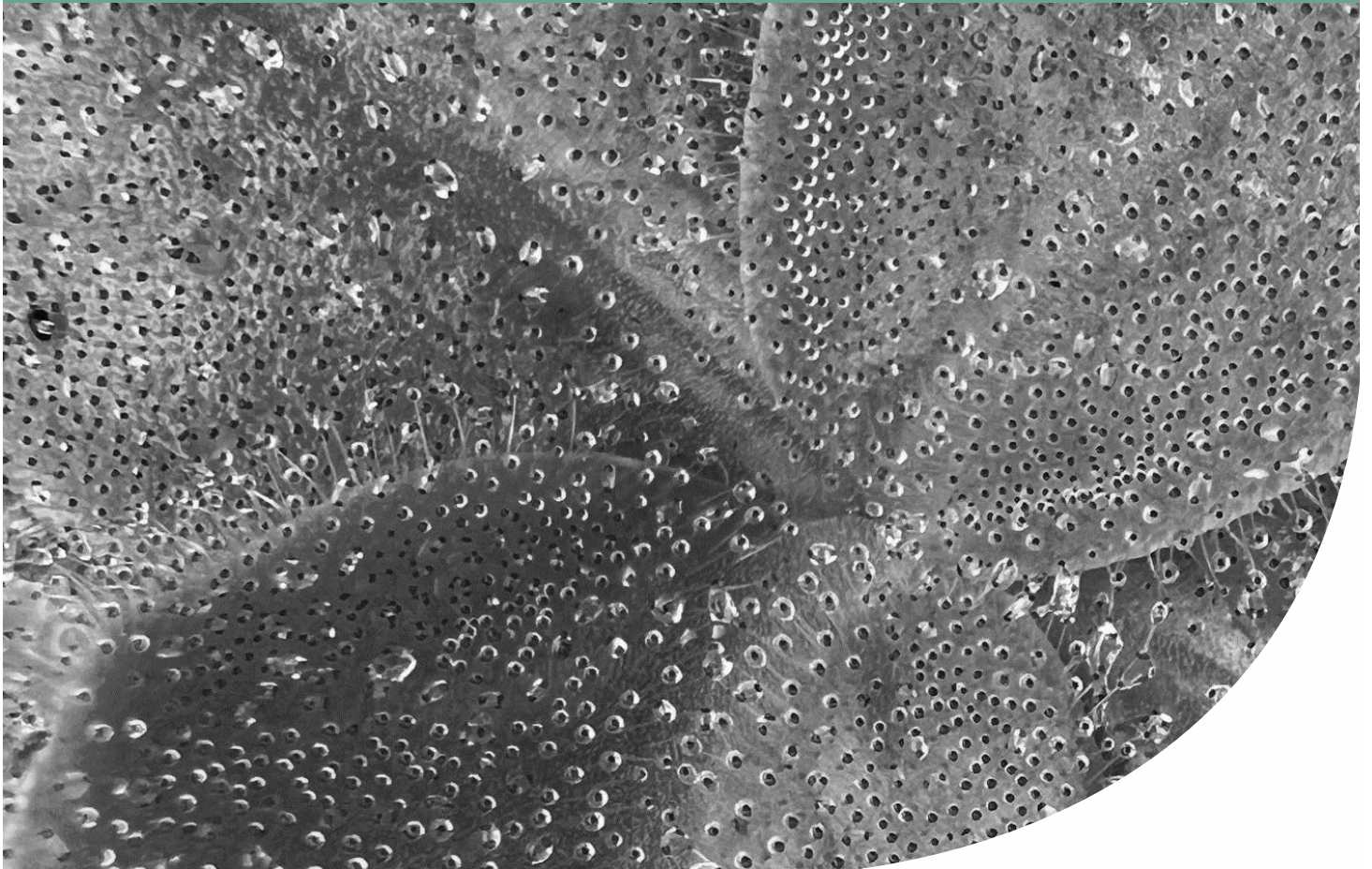


# Detailed Flora and Vegetation Assessment

Parron Wind Farm Development Support

Project No: EP23-085(01)

**Prepared for Zephyr Energy Pty Ltd  
November 2024**



# Detailed Flora and Vegetation Assessment

## Parron Wind Farm Development Support



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# Detailed Flora and Vegetation Assessment

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## Executive Summary

Zephyr Energy Pty Ltd engaged Emerge Associates to conduct a flora and vegetation assessment within the proposed Parron windfarm and associated road reserves in Badgingarra (referred to herein as the 'site').

The assessment included a desktop study of the environmental context of the site and the likelihood of occurrence of threatened and priority flora and ecological communities. Field surveys were conducted over multiple days in September and November 2023 and September 2024 during which the composition and condition of vegetation was recorded. Flora and vegetation values were characterised to the standard required of a detailed survey with reference to EPA (2016b).

Outcomes of the assessment include the following:

- A total of 478 native and 25 non-native or planted flora species were recorded within the site.
- 23 species listed as priority flora in Western Australia were recorded: *Chordifex resemians* (P2), *Hypocalymma serrulatum* (P2), *Leucopogon plumuliflorus* (P2), *Lyginia excelsa* (P2), *Synaphea xela*, *Austrostipa nunaginensis* (P3), *Banksia kippistiana* var. *paenepeccata* (P3), *Banksia nana* (P3), *Beaufortia bicolor* (P3), *Drosera prophylla* (P3), *Hensmania stoniella* (P3), *Lepidobolus quadratus* (P3), *Phlebocarya pilosissima* subsp. *pilosissima* (P3), *Stylidium hymenocraspedum* (P3), *Stylidium nonscandens* (P3), *Tetratheca angulata* (P3), *Banksia chamaephyton* (P4), *Desmocladius elongatus* (P4), *Eucalyptus x carnabyi* (P4), *Hypolaena robusta* (P4), *Schoenus griffinianus* (P4), *Stylidium aeonioides* (P4) and *Stylidium inversiflorum* (P4).
- No threatened flora species were recorded in the site.
- 13 threatened and 84 additional priority flora species may occur in the site.
- The majority of the site comprises **predominantly non-native vegetation** in 'completely degraded' condition (8,153.05 ha, 95.58%).
- 14 native vegetation units were identified within the site, ranging from 'excellent' to 'degraded - completely degraded' condition. Native vegetation occurs over 376.75 ha (4.42% of the site).
- No threatened ecological communities or priority ecological communities occur within the site.

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Additional Information

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Conservation Significant Flora Species and likelihood of Occurrence Assessment

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Conservation Significant Communities and Likelihood of Occurrence Assessment

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## Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
EPA	Environmental Protection Authority
DBCA	Department of Biodiversity, Conservation and Attractions
DoW	Department of Water (now DWER)
DWER	Department of Water and Environmental Regulation

Table A2: Abbreviations – General terms

General terms	
A	Annual
IBRA	Interim Biogeographic Regionalisation for Australia
CR	Critically endangered
EN	Endangered
NVIS	National Vegetation Information System (ESCAVI 2003)
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
P5	Priority 5
PEC	Priority ecological community
P	Perennial
TEC	Threatened ecological communities
UFI	Unique feature identifier
VU	Vulnerable

Table A3: Abbreviations – Legislation

Legislation	
BAM Act	<i>Biosecurity and Agriculture Management Act 2007</i>
EP Act	<i>Environmental Protection Act 1986</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
BC Act	<i>Biodiversity Conservation Act 2016</i>
BC Regs	<i>Biodiversity Conservation Regulations 2018</i>

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*Table A4: Abbreviations – Units of measurement*

Units of measurement	
ha	Hectare
km	Kilometre
m	Metre
m AHD	m in relation to the Australian height datum
mm	Millimetre

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## 1 Introduction

### 1.1 Purpose

Emerge Associates (Emerge) were engaged by Zephyr Energy Pty Ltd to conduct a flora and vegetation assessment within Parron Windfarm and associated road reserves in Badgingarra as shown in **Figure 1** (referred to herein as the 'site').

Flora and vegetation assessments are required to characterise vegetation values and, in particular, confirm the presence or absence of values relevant to environmental approvals process, such as 'native vegetation', 'threatened' flora, 'priority' flora, 'threatened ecological communities' (TECs), 'priority ecological communities' (PECs) and weeds.

### 1.2 Legislation and policy

'Native vegetation' is defined by the *Environmental Protection Act 1986* (EP Act) as indigenous aquatic or terrestrial flora. In the *Environmental Factor Guideline – Flora and Vegetation* the EPA further defines it as native vascular flora and defines vegetation as groupings of flora (EPA 2016a). Native vegetation is protected in Western Australia and can't be cleared without a permit or valid exemption. Biological diversity, habitat function, scarcity, association with wetlands and other ecosystem services influence the value placed on native vegetation (DWER 2018a). Planted flora and vegetation are generally not regarded as native vegetation unless required to be established under the EP Act or other written law or regulation.

Flora and ecological communities may be listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DCCEEW 2021) and the State *Biodiversity Conservation Act 2016* (BC Act) (DBCA 2022c, 2023f). Threatened flora and TECs are classified as either 'critically endangered'(CR), 'endangered' (EN) and 'vulnerable' (VU) (DCCEEW 2021). Commonwealth and/or State ministerial approval is required to impact threatened flora or TECs.

Native flora and ecological communities that are not listed as threatened, but are otherwise considered rare or under threat, may be added to a Department of Biodiversity, Conservation and Attractions (DBCA) priority list (DBCA 2022b, c). 'Priority flora' and PECs are classified as either 'priority 1' (P1), 'priority 2' (P2), 'priority 3' (P3) or 'priority 4' (P4). They do not have direct statutory protection. However, their priority classification is taken into account during State and Local government approval processes.

Flora that are regarded as having negative environmental or economic impacts are often referred to as weeds (DBCA 2023h). Particularly detrimental weed species may be listed as a 'declared pest' pursuant to the State *Biosecurity and Agriculture Management Act 2007* (BAM Act) or as a 'weed of national significance' (WoNS) (DAWE 2021). Management of weeds, declared pests and WoNS may be required during government approval processes.

Further information on legislation and policy relevant to flora and vegetation assessments is provided in **Appendix A**.

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### 1.3 Scope of work

The Environmental Protection Authority (EPA) *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* establishes standards for the assessment of flora and vegetation in Western Australia (EPA 2016b).

The scope of work was to undertake a detailed survey with reference to EPA (2016b). As part of this scope of work, the following tasks were undertaken:

- Desktop study to provide contextual information and determine the likelihood of occurrence of threatened and priority flora or ecological communities.
- Field surveys to record flora, vegetation units and vegetation condition.
- Analysis and mapping of contextual information, vegetation units, vegetation condition and threatened and priority flora or ecological communities (if present).
- Documentation of the desktop study, methods, results, discussion and conclusions.

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## 2 Desktop Study

### 2.1 Site context

#### 2.1.1 Location and extent

The site is located in the Shire of Dandaragan in the Wheatbelt region of Western Australia and extends over 8,529.8 hectares (ha) as shown in **Figure 1**. The site is bounded by a mix of agricultural land and remnant native vegetation to the north and east, Badgingarra National Park and Cadda Road to the south and Yerramullah Road to the west. The site includes road reserves, namely Cowalla road (both sides), Yerramullah Road (eastern side only), Cadda Road (northern side only) and the Cowalla Road and Brand Highway intersection.

#### 2.1.2 Climate

The Wheatbelt region of Western Australia experiences a Mediterranean climate of hot dry summers and cool wet winters (Hobbs 2003). Recent rainfall at the closest weather station to the site has been somewhat inconsistent (lower) with long term averages, as shown in **Plate 1** (BoM 2024). Flora and vegetation surveys should be undertaken during the season that is most suitable for detection and identification of the range of flora likely to occur in the area (EPA 2016b). For the 'south-west and interzone' botanical province in which the site lies, the primary survey time is spring (September to November) (EPA 2016b).

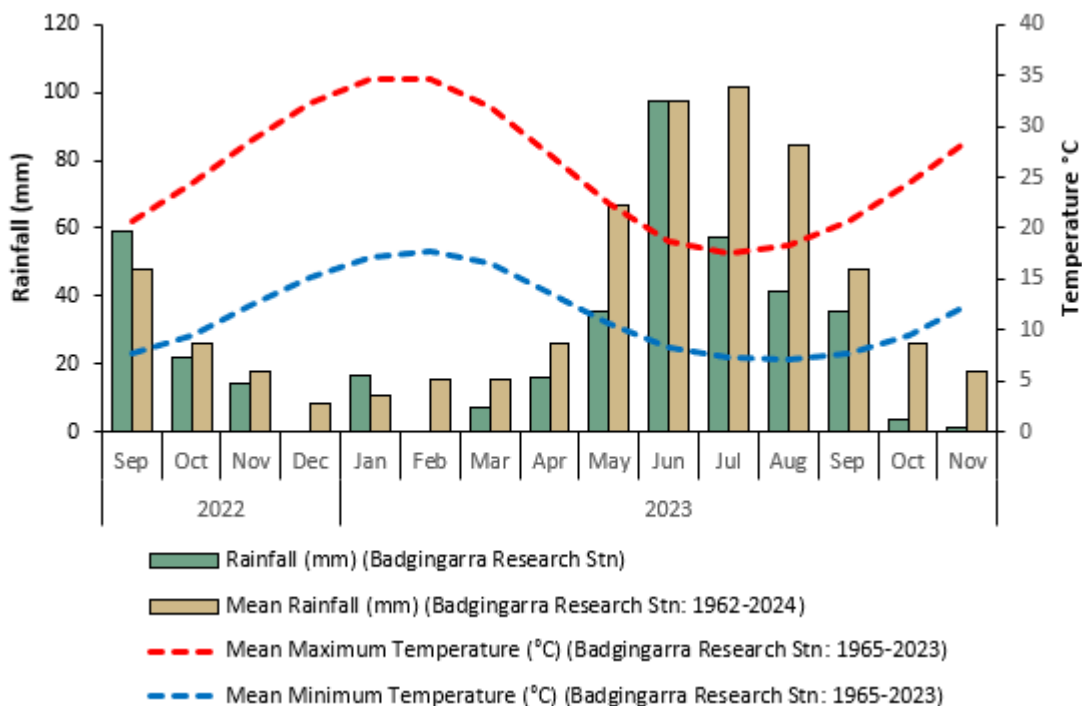


Plate 1: Recent rainfall and long-term mean temperature and rainfall

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### 2.1.3 Geomorphology and soils

The site occurs on the Geraldton Sandplain, which is the geomorphic unit that characterises the region spanning from Dongara in the north, to Greenhead in the south and inland to Badgingarra. The Geraldton Sandplain comprises three subregions: Edel, Geraldton Hills and Lesueur Sandplains. The site lies within the Lesueur Sandplains subregion, which stretch from the south end of the Carnarvon basin to the northern areas of the Perth Basin and Pinjarra Orogen (CALM 2003). The subregion is characterised by an undulating lateritic sandplain mantling Permian to Cretaceous strata with areas of coastal aeolian sands and limestone. Alluvial outwash plains exist in areas of valleys and hills (Purdie *et al.* 2004).

Fine scale soil landscape mapping by DPIRD (2022) shows eight units as occurring within the site, as described in **Table 1** and shown in **Figure 2**.

*Table 1: Soil landscape mapping units within the site (DPIRD 2022)*

Soil landscape unit	Location within site	Description
Yerramullah 1 Subsystem	Two patches in the central and south-eastern portion	Laterite plateau residual; shallow gravel, shallow sand over duricrust, sandy gravels
Yerramullah 2 Subsystem	Many patches scattered throughout much of the site	Plateau residuals, very gently to gently inclined hillcrest and hillslopes; pale sandy gravels, shallow gravel over duricrust, gravelly pale deep sand, pale and yellow deep sands
Yerramullah 3 Subsystem	Most abundant system covering the majority of the site	Colluvial slopes and some plateau remnants, very gently to gently inclined hillslopes and sand filled minor valleys; pale and yellow deep sands, pale sandy gravels, shallow gravel over duricrust, some sandy duplexes and sandy earths
Yerramullah 4 Subsystem	Two patches in the north-western portion	Plateau residuals, complex of Ye2 and Ye3; pale sandy gravels, gravelly pale deep sand, shallow gravel over duricrust, pale deep sand, some sandy duplexes, yellow deep sand
Yerramullah 6 Subsystem	One patch in the south-eastern portion	Colluvial slopes, very gently to gently inclined mid to lower hillslopes and sand filled minor valleys; pale deep sand, some sandy duplexes and shallow sand over pan or bog iron
Yerramullah 9 Subsystem	One patch in the south-western portion	Narrow alluvial flats of minor creeks; pale to brown deep sands, sandy and loamy duplexes, shallow sand over pans
Mintaja Hills System	One patch in the north-western portion	Rises and low hills on sedimentary rocks north and south of the Mount Lesueur area. Variable soils including red/brown non-cracking clays, brown loamy earths, and grey/brown shallow loamy duplexes. Woodlands.
Nylagarda 1 Subsystem	One patch in the north-eastern portion	Drainage line and adjacent very gently inclined footslopes; mainly sandy duplexes, brown deep sand and brown sandy earth

The site is not known to contain any restricted landforms or unique geological features.

### 2.1.4 Topography

The elevation of the site ranges from 94 m in relation to the Australian height datum (mAHD) in the north-western corner to 278 mAHD in the centre (DoW 2008) (**Figure 2**).

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### 2.1.5 Hydrology and wetlands

Wetlands are areas of seasonally, intermittently or permanently waterlogged land such as poorly drained soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries (Wetlands Advisory Committee 1977). Wetlands can be recognised by the presence of vegetation associated with waterlogging or the presence of hydric soils such as peat, peaty sand or carbonate mud (Hill *et al.* 1996).

Wetlands of national or international significance may be afforded special protection under Commonwealth or international agreements. Review of the *Ramsar List of Wetlands of International Importance* (DBCA 2017) and *A Directory of Important Wetlands in Australia – Western Australia* (DBCA 2018) indicates that no Ramsar or listed ‘important wetlands’ are located within or near the site.

The Department of Water and Environmental Regulation (DWER) hydrography linear dataset (DWER 2018b) records the following 43 wetland or water related features within the site:

- 16 earth dams,
- 18 watercourses - minor, non-perennial
- nine unnamed hydrological features

The *Geomorphic Wetlands Cervantes Eneabba* dataset maps geomorphic wetland features and classifies them based on their landform shape and water permanence (DBCA 2023a). Each wetland feature is classified according to their host landform and hydroperiod.

The *Geomorphic Wetlands Cervantes Eneabba* dataset records two ‘dampland’ wetland features (UFIs 581 and 238) occur in the north-central and north-eastern portion of the site (DBCA 2023a). An additional ‘not classified’ wetland feature (UFI 258) occurs in the south-western portion of the site. The locations of the geomorphic wetlands within and adjacent to the site and are shown in **Figure 3**.

### 2.1.6 Regional vegetation

Native vegetation is described and mapped at different scales to illustrate patterns in its distribution. At a continental scale the *Interim Biogeographic Regionalisation for Australia* (IBRA) divides Australia into floristic subregions (Environment Australia 2000).

The site is contained within the Geraldton Sandplains IBRA region and within the ‘GES02’ or Lesueur Sandplain subregion. The Geraldton Sandplains region (previously ‘Northern Sandplains’ region) is described as comprising mainly ‘scrub heath on sandplain near the coast, *Acacia* to *Casuarina* thickets further inland and *Acacia* scrub with scattered trees of *Eucalyptus loxophleba* on hard-setting loams’ (Beard 1990).

Variations in native vegetation can be further classified based on regional vegetation mapping. Beard *et al.* (2013) mapping shows the majority of the site as comprising vegetation association ‘Le Sueur\_1031’ which is described as ‘scrub-heath or heath’. A small portion in the north-eastern portion of the site is mapped as comprising the ‘Le Sueur\_1034’ vegetation association which is described as ‘woodland’ (Beard *et al.* 2013).

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The 'Le Sueur\_1031' association was determined to have 34.48% of its pre-European extent remaining in the Geraldton Sandplains region in 2017, with 14.72% protected for conservation purposes. The 'Le Sueur\_1034' association was determined to have 61.90% of its pre-European extent remaining with 36.73% protected for conservation purposes (Government of Western Australia 2018).

#### 2.1.7 Threatened and priority flora

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) has compiled various datasets relating to 'matters of national environmental significance' (MNES) (DCCEEW 2024). The *Protected Matters Search Tool* provides general guidance on threatened flora listed under the EPBC Act that may occur within a location based on validated records and less reliable unvalidated habitat distribution modelling (DCCEEW 2024).

DBCA's *Threatened and Priority Flora Database* and *WA Herbarium Database* contain records of threatened and priority flora in Western Australia (DBCA 2023g). Searches of these databases provide point data for threatened and priority flora within a location, comprising validated and historical unvalidated records.

The *Protected Matters Search Tool* (DCCEEW 2024) and DBCA's threatened and priority flora databases (reference no. 72-0923FL) identified 41 threatened and 160 priority flora occurring or potentially occurring within a 20 km radius of the site (refer **Appendix B**).

#### 2.1.8 TECs and PECs

The *Protected Matters Search Tool* provides general guidance on TECs listed as CR and EN under the EPBC Act that may occur within a location based on reliable records and less reliable habitat distribution modelling (DCCEEW 2024).

DBCA's *Threatened and Priority Ecological Community buffers and boundaries in WA* dataset contains validated records of TECs and PECs. Searches of this dataset provides buffered polygons of TEC and PEC records.

The *Protected Matters Search Tool* (DCCEEW 2024) and DBCA's TEC and PEC database (reference no. 46-0923EC) identified five TECs and four PECs occurring or potentially occurring within a 50 km radius of the site (refer **Appendix C**).

#### 2.1.9 Historical land use

Review of historical images available from 2000 onwards shows that the majority of the site was cleared of native vegetation prior to 2000, likely for Grazing and/or cropping uses. Since this time the extent of native vegetation within the site has remained relatively stable (WALIA 2024).

#### 2.1.10 DBCA managed or legislated land

DBCA has tenure of, or interests in, numerous areas of land across the state for a range of purposes. Tenure categories include national parks, nature reserves, conservation parks, marine parks, marine nature reserves, marine management areas, section 5(1)(g) reserves, state forest and timber reserves. These areas are mapped within the *Legislated Lands and Waters* (DBCA 2023b) and *Lands*

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of Interest (DBCA 2022a) datasets. The *Legislated Lands and Waters* (DBCA 2023b) dataset includes lands subject to the *Conservation and Land Management Act 1984* (CALM Act 1984), *Swan and Canning Rivers Management Act 2006* (SCRM Act) and lands identified under the *Land Administration Act 1997* (LA Act). The *Lands of Interest* (DBCA 2022a) dataset includes all other lands of which DBCA is recognised as the manager but is not vested under any act.

Two DBCA managed or legislated lands occur immediately adjacent to the site. Badgingarra National Park (R31809) lies adjacent to the entire southern boundary of the site and extends to the south and east. Hill River Nature Reserve (R36093) lies adjacent to the north-eastern corner of the site and extends to the north-west and south-east (DBCA 2023b). The locations of both DBCA legislated or managed lands are shown in **Figure 3**.

### 2.1.11 Previous surveys

A flora and vegetation assessment of the site and wider Badgingarra area was previously undertaken in March 2007 for the now developed Badgingarra wind farm (Brett Lane & Associates Pty Ltd 2008). The survey identified two native vegetation types within the site: 'kwongan heathland' and 'grassy woodland' which ranged from 'low' to 'high' quality remnants. The majority of the site was mapped as comprising 'exotic (introduced) vegetation'.

The survey recorded two conservation significant flora species:

- *Hakea megalosperma* which is listed as threatened (vulnerable) under the EPBC Act and the BC Act
- *Loxocarya gigas* which is listed as priority 2 under in WA.

Both species were found within remnant native vegetation associated with vegetation site number 26 which is located approximately 4 km south of the site. No threatened or priority flora species were identified within the site by Brett Lane & Associates Pty Ltd (2008).

## 2.2 Likelihood of occurrence

The distribution and habitat preferences of the threatened and priority flora species and ecological communities listed in **Appendix B** and **Appendix C** was reviewed against site context information described in **Section 2.1**. The intensity and results of the field survey was also taken into account when determining the likelihood of occurrence. Likelihood of occurrence of threatened and priority flora species and ecological communities within the site was classified as 'high', 'moderate', 'low' or 'negligible' as outlined in **Table 2**.

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Table 2: Decision matrix for likelihood of occurrence of threatened and priority flora and ecological communities post survey

		Distribution <sup>1</sup>	
		Reliable record within search area <sup>2</sup>	No reliable record within search area <sup>2</sup>
Habitat	Suitable	High	Negligible
	Potentially suitable	Moderate	
	Unsuitable	Low	
Conclusive <sup>3</sup> survey undertaken		Nil	

<sup>1</sup> Reliable record defined as validated, recent (within the last ~40 years) and spatially accurate (refer DBCA search meta data) in order to exclude unverified range or habitat projections. <sup>2</sup>Search area defined as a 20 km buffer surrounding the site. <sup>3</sup>Conclusive survey defined as targeted searches undertaken at a suitable time of year and with sufficient effort to detect the species/community.

### 2.2.1 Threatened and priority flora

13 threatened and 106 priority flora were classified as having a 'high' or 'moderate' likelihood of occurrence within the site, as outlined in **Appendix B**.

### 2.2.2 TECs and PECs

All TECs and PECs identified from database searches were determined to have a 'nil' likelihood of occurrence within the site following the field survey, as outlined in **Appendix C**.

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## 3 Methods

### 3.1 Field survey

Experienced botanists visited the site on 18-22 September, 23-27 October and 2-3 November 2023 to conduct the field survey. Additionally, the portion of the site associated with the intersection of Cowalla Road and Brand Highway was surveyed on 25 September 2024. During all surveys the site was traversed on foot and the composition and condition of vegetation was recorded. Plant specimens were collected where the identity of flora required further confirmation. Photographic images and notes were recorded as required.

#### 3.1.1 Targeted searches

Targeted searches were conducted for threatened and priority flora and ecological communities, with a particular focus on those with a high or moderate likelihood of occurrence (refer **Section 2.2**). Transects for flora were traversed approximately 50 m apart through areas of potentially suitable habitat. Transects and records were marked using a hand-held GPS receiver ( $\pm 5$  m accuracy).

#### 3.1.2 Sampling

Detailed sampling of the vegetation was undertaken using a combination of non-permanent 10 x 10 m quadrats and relevés. The quadrats were established using fence droppers bounded by measuring tape. The relevés were completed over an equivalent 10 x 10 m area without the use of physical markers and were included to provide a more rapid sample of patches of vegetation in poorer condition and/or of smaller size. The position<sup>1</sup> of each sample was recorded with a hand-held GPS receiver ( $\pm 5$  m accuracy).

The data recorded within each sample included:

- site details (site name, site number, observers, date, location)
- environmental information (slope, aspect, bare-ground, rock outcropping, soil type and colour, litter layer, topographical position, time since last fire event)
- biological information (species, plant specimens, vegetation structure, vegetation condition, 'foliage projective cover', and disturbance).

A total of 19 locations were sampled, comprised of 15 quadrats and four relevés, as shown in **Figure 4** and **Figure 5**.

#### 3.1.3 Vegetation condition

The condition of the vegetation was assessed using the Keighery (1994) scale (**Table 3**).

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<sup>1</sup> For quadrats the north-west corner was recorded.

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Table 3: Vegetation condition scale applied during the field survey

Category	Definition (Keighery 1994)
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very good	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
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.

^relative to the expected natural diversity for that vegetation.

## 3.2 Analysis and data preparation

### 3.2.1 Flora identification

Flora were identified through comparison with named material and through the use of taxonomic keys. Plant specimens collected during the field survey were dried, pressed and named in accordance with requirements of the (Western Australian Herbarium 2024).

Flora was classified as native if indigenous to the IBRA region in which the site occurs. Non-native flora is denoted by '\*' in text and raw data. The legal or policy status of flora was denoted using codes outlined in **Appendix A**.

### 3.2.2 Sampling adequacy

A species accumulation curve was plotted from sample data by generating a trendline (log) in Microsoft Excel. The trendline was forecast to locate the asymptote of the curve (the point at which the curve flattens), which provides an indication of amount of sampling that would be required before it can be assumed few species remain undetected.

Species richness was estimated in PRIMER v6 (Clarke and Gorley 2006). Jackknife1 and Chao2 non-parametric estimators are reported as these are known to perform well in comparison to simulated and real data sets and are also recommended for small sample sizes (Gotelli and Colwell 2011).

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Differences between recorded and estimated species richness was used to evaluate the adequacy of sampling effort.

#### 3.2.3 Threatened and priority flora confirmation

Threatened and priority flora were confirmed as absent from the site where no significant limitation was identified that could have affected their detection (refer **Section 3.3**).

#### 3.2.4 Vegetation unit identification and description

The vegetation units within the site were identified from the sample data collected during the field survey. Sample similarity was calculated using PRIMER v6. A cluster analysis was performed to generate a dendrogram of sample groups.

The vegetation was described according to the dominant species present using the structural formation descriptions of the *National Vegetation Inventory System (NVIS)* (NVIS Technical Working Group 2017).

#### 3.2.5 TEC and PEC confirmation

Vegetation units were assessed against TEC and PEC diagnostic characteristics and, if available, size and/or vegetation condition thresholds (DBCA 2023c). TECs and PECs were confirmed as absent from the site where no significant limitation was identified that could have affected their detection (refer **Section 3.3**).

#### 3.2.6 Mapping

Environmental features, vegetation units, vegetation condition, threatened or priority flora or ecological communities were mapped on aerial photography using notes and data collected in the field.

### 3.3 Limitations

It is important to note constraints imposed on assessments and the degree to which these may have limited outcomes. An evaluation of the desktop study and methods applied in the current assessment against standard constraints outlined in the EPA document *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) is provided in **Table 4**.

Table 4: Evaluation of assessment against standard constraints outlined in (EPA 2016b)

Constraint	Degree of limitation	Details
Availability of contextual information	No limitation	The broad scale contextual information described in <b>Section 2.1</b> and information available from previous surveys is adequate to place the site and vegetation in context.

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Table 5: Evaluation of assessment against standard constraints outlined in (EPA 2016b)(continued)

Constraint	Degree of limitation	Details
Availability of contextual information	Minor limitation	Recent high quality aerial imagery for the area of the site was limited. The highest quality imagery available was the 2015 Landgate imagery (WALIA 2024). However, as the imagery is over eight years old, some of the vegetation boundaries mapped using this imagery may not be current. Notes and photos taken in the field, as well as comparison to other aerial imagery streaming services were used to ensure vegetation boundaries are drawn as accurately as possible.
Experience level of personnel	No limitation	This flora and vegetation assessment was undertaken by qualified botanists with over five years of botanical experience in Western Australia. Technical review was undertaken by a senior environmental consultant with 13 years' experience in environmental science in Western Australia.
Suitability of timing	Limitation	<p>In Mediterranean climates some flora spend part of their lifecycle as underground storage organs or seed to avoid excessive heat and drought over the summer period. These species, known as 'geophytes' or 'annuals', tend to re-emerge during winter and are often most visible during spring, which is the flowering period for the majority of plant species. Therefore, spring is the optimal time to complete flora and vegetation surveys in the south-west of WA.</p> <p>The survey was conducted during September, October and November and thus within the main flowering season for the region.</p> <p>Rainfall for June 2023 was consistent with long-term averages but rainfall in July and August 2023 was lower. However, total rainfall prior to the survey was considered sufficient to promote flowering and emergence in spring and this was confirmed during the survey by the presence of various annual and geophytic species. Therefore, survey timing was considered adequate to allow the detection of most species for which seasonal timing is critical. The survey was undertaken outside or partially outside of the flowering period of some conservation significant annual or perennial geophytic species, including <i>Diuris recurva</i> (P4), <i>Poranthera asybosca</i> (P1), <i>Schoenus pennisetis</i> (P3), <i>Thelymitra pulcherrima</i> (P2) and <i>Thelymitra apiculata</i> (P4) and so they would not have been detectable during the survey.</p>
Temporal coverage	Minor limitation	<p>Detailed flora and vegetation assessments can require multiple visits, at different times of year, and over a period of a number of years, to enable observation of all species present.</p> <p>The site was visited on three occasions, in September, October and November 2023 which falls during the main flowering period for the region. As such the survey may not strictly meet the definition of a detailed survey. However, the survey is considered to provide a fair estimate of the flora assemblage present and the condition of the vegetation and so this is only considered a minor limitation.</p>

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Table 5: Evaluation of assessment against standard constraints outlined in (EPA 2016b)(continued)

Constraint	Degree of limitation	Details
Spatial coverage and access	Limitation	Site coverage was comprehensive (track logged). However, due to the large scale of the site, transects during targeted searches were spaced 50 metres (m) apart. The distance from which conservation significant species can be detected depends on the size of the target species and the density of the vegetation. Some of the conservation significant species with potential to occur in the site are small (e.g. orchids) and the vegetation was often dense and so it is possible that some conservation significant species were not detected during targeted searches.
	No limitation	All parts of the site could be accessed as required.
Sampling intensity	Limitation	A total of 502 species were recorded, of which 325 were recorded from 19 sample locations and 177 were recorded opportunistically. Minimum species richness within site is estimated at between 459 (Jackknife1) and 503 (Chao2) species (refer species accumulation curve and estimates shown in <b>Plate 2</b> ). The number of species recorded in the site is similar to that of the Chao2 estimate and, combined with the high sampling intensity within native vegetation and the degraded nature of the remainder of the site, demonstrates that survey effort was adequate to prepare a near-comprehensive species inventory for the site.
	Limitation	A high number of conservation significant flora species were identified to have potential to occur within the site as detailed in <b>Section 2.1.7</b> . Identification of flora species often requires detailed review of specimens using specialist texts and equipment such as microscopes. Due to the high number of threatened and priority flora species that have potential to occur in the site, and the requirement for detailed analysis using specimen, identification of conservation significant flora species in the field was not possible. A large number of specimens was collected and positively identified. However, occurrences of conservation significant species are restricted to opportunistic collections and vegetation sampling locations and it is likely that additional occurrences of the conservation significant flora species recorded within the site occur within areas of suitable habitat.
Influence of disturbance	Minor limitation	Historical imagery available for the site is limited but time since fire likely to be greater than 20 years as interpreted from aerial imagery. As a result, short-lived species more common after fire may not have been visible.
	No limitation	Historical ground disturbance was evident throughout the much of the site but the disturbance history was considered when undertaking field sampling.
Adequacy of resources	No limitation	All resources required to perform the survey were available.

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## 4 Results

### 4.1 Flora

#### 4.1.1 Species inventory

A total of 502 species were recorded during the field survey. A summary of legal and policy status of flora records is provided in **Table 5**. A complete species list is provided in **Appendix D**.

Table 5: Summary of legal and policy status of taxa recorded in the site

Status	Unlisted	Threatened	Priority	Declared Pest	Planted	Total
Native	455	0	23	0	0	<b>478</b>
Non-native	23	-	-	1	1	<b>25</b>
Total	478	0	23	1	1	<b>502</b>

Sampling recorded 325 species from 19 samples. A further 178 species were recorded opportunistically across the site. A species accumulation curve derived from sample data is presented in **Plate 2**. Species richness was estimated to be between 459 (Jackknife1) and 503 (Chao2).

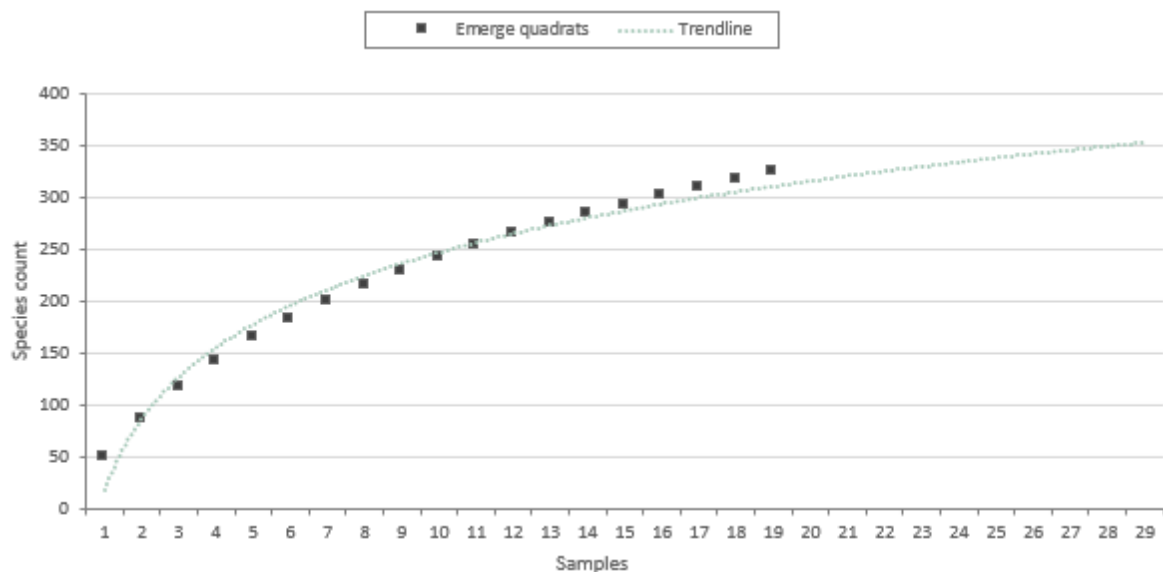


Plate 2: Species accumulation curve derived from sample data  $y = 99.876\ln(x) + 17.112$   $R^2 = 0.9797$

#### 4.1.2 Threatened and priority flora

A total of 23 priority flora species were recorded within areas of native vegetation in the site as listed in **Table 6**. A total of 79 individuals were recorded, with additional plants likely to occur within the site as discussed in **Section 5.1.2**. The locations of these species are shown in **Figure 6** and listed in **Appendix E**.

The remainder of the threatened and priority flora species identified in **Section 2.2** were not recorded in the site during the survey. However, the survey was unable to confirm the

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presence/absence of 13 threatened and 84 priority flora species as discussed in **Section 5.1.2** and listed in **Appendix B**.

Table 6: Priority flora species recorded within the site

Species	Conservation status	Number of individuals recorded
<i>Chordifex reseminans</i>	P2	6
<i>Hypocalymma serrulatum</i>	P2	1
<i>Leucopogon plumuliflorus</i>	P2	4
<i>Lyginia excelsa</i>	P2	2
<i>Synaphea xela</i>	P2	1
<i>Austrostipa nunaginensis</i>	P3	2
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	13
<i>Banksia nana</i>	P3	11
<i>Beaufortia bicolor</i>	P3	4
<i>Drosera prophylla</i>	P3	2
<i>Hensmania stoniella</i>	P3	7
<i>Lepidobolus quadratus</i>	P3	5
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3	3
<i>Stylidium hymenocraspedum</i>	P3	1
<i>Stylidium nonscandens</i>	P3	1
<i>Tetrateca angulata</i>	P3	3
<i>Banksia chamaephyton</i>	P4	2
<i>Desmocladius elongatus</i>	P4	3
<i>Eucalyptus x carnabyi</i>	P4	1
<i>Hypolaena robusta</i>	P4	2
<i>Schoenus griffinianus</i>	P4	1
<i>Stylidium aeonioides</i>	P4	3
<i>Stylidium inversiflorum</i>	P4	1

Note: P1-P4 = priority 1 to priority 4.

### 4.1.3 Declared pests

One species listed as a declared pest pursuant to the BAM Act, *\*Echium plantagineum* (Paterson's curse), was recorded within the site. The species occurs as scattered plants throughout the predominantly non-native vegetation unit. No control category applies to this species. No weeds of national significance (WoNS) were recorded.

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## 4.2 Vegetation



### 4.2.1 Vegetation units

Fifteen vegetation units were identified within the site. A description and the area of each vegetation unit is provided in **Table 7**. The location of each vegetation unit is shown in **Figure 4**. Raw sample data is provided in **Appendix F** and the output of the cluster analysis are provided in **Appendix G**.

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Table 7: Description and extent of vegetation units identified within the site

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
Cc	Open woodland <i>Corymbia calophylla</i> and scattered non-native trees over pasture weeds and occasional native species.	-	14.62	0.17	
CcXpEm	Low woodland <i>Corymbia calophylla</i> (or absent) over open shrubland <i>Xanthorrhoea preissii</i> , <i>Banksia armata</i> var. <i>armata</i> , <i>Hakea lissocarpa</i> , <i>Gastrolobium oxylobioides</i> and <i>Hibbertia hypericoides</i> over rushland <i>Ecdeiocolea monostachya</i> , <i>Lepidosperma</i> sp. 5 and <i>Caustis dioica</i> over sparse grassland <i>Austrostipa elegantissima</i> over mixed native forbs and occasional pasture weeds on sandy loam soils.	Q15	4.12	0.05	

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Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
EgEdGpTa	Open mallee woodland <i>Eucalyptus gittinsii</i> subsp. <i>illucida</i> and <i>Eucalyptus drummondii</i> over shrubland <i>Gastrolobium plicatum</i> , <i>Banksia shuttleworthiana</i> and <i>Hibbertia hypericoides</i> over low scattered shrubs <i>Tetratheca angulata</i> (P3) and <i>Scaevola</i> spp. over diverse native herbs on sandy soils sometimes with lateritic gravel associated with lower slopes and flats.	Q10	7.44	0.09	
EI	Open woodland <i>Eucalyptus lane-poolei</i> over mixed native understorey vegetation encroaching from adjacent <b>EtBaBmBc</b> vegetation (or absent), bare ground and pasture weeds.	-	7.27	0.09	

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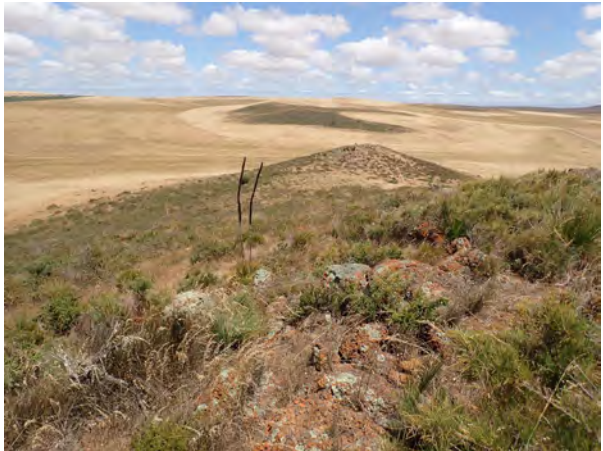

Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
ElEaJcCa	Open woodland <i>Eucalyptus lane-poolei</i> and occasional <i>Eucalyptus accedens</i> over open shrubland <i>Jacksonia calcicola</i> , <i>Acacia pulchella</i> var. <i>glaberrima</i> , <i>Gastrolobium oxylobioides</i> and <i>Hibbertia hypericoides</i> over open rush/sedgeland <i>Mesomelaena pseudostygia</i> , <i>Caustis dioica</i> and <i>Lepidosperma</i> sp. 7 over low shrubland <i>Conostylis aculeata</i> var. <i>aculeata</i> on sandy soils.	Q18, Q19	6.62	0.08	
EtBaBmBc	Low open woodland <i>Eucalyptus tottiana</i> , <i>Banksia attenuata</i> , <i>Banksia menziesii</i> , <i>Banksia candolleana</i> and occasional <i>Banksia prionotes</i> and/or <i>Hakea obliqua</i> over open shrubland <i>Apectospermum spinescens</i> , <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> , <i>Allocasuarina humilis</i> and <i>Callitris acuminata</i> over low shrubland <i>Eremaea</i> spp., <i>Hypocalymma xanthopetalum</i> , <i>Hibbertia hypericoides</i> , <i>Stirlingia latifolia</i> and <i>Conospermum</i> spp. over forb/rushland <i>Alexgeorgea subterranea</i> , <i>Alexgeorgea nitens</i> , <i>Chordifex sinuosus</i> , <i>Chordifex microdon</i> , <i>Mesomelaena pseudostygia</i> and <i>Lomandra</i> spp. over mixed native herbs and occasional weeds on sandy soils/sandplains.	Q1, Q2, Q3, Q8, Q9	185.1	2.17	

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Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
GsBaX	Heathland to sparse heathland <i>Gastrolobium spinosum</i> , <i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i> , <i>Banksia armata</i> var. <i>armata</i> , <i>Allocasuarina humilis</i> and <i>Xanthorrhoea</i> sp. 1 over sparse rush/sedge/grassland <i>Lepidosperma</i> sp. 3., <i>Schoenus brevisetis</i> and <i>Neurachne alopecuroidea</i> and pasture weeds on lower laterite hills.	R13, R14	64.15	0.75	
M	Woodland to tall shrubland <i>Melaleuca</i> spp. over pasture weeds and occasional native species.	-	2.11	0.02	

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Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
MpEt	Woodland <i>Melaleuca preissiana</i> and <i>Eucalyptus todtiana</i> over pasture weeds and/or * <i>Juncus acutus</i> and occasional native species.	-	4.22	0.05	
Mr	Occasional <i>Corymbia calophylla</i> and <i>Acacia acuminata</i> over closed shrubland <i>Melaleuca radula</i> and occasional <i>Calothamnus</i> sp. 1, <i>Hibbertia hypericoides</i> and <i>Styphelia serratifolia</i> over sparse forbland <i>Dianella revoluta</i> , <i>Dichopogon capillipes</i> , <i>Haemodorum ?simplex</i> over open grassland <i>Themeda triandra</i> or * <i>Briza maxima</i> on sandy loam soils.	R16	1.83	0.02	

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Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
Predominantly non-native vegetation	Heavily disturbed areas comprising predominantly pasture grasses and forbs and/or scattered non-native and planted trees with occasional native species including scattered <i>Eucalyptus tottiana</i> , <i>Eucalyptus lane-polei</i> and <i>Eucalyptus rudis</i> trees. Waterways dominated by <i>*Juncus acutus</i> , bare soil, roads and buildings have also been included in this category.	-	8153.05	95.58	
Ps	Tall open shrubland <i>Petrophile shuttleworthiana</i> over scattered native shrubs over sparse grassland <i>Austrostipa</i> spp. and/or pasture weeds.	-	10.85	0.13	

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Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
PsBsAhX	Closed heathland <i>Petrophile shuttleworthiana</i> , <i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i> , <i>Lambertia multiflora</i> var. <i>multiflora</i> , <i>Allocasuarina humilis</i> , <i>Banksia kippistiana</i> var. <i>paenepeccata</i> (P3), <i>Hibbertia hypericoides</i> and <i>Xanthorrhoea</i> spp. over sparse low shrubland <i>Banksia stenoprion</i> and <i>Banksia nana</i> (P3) over open rush/sedgeland <i>Mesomelaena</i> spp., <i>Schoenus</i> spp., <i>Lepidosperma</i> spp. over diverse native forbs on laterite plateaus and rises.	Q4, Q5, Q11	52.52	0.62	
X	Shrubland to open shrubland <i>Xanthorrhoea</i> spp. over scattered mixed native shrubs (or absent) over pasture weeds and occasional native species.	-	1.98	0.02	

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Table 8: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
XBcM	Heathland <i>Xanthorrhoea</i> spp., <i>Banksia carlinoides</i> , <i>Lambertia multiflora</i> var. <i>multiflora</i> , <i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i> , <i>Calothamnus longissimus</i> and <i>Melaleuca</i> sp. 2 over rush/sedgeland <i>Mesomelaena</i> spp., <i>Schoenus</i> spp., <i>Lepidosperma</i> spp. and <i>Lepidobolus quadratus</i> (P3) over diverse native herbs on lateritic breakaways.	Q6, Q7, R12	13.92	0.16	

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#### 4.2.2 Vegetation condition

The extent of vegetation by condition category is detailed in **Table 8** and shown in **Figure 5**.

*Table 8: Extent of vegetation condition categories within the site*

Condition category (Keighery 1994)	Total area (ha)	Proportion of site (%)
Pristine	0	0
Excellent	168.48	1.98
Very good	91.09	1.07
Very good - good	23.59	0.28
Good	3.71	0.04
Good - degraded	26.42	0.31
Degraded	33.09	0.39
Degraded - completely degraded	30.35	0.36
Completely degraded	8,1553.05	95.58

#### 4.2.3 Threatened and priority ecological communities

No TECs or PECs occur within the site.

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## 5 Discussion

### 5.1 Flora

#### 5.1.1 Flora inventory

A total of 502 flora species were recorded within the site of which most are native (95.22%). It should be noted that the survey effort was directed towards recording plant taxa within areas of native vegetation and did not aim to record all planted native or non-native species within areas of **predominantly non-native vegetation** which occur over the majority of the site.

The dominant families from which native taxa were recorded are Myrtaceae (75 native and 7 non-native/planted taxa), Proteaceae (65 native taxa) and Fabaceae (54 native and one non-native taxa). The most common genera were *Banksia* (20 taxa), *Acacia* (17 taxa), *Eucalyptus* and *Stylidium* (15 taxa each). The high diversity of flora species recorded was not unexpected given that the site is located within Leseur sandplain subregion which is renowned for its high floristic diversity and level of endemism (Beard 1975; Griffin 1994).

Due to the large number of specimens collected (887) and time and budget limitations not all specimens were identified to species or in some instances genus level. However, all specimens were individually reviewed and identifications were completed for any specimens that had potential to represent conservation significant species.

While both the estimates of the Chao2 and the Jackknife1 (refer **Section 4.1.1**) indicate that the survey effort recorded a near comprehensive species inventory, it is likely that additional species, not recorded during the current survey, occur within the site. This may be due to the wide spacing of transects during targeted searches (50 m) as well as seasonal changes in species composition in the case of annual and perennial geophytic species.

#### 5.1.2 Threatened and priority flora species

A number of priority flora species were recorded within the site as listed in **Table 6**. Most of the species were recorded scattered throughout areas of native vegetation, with the exception of one record of *Eucalyptus x carnabyi* which occurred within predominantly non-native vegetation immediately adjacent to vegetation unit **EtBaBmBc**.

Identification of flora species often requires detailed review of specimens using taxonomic keys and equipment such as microscopes. Due to the high number of threatened and priority flora species that have potential to occur in the site, and the requirement for detailed analysis using specimen, identification of conservation significant flora species in the field was not possible. A large number of specimens was collected and positively identified. However, occurrences of conservation significant species are restricted to opportunistic collections and vegetation sampling locations and it is likely that additional occurrences of the conservation significant flora species recorded within the site occur within areas of suitable habitat as detailed below.

*Leucopogon plumuliflorus* (P2), *Banksia nana* (P3), *Drosera prophylla* (P3), *Stylidium nonscandens* (P3) and *Stylidium aeonioides* (P4) were recorded within vegetation units **PsBsAhX**, **XBcM** and/or

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**GsBaX** which are associated with lateritic hills, rises and breakaways. It is likely that additional individuals of all of these species occur within these vegetation units. The known habitat preferences for these species suggest that these species are likely to be restricted to areas containing lateritic soils and so they are unlikely to occur in areas comprising sandy soils. While vegetation unit **EtBaBmBc** mainly comprises sandy soils, some minor lateritic rises occur scattered amongst this unit in the road reserves and so it is possible that some these species also occur in within vegetation unit **EtBaBmBc** where laterite is present.

*Chordifex reseminans* (P2), *Hypocalymma serrulatum* (P2), *Lyginia excelsa* (P2), *Synaphea xela* (P2), *Hensmania stoniella* (P3), *Stylidium hymenocraspedum* (P3), *Austrostipa nunaginensis* (P3), *Banksia chamaephyton* (P4), *Desmocladius elongatus* (P4), *Hypolaena robusta* (P4), *Stylidium inversiflorum* (P4) and *Schoenus griffinianus* (P4) were recorded within vegetation units **EtBaBm**, **CcXpEm** and/or **EIEaJcCa** which are associated with sandy and/or loamy soils. It is likely that additional individuals of all of these species occur within these vegetation units.

*Banksia kippistiana* var. *paenepeccata* (P3), *Tetratheca angulata* (P3), *Lepidobolus quadratus* (P3) and *Beaufortia bicolor* (P3) were recorded within vegetation units that occur on sandy soils, as well as vegetation units that are associated with laterite, including **EtBaBmBc**, **GsBaX**, **PsBsAhX**, **EgEdGpTa** and/or **XBcM**. The habitat descriptions for all three species suggest that they may occur both on lateritic soils and on sandy soils over laterite, as well as the interzone between the two soil types. Therefore, additional occurrences of these species may occur in the aforementioned vegetation units, as well as vegetation unit **EIEaJcCa**. Similarly, *Eucalyptus x carnabyi* (P3) and *Phlebocarya pilosissima* subsp. *pilosissima* (P3), while only recorded within vegetation unit **EtBaBm** which comprises sandy soils, may also occur within other areas comprising sandy soils, as well areas containing laterite, including vegetation units **GsBaX**, **PsBsAhX**, **EgEdGpTa**, **XBcM** and **EIEaJcCa**.

*Acacia sphaelata* subsp. *verticillata* was recorded throughout much of the site. As this species looks very similar to the undescribed priority 2 species *Acacia* sp. Badgingarra (F. Hort & J. Hort FH 4636) specimens were submitted to the WA herbarium for identification. Herbarium staff confirmed that the lodged specimen represents *A. sphaelata* subsp. *verticillata* and advised that this taxa and *Acacia* sp. Badgingarra (F. Hort & J. Hort FH 4636) are the same entity. It is assumed that the name *Acacia* sp. Badgingarra (F. Hort & J. Hort FH 4636) will soon be removed from DBCA's priority list and the Western Australian plant census kept by the WA herbarium.

As outlined in **Section 4.1.2**, other threatened and priority flora species which were identified as having potential to occur in the site were not recorded during the survey. The survey was undertaken during the flowering period of most of the species with moderate or high likelihood of occurrence. However, some species have flowering periods outside or partially<sup>2</sup> outside of the current survey period and so would not have been visible at the time of the survey, including annual and perennial geophytic species *Diuris recurva* (P4), *Poranthera asybosca* (P1), *Schoenus pennisetis* (P3), *Thelymitra pulcherrima* (P2) and *Thelymitra apiculata* (P4), and so they would not have been detectable during the survey. Additionally, targeted searches were undertaken along transects spaced 50 m apart. And while larger perennials such as trees (*Eucalyptus* species) would have still been visible from this distance, smaller species could have been missed. Therefore, it is recommended that an additional

<sup>2</sup> This is relevant as not all areas of native vegetation were traversed during every survey event (September, October and November).

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targeted survey is undertaken of any areas of native vegetation in 'good – degraded' or better condition proposed to be cleared in order to identify any occurrences of conservation significant species present and confirm total population and/or impact numbers.

## 5.2 Vegetation

### 5.2.1 Vegetation units

The cluster dendrogram allowed for relatively easy determination of vegetation units, with a similarity value of 40% used to separate vegetation units. Where the 40% similarity value intersected the vertical black lines as shown in **Appendix G**, the samples were determined to represent a distinct floristic group. Following statistical analysis, some vegetation units were further separated based on vegetation structure, dominant species and landform, where appropriate.

Samples Q1, Q2, Q3, Q8 and Q9 all occur on a sandplain and are structurally similar (low open woodland) with the same dominant species. These samples showed high similarity to each other (>40%) and so were determined to represent the same floristic group (vegetation unit **EtBaBm**).

Vegetation unit **EtBaBmBc** occurs over most of the Cadda Road, Cowalla Road, Yerramullah Road and Brand Highway road reserves. Occasionally the sandy soils associated with vegetation unit **EtBaBmBc** are intersected with minor incursion of laterite gravel which results in appearance of scattered species that are more characteristic of the vegetation units associated with the laterite ranges, while still containing species that characteristic of vegetation unit **EtBaBmBc**. An example of this is the vegetation associated with sample Q17. Q17 shows low similarity (20-25%) to samples within a number of vegetation units associated with the laterite ranges, as well as the sandplain, including **EgEdGpTa**, **PsBsAhX**, **XBcM**, **EtBaBmBc** and **GsBaX**. Given the small extent of this vegetation and given that it occurs on the boundary of sandy soils and sandy soils with laterite gravel, it is considered to represent a transitional vegetation unit rather than its own floristic group. These transitional areas of vegetation were grouped with other vegetation units depending on which unit it appeared more similar to. In most cases this was vegetation unit **EtBaBmBc** but a few small areas of transitional vegetation within the Yerramullah road reserve are more similar to vegetation unit **GsBaX** which is associated with low laterite hills.

Samples Q4, Q5, Q6, Q7 and Q11 all showed high similarity to each other (>40%) which is not surprising given that all samples occur on the same laterite range and so they share many common species. However, Q4, Q5 and Q11 were largely dominated by *Petrophile shuttleworthiana* and *Banksia sphaerocarpa* and are located on the flat plateau, while samples Q6 and Q7 are dominated by *Xanthorrhoea* spp., *Banksia carlinoides* and *Melaleuca* sp. 2 and are located on the steep breakaway. Therefore, samples were separated into two floristic groups based on differences in dominant species and topographic location: Q4, Q5 and Q11 were determined to represent vegetation unit **PsBsAhX** and samples Q6 and Q7 were determined to represent vegetation unit **XBcM**. Sample R12 is located on an isolated laterite breakaway in poorer condition and with higher weed loads, which is likely the reason why sample R12 didn't show high similarity to any other samples. Given that R12 is associated with a similar landform and was dominated by many of the species characteristic of vegetation unit **XBcM**, namely *Xanthorrhoea* sp. 1 and *Melaleuca* sp. 2, this area was assigned to **XBcM**.

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Sample Q10 had moderate similarity to a number of other samples, particularly Q4, Q5, Q6 and Q7 (~35%). This is likely because it is located on the same laterite range and shares many common understorey species with vegetation units **PsBsAhX** and **XBcM**. However, the vegetation associated with Q10 has a distinct overstorey layer of *Eucalyptus gittinsii* subsp. *illucida* and *Eucalyptus drummondii* which other vegetation units lack and so Q10 was determined to represent a distinct floristic group (vegetation unit **EgEdGpTa**).

Determining vegetation units for the remainder of the samples was straight forward and was based solely on the results of the cluster analysis, including samples R13 and R14 in **GsBaX**, samples Q18 and Q19 in **EIEaJcCa**, sample Q15 in **CcXpEm** and R16 in **Mr**.

A number of additional areas in the site contained native vegetation in good - degraded, degraded or degraded - completely degraded condition that were considered too disturbed to warrant formal sampling, including vegetation units **Cc**, **EI**, **M**, **Ps**, and **X**. This is because vegetation was largely limited to an overstorey or midstorey layer of native trees or tall shrubs without or with only scattered native understorey vegetation and so was described based on the dominant species present.

## 5.2.2 Vegetation condition

The majority of the site was mapped as being in 'completely degraded' condition as it comprises predominantly non-native grassland and/or agricultural crops with only occasional scattered native species.

The most intact native vegetation is associated with vegetation units **EtBaBmBc**, **EgEdGpTa**, **XBcM** and **PsBsAhX** in the south-eastern portion of the site. These patches of vegetation were mapped as being in 'excellent' condition as they had an intact vegetation structure with high native species diversity and low weed cover (if any).

Parts of vegetation units **EtBaBmBc**, **Mr** and **XBcM** and all of vegetation units **CcXpEm** and **EIEaJcCa** were mapped in 'very good' condition as previous disturbance was evident through impacts to vegetation structure and/or higher weed cover in combination with lower native species cover and diversity. Most of this vegetation occurs within road reserves or on the edges of larger patches of vegetation where it is more susceptible to disturbance and weed invasion.

Parts of vegetation units **GsBaX** and **EtBaBmBc** were mapped as being in 'good' condition where basic vegetation structure was retained but native species occurred at lower diversity and cover in combination with higher weed loads.

Vegetation units **EI**, **M** and **X** as well as part of vegetation units **EtBaBmBc** and **GsBaX** were mapped as being in 'degraded' condition as native understorey species cover and diversity was low in combination with high weeds loads.

Multiple compound categories were applied where areas of vegetation partially met criteria for multiple condition categories. Parts of vegetation units **EtBaBmBc** and **GsBaX** were mapped as being in 'very good - good' condition. This is because vegetation the vegetation retained moderate to high native species diversity but the vegetation structure was altered through historical disturbance and weeds were present at higher cover in combination with lower native species cover. Parts of

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vegetation unit **GsBaX** was mapped as being in 'good - degraded' condition, as vegetation was impacted by stock grazing which resulted in significant changes to the vegetation structure but native species diversity was often still moderate to high which is more characteristic of 'good' condition. Vegetation units **Ps**, **MpEt** and **Cc** were mapped as being in 'degraded - completely degraded' condition as, while they comprise a native overstorey layer of native trees or tall shrubs, they lack native understorey vegetation and instead occur as a non-native grassland of pasture weeds.

Due to the large size of the site, small scale changes in condition categories, such as narrow strips of vegetation in lower condition along the edges, were not separated.

### 5.2.3 Threatened and priority ecological communities

Vegetation unit **EtBaBmBc** has some similarity to the 'Lesueur-Coomallo floristic community A1.2' TEC (A1.2 TEC) which is described as 'a species-rich heath with emergent *Hakea obliqua* on sand with faithful species of *Hakea obliqua* and *Beaufortia elegans* and constant species of *Dasyopogon bromeliifolius* and *Stirlingia latifolia* over well-drained grey sand over pale yellow sand on lateritic uplands. Associated species include *Allocasuarina humilis*, *Calothamnus sanguineus*, *Hibbertia hypericoides*, *Hypocalymma xanthopetalum* and *Schoenus subflavus*' (DCLM 2002a; DBCA 2023e). A number of the species that are described as characteristic of the A1.2 TEC were recorded within vegetation unit **EtBaBmBc**, including *Hakea obliqua*, *Stirlingia latifolia*, *Allocasuarina humilis*, *Calothamnus sanguineus*, *Hibbertia hypericoides*, *Hypocalymma xanthopetalum* and *Schoenus subflavus*. These species are generally common and widespread throughout sandy soils of the Geraldton Sandplains IBRA region, including areas that do not represent the TEC. The Lesueur-Coomallo Floristic Community A1.2 is currently known from a single occurrence within Lesueur National Park that is 4 ha in size (DCLM 2002a; DBCA 2023e). Martinick and Associates (1989) have undertaken regional vegetation studies over multiple reserves in the wider areas of the site, including Badgingarra National Park. The study identified that *Hakea obliqua* dominated heath on sandy soils occurs in all of the major reserves. Despite significant survey effort in the wider region (Hopkins and Hnatiuk 1981; Martinick and Associates 1989; Griffin and Hopkins 1990; Griffin 1994; Griffin and Hopkins undated), no additional occurrences of the A1.2 TEC have been identified and so it appears that the TEC is floristically distinct from other areas of *Hakea obliqua* heath and that the vegetation type may be restricted to the Mount Lesueur area. Therefore, the vegetation in the site is not considered to represent this TEC.

Vegetation units **PsBsAhX**, **XBcM** and **GsBaX** have some similarity to the 'Lesueur-Coomallo floristic community D1' TEC (D1 TEC) which is described as 'a species-rich low heath on moderately to well-drained lateritic gravels on lower slopes and low rises, dominated by *Allocasuarina microstachya* with *Allocasuarina ramosissima*, *Allocasuarina humilis*, *Babingtonia grandiflora*, *Borya nitida*, *Calytrix flavescens*, *Calothamnus sanguineus*, *Conostylis androstemma*, *Cryptandra pungens*, *Banksia armata*, *Gastrolobium polystachyum*, *Hakea auriculata*, *Hakea incrassata*, *Hakea erinacea*, *Hibbertia hypericoides*, *Hypocalymma xanthopetalum*, *Melaleuca trichophylla*, *Petrophile chrysantha*, *Schoenus subflavus* and *Xanthorrhoea drummondii*' (DCLM 2002b; DBCA 2023f). The D1 TEC is currently known from a single occurrence that is 0.1 ha in size and located within private freehold land between Lesueur National Park and Coomallo Creek Nature Reserve. While a number of the species that are characteristic of the D1 TEC were recorded within vegetation units **PsBsAhX** and **XBcM**, including *Allocasuarina microstachya*, they are not dominated by this species which appears to be a key defining feature of the TEC. Therefore, they are not considered to represent this TEC.

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Vegetation units **PsBsAhX**, **XBcM** and **GsBaX** have some similarity to the '*Petrophile chrysantha* low heath on Lesueur dissected uplands' PEC (*Petrophile chrysantha* PEC) which is described as 'low heath dominated by *Petrophile chrysantha* on Lesueur dissected uplands. Associated species include *Dryandra armata* and *Hakea undulata*' (DBCAs 2023d). This PEC is known from multiple small occurrences within Lesueur National Park. While a number of the species that are characteristic of the *Petrophile chrysantha* PEC were recorded within vegetation units **PsBsAhX**, **XBcM** and **GsBaX**, including *Petrophile chrysantha*, they are not dominated by this species and so it is considered unlikely that the vegetation in the site comprises this PEC.

#### 5.2.4 Regional and local significance

Flora and vegetation may be significant irrespective of protection under policy or legislation.

Some of the vegetation in the site represents intact native kwongan heathland which is recognised as supporting a high floristic diversity and level of endemism. Additionally, native vegetation in the southern portion of site, while intersected by Cadda Road, is connected to and forms an extension of Badgingarra National Park and is likely to support dispersal of genetic diversity.

*Schoenus subbarbatus*, a species of Cyperaceae currently not known from the Geraldton Sandplains IBRA region was recorded within the site. This is a 175 km northern range extension for the species which was previously only known from an area ranging from Perth in the north-west and Cape Arid in the south-east and an isolated occurrence from near Mount Palmer. Additionally, the record of priority 3 species *Eucalyptus x carnabyi* represents a slight western range extension with the nearest known records occurring approximately 31 km south-east and 41 km north-east of the site. Due to the distance to other known records, this species did not get reported from database searches for conservation significant flora species undertaken for the site.

The WA Herbarium has advised that flora specimens from the region are limited. Therefore, specimens of interest to the herbarium, including poorly represented taxa, range extensions and specimens identified as being valuable will be lodged for incorporation into the reference herbarium.

The vegetation in the site may be significant as it provides habitat to a range of native fauna species, including threatened *Calyptorhynchus latirostris* (Carnaby's black cockatoo).

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# 6 Conclusions

Outcomes of the assessment include the following:

- A total of 478 native and 25 non-native flora species were recorded within the site.
- 23 species listed as priority flora in Western Australia were recorded: *Chordifex reseinans* (P2), *Hypocalymma serrulatum* (P2), *Leucopogon plumuliflorus* (P2), *Lyginia excelsa* (P2), *Synaphea xela*, *Austrostipa nunaginensis* (P3), *Banksia kippistiana* var. *paenepeccata* (P3), *Banksia nana* (P3), *Beaufortia bicolor* (P3), *Drosera prophylla* (P3), *Hensmania stoniella* (P3), *Lepidobolus quadratus* (P3), *Phlebocarya pilosissima* subsp. *pilosissima* (P3), *Stylidium hymenocraspedum* (P3), *Stylidium nonscandens* (P3), *Tetradthea angulata* (P3), *Banksia chamaephyton* (P4), *Desmocladius elongatus* (P4), *Eucalyptus x carnabyi* (P4), *Hypolaena robusta* (P4), *Schoenus griffinianus* (P4), *Stylidium aeonioides* (P4) and *Stylidium inversiflorum* (P4).
- 13 threatened and 84 additional priority flora species may occur in the site.
- The majority of the site comprises **predominantly non-native vegetation** in 'completely degraded' condition (8153.05 ha, 95.58%).
- 14 native vegetation units were identified within the site, ranging from 'excellent' to 'degraded - completely degraded' condition. Native vegetation occurs over 376.75 ha in the site (4.42%).
- No threatened ecological communities or priority ecological communities occur within the site.

# Detailed Flora and Vegetation Assessment

## Parron Wind Farm Development Support



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### 7.2 Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 7.1**, with access date information provided in **Table R 1**.

*Table R 1 Access dates for online references*

Reference	Date accessed	Website or dataset name
(BoM 2024)	1 February 2024	Climate Data Online
(DBCA 2023f)	3 April 2024	Threatened Ecological Communities
(DAWE 2021)	3 April 2024	Weeds of National Significance (WoNS)
(DCCEEW 2024)	20 November 2023	Protected Matters Search Tool
(WALIA 2024)	3 April 2024	Landgate Map Viewer
(Western Australian Herbarium 2024)	Multiple dates between January and April 2024	Florabase

# Figures



*Figure 1: Site Location*

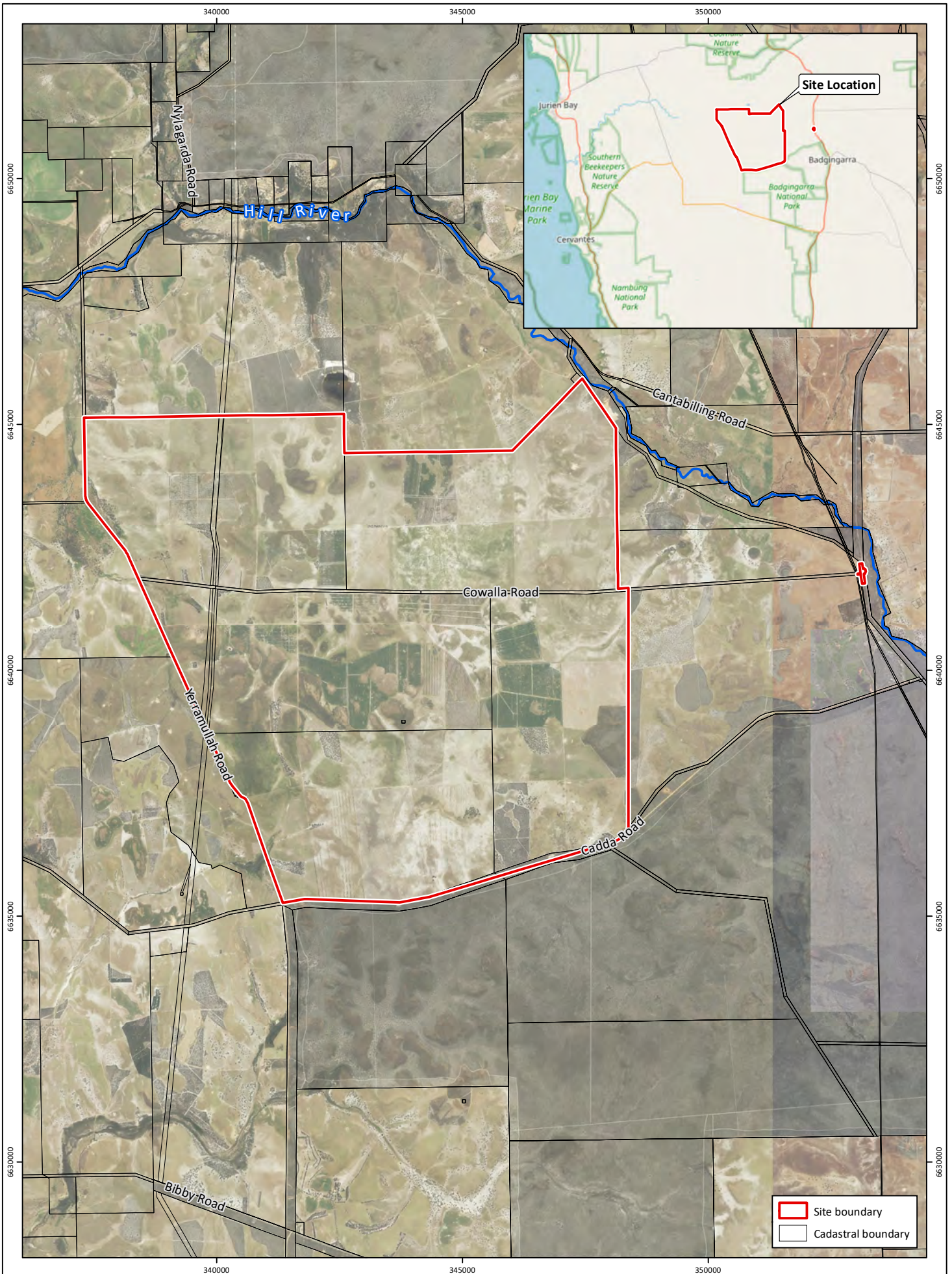
*Figure 2: Soils and Topography*

*Figure 3: Legislated lands and Hydrology*

*Figure 4: Vegetation Units*

*Figure 5: Vegetation Condition*

*Figure 6: Priority Flora Locations*



**Figure 1: Site Location**

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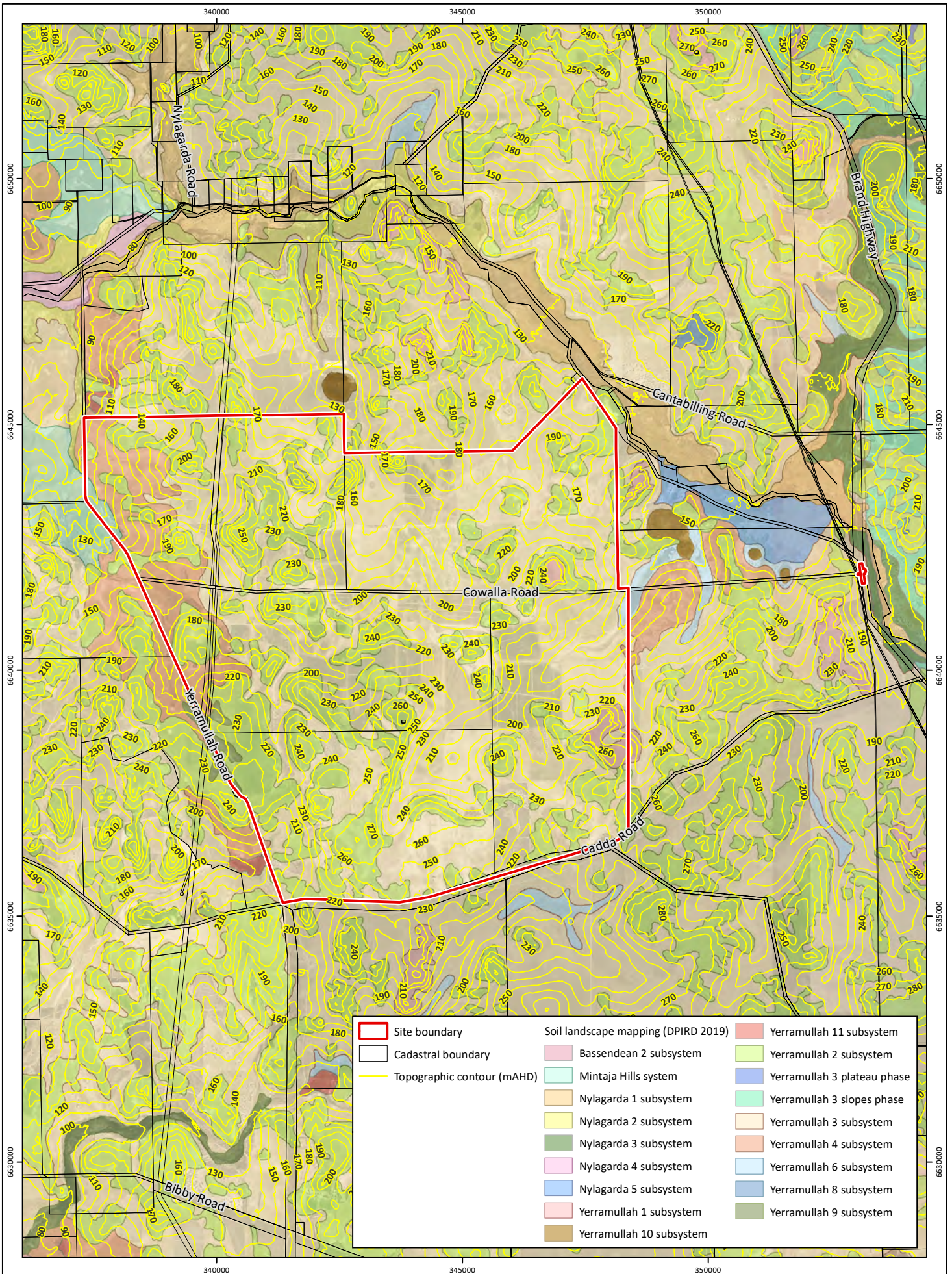
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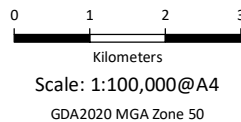
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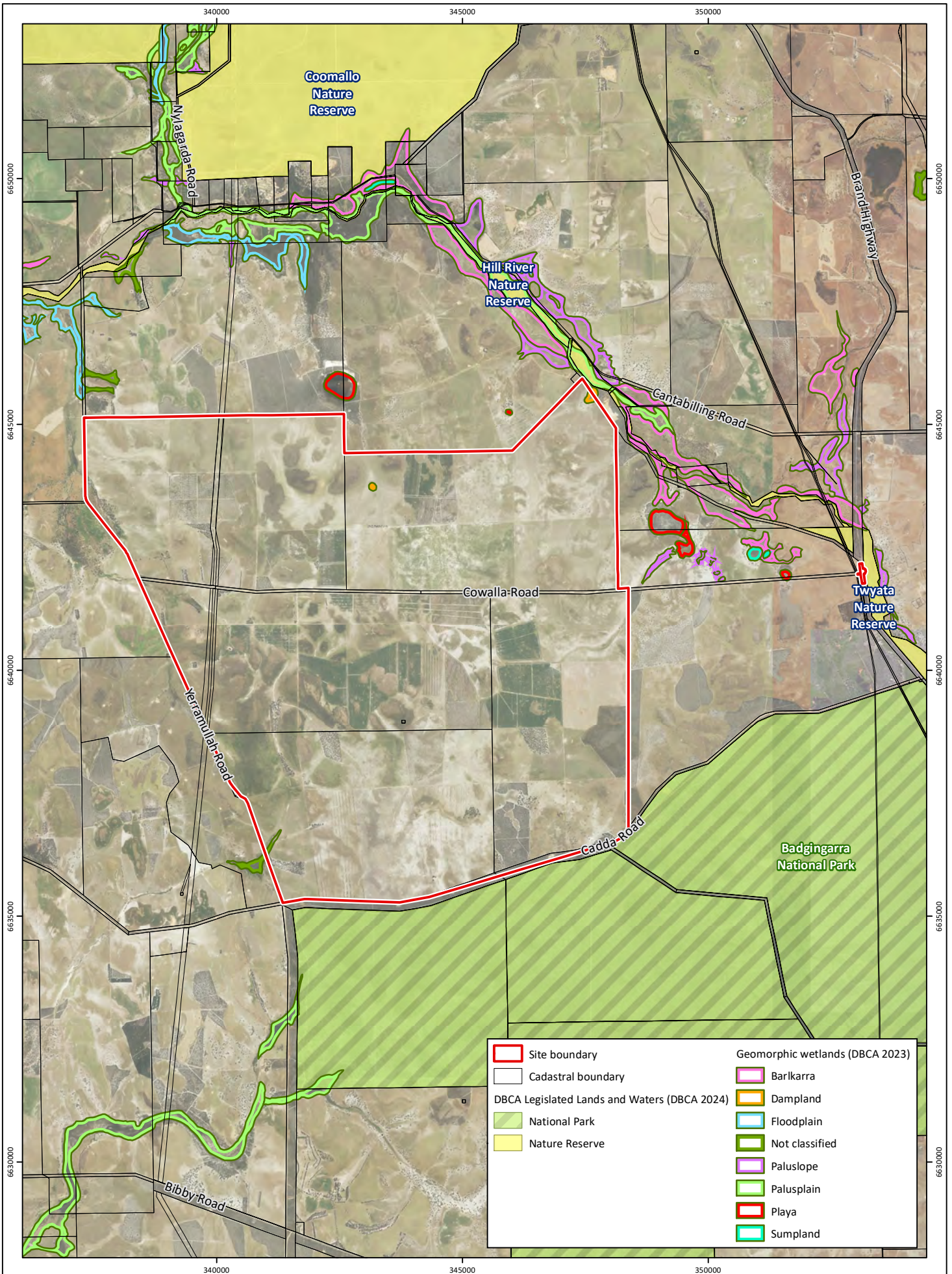


**Figure 2: Soils and Topography**

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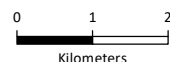


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**Figure 3: Legislated Lands and Hydrology**

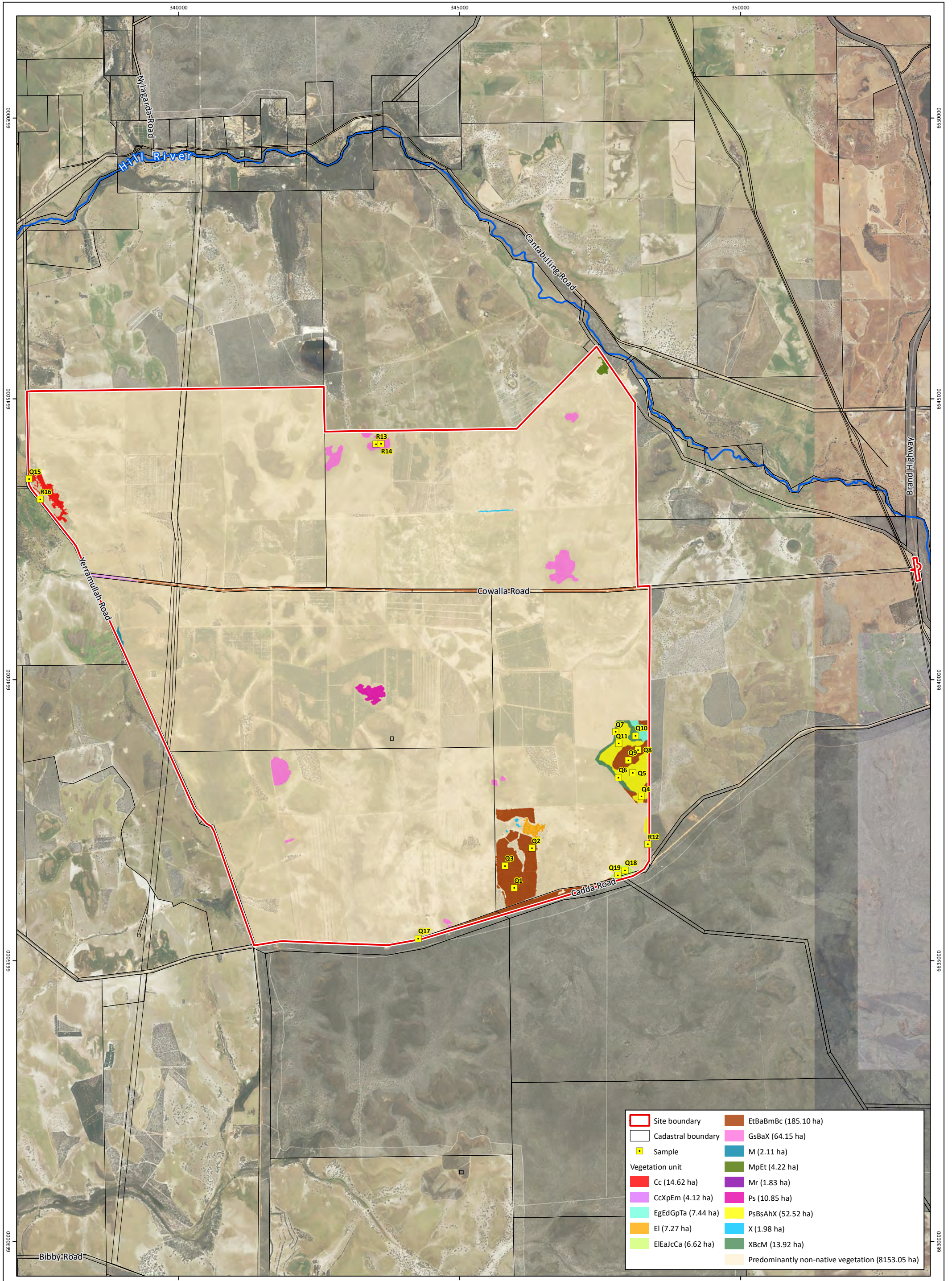
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**Figure 4: Vegetation Units**

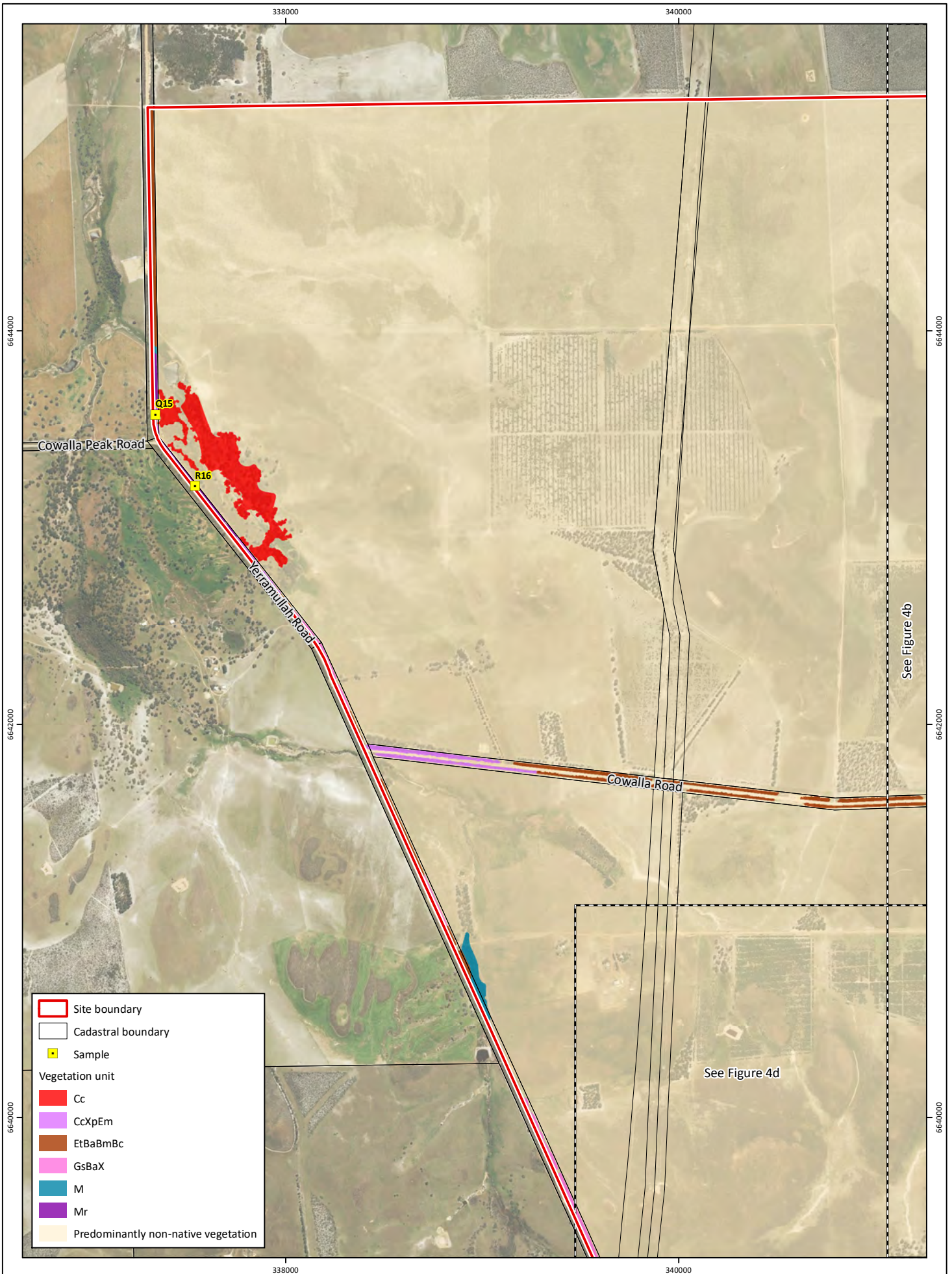
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Parron Wind Farm Development Support  
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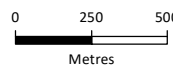


**Figure 4a: Vegetation Units**

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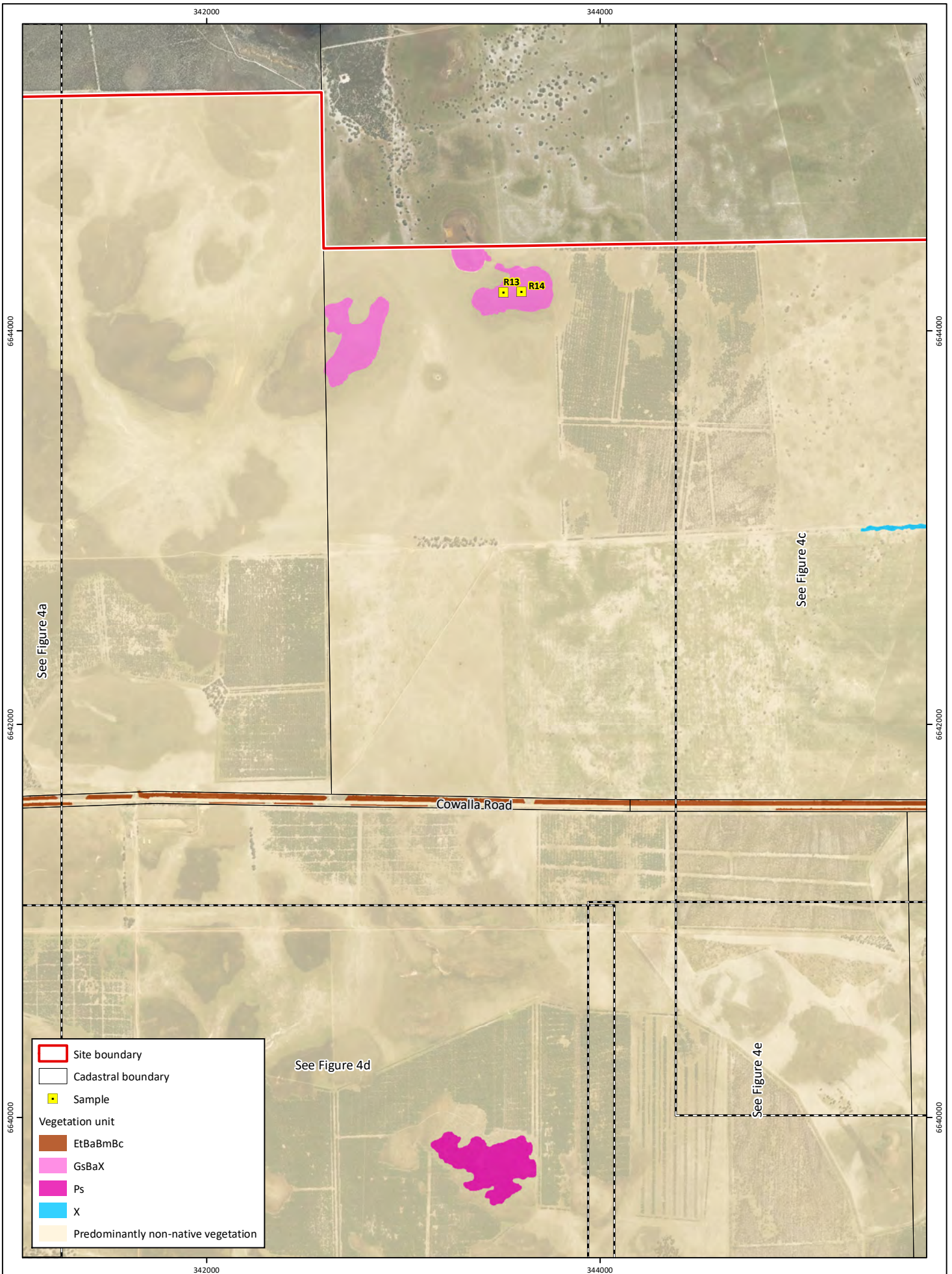
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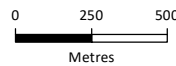


**Figure 4b: Vegetation Units**

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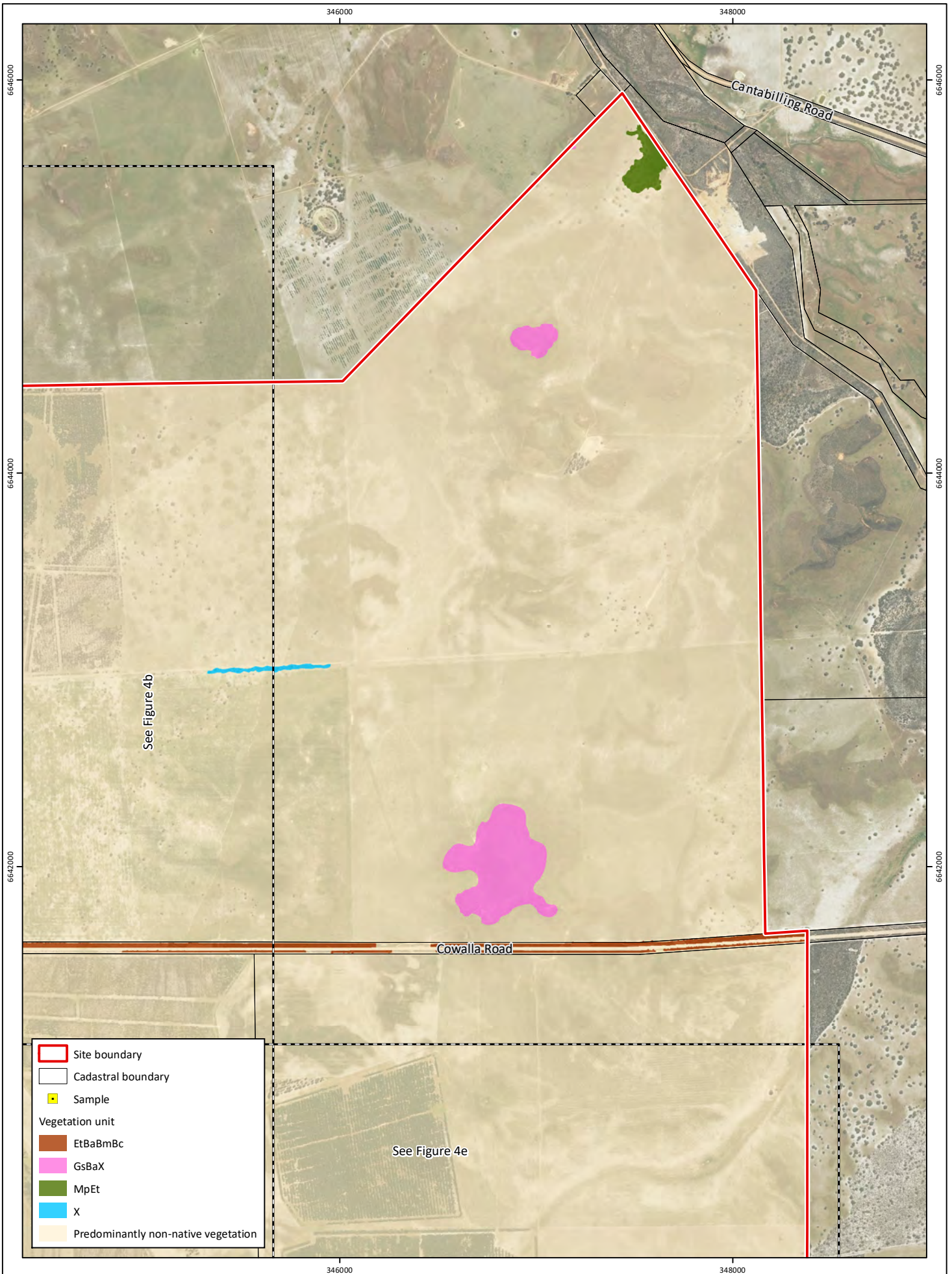
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GDA2020 MGA Zone 50



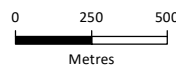


**Figure 4c: Vegetation Units**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support

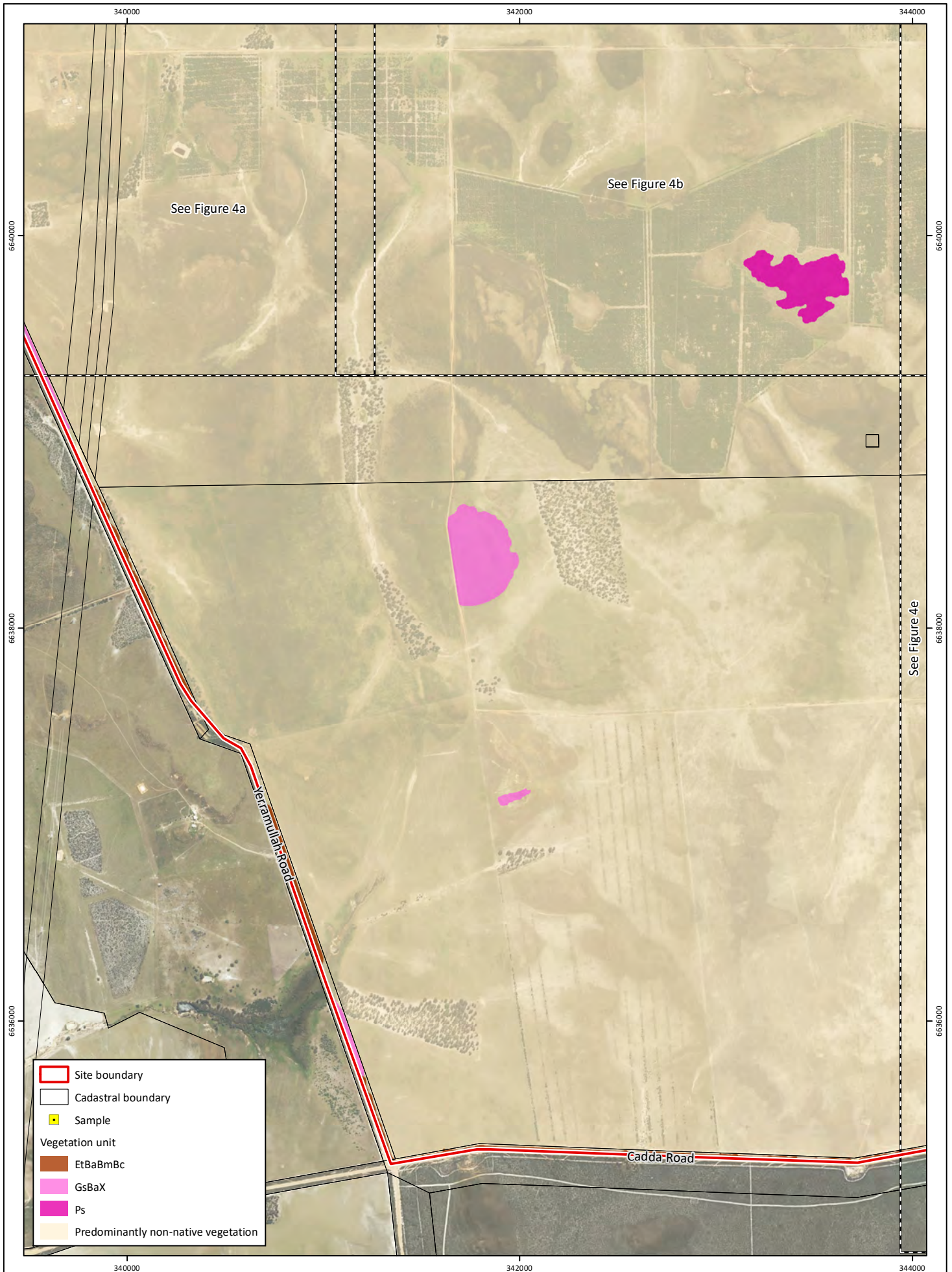
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**Plan Number:** EP23-085(01)--F33a  
**Drawn:** WJC  
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**Date:** 01/11/2024



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GDA2020 MGA Zone 50



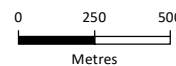


**Figure 4d: Vegetation Units**

**Project:** Detailed Flora and Vegetation Assessment  
 Parron Wind Farm Development Support

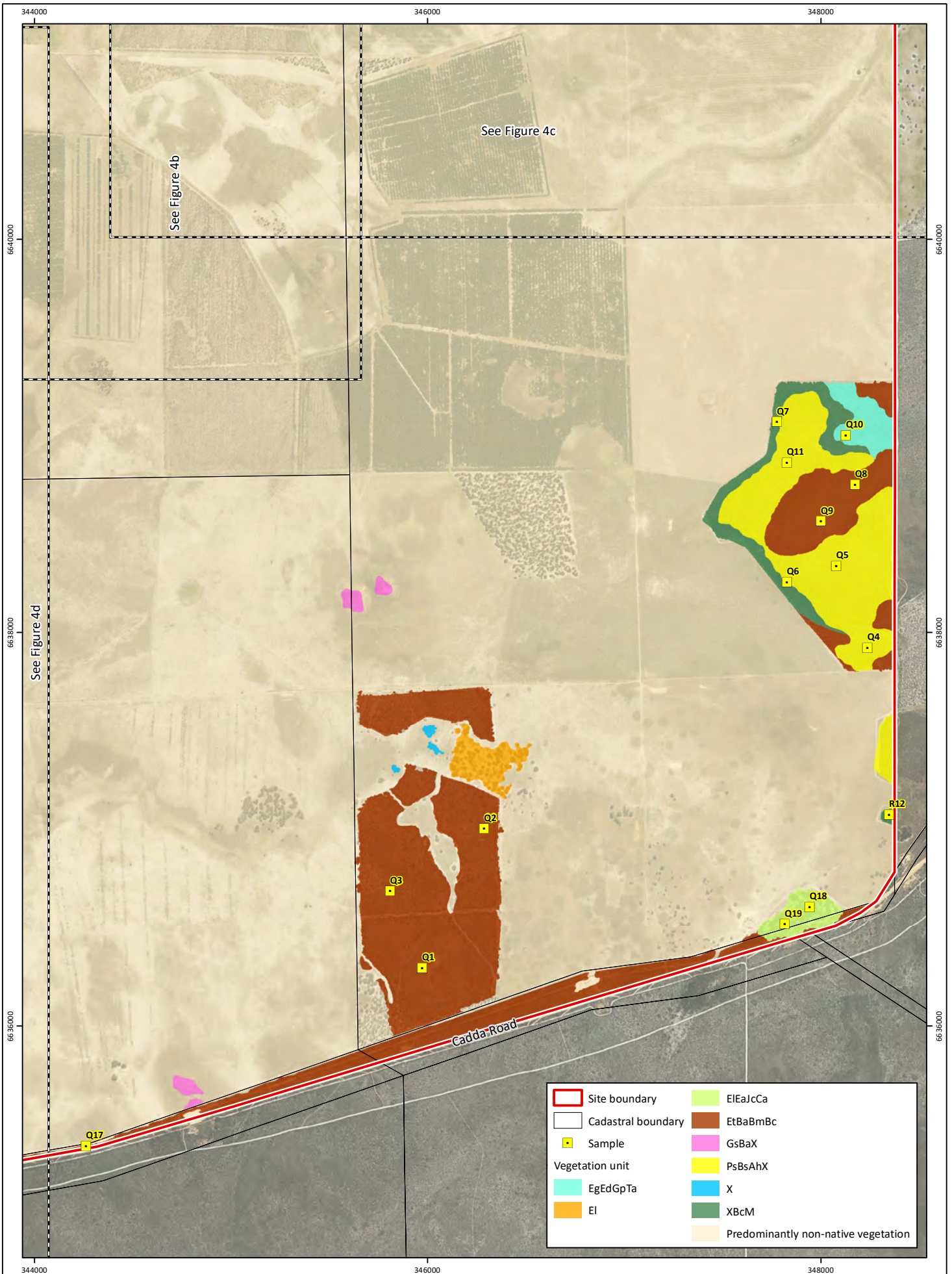
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**Drawn:** WJC  
**Date:** 30/10/2024  
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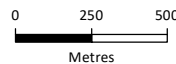
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**Figure 4e: Vegetation Units**

Plan Number:  
EP23-085(01)-F33a  
Drawn: WJC  
Date: 30/10/2024  
Checked: MS  
Approved: RAW  
Date: 01/11/2024



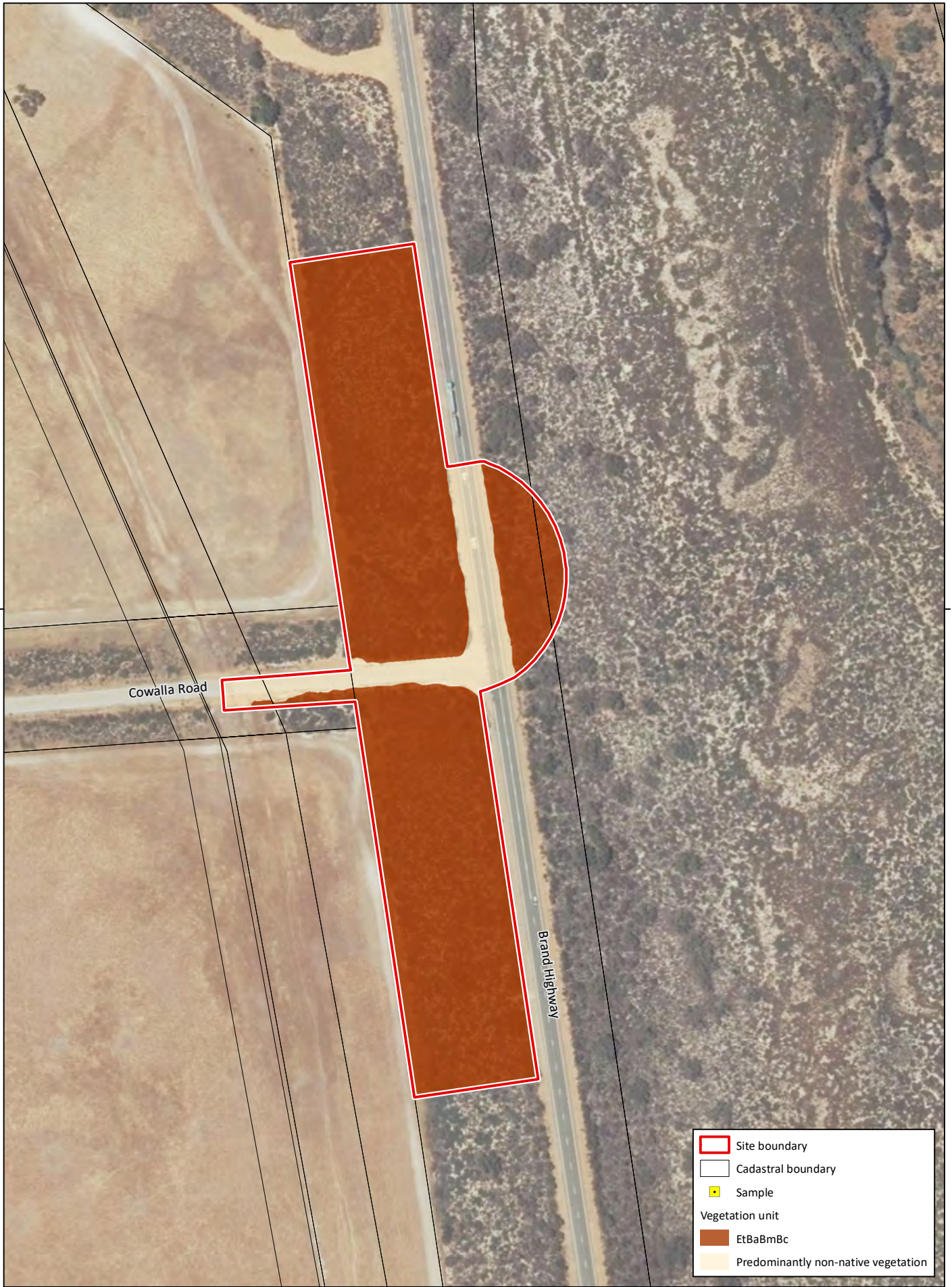
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**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support  
**Client:** Zephyr Energy Pty Ltd



6642000

6642000

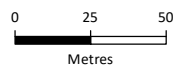


**Figure 4f: Vegetation Units**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support

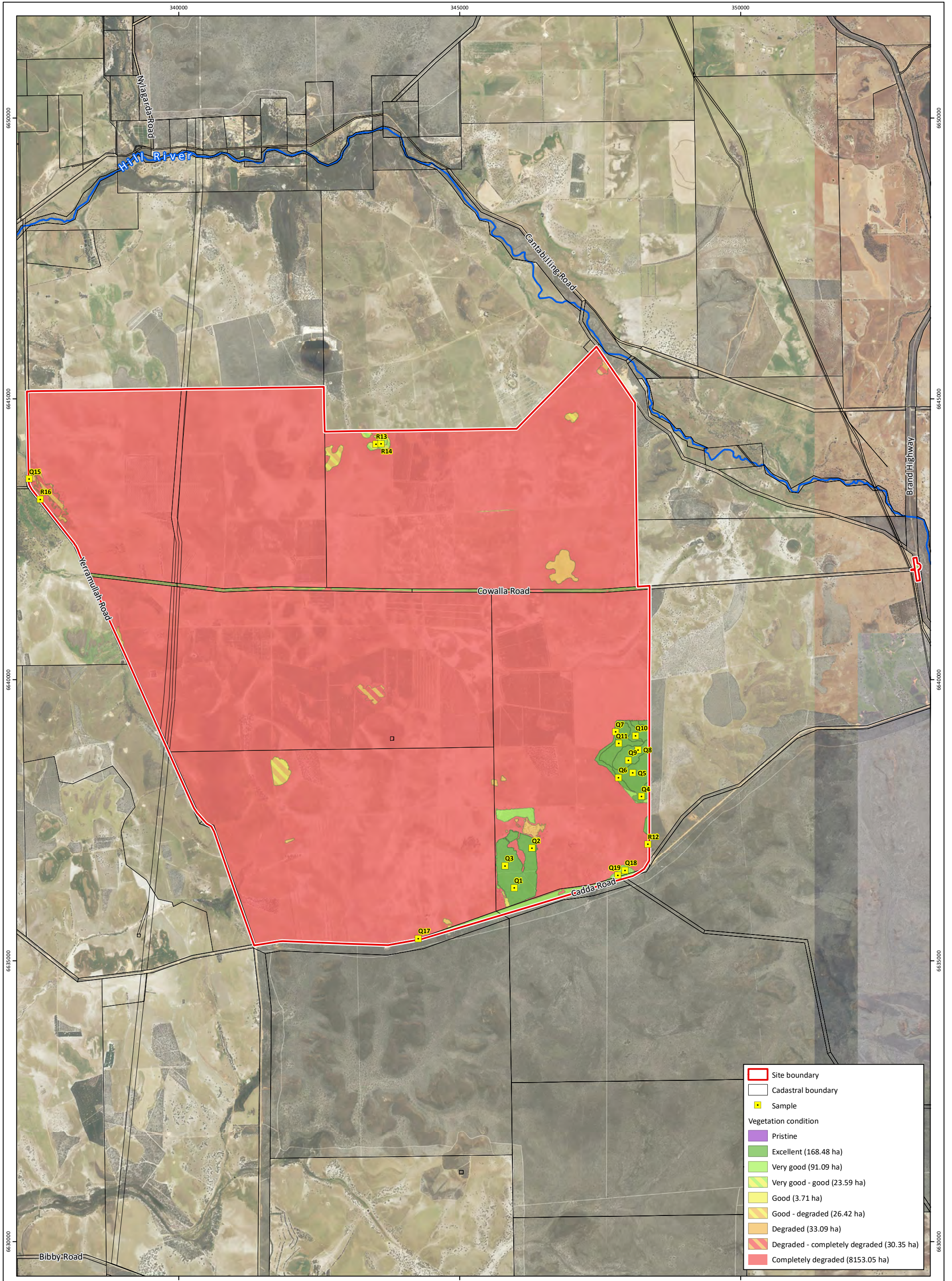
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**Plan Number:** EP23-085(01)--F33a  
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**Checked:** MS  
**Approved:** RAW  
**Date:** 01/11/2024



**Scale:** 1:2,500@A4  
GDA2020 MGA Zone 50





**Figure 5: Vegetation Condition**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support  
**Client:** Zephyr Energy Pty Ltd

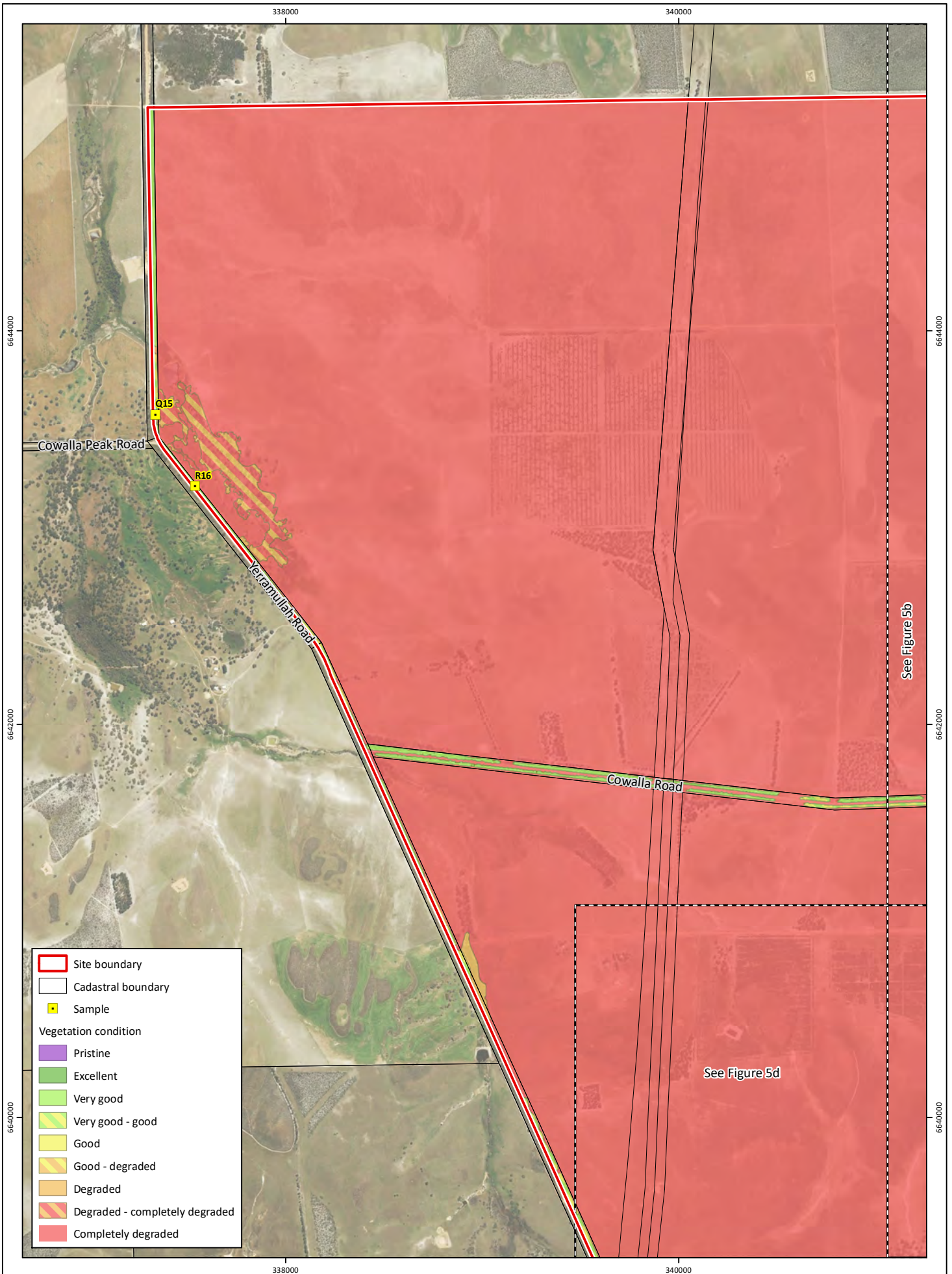
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**Date:** 01/11/2024



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GDA2020 MGA Zone 50



While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used ©Landgate (2024).

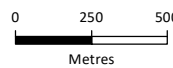


**Figure 5a: Vegetation Condition**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support

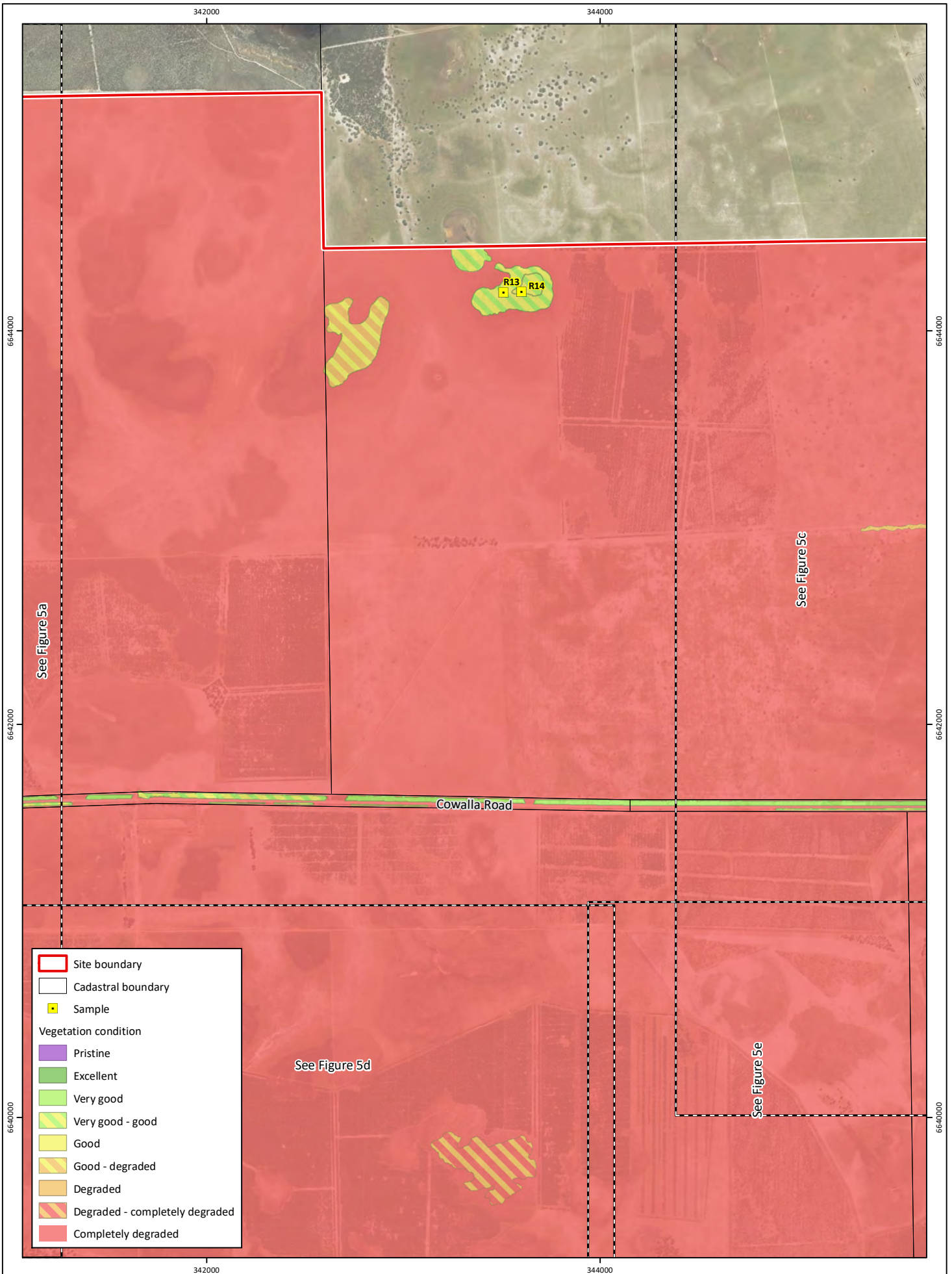
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**Plan Number:** EP23-085(01)-F35a  
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**Scale:** 1:25,000@A4  
GDA2020 MGA Zone 50

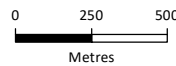




**Figure 5b: Vegetation Condition**

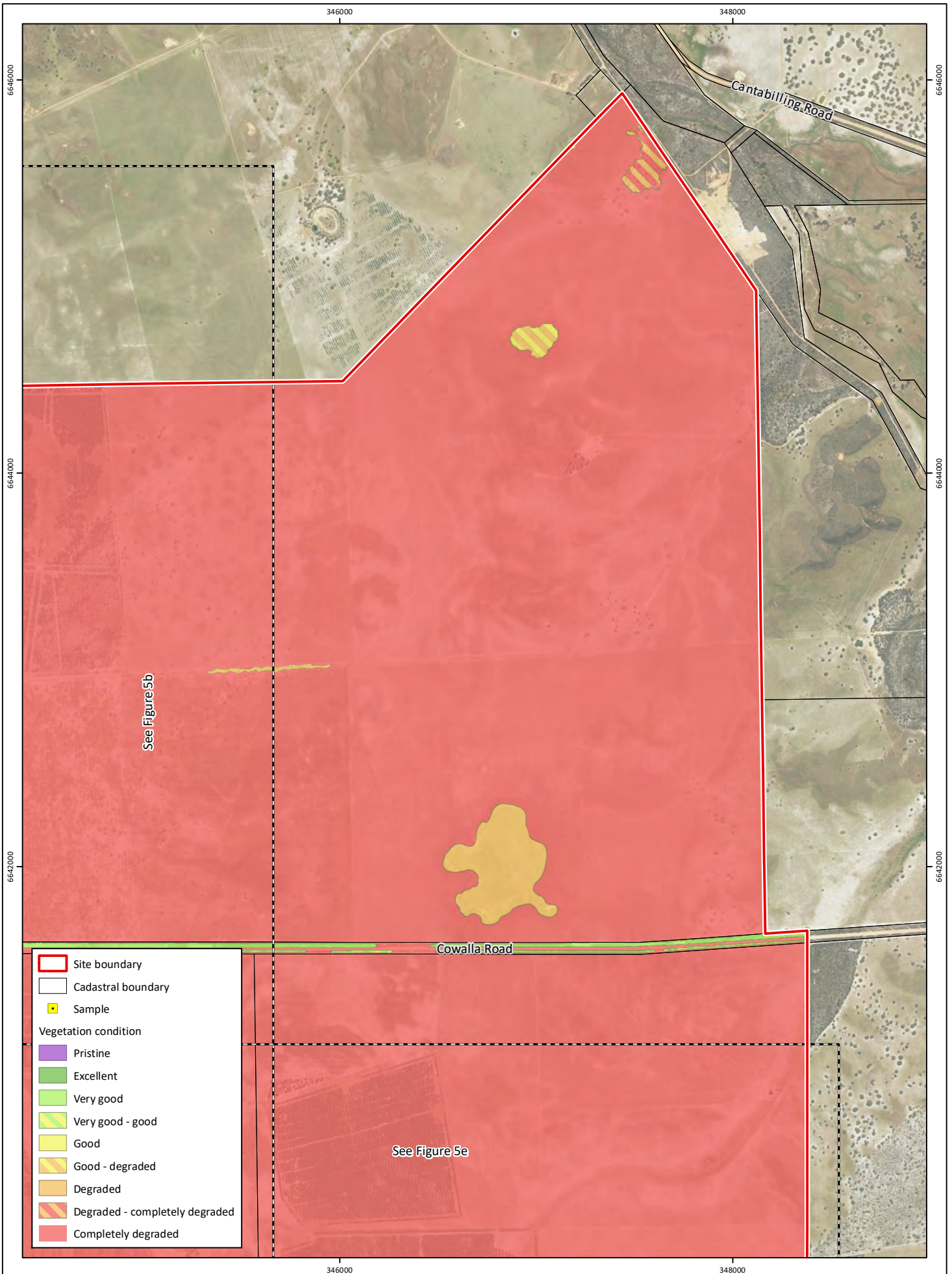
**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support  
**Client:** Zephyr Energy Pty Ltd

**Plan Number:** EP23-085(01)--F35a  
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**Date:** 30/10/2024  
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**Date:** 01/11/2024



**Scale:** 1:25,000@A4  
GDA2020 MGA Zone 50





**Figure 5c: Vegetation Condition**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support

**Client:** Zephyr Energy Pty Ltd

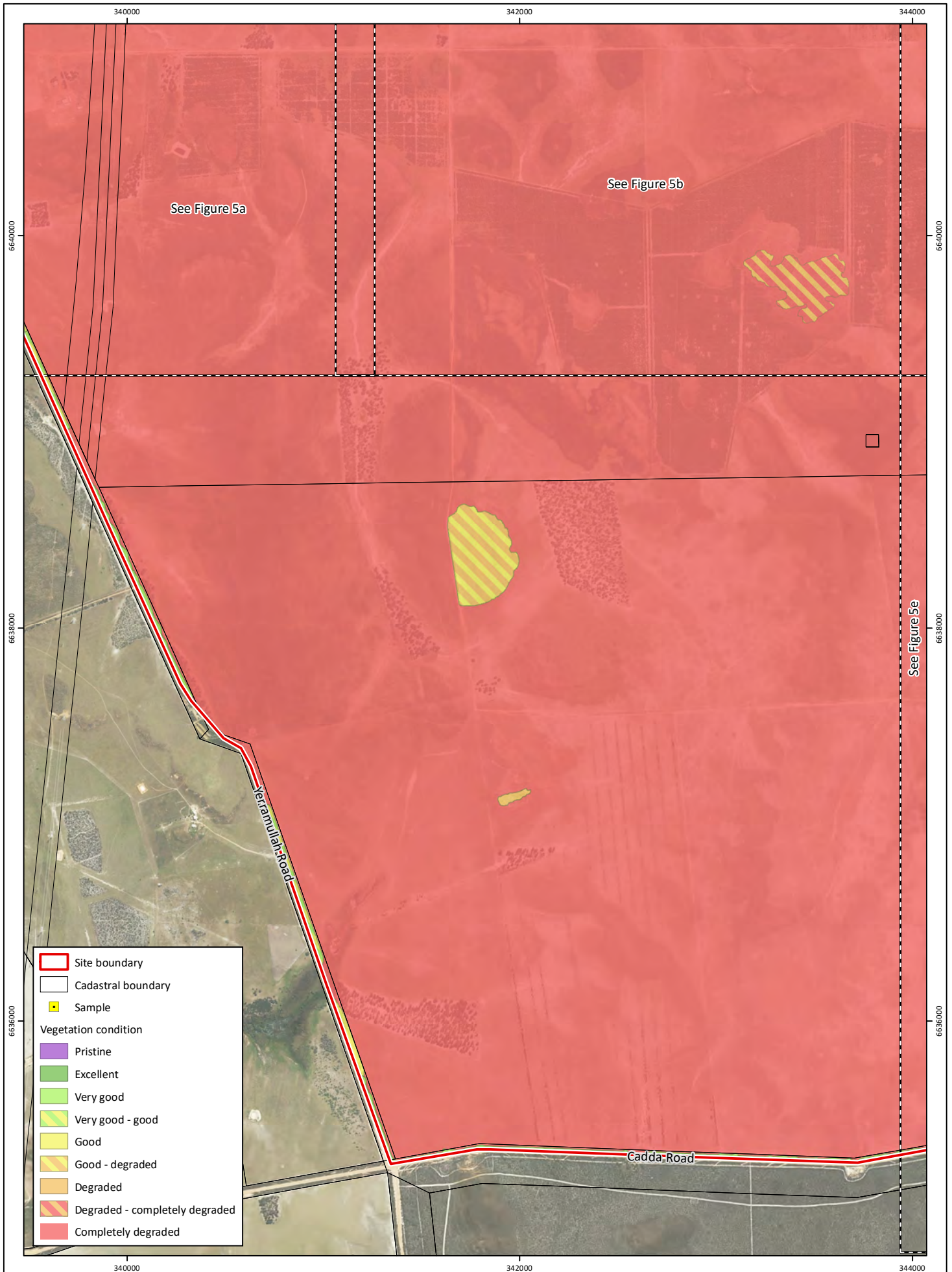
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**Date:** 01/11/2024



0 250 500  
Metres

Scale: 1:25,000@A4  
GDA2020 MGA Zone 50





**Figure 5d: Vegetation Condition**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support

**Client:** Zephyr Energy Pty Ltd

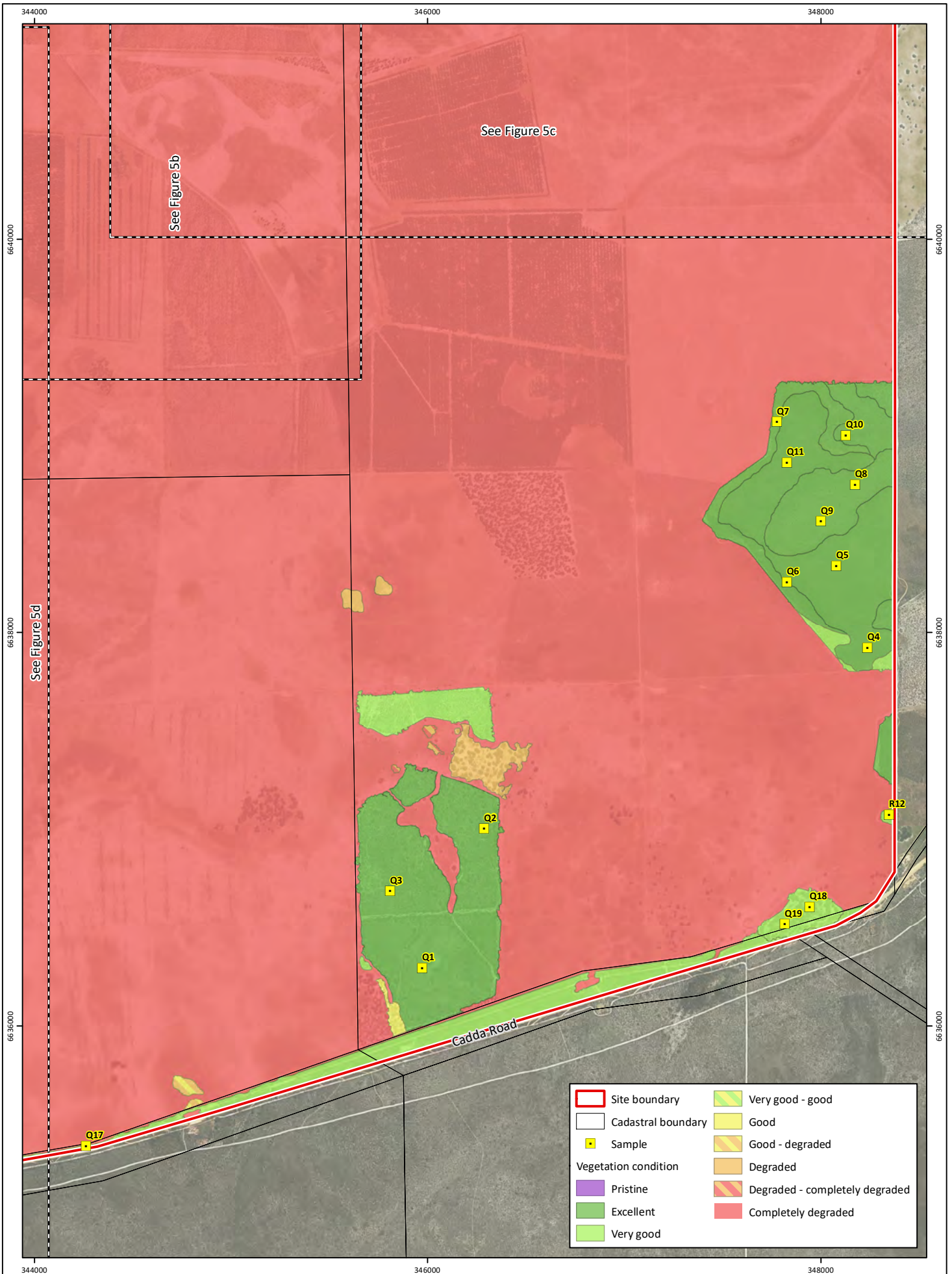
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Metres

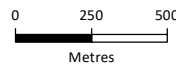
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GDA2020 MGA Zone 50





**Figure 5e: Vegetation Condition**

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Drawn: WJC  
Date: 30/10/2024  
Checked: MS  
Approved: RAW  
Date: 01/11/2024



Scale: 1:25,000@A4  
GDA2020 MGA Zone 50

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support  
**Client:** Zephyr Energy Pty Ltd



6642000

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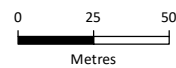


**Figure 5f: Vegetation Condition**

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support

**Client:** Zephyr Energy Pty Ltd

**Plan Number:** EP23-085(01)--F35a  
**Drawn:** WJC  
**Date:** 30/10/2024  
**Checked:** MS  
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GDA2020 MGA Zone 50



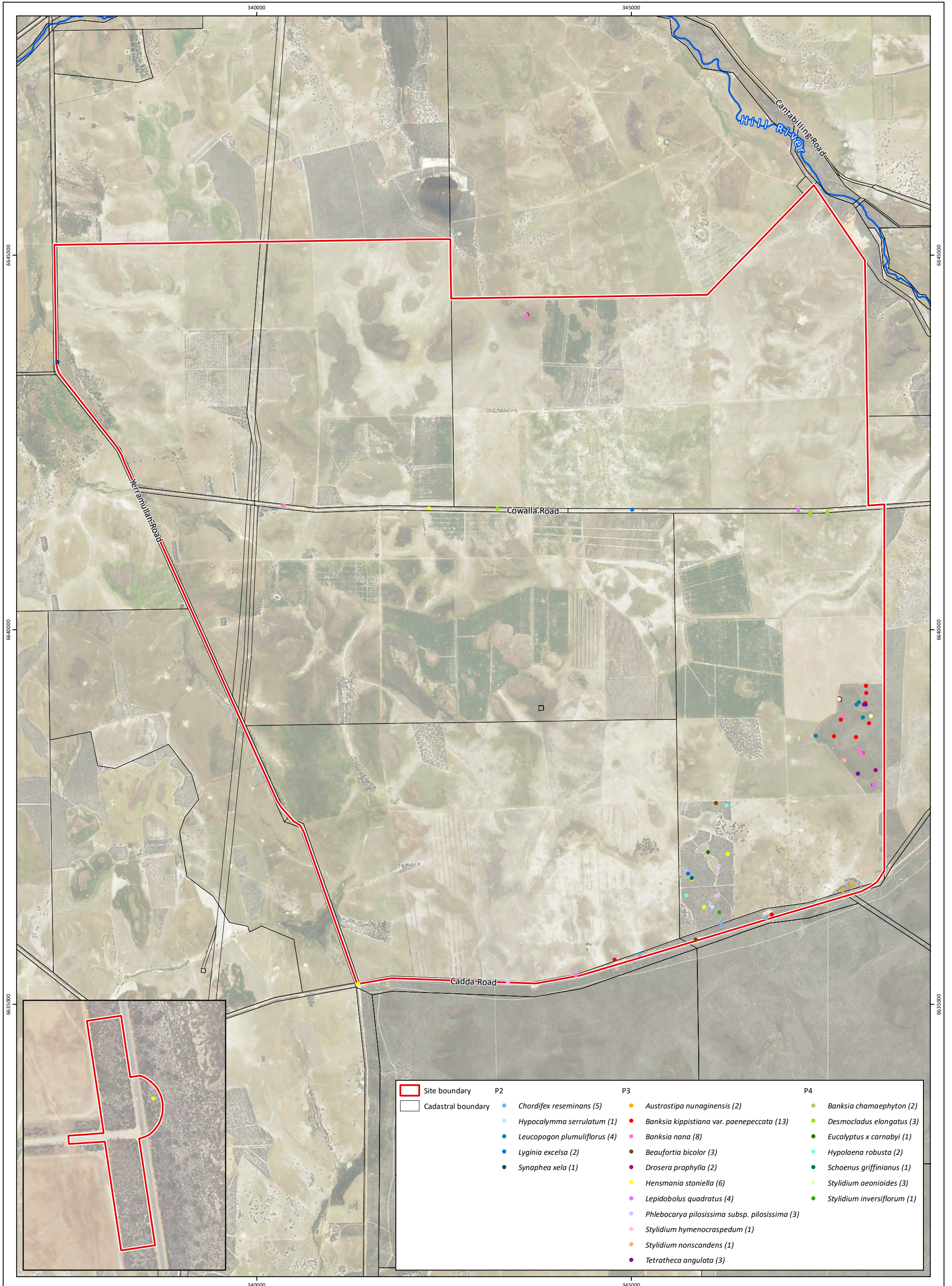


Figure 6: Priority Flora Locations

**Project:** Detailed Flora and Vegetation Assessment  
Parron Wind Farm Development Support  
**Client:** Zephyr Energy Pty Ltd

**Plan Number:** EP23-085(01)-F36a  
**Drawn:** WJC  
**Date:** 30/10/2024  
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**Approved:** RAW  
**Date:** 01/11/2024



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GDA2020 MGA Zone 50





# Appendix A

Additional Information





## Conservation Significant Flora and Vegetation

### Threatened and priority flora

Flora species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. At the Commonwealth level, flora species can be listed as ‘threatened’ pursuant to Schedule 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In Western Australia, plant taxa may be classed as ‘threatened’ under the *Biodiversity Conservation Act 2016* (BC Act) which is enforced by Department of Biodiversity Conservation and Attractions (DBCA). Threatened flora species are listed under sections 19(1) and 26(2) of the BC Act and published in the Biodiversity Conservation (Species) Order 2022. It is an offence to ‘take’ or disturb threatened flora without Ministerial approval. Section 5(1)1 of the Act defines to take as including “... to gather, pluck, cut, pull up, destroy, dig up, remove, harvest or damage flora by any means” or to cause or permit the same to be done.

Threatened flora are assigned categories under the EPBC Act and BC Act according to their conservation status, as outlined in **Table 1**.

Flora species that may be threatened or near threatened but lack sufficient information to be listed under the BC Act may be added to the DBCA’s *Priority Flora List* (DBCA 2018b). Priority flora species are considered during State approval processes. Priority flora are assigned categories as listed in **Table 1**.

## Additional Background Information

Table 1: Definitions of threatened and priority flora species pursuant to the EPBC Act and BC Act and on DBCA's Priority Flora List (DBCA 2023b)

Conservation code	Description
EX <sup>†</sup>	Threatened Flora – Presumed Extinct Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.
T <sup>†</sup>	Threatened Flora – Extant Taxa which are declared to be likely to become extinct or is rare, or otherwise in need of special protection.
CR <sup>^</sup>	Threatened Flora – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN <sup>^</sup>	Threatened Flora – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.
VU <sup>^</sup>	Threatened Flora – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
P1 <sup>□</sup>	Priority One – Poorly Known Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verges, urban areas, farmland, active mineral leases etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2 <sup>□</sup>	Priority Two – Poorly Known Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey.
P3 <sup>□</sup>	Priority Three – Poorly Known Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but needs further survey.
P4 <sup>□</sup>	Priority Four – Rare Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

<sup>^</sup>pursuant to the EPBC Act, <sup>†</sup>pursuant to the BC Act, <sup>□</sup>on DBCA's Priority Flora List

## Threatened and priority ecological communities

'Threatened ecological communities' (TECs) are ecological communities that are rare or under threat and therefore warrant special protection. Selected TECs are afforded statutory protection at a Commonwealth level under section 181 of the EPBC Act. TECs nominated for listing under the EPBC Act are considered by the Threatened Species Scientific Committee and a final decision is made by the Commonwealth Minister for the Environment. Once listed under the EPBC Act, communities are categorised as either 'critically endangered', 'endangered' or 'vulnerable' as defined in **Table 2**. Any action likely to have a significant impact on a community listed under the EPBC Act requires approval from the Minister for the Environment.

## Additional Background Information

In Western Australia TECs are listed under sections 27(1), 31 and 33 of the BC Act. TECs are determined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee (WATECSAC) and endorsed by the State Minister for the Environment. The WATECSAC is an independent group comprised of representatives from organisations including tertiary institutions, the Western Australian Museum and DBCA. The TECs listed under the BC Act are defined in Schedule 1 of the Biodiversity Conservation (Threatened Ecological Communities) Order 2023. State TECs are also acknowledged through other environmental approval processes such as 'environmental impact assessment' pursuant to Part IV of the *Environmental Protection Act 1986* (EP Act) and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

TECs are assigned to one of the categories outlined in **Table 2** according to their level of threat.

*Table 2: Categories of threatened ecological communities (English and Blyth 1997; DEC 2009)*

Conservation code	Description
PD	Presumably Totally Destroyed An ecological community that has been adequately searched for but for which no representative occurrences have been located.
CE	Critically Endangered An ecological community that has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
E	Endangered An ecological community that has been adequately surveyed and is not critically endangered but is facing a very high risk of total destruction in the near future.
V	Vulnerable An ecological community that has been adequately surveyed and is not critically endangered or endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.

An ecological community with insufficient information available to be considered a TEC or which are rare but not currently threatened may be listed as a 'priority ecological community' (PEC). PECs are categorised based on a variety of criteria, as described in **Table 3**. Listed PECs are published by DBCA (DBCA 2023a).

## Additional Background Information

Table 3: Categories of priority ecological communities (DEC 2013)

Priority code	Description
P1	<p>Priority One: Poorly known ecological communities</p> <p>Ecological communities that are known from very few occurrences with a very restricted distribution (generally <math>\leq 5</math> occurrences or a total area of <math>\leq 100</math>ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.</p>
P2	<p>Priority Two: Poorly known ecological communities</p> <p>Communities that are known from few occurrences with a restricted distribution (generally <math>\leq 10</math> occurrences or a total area of <math>\leq 200</math>ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.</p>
P3	<p>Priority Three: Poorly known ecological communities</p> <p>(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:</p> <p>(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;</p> <p>(iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.</p> <p>Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.</p>
P4	<p>Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.</p> <p>(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.</p> <p>(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.</p> <p>(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.</p>
P5	<p>Priority Five: Conservation Dependent ecological communities</p> <p>Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.</p>

## Reporting

Section 43 of the BC Act requires that an occurrence of a threatened species or threatened ecological community is reported to DBCA where the occurrence has been identified as part of field work completed:

- as part of an assessment under Part IV of the *Environmental Protection Act 1986*; or
- in relation to an application for a clearing permit under the *Environmental Protection Act 1986* section 51E(1)(d).

Penalties apply to individuals and organisations that fail to provide accurate reports of threatened species or communities.

The *Biodiversity Conservation Regulations 2018* (BC Regulations 2018) came into effect on January 1 2019. The BC Regulations include provisions for licencing, charges, penalties and other provisions associated with the BC Act.

## Weeds

A number of legislative and policy documents exist in relation to weed management at state and national levels. The *Biosecurity and Agriculture Management Act 2007* (BAM Act) is the principle legislation guiding weed management in Western Australia and lists declared pest species. At a national level, the Australian government has compiled a list of 32 Weeds of National Significance (WoNS) (DoEE 2018), of which many are also listed under the BAM Act.

## Declared Pests

Part 2.3.23 of the BAM Act requires a person must not; “a) keep, breed or cultivate the declared pest; b) keep, breed or cultivate an animal, plant or other thing that is infected or infested with the declared pest; c) release into the environment the declared pest, or an animal, plant or other thing that is infected or infested with the declared pest; or d) intentionally infect or infest, or expose to infection or infestation, a plant, animal or other thing with a declared pest”.

Under the BAM Act, all declared pests are assigned a legal status, as described in **Table 7**. Species assigned to the ‘declared pest, prohibited - s12’ category are placed in one of three control categories, as described in **Table 8**.

The *Biosecurity and Agriculture Management Regulations 2013* specify keeping categories for species assigned to the ‘declared pest - s22(2)’ category, which relate to the purposes of which species can be kept, as well as the entities that can keep them. The categories are described in **Table 9**.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act (DPIRD 2020).

Table 4: Legal status of declared pest species listed under the BAM Act (DPIRD 2020)

Category	Description
Declared Pest Prohibited - s12	May only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest s22(2)	Must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia

## Additional Background Information

*Table 5: Control categories of declared pest species listed under the BAM Act (DPIRD 2020)*

Category	Description
C1	<p>Exclusion</p> <p>Not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.</p>
C2	<p>Eradication</p> <p>Present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.</p>
C3	<p>Management</p> <p>Established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.</p>

*Table 6: Keeping categories of declared pest species listed under the BAM Act (DPIRD 2020)*

Category	Description
Prohibited	Can only be kept under a permit for public display and education purposes, and/or genuine scientific research, by entities approved by the state authority.
Exempt	No permit or conditions are required for keeping.
Restricted	Organisms which, relative to other species, have a low risk of becoming a problem for the environment, primary industry or public safety and can be kept under a permit by private individuals.

## Wetland Habitat

### Geomorphic wetland types

On the Swan Coastal Plain DBCA (2017) have used the geomorphic wetland classification system developed by Semeniuk (1987) and Semeniuk and Semeniuk (1995) to classify wetlands based on the landform shape and water permanence (hydro-period) as outlined in **Table 10**.

Table 7: Geomorphic Wetlands of the Swan Coastal Plain classification categories (DBCA 2017)

Level of inundation	Geomorphology			
	Basin	Flat	Channel	Slope
Permanently inundated	Lake	-	River	-
Seasonally inundated	Sumpland	Floodplain	Creek	-
Seasonally waterlogged	Dampland	Palusplain	-	Paluslope

### Wetland management categories

DBCA maintains the *Geomorphic Wetland of the Swan Coastal Plain* dataset (DBCA 2018a), which also categorises individual wetlands into specific management categories as described in **Table 11**.

Table 8: Geomorphic Wetlands of the Swan Coastal Plain classification categories (DBCA 2017)

Management category	Description of wetland	Management objectives
Conservation (CCW)	Support high levels of attributes	Preserve wetland attributes and functions through reservation in national parks, crown reserves and state owned land. Protection provided under environmental protection policies.
Resource enhancement (REW)	Partly modified but still supporting substantial functions and attributes	Restore wetland through maintenance and enhancement of wetland functions and attributes. Protection via crown reserves, state or local government owned land, environmental protection policies and sustainable management on private properties.
Multiple use (MUW)	Few wetland attributes but still provide important hydrological functions	Use, development and management considered in the context of water, town and environmental planning through land care.

The management categories of wetland features are determined based on hydrological, biological and human use features. The DBCA document *A methodology for the evaluation of specific wetland types on the Swan Coastal Plain, Western Australia* (DBCA 2017) details the methodology by which wetlands on the Swan Coastal Plain are assigned management categories based on a two tiered evaluation system, with preliminary and secondary evaluation stages. The preliminary evaluation aims to identify any features of conservation significance that would immediately place the wetland within the CCW management category. Examples of these significant features include presence on significant wetland lists, presence of TECs or PECs (Priority 1 and 2), presence of threatened flora and

over 90% of vegetation in good or better condition based on the Keighery (1994) scale. If such environmental values are identified the wetland would be categorised as CCW without further evaluation.

Should the preliminary evaluation indicate that no such features occur, the secondary evaluation and site assessment are then applied. In the secondary evaluation, an appropriate management category is determined through the assessment of a range of environmental attributes, functions and values.

#### Wetland reclassification

DBCA have a protocol for proposing changes to the wetland boundaries and management categories of the existing geomorphic wetland dataset (DEC 2007). The procedure involves a wetland desktop evaluation and site assessment which culminates in a recommended management category.

Relevant information should be obtained in the optimal season for vegetation condition and water levels, which is usually spring (DEC 2007). In the case of larger wetlands that have undergone a degree of disturbance, a separate management category may be assigned to parts of the wetland in order to reflect the current values.

## References

### General references

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *A methodology for the evaluation of wetlands on the Swan Coastal Plain*, draft prepared by the Wetlands Section of the Department of Biodiversity, Conservation and Attractions and the Urban Water Branch of the Department of Water and Environmental Regulation, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*.

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Department of Environment and Conservation (DEC) 2009, *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*, Perth.

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English, V. and Blyth, J. 1997, *Identifying and Conserving Threatened Ecological Communities in the South West Botanical Province*, ANCA National Reserves System Cooperative Program, Project Number N702, Perth.

Keighery, B. 1994, *Bushland Plant Survey: A guide to plant community survey for the community*, Wildflower Society of WA (Inc), Nedlands.

Semeniuk, C. A. 1987, *Wetlands of the Darling System - a geomorphic approach to habitat classification*, Journal of the Royal Society of Western Australia, 69: 95-112.

Semeniuk, C. A. and Semeniuk, V. 1995, *A Geomorphic Approach to Global Classification for Inland Wetlands*, Vegetatio, 118(1/2): 103-124.

### Online references

Department of Environment and Energy (DoEE) 2018, Weeds of National Significance, <<http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html>>.

Department of Primary Industries and Regional Development (DPIRD) 2020, The Western Australian Organism List (WAOL), <<https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>>.

# Appendix B

Conservation Significant Flora Species and likelihood of  
Occurrence Assessment





Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Acacia splendens</i>	CR	EN	P	White sand over clay, pale brown loam, cracked brown soil, gravel, laterite, ironstone. Slopes of breakaways, especially southern slopes, hills.	May	Moderate
<i>Banksia serratuloides subsp. perissa</i>	CR	CR	P	Gravelly lateritic soils.	Aug-Sep	Moderate
<i>Drakaea elastica</i>	CR	EN	PG	Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps. Typically in banksia woodland or thickets of <i>Kunzea glabrescens</i> .	late Sep-Oct/Nov, survey Jul-Aug	Negligible
<i>Eremophila scaberula</i>	CR	EN	P	Winter-wet plains, inundated areas.	Aug-Oct	Negligible
<i>Eucalyptus absita</i>	CR	EN	P	White lateritic sand. Paddocks.	Apr-Jul	Nil
<i>Eucalyptus dolorosa</i>	CR	EN	P	Laterite. Hillsides.	Feb-Mar	Negligible
<i>Eucalyptus impensa</i>	CR	EN	P	Yellow sand. Lateritic hills.	Jun-Jul	Negligible
<i>Eucalyptus x balanites</i>	CR	EN	P	Light coloured sandy soils over laterite. Habitat consists of gently sloping heathlands; open mallee woodland over shrubland (Population 2) or heathland with emergent mallees (population 1).	Oct - Feb	Nil
<i>Grevillea batrachioides</i>	CR	EN	P	Sandy loam. Sandstone outcrops.	Oct	Low
<i>Grevillea humifusa</i>	CR	EN	P	Gravelly loam over laterite.	Sep-Nov	Moderate
<i>Hemiandra gardneri</i>	CR	EN	P	Grey or yellow sand, clayey sand. Sandplains.	Aug-Oct	Negligible
<i>Tetradlea nephelioides</i>	EN	CR	P	White-grey sand, yellow-brown clayey sand, gravel, laterite. Outcrops, undulating hills, ridges.	Sep	Negligible
<i>Acacia wilsonii</i>	EN	EN	P	White/yellow sand & lateritic gravel, sandy clay over laterite.	Jan-Mar	Moderate
<i>Andersonia gracilis</i>	VU	EN	P	Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep-Nov	Low
<i>Banksia mimica</i>	VU	EN	P	Flat to gentle slopes in grey and white sand in open woodlands.	Dec-Jan	Negligible
<i>Caladenia hoffmanii</i>	EN	EN	PG	Clay, loam, laterite, granite. Rocky outcrops and hillsides, ridges, swamps and gullies.	Aug-Oct	Negligible
<i>Chamelaucium lullfitzii</i>	VU	EN	P	White yellow sand in low woodland.	Oct-Nov	Negligible
<i>Conospermum densiflorum subsp. unicephalum</i>	EN	EN	P	Clay in low lying areas.	Sep-Nov	Negligible
<i>Eremophila glabra subsp. chlorella</i>	EN	-	P	Sandy clay. Winter-wet depressions.	Jul-Nov	Low
<i>Eucalyptus crispata</i>	EN	VU	P	Sand, loam with lateritic gravel. Lateritic breakaways.	Mar-Jun	Nil
<i>Eucalyptus lateritica</i>	EN	VU	P	White or grey sand with gravel. Lateritic breakaways & mesas.	Aug-Oct	Nil
<i>Eucalyptus leprophloia</i>	EN	EN	P	White or grey sand over laterite. Valley slopes.	Aug-Oct	Nil
<i>Eucalyptus pruiniramis</i>	EN	EN	P	Skeletal soils over sandstone or laterite. Rocky hillslopes.	Dec	Negligible
<i>Eucalyptus x lateritica</i>	EN	VU	P	White or grey sand with gravel. Lateritic breakaways & mesas.	Aug-Oct	Nil
<i>Grevillea christineae</i>	EN	EN	P	Clay loam, sandy clay, often moist.	Aug-Sep	Negligible
<i>Grevillea curviloba subsp. incurva</i>	EN	EN	P	Sand, sandy loam. Winter-wet heath.	Aug-Sep	Negligible
<i>Macarthuria keigheryi</i>	EN	EN	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec or Feb-Mar	Moderate
<i>Paracaleana dixonii</i>	VU	EN	PG	Deep sand in open areas beneath dense tall shrubs with scattered banksias, or in heathland in shallow sand over laterite. Occurs from near Eneabba to near Cataby	Oct-Jan	Moderate
<i>Patersonia spirifolia</i>	EN	EN	P	Sand over laterite. Low hills.	Oct-Nov	High
<i>Spirogardnera rubescens</i>	VU	EN	P	Laterite, sand over laterite, loam.	Aug-Dec	Moderate
<i>Styphelia obtecta</i>	EN	EN	P	Grey sand.	Aug-Oct	Moderate
<i>Thelymitra stellata</i>	EN	EN	PG	Sandy loam, clay or gravel over laterite or gravel.	Sep-Nov	Moderate
<i>Acacia forrestiana</i>	VU	VU	P	Lateritic gravelly soils, clay loam over sandstone. Gullies, hills, breakaways.	Nov-Dec	Moderate
<i>Anigozanthos viridis subsp. terraspectans</i>	VU	VU	P	Grey sand, clay loam. Winter-wet depressions.	Aug-Sep	Moderate
<i>Banksia cataglypta</i>	VU	VU	P	Lateritic breakaways.	Jun-Jul	Negligible
<i>Eucalyptus argutifolia</i>	VU	VU	P	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops	Mar-Apr	Negligible

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Eucalyptus johnsoniana</i>	VU	VU	P	White/grey sand with lateritic gravel. Sandplains, lateritic breakaways.	Jul-Aug or Oct-Dec or Jan-May	Nil
<i>Eucalyptus suberea</i>	VU	VU	P	Grey sand. Near or on lateritic breakaways.	Nov-Dec or Jan	Nil
<i>Hakea megalosperma</i>	VU	VU	P	Grey sand, loam. Lateritic hills & rocks.	May-Jun	High
<i>Petrophile nivea</i>	VU	VU	P	Dry bare white sand over gravel over laterite. Uplands.	May or Jul	Negligible
<i>Ptychosema pusillum</i>	VU	VU	P	Red, brown & yellow sand rises.	Aug-Oct	Negligible
<i>Chamaescilla maculata</i>	P1	-	P	Boggy, seasonally wet areas.	Jul-Sep	Low
<i>Corymbia chlorolampra</i>	P1	-	P	Sand over limestone. Hills, lateritic breakaways.	Feb (limited data)	Moderate
<i>Drosera allantostigma</i>	P1	-	P	Loam, silica sand or peaty soils. Margins of winter-wet depressions.	Nov-Dec	Moderate
<i>Drosera pedicellaris</i>	P1	-	P	Deep beige sand.	Oct-Nov	High
<i>Eucalyptus absita x loxophleba</i>	P1	-	P	Lateritic sand.	Apr-Jul? (Unknown)	Nil
<i>Grevillea cooljarloo</i>	P1	-	P	Winter-wet flats in grey sand over clay. Floodplains, drainage lines, creeks.	Most of the year with spring peak	Low
<i>Hypocalymma lateriticola</i>	P1	-	P	Lateritic soils. Sand with laterite pebbles, laterite over clay.	Aug-Sep	Negligible
<i>Hypocalymma x proliferum</i>	P1	-	P	Sand, typically along margins of watercourses.	Jun-Oct	Negligible
<i>Lasiopetalum rupicola</i>	P1	-	P	Brown loam over laterite. Hillsides and summits.	Sep-Oct	Negligible
<i>Levenhookia preissii</i>	P1	-	A	Grey or black, peaty sand. Swamps	Sep-Dec/Jan	Low
<i>Poranthera asybosca</i>	P1	-	A	Sand or sand over laterite.	Sep-Oct	Moderate
<i>Rhynchospora suffruticosa</i>	P1	-	P	Red-brown loamy clay, gravelly loam or clay loam over laterite. Slopes, small ridges.	Nov-Dec	Low
<i>Stylidium carnosum subsp. Narrow leaves (J.A. Wege 490)</i>	P1	-	P	Gravelly sands over laterite, generally on slopes.	Apr, Sep-Oct (limited data)	Moderate
<i>Acacia carens</i>	P2	-	P	Gravel or sandy gravel. Lateritic uplands.	Apr-Jun	Moderate
<i>Acacia lasiocarpa var. lasiocarpa Cockleshell Gully variant (E.A. Griffin 2039)</i>	P2	-	P	Grey-yellow sand with laterite. Low open heath.	Aug	Negligible
<i>Acacia retrorsa</i>	P2	-	P	Grey sand & lateritic gravel, sandy loam.	Aug-Sep	Moderate
<i>Acacia sp. Badgingarra (F. Hort &amp; J. Hort FH 4636)</i>	P2	-	P	Sand/laterite on hill slopes and rises.	Jun-Oct (limited data)	High (recorded)
<i>Andersonia sp. Mt Lesueur (E.A. Griffin 5536)</i>	P2	-	P	Slope, breakaways. Dry brown/grey/cream sandy clay over sandstone.	Mar-May	Moderate
<i>Andersonia sp. Mysosma (E.A. Griffin 2213)</i>	P2	-	P	Grey sand, sandy clay, slope of sandstone or laterite breakaways, flat.	Sep, Feb (limited data)	Moderate
<i>Boronia scabra subsp. condensata</i>	P2	-	P	Sandy clay or gravel. Upper slopes, edges of lateritic breakaways.	Aug	Negligible
<i>Calectasia palustris</i>	P2	-	P	White or grey sand. Seasonally inundated swamplands.	Jul-Oct	Low
<i>Catacolea enodis</i>	P2	-	P	Deep white sand over laterite. Tall heath.	Aug-Nov (limited data)	Moderate
<i>Chordifex reseminans</i>	P2	-	P	Dry sand. Heath.	Mar-May	High (recorded)
<i>Comesperma rhadinocarpum</i>	P2	-	P	Sandy soils.	Oct-Nov	Moderate
<i>Cristonia biloba subsp. pubescens</i>	P2	-	P	Sand, gravelly loam, sand over laterite.	Jun-July	Moderate
<i>Cyanothamnus ramosus subsp. lesueuranus</i>	P2	-	P	Sand over laterite.	Jul-Aug	Negligible
<i>Desmodcladus microcarpus</i>	P2	-	P	Deep white and yellow sand.	Aug-Oct	High
<i>Drosera rubricalyx</i>	P2	-	P	Poorly drained, seasonally moist flats, depressions, and hillslopes	Aug-Sep	Low
<i>Eucalyptus angularis</i>	P2	-	P	Lateritic breakaways.	Unknown	Negligible
<i>Goodenia xanthotricha</i>	P2	-	P	Sandy soils. Gravelly hills.	Nov-Dec or Jan-Feb	Negligible
<i>Grevillea delta</i>	P2	-	P	Sandy clay, loam, gravelly soils, often over sandstone. Sandstone outcrops, creek beds.	Jun-Jul or Sep-Oct	Negligible
<i>Grevillea trichantha</i>	P2	-	P	Cream brown sand (only one observation).	Sep (limited information)	Moderate
<i>Hypocalymma serrulatum</i>	P2	-	P	Grey or white sand. Along drainage lines.	Apr-May	High (recorded)
<i>Hypocalymma tenuatum</i>	P2	-	P	Sandy loam over sandstone. Outcrops, ridges.	Jul-Aug	Low
<i>Jacksonia rubra</i>	P2	-	P	Clayey sand.	Oct	Negligible
<i>Lasiopetalum rutilans</i>	P2	-	P	Brown/white sand with laterite. Skeletal soil over sandstone. Upper slopes or valley floors.	Aug-Dec	Moderate
<i>Lepyrodia curvescens</i>	P2	-	P	Sand, laterite. Seasonally inundated swampland.	Sep-Nov	Low

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	WA	EPBC Act				
<i>Leucopogon plumuliflorus</i>	P2	-	P	Lateritic sandy soils. Amongst lateritic boulders, hillslopes.	Apr or Jul-Nov	High (recorded)
<i>Loxocarya gigas</i>	P2	-	P	Sandy gravelly lateritic soils. Low hills & ridges, sandplains.	Jul, Sep-Oct (limited data)	Negligible
<i>Lyginia excelsa</i>	P2	-	?P	Sand. Dry heath & Banksia woodland.	Mar-Nov	High (recorded)
<i>Phlebocarya pilosissima subsp. teretifolia</i>	P2	-	P	White or grey sand.	Aug-Oct	High
<i>Poranthera moorokatta</i>	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes in banksia woodland.	Sep-early Nov	Moderate
<i>Pultenaea sp. Mt Lesueur (J.S. Beard 7827)</i>	P2	-	P	Gravelly sands over laterite, laterite outcrops. Slopes.	Sep-Nov	Moderate
<i>Schoenus badius</i>	P2	-	A	Grey sand. Moist areas.	Sep-Oct	Moderate
<i>Stenanthemum limitatum</i>	P2	-	P	Sand and lateritic gravel, sandstone.	Oct-Nov	Moderate
<i>Stylidium diplotrichum</i>	P2	-	P	Clayey sand or clay loam over laterite. Hillslopes and gullies.	Sep-Nov	Negligible
<i>Stylidium strigosum</i>	P2	-	P	Clay/loam over laterite. Hillslopes and near watercourses.	Oct-Nov	Moderate
<i>Stylidium tinkeri</i>	P2	-	A	Grey sandy soil. Seasonal wetlands.	Oct	Low
<i>Styphelia carolineae</i>	P2	-	P	White sand over laterite.	May-Jul	Negligible
<i>Styphelia undulata</i>	P2	-	P	Grey sand, dry white sand. Hills, plains.	Dec-Mar	High
<i>Synaphea lesueurensis</i>	P2	-	P	Laterite, sandy soils over laterite or sandstone. Hillslopes.	Aug-Oct	Moderate
<i>Synaphea sparsiflora</i>	P2	-	P	Sandy loam over laterite.	Aug-Sep	Moderate
<i>Synaphea xela</i>	P2	-	P	Red-brown gravelly sand, white-pink, grey-brown clayey sand and loam, over laterite. Undulating sites.	Jul-Sep	High (recorded)
<i>Tetratheca remota</i>	P2	-	P	Sandy gravel.	Nov	Moderate
<i>Thelymitra pulcherrima</i>	P2	-	PG	Open areas among shrubs in laterite soils, rarely sandy soils.	Jun-Sep	High
<i>Acacia cummingiana</i>	P3	-	P	Grey or yellow sand, lateritic gravel on sandplains, lateritic breakaways.	May-Aug	High
<i>Acacia epacantha</i>	P3	-	P	Lateritic gravelly loam or clay.	Jul-Aug	Moderate
<i>Acacia flabellifolia</i>	P3	-	P	Rocky loam, lateritic gravelly soils. Low hills & ridges.	Aug (limited data)	Negligible
<i>Acacia plicata</i>	P3	-	P	Loamy & clayey soils, often over sandstone or siltstone. Along drainage lines.	Aug-Oct	Negligible
<i>Allocasuarina grevilleoides</i>	P3	-	P	Sand over laterite, gravel.	Sep-Nov	High
<i>Allocasuarina ramosissima</i>	P3	-	P	Lateritic soils, gravel.	Jun-Sep	Moderate
<i>Angianthus micropodioides</i>	P3	-	A	Saline sandy soils on edge of rivers, depressions and clay pans.	Nov-Dec or Jan-Feb	Low
<i>Arnocrinum gracillimum</i>	P3	-	P	White, grey, yellow or lateritic sand.	Oct-Nov	Moderate
<i>Austrostipa nunaginensis</i>	P3	-	P	Yellow-brown sand, grey light clay. Slopes with or without stones.	Unknown	High (recorded)
<i>Babingtonia urbana</i>	P3	-	P	Grey sand, lateritic gravel. Associated with wetlands	Jan-Mar	Low
<i>Balaustion grande</i>	P3	-	P	Yellow sand.	Aug-Oct	Negligible
<i>Banksia cypholoba</i>	P3	-	P	Sand & gravelly loam.	Aug	Moderate
<i>Banksia fraseri var. crebra</i>	P3	-	P	Lateritic or gravelly soils, typically sand but also loam/clay.	Jul-Aug (limited data)	Negligible
<i>Banksia kippistiana var. paenepeccata</i>	P3	-	P	Lateritic gravelly soils.	Oct-Nov	High (recorded)
<i>Banksia nana</i>	P3	-	P	White/grey sand and/or gravel over laterite. Hills.	Oct	High (recorded)
<i>Banksia nobilis subsp. fragrans</i>	P3	-	P	Lateritic rises.	Jul-Sep	Negligible
<i>Banksia pteridifolia subsp. vernalis</i>	P3	-	P	White/grey sand over laterite.	Sep-Oct	Moderate
<i>Banksia splendida subsp. macrocarpa</i>	P3	-	P	Lateritic gravel.	Jul-Aug	High
<i>Banksia subulata</i>	P3	-	P	White/grey or yellow sand over laterite, gravelly laterite.	Sep	Moderate
<i>Beaufortia bicolor</i>	P3	-	P	White sand over laterite. Sandplains.	Nov-Dec	High (recorded)
<i>Beaufortia eriocephala</i>	P3	-	P	Lateritic sandy soils. Slopes.	Sep-Nov	Negligible
<i>Beyeria gardneri</i>	P3	-	P	Yellow sand.	Aug-Sep	Negligible
<i>Calytrix ecalycata subsp. brevis</i>	P3	-	P	Dry yellow sand. Sandplains, low rises.	Aug-Sep	Negligible
<i>Centrolepis milleri</i>	P3	-	A	Open sandy soil.	Oct-Nov	Moderate
<i>Conospermum scaposum</i>	P3	-	P	White-grey sand, sandy clay. Low swampy areas, road verges.	Jan-Feb	Moderate
<i>Dampiera tephrea</i>	P3	-	P	Sand, gravelly loam.	Jul	Moderate
<i>Daviesia pteroclada</i>	P3	-	P	Sandy or clay gravelly soils over laterite. Hills.	Jul-Aug	Negligible
<i>Desmodcladus biformis</i>	P3	-	P	Sand, sandy clay, lateritic soils. Dry sites.	Sep-Oct	Moderate

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Desmodium nodatum</i>	P3	-	P	Sand or clay in low-lying areas.	Oct-Nov (limited data)	Moderate
<i>Drosera atrata</i>	P3	-	P	Lateritic soil. Hills and breakaways.	Jun-Aug	High
<i>Drosera prophylla</i>	P3	-	P	Sand over laterite.	Jun-Aug	High (recorded)
<i>Eryngium pinnatifidum subsp. Palustre</i> (G.J. Keighery 13459)	P3	-	P	Grey brown sand or clay in winter wet flats.	Sep-Nov	Low
<i>Gompholobium gairdnerianum</i>	P3	-	P	White, cream or brown sandy clay, white sand over sandstone, brown or grey sand over laterite, gravel. Hill summits and slopes, ridges.	Sep-Nov	High
<i>Grevillea florida</i>	P3	-	P	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.	Jul-Sep	Moderate
<i>Grevillea leptopoda</i>	P3	-	P	Loam & lateritic gravel, sand, clay.	Aug-Sep	Negligible
<i>Grevillea thyrsoidea subsp. thyrsoidea</i>	P3	-	P	Sand or sandy lateritic gravel.	Feb or Aug-Sep	Moderate
<i>Grevillea uniformis</i>	P3	-	P	Sand or sandy loam on sandstone, lateritic gravel. Sandstone outcrops, creeklines.	Jul or Sep-Nov	Moderate
<i>Guichenotia alba</i>	P3	-	P	Sandy & gravelly soils. Low-lying flats, depressions.	Jul-Aug	Moderate
<i>Haemodorum loratum</i>	P3	-	P	Grey or yellow sand, gravel.	Nov	High
<i>Hakea longiflora</i>	P3	-	P	White sand, loam, gravel, laterite. Breakaways.	Jun-Sep	Moderate
<i>Hensmania stoniella</i>	P3	-	P	White, grey or lateritic sand, often winter-wet (but also records on ridges and dry sand)	Sep-Nov	High (recorded)
<i>Hibbertia subglabra</i>	P3	-	P	Sand over laterite on slopes and in gullies.	Aug-Dec (limited information)	Negligible
<i>Hibbertia subvillosa</i>	P3	-	P	Sandy loam. Also sandy sandy creek-beds and graded roadsides.	Apr-Sep	Negligible
<i>Hypocalymma gardneri</i>	P3	-	P	Grey-brown sand, laterite. Sandplains, upper slopes, heathland.	Aug-Sep	Moderate
<i>Hypocalymma quadrangulare</i>	P3	-	P	Sands in Banksia woodlands or shrublands. Sometimes on limestone.	Jul-Oct	Negligible
<i>Hypocalymma tetrapterum</i>	P3	-	P	Grey sand, loam, lateritic gravel. Riverbanks, breakaways.	Aug	Negligible
<i>Isopogon panduratus subsp. palustris</i>	P3	-	P	Winter-wet sands or sandy loams.	Aug-Oct	Moderate
<i>Jacksonia anthoclada</i>	P3	-	P	White or grey sand. Sandplains.	Apr	Moderate
<i>Jacksonia carduea</i>	P3	-	P	Grey sand, sandy clay.	Aug-Dec	Moderate
<i>Lechenaultia juncea</i>	P3	-	P	White, grey or yellow sand, sandy gravel.	Nov-Dec	Moderate
<i>Lepidobolus quadratus</i>	P3	-	P	Lateritic gravel, grey/white sand. Dry kwongan.	Aug-Sep	High (recorded)
<i>Leucopogon foliosus</i>	P3	-	P	Shallow gravelly soils over laterite.	Oct-Dec (limited data)	High
<i>Patersonia argyrea</i>	P3	-	P	Grey sand and lateritic gravel.	Sep-Nov	Moderate
<i>Persoonia filiformis</i>	P3	-	P	Yellow or white sand over laterite.	Nov-Dec	Moderate
<i>Persoonia rudis</i>	P3	-	P	White, grey or yellow sand, often over laterite.	Dec-Jan	Moderate
<i>Phlebocarya pilosissima subsp. pilosissima</i>	P3	-	P	White or grey sand, lateritic gravel.	Aug-Oct	High (recorded)
<i>Platysace ramosissima</i>	P3	-	P	Sandy soils.	Oct-Nov	Moderate
<i>Schoenus pennisetis</i>	P3	-	A	Grey or peaty sand in swamps and winter-wet depressions.	Aug-Sep	Moderate
<i>Stackhousia sp. red-blotched corolla</i> (A. Markey 911)	P3	-	P	Granitic soils on slopes.	Sep-Nov	Negligible
<i>Stylidium aceratum</i>	P3	-	A	Sandy soils in swamp heathland.	Oct-Nov	Low
<i>Stylidium hymenocraspedum</i>	P3	-	P	Sand over laterite. Hillslopes. Heath, Banksia and Eucalyptus low open woodland.	Sep-Oct	High (recorded)
<i>Stylidium nonscandens</i>	P3	-	P	Sand over laterite. Hillslopes and crests. Banksia woodland, heath, mallee shrubland.	Sep-Nov	High (recorded)
<i>Stylidium periscelanthum</i>	P3	-	P	Loamy clay, moist soils pockets. Wet flats, low granitic hills.	Sep-Oct	Low
<i>Stylidium torticarpum</i>	P3	-	P	Sandy clay and clay loam over laterite adjacent to creeklines, depressions, and beneath breakaways in heath or mallee shrubland.	Sep-Nov	Moderate
<i>Styphelia filamentosa</i>	P3	-	P	Sand or sand over laterite.	Oct-Dec	Moderate
<i>Styphelia filifolia</i>	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Negligible

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Styphelia williamsiorum</i>	P3	-	P	White-grey sand, yellow-brown sandy loam, gravel, laterite. Uplands, breakaways.	Oct-Dec	High
<i>Synaphea endothrix</i>	P3	-	P	Gravelly loam, sand. Lateritic rises.	Aug-Sep	High
<i>Tetratheca angulata</i>	P3	-	P	Sandy to gravelly laterite soils. Low hill crests, breakaways with massive laterite boulders.	Sep-Dec	High (recorded)
<i>Thysanotus anceps</i>	P3	-	P	White or grey sand, lateritic gravel, laterite.	Oct-Dec	Moderate
<i>Thysanotus vernalis</i>	P3	-	P	Sandy loam.	Sep-Oct	Moderate
<i>Verticordia amphigia</i>	P3	-	P	Sandy loam, clay & rocky loam. Winter-wet depressions.	Oct-Nov	Negligible
<i>Verticordia fragrans</i>	P3	-	P	White, grey or yellow sand, clay loam. Low-lying areas, sandplains.	Sep-Nov	Moderate
<i>Verticordia insignis subsp. eomagis</i>	P3	-	P	Sandy soils over laterite. Sandplains, rocky rises.	Aug-Nov	Moderate
<i>Verticordia rutilastra</i>	P3	-	P	Sand & lateritic gravel. Hills.	Sep-Nov	Moderate
<i>Asterolasia drummondii</i>	P4	-	P	Lateritic gravel & sand or loam. Lateritic hills & sandplains, breakaways.	Jul-Sep	High
<i>Banksia chamaephyton</i>	P4	-	P	Grey or white sand over laterite.	Oct-Dec	High (recorded)
<i>Banksia elegans</i>	P4	-	P	Yellow, white or red sand. Sandplains, low consolidated dunes.	Oct-Nov	Moderate
<i>Banksia tricuspis</i>	P4	-	P	Lateritic rocky soils. Sides & hilltops, breakaway edges.	Mar-Jul	Moderate
<i>Calothamnus accedens</i>	P4	-	P	Sandy soils over laterite.	Sep-Jan	Moderate
<i>Calytrix chrysantha</i>	P4	-	P	White, grey or yellow/brown sand. Flats.	Jan-Feb	Negligible
<i>Chordifex chaunocoleus</i>	P4	-	P	Grey, siliceous or peaty sand, well to poorly drained. Drainage lines, depressions.	Sep	High
<i>Conostephium magnum</i>	P4	-	P	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.	Jul-Sep	Moderate
<i>Desmocladius elongatus</i>	P4	-	P	Deep sand over laterite.	Aug-Dec	High (recorded)
<i>Diuris recurva</i>	P4	-	PG	Loam. Winter-wet areas.	Jul-Aug	Moderate
<i>Eucalyptus exilis</i>	P4	-	P	Grey sand, gravelly loam. Lateritic ridges.	Aug-Oct	Nil
<i>Eucalyptus foecunda subsp. foecunda</i>	P4	-	P	Sand over limestone. Outcropping limestone.	Jan-Mar	Low
<i>Eucalyptus macrocarpa subsp. elachantha</i>	P4	-	P	White or grey sand over laterite. Hillslopes, ridges, sandplains.	Aug-Sep or Nov-Dec	Nil
<i>Eucalyptus pendens</i>	P4	-	P	White or grey sand with lateritic gravel. Hillsides, breakaways, sandplains.	Aug-Nov	Nil
<i>Grevillea olivacea</i>	P4	-	P	White or grey sand. Coastal dunes, limestone rocks	Jun-Sep	Negligible
<i>Grevillea rudis</i>	P4	-	P	White, grey, yellow or red sand, often with gravel & over laterite.	Jan or Apr or Jun-Sep or Nov-Dec	High
<i>Grevillea saccata</i>	P4	-	P	Yellow or brown sand, often with lateritic gravel.	Apr or Jun-Nov	Moderate
<i>Hakea neurophylla</i>	P4	-	P	Lateritic sandy soils. Hillsides.	Aug	Moderate
<i>Hemiandra sp. Watheroo (S. Hancocks 4)</i>	P4	-	P	Yellow/grey sand.	Jun or Oct-Dec (limited data)	Moderate
<i>Hibbertia propinqua</i>	P4	-	P	Pale grey to yellow sand and sandy loams, usually over laterite or close to laterite breakaways.	Aug-Sep (limited data)	Negligible
<i>Hypolaena robusta</i>	P4	-	P	White sand. Sandplains	Sep-Oct	High (recorded)
<i>Schoenus griffinianus</i>	P4	-	P	White sand.	Sep-Oct	Moderate
<i>Stylidium aeonioides</i>	P4	-	P	Sandy clay loam over laterite. Hillsides and breakaways. Low heath, open woodland.	Sep-Nov	High (recorded)
<i>Stylidium inversiflorum</i>	P4	-	P	White or grey sand over laterite. Sandplains, hillslopes and gullies. Heath, open woodland.	Sep-Nov	High (recorded)
<i>Stylidium longitubum</i>	P4	-	A	Sandy clay, clay. Seasonal wetlands.	Oct-Dec	Low
<i>Stylidium striatum</i>	P4	-	P	Brown clay over laterite on hill slopes.	Oct-Nov	Low
<i>Thelymitra apiculata</i>	P4	-	PG	Grey sand, lateritic gravel.	May-Jul	High
<i>Thysanotus glaucus</i>	P4	-	P	White, grey or yellow sand, sandy gravel.	Oct-Mar	High

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Tripterococcus sp. Brachylobus (A.S. George 14234)</i>	P4	-	P	Winter-wet areas on grey sand.	Oct-Feb	Moderate
<i>Xanthosia tomentosa</i>	P4	-	P	Lateritic gravelly soils.	Sep-Dec	Moderate

Note: CR=critically endangered, EN=endangered, VU=vulnerable, P1 - P4=priority 1 to priority 4, P=perennial, PG=perennial geophyte, A=annual.

# Appendix C

Conservation Significant Communities and Likelihood of  
Occurrence Assessment





Code	Community name	TEC/ PEC	Level of significance		Likelihood of occurrence
			State	EPBC Act	
SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. 1994)	TEC	EN	CR	Nil
Tuart woodlands	Tuart ( <i>Eucalyptus gomphocephala</i> ) woodlands and forests of the Swan Coastal Plain	TEC/ PEC	P3	CR	Nil
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	TEC	CR	EN	Nil
Lesueur-Coomallo A1.2	Lesueur-Coomallo floristic community A1.2 as originally described by Griffin and Hopkins (1990)	TEC	CR	-	Nil
Lesueur-Coomallo D1	Lesueur-Coomallo floristic community D1 as originally described by Griffin and Hopkins (1990)	TEC	CR	-	Nil
Lesueur-Coomallo DFGH	Lesueur-Coomallo Floristic Community DFGH	PEC	P1	-	Nil
Lesueur-Coomallo M2	Lesueur-Coomallo Floristic Community M2 ( <i>Melaleuca preissiana</i> woodland)	PEC	P1	-	Nil
Gp200-170	<i>Petrophile chrysantha</i> low heath on Lesueur dissected uplands (Gp200-170)	PEC	P2	-	Nil

Note: TEC=threatened ecological community, PEC=priority ecological community, CR=critically endangered, EN=endangered, VU=vulnerable, P1 - P4=priority 1 to priority 4.



# Appendix D

Species List





Family	Status	Species
Amaranthaceae		<i>Ptilotus manglesii</i>
		<i>Ptilotus polystachyus</i>
Anarthriaceae		<i>Anarthria humilis</i>
		<i>Lyginia barbata</i>
	P2	<i>Lyginia excelsa</i>
		<i>Lyginia imberbis</i>
Apiaceae		<i>Xanthosia huegelii</i>
Araliaceae		<i>Trachymene pilosa</i>
Asparagaceae		<i>Chamaescilla sp.</i>
		<i>Dichopogon capillipes</i>
		<i>Laxmannia omnifertilis</i>
		<i>Laxmannia ramosa subsp. ramosa</i>
		<i>Lomandra ?preissii</i>
		<i>Lomandra ?suaveolens</i>
		<i>Lomandra caespitosa</i>
		<i>Lomandra hastilis</i>
		<i>Lomandra preissii</i>
		<i>Lomandra sericea</i>
		<i>Sowerbaea laxiflora</i>
		<i>Thysanotus arbuscula</i>
		<i>Thysanotus asper</i>
		<i>Thysanotus patersonii</i>
		<i>Thysanotus sp.</i>
		<i>Thysanotus thyrsoideus</i>
		<i>Thysanotus triandrus</i>
Asteraceae	*	<i>Arctotheca calendula</i>
		<i>Asteraceae sp.</i>
	*	<i>Hypochaeris glabra</i>
		<i>Lagenophora huegelii</i>
		<i>Olearia muricata</i>
		<i>Podotheca ?gnaphalioides</i>
		<i>Podotheca angustifolia</i>
		<i>Pterochaeta paniculata</i>
		<i>Rhodanthe manglesii</i>
		<i>Rhodanthe sp.</i>
		<i>Siemssenia capillaris</i>
		<i>Siloxerus sp.</i>
	*	<i>Ursinia anthemoides</i>
		<i>Waitzia acuminata</i>
		<i>Waitzia suaveolens var. suaveolens</i>
Boraginaceae	*DP	<i>Echium plantagineum</i>
Brassicaceae	*	<i>Brassicaceae sp.</i>
Campanulaceae		<i>Lobelia cleistogamoides</i>
Casuarinaceae		<i>Allocasuarina campestris</i>
		<i>Allocasuarina humilis</i>
		<i>Allocasuarina microstachya</i>
Celastraceae		<i>Stackhousia ?monogyna</i>
		<i>Tripterococcus brunonis</i>

Colchicaceae	<i>Burchardia congesta</i>
Crassulaceae	<i>Crassula colorata</i>
	<i>Crassula thunbergiana</i>
Cupressaceae	<i>Callitris acuminata</i>
Cyperaceae	<i>Caustis dioica</i>
	<i>Chaetospora curvifolia</i>
	<i>Isolepis cernua</i> var. <i>setiformis</i>
	<i>Lepidosperma</i> sp. 1
	<i>Lepidosperma</i> sp. 2
	<i>Lepidosperma</i> sp. 3
	<i>Lepidosperma</i> sp. 4
	<i>Lepidosperma</i> sp. 5
	<i>Lepidosperma</i> sp. 6
	<i>Lepidosperma</i> sp. 7
	<i>Lepidosperma</i> sp. 8
	<i>Mesomelaena pseudostygia</i>
	<i>Mesomelaena tetragona</i>
	<i>Morelotia octandra</i>
	<i>Schoenus</i> ? <i>clandestinus</i>
	<i>Schoenus brevisetis</i>
	<i>Schoenus caespititius</i>
P4	<i>Schoenus griffinianus</i>
	<i>Schoenus obtusifolius</i>
	<i>Schoenus pleiostemoneus</i>
	<i>Schoenus</i> sp.
	<i>Schoenus subbarbatus</i>
	<i>Schoenus subflavus</i> subsp. <i>hispid culms</i> (K.R. Newbey 8278)
	<i>Schoenus unispiculatus</i>
Dasygogonaceae	<i>Calectasia hispida</i>
	<i>Calectasia narragara</i>
	<i>Dasygogon obliquifolius</i>
	<i>Kingia australis</i>
Dilleniaceae	<i>Hibbertia acerosa</i>
	<i>Hibbertia crassiflora</i>
	<i>Hibbertia hypericoides</i>
	<i>Hibbertia mylnei</i>
	<i>Hibbertia pubens</i>
	<i>Hibbertia sericosepala</i>
	<i>Hibbertia striata</i>
	<i>Hibbertia subvaginata</i>
Dioscoreaceae	<i>Dioscorea hastifolia</i>
Droseraceae	<i>Drosera</i> ? <i>drummondii</i>
	<i>Drosera</i> ? <i>eneabba</i>
	<i>Drosera</i> ? <i>erythrorhiza</i>
	<i>Drosera</i> ? <i>porrecta</i>
	<i>Drosera barbigera</i>
	<i>Drosera drummondii</i>
	<i>Drosera eneabba</i>
	<i>Drosera menziesii</i>

	P3	<i>Drosera prophylla</i>
		<i>Drosera sp. 1</i>
		<i>Drosera sp. 2</i>
		<i>Drosera thysanosepala</i>
Ecdeiocoleaceae		<i>Ecdeiocolea monostachya</i>
		<i>Georgeantha hexandra</i>
Elaeocarpaceae		<i>Tetratheca ?confertifolia</i>
	P3	<i>Tetratheca angulata</i>
Ericaceae		<i>Andersonia heterophylla</i>
		<i>Andersonia lehmanniana</i>
		<i>Conostephium pendulum</i>
		<i>Ericaceae sp. 1</i>
		<i>Ericaceae sp. 2</i>
		<i>Leucopogon oldfieldii</i>
	P3	<i>Leucopogon plumuliflorus</i>
		<i>Leucopogon sp.</i>
		<i>Lysinema ciliatum</i>
		<i>Styphelia conostephioides</i>
		<i>Styphelia crassiflora</i>
		<i>Styphelia kingiana</i>
		<i>Styphelia serratifolia</i>
		<i>Styphelia sp. 1</i>
		<i>Styphelia sp. 2</i>
		<i>Styphelia sp. 3</i>
		<i>Styphelia sp. 4</i>
		<i>Styphelia xerophylla</i>
Euphorbiaceae		<i>Monotaxis grandiflora</i>
Fabaceae		<i>Acacia ?cyclops</i>
		<i>Acacia ?latior</i>
		<i>Acacia ?moirii subsp. recurvistipula</i>
		<i>Acacia acuminata</i>
		<i>Acacia alata var. tetrantha</i>
		<i>Acacia applanata</i>
		<i>Acacia auronitens</i>
		<i>Acacia cyclops</i>
		<i>Acacia incrassata</i>
		<i>Acacia lasiocarpa var. lasiocarpa</i>
		<i>Acacia multispicata</i>
		<i>Acacia obovata</i>
		<i>Acacia pulchella var. reflexa</i>
		<i>Acacia retrorsa</i>
		<i>Acacia saligna</i>
		<i>Acacia sphacelata subsp. verticillata</i>
		<i>Acacia stenoptera</i>
		<i>Aotus procumbens</i>
		<i>Bossiaea eriocarpa</i>
		<i>Chamaecytisus palmensis</i>
		<i>Chorizema aciculare subsp. laxum</i>
		<i>Daviesia chapmanii</i>

*Daviesia daphnoides*  
*Daviesia decurrens subsp. decurrens*  
*Daviesia epiphyllum*  
*Daviesia nudiflora subsp. nudiflora*  
*Daviesia pedunculata*  
*Daviesia podophylla*  
*Fabaceae sp.*  
*Gastrolobium ?oxylobioides*  
*Gastrolobium axillare*  
*Gastrolobium ilicifolia*  
*Gastrolobium linearifolium*  
*Gastrolobium oxylobioides*  
*Gastrolobium plicatum*  
*Gastrolobium polystachyum*  
*Gastrolobium spinosum*  
*Gompholobium aristatum*  
*Gompholobium knightianum*  
*Gompholobium tomentosum*  
*Hovea stricta*  
*Isotropis cuneifolia subsp. cuneifolia*  
*Jacksonia ?sternbergiana*  
*Jacksonia angulata*  
*Jacksonia calcicola*  
*Jacksonia floribunda*  
*Jacksonia lehmannii*  
*Jacksonia sp.*  
*Kennedia prostrata*  
*Labichea punctata*  
*Mirbelia spinosa*  
*Sphaerolobium drummondii*  
*Sphaerolobium medium*  
*Sphaerolobium pulchellum*  
 \* *Trifolium arvense*  
 \* *Pelargonium capitatum*  
*?Goodeniaceae sp.*  
*Dampiera ?lavandulacea*  
*Dampiera ?spicigera*  
*Dampiera alata*  
*Dampiera haemotricha subsp. dura*  
*Dampiera spicigera*  
*Goodenia affinis*  
*Goodenia coerulea*  
*Goodenia micrantha*  
*Goodenia reinwardtii*  
*Goodenia sp.*  
*Goodenia sp. 2*  
*Goodeniaceae sp. 1*  
*Goodeniaceae sp. 2*  
*Lechenaultia biloba*

Geraniaceae

Goodeniaceae

	<i>Lechenaultia floribunda</i>
	<i>Lechenaultia stenosepala</i>
	<i>Scaevola anchlussifolia</i>
	<i>Scaevola canescens</i>
	<i>Scaevola glandulifera</i>
Gyrostemonaceae	<i>Tersonia cyathiflora</i>
Haemodoraceae	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>
	<i>Blancoa canescens</i>
	<i>Conostylis aculeata</i> subsp. <i>breviflora</i>
	<i>Conostylis androstemma</i>
	<i>Conostylis angustifolia</i>
	<i>Conostylis crassinerva</i> subsp. <i>absens</i>
	<i>Conostylis juncea</i>
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>
	<i>Haemodorum ?simplex</i>
	<i>Haemodorum simplex</i>
	<i>Haemodorum simulans</i>
	<i>Haemodorum</i> sp. 1
	<i>Macropidia fuliginosa</i>
	<i>Phlebocarya filifolia</i>
	P3 <i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>
Haloragaceae	<i>Glischrocaryon aureum</i>
	<i>Gonocarpus pithyoides</i>
Hemerocallidaceae	<i>Arnocrinum preissii</i>
	<i>Caesia micrantha</i>
	<i>Dianella revoluta</i>
	P3 <i>Hensmania stoniella</i>
	<i>Johnsonia pubescens</i> subsp. <i>pubescens</i>
	<i>Tricoryne elatior</i>
Iridaceae	<i>Patersonia ?drummondii</i>
	<i>Patersonia occidentalis</i> var. <i>latifolia</i>
	* <i>Romulea rosea</i>
Lamiaceae	<i>Hemiandra pungens</i>
	<i>Hemiandra scabra</i>
	<i>Hemiphora bartlingii</i>
	<i>Physopsis spicata</i>
	<i>Quoya verbascina</i>
Lauraceae	<i>Cassytha glabella</i>
	<i>Cassytha pomiformis</i>
	<i>Cassytha racemosa</i>
	<i>Cassytha</i> sp.
Loganiaceae	<i>Phyllangium divergens</i>
	<i>Phyllangium paradoxum</i>
Loranthaceae	<i>Nuytsia floribunda</i>
Malvaceae	<i>Lasiopetalum drummondii</i>
	<i>Thomasia foliosa</i>
	<i>Thomasia grandiflora</i>
Molluginaceae	<i>Macarthuria ?apetala</i>
	<i>Macarthuria apetala</i>

Myrtaceae

- Macarthuria australis*
- ?*Baeckea* sp. 1
- ?*Baeckea* sp. 2
- ?*Baeckea* sp. 3
- ?*Leptospermopsis oligandrum*
- Apectospermum spinescens*
- Babingtonia camphorosmae*
- Babingtonia grandiflora*
- P3 *Beaufortia bicolor*
- Calothamnus longissimus*
- Calothamnus* sp. 1
- Calothamnus* sp. 2
- Calothamnus* sp. 3
- Calothamnus* sp. 4
- Calytrix* ?*angulata*
- Calytrix aurea*
- Calytrix* sp.
- Calytrix* sp. 1
- Calytrix* sp. 2
- Calytrix* sp. 3
- Chamelaucium uncinatum*
- Corymbia calophylla*
- Darwinia* ?*helichrysoides*
- Darwinia neildiana*
- Darwinia sanguinea*
- Darwinia speciosa*
- Eremaea* ?*asterocarpa*
- Eremaea asterocarpa*
- Eremaea beaufortioides*
- Eremaea fimbriata*
- Eremaea pauciflora*
- Eremaea* sp. 1
- Eremaea* sp. 2
- \* *Eucalyptus* ?*camaldulensis*
- \* *Eucalyptus* ?*leucoxylon* var. *rosea*
- Eucalyptus accedens*
- \* *Eucalyptus botryoides*
- \* *Eucalyptus camaldulensis*
- Eucalyptus drummondii*
- Eucalyptus gittinsii* subsp. *illucida*
- PI *Eucalyptus gomphocephala*
- Eucalyptus lane-poolei*
- Eucalyptus opimiflora*
- \* *Eucalyptus* sp. 1
- \* *Eucalyptus* sp. 2
- ?*Eucalyptus* sp. 3
- Eucalyptus todtiana*
- P4 *Eucalyptus xcarnabyi*
- P2 *Hypocalymma serrulatum*

*Hypocalymma xanthopetalum*  
*Kunzea ?micrantha*  
*Leptospermum erubescens*  
*Melaleuca ?urceolaris*  
*Melaleuca platycalyx*  
*Melaleuca radula*  
*Melaleuca sp. 1*  
*Melaleuca sp. 10*  
*Melaleuca sp. 2*  
*Melaleuca sp. 3*  
*Melaleuca sp. 4*  
*Melaleuca sp. 5*  
*Melaleuca sp. 6*  
*Melaleuca sp. 7*  
*Melaleuca sp. 9*  
*Myrtaceae sp.*  
*Myrtaceae sp. 1*  
*Myrtaceae sp. 2*  
*Myrtaceae sp. 3*  
*Pileanthus sp.*  
*Regelia ciliata*  
*Scholtzia ?parviflora*  
*Scholtzia involucrata*  
*Scholtzia sp.*  
*Verticordia chrysanthella*  
*Verticordia densiflora*  
*Verticordia grandis*  
*Verticordia nobilis*  
*Verticordia ovalifolia*  
*Verticordia sp. 1*  
*Verticordia sp. 2*  
*Verticordia sp. 3 (sterile)*  
*Verticordia sp. 4*  
*Verticordia sp. 5*  
*Olax benthamiana*  
*Caladenia discoidea*  
*Caladenia flava*  
*Caladenia sp. 1*  
*Caladenia sp. 2*  
*Caladenia sp. 3*  
*Diuris corymbosa*  
*Diuris setacea*  
*Drakaea livida*  
*Elythranthera brunonis*  
*Orchidaceae sp. 1*  
*Orchidaceae sp. 2*  
*Paracaleana nigrita*  
*Prasophyllum elatum*  
*Pterostylis ?vittata*

Olacaceae  
Orchidaceae

		<i>Pterostylis</i> sp.
		<i>Pyrorchis nigricans</i>
		<i>Thelymitra campanulata</i>
Orobanchaceae	*	<i>Orobanche minor</i>
Poaceae		? <i>Amphipogon</i> sp. 1 (sterile)
		? <i>Amphipogon</i> sp. 2 (sterile)
	*	<i>Aira</i> sp.
		<i>Amphipogon</i> ? <i>caricinus</i> var. <i>caricinus</i>
		<i>Amphipogon</i> ? <i>turbinatus</i>
		<i>Amphipogon</i> sp. (hairy)
		<i>Aristida</i> sp.
		<i>Austrostipa</i> ? <i>elegantissima</i> (sterile)
		<i>Austrostipa anaiwaniorum</i>
		<i>Austrostipa elegantissima</i>
		<i>Austrostipa hemipogon</i>
		<i>Austrostipa macalpinei</i>
	P3	<i>Austrostipa nunaginensis</i>
		<i>Austrostipa</i> sp. (sterile)
	*	<i>Briza maxima</i>
	*	<i>Bromus</i> sp.
	*	<i>Chloris</i> sp.
	*	<i>Ehrharta calycina</i>
		<i>Neurachne alopecuroidea</i>
	*	<i>Pentameris</i> ? <i>airoides</i> subsp. <i>airoides</i>
		<i>Poaceae</i> sp. 1 (sterile)
	*	<i>Poaceae</i> sp. 2 (sterile)
		<i>Rytidosperma</i> sp. 1
		<i>Rytidosperma</i> sp. 2 (hairy)
		<i>Themeda triandra</i>
	*	<i>Vulpia</i> sp.
Polygalaceae		<i>Comesperma acerosum</i>
		<i>Comesperma calymega</i>
Proteaceae		? <i>Persoonia quinquenervis</i>
		<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>
		<i>Banksia</i> ? <i>stenoprion</i>
		<i>Banksia armata</i> var. <i>armata</i>
		<i>Banksia attenuata</i>
		<i>Banksia bipinnatifida</i> subsp. <i>multifida</i>
		<i>Banksia candolleana</i>
		<i>Banksia carlinoides</i>
	P4	<i>Banksia chamaephyton</i>
		<i>Banksia glaucifolia</i>
		<i>Banksia grossa</i>
		<i>Banksia incana</i> var. <i>incana</i>
		<i>Banksia kippistiana</i> var. <i>kippistiana</i>
	P3	<i>Banksia kippistiana</i> var. <i>paenepeccata</i>
	P3	<i>Banksia nana</i>
		<i>Banksia platycarpa</i>
		<i>Banksia prionotes</i>

*Banksia shuttleworthiana*  
*Banksia sphaerocarpa* var. *sphaerocarpa*  
*Banksia stenoprion*  
*Banksia tortifolia*  
*Banksia tridentata*  
*Conospermum ?crassinervium*  
*Conospermum acerosum* subsp. *acerosum*  
*Conospermum crassinervium*  
*Conospermum incurvum*  
*Conospermum nervosum*  
*Conospermum wycherleyi* subsp. *glabrum*  
*Grevillea synapheae* subsp. *pachyphylla*  
*Hakea ?incrassata*  
*Hakea auriculata*  
*Hakea eneabba*  
*Hakea flabellifolia*  
*Hakea incrassata*  
*Hakea lissocarpha*  
*Hakea neospathulata*  
*Hakea neospathulata*  
*Hakea obliqua*  
*Hakea prostrata*  
*Hakea psilorrhyncha*  
*Hakea smilacifolia*  
*Hakea trifurcata*  
*Isopogon adenanthoides*  
*Isopogon asper*  
*Isopogon inconspicuus*  
*Isopogon linearis*  
*Lambertia multiflora* var. *multiflora*  
*Persoonia ?quinquenervis*  
*Persoonia comata*  
*Persoonia rufiflora*  
*Persoonia trinervis*  
*Petrophile ?pilostyla* subsp. *austrina*  
*Petrophile chrysantha*  
*Petrophile linearis*  
*Petrophile macrostachya*  
*Petrophile rigida*  
*Petrophile serruriae*  
*Petrophile shuttleworthiana*  
*Petrophile striata*  
*Proteaceae* sp.  
*Stirlingia latifolia*  
*Strangea cynanchicarpa*  
*Synaphea aephyrsa*  
*Synaphea spinulosa* subsp. *spinulosa*  
P2 *Synaphea xela*  
*Cheilanthes* sp.

Restionaceae	<i>Alexgeorgea nitens</i>
	<i>Alexgeorgea subterranea</i>
	<i>Chordifex microcodon</i>
P2	<i>Chordifex reseminans</i>
	<i>Chordifex sinuosus</i>
	<i>Chordifex stenandrus</i>
P4	<i>Desmocladius elongatus</i>
	<i>Desmocladius fasciculatus</i>
	<i>Desmocladius flexuosus</i>
	<i>Desmocladius virgatus</i>
P4	<i>Hypolaena robusta</i>
	<i>Lepidobolus preissianus</i>
P3	<i>Lepidobolus quadratus</i>
Rhamnaceae	<i>Cryptandra pungens</i>
	<i>Cryptandra sp. 1</i>
	<i>Cryptandra sp. 2</i>
	<i>Cryptandra sp. 3</i>
	<i>Cryptandra sp. 4</i>
	<i>Cryptandra sp. 5</i>
	<i>Stenanthemum limitatum</i>
	<i>Stenanthemum notiale subsp. notiale</i>
	<i>Stenanthemum reissekii</i>
	<i>Trymalium daphnifolium</i>
Rubiaceae	<i>Opercularia vaginata</i>
Rutaceae	<i>Boronia ?crassifolia</i>
	<i>Cyanothamnus ramosus subsp. anethifolius</i>
	<i>Cyanothamnus sp.</i>
	<i>Diplolaena ferruginea</i>
	<i>Philothea pinoides</i>
	<i>Philothea spicata</i>
	<i>Rutaceae sp.</i>
Santalaceae	<i>Leptomeria pauciflora</i>
	<i>Santalum acuminatum</i>
Sapindaceae	<i>Dodonaea ericoides</i>
Scrophulariaceae	<i>Eremophila sp.</i>
Stylidiaceae	<i>Levenhookia ?stipitata</i>
	<i>Levenhookia murfetii</i>
	<i>Levenhookia pauciflora</i>
	<i>Levenhookia pusilla</i>
	<i>Stylidium ?kalbarriense/rigidulum</i>
	<i>Stylidium ?miniatum</i>
	<i>Stylidium ?repens</i>
P4	<i>Stylidium aeonioides</i>
	<i>Stylidium bicolor</i>
	<i>Stylidium caricifolium</i>
	<i>Stylidium crossocephalum</i>
	<i>Stylidium cygnorum</i>
P3	<i>Stylidium hymenocraspedum</i>
P4	<i>Stylidium inversiflorum</i>

	<i>Stylidium miniatum</i>
P3	<i>Stylidium nonscandens</i>
	<i>Stylidium repens</i>
	<i>Stylidium scariosum</i>
	<i>Stylidium schoenoides</i>
Thymelaeaceae	<i>Pimelea ?floribunda</i>
	<i>Pimelea angustifolia</i>
	<i>Pimelea imbricata</i> var. <i>piligera</i>
	<i>Pimelea sulphurea</i>
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>
	<i>Xanthorrhoea</i> sp. 1
	<i>Xanthorrhoea</i> sp. 2
	<i>Xanthorrhoea</i> sp. 3

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\*=non-native, Pl=planted, DP=declared pest, P1-P4=priority 1 to priority 4



# Appendix E

Conservation Significant Flora Species Records





<b>Species</b>	<b>Conservation status</b>	<b>Easting</b>	<b>Northing</b>
<i>Chordifex reseminans</i>	P2	345110.33	6635659.67
<i>Chordifex reseminans</i>	P2	346196.71	6636079.28
<i>Chordifex reseminans</i>	P2	346807.00	6636149.97
<i>Chordifex reseminans</i>	P2	345972.64	6636294.28
<i>Chordifex reseminans</i>	P2	345809.60	6636684.29
<i>Hypocalymma serrulatum</i>	P2	346084.26	6636297.85
<i>Leucopogon plumuliflorus</i>	P2	347462.53	6638580.20
<i>Leucopogon plumuliflorus</i>	P2	348091.95	6638826.46
<i>Leucopogon plumuliflorus</i>	P2	348037.79	6639029.01
<i>Leucopogon plumuliflorus</i>	P2	348007.73	6638999.99
<i>Lyginia excelsa</i>	P2	345011.92	6641601.06
<i>Lyginia excelsa</i>	P2	345759.83	6636744.45
<i>Synaphea xela</i>	P2	337337.85	6643573.97
<i>Austrostipa nunaginensis</i>	P3	347943.45	6636604.25
<i>Austrostipa nunaginensis</i>	P3	347817.34	6636516.79
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	346876.12	6636195.62
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	347704.98	6638578.05
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348138.23	6639153.58
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348132.10	6639248.83
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	347798.45	6638795.09
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	344779.88	6635597.64
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348238.64	6637923.03
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348078.85	6638339.28
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	347776.42	6639070.81
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348174.20	6638752.78
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348001.40	6638565.23
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	348128.81	6639002.35
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	343601.15	6644200.71
<i>Banksia nana</i>	P3	348039.63	6638401.81
<i>Banksia nana</i>	P3	340350.82	6641657.26
<i>Banksia nana</i>	P3	348238.64	6637923.03
<i>Banksia nana</i>	P3	348078.85	6638339.28
<i>Banksia nana</i>	P3	347828.28	6638256.30
<i>Banksia nana</i>	P3	347828.32	6638865.12
<i>Banksia nana</i>	P3	344262.33	6635388.03
<i>Banksia nana</i>	P3	343601.15	6644200.71
<i>Banksia nana</i>	P3	341121.61	6641617.28
<i>Beaufortia bicolor</i>	P3	345862.40	6635861.03
<i>Beaufortia bicolor</i>	P3	346132.54	6637681.27
<i>Beaufortia bicolor</i>	P3	347776.42	6639070.81
<i>Beaufortia bicolor</i>	P3	345837.36	6635851.07
<i>Beaufortia bicolor</i>	P3	339514.01	6641759.54
<i>Beaufortia bicolor</i>	P3	339328.52	6641779.82
<i>Beaufortia bicolor</i>	P3	339209.37	6641794.58
<i>Beaufortia bicolor</i>	P3	342410.15	6641631.91
<i>Beaufortia bicolor</i>	P3	347276.13	6641566.68

<i>Beaufortia bicolor</i>	P3	347590.19	6641600.05
<i>Drosera prophylla</i>	P3	348263.12	6638124.79
<i>Drosera prophylla</i>	P3	347776.42	6639070.81
<i>Hensmania stoniella</i>	P3	341355.22	6635273.28
<i>Hensmania stoniella</i>	P3	342298.70	6641620.55
<i>Hensmania stoniella</i>	P3	345972.64	6636294.28
<i>Hensmania stoniella</i>	P3	345809.60	6636684.29
<i>Hensmania stoniella</i>	P3	346287.84	6637001.91
<i>Hensmania stoniella</i>	P3	340348.94	6641657.53
<i>Hensmania stoniella</i>	P3	353187.04	6642031.71
<i>Lepidobolus quadratus</i>	P3	347230.48	6641596.91
<i>Lepidobolus quadratus</i>	P3	348238.64	6637923.03
<i>Lepidobolus quadratus</i>	P3	347828.28	6638256.30
<i>Lepidobolus quadratus</i>	P3	347776.42	6639070.81
<i>Lepidobolus quadratus</i>	P3	347365.45	6641597.09
<i>Phlebocarya pilosissima subsp. pilosissima</i>	P3	343352.32	6635294.48
<i>Phlebocarya pilosissima subsp. pilosissima</i>	P3	346168.87	6636844.91
<i>Phlebocarya pilosissima subsp. pilosissima</i>	P3	346133.24	6636448.87
<i>Stylidium hymenocraspedum</i>	P3	346153.76	6636452.60
<i>Stylidium hymenocraspedum</i>	P3	346160.47	6636402.10
<i>Stylidium nonscandens</i>	P3	347828.28	6638256.30
<i>Tetratheca angulata</i>	P3	348107.04	6638998.83
<i>Tetratheca angulata</i>	P3	348025.34	6638075.91
<i>Tetratheca angulata</i>	P3	348128.81	6639002.35
<i>Banksia chamaephyton</i>	P4	346807.00	6636149.97
<i>Banksia chamaephyton</i>	P4	340350.82	6641657.26
<i>Banksia chamaephyton</i>	P4	343642.47	6635288.28
<i>Banksia chamaephyton</i>	P4	341121.37	6641617.45
<i>Banksia chamaephyton</i>	P4	341117.61	6641618.88
<i>Banksia chamaephyton</i>	P4	340999.68	6641615.69
<i>Desmocladius elongatus</i>	P4	343213.55	6641614.91
<i>Desmocladius elongatus</i>	P4	347389.67	6641564.89
<i>Desmocladius elongatus</i>	P4	347616.84	6641573.61
<i>Eucalyptus x carnabyi</i>	P4	346024.99	6637029.23
<i>Hypolaena robusta</i>	P4	345734.64	6636453.53
<i>Hypolaena robusta</i>	P4	346273.91	6637654.89
<i>Schoenus griffinianus</i>	P4	345809.60	6636684.29
<i>Stylidium aeonioides</i>	P4	348196.68	6638843.22
<i>Stylidium aeonioides</i>	P4	347828.28	6638256.30
<i>Stylidium aeonioides</i>	P4	347776.42	6639070.81
<i>Stylidium inversiflorum</i>	P4	346178.99	6636224.92

Note: P2-P4=priority 1 to priority 4

# Appendix F

Sample Data





**Sample Name: Q1**

**Project no.:** EP23-085

**Date:** 18/09/2023

**Author:** SCM,MS

**Status** Permanent

Q1: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 345972.6374

NW corner northing: 6636294.276

Altitude (m): 231

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: mid-slope

Time since fire: no evidence

Disturbance: no evidence -

Soil type/texture sand/

Bare ground (%): 25

Rocks (%) and type: No rocks

Soil colour: grey/yellow

Litter: 5% (leaves,twigs,branches)

Vegetation condition: excellent



**Sample Name:** Q1

**Project no.:** EP23-085

**Date:** 18/09/2023

**Author:** SCM,MS

**Status** Permanent

Q1: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Apectospermum spinescens</i>	0.1
	<i>Acacia stenoptera</i>	2
	<i>Adenanthos cygnorum subsp. cygnorum</i>	2
	<i>Alexgeorgea nitens</i>	1
	<i>Allocasuarina humilis</i>	1
	<i>Amphipogon ?turbinatus</i>	0.5
	* <i>Arctotheca calendula</i>	0.1
	<i>Banksia attenuata</i>	20
	<i>Burchardia congesta</i>	0.1
	<i>Caladenia sp. 2</i>	0.1
	<i>Cassytha sp.</i>	0.1
	<i>Chordifex microcodon</i>	1
P2	<i>Chordifex reseminans</i>	0.5
	<i>Chordifex sinuosus</i>	2
	<i>Conospermum crassinervium</i>	1
	<i>Conostylis angustifolia</i>	opp
	<i>Conostylis crassinerva subsp. absens</i>	0.1
	<i>Cyanothamnus ramosus subsp. anethifolius</i>	0.1
	<i>Dampiera haemotricha subsp. dura</i>	0.1
	<i>Dasypogon obliquifolius</i>	1
	<i>Daviesia podophylla</i>	5
	<i>Drosera ?eneabba</i>	0.1
	<i>Drosera ?erythrorhiza</i>	0.1
	<i>Drosera thysanosepala</i>	0.1
	<i>Eremaea asterocarpa</i>	1
	<i>Haemodorum ?simplex</i>	0.1
P3	<i>Hensmania stoniella</i>	0.1
	<i>Hibbertia hypericoides</i>	0.5
	<i>Hibbertia pubens</i>	opp
	<i>Hovea stricta</i>	0.1
	<i>Hypocalymma xanthopetalum</i>	2
	* <i>Hypochoeris glabra</i>	0.1
	<i>Johnsonia pubescens subsp. pubescens</i>	0.5
	<i>Lepidosperma sp. 4</i>	1
	<i>Leucopogon oldfieldii</i>	0.5
	<i>Levenhookia ?stipitata</i>	0.1

### Sample Name: Q1

Project no.: EP23-085

Date: 18/09/2023

Author: SCM,MS

Status Permanent

Q1: Page 3 of 3

<i>Lomandra caespitosa</i>	0.1
<i>Lomandra sericea</i>	opp
<i>Lyginia barbata</i>	0.5
<i>Lysinema ciliatum</i>	0.1
<i>Melaleuca sp. 7</i>	2
<i>Mesomelaena pseudostygia</i>	1
<i>Neurachne alopecuroidea</i>	0.1
<i>Persoonia comata</i>	0.5
<i>Petrophile linearis</i>	0.1
<i>Petrophile rigida</i>	0.5
<i>Podotheca angustifolia</i>	0.1
<i>Schoenus brevisetis</i>	0.5
<i>Schoenus caespititius</i>	0.5
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stirlingia latifolia</i>	2
<i>Stylidium ?repens</i>	1
<i>Styphelia kingiana</i>	0.5
<i>Styphelia xerophylla</i>	0.5
<i>Synaphea spinulosa subsp. spinulosa</i>	0.1
<i>Trachymene pilosa</i>	0.1
* <i>Ursinia anthemoides</i>	0.1
<i>Verticordia sp. 5</i>	0.1

**Sample Name:**

**Q2**

**Project no.:** EP23-085

**Date:** 19/09/2023

**Author:** SCM,MS

**Status** Permanent

Q2: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 346287.8423

NW corner northing: 6637001.909

Altitude (m): 237

Geographic datum/zone: GDA94/Zone 50

Soil water content: slightly damp

Landform: mid-slope

Time since fire: no evidence

Disturbance: low - weds

Soil type/texture sand/

Bare ground (%): 25

Rocks (%) and type: No rocks

Soil colour: grey/yellow

Litter: 10% (branches,leaves,twigs)

Vegetation condition: excellent



**Sample Name:**

**Q2**

**Project no.:** EP23-085

**Date:** 19/09/2023

**Status** Permanent

**Author:** SCM,MS

Q2: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Apectospermum spinescens</i>	1
	? <i>Amphipogon sp. 2 (sterile)</i>	0.1
	<i>Adenanthos cygnorum subsp. cygnorum</i>	5
	<i>Alexgeorgea subterranea</i>	5
	<i>Allocasuarina humilis</i>	3
	<i>Banksia attenuata</i>	2
	<i>Banksia candolleana</i>	5
	<i>Burchardia congesta</i>	0.1
	<i>Caladenia flava</i>	0.1
	<i>Callitris acuminata</i>	2
	<i>Calytrix sp.</i>	0.1
	<i>Cassytha sp.</i>	0.1
	<i>Chaetospora curvifolia</i>	opp
	<i>Chordifex sinuosus</i>	0.1
	<i>Conospermum crassinervium</i>	0.1
	<i>Conostephium pendulum</i>	1
	<i>Conostylis angustifolia</i>	opp
	<i>Conostylis crassinerva subsp. absens</i>	0.1
	<i>Crassula colorata</i>	0.1
	<i>Cyanothamnus ramosus subsp. anethifolius</i>	0.1
	<i>Dampiera haemotricha subsp. dura</i>	0.1
	<i>Darwinia speciosa</i>	opp
	<i>Daviesia podophylla</i>	2
	<i>Drosera ?eneabba</i>	0.1
	<i>Drosera ?erythrorhiza</i>	0.1
	<i>Drosera thysanosepala</i>	0.1
	* <i>Ehrharta calycina</i>	0.1
	<i>Elythranthera brunonis</i>	opp
	<i>Eremaea asterocarpa</i>	3
	<i>Eremaea pauciflora</i>	1
	<i>Eremaea sp. 2</i>	2
	<i>Haemodorum ?simplex</i>	0.1
P3	<i>Hensmania stoniella</i>	0.1
	<i>Hibbertia hypericoides</i>	0.1
	<i>Hovea stricta</i>	0.1
	<i>Hypocalymma xanthopetalum</i>	10

### Sample Name: Q2

Project no.: EP23-085

Date: 19/09/2023

Author: SCM,MS

Status Permanent

Q2: Page 3 of 3

* <i>Hypochaeris glabra</i>	0.1
<i>Jacksonia floribunda</i>	opp
<i>Levenhookia murfetii</i>	0.1
<i>Lomandra ?suaveolens</i>	0.1
<i>Lomandra caespitosa</i>	0.1
<i>Macarthuria apetala</i>	opp
<i>Melaleuca sp. 3</i>	0.1
<i>Mesomelaena pseudostygia</i>	1
<i>Neurachne alopecuroidea</i>	0.1
* <i>Pentameris ?airoides subsp. airoides</i>	0.1
<i>Persoonia comata</i>	1
<i>Petrophile linearis</i>	0.1
<i>Petrophile rigida</i>	0.1
<i>Phlebocarya filifolia</i>	0.1
<i>Podotheca ?gnaphalioides</i>	0.1
<i>Pterostylis ?vittata</i>	0.1
<i>Pyrorchis nigricans</i>	opp
<i>Schoenus brevisetis</i>	0.1
<i>Schoenus caespititius</i>	0.1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stirlingia latifolia</i>	5
<i>Stylidium ?repens</i>	opp
<i>Stylidium bicolor</i>	0.1
<i>Styphelia crassiflora</i>	2
<i>Styphelia kingiana</i>	2
<i>Styphelia xerophylla</i>	opp
<i>Trachymene pilosa</i>	0.1
* <i>Ursinia anthemoides</i>	0.1
<i>Verticordia sp. 5</i>	0.1
* <i>Vulpia sp.</i>	0.1

**Sample Name:**

**Q3**

**Project no.:** EP23-085

**Date:** 19/09/2023

**Author:** MS,TDP

**Status** Permanent

Q3: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 345809.5994

NW corner northing: 6636684.294

Altitude (m): 249

Geographic datum/zone: GDA94/Zone 50

Soil water content: slightly damp

Landform: upper slope

Time since fire: no evidence

Disturbance: no evidence -

Soil type/texture sand/

Bare ground (%): 30

Rocks (%) and type: No rocks

Soil colour: white/brown

Litter: 5% (branches,leaves,twigs)

Vegetation condition: excellent



**Sample Name:**

**Q3**

**Project no.:** EP23-085

**Date:** 19/09/2023

**Status** Permanent

**Author:** MS,TDP

Q3: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Apectospermum spinescens</i>	1
	<i>Acacia stenoptera</i>	0.1
	<i>Adenanthos cygnorum subsp. cygnorum</i>	3
	<i>Alexgeorgea nitens</i>	1
	<i>Alexgeorgea subterranea</i>	1
	<i>Andersonia heterophylla</i>	0.1
	<i>Banksia attenuata</i>	25
	<i>Banksia candolleana</i>	15
	<i>Blancoa canescens</i>	0.1
	<i>Burchardia congesta</i>	0.1
	<i>Callitris acuminata</i>	0.1
	<i>Cassytha sp.</i>	opp
P2	<i>Chordifex reseminans</i>	1
	<i>Chordifex sinuosus</i>	0.1
	<i>Conospermum crassinervium</i>	0.1
	<i>Conostephium pendulum</i>	0.1
	<i>Conostylis angustifolia</i>	0.1
	<i>Conostylis crassinerva subsp. absens</i>	0.1
	<i>Conostylis teretifolia subsp. teretifolia</i>	0.1
	<i>Cyanothamnus ramosus subsp. anethifolius</i>	0.1
	<i>Dampiera haemotricha subsp. dura</i>	0.1
	<i>Daviesia pedunculata</i>	opp
	<i>Daviesia podophylla</i>	0.1
	<i>Drosera ?eneabba</i>	0
	<i>Drosera ?erythrorhiza</i>	0.1
	<i>Eremaea asterocarpa</i>	2
	<i>Eremaea pauciflora</i>	20
P3	<i>Hensmania stoniella</i>	0.1
	<i>Hibbertia hypericoides</i>	1
	<i>Hibbertia pubens</i>	0.1
	<i>Hypocalymma xanthopetalum</i>	1
	<i>Jacksonia floribunda</i>	1
	<i>Lepidosperma sp. 8</i>	0.1
	<i>Leucopogon oldfieldii</i>	1
	<i>Lyginia barbata</i>	0.1
	<i>Mesomelaena pseudostygia</i>	0.1

**Sample Name: Q3**

**Project no.:** EP23-085

**Date:** 19/09/2023

**Author:** MS,TDP

**Status** Permanent

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<i>Persoonia comata</i>	0.1
<i>Petrophile linearis</i>	0.1
<i>Petrophile rigida</i>	0.1
<i>Phlebocarya filifolia</i>	0.1
<i>Physopsis spicata</i>	1
<i>Pimelea angustifolia</i>	0.1
P4 <i>Schoenus griffinianus</i>	0.1
<i>Stirlingia latifolia</i>	1
<i>Stylidium bicolor</i>	0.1
<i>Styphelia xerophylla</i>	0.1
<i>Synaphea spinulosa subsp. spinulosa</i>	1
<i>Thysanotus patersonii</i>	0.1
<i>Tricoryne elatior</i>	0.1
<i>Verticordia sp. 5</i>	0.1

**Sample Name:**

**Q4**

**Project no.:** EP23-085

**Date:** 20/09/2023

**Author:** SCM,MS

**Status** Permanent

Q4: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 348238.6355

NW corner northing: 6637923.026

Altitude (m): 253

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: upper slope

Time since fire: no evidence

Disturbance: no evidence -

Soil type/texture silt/

Bare ground (%): 15

Rocks (%) and type: 2%, laterite

Soil colour: grey/

Litter: 2% (leaves,twigs,)

Vegetation condition: excellent



**Sample Name:** Q4

**Project no.:** EP23-085

**Date:** 20/09/2023

**Author:** SCM,MS

**Status** Permanent

Q4: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Apectospermum spinescens</i>	0.1
	<i>Acacia sphacelata</i> subsp. <i>verticillata</i>	0.1
	<i>Acacia stenoptera</i>	0.1
	<i>Allocasuarina humilis</i>	5
	<i>Andersonia lehmanniana</i>	0.1
	<i>Babingtonia grandiflora</i>	0.5
	<i>Banksia glaucifolia</i>	2
P3	<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	2
P3	<i>Banksia nana</i>	1
	<i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i>	10
	<i>Banksia stenoprion</i>	2
	<i>Calectasia hispida</i>	0.5
	<i>Calothamnus longissimus</i>	2
	<i>Calothamnus</i> sp. 4	2
	<i>Cassytha</i> sp.	0.5
	<i>Caustis dioica</i>	0.5
	<i>Comesperma acerosum</i>	0.1
	<i>Conospermum nervosum</i>	0.1
	<i>Conostylis crassinerva</i> subsp. <i>absens</i>	0.1
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>	0.5
	<i>Dampiera alata</i>	0.1
	<i>Dampiera spicigera</i>	0.1
	<i>Daviesia chapmanii</i>	0.1
	<i>Daviesia decurrens</i> subsp. <i>decurrens</i>	0.5
	<i>Desmocladius flexuosus</i>	0.1
	<i>Drosera ?erythrorhiza</i>	0.1
	<i>Elythranthera brunonis</i>	0.1
	<i>Ericaceae</i> sp. 2	0.1
	<i>Gastrolobium plicatum</i>	1
	<i>Glischrocaryon aureum</i>	0.1
	<i>Gompholobium knightianum</i>	0.1
	<i>Goodenia coerulea</i>	0.1
	<i>Haemodorum</i> sp. 1	0.1
	<i>Hakea incrassata</i>	1
	<i>Hakea neospathulata</i>	2
	<i>Hakea smilacifolia</i>	0.5

### Sample Name: Q4

Project no.: EP23-085

Date: 20/09/2023

Author: SCM,MS

Status Permanent

Q4: Page 3 of 3

<i>Hibbertia crassiflora</i>	0.1
<i>Hibbertia hypericoides</i>	5
<i>Hibbertia mylnei</i>	0.1
<i>Hypocalymma xanthopetalum</i>	0.5
* <i>Hypochaeris glabra</i>	0.1
<i>Isopogon adenanthoides</i>	opp
<i>Jacksonia lehmannii</i>	0.1
<i>Labichea punctata</i>	0.1
<i>Lambertia multiflora var. multiflora</i>	10
<i>Lasiopetalum drummondii</i>	0.1
P3 <i>Lepidobolus quadratus</i>	0.1
<i>Lepidosperma sp. 1</i>	0.1
<i>Lepidosperma sp. 4</i>	0.1
<i>Leucopogon oldfieldii</i>	0.5
<i>Lomandra caespitosa</i>	0.1
<i>Lomandra sericea</i>	0.1
<i>Macropidia fuliginosa</i>	opp
<i>Melaleuca sp. 1</i>	0.1
<i>Melaleuca sp. 3</i>	15
<i>Mesomelaena pseudostygia</i>	2
<i>Mesomelaena tetragona</i>	5
<i>Morelotia octandra</i>	1
<i>Neurachne alopecuroidea</i>	0.1
<i>Petrophile ?pilotyla subsp. austrina</i>	1
<i>Petrophile shuttleworthiana</i>	2
<i>Philothea spicata</i>	opp
<i>Pimelea sulphurea</i>	0.1
<i>Podotheca ?gnaphalioides</i>	0.1
<i>Proteaceae sp.</i>	opp
<i>Schoenus brevisetis</i>	0.1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stylidium ?repens</i>	0.1
<i>Stylidium bicolor</i>	0.1
<i>Stylidium cygnorum</i>	0.1
<i>Synaphea aephynsa</i>	0.1
<i>Trachymene pilosa</i>	opp
* <i>Ursinia anthemoides</i>	0.1
<i>Xanthorrhoea sp. 3</i>	10

**Sample Name:**

**Q5**

**Project no.:** EP23-085

**Date:** 20/09/2023

**Author:** SCM,MS

**Status** Permanent

Q5: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 348078.8508

NW corner northing: 6638339.281

Altitude (m): 262

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: upper slope

Time since fire: no evidence

Disturbance: no evidence -

Soil type/texture silt/

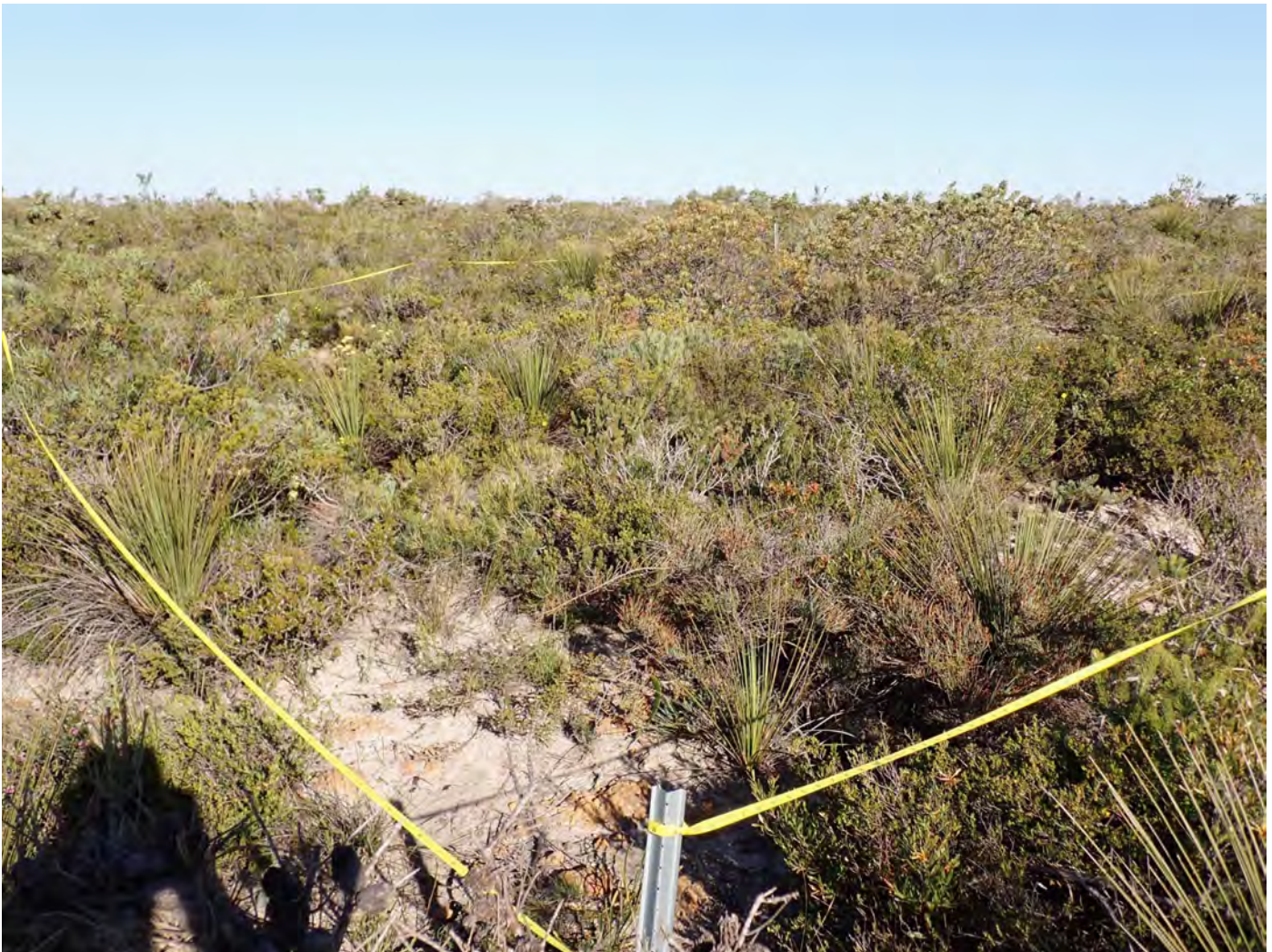
Bare ground (%): 15

Rocks (%) and type: 3%, laterite

Soil colour: grey/

Litter: 2% (leaves,twigs,)

Vegetation condition: excellent



**Sample Name:**

**Q5**

**Project no.:** EP23-085

**Date:** 20/09/2023

**Author:** SCM,MS

**Status** Permanent

Q5: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia sphacelata</i> subsp. <i>verticillata</i>	opp
	<i>Acacia stenoptera</i>	0.1
	<i>Allocasuarina humilis</i>	5
	<i>Amphipogon</i> ? <i>caricinus</i> var. <i>caricinus</i>	opp
	<i>Andersonia lehmanniana</i>	0.1
	<i>Babingtonia grandiflora</i>	0.1
	<i>Banksia bipinnatifida</i> subsp. <i>multifida</i>	0.1
	<i>Banksia glaucifolia</i>	opp
P3	<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	1
P3	<i>Banksia nana</i>	0.1
	<i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i>	1
	<i>Banksia stenoprion</i>	1
	<i>Calectasia hispida</i>	1
	<i>Calothamnus longissimus</i>	1
	<i>Calothamnus</i> sp. 4	2
	<i>Cassutha racemosa</i>	0.1
	<i>Cassutha</i> sp.	0.1
	<i>Caustis dioica</i>	0.1
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>	0.1
	<i>Dampiera alata</i>	0.1
	<i>Desmocladius flexuosus</i>	0.1
	<i>Drakaea livida</i>	0.1
	<i>Drosera</i> ? <i>erythrorhiza</i>	0.1
	<i>Drosera</i> ? <i>porrecta</i>	opp
	<i>Gompholobium knightianum</i>	opp
	<i>Goodenia coerulea</i>	0.1
	<i>Haemodorum</i> sp. 1	0.1
	<i>Hakea incrassata</i>	1
	<i>Hakea neospathulata</i>	1
	<i>Hakea smilacifolia</i>	1
	<i>Hibbertia crassiflora</i>	0.1
	<i>Hibbertia hypericoides</i>	15
	<i>Hibbertia mylnei</i>	0.1
	<i>Hypocalymma xanthopetalum</i>	1
	<i>Isopogon linearis</i>	opp
	<i>Labichea punctata</i>	0.1

### Sample Name: Q5

**Project no.:** EP23-085

**Date:** 20/09/2023

**Author:** SCM,MS

**Status** Permanent

Q5: Page 2 of 3

<i>Lambertia multiflora var. multiflora</i>	5
<i>Lepidosperma sp. 1</i>	opp
<i>Lepidosperma sp. 3</i>	0.1
<i>Leucopogon sp.</i>	0.1
<i>Lomandra sericea</i>	0.1
<i>Melaleuca sp. 1</i>	0.1
<i>Melaleuca sp. 3</i>	10
<i>Mesomelaena pseudostygia</i>	0.1
<i>Mesomelaena tetragona</i>	0.1
<i>Morelotia octandra</i>	0.1
<i>Neurachne alopecuroidea</i>	0.1
<i>Opercularia vaginata</i>	0.1
<i>Persoonia rufiflora</i>	0.1
<i>Petrophile ?pilostyla subsp. austrina</i>	1
<i>Petrophile shuttleworthiana</i>	15
<i>Pimelea sulphurea</i>	0.1
<i>Schoenus brevisetis</i>	0.1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stylidium ?repens</i>	0.1
<i>Stylidium bicolor</i>	0.1
<i>Synaphea aephynsa</i>	0.1
<i>Thysanotus sp.</i>	0.1
<i>Xanthorrhoea sp. 2</i>	0.1
<i>Xanthorrhoea sp. 3</i>	5
<i>Xanthosia huegelii</i>	0.1

**Sample Name:**

**Q6**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** SCM,MS

**Status** Permanent

Q6: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 347828.2793

NW corner northing: 6638256.296

Altitude (m): 264

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: ridge

Time since fire: > 5 yrs

Disturbance: no evidence -

Soil type/texture silt/

Bare ground (%): 2

Rocks (%) and type: 30%, laterite

Soil colour: grey/brown

Litter: 2% (leaves,twigs,)

Vegetation condition: excellent



**Sample Name:**

**Q6**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** SCM,MS

**Status** Permanent

Q6: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia ?moirii subsp. recurvistipula</i>	0.1
	<i>Acacia sphacelata subsp. verticillata</i>	0.1
	<i>Allocasuarina humilis</i>	1
	<i>Aotus procumbens</i>	0.1
	<i>Babingtonia grandiflora</i>	0.1
	<i>Banksia bipinnatifida subsp. multifida</i>	1
	<i>Banksia carlinoides</i>	10
P3	<i>Banksia nana</i>	1
	<i>Banksia sphaerocarpa var. sphaerocarpa</i>	3
	<i>Banksia stenoprion</i>	0.1
	<i>Burchardia congesta</i>	0.1
	<i>Caladenia sp. 3</i>	0.1
	<i>Calectasia hispida</i>	1
	<i>Callitris acuminata</i>	1
	<i>Calothamnus longissimus</i>	2
	<i>Calothamnus sp. 4</i>	2
	<i>Caustis dioica</i>	0.1
	<i>Conostylis androstemma</i>	0.1
	<i>Conostylis teretifolia subsp. teretifolia</i>	0.1
	<i>Cryptandra sp. 4</i>	0.1
	<i>Cryptandra sp. 5</i>	0.1
	<i>Desmocladius flexuosus</i>	0.1
	<i>Drosera ?erythrorhiza</i>	0.1
	<i>Drosera ?porrecta</i>	0.1
	<i>Drosera barbiger</i>	0.1
	<i>Elythranthera brunonis</i>	0.1
	<i>Ericaceae sp. 1</i>	0.1
	<i>Gastrolobium axillare</i>	0.1
	<i>Gompholobium knightianum</i>	0.1
	<i>Goodenia affinis</i>	0.1
	<i>Haemodorum sp. 1</i>	0.1
	<i>Hakea incrassata</i>	1
	<i>Hakea lissocarpha</i>	0.1
	<i>Hakea smilacifolia</i>	0.1
	<i>Hibbertia crassiflora</i>	1
	<i>Hibbertia hypericoides</i>	5

### Sample Name: Q6

Project no.: EP23-085

Date: 21/09/2023

Author: SCM,MS

Status Permanent

Q6: Page 3 of 3

<i>Hibbertia mylnei</i>	0.1
<i>Hypocalymma xanthopetalum</i>	1
<i>Isopogon asper</i>	opp
<i>Kingia australis</i>	opp
<i>Labichea punctata</i>	0.1
<i>Lambertia multiflora</i> var. <i>multiflora</i>	3
P3 <i>Lepidobolus quadratus</i>	0.1
<i>Lepidosperma</i> sp. 3	0.1
<i>Lepidosperma</i> sp. 4	0.1
<i>Leucopogon oldfieldii</i>	1
<i>Lomandra sericea</i>	0.1
<i>Melaleuca</i> sp. 1	0.1
<i>Melaleuca</i> sp. 2	0.1
<i>Melaleuca</i> sp. 3	3
<i>Mesomelaena tetragona</i>	0.1
<i>Monotaxis grandiflora</i>	2
<i>Morelotia octandra</i>	1
<i>Neurachne alopecuroidea</i>	0.1
<i>Persoonia rufiflora</i>	0.1
<i>Petrophile ?pilotyla</i> subsp. <i>austrina</i>	1
<i>Schoenus brevisetis</i>	0.1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Scholtzia ?parviflora</i>	0.1
<i>Stenanthemum reissekii</i>	0.1
P4 <i>Stylidium aeonioides</i>	0.1
P3 <i>Stylidium nonscandens</i>	opp
<i>Styphelia</i> sp. 2	0.1
<i>Tetratheca ?confertifolia</i>	0.1
<i>Thysanotus</i> sp.	0.1
<i>Xanthorrhoea</i> sp. 1	5
<i>Xanthorrhoea</i> sp. 2	0.1
<i>Xanthosia huegelii</i>	0.1

**Sample Name:**

**Q7**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** SCM,MS

**Status** Permanent

Q7: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 347776.424

NW corner northing: 6639070.813

Altitude (m): 290

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: ridge

Time since fire: > 5 yrs

Disturbance: no evidence -

Soil type/texture silt/

Bare ground (%): 3

Rocks (%) and type: 45%, laterite

Soil colour: grey/brown

Litter: 1% (leaves,twigs,)

Vegetation condition: excellent



**Sample Name:**

**Q7**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** SCM,MS

**Status** Permanent

Q7: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia ?moirii subsp. recurvistipula</i>	0.1
	<i>Acacia sphacelata subsp. verticillata</i>	0.1
	<i>Allocasuarina humilis</i>	1
	* <i>Arctotheca calendula</i>	0.1
	<i>Babingtonia grandiflora</i>	opp
	<i>Banksia bipinnatifida subsp. multifida</i>	0.1
	<i>Banksia carlinoides</i>	opp
	<i>Banksia glaucifolia</i>	opp
P3	<i>Banksia kippistiana var. paenepeccata</i>	0.1
	<i>Banksia sphaerocarpa var. sphaerocarpa</i>	5
	<i>Banksia stenoprion</i>	0.1
P3	<i>Beaufortia bicolor</i>	0.1
	<i>Calectasia hispida</i>	0.1
	<i>Calothamnus longissimus</i>	2
	<i>Caustis dioica</i>	0.1
	<i>Conostylis androstemma</i>	0.1
	<i>Dampiera alata</i>	0.1
	<i>Desmocladus flexuosus</i>	0.1
	<i>Dodonaea ericoides</i>	0.1
	<i>Drosera barbigera</i>	0.1
P3	<i>Drosera prophylla</i>	0.1
	<i>Gastrolobium axillare</i>	0.1
	<i>Gastrolobium plicatum</i>	0.1
	<i>Goodenia coerulea</i>	0.1
	<i>Haemodorum sp. 1</i>	0.1
	<i>Hakea incrassata</i>	1
	<i>Hakea lissocarpha</i>	0.1
	<i>Hakea smilacifolia</i>	0.1
	<i>Hibbertia crassiflora</i>	0.1
	<i>Hibbertia hypericoides</i>	0.1
	<i>Hibbertia mylnei</i>	0.1
	<i>Isopogon asper</i>	0.1
	<i>Jacksonia lehmannii</i>	0.1
	<i>Labichea punctata</i>	opp
	<i>Lambertia multiflora var. multiflora</i>	2
	<i>Lechenaultia biloba</i>	0.1

### Sample Name: Q7

Project no.: EP23-085

Date: 21/09/2023

Author: SCM,MS

Status Permanent

Q7: Page 3 of 3

P3 <i>Lepidobolus quadratus</i>	0.1
<i>Lepidosperma sp. 3</i>	0.1
<i>Lepidosperma sp. 6</i>	0.1
<i>Levenhookia pusilla</i>	0.1
<i>Lomandra sericea</i>	opp
<i>Melaleuca sp. 2</i>	2
<i>Melaleuca sp. 3</i>	opp
<i>Mesomelaena pseudostygia</i>	1
<i>Mesomelaena tetragona</i>	0.1
<i>Morelotia octandra</i>	0.1
<i>Neurachne alopecuroidea</i>	0.1
<i>Persoonia rufiflora</i>	0.1
<i>Petrophile ?pilostyla subsp. austrina</i>	1
<i>Petrophile shuttleworthiana</i>	opp
<i>Poaceae sp. 1 (sterile)</i>	0.1
<i>Pterostylis sp.</i>	0.1
<i>Schoenus brevisetis</i>	1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stenanthemum reissekii</i>	0.1
P4 <i>Stylidium aeonioides</i>	0.1
<i>Stylidium miniatum</i>	0.1
<i>Styphelia sp. 4</i>	1
<i>Tetradthea ?confertifolia</i>	opp
<i>Thomasia foliosa</i>	0.1
<i>Xanthorrhoea sp. 3</i>	15

**Sample Name: Q8**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** MS,TDP

**Status** Permanent

Q8: Page 1 of #REF!

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 348174.1988

NW corner northing: 6638752.777

Altitude (m): 243

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: mid-slope

Time since fire: > 5 yrs

Disturbance: no evidence -

Soil type/texture sand/silt

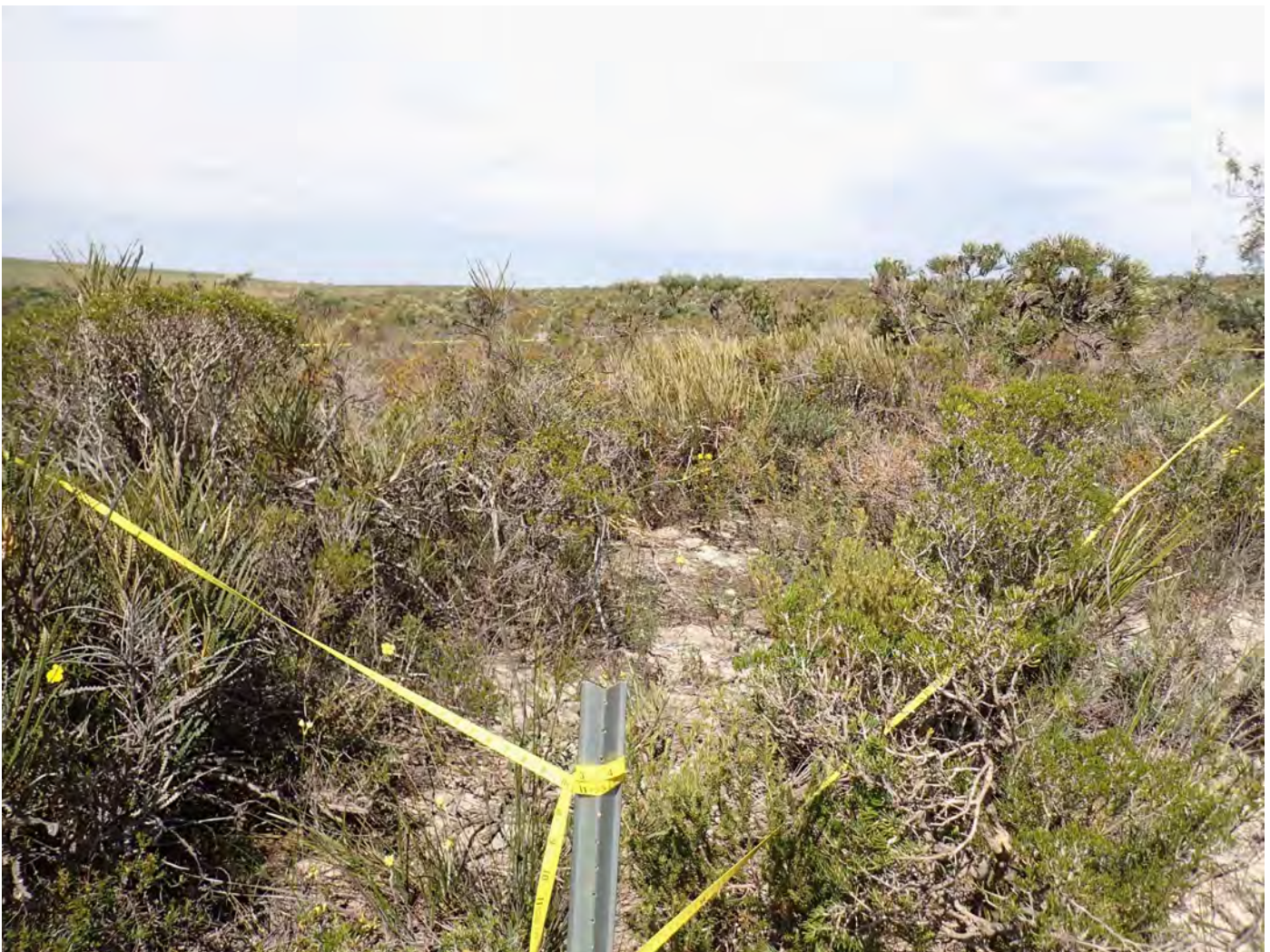
Bare ground (%): 20

Rocks (%) and type: No rocks

Soil colour: white/brown

Litter: 10% (twigs,branches,leaves)

Vegetation condition: excellent



**Sample Name:**

**Q8**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** MS,TDP

**Status** Permanent

Q8: Page 2 of #REF!

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Apectospermum spinescens</i>	2
	<i>Alexgeorgea nitens</i>	0.1
	<i>Allocasuarina humilis</i>	opp
	<i>Amphipogon ?caricinus var. caricinus</i>	0.1
	<i>Anigozanthos humilis subsp. humilis</i>	opp
	<i>Banksia attenuata</i>	20
	<i>Banksia candolleana</i>	10
P3	<i>Banksia kippistiana var. paenepeccata</i>	1
	<i>Banksia stenoprion</i>	0.1
	<i>Banksia tortifolia</i>	opp
	<i>Burchardia congesta</i>	0.1
	<i>Calothamnus sp. 3</i>	1
	<i>Cassytha sp.</i>	1
	<i>Chaetospora curvifolia</i>	0.1
	<i>Chordifex sinuosus</i>	0.1
	<i>Conostephium pendulum</i>	1
	<i>Conostylis angustifolia</i>	1
	<i>Conostylis crassinerva subsp. absens</i>	0.1
	<i>Conostylis teretifolia subsp. teretifolia</i>	0.1
	<i>Dasypogon obliquifolius</i>	5
	<i>Drosera ?erythrorhiza</i>	0.1
	<i>Drosera eneabba</i>	0.1
	<i>Drosera thysanosepala</i>	0.1
	<i>Eremaea pauciflora</i>	5
	<i>Eucalyptus todtiana</i>	0.1
	<i>Goodenia coerulea</i>	0.1
	<i>Hakea obliqua</i>	0.1
	<i>Hibbertia crassiflora</i>	0.1
	<i>Hibbertia hypericoides</i>	3
	<i>Hibbertia striata</i>	0.1
	<i>Jacksonia floribunda</i>	1
	<i>Johnsonia pubescens subsp. pubescens</i>	0.1
	<i>Lasiopetalum drummondii</i>	0.1
	<i>Lepidosperma sp. 3</i>	0.1
	<i>Lepidosperma sp. 4</i>	0.1
	<i>Leucopogon oldfieldii</i>	0.1

**Sample Name:** Q8

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** MS,TDP

**Status** Permanent

Q8: Page 3 of 3

<i>Lyginia imberbis</i>	0.1
<i>Melaleuca sp. 3</i>	5
<i>Melaleuca sp. 7</i>	1
<i>Mesomelaena pseudostygia</i>	1
<i>Monotaxis grandiflora</i>	0.1
<i>Patersonia occidentalis var. latifolia</i>	0.1
<i>Persoonia comata</i>	5
<i>Petrophile linearis</i>	0.1
<i>Petrophile shuttleworthiana</i>	5
<i>Rutaceae sp.</i>	opp
<i>Schoenus brevisetis</i>	1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stirlingia latifolia</i>	1
<i>Stylidium crossocephalum</i>	opp
<i>Verticordia sp. 3 (sterile)</i>	0.1

**Sample Name: Q9**

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** MS,TDP

**Status** Permanent

Q9: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 348001.3967

NW corner northing: 6638565.235

Altitude (m): 251

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: mid-slope

Time since fire: > 5 yrs

Disturbance: no evidence -

Soil type/texture sand/silt

Bare ground (%): 20

Rocks (%) and type: No rocks

Soil colour: white/

Litter: 5% (twigs,branches,leaves)

Vegetation condition: excellent



**Sample Name:** Q9

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** MS,TDP

**Status:** Permanent

Q9: Page 2 of 3

### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Apectospermum spinescens</i>	1
	? <i>Goodeniaceae sp.</i>	0.1
	<i>Alexgeorgea nitens</i>	0.1
	<i>Allocasuarina humilis</i>	5
	<i>Amphipogon ?caricinus var. caricinus</i>	0.1
	<i>Anigozanthos humilis subsp. humilis</i>	0.1
	<i>Banksia attenuata</i>	0.1
	<i>Banksia grossa</i>	5
P3	<i>Banksia kippistiana var. paenepeccata</i>	1
	<i>Banksia stenoprion</i>	0.1
	<i>Banksia tortifolia</i>	0.1
	<i>Burchardia congesta</i>	0.1
	<i>Caladenia sp. 1</i>	0.1
	<i>Cassytha sp.</i>	1
	<i>Chaetospora curvifolia</i>	1
	<i>Conostylis angustifolia</i>	1
	<i>Conostylis teretifolia subsp. teretifolia</i>	0.1
	<i>Cyanothamnus ramosus subsp. anethifolius</i>	0.1
	<i>Dasypogon obliquifolius</i>	3
	<i>Drosera ?eneabba</i>	0.1
	<i>Drosera ?erythrorhiza</i>	opp
	<i>Drosera ?porrecta</i>	0.1
	<i>Drosera sp. 1</i>	opp
	<i>Eremaea pauciflora</i>	5
	<i>Ericaceae sp. 2</i>	0.1
	<i>Hakea flabellifolia</i>	0.1
	<i>Hibbertia hypericoides</i>	0.1
	<i>Hibbertia striata</i>	0.1
	<i>Hypocalymma xanthopetalum</i>	0.1
	<i>Jacksonia floribunda</i>	0.1
	<i>Johnsonia pubescens subsp. pubescens</i>	0.1
	<i>Lambertia multiflora var. multiflora</i>	0.1
	<i>Lasiopetalum drummondii</i>	2
	<i>Lepidobolus preissianus</i>	1
	<i>Lomandra ?suaveolens</i>	0.1
	<i>Lomandra preissii</i>	opp

### Sample Name: Q9

**Project no.:** EP23-085

**Date:** 21/09/2023

**Author:** MS,TDP

**Status** Permanent

Q9: Page 3 of 3

<i>Melaleuca sp. 3</i>	5
<i>Melaleuca sp. 7</i>	1
<i>Mesomelaena pseudostygia</i>	1
<i>Monotaxis grandiflora</i>	0.1
<i>Neurachne alopecuroidea</i>	0.1
<i>Persoonia comata</i>	1
<i>Petrophile linearis</i>	opp
<i>Petrophile shuttleworthiana</i>	0.1
<i>Pyrorchis nigricans</i>	0.1
<i>Rutaceae sp.</i>	opp
<i>Schoenus brevisetis</i>	0.1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stirlingia latifolia</i>	0.1
<i>Stylidium ?repens</i>	0.1
<i>Stylidium bicolor</i>	0.1
<i>Stylidium crossocephalum</i>	0.1
* <i>Ursinia anthemoides</i>	opp
<i>Verticordia grandis</i>	1
<i>Verticordia sp. 3 (sterile)</i>	0.1

**Sample Name: Q10**

**Project no.:** EP23-085

**Date:** 23/10/2023

**Author:** MS,

**Status** Permanent

Q10: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 348128.8083

NW corner northing: 6639002.347

Altitude (m): 238

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: mid-slope

Time since fire: > 5 yrs

Disturbance: low - tracks

Soil type/texture silt/

Bare ground (%): 20

Rocks (%) and type: 1%, laterite

Soil colour: white/yellow

Litter: 5% (leaves,twigs,branches)

Vegetation condition: excellent



### Sample Name: Q10

Project no.: EP23-085

Date: 23/10/2023

Author: MS,

Status Permanent

Q10: Page 2 of 3

#### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	? <i>Amphipogon sp. 1 (sterile)</i>	0.1
	<i>Acacia pulchella var. reflexa</i>	opp
	<i>Allocasuarina humilis</i>	1
	<i>Amphipogon ?turbinatus</i>	0.1
	<i>Austrostipa sp. (sterile)</i>	opp
	<i>Babingtonia grandiflora</i>	0.1
	<i>Banksia bipinnatifida subsp. multifida</i>	opp
	<i>Banksia carlinoides</i>	0.1
P3	<i>Banksia kippistiana var. paenepeccata</i>	1
	<i>Banksia shuttleworthiana</i>	2
	<i>Banksia sphaerocarpa var. sphaerocarpa</i>	1
	<i>Calothamnus longissimus</i>	1
	<i>Calothamnus sp. 4</i>	1
	<i>Calytrix aurea</i>	0.1
	<i>Cassylia glabella</i>	0.1
	<i>Caustis dioica</i>	opp
	<i>Conostylis teretifolia subsp. teretifolia</i>	0.1
	<i>Cryptandra pungens</i>	0.1
	<i>Cyanothamnus ramosus subsp. anethifolius</i>	0.1
	<i>Cyanothamnus sp.</i>	0.1
	<i>Desmocladius flexuosus</i>	0.1
	<i>Drosera sp. 2</i>	opp
	<i>Eucalyptus drummondii</i>	0.1
	<i>Eucalyptus gittinsii subsp. Illucida</i>	2
	<i>Gastrolobium plicatum</i>	25
	<i>Gompholobium knightianum</i>	0.1
	<i>Goodenia coerulea</i>	0.1
	<i>Haemodorum ?simplex</i>	opp
	<i>Hakea lissocarpha</i>	1
	<i>Hibbertia hypericoides</i>	25
	<i>Hibbertia striata</i>	opp
	<i>Hypocalymma xanthopetalum</i>	1
	<i>Isopogon linearis</i>	0.1
	<i>Lambertia multiflora var. multiflora</i>	1
	<i>Lepidosperma sp. 1</i>	0.1
	<i>Lomandra sericea</i>	opp

### Sample Name: Q10

Project no.: EP23-085

Date: 23/10/2023

Author: MS,

Status Permanent

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<i>Lyginia imberbis</i>	1
<i>Melaleuca sp. 2</i>	2
<i>Melaleuca sp. 3</i>	1
<i>Melaleuca sp. 7</i>	opp
<i>Mesomelaena pseudostygia</i>	2
<i>Morelotia octandra</i>	1
<i>Persoonia comata</i>	1
<i>Petrophile ?pilotyla subsp. austrina</i>	0.1
<i>Petrophile shuttleworthiana</i>	1
<i>Scaevola canescens</i>	opp
<i>Scaevola glandulifera</i>	opp
<i>Schoenus ?clandestinus</i>	0.1
<i>Schoenus brevisetis</i>	0.1
<i>Schoenus pleiostemoneus</i>	0.1
<i>Stylidium crossocephalum</i>	0.1
P3 <i>Tetradlea angulata</i>	0.1
<i>Xanthorrhoea sp. 1</i>	1
<i>Xanthosia huegelii</i>	0.1

**Sample Name: Q11**

**Project no.:** EP23-085

**Date:** 24/10/2023

**Author:** MS,

**Status**

Q11: Page 1 of

Permanent

3

**Quadrat and landform details**

Sample type: quadrat	Size:	10 m x 10 m
NW corner easting: 347828.3225	NW corner northing:	6638865.123
Altitude (m): 264	Geographic datum/zone:	GDA94/Zone 50
Soil water content: dry	Landform:	hilltop
Time since fire: no evidence	Disturbance:	low - tracks
Soil type/texture silt/	Bare ground (%):	5
Rocks (%) and type: 30%, laterite	Soil colour:	grey/brown
Litter: 2% (leaves,twigs,branches)	Vegetation condition:	excellent



### Sample Name: Q11

Project no.: EP23-085

Date: 24/10/2023

Author: MS,

Status

Q11: Page 2 of

Permanent

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#### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia applanata</i>	0.1
	<i>Acacia sphacelata</i> subsp. <i>verticillata</i>	0.1
	<i>Acacia stenoptera</i>	0.1
	<i>Babingtonia grandiflora</i>	0.1
	<i>Banksia glaucifolia</i>	1
P3	<i>Banksia nana</i>	1
	<i>Banksia shuttleworthiana</i>	1
	<i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i>	3
	<i>Banksia stenoprion</i>	1
	<i>Calectasia hispida</i>	1
	<i>Calothamnus longissimus</i>	1
	<i>Cassutha pomiformis</i>	0.1
	<i>Cassutha racemosa</i>	1
	<i>Caustis dioica</i>	5
	<i>Chordifex sinuosus</i>	0.1
	<i>Comesperma acerosum</i>	0.1
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>	0.1
	<i>Daviesia decurrens</i> subsp. <i>decurrens</i>	1
	<i>Desmocladus flexuosus</i>	0.1
	<i>Drosera ?drummondii</i>	opp
	<i>Gastrolobium polystachyum</i>	1
	<i>Grevillea synapheae</i> subsp. <i>pachyphylla</i>	0.1
	<i>Haemodorum</i> sp. 1	0.1
	<i>Hakea smilacifolia</i>	1
	<i>Hemiandra scabra</i>	1
	<i>Hibbertia crassiflora</i>	1
	<i>Hibbertia hypericoides</i>	5
	<i>Hibbertia mylnei</i>	1
	<i>Labichea punctata</i>	0.1
	<i>Lambertia multiflora</i> var. <i>multiflora</i>	1
	<i>Lepidosperma</i> sp. 3	0.1
	<i>Lepidosperma</i> sp. 4	0.1
	<i>Leucopogon oldfieldii</i>	opp
	<i>Lomandra preissii</i>	0.1
	<i>Lomandra sericea</i>	0.1
	<i>Melaleuca</i> sp. 1	1

### Sample Name: Q11

Project no.: EP23-085

Date: 24/10/2023

Author: MS,

Status

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Permanent

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<i>Melaleuca sp. 3</i>	5
<i>Melaleuca sp. 5</i>	1
<i>Mesomelaena tetragona</i>	0.1
<i>Morelotia octandra</i>	1
<i>Neurachne alopecuroidea</i>	0.1
<i>Orchidaceae sp. 2</i>	opp
<i>Patersonia ?drummondii</i>	0.1
<i>Persoonia comata</i>	0.1
<i>Persoonia rufiflora</i>	1
<i>Petrophile ?pilotyla subsp. austrina</i>	0.1
<i>Petrophile shuttleworthiana</i>	5
<i>Petrophile striata</i>	1
<i>Schoenus subflavus subsp. hispid culms (K.R. Newbey 8278)</i>	0.1
<i>Styphelia sp. 3</i>	1
<i>Synaphea aephynsa</i>	opp
<i>Thysanotus sp.</i>	0.1
<i>Xanthorrhoea sp. 1</i>	10

**Sample Name: R12**

**Project no.:** EP23-085

**Date:** 25/10/2023

**Author:** MS,SCM

**Status** Non-permanent

R12: Page 1 of 2

**Quadrat and landform details**

Sample type: releve

Size: other

NW corner easting: 348347.7635

NW corner northing: 6637072.058

Altitude (m): 262

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: hilltop

Time since fire: no evidence

Disturbance: moderate - weeds

Soil type/texture silt/

Bare ground (%): 5

Rocks (%) and type: 40%, laterite

Soil colour: white/

Litter: 5% (leaves,twigs,)

Vegetation condition: very good



**Sample Name:**

**R12**

**Project no.:** EP23-085

**Date:** 25/10/2023

**Author:** MS,SCM

**Status** Permanent

R12: Page 2 of 2

### Species Data

\* denotes non-native species

Status	Confirmed name
	<i>Allocasuarina humilis</i>
	<i>Caustis dioica</i>
*	<i>Chamaecytisus palmensis</i>
	<i>Dianella revoluta</i>
*	<i>Ehrharta calycina</i>
	<i>Eucalyptus drummondii</i>
	<i>Gastrolobium ilicifolia</i>
	<i>Glischrocaryon aureum</i>
	<i>Hakea lissocarpha</i>
	<i>Isopogon linearis</i>
	<i>Lepidosperma sp. 7</i>
	<i>Melaleuca sp. 2</i>
	<i>Neurachne alopecuroidea</i>
	<i>Opercularia vaginata</i>
	<i>Petrophile chrysantha</i>
	<i>Petrophile shuttleworthiana</i>
	<i>Santalum acuminatum</i>
	<i>Styphelia sp. 2</i>
	<i>Trymalium daphnifolium</i>
	<i>Xanthorrhoea sp. 1</i>

**Sample Name:**

**R13**

**Project no.:** EP23-085

**Date:** 26/10/2023

**Author:** MS,

**Status** Non-permanent

R13: Page 1 of 2

**Quadrat and landform details**

Sample type: releve

Size: 10 m x 10 m

NW corner easting: 343510.6278

NW corner northing: 6644195.534

Altitude (m): 192

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: upper slope

Time since fire: no evidence

Disturbance: high - tracks, weeds, grazing

Soil type/texture silt/

Bare ground (%): 10

Rocks (%) and type: 15%, laterite

Soil colour: orange/

Litter: 1% (leaves,twigs,)

Vegetation condition: very good



**Sample Name:**

**R13**

**Project no.:** EP23-085

**Date:** 26/10/2023

**Status** Permanent

**Author:** MS,

R13: Page 2 of 2

**Species Data**

\* denotes non-native species

**Status**

**Confirmed name**

*Acacia lasiocarpa* var. *lasiocarpa*

*Amphipogon ?caricinus* var. *caricinus*

*Amphipogon* sp. (hairy)

*Austrostipa anaiwaniorum*

*Austrostipa elegantissima*

*Banksia armata* var. *armata*

*Banksia bipinnatifida* subsp. *multifida*

\* *Brassicaceae* sp.

\* *Briza maxima*

\* *Bromus* sp.

*Daviesia chapmanii*

*Desmocladius flexuosus*

*Dodonaea ericoides*

\* *Ehrharta calycina*

*Gastrolobium spinosum*

*Goodeniaceae* sp. 1

*Lepidosperma* sp. 3

*Melaleuca* sp. 2

*Morelotia octandra*

*Neurachne alopecuroidea*

*Opercularia vaginata*

\* *Orobanche minor*

*Petrophile chrysantha*

*Ptilotus polystachyus*

*Schoenus brevisetis*

*Schoenus subflavus* subsp. *hispid culms* (K.R. Newbey 8278)

\* *Trifolium arvense*

*Trymalium daphnifolium*

\* *Ursinia anthemoides*

\* *Vulpia* sp.

*Xanthorrhoea* sp. 1

**Sample Name:**

**R14**

**Project no.:** EP23-085

**Date:** 26/10/2023

**Author:** MS,

**Status** Non-permanent

R14: Page 1 of 2

**Quadrat and landform details**

Sample type: releve

Size: 10 m x 10 m

NW corner easting: 343601.1474

NW corner northing: 6644200.713

Altitude (m): 208

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: hilltop

Time since fire: no evidence

Disturbance: high - tracks, weeds, grazing

Soil type/texture silt/

Bare ground (%): 5

Rocks (%) and type: 25%, laterite

Soil colour: grey/

Litter: 1% (leaves,twigs,)

Vegetation condition: very good



**Sample Name:**

**R14**

**Project no.:** EP23-085

**Date:** 26/10/2023

**Status** Permanent

**Author:** MS,

R14: Page 2 of 2

### Species Data

\* denotes non-native species

Status	Confirmed name
	<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i>
*	<i>Aira</i> sp.
	<i>Allocasuarina humilis</i>
	<i>Austrostipa elegantissima</i>
	<i>Banksia carlinoides</i>
P3	<i>Banksia kippistiana</i> var. <i>paenepeccata</i>
P3	<i>Banksia nana</i>
	<i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i>
	<i>Banksia stenoprion</i>
*	<i>Bromus</i> sp.
	<i>Cassytha</i> sp.
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>
	<i>Daviesia decurrens</i> subsp. <i>decurrens</i>
	<i>Desmocladius flexuosus</i>
*	<i>Ehrharta calycina</i>
	<i>Hibbertia hypericoides</i>
	<i>Lepidosperma</i> sp. 3
	<i>Melaleuca</i> sp. 2
	<i>Morelotia octandra</i>
	<i>Neurachne alopecuroidea</i>
	<i>Opercularia vaginata</i>
	<i>Podotheca ?gnaphalioides</i>
	<i>Schoenus brevisetis</i>
*	<i>Trifolium arvense</i>
*	<i>Ursinia anthemoides</i>
*	<i>Vulpia</i> sp.
	<i>Xanthorrhoea</i> sp. 1

**Sample Name: Q15**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Author:** MS,

**Status** Permanent

Q15: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 337337.8464

NW corner northing: 6643573.972

Altitude (m): 103

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: flat

Time since fire: > 5 yrs

Disturbance: moderate - weeds

Soil type/texture loam/ with organic layer

Bare ground (%): 1

Rocks (%) and type: No rocks

Soil colour: grey/

Litter: 10% (leaves,twigs,branches)

Vegetation condition: very good



### Sample Name: Q15

Project no.: EP23-085

Date: 27/10/2023

Author: MS,

Status Permanent

Q15: Page 2 of 3

#### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	? <i>Baekkea sp. 1</i>	0.1
	<i>Acacia ?latior</i>	0.1
	<i>Acacia incrassata</i>	0.1
	<i>Acacia multispicata</i>	0.1
	<i>Acacia saligna</i>	1
	<i>Allocasuarina microstachya</i>	0.1
	<i>Amphipogon ?caricinus var. caricinus</i>	0.1
	<i>Austrostipa elegantissima</i>	1
	<i>Banksia armata var. armata</i>	1
*	<i>Briza maxima</i>	0.1
	<i>Burchardia congesta</i>	0.1
	<i>Caesia micrantha</i>	0.1
	<i>Cassytha sp.</i>	0.1
	<i>Caustis dioica</i>	2
	<i>Chamaescilla sp.</i>	0.1
	<i>Corymbia calophylla</i>	70
	<i>Dianella revoluta</i>	0.1
	<i>Ecdeiocolea monostachya</i>	60
*	<i>Ehrharta calycina</i>	1
	<i>Gastrolobium oxylobioides</i>	2
	<i>Georgeantha hexandra</i>	0.1
	<i>Hakea lissocarpha</i>	1
	<i>Hakea neospathulata</i>	0.1
	<i>Hibbertia hypericoides</i>	3
	<i>Lepidobolus preissianus</i>	0.1
	<i>Lepidosperma sp. 5</i>	1
	<i>Leptomeria pauciflora</i>	0.1
	<i>Melaleuca sp. 9</i>	0.1
	<i>Mesomelaena pseudostygia</i>	0.1
	<i>Neurachne alopecuroidea</i>	0.1
	<i>Opercularia vaginata</i>	2
	<i>Orchidaceae sp. 1</i>	0.1
	<i>Pimelea imbricata var. piligera</i>	0.1
	<i>Ptilotus manglesii</i>	0.1
*	<i>Romulea rosea</i>	0.1
	<i>Schoenus sp.</i>	0.1

### Sample Name: Q15

Project no.: EP23-085

Date: 27/10/2023

Author: MS,

Status Permanent

Q15: Page 2 of 3

<i>Sowerbaea laxiflora</i>	0.1
<i>Styphelia serratifolia</i>	1
P2 <i>Synaphea xela</i>	0.1
<i>Tricoryne elatior</i>	0.1
* <i>Ursinia anthemoides</i>	0.1
<i>Verticordia sp. 2</i>	1
* <i>Vulpia sp.</i>	1
<i>Xanthorrhoea ?preissii</i>	2

**Sample Name:**

**R16**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Author:** MS,

**Status** Non-permanent

R16: Page 1 of 2

**Quadrat and landform details**

Sample type: releve

Size: 10 m x 10 m

NW corner easting: 337538.0937

NW corner northing: 6643211.112

Altitude (m): 124

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: flat

Time since fire: no evidence

Disturbance: high - weeds, clearing

Soil type/texture loam/

Bare ground (%): 2

Rocks (%) and type: No rocks

Soil colour: grey/

Litter: 15% (leaves,twigs,)

Vegetation condition: good



**Sample Name:**

**R16**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Author:** MS,

**Status** Permanent

R16: Page 2 of 2

### Species Data

\* denotes non-native species

Status	Confirmed name
	<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i>
*	<i>Briza maxima</i>
	<i>Burchardia congesta</i>
	<i>Calothamnus</i> sp. 1
	<i>Cheilanthes</i> sp.
	<i>Corymbia calophylla</i>
	<i>Dianella revoluta</i>
	<i>Dichopogon capillipes</i>
	<i>Haemodorum simplex</i>
	<i>Hibbertia hypericoides</i>
	<i>Melaleuca radula</i>
	<i>Myrtaceae</i> sp.
	<i>Neurachne alopecuroidea</i>
	<i>Ptilotus manglesii</i>
	<i>Stylidium crossocephalum</i>
	<i>Styphelia serratifolia</i>
	<i>Themeda triandra</i>
	<i>Xanthorrhoea preissii</i>
	<i>Diuris setacea</i>

**Sample Name: Q17**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Author:** MS,

**Status** Permanent

Q17: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 344262.3299

NW corner northing: 6635388.034

Altitude (m): 242

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: hilltop

Time since fire: no evidence

Disturbance: moderate - weeds, clearing for road

Soil type/texture loam/

Bare ground (%): 2

Rocks (%) and type: 1%, laterite

Soil colour: grey/

Litter: 25% (leaves,logs,branches)

Vegetation condition: very good



### Sample Name: Q17

Project no.: EP23-085

Date: 27/10/2023

Author: MS,

Status Permanent

Q17: Page 2 of 3

#### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia obovata</i>	0.1
	<i>Adenanthos cygnorum subsp. cygnorum</i>	2
	<i>Alexgeorgea nitens</i>	1
	<i>Allocasuarina humilis</i>	1
	<i>Amphipogon ?turbinatus</i>	0.1
	<i>Anarthria humilis</i>	opp
	<i>Austrostipa elegantissima</i>	0.1
	<i>Austrostipa hemipogon</i>	opp
	<i>Banksia bipinnatifida subsp. multifida</i>	0.1
	<i>Banksia candolleana</i>	25
	<i>Banksia incana var. incana</i>	2
P3	<i>Banksia nana</i>	0.1
	<i>Banksia shuttleworthiana</i>	0.1
	<i>Callitris acuminata</i>	0.1
	<i>Caustis dioica</i>	0.1
	<i>Chordifex sinuosus</i>	0.1
	<i>Conostylis angustifolia</i>	0.1
	<i>Conostylis teretifolia subsp. teretifolia</i>	opp
	<i>Daviesia chapmanii</i>	0.1
	<i>Desmocladius fasciculatus</i>	0.1
	<i>Ericaceae sp. 2</i>	0.1
	<i>Eucalyptus lane-poolei</i>	50
	<i>Gastrolobium oxylobioides</i>	opp
	<i>Gompholobium knightianum</i>	opp
	<i>Hakea flabellifolia</i>	1
	<i>Hakea lissocarpha</i>	1
	<i>Hakea smilacifolia</i>	0.1
	<i>Hibbertia mylnei</i>	opp
	<i>Jacksonia lehmannii</i>	0.1
	<i>Lambertia multiflora var. multiflora</i>	5
	<i>Lasiopetalum drummondii</i>	0.1
	<i>Lepidosperma sp. 2</i>	1
	<i>Lepidosperma sp. 3</i>	1
	<i>Lepidosperma sp. 4</i>	1
	<i>Lomandra ?suaveolens</i>	0.1
	<i>Lomandra sericea</i>	0.1

**Sample Name: Q17**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Author:** MS,

**Status** Permanent

Q17: Page 2 of 3

<i>Lyginia imberbis</i>	0.1
<i>Melaleuca ?urceolaris</i>	opp
<i>Mesomelaena pseudostygia</i>	1
<i>Monotaxis grandiflora</i>	0.1
<i>Myrtaceae sp. 1</i>	0.1
<i>Myrtaceae sp. 3</i>	0.1
<i>Neurachne alopecuroidea</i>	0.1
<i>Podotheca ?gnaphalioides</i>	opp
<i>Ptilotus polystachyus</i>	opp
<i>Santalum acuminatum</i>	opp
<i>Schoenus brevisetis</i>	0.1
<i>Stirlingia latifolia</i>	opp
<i>Synaphea aephynsa</i>	0.1
<i>Thysanotus sp.</i>	0.1
* <i>Ursinia anthemoides</i>	opp
* <i>Vulpia sp.</i>	opp
<i>Xanthorrhoea sp. 1</i>	1

**Sample Name: Q18**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Author:** SCM,

**Status** Permanent

Q18: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 347943.4487

NW corner northing: 6636604.251

Altitude (m): 249

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: flat

Time since fire: no evidence

Disturbance: low - possible historic grazing or clearing

Soil type/texture sand/silt

Bare ground (%): 25

Rocks (%) and type: No rocks

Soil colour: grey/white

Litter: 20% (leaves,branches,bark)

Vegetation condition: very good



### Sample Name: Q18

Project no.: EP23-085

Date: 27/10/2023

Author: SCM,

Status Permanent

Q18: Page 2 of 3

#### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	<i>Acacia alata</i> var. <i>tetrantha</i>	0.5
	<i>Acacia pulchella</i> var. <i>reflexa</i>	1
	* <i>Aira</i> sp.	0.1
	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>	opp
	<i>Aristida</i> sp.	0.1
	<i>Austrostipa elegantissima</i>	0.1
P3	<i>Austrostipa nunaginis</i>	0.1
	<i>Bossiaea eriocarpa</i>	0.1
	<i>Calytrix aurea</i>	opp
	<i>Caustis dioica</i>	1
	<i>Chamaescilla</i> sp.	opp
	<i>Conostylis aculeata</i> subsp. <i>breviflora</i>	35
	<i>Cyanothamnus ramosus</i> subsp. <i>anethifolius</i>	0.1
	<i>Dianella revoluta</i>	0.1
	<i>Eucalyptus lane-poolei</i>	15
	<i>Gastrolobium oxylobioides</i>	1
	<i>Glischrocaryon aureum</i>	5
	<i>Gompholobium knightianum</i>	0.1
	<i>Goodenia micrantha</i>	0.1
	<i>Hakea lissocarpa</i>	1
	<i>Hibbertia hypericoides</i>	0.5
	<i>Hibbertia subvaginata</i>	opp
	<i>Hypocalymma xanthopetalum</i>	opp
	<i>Jacksonia calcicola</i>	2
	<i>Kennedia prostrata</i>	opp
	<i>Lagenophora huegelii</i>	0.1
	<i>Lepidosperma</i> sp. 7	2
	<i>Neurachne alopecuroidea</i>	0.1
	<i>Opercularia vaginata</i>	0.1
	<i>Pimelea ?floribunda</i>	opp
	<i>Podotheca ?gnaphalioides</i>	0.1
	<i>Ptilotus manglesii</i>	0.1
	<i>Rytidosperma</i> sp. 1	0.1
	<i>Siloxerus</i> sp.	0.1
	<i>Stackhousia ?monogyna</i>	0.1
	<i>Trachymene pilosa</i>	opp

**Sample Name:** **Q18**

**Project no.:** EP23-085

**Date:** 27/10/2023

**Status** Permanent

**Author:** SCM,

Q18: Page 2 of 3

\* *Ursinia anthemoides*

opp

*Verticordia* sp. 2

0.1

**Sample Name: Q19**

**Project no.:** EP23-085

**Date:** 23/10/2023

**Author:** SCM,

**Status** Permanent

Q19: Page 1 of 3

**Quadrat and landform details**

Sample type: quadrat

Size: 10 m x 10 m

NW corner easting: 347817.3369

NW corner northing: 6636516.795

Altitude (m): 236

Geographic datum/zone: GDA94/Zone 50

Soil water content: dry

Landform: flat

Time since fire: no evidence

Disturbance: low - possible historic grazing or clearing

Soil type/texture silt/

Bare ground (%): 15

Rocks (%) and type: No rocks

Soil colour: grey/white

Litter: 30% (leaves,twigs,branches)

Vegetation condition: very good



### Sample Name: Q19

Project no.: EP23-085

Date: 23/10/2023

Author: SCM,

Status Permanent

Q19: Page 2 of 3

#### Species Data

\* denotes non-native species

Status	Confirmed name	Cover (%)
	? <i>Baeckea sp. 3</i>	opp
	<i>Acacia alata var. tetrantha</i>	opp
	<i>Acacia pulchella var. reflexa</i>	1
	* <i>Aira sp.</i>	0.5
	<i>Allocasuarina humilis</i>	0.1
	<i>Anigozanthos humilis subsp. humilis</i>	0.1
	<i>Austrostipa hemipogon</i>	0.1
P3	<i>Austrostipa nunaginensis</i>	opp
	<i>Bossiaea eriocarpa</i>	opp
	* <i>Briza maxima</i>	0.1
	<i>Cassytha sp.</i>	0.1
	<i>Caustis dioica</i>	10
	<i>Comesperma calymega</i>	0.1
	<i>Conostylis aculeata subsp. breviflora</i>	2
	<i>Cyanothamnus ramosus subsp. anethifolius</i>	opp
	<i>Cyanothamnus sp.</i>	0.1
	<i>Darwinia neildiana</i>	opp
	* <i>Ehrharta calycina</i>	0.1
	<i>Eucalyptus lane-poolei</i>	10
	<i>Gastrolobium oxylobioides</i>	10
	<i>Gompholobium tomentosum</i>	0.1
	<i>Goodenia coerulea</i>	0.1
	<i>Hibbertia hypericoides</i>	2
	<i>Jacksonia calcicola</i>	5
	<i>Lepidosperma sp. 4</i>	0.1
	<i>Mesomelaena pseudostygia</i>	10
	<i>Mesomelaena tetragona</i>	1
	<i>Morelotia octandra</i>	opp
	<i>Neurachne alopecuroidea</i>	0.1
	<i>Opercularia vaginata</i>	0.1
	<i>Podotheca ?gnaphalioides</i>	0.1
	<i>Pterochaeta paniculata</i>	0.1
	<i>Rytidosperma sp. 2 (hairy)</i>	0.1
	<i>Schoenus ?clandestinus</i>	0.1
	<i>Siloxerus sp.</i>	0.1
	<i>Stackhousia ?monogyne</i>	0.1

### Sample Name: Q19

**Project no.:** EP23-085

**Date:** 23/10/2023

**Author:** SCM,

**Status** Permanent

Q19: Page 2 of 3

<i>Stylidium ?kalbarriense/rigidulum</i>	0.1
<i>Tetradlea ?confertifolia</i>	opp
<i>Trachymene pilosa</i>	0.1
* <i>Ursinia anthemoides</i>	0.1
<i>Verticordia sp. 2</i>	0.5
* <i>Vulpia sp.</i>	0.1
<i>Xanthorrhoea preissii</i>	opp
<i>Xanthosia huegelii</i>	opp



# Appendix G

Cluster Dendrograms





