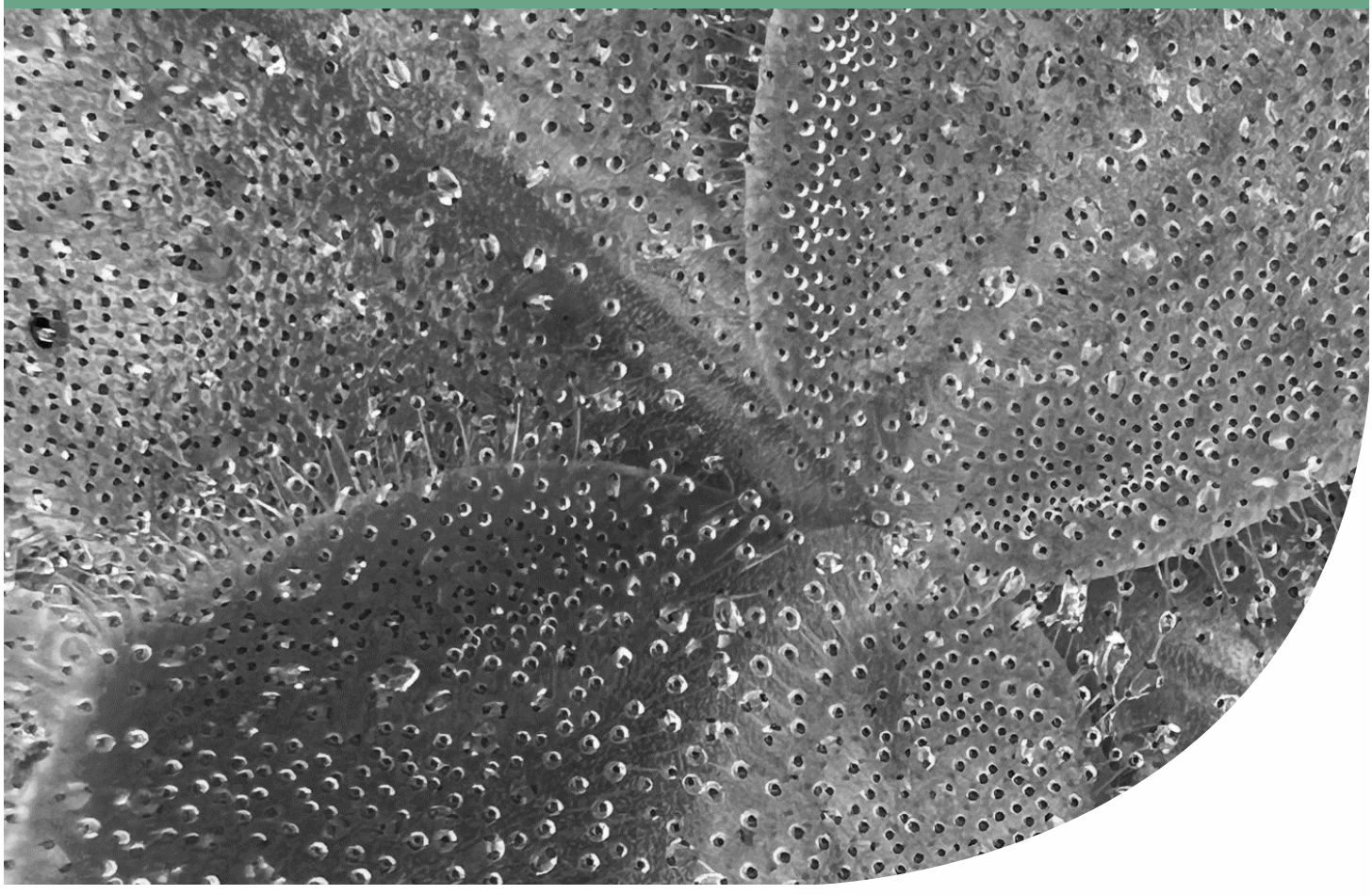
Detailed Flora and Vegetation Assessment

Part Lot 500 on DP421144, Boddington

Project No: EP23-044(02)

Prepared for Shire of Boddington
December 2024



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Executive Summary

The Shire of Boddington engaged Emerge Associates to conduct a flora and vegetation assessment within part Lot 500 on DP421144 in Boddington (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 on 17 August, 26-29 September and 9 November 2023 and 14 and 29 October, 20 November and 2 December 2024 during which the composition and condition of vegetation was recorded. Flora and vegetation values were characterised to the standard required of a detailed and a targeted survey with reference to EPA (2016b).

Outcomes of the assessment include the following:

- A total of 215 native and 22 non-native (weed) species were recorded in the site.
- Three priority flora species were recorded within the site: *Gastrolobium* sp. prostate Boddington (M. Hislop 2130) (P1) (42 individuals), *Goodenia katabudjar* (P3) (7,164 individuals) and *Lasiopetalum cardiophyllum* (P4) (220 individuals).
- No other threatened or priority flora species were recorded in the site or are considered likely to occur, given that the survey effort was comprehensive and that the survey was undertaken at a suitable time of year for detecting species for which timing is critical.
- One species listed as a declared pest was recorded but no management is required as no control category is assigned under the BAM Act.
- The vegetation within the site was classified into eight vegetation units: **AhHaLl**, **AhHpBs**, **AhXpBf**, **EmCcAf**, **ErCe**, **Ew**, **EwEmCc** and **non-native**.
- The vegetation in the site is present in 'very good' to 'completely degraded' condition. The majority of the vegetation is in 'very good' and 'very good – good' condition (76.59% of the site).
- No threatened ecological communities or priority ecological communities occur within the site.

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Abbreviation Tables

Table A1: Abbreviations – Organisations

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

Table A2: Abbreviations – General terms

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

Table A3: Abbreviations – Legislation

Legislation	
BAM Act	*Biosecurity and Agriculture Management Act 2007*
EP Act	*Environmental Protection Act 1986*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
BC Act	*Biodiversity Conservation Act 2016*

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

1 Introduction

1.1 Purpose

Emerge Associates (Emerge) were engaged by the Shire of Boddington to conduct a flora and vegetation assessment within part Lot 500 on deposited plan 421144 in Boddington as shown in **Figure 1** (referred to herein as the 'site'). The site comprises a 20 to 50 metre (m) buffer around a proposed mountain bike trail.

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, 2023c). 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 2023e). 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**.

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 and a targeted 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.

2 Desktop Study

2.1 Site context

2.1.1 Location and extent

The site is located in the Shire of Boddington in the South-West region of Western Australia and extends over 105.77 hectares (ha) as shown in **Figure 1**. The site is bounded by farmland the east and north, Bannister-Marradong Road to the west and Newmarket Road to the south.

2.1.2 Climate

The Southwest region of Western Australia experiences a mediterranean climate of hot dry summers and cool wet winters (BoM 2023, 2024).

Recent rainfall at the closest weather station to the site has been somewhat inconsistent with long term averages both in 2023 and 2024 (**Plate 1** and **Plate 2**) (BoM 2023, 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 September to November (EPA 2016b).

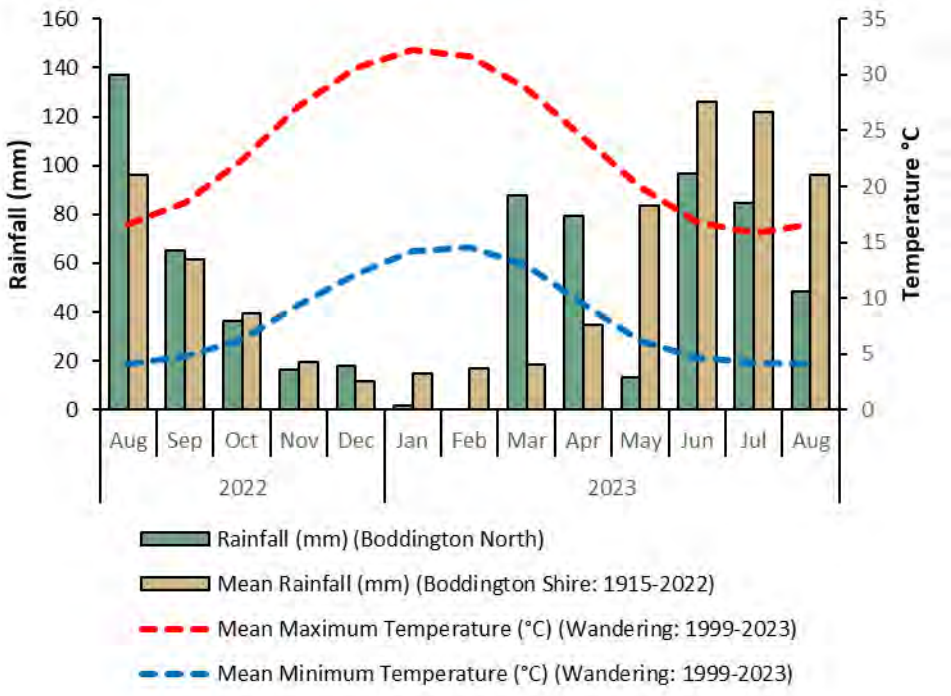

Plate 1: Recent rainfall and long-term mean temperature and rainfall (2022-2023)

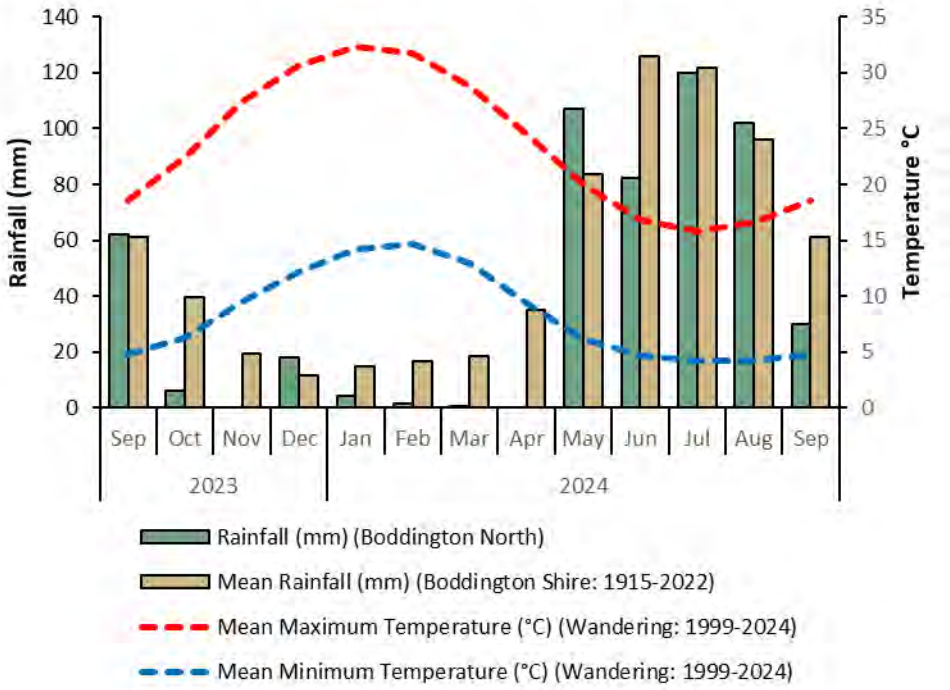

Plate 2: Recent rainfall and long-term mean temperature and rainfall (2023-2024)

2.1.3 Geomorphology and soils

The site occurs on the Darling Plateau which lies east of Perth CBD and directly east of the Darling Scarp. The Darling Plateau is an ancient erosion surface capped with laterite and dissected by drainage channels (Beard 1990). The site occurs in the eastern part of the Plateau which is characterised by flat-topped hills bound by breakaways and more prominent hills (monadnocks) which protrude above the general level of the plateau (Gozzard 2011). The western part comprises valleys with steep, rocky slopes and narrow, flat floors (Gozzard 2011).

Fine scale soil landscape mapping by (DPIRD 2022) shows two soil 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
Coolakin Subsystem (Marradong)	Western portion and a small area in the south-eastern portion	Minor Valleys bounded by Dwellingup or Norrine units; moderate slopes with gravelly and sandy yellow duplex soils; a minor valley floor with sandy alluvium; occasional rock outcrops and laterite spur.
Dwellingup Subsystem (Marradong)	Central portion	Divides, lower to upper slopes and hillcrests. Duplex sandy gravels and loamy gravels with minor areas of shallow gravels, deep sandy gravels, yellow deep sands and yellow and pale deep sands, often gravelly.

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 320 metres in relation to the Australian height datum (mAHD) on the eastern and southern side to 238 mAHD on the western side (DPIRD 2020) (**Figure 2**).

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 six wetland or water related features within the site:

- Three watercourses (minor, non-perennial)
- Two drains (major)
- One lake (perennial).

The location of hydrological features in the site is shown in **Figure 2**.

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 Jarrah Forest region and within the 'JF1' or northern jarrah forest subregion. The northern jarrah forest subregion is characterised by *Eucalyptus marginata* (jarrah) – *Corymbia calophylla* (marri) forest on laterite gravels with *Eucalyptus wandoo* – marri woodlands in the eastern part (CALM 2003).

Variations in native vegetation can be further classified based on regional vegetation mapping. DBCA (2019) mapping shows the site as comprising the 'Coolakin (Ck)' complex is described as 'woodland of *Eucalyptus wandoo* with mixtures of *Eucalyptus patens*, *Eucalyptus marginata* subsp. *thalassica* and *Corymbia calophylla* on the valley slopes in arid and perarid zones'. The central and eastern portion of the site is mapped as comprising 'Yalanbee (Y6)' complex which is described as a 'woodland of *Eucalyptus wandoo-Eucalyptus accedens*, less consistently open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on lateritic uplands and breakaway landscapes in arid and perarid zones'.

The Coolakin complex was determined to have 39.15% of its pre-European extent remaining in 2018, of which 3.89% was protected for conservation purposes (Government of Western Australia 2019). The Yalanbee (Y6) complex was determined to have 46.54% of its pre-European extent remaining in 2018, of which 11.49% was protected for conservation purposes (Government of Western Australia 2019).

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 2023). 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 2023).

DBCA's *Threatened and Priority Flora Database* and *WA Herbarium Database* contain records of threatened and priority flora in Western Australia (DBCA 2023d). 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 2023) and DBCA's threatened and priority flora databases (reference no. 26-0822FL) identified nine threatened and 29 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 2023).

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* and DBCA's TEC and PEC database (reference no. 26-0822EC) identified one TEC and one PEC occurring or potentially occurring within a 20 km radius of the site (refer **Appendix C**).

2.1.9 Historical land use

Review of historical images available from 1995 onwards shows that part of the north-western portion in the site was partially cleared of native vegetation prior to 1995, likely for purposes associated with use of Boddington town dam which was the towns' main water supply up until 2001. Since that time the extent of native vegetation in the site has remained relatively stable. The historical images also show evidence that a fire occurred in the southern portion of the site between November 2013 and October 2015 (WALIA 2023).

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 2023a) and *Lands of Interest* (DBCA 2022a) datasets. The *Legislated Lands and Waters* (DBCA 2023a) 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.

The site is not mapped as DBCA managed or legislated land or land of interest. The closest DBCA legislated land is located approximately 250 m west of the site and comprises a timber reserve under the *Conservation and Land Management Act 1984.* The location of this reserve is shown in **Figure 3**.

2.1.11 Ecological linkages

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of habitat. This exchange of genetic material between vegetation improves the viability of this vegetation by allowing greater access to breeding partners and food sources, refuge from disturbances such as fire and maintenance of genetic diversity of Vegetation units and populations. Ecological linkages are ideally continuous or near-continuous as the more fractured a linkage is, the less ease flora and fauna have in moving within the corridor (Alan Tingay and Associates 1998).

The South West Biodiversity Project identified and mapped ecological linkages within the South West region of Western Australia (Molloy *et al.* 2009).

There are no mapped ecological linkages within or in close proximity to the site. One regional ecological linkage (No. 195) occurs approximately 2 km north of the site and extends to the north-east and south-west. The location of this linkage is shown in **Figure 3**.

Review of aerial imagery indicates that much of the vegetation within the site is connected to extensive areas of native vegetation within the local area.

2.1.12 Previous surveys

No previous surveys are known to have been undertaken within or adjacent to the site.

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**. 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**.

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

		Distribution[1]	
		Reliable record within search area (20 km)	No reliable record within search area
Habitat	Suitable	High	Negligible
	Potentially suitable	Moderate	
	Unsuitable	Low	

[1] 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.

2.2.1 Threatened and priority flora

Four threatened and 20 priority flora were classified as having a 'moderate' likelihood of occurrence within the site, as outlined in **Table 3**. The remaining species were classified as having a 'low' or 'negligible' likelihood of occurrence in the site. The complete likelihood of occurrence assessment is provided as **Appendix B**.

Table 3: Threatened or priority flora species with a moderate likelihood occurrence in the site

Species	Status		Life strategy	Flowering period
	WA	EPBC Act		
Caladenia dorrienii	EN	EN	PG	Sep-Nov
Caladenia hopperiana	EN	EN	PG	Sep-Oct
Jacksonia velveta	EN	EN	P	Nov-Dec
Pultenaea pauciflora	VU	VU	P	Oct-Dec
Calytrix simplex subsp. simplex	P1	-	P	(Dec-) Jan
Gastrolobium sp. Prostrate Boddington (M. Hislop 2130)	P1	-	P	Oct
Hibbertia ambita	P1	-	P	Aug-Oct
Isopogon sp. Canning Reservoir (M.D. Tindale 121 & B.R. Maslin)	P1	-	P	Aug-Sep
Banksia recurvistylis	P2	-	P	Nov and early Dec
Banksia subpinnatifida var. imberbis	P3	-	P	Sep-Oct
Goodenia katabudjar	P3	-	P	Dec
Halgania corymbosa	P3	-	P	Aug-Nov
Leucopogon florulentus	P3	-	P	Jun-Nov
Meionectes tenuifolia	P3	-	A	Oct-Dec
Netrostylis sp. Blackwood River (A.R. Annels 3043)	P3	-	P	?Nov (limited information)
Stylidium marradongense	P3	-	P	Sep-Nov
Tetratheca pilifera	P3	-	P	Aug-Oct

Table 3: Threatened or priority flora species with a moderate likelihood occurrence in the site (continued)

Species	Status		Life strategy	Flowering period
	WA	EPBC Act		
Acacia alata var. platyptera	P4	-	P	Jun-Aug
Caladenia integra	P4	-	PG	Sep-Oct
Darwinia thymoides subsp. St Ronans (J.J. Alford & G.J. Keighery 64)	P4	-	P	Oct-Nov
Eucalyptus exilis	P4	-	P	Aug-Oct
Lasiopetalum cardiophyllum	P4	-	P	Aug-Dec/Jan
Parsonsia diaphanophleba	P4	-	P	Jan-Feb or Apr-Sep
Senecio leucoglossus	P4	-	A	Aug-Dec

EN=endangered, VU=vulnerable, P1-P4=Priority 1-Priority 4, P=perennial, PG=perennial geophyte.

2.2.2 TECs and PECs

One PEC was classified as having a 'moderate' likelihood of occurrence within the site, as detailed in **Table 4**. The remaining TECs/PECs were classified as having a 'negligible' likelihood of occurrence in the site. The complete likelihood of occurrence assessment is provided as **Appendix C**.

Table 4: Threatened or priority ecological communities with a moderate likelihood of occurrence in the site

Community	Status	
	WA	EPBC Act
Mount Saddleback heath communities	PEC (P1)	-

3 Methods

3.1 Field survey

Experienced botanist(s) visited the site on multiple dates in 2023 and 2024 to conduct the field survey. The majority of the site was surveyed on 17 August, 26-29 September and 9 November 2023. A small portion of the site was surveyed on 14 and 29 October 2024 following an update of the trail network design. 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**). Informal transects for flora were traversed approximately 20 m apart through areas of potentially suitable habitat. Transects and records were marked using a hand-held GPS receiver (±5 m accuracy). Individual point locations were recorded for each occurrence of threatened and/or priority flora species. Where large numbers of threatened or priority species occurred, the population size was estimated and recorded under a single point location.

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[1] of each sample was recorded with a hand-held GPS receiver (±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 15 locations were sampled, comprised of nine quadrats and six relevés, as shown in **Figure 4**.

3.1.3 Vegetation condition

The condition of the vegetation was assessed using the Keighery (1994) scale (**Table 5**).

[1] For quadrats the north-west corner was recorded.

Table 5: 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 (2023).

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). Jacknife1 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). 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 2023b). 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 6**.

Table 6: 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 **Section 2.1** is adequate to place the site and vegetation in context.
Experience level of personnel	No limitation	This flora and vegetation assessment was undertaken by qualified botanists, with 5-13 years of botanical experience in Western Australia. Technical review was undertaken by a senior environmental consultant with over 13 years' experience in environmental science in Western Australia.

Table 6: Evaluation of assessment against standard constraints outlined in (EPA 2016b) (continued)

Constraint	Degree of limitation	Details
Suitability of timing	No limitation	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. The survey was conducted in August, September and November 2023 and in October 2024 and thus within the main flowering season. Sufficient rainfall was recorded in the months immediately preceding the surveys in 2023 and 2024. Therefore, it is likely that many plant species would have been in flower and/or visible at the time of survey. The survey timing was considered adequate to allow the detection of species for which seasonal timing is critical.
Temporal coverage	No limitation	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. The site was visited multiple times in late September and once in August and November 2023, as well as twice in October 2024. Therefore, according to the EPA guidelines this survey is considered to meet the requirements of a 'detailed' survey.
Spatial coverage and access	No limitation	Site coverage was comprehensive (track logged).
	No limitation	All parts of the site could be accessed as required.
Sampling intensity	No limitation	A total of 237 species were recorded, of which 178 were recorded from 16 sample locations and 59 were recorded opportunistically. Minimum species richness within site is estimated at between 244 (Jacknife1) and 264 (Chao2) species (refer species accumulation curve and estimates shown in **Plate 3**). The number of species recorded in the site is similar to the number of species predicted by the Jacknife1 but slightly lower than that of the Chao2. Nonetheless, the survey effort was adequate to prepare a comprehensive species inventory for the site.
Influence of disturbance	Minor limitation	Time since fire is greater than five years as interpreted from aerial imagery and therefore short-lived species more common after fire may not have been visible.
	No limitation	Historical ground disturbance was evident in parts of the site and some native vegetation in the site is regrowth. Evidence of a historical fire was noted in the southern portion of the site. The disturbance history of the site was considered when undertaking field sampling.
Adequacy of resources	No limitation	All resources required to perform the survey were available.

4 Results

4.1 Flora

4.1.1 Species inventory

A total of 237 species were recorded during the field survey. A summary of legal and policy status of flora records is provided in **Table 7**. A complete species list is provided in **Appendix D**.

Table 7: Summary of legal and policy status of taxa recorded in the site

Status	Unlisted	Threatened	Priority	Declared Pest	Planted	Total
Native	212	-	3	-	0	**215**
Non-native	21	-	-	1	0	**22**
Total	233	-	3	1	0	**237**

Sampling recorded 178 species from 15 samples. A further 59 species were recorded opportunistically across the site. A species accumulation curve derived from sample data is presented in **Plate 3**. Species richness was estimated to be between 244 (Jacknife1) and 264 (Chao2).

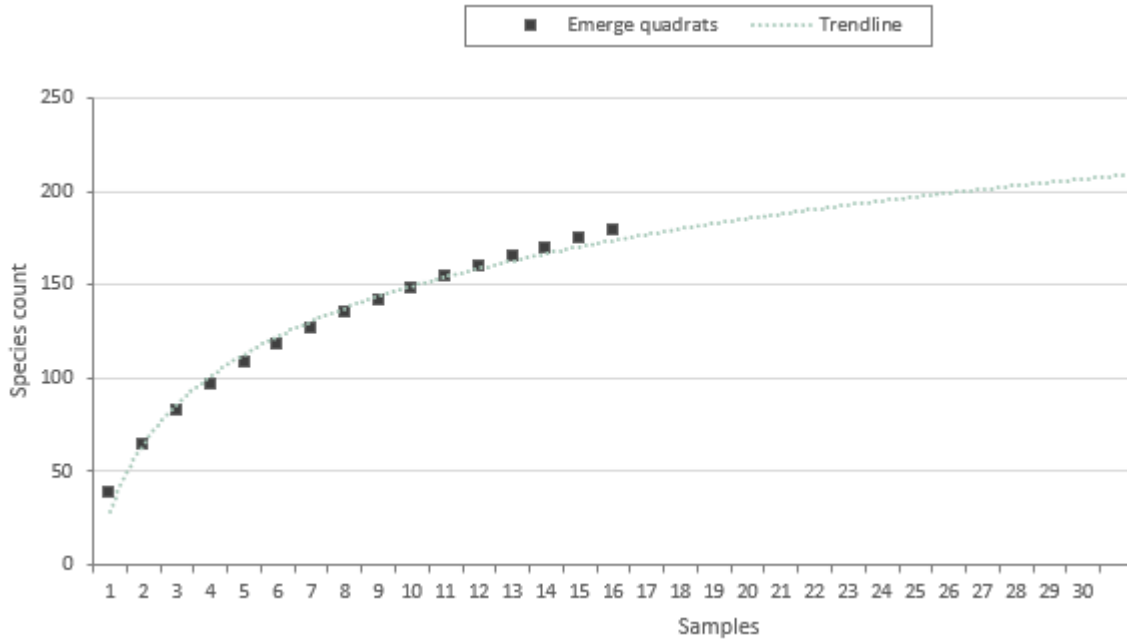

Plate 3: Species accumulation curve derived from sample data y = 52.348ln(x) + 28.54R² = 0.9899

4.1.2 Threatened and priority flora

Three priority flora species were recorded within the site:

- *Gastrolobium* sp. prostrate Boddington (M. Hislop 2130) (P1)
- *Goodenia katabudjar* (P3)

- *Lasiopetalum cardiophyllum* (P4).

Gastrolobium sp. prostrate Boddington (M. Hislop 2130) was recorded within the eastern portion of the site. A total of 42 individuals was recorded, with plants in good condition and flowering during the 2023 survey but not in 2024. *Goodenia katabudjar* was scattered throughout much of the site but particularly in the southern and central portions, with 7,164 individuals recorded. Plants were in good health and many individuals were observed flowering during the November 2023 and October 2024 survey. *Lasiopetalum cardiophyllum* was restricted to a small number of laterite outcrops in the central portion of the site from which 220 individuals were recorded. The locations of the priority flora species recorded in the site are shown in **Figure 5** and representative photographs are provided in **Plate 5** and **Plate 6**.

The remainder of the threatened and priority flora species identified in **Section 2.2** are not considered to occur in the site as no significant limitation affecting their detection was identified (refer **Section 3.3**).

Plate 4: Gastrolobium sp. prostrate Boddington (M. Hislop 2130) habitat (top left), habit (bottom left) and flower (right)

Plate 5: Goodenia katabudjar habitat (top left), habit (bottom left) and flower (right)

Plate 6: Lasiopetalum cardiophyllum habitat (top left), habit (bottom left) and flower/bud (right)

4.1.3 Declared pests

One species listed as a declared pest (control category unassigned) pursuant to the BAM Act, **Moraea flaccida* (one-leaf cape tulip), was recorded within the site. Multiple individuals were recorded scattered throughout the western portion of the site. No weeds of national significance (WoNS) were recorded.

4.2 Vegetation

4.2.1 Vegetation units

Eight vegetation units were identified within the site. A description and the area of each vegetation unit is provided in **Table 8**. The location of each vegetation unit is shown in **Figure 6** and raw sample data is provided in **Appendix E**.

Table 8: Description and extent of vegetation units identified within the site

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
AhHaLl	Closed to open forest *Allocasuarina huegeliana* and occasional *Eucalyptus wandoo* and/or *Corymbia calophylla* over open shrubland *Hypocalymma angustifolium*, *Hakea lissocarpha* and *Leucopogon capitellatus* over tall open forb/sedgeland *Stylidium crassifolium* and *Lepidosperma leptostachyum* over mixed native herbs and grasses and/or weeds including **Briza maxima*, **Aira cupaniana* and/or **Romulea rosea*.	R5	0.19	0.18%	
AhHpBs	Open to closed forest *Allocasuarina huegeliana* with occasional *Eucalyptus marginata*, *Corymbia calophylla* and *Eucalyptus wandoo* over open to closed tall shrubland *Banksia sessilis* and *Hakea prostrata* over low shrubland (or absent) *Daviesia* spp., *Bossiaea eriocarpa*, *Banksia nivea*, *Synaphea gracillima* and *Hypocalymma angustifolium* over mixed native herbs and/or grassland of pasture weeds.	R14	8.97	8.48%	

Table 9: Description and extent of vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
AhXpBf	Woodland *Allocasuarina huegeliana* with scattered *Eucalyptus wandoo*, *Eucalyptus marginata* and *Corymbia calophylla* over open shrubland *Xanthorrhoea preissii*, *Banksia fraseri* var. *fraseri*, *Hypocalymma angustifolium* and *Haemodorum laxum* over scattered native and non-native herbs over open grassland *Neurachne alopecuroidea*, **Aira cupaniana* and **Vulpia myuros* on outcropping granite.	R12	0.2	0.19%	
EmCcAf	Open forest *Eucalyptus marginata*, *Allocasuarina fraseriana* and occasional *Corymbia calophylla* over open to closed tall shrubland (or absent) *Trymalium* spp., *Banksia sessilis* and/or over low shrubland *Hibbertia commutata*, *Bossiaea ornata* over sparse to closed sedgeland *Patersonia rudis*, *Lepidosperma* spp. and *Netrostylis* over scattered *Austrostipa* spp. and *Rytidosperma setaceum* over mixed native herbs on plateaus and upper slopes.	Q3, Q5, R6	38.63	36.52%	

Table 10: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
ErCe	Open forest *Eucalyptus rudis* and occasional *Melaleuca preissiana* and Acacia saligna over closed sedgeland Chorizandra enodis (or absent) over non-native grass/herbland **Briza maxima*, **Briza minima*, **Ehrharta longiflora*, *Morea flaccida and **Romulea rosea*.	Q16	0.33	0.31%	
Ew	Open forest *Eucalyptus wandoo* with occasional *Corymbia calophylla* and *Eucalyptus marginata* over open to closed shrubland *Allocasuarina humilis* (or absent), Chorizema dicksonii, *Gastrolobium calycinum*, *Hypocalymma angustifolium* and *Pimelea ?preissii* over low shrubland *Tetratheca* spp., *Daviesia* spp., *Bossiaea eriocarpa* and *Hibbertia commutata* and *Synaphea gracillima*, *Gonocarpus cordiger*, *Dampiera* spp. and *Lechenaultia biloba* over mixed native herbland on lower slopes and low lying areas and drainage lines.	Q4, Q11, R7	38.96	36.83%	

Table 11: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
EwEmCc	Open forest *Eucalyptus wandoo* with scattered *Eucalyptus marginata* and *Corymbia calophylla* over open to closed shrubland *Allocasuarina humilis* (or absent), *Macrozamia riedlei* and *Styphelia* spp. over low shrubland *Hibbertia commutata*, *Bossiaea ornata*, *Dampiera* spp. and *Tetratheca* spp., over open sedgeland *Lepidosperma* spp. and *Lomandra* spp. over mixed native herbland on mid to upper slopes.	Q1, R8, Q2, Q10	17.08	16.15%	
Non-native	Heavily disturbed areas comprising predominantly hardstand, cleared tracks/roads, weeds and occasional native plants.	-	1.38	1.3%	

Table 12: Description and extent of Vegetation units identified within the site (continued)

Code	Description	Sample/s	Total area (ha)	Proportion of site (%)	Representative photograph
Water	Small area of unvegetated banks and surface water associated with a dam.	-	0.03	0.03%	No photo

4.2.2 Vegetation condition

The extent of vegetation by condition category is detailed in **Table 13** and shown in **Figure 6**.

Table 13: Extent of vegetation condition categories within the site

Condition category (Keighery 1994)	Total area (ha)	Proportion of site (%)
Pristine	0	0
Excellent	0	0
Very good	69.91	66.10%
Very good - good	11.1	10.49%
Good	16.7	15.79%
Good - degraded	3.83	3.62%
Degraded	2.82	2.67%
Completely degraded	1.38	1.3%
N/A	0.03	0.03%

4.2.3 Threatened and priority ecological communities

No TECs or PECs occur within the site.

5 Discussion

5.1 Flora

5.1.1 Species inventory

A total of 237 flora species were recorded in the site, which is similar to the number of species estimated to occur (refer **Section 4.1.1**). This is not surprising considering the site was traversed thoroughly during three different months over two years. A range of seasonal species were also recorded, including 17 Orchidaceae taxa which are perennial geophytes visible during only part of the year.

5.1.2 Threatened and priority flora

Three priority flora species were recorded within the site: *Gastrolobium*. sp. prostrate Boddington (M. Hislop 2130) (P1), *Goodenia katabudjar* (P3) and *Lasiopetalum cardiophyllum* (P4).

Records of *G*. sp. prostrate Boddington (M. Hislop 2130) were limited to the western portion of the site, from which a relatively small number of plants was recorded (42 individuals). The species appeared to favour open areas, including disturbed ground adjacent to tracks. *G*. sp. prostrate Boddington (M. Hislop 2130) is currently only known from six populations, all of which are located within 10 km of the site. The limited number of known populations of the species may suggest that the species is rare and has a restricted range. However, taxonomic work is currently being undertaken by the WA herbarium in order to determine how and if the species differs from the common species *G*. *hookeri*. *G*. *hookeri* looks superficially identical but differs in having an upright rather than a prostrate growth form. If the two species are determined to represent the same entity, it is likely that *G*. sp. prostrate Boddington (M. Hislop 2130) will ultimately be removed from DBCA's priority flora list. It is possible that additional individuals of that *G*. sp. prostrate Boddington (M. Hislop 2130) occur adjacent to the site within the remainder of Lot 500, particularly in the western portion where similar habitat occurs.

A high number of *G*. *katabudjar* individuals was recorded in the site (7,164 individuals recorded over a 2 year period), with plants concentrated in the southern and central portions. *G*. *katabudjar* often occurs as dense populations, with some nearby records of the species comprising 200-2,500 individuals (DBCA 2023d). Since the remainder of Lot 500 comprises similar vegetation, it is likely that many *G*. *katabudjar* individuals occur adjacent to the site.

L. *cardiophyllum* occurred predominantly on rocky laterite outcrops in the central portion of the site. Twenty-nine populations of *L*. *cardiophyllum* occur within 20 km of the site (DBCA 2023d) and so a record of this species was not unexpected. It is likely that additional *L*. *cardiophyllum* individuals occur within the remainder of Lot 500, although the species does not appear to be as abundant as *G*. *katabudjar*.

With regard to other threatened or priority flora with potential to occur that were not recorded during the surveys (refer **Table 3**), the absence of the larger perennial species such as *Isopogon* sp. Canning Reservoir (M.D. Tindale 121 & B.R. Maslin), *Acacia alata* var. *platyptera* and *Eucalyptus exilis* was relatively easy to confirm. However, smaller annual or geophytic species such as *Caladenia*

hopperiana, Caladenia dorrienii, *Caladenia integra* and *Stylidium marradongense* would have been more difficult to detect.

As the timing of the surveys coincided with the main flowering period of the annual or geophytic species with potential to occur in the site, they should have been visible if present. Areas of suitable habitat for these species was searched on three occasions in 2023 to cover different stages of flowering, including just before the flowering period (August), during the flowering period (September) and at the end/just after the flowering period (early November) but none of the species was recorded. During the 2024 survey the site was searched once (over two days in mid-late October) during the flowering period with no individuals found. Therefore, it is considered unlikely that any of the species occur in the site.

The survey was undertaken outside of the main flowering period of *Calytrix simplex* subsp. *simplex* and *Parsonsia diaphanophleba* but both species are perennial and would be visible at any time of year, even if not flowering. Given that no sterile specimen potentially representing these species were collected, the survey is considered conclusive in determining that neither of the species occur in the site.

No other threatened or priority flora species were recorded in the site or are considered to have potential to occur, given that the survey effort was comprehensive and that the survey was undertaken at a suitable time of year for detecting species for which timing is critical (refer **Table 3**).

5.1.3 Declared pests

One species listed as a declared pest pursuant to the BAM Act was recorded within the site (**Moraea flaccida*). No control category was assigned for this species and its keeping category is listed as 'exempt' under the Act and so no management is required.

5.2 Vegetation

5.2.1 Vegetation units

The site comprises a series undulating laterite hills and associated valleys. Outcropping laterite was observed in multiple locations in the site, particularly on hilltops. A minor drainage line intersects the site in an east/west direction through the northern portion. Whilst the waterway did not contain standing water at the time of the survey, the soil was slightly damp in parts.

A cluster analysis was performed to aid in determining which vegetation samples are statistically different from each other (refer **Appendix F**). The results of the cluster analysis were somewhat inconclusive as the majority of the samples were grouped together under a single vegetation unit. This is likely due to similar species composition across much of the site. However, structural differences in the under and mid storey strata and differences in dominant flora species and abiotic attributes discussed above such as topography and hydrology were noted. Ultimately vegetation units were defined based on the results of the cluster analysis in combination with notes taken in the field.

5.2.2 Vegetation condition

Evidence of past disturbance and clearing such as weed invasion and/or lack of understorey vegetation was evident throughout much of the site, particularly the northern and western portions. The southern portion of the site had been impacted by a relatively recent fire (refer **Section 2.1.9**) which was evident through burnt tree trunks and changes to the vegetation structure. Burnt areas generally contained a more prominent shrub layer.

Although vegetation structure was somewhat altered through historical disturbances, the majority of the vegetation in the site was mapped as occurring in 'very good' condition as it had moderate to high native species diversity in combination with low weed loads.

Two compound condition categories ('very good - good' and 'good - degraded') were applied to patches of vegetation that partially met criteria for multiple condition categories. Areas mapped as being in very good - good condition retained basic vegetation structure and moderate species diversity but the percentage cover of native species, particularly in the understorey, was reduced with more bare ground and/or higher weed loads present.

One area in the western portion of the site was mapped as being in good - degraded condition as vegetation structure was severely impacted by historical clearing which was evident through the lack of overstorey tree species and a midstorey dominated by typical disturbance specialist species such as *Banksia sessilis* and *Hakea prostrata*. Nonetheless, many groundcover species have started to repopulate the area and weed loads were moderate.

The remaining vegetation clearly met condition criteria for 'good', 'degraded' and 'completely degraded condition'.

5.2.3 Threatened and priority ecological communities

The PEC 'mount saddleback heath communities' was initially considered to have a moderate likelihood of occurrence within the site based on desktop information. The PEC is described as comprising Proteaceae and Myrtaceae dominated heath/shrubland vegetation on shallow soils and granite outcrops, sometimes with emerging mallee trees. No areas of heath or mallee vegetation were identified within the site and so it was determined that this PEC does not occur.

5.2.4 Regional and local significance

Flora and vegetation may be significant irrespective of protection under policy or legislation. The vegetation in the site forms part of a relatively large patch of native vegetation which provides habitat for many native fauna species, including some that are of conservation significance such as threatened species of black cockatoo.

6 Conclusions

Outcomes of the assessment include the following:

- A total of 237 flora species were recorded within the site, the majority of which are native (91%).
- Three priority flora species were recorded within the site: *Gastrolobium* sp. prostrate Boddington (M. Hislop 2130) (P1) (42 individuals), *Goodenia katabudjar* (P3) (7,164 individuals) and *Lasiopetalum cardiophyllum* (P4) (220 individuals).
- No other threatened or priority flora species were recorded in the site or are considered to have potential to occur, given that the survey effort was comprehensive and that the survey was undertaken at a suitable time of year for detecting species for which timing is critical.
- One species listed as a declared pest was recorded but no management is required as no control category was assigned under the BAM Act.
- Eight vegetation units were recorded within the site: **AhHaLl**, **AhHpBs**, **AhXpBf**, **EmCcAf**, **ErCe**, **Ew**, **EwEmCc** and **non-native**.
- The majority of the site supports native vegetation in 'very good' and 'very good – good' condition (76.59%).
- No TECs or PECs occur within the site.

7 References

7.1 General references

Alan Tingay and Associates 1998, *A Strategic Plan for Perth's Greenways - Final Report*. December 1998.

Beard, J. S. 1990, *Plant Life of Western Australia*, Kangaroo Press Pty Ltd., Kenthurst, N.S.W.

Bureau of Meteorology (BoM) 2023, *Climate Data Online*, <http://www.bom.gov.au/climate/data/>.

Bureau of Meterology (BoM) 2024, *Climate Data Online*, <http://www.bom.gov.au/climate/data/>.

Department of Conservation and Land Management (CALM) 2003, *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Perth, WA.

Clarke, K. R. and Gorley, R. N. 2006, *PRIMER v6: User Manual/Tutorial*, PRIMER-E, Plymouth.

Department of Agriculture, Water and the Environment (DAWE) 2021, *Weeds of National Significance (WoNS)*, Centre for Invasive Species Solutions (CISS), <https://weeds.org.au/weeds-profiles/>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018, *Directory of Important Wetlands in Australia - Western Australia (DBCA-045)*.

Department of Biodiversity Conservation and Attractions (DBCA) 2019, *Vegetation Complexes - South West forest region of Western Australia (DBCA-047)*, Kensington.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022a, *Lands of Interest (DBCA-012)*, <https://catalogue.data.wa.gov.au/dataset/dbca-lands-of-interest>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022b, *Priority Ecological Communities for Western Australian Version 34*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022c, *Threatened and Priority Flora List 6 October 2022*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023a, *Legislated Lands and Waters (DBCA-011)*, Perth, WA, <https://catalogue.data.wa.gov.au/dataset/dbca-lands-of-interest>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023b, *Methods for survey and identification of Western Australian threatened ecological communities (draft)*, Perth, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023c, *Threatened Ecological Community List 26 May 2023*, Perth, WA,

<https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023d, *Threatened Species and Communities - Data Searches*, Perth, WA, <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023e, *Weeds*, Perth, WA, <https://www.dbca.wa.gov.au/parks-and-wildlife-service/threat-management/plant-diseases/weeds#:~:text=Weeds%20are%20plants%20(not%20necessarily,detectable%20environmental%20or%20economic%20impacts>.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2021, *Threatened Ecological Communities*, <https://www.dcceew.gov.au/environment/biodiversity/threatened/communities>.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, *Protected Matters Search Tool*, <https://pmst.awe.gov.au/#/map>.

Department of Primary Industries and Regional Development (DPIRD) 2020, *10 metre contours (DPIRD-073)*, Perth, WA.

Department of Primary Industries and Regional Development (DPIRD) 2022, *Soil Landscape Mapping - Systems (DPIRD-064)*.

Department of Water and Environmental Regulation (DWER) 2018a, *A Guide to Preparing Revegetation Plans for Clearing Permits*

Department of Water and Environmental Regulation (DWER) 2018b, *Hydrography Linear (Heirarchy) (DWER-031)*, Perth.

Environment Australia 2000, *Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) and Development of Version 5.1 - Summary Report*, Department of Environment and Heritage.

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

Environmental Protection Authority (EPA) 2016b, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Perth.

Gotelli, N. J. and Colwell, R. K. 2011, *Estimating species richness*, Oxford University Press, Oxford.

Gozzard, J. 2011, *Sea to scarp - geology, landscape, and land use planning in the southern Swan Coastal Plain*, Geological Survey of Western Australia.

Hill, A. L., Semeniuk, C. A., Semeniuk, V. and Del Marco, A. 1996, *Wetlands of the Swan Coastal Plain: Volume 2A - Wetland Mapping, Classification and Evaluation*, Water and Rivers Commission and the Department of Environmental Protection, Perth.

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

Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. 2009, *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.

NVIS Technical Working Group 2017, *Australian Vegetation Attribute Manual: National Vegetation Information System*, Department of the Environment and Energy, Canberra.

Western Australian Land Information Authority (WALIA) 2023, *Landgate Map Viewer Plus*.

Western Australian Herbarium 2023, *Florabase*, Department of Biodiversity, Conservation and Attractions (DBCA), <https://florabase.dpaw.wa.gov.au/>.

Wetlands Advisory Committee 1977, *The status of reserves in System Six*, Environmental Protection Authority, Perth.

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 2023)	12 December 2023	Climate Data Online
(DBCA 2023c)	16 August 2022	Threatened Ecological Communities
(DAWE 2021)	12 December 2023	Weeds of National Significance (WoNS)
DCCEEW (2023)	8 August 2022	Protected Matters Search Tool
WALIA (2023)	12 December 2023	Landgate Map Viewer
Western Australian Herbarium (2023)	12 December 2023	Florabase

Figures

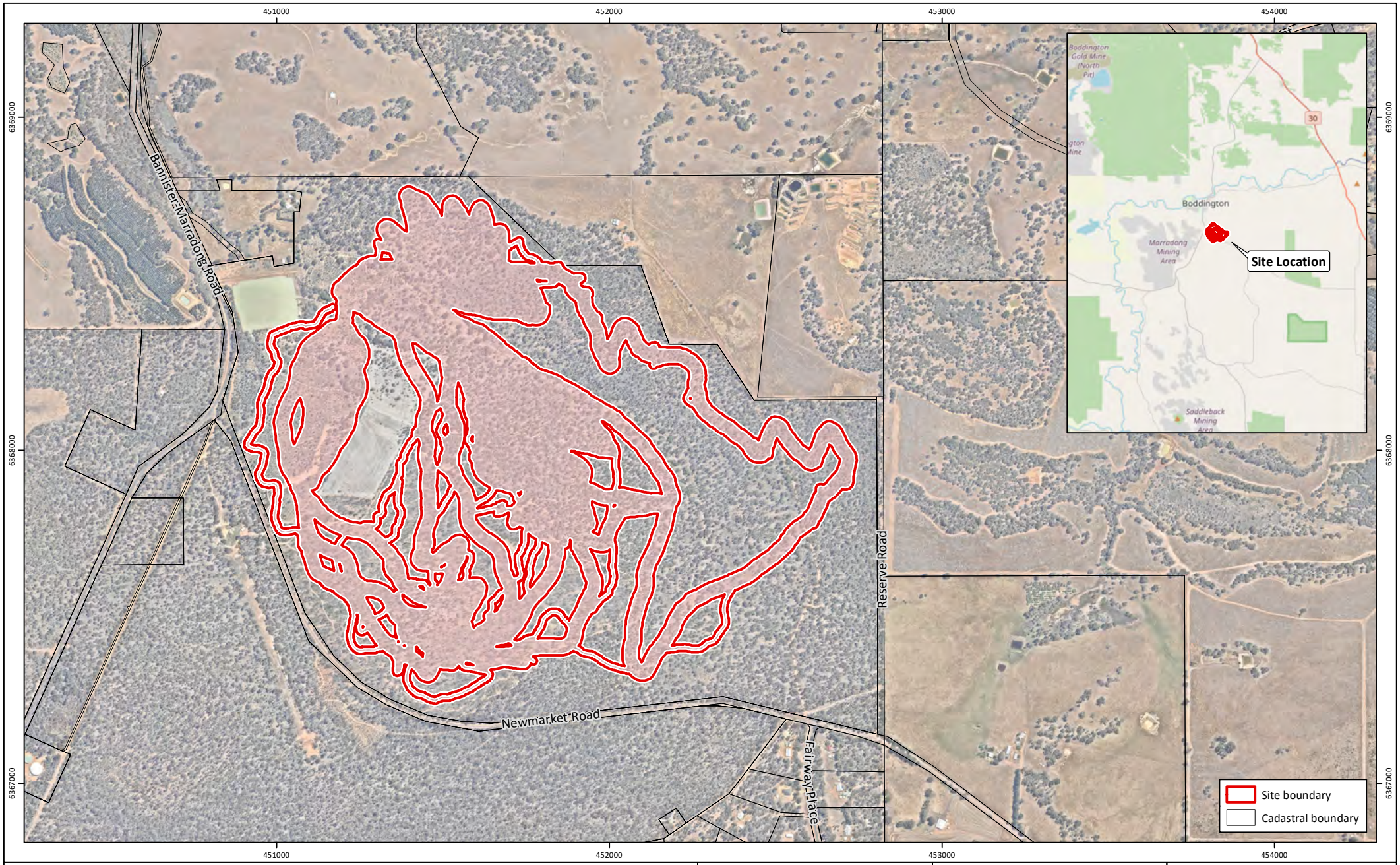

Figure 1: Site Location

Project: Detailed Flora and Vegetation Assessment
Part Lot 500 DP421144

Client: Shire of Boddington

Plan Number:
EP23-044(02)--F25

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Date:	10/12/2024
Checked:	MS
Approved:	RAW
Date:	13/12/2024

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GDA2020 MGA Zone 50

emerge ASSOCIATES

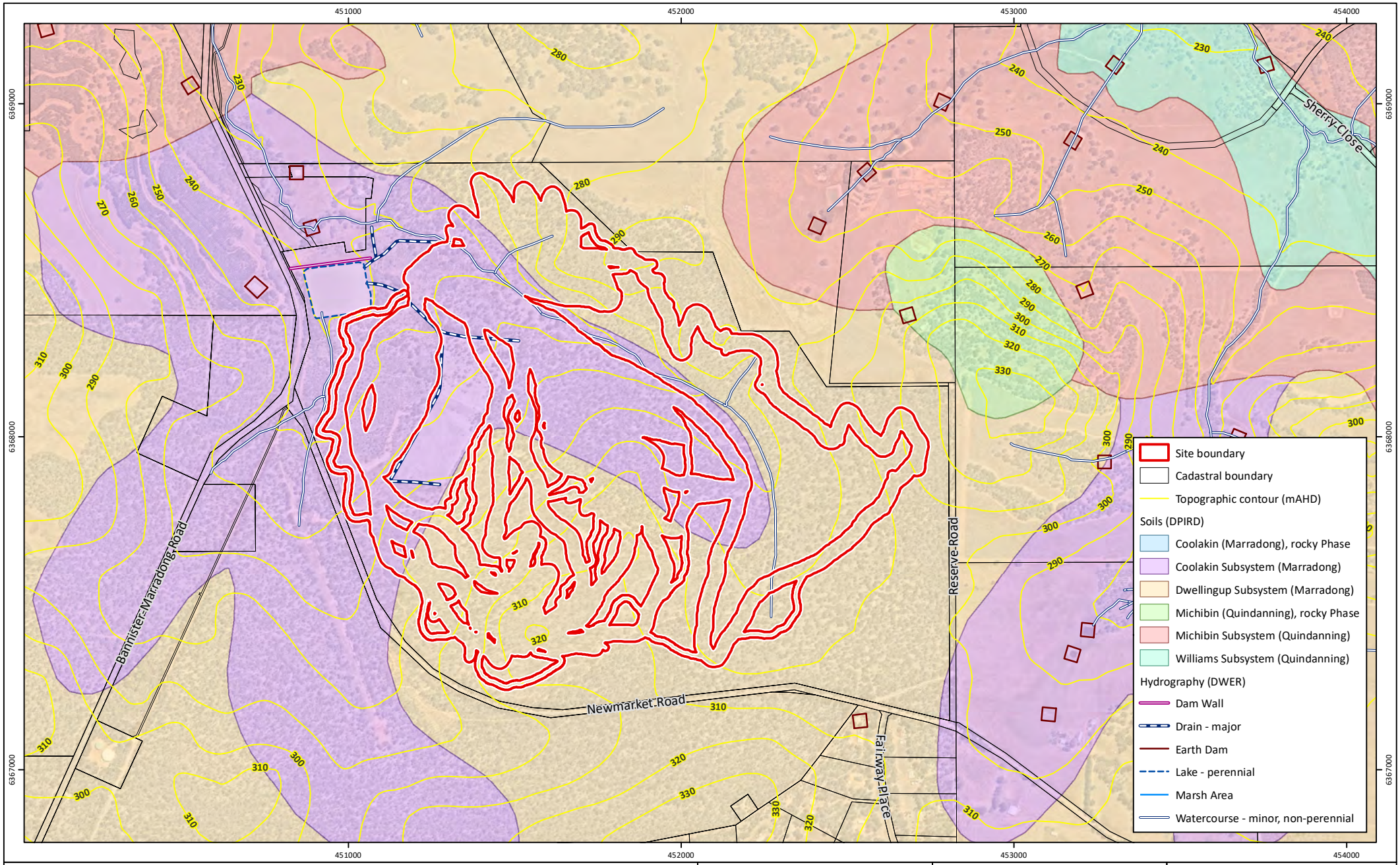

Figure 2: Hydrography, Soils and Topography

Project: Detailed Flora and Vegetation Assessment
Part Lot 500 DP421144
Client: Shire of Boddington

Plan Number:
EP23-044(02)--F26

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Date:	10/12/2024
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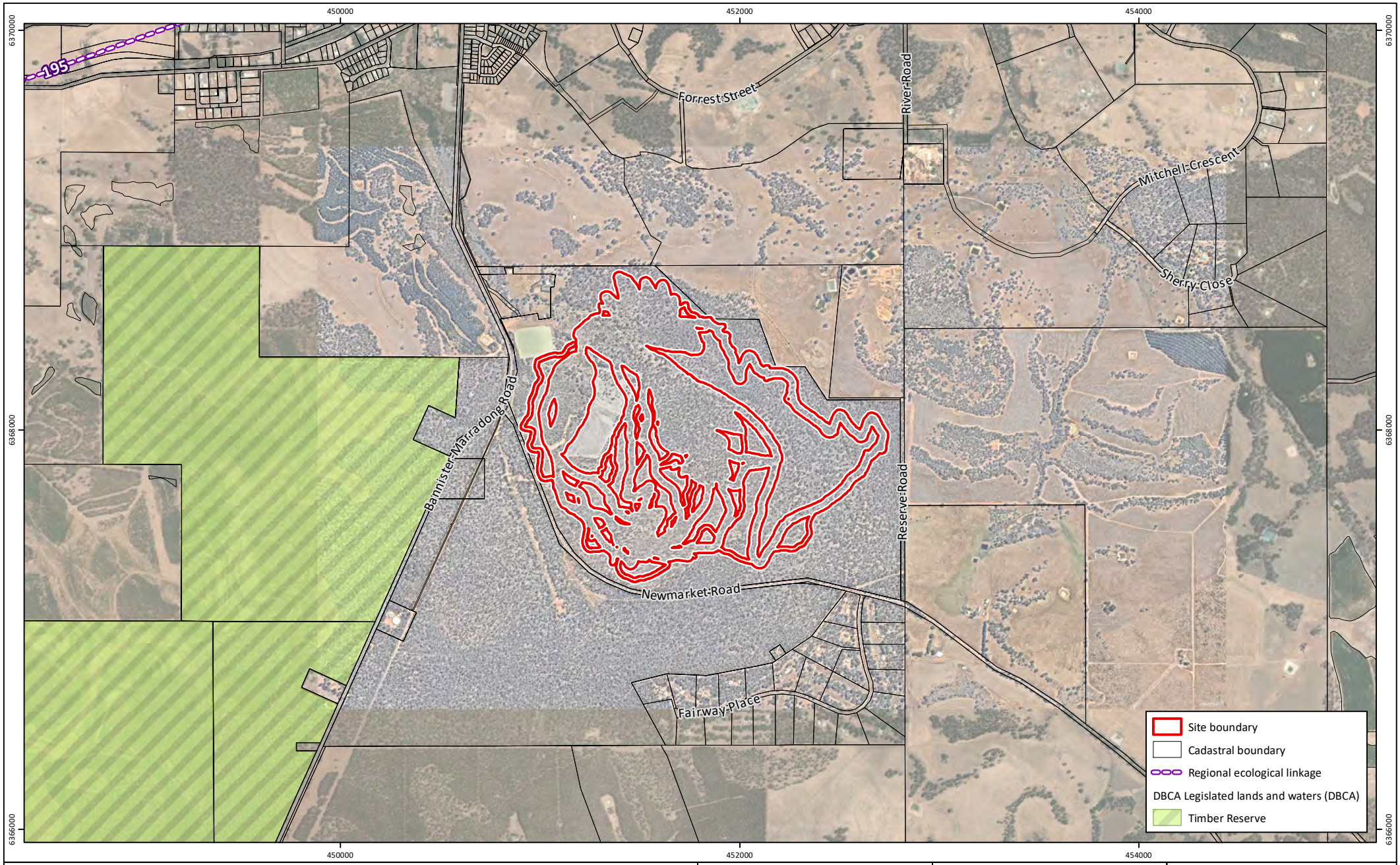

Figure 3: Environmental Features

Project: Detailed Flora and Vegetation Assessment
Part Lot 500 DP421144
Client: Shire of Boddington

Plan Number:
EP23-044(02)--F27

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emerge ASSOCIATES

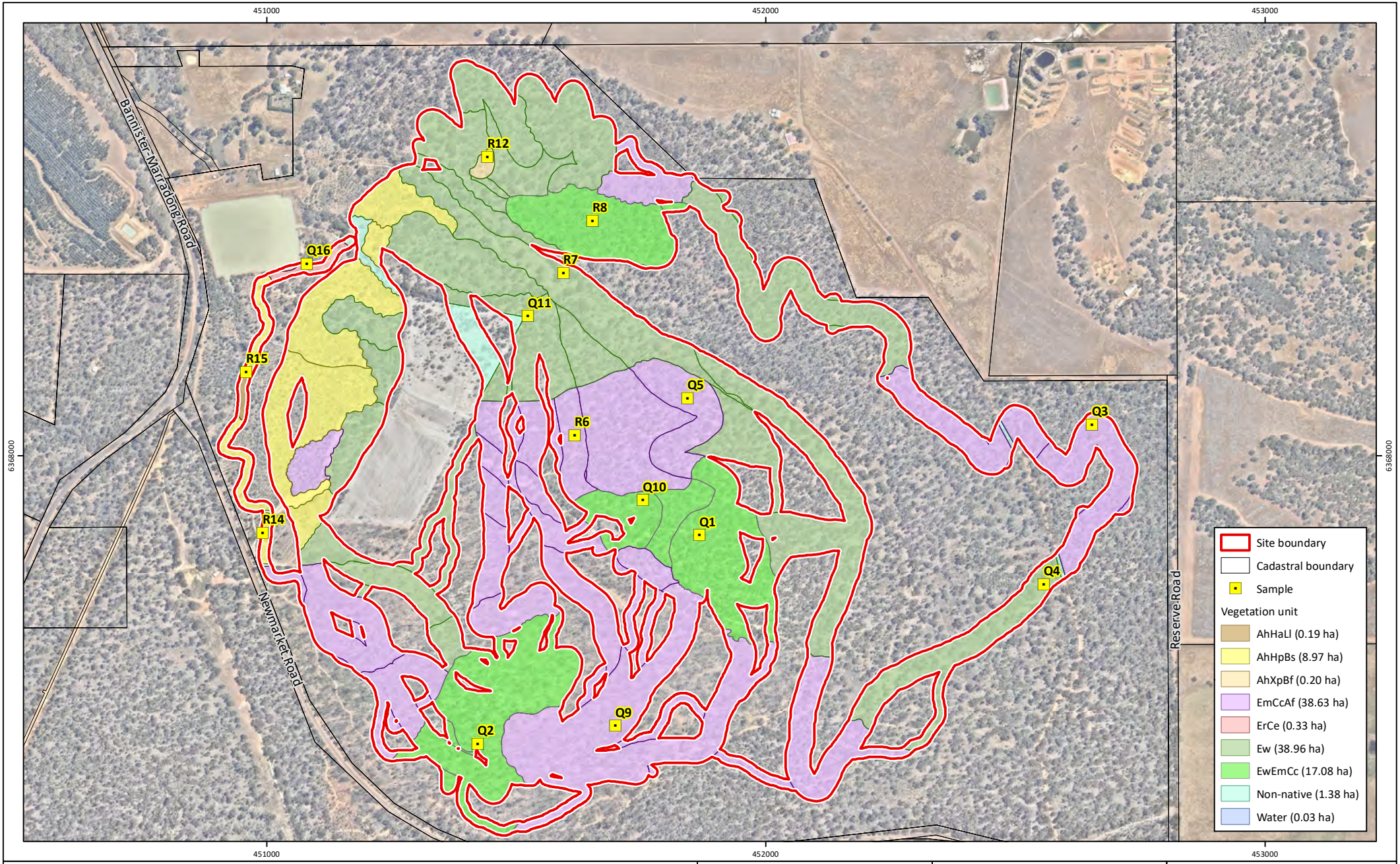

Figure 4: Vegetation Units

Project: Detailed Flora and Vegetation Assessment
Part Lot 500 DP421144
Client: Shire of Boddington

Plan Number:
EP23-044(02)--F28

Drawn:	CTH
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Checked:	MS
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GDA2020 MGA Zone 50

emerge ASSOCIATES

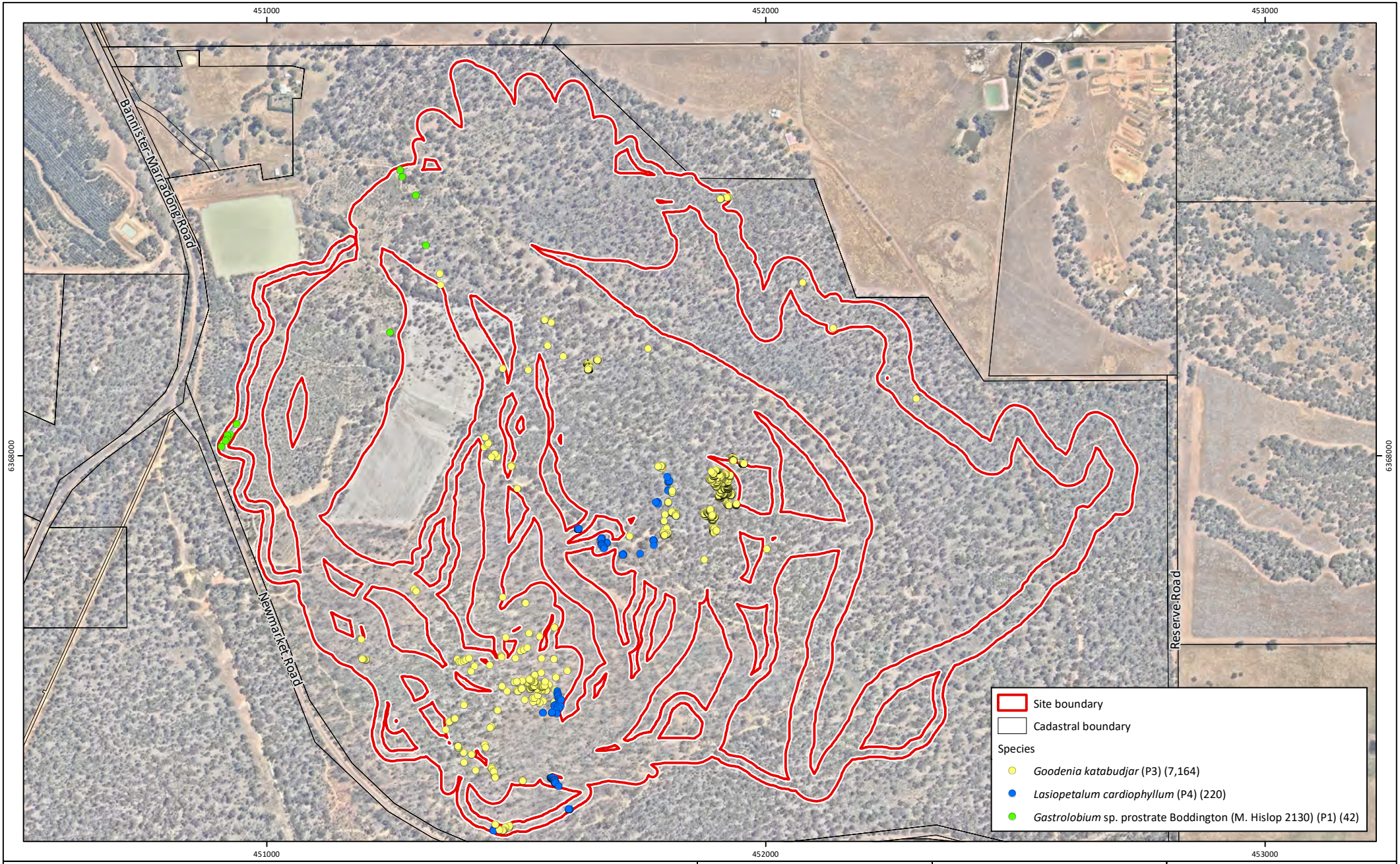

Figure 5: Priority Flora

Project: Detailed Flora and Vegetation Assessment
Part Lot 500 DP421144

Client: Shire of Boddington

Plan Number:
EP23-044(02)--F29

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Date:	10/12/2024
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Metres

Scale: 1:10,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

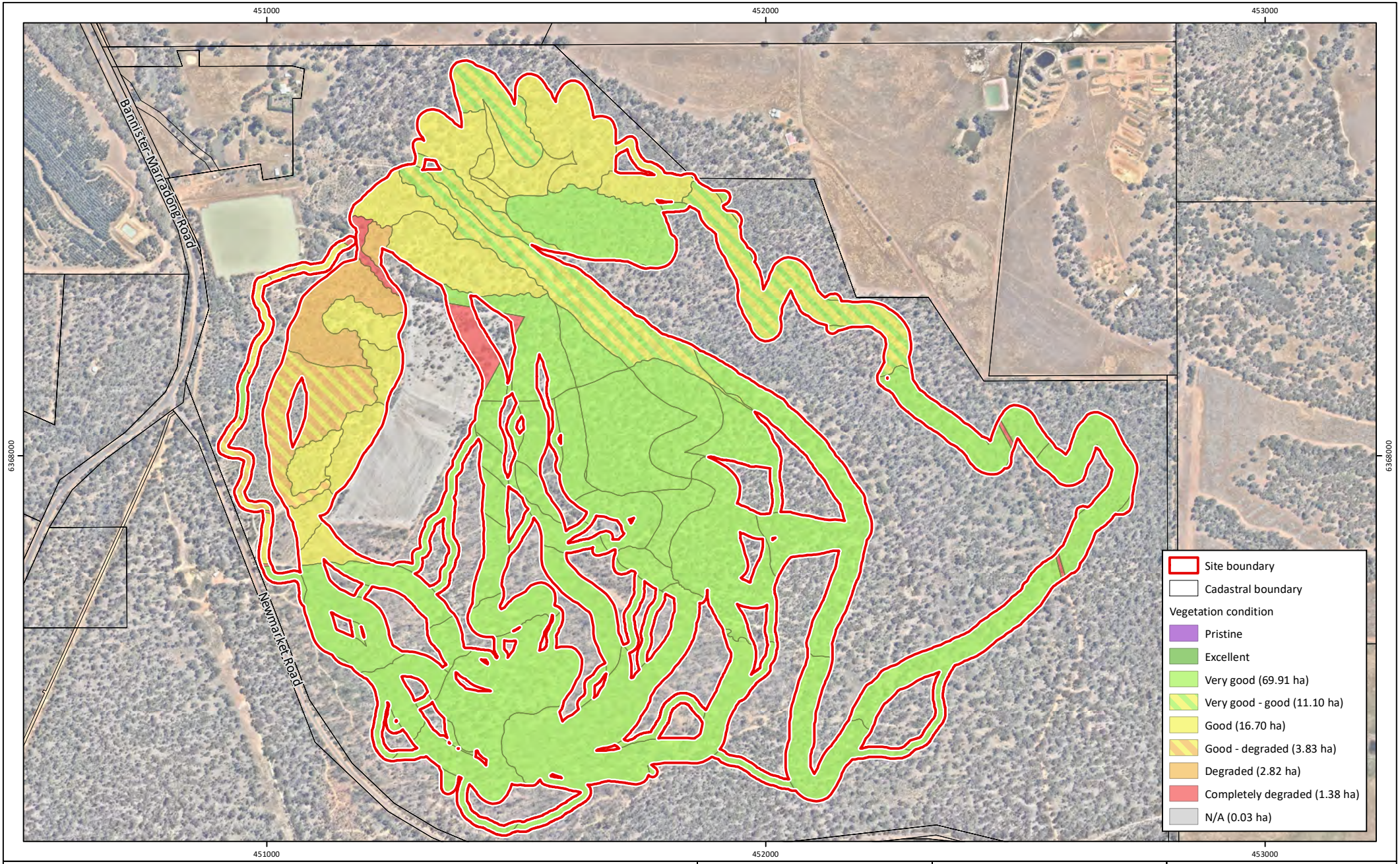


Figure 6: Vegetation Condition

Project: Detailed Flora and Vegetation Assessment
Part Lot 500 DP421144
Client: Shire of Boddington

Plan Number:
EP23-044(02)--F30
Drawn: CTH
Date: 10/12/2024
Checked: MS
Approved: RAW
Date: 13/12/2024

N

0 100 200 300
Metres
Scale: 1:10,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

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**.

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†	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^†	Threatened Flora – Extant Taxa which are declared to be likely to become extinct or is rare, or otherwise in need of special protection.
CR^	Threatened Flora – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN^	Threatened Flora – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.
VU^	Threatened Flora – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
P1	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	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	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	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.

^pursuant to the EPBC Act, †pursuant to the BC Act, 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.

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).

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

Priority code	Description
P1	Priority One: Poorly known ecological communities Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). 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.
P2	Priority Two: Poorly known ecological communities Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). 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.
P3	Priority Three: Poorly known ecological communities (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (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. 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.
P4	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. (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. (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. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	Priority Five: Conservation Dependent ecological communities Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

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

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

Category	Description
C1	Exclusion 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.
C2	Eradication Present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3	Management 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.

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)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018b, *Threatened and Priority Flora List 16 January 2018*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023a, *Priority Ecological Communities for Western Australia Version 35*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023b, *Threatened and Priority Flora List July 2023* Perth.

Department of Environment and Conservation (DEC) 2007, *Protocol for proposing modifications to the Geomorphic Wetlands Swan Coastal Plain dataset*, Perth.

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

Department of Conservation (DEC) 2013, *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*, Perth.

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		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Caladenia dorrienii	EN	EN	PG	Sandy clays, usually in moist valley sites in open wandoo/jarrah woodland over low scattered shrubs. Often on slopes and near streams.	Sep-Nov	Moderate
Caladenia hopperiana	EN	EN	PG	Gravel over brown sand in slight depressions or moist, brown clay loams on the margins of winter-wet creeklines.	Sep-Oct	Moderate
Jacksonia velveta	EN	EN	P	Brown to red gravelly loam over laterite on slight slopes in low woodland areas.	Nov-Dec	Moderate
Diuris purdiei	EN	EN	PG	Sand to sandy clay soils in areas subject to winter inundation.	late September to mid-October, but only after a summer or early autumn fire (Brown et al., 1998)	Negligible
Goodenia arthrotricha	EN	EN	P	Granite rocks, slopes	Oct-Nov	Negligible
Pultenaea pauciflora	VU	VU	P	White sand over laterite in association with open woodlands of wandoo, marri and parrot bush (Banksia sessilis).	Oct-Dec	Moderate
Anthocercis gracilis	VU	VU	P	Steep granite slopes along the Darling Scarp in shallow, humis-rich sandy or loamy soils.	Sep-Oct, Apr	Negligible
Diuris micrantha	VU	VU	PG	Dark grey-black sandy clay-loam in winter wet depressions or swamps. Often in shallow standing water.	Aug/Sep-early Oct	Negligible

Species name	Level of		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Eleocharis keigheryi	VU	VU	P	Clay or sandy loam in freshwater creeks and transient waterbodies such as seasonally wet clay pans.	Aug-Dec	Negligible
Calytrix simplex subsp. *simplex*	P1	-	P	Swamps to well drained lateritic gravel slopes and flats.	(Dec-) Jan	Moderate
Gastrolobium sp. Prostrate Boddington (M. Hislop 2130)	P1	-	P	Littered brown loam, clay, laterite. Lower slopes and rises, valley bottoms.	Oct	Moderate
Hibbertia ambita	P1	-	P	Clay/loam with lateritic gravel.	Aug-Oct	Moderate
Isopogon sp. Canning Reservoir (M.D. Tindale 121 & B.R. Maslin)	P1	-	P	Brown, yellow or grey sand over laterite on flats and low plains.	Aug-Sep	Moderate
Papistylus intropubens	P1	-	P	Heath (limited records and information).	Unknown	Negligible
Synaphea panhesya	P1	-	P	Gravelly loam & sandy gravel.	Aug-Sep	Negligible
Banksia recurvistylis	P2	-	P	Shallow, lateritic soils associated with granite outcrops.	Nov and early Dec	Moderate
Banksia subpinnatifida var. *imberbis*	P3	-	P	Laterite.	Sep-Oct	Moderate
Goodenia katabudjar	P3	-	P	Sandy gravel in upland areas of open wandoo woodland.	Dec	Moderate
Halgania corymbosa	P3	-	P	Gravelly soils, soils over granite.	Aug-Nov	Moderate
Leucopogon florulentus	P3	-	P	White/grey or yellow sand, sandy clay, gravelly lateritic soils. Sandplains, gentle slopes.	Jun-Nov	Moderate
Meionectes tenuifolia	P3	-	A	Clay loam in seasonally wet areas.	Oct-Dec	Moderate
Netrostylis sp. Blackwood River (A.R. Annels 3043)	P3	-	P	Creebeds, edges of lakes and swamps. Clay, peat or loam soils.	?Nov (limited information)	Moderate
Stylidium marradongense	P3	-	P	Sand over laterite in jarrah-marri forest.	Sep-Nov	Moderate
Tetratheca pilifera	P3	-	P	Gravelly soils.	Aug-Oct	Moderate
Asteridea gracilis	P3	-	A	Sand, clay, gravelly soils.	Sep-Dec	Negligible

Species name	Level of		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Gastrolobium sp. Asperum (F. Hort 2864)	P3	-	P	Lateritic soil.	Sep (limited informatio n)	Negligible
Hakea oldfieldii	P3	-	P	Red clay or sand over laterite on seasonally wet flats.	Aug-Oct	Negligible
Byblis gigantea	P3	-	P	Sandy-peat swamps. Seasonally wet areas.	Sep-Jan	Low
Chordifex gracilior	P3	-	P	Peaty sand in swamps.	Sep-Dec	Low
Acacia alata var. *platyptera*	P4	-	P	Clay, gravelly sandy clay on lateritic ridges, clay flats.	Jun-Aug	Moderate
Caladenia integra	P4	-	PG	Clayey loam. Granite outcrops, rocky slopes.	Sep-Oct	Moderate
Darwinia thymoides subsp. St Ronans (J.J. Alford & G.J. Keighery 64)	P4	-	P	Sand/loam/clay on laterite near granitic outcrops.	Oct-Nov	Moderate
Eucalyptus exilis	P4	-	P	Grey sand, gravelly loam. Lateritic ridges.	Aug-Oct	Moderate
Lasiopetalum cardiophyllum	P4	-	P	Lateritic gravelly soils, sandy clay on flats and hillslopes.	Aug-Dec/Jan	Moderate
Parsonsia diaphanophleba	P4	-	P	Alluvial soils along rivers.	Jan-Feb or Apr-Sep	Moderate
Senecio leucoglossus	P4	-	A	Gravelly lateritic or granitic soils on outcrops or slopes.	Aug-Dec	Moderate
Calothamnus quadrifidus subsp. teretifolius	P4	-	P	Sand, loam or clay with laterite.	Oct-Dec	Negligible
Cyanothamnus tenuis	P4	-	P	Laterite, stony soils, granite.	Aug-Nov	Negligible

Note: EN=endangered, VU=vulnerable, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4, P=perennial, PG=perennial geophyte, A=annual.

Appendix C

Conservation Significant Communities and Likelihood of Occurrence Assessment

Community name	**TEC/ PEC**	**Level of significance**		**Likelihood of occurrence**
		State	**EPBC Act**	
Eucalypt Woodlands of the Western Australian Wheatbelt	TEC/ PEC	P3	CR	Negligible
Mount Saddleback heath communities	PEC	P1	-	Moderate
Note: TEC=threatened ecological community, PEC=priority ecological community, CR=critically endangered, P3=priority 3.				

Appendix D

Species List

Family	Status	Species
Amaranthaceae		
		Ptilotus manglesii
Apiaceae		
		Daucus glochidiatus
		Xanthosia atkinsoniana
		Xanthosia candida
		Xanthosia ciliata
		Xanthosia huegelii
		Xanthosia ?singuliflora
Araliaceae		
		Hydrocotyle intertexta
		Trachymene pilosa
Asparagaceae		
		Chamaescilla corymbosa
		Dichopogon capillipes
		Lomandra ?caespitosa
		Lomandra hermaphrodita
		Lomandra ?micrantha
		Lomandra spartea
		Sowerbaea laxiflora
		Thysanotus manglesianus
		Thysanotus patersonii
		Thysanotus thyrsoideus
		Thysanotus sp. climbing (sterile)
Asteraceae		
	*	*Arctotheca calendula*
		Craspedia variabilis
		Hyalosperma cotula
	*	*Hypochaeris radicata*
		Lagenophora huegelii
		Millotia tenuiflora
	*	*Osteospermum ecklonis*
		Panaetia lessonii
		Podolepis nutans
		Podotheca angustifolia
		Pterochaeta paniculata
		Senecio ?quadridentatus
		Trichocline spathulata
	*	*Ursinia anthemoides*
		?*Xerochrysum macranthum*
Boraginaceae		
		Halgania cyanea
Boryaceae		
		Borya sphaerocephala
Campanulaceae		
		Isotoma hypocrateriformis
Casuarinaceae		
		Allocasuarina fraseriana

Family	Status	Species
		Allocasuarina huegeliana
		Allocasuarina humilis
Celastraceae		
		Stackhousia monogyna
		Tripterococcus brunonis
Colchicaceae		
		Wurmbea sinora
Cyperaceae		
		Chorizandra enodis
		Gahnia aristata
		Lepidosperma ?*apricola*
		Lepidosperma leptostachyum
		Lepidosperma ?*squamatum*
		Morelotia octandra
		Netrostylis sp. Jarrah Forest (R. Davis 7391)
		?*Schoenus* sp.
Dilleniaceae		
		Hibbertia amplexicaulis
		Hibbertia asterella
		Hibbertia commutata
		Hibbertia hypericoides
		Hibbertia pilosa
		?*Hibbertia* sp.
Droseraceae		
		Drosera bulbosa
		Drosera glanduligera
		Drosera menziesii
		Drosera sp.
		Drosera spilos
		Drosera stolonifera
Elaeocarpaceae		
		Tetratheca hirsuta
		Tetratheca virgata
Ericaceae		
		Ericaceae sp.
		Leucopogon capitellatus
		Styphelia discolor
		Styphelia pallida
		Styphelia sp.
Euphorbiaceae		
		Monotaxis grandiflora
Fabaceae		
		Acacia applanata
	*	*Acacia baileyana*
		Acacia browniana
		Acacia drummondii
	*	*Acacia iteaphylla*
		Acacia ?*lateriticola*

Family	Status	Species
		Acacia myrtifolia
		Acacia nervosa
		Acacia pulchella
		Acacia saligna
		Acacia stenoptera
		Bossiaea eriocarpa
		Bossiaea ornata
		Bossiaea spinescens
		Chorizema dicksonii
		Daviesia cordata
		Daviesia costata
		Daviesia decurrens
		Daviesia hakeoides subsp. *hakeoides*
		Daviesia incrassata subsp. *incrassata*
		Daviesia ?incrassata subsp. *incrassata*
		Daviesia ?preissii
		Dillwynia laxiflora
		Gastrolobium calycinum
	P1	*Gastrolobium* sp. prostrate Boddington (M. Hislop 2130)
		Gastrolobium trilobum
		Gompholobium marginatum
		Gompholobium polymorphum
		Gompholobium preissii
		Hovea chorizemifolia
		Isotropis cuneifolia subsp. *cuneifolia*
		Kennedia coccinea
		Kennedia prostrata
		Labichea punctata
	*	*Lotus angustissimus*
		Sphaerolobium medium
Geraniaceae		
	*	*Geranium dissectum*
Goodeniaceae		
		Dampiera alata
		Dampiera linearis
		Goodenia convexa
		Goodenia coerulea
	P3	*Goodenia katabudjar*
		Goodenia trinervis
		Lechenaultia biloba
		Scaevola calliptera
		Scaevola glandulifera
Gyrostemonaceae		
		Gyrostemon subnudus
Haemodoraceae		
		Anigozanthos bicolor
		Conostylis setigera
		Conostylis sp.

Family	Status	Species
		Haemadorum sp.
		Haemodorum ?*simplex*
		Haemodorum laxum
		Tribonanthes longipetala
Haloragaceae		
		Glischrocaryon angustifolium
		Gonocarpus cordiger
Hemerocallidaceae		
		Agrostocrinum hirsutum
		Caesia micrantha
		Dianella revoluta
		Stypandra glauca
		Tricoryne humilis
Iridaceae		
	*DP	*Moraea flaccida*
		Orthrosanthus laxus var. *gramineous*
		Patersonia juncea
		Patersonia rudis
	*	*Romulea rosea*
Lamiaceae		
		Hemiandra pungens
Lauraceae		
		Cassytha sp.
Linaceae		
	*	*Linum marginale*
Loganiaceae		
		Phyllangium paradoxum
Malvaceae		
	P4	*Lasiopetalum cardiophyllum*
Myrtaceae		
		Babingtonia camphorosmae
		Calothamnus ?*quadrifidus*
		Corymbia calophylla
		Ericomyrtus serpyllifolia
		Eucalyptus marginata
		Eucalyptus rudis
		Eucalyptus wandoo
		Hypocalymma angustifolia
		Leptospermopsis erubescens
		Melaleuca incana
		Melaleuca rhaphiophylla
Orchidaceae		
		Caladenia flava
		Caladenia longicauda subsp. *eminens*
		Caladenia macrostylis
		Caladenia reptans subsp. *reptans*
		Caladenia ?*uliginosa* subsp. *candicans*
		Cyanicula sericea

Family	Status	Species
		Disa bracteata
		Diuris porrifolia
		Diuris setacea
		Elythranthera emarginata
		Eriochilus sp.
		Pterostylis recurva
		Pterostylis ?vittata
		Thelymitra crinita
		Thelymitra graminea
		Thelymitra sp.
		?Thelymitra sp.
Orobanchaceae		
	*	*Bartsia trixago*
	*	*Parentucellia latifolia*
Oxalidaceae		
	*	*Oxalis corniculata*
Phyllanthaceae		
		Lysiandra calycina
		Poranthera microphylla
Pittosporaceae		
		Billardiera fusiformis
		Billardiera ?laxiflora
		Billardiera sp.
Poaceae		
	*	*Aira cupaniana*
		Austrostipa campylachne
		Austrostipa elegantissima
		Austrostipa ?flavescens
	*	*Brachypodium distachyon*
	*	*Briza maxima*
	*	*Briza minor*
	*	*Cynodon dactylon*
	*	*Ehrharta longiflora*
		Microlaena stipoides
		Neurachne alopecuroidea
		Poa drummondiana
		Rytidosperma setaceum
	*	*Vulpia myuros*
Polygalaceae		
		Comesperma calymega
Primulaceae		
	*	*Lysimachia arvensis*
Proteaceae		
		Banksia armata
		Banksia bipinnatifida
		Banksia fraseri var. *fraseri*
		Banksia nivea

Family	Status	Species
		Banksia sessilis
		Banksia squarrosa
		Grevillea ?tenuiflora
		Grevillea bipinnatifida
		Grevillea monticola
		Hakea lissocarpha
		Hakea prostrata
		Hakea varia
		Isopogon dubius
		Petrophile striata
		Synaphea gracillima
Ranunculaceae		
		Clematis pubescens
Restionaceae		
		Desmocladus asper
		Desmocladus fasciculatus
		Lepidobolus preissianus subsp. *preissianus*
Rhamnaceae		
		Stenanthemum ?nanum
		Trymalium angustifolium
		Trymalium ledifolium
		Trymalium odoratum
Rubiaceae		
		Opercularia echinocephala
		Opercularia vaginata
Rutaceae		
		Boronia crenulata
		Cyanothamnus ramosus
Santalaceae		
		Exocarpos sparteus
		Leptomeria cunninghamii
Stylidiaceae		
		Levenhookia pusilla
		Stylidium ?dichotomum
		Stylidium amoenum
		Stylidium androsaceum
		Stylidium caricifolium
		Stylidium ciliatum
		Stylidium crassifolium
		Stylidium ?lateriticola
		Stylidium uniflorum
Thymelaeaceae		
		Pimelea ciliata
		Pimelea imbricata
		Pimelea ?preissii
Xanthorrhoeaceae		
		Xanthorrhoea preissii

Family	Status	Species
Zamiaceae		
		Macrozamia riedlei

*=non-native, DP=declared pest, Pl=planted, P1=Priority 1, P3=Priority 3 and P4=Priority

Appendix E

Sample Data

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q1

Project no.: EP23-044
Date: 26/09/2023 **Status** Permanent
Author: MS, Q1: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451866.9708	NW corner northing:	6367840.782
Altitude (m):	320	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	upper slope
Time since fire:	> 5 yrs	Disturbance:	low - kangaroo grazjng
Soil type/texture	silt/	Bare ground (%):	1
Rocks (%) and type:	25%, laterite	Soil colour:	brown/
Litter:	15% (leaves,logs,branches)	Vegetation condition:	excellent

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q1

Project no.: EP23-044
Date: 26/09/2023 **Status** Permanent
Author: MS, Q1: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Austrostipa elegantissima	opp
	Billardiera sp.	0.1
	Bossiaea ornata	1
*	*Briza maxima*	opp
	Caesia micrantha	0.1
	Caladenia sp.	opp
	Chamaescilla corymbosa	0.1
	Corymbia calophylla	opp
	Dampiera alata	0.1
	Daucus glochidiatus	0.1
	Eucalyptus marginata	opp
	Eucalyptus wandoo	30
	Haemodorum laxum	opp
	Hakea lissocarpha	1
	Hibbertia commutata	0.1
	Labichea punctata	0.1
	Lagenophora huegelii	0.1
	Lepidosperma ?apricola	3
	Leucopogon capitellatus	1
	Lomandra ?micrantha	0.1
	Lomandra spartea	0.1
	Lomandra ?caespitosa	0.1
	Macrozamia riedlei	opp
	Netrostylis sp.	1
	Neurachne alopecuroidea	1
	Opercularia vaginata	1
*	*Oxalis corniculata*	0.1
	Patersonia rudis	0.1
	Poa drummondiana	0.1
	Scaevola calliptera	0.1
	Sphaerolobium medium	0.1
	Stylidium amoenum	0.1
	Stylidium ?lateriticola	opp
	Styphelia pallida	0.1
	Tetratheca hirsuta	1
	Tetratheca virgata	5

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q1

Project no.: EP23-044
Date: 26/09/2023 **Status** Permanent
Author: MS, Q1: Page 2 of 3

Status	Confirmed name	Cover (%)
	Thysanotus sp.	0.1
	Trachymene pilosa	0.1
	Trichocline spathulata	0.1
	Xanthosia atkinsoniana	opp

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q2

Project no.: EP23-044
Date: 26/09/2023 **Status** Permanent
Author: MS, Q2: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451422.6322	NW corner northing:	6367423.323
Altitude (m):	309	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	upper slope
Time since fire:	> 5 yrs	Disturbance:	moderate - fire
Soil type/texture	silt/	Bare ground (%):	10
Rocks (%) and type:	2%, laterite	Soil colour:	brown
Litter:	40% (leaves,logs,branches)	Vegetation condition:	excellent

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q2

Project no.: EP23-044
Date: 26/09/2023 **Status** Permanent
Author: MS, Q2: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Agrostocrinum hirsutum	0.1
*	*Aira cupaniana*	0.1
	Allocasuarina humilis	2
	Austrostipa elegantissima	0.1
	Billardiera fusiformis	1
	Bossiaea ornata	1
	Caesia micrantha	0.1
	Craspedia variabilis	0.1
	Dampiera alata	0.1
	Dampiera linearis	0.1
	Daviesia incrassata subsp. *incrassata*	1
	Dianella revoluta	0.1
	Dillwynia laxiflora	0.1
	Drosera sp.	opp
	Eucalyptus wandoo	15
	Gompholobium marginatum	0.1
P3	*Goodenia katabudjar*	0.1
	Haemodorum laxum	0.1
	Hakea lissocarpha	1
	Hemiandra pungens	0.1
	Hibbertia amplexicaulis	1
	Hibbertia commutata	5
	Hovea chorizemifolia	0.1
	Hydrocotyle intertexta	0.1
	Labichea punctata	0.1
	Lagenophora huegelii	0.1
	Lechenaultia biloba	0.1
	Lepidosperma ?apricola	1
	Leptomeria cunninghamii	0.1
	Leucopogon capitellatus	0.1
	Lomandra ?caespitosa	0.1
	Lomandra hermaphrodita	0.1
	Lomandra spartea	0.1
	Lysiandra calycina	1
	Macrozamia riedlei	5
	Millotia tenuiflora	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q2

Project no.: EP23-044

Date: 26/09/2023 **Status** Permanent

Author: MS, Q2: Page 2 of 3

Status	Confirmed name	Cover (%)
	Morelotia octandra	0.1
	Netrostylis sp.	1
	Neurachne alopecuroidea	0.1
	Opercularia vaginata	0.1
	Patersonia rudis	1
	Pimelea ?preissii	0.1
	Rytidosperma setaceum	0.1
	Scaevola calliptera	0.1
	Sphaerolobium medium	0.1
	Stackhousia monogyna	0.1
	Stylidium androsaceum	0.1
	Stylidium caricifolium	0.1
	Stylidium ciliatum	0.1
	Styphelia discolor	0.1
	Styphelia pallida	0.1
	Styphelia sp.	1
	Tetratheca virgata	1
	Thysanotus sp.	0.1
	Trichocline spathulata	0.1
	Tricoryne humilis	0.1
	Trymalium angustifolium	20
*	*Ursinia anthemoides*	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q3

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q3: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	452653.0065	NW corner northing:	6368063.083
Altitude (m):	316	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	upper slope
Time since fire:	> 5 yrs	Disturbance:	no evidence -
Soil type/texture	loam/	Bare ground (%):	1
Rocks (%) and type:	2%, laterite	Soil colour:	brown/orange
Litter:	80% (leaves,branches,twigs)	Vegetation condition:	excellent

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q3

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q3: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Acacia pulchella	1
	Allocasuarina fraseriana	35
	Austrostipa elegantissima	0.1
	Banksia nivea	0.1
	Banksia sessilis	opp
	Bossiaea ornata	0.1
	Caesia micrantha	0.1
	Caladenia ?longicauda	opp
	Caladenia flava	0.1
	Chamaescilla corymbosa	0.1
	Conostylis setigera	0.1
	Corymbia calophylla	opp
	Diuris sp.	0.1
	Drosera stolonifera	0.1
	Eucalyptus marginata	30
	Glischrocaryon angustifolium	opp
	Gompholobium marginatum	0.1
	Gompholobium preissii	0.1
	Gyrostemon subnudus	1
	Hibbertia commutata	0.1
*	*Hypochaeris radicata*	0.1
	Kennedia prostrata	0.1
	Lagenophora huegelii	0.1
	Lechenaultia biloba	0.1
	Lepidosperma ?apricola	0.1
	Levenhookia pusilla	0.1
	Lomandra ?micrantha	0.1
	Lomandra ?caespitosa	0.1
	Lysiandra calycina	1
	Millotia tenuiflora	0.1
	Morelotia octandra	0.1
	Netrostylis sp.	15
	Neurachne alopecuroidea	0.1
	Opercularia echinocephala	1
*	*Oxalis corniculata*	0.1
	Patersonia rudis	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q3

Project no.: EP23-044

Date: 27/09/2023 **Status** Permanent

Author: MS, Q3: Page 2 of 3

Status	Confirmed name	Cover (%)
	Phyllangium paradoxum	0.1
	Podotheca angustifolia	0.1
	Poranthera microphylla	0.1
	Pterostylis ?vittata	opp
	Rytidosperma setaceum	0.1
	Scaevola calliptera	0.1
	Stackhousia monogyna	0.1
	Stylidium ciliatum	0.1
	Styphelia sp.	1
	Tetratheca hirsuta	opp
	Thelymitra crinita	opp
	Thysanotus thyrsoideus	0.1
	Trachymene pilosa	0.1
	Trymalium ledifolium	5
	Trymalium odoratum	20

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q4

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q4: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	452556.7285	NW corner northing:	6367742.343
Altitude (m):	300	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	mid-slope
Time since fire:	> 5 yrs	Disturbance:	moderate - tracks, ?clearing of trees
Soil type/texture	clay/loam	Bare ground (%):	5
Rocks (%) and type:	No rocks	Soil colour:	orange/brown
Litter:	10% (logs,leaves,twigs)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q4

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q4: Page 2 of 3

Species Data

* denotes non-native species

Status		Confirmed name	Cover (%)
	*	*Aira cupaniana*	0.1
		Banksia nivea	2
		Borya sphaerocephala	2
		Bossiaea eriocarpa	1
	*	*Briza maxima*	0.1
		Chorizema dicksonii	opp
		Conostylis setigera	0.1
		Corymbia calophylla	opp
		Daviesia decurrens	5
		Daviesia incrassata subsp. *incrassata*	5
		Desmocladus asper	10
		Drosera sp.	0.1
		Eucalyptus marginata	opp
		Eucalyptus wandoo	30
		Glischrocaryon angustifolium	0.1
		Gompholobium marginatum	0.1
		Haemodorum laxum	0.1
		Hakea lissocarpha	1
		Hibbertia commutata	opp
		Hyalosperma cotula	0.1
		Hypocalymma angustifolia	0.1
		Lagenophora huegelii	0.1
		Lechenaultia biloba	0.1
		Lepidosperma ?apricola	0.1
		Lomandra ?caespitosa	0.1
		Lysiandra calycina	1
		Lysiandra calycina	1
	*	*Lysimachia arvensis*	opp
		Neurachne alopecuroidea	0.1
		Opercularia vaginata	0.1
		Panaetia lessonii	0.1
	*	*Parentucellia latifolia*	0.1
		Rytidosperma setaceum	0.1
		Stylidium androsaceum	0.1
		Stylidium ciliatum	0.1
		Stylidium uniflorum	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q4

Project no.: EP23-044

Date: 27/09/2023 **Status** Permanent

Author: MS, Q4: Page 2 of 3

Status	Confirmed name	Cover (%)
	Stypandra glauca	5
	Styphelia pallida	0.1
	Styphelia sp.	1
	Synaphea gracillima	1
	Tetratheca virgata	0.1
	Thysanotus manglesianus	0.1
*	*Ursinia anthemoides*	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q5

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q5: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451843.1696	NW corner northing:	6368115.381
Altitude (m):	289	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	mid-slope
Time since fire:	> 5 yrs	Disturbance:	low - tracks
Soil type/texture	loam/	Bare ground (%):	0
Rocks (%) and type:	1%, laterite	Soil colour:	brown/
Litter:	95% (leaves,twigs,branches)	Vegetation condition:	excellent

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q5

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q5: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Allocasuarina fraseriana	15
	Banksia nivea	0.1
	Banksia sessilis	5
	Borya sphaerocephala	opp
	Bossiaea ornata	1
	Caesia micrantha	0.1
	Caladenia flava	0.1
	Chamaescilla corymbosa	0.1
	Conostylis setigera	0.1
	Dampiera linearis	0.1
	Daviesia decurrens	0.1
	Desmocladus fasciculatus	0.1
	Drosera sp.	0.1
	Eucalyptus marginata	40
	Gompholobium marginatum	0.1
	Gompholobium preissii	opp
	Isotropis cuneifolia subsp. *cuneifolia*	0.1
	Hemiandra pungens	0.1
	Hibbertia commutata	0.1
	Hibbertia hypericoides	0.1
	Labichea punctata	opp
	Lagenophora huegelii	0.1
	Lechenaultia biloba	0.1
	Lepidobolus preissianus subsp. *preissianus*	0.1
	Lepidosperma ?apricola	0.1
	Lepidosperma ?squamatum	1
	Leptospermopsis erubescens	2
	Leucopogon capitellatus	0.1
	Lomandra ?caespitosa	0.1
	Morelotia octandra	opp
	Netrostylis sp.	15
	Neurachne alopecuroidea	0.1
	Opercularia vaginata	0.1
*	*Oxalis corniculata*	0.1
	Patersonia rudis	1
	Pterostylis recurva	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q5

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q5: Page 2 of 3

Status	Confirmed name	Cover (%)
	Rytidosperma setaceum	0.1
	Scaevola calliptera	0.1
	Stylidium ciliatum	0.1
	Styphelia pallida	opp
	Tetratheca hirsuta	opp
	Thelymitra crinita	opp
	Thysanotus sp.	0.1
	Thysanotus thyrsoideus	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R6

Project no.: EP23-044
Date: 27/09/2023 **Status** Non-permanent
Author: MS, R6: Page 1 of 2

Quadrat and landform details

Sample type:	releve	Size:	10 m x 10 m
NW corner easting:	451616.7286	NW corner northing:	6368041.108
Altitude (m):	286	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	lower slope
Time since fire:	> 5 yrs	Disturbance:	moderate - clearing, travks
Soil type/texture	loam/	Bare ground (%):	0
Rocks (%) and type:	1%, laterite	Soil colour:	brown/
Litter:	90% (leaves,leaves,logs)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R6

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS,

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Banksia nivea	
	Banksia sessilis	
	Bossiaea ornata	
	Caladenia flava	
	Chamaescilla corymbosa	
	Conostylis setigera	
	Corymbia calophylla	
	Dampiera alata	
	Daviesia decurrens	
	Desmocladus fasciculatus	
	Drosera sp.	
	Eucalyptus marginata	
	Gyrostemon subnudus	
	Hakea lissocarpha	
	Hibbertia commutata	
	Labichea punctata	
	Lechenaultia biloba	
	Lepidosperma ?apricola	
	Lepidosperma ?squamatum	
	Netrostylis sp.	
	Neurachne alopecuroidea	
	Patersonia rudis	
	Poranthera microphylla	
	Sphaerolobium medium	
	Stylidium ciliatum	
	Styphelia pallida	
	Styphelia sp.	
	Tetratheca hirsuta	

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R7

Project no.: EP23-044
Date: 27/09/2023 **Status** Non-permanent
Author: MS, R7: Page 1 of 2

Quadrat and landform details

Sample type:	releve	Size:	other
NW corner easting:	451594.3538	NW corner northing:	6368367.042
Altitude (m):	265	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	waterway
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:	brown/
Litter:	99% (leaves,twigs,)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R7

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS,

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Allocasuarina huegeliana	
	Bossiaea eriocarpa	
*	*Briza maxima*	
	Caesia micrantha	
	Corymbia calophylla	
*	*Cynodon dactylon*	
	Dampiera alata	
	Desmocladus asper	
	Eucalyptus wandoo	
	Hibbertia commutata	
	Hypocalymma angustifolia	
	Kennedia prostrata	
	Lagenophora huegelii	
	Lepidobolus preissianus subsp. *preissianus*	
	Lepidosperma ?apricola	
	Leucopogon capitellatus	
	Melaleuca incana	
	Netrostylis sp.	
	Neurachne alopecuroidea	
	Patersonia rudis	
	Pimelea ?preissii	
	Rytidosperma ?flavescens	
	Stackhousia monogyna	
	Stypandra glauca	
	Styphelia sp.	
	Tetratheca virgata	

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R8

Project no.: EP23-044
Date: 27/09/2023 **Status** Non-permanent
Author: MS, R8: Page 1 of 3

Quadrat and landform details

Sample type:	releve	Size:	10 m x 10 m
NW corner easting:	451653.0046	NW corner northing:	6368471.206
Altitude (m):	285	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	upper slope
Time since fire:	> 5 yrs	Disturbance:	moderate - tracks, weeds
Soil type/texture	silt/	Bare ground (%):	10
Rocks (%) and type:	1%, laterite	Soil colour:	brown/orange
Litter:	20% (leaves,branches,twigs)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R8

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, R8: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Banksia sessilis	
	Bossiaea eriocarpa	
	Bossiaea ornata	
*	*Briza maxima*	
	Caesia micrantha	
	Caladenia macrostylis	
	Chamaescilla corymbosa	
	Corymbia calophylla	
	Dampiera alata	
	Eucalyptus marginata	
	Eucalyptus wandoo	
	Hakea lissocarpha	
	Hibbertia commutata	
	Labichea punctata	
	Lagenophora huegelii	
	Lechenaultia biloba	
	Lepidosperma ?apricola	
	Leucopogon capitellatus	
	Linum marginale	
	Lomandra ?caespitosa	
	Macrozamia riedlei	
	Netrostylis sp.	
	Neurachne alopecuroidea	
*	*Oxalis corniculata*	
	Panaetia lessonii	
	Poa drummondiana	
	Rytidosperma setaceum	
	Stylidium amoenum	
	Stylidium androsaceum	
	Stylidium ciliatum	
	Stylidium ?lateriticola	
	Styphelia sp.	
	Tetratheca hirsuta	
	Trichocline spathulata	
*	*Ursinia anthemoides*	

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q9

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q9: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451698.103	NW corner northing:	6367459.371
Altitude (m):	322	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	hilltop
Time since fire:	3-5 yrs	Disturbance:	high - tracks, fire
Soil type/texture	silt/	Bare ground (%):	5
Rocks (%) and type:	1%, laterite	Soil colour:	brown/
Litter:	25% (leaves,twigs,)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q9

Project no.: EP23-044
Date: 27/09/2023 **Status** Permanent
Author: MS, Q9: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Acacia applanata	0.1
	Acacia drummondii	0.1
	Acacia nervosa	0.1
	Allocasuarina fraseriana	opp
	Boronia ?crenulata	opp
	Bossiaea ornata	1
	Caesia micrantha	0.1
	Conostylis setigera	0.1
	Corymbia calophylla	10
	Dampiera alata	0.1
	Dampiera linearis	0.1
	Daviesia ?preissii	1
	Daviesia decurrens	2
	Dillwynia laxiflora	0.1
	Ericaceae sp.	0.1
	Eucalyptus marginata	25
	Exocarpos sparteus	0.1
	Gompholobium preissii	0.1
	Hakea lissocarpha	0.1
	Hibbertia commutata	1
	Hyalosperma cotula	0.1
	Lechenaultia biloba	0.1
	Lepidosperma ?apricola	opp
	Leptomeria cunninghamii	1
	Lomandra hermaphrodita	opp
	Lomandra ?micrantha	0.1
	Lysiandra calycina	0.1
	Macrozamia riedlei	0.1
	Morelotia octandra	0.1
	Neurachne alopecuroidea	opp
	Opercularia vaginata	0.1
	Patersonia rudis	0.1
	Pimelea ?preissii	opp
	Rytidosperma setaceum	0.1
	Scaevola calliptera	0.1
	Sphaerolobium medium	opp

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q9

Project no.: EP23-044

Date: 27/09/2023 **Status** Permanent

Author: MS, Q9: Page 2 of 3

Status	Confirmed name	Cover (%)
	Stackhousia monogyna	0.1
	Stylidium amoenum	0.1
	Stylidium caricifolium	0.1
	Stylidium ciliatum	0.1
	Styphelia pallida	0.1
	Styphelia sp.	1
	Tetratheca hirsuta	0.1
	Trymalium ledifolium	30

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q10

Project no.: EP23-044
Date: 28/09/2023 **Status** Permanent
Author: MS, Q10: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451753.6492	NW corner northing:	6367911.292
Altitude (m):	297	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	upper slope
Time since fire:	3-5 yrs	Disturbance:	moderate - fire
Soil type/texture	silt/	Bare ground (%):	2
Rocks (%) and type:	2%, laterite	Soil colour:	brown/
Litter:	40% (leaves,bark,twigs)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q10

Project no.: EP23-044
Date: 28/09/2023 **Status** Permanent
Author: MS, Q10: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Acacia ?lateriticola	0.1
*	*Aira cupaniana*	0.1
	Allocasuarina humilis	30
	Anigozanthos bicolor	opp
	Banksia nivea	1
	Billardiera ?laxiflora	1
	Boronia ?crenulata	0.1
	Bossiaea ornata	0.1
	Caladenia sp.	0.1
	Chamaescilla corymbosa	0.1
	Conostylis setigera	0.1
	Corymbia calophylla	20
	Dampiera alata	0.1
	Dampiera linearis	0.1
	Daviesia decurrens	0.1
	Desmocladus fasciculatus	0.1
	Eucalyptus marginata	opp
	Eucalyptus wandoo	25
	Gompholobium marginatum	0.1
	Gonocarpus cordiger	1
	Grevillea ?tenuiflora	1
	Haemodorum laxum	0.1
	Hakea lissocarpha	0.1
	Hemiandra pungens	opp
	Hibbertia commutata	0.1
	Hibbertia hypericoides	0.1
	Hyalosperma cotula	0.1
	Hypocalymma angustifolia	0.1
*	*Hypochaeris radicata*	0.1
	Lagenophora huegelii	0.1
	Lechenaultia biloba	0.1
	Lepidosperma ?apricola	0.1
	Lepidosperma ?squamatum	1
	Levenhookia pusilla	0.1
	Lomandra ?caespitosa	0.1
	Lomandra ?micrantha	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q10

Project no.: EP23-044

Date: 28/09/2023 **Status** Permanent

Author: MS, Q10: Page 2 of 3

Status	Confirmed name	Cover (%)
	Lomandra spartea	0.1
	Lomandra hermaphrodita	0.1
	Morelotia octandra	0.1
	Netrostylis sp.	2
	Neurachne alopecuroidea	1
	Opercularia vaginata	0.1
*	*Oxalis corniculata*	0.1
	Patersonia rudis	1
	Poranthera microphylla	0.1
	Pterochaeta paniculata	0.1
	Rytidosperma setaceum	opp
	Scaevola calliptera	0.1
	Schoenus sp.	0.1
	Sphaerolobium medium	1
	Stackhousia monogyna	opp
	Stylidium androsaceum	0.1
	Stylidium ciliatum	0.1
	Styphelia pallida	0.1
	Styphelia pallida	0.1
	Styphelia sp.	0.1
	Tetratheca virgata	0.1
	Thelymitra sp.	0.1
	Trachymene pilosa	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q11

Project no.: EP23-044
Date: 28/09/2023 **Status** Permanent
Author: MS, Q11: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451523.2633	NW corner northing:	6368280.222
Altitude (m):	272	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	lower slope
Time since fire:	3-5 yrs	Disturbance:	moderate - tracks
Soil type/texture	loam/brown	Bare ground (%):	2
Rocks (%) and type:	80%, leaves	Soil colour:	no/1
Litter:	#REF!	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q11

Project no.: EP23-044
Date: 28/09/2023 **Status** Permanent
Author: MS, Q11: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Acacia ?lateriticola	0.1
	Acacia drummondii	0.1
	Allocasuarina humilis	0.1
	Austrostipa elegantissima	opp
	Banksia nivea	0.1
	Banksia sessilis	opp
	Billardiera ?laxiflora	1
	Bossiaea eriocarpa	1
	Bossiaea ornata	0.1
	Caesia micrantha	0.1
	Cassytha sp.	0.1
	Chamaescilla corymbosa	0.1
	Conostylis setigera	0.1
	Dampiera alata	0.1
	Dampiera linearis	0.1
	Desmocladus fasciculatus	0.1
	Dianella revoluta	0.1
	Dillwynia laxiflora	opp
	Drosera sp.	0.1
	Eucalyptus wandoo	80
	Gompholobium marginatum	0.1
	Gompholobium preissii	0.1
	Gonocarpus cordiger	0.1
	Goodenia trinervis	0.1
	Haemodorum laxum	0.1
	Hakea lissocarpha	0.1
	Hakea prostrata	0.1
	Hibbertia commutata	1
	Kennedia prostrata	0.1
	Labichea punctata	0.1
	Lagenophora huegelii	0.1
	Lechenaultia biloba	0.1
	Lepidosperma ?apricola	1
	Morelotia octandra	0.1
	Netrostylis sp.	1
	Neurachne alopecuroidea	0.1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: Q11

Project no.: EP23-044

Date: 28/09/2023 **Status** Permanent

Author: MS, Q11: Page 2 of 3

Status	Confirmed name	Cover (%)
	Opercularia vaginata	opp
	Patersonia rudis	1
	Pterostylis recurva	0.1
	Rytidosperma setaceum	0.1
	Scaevola calliptera	1
	Stackhousia monogyna	0.1
	Stylidium amoenum	0.1
	Stylidium caricifolium	0.1
	Stylidium sp.	1
	Stypandra glauca	0.1
	Styphelia discolor	opp
	Styphelia pallida	0.1
	Styphelia sp.	0.1
	Tetratheca virgata	1

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R12

Project no.: EP23-044
Date: 29/09/2023 **Status** Non-permanent
Author: MS, R12: Page 1 of 2

Quadrat and landform details

Sample type:	releve	Size:	other
NW corner easting:	451441.7564	NW corner northing:	6368599.547
Altitude (m):	266	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	slightly damp	Landform:	lower slope
Time since fire:	no evidence	Disturbance:	high - weeds, clearing
Soil type/texture	clay/silt	Bare ground (%):	2
Rocks (%) and type:	10%, granite	Soil colour:	brown/orange
Litter:	2% (leaves,,)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R12

Project no.: EP23-044
Date: 29/09/2023 **Status** Permanent
Author: MS, R12: Page 2 of 2

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
*	*Aira cupaniana*	
	Allocasuarina huegeliana	
	Banksia fraseri var. fraseri	
	Caladenia flava	
	Corymbia calophylla	
	Drosera spilos	
	Eucalyptus wandoo	
	Haemodorum laxum	
	Hypocalymma angustifolia	
	Neurachne alopecuroidea	
	Pimelea ?preissii	
	Sowerbaea laxiflora	
	Stylidium androsaceum	
	Thelymitra sp.	
*	*Vulpia myuros*	

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R13

Project no.: EP23-044
Date: 29/09/2023 **Status** Non-permanent
Author: MS, R13: Page 1 of 3

Quadrat and landform details

Sample type:	releve	Size:	other
NW corner easting:	0	NW corner northing:	0
Altitude (m):	0	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	0	Landform:	0
Time since fire:	0	Disturbance:	-
Soil type/texture	/	Bare ground (%):	0
Rocks (%) and type:	No rocks	Soil colour:	/
Litter:	% (,,)	Vegetation condition:	good

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R13

Project no.: EP23-044
Date: 29/09/2023 **Status** Permanent
Author: MS,

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
*	*Acacia iteaphylla*	
*	*Aira cupaniana*	
	Allocasuarina huegeliana	
	Arctotheca calendula	
	Banksia nivea	
	Banksia sessilis	
	Bossiaea eriocarpa	
*	*Briza maxima*	
*	*Briza minor*	
	Corymbia calophylla	
	Dampiera alata	
	Daviesia ?preissii	
	Daviesia decurrens	
	Desmocladus asper	
	Dillwynia laxiflora	
	Disa bracteata	
	Diuris sp.	
	Eucalyptus marginata	
	Eucalyptus wandoo	
	Gastrolobium calycinum	
	Glischrocaryon angustifolium	
	Haemodorum laxum	
	Hakea lissocarpha	
	Hakea prostrata	
	Hibbertia commutata	
	Hypocalymma angustifolia	
*	*Hypochaeris radicata*	
	Labichea punctata	
	Lechenaultia biloba	
	Lepidosperma ?apricola	
	Leptospermopsis erubescens	
*	*Lysimachia arvensis*	
	Neurachne alopecuroidea	
	Opercularia vaginata	
	Patersonia rudis	
	Pimelea ?preissii	

Vegetation Sample Data

Part Lot 500 on DP421144 Boddington

Sample Name: R13

Project no.: EP23-044

Date: 29/09/2023 **Status** Permanent

Author: MS,

Status	Confirmed name	Cover (%)
	Sphaerolobium medium	
	Stackhousia monogyna	
	Synaphea gracillima	
	Tetratheca virgata	
	Thelymitra sp.	
*	*Ursinia anthemoides*	

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name: R14

Project no.: EP23-044
Date: 29/10/2024 **Status** Non-permanent
Author: RAW, R14: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	450991.2312	NW corner northing:	6367845.431
Altitude (m):	257	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	lower slope
Time since fire:	> 5 yrs	Disturbance:	moderate - previous clearing
Soil type/texture	sand/clay	Bare ground (%):	10
Rocks (%) and type:	5%, ironstone	Soil colour:	brown/white
Litter:	15% (leaves,twigs,branches)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name: R14

Project no.: EP23-044
Date: 29/10/2024 **Status** Non-permanent
Author: RAW, R14: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
	Acacia stenoptera	
*	*Aira cupaniana*	
	Allocasuarina huegeliana	
	Austrostipa campylachne	
	Austrostipa elegantissima	
	Banksia bipinnatifida	
	Banksia nivea	
	Banksia sessilis	
*	*Bartsia trixago*	
*	*Briza maxima*	
	Corymbia calophylla	
	Dampiera alata	
	Dampiera linearis	
	Daviesia ?incrassata subsp. incrassata	
	Desmocladus fasciculatus	
	Gompholobium marginatum	
	Gompholobium polymorphum	
	Haemadorum sp.	
	Hakea lissocarpha	
	Hakea prostrata	
	Hibbertia asterella	
	Hibbertia pilosa	
	Hypocalymma angustifolium	
	Lechenaultia biloba	
	Lepidosperma leptostachyum	
	Leucopogon capitellatus	
	Levenhookia pusilla	
	Morelotia octandra	
	Neurachne alopecuroidea	
	Opercularia vaginata	
	Pimelea ciliata	
*	*Romulea rosea*	
	Rytidosperma setaceum	
	Stackhousia monogyna	
	Stylidium uniflorum	
	Styphelia discolor	

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name:	**R14**
Project no.:	EP23-044
Date:	0/01/1900
Status	Non-permanent
Author:	RAW,
	R14: Page 3 of 3

Status	Confirmed name	Cover (%)
	Thelymitra crinita	
	Tricoryne humilis	
	Tripterococcus brunonis	
	Xanthosia candida	

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name: R15

Project no.: EP23-044
Date: 29/10/2024 **Status** Non-permanent
Author: RAW, R15: Page 1 of 3

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	450958.2496	NW corner northing:	6368168.017
Altitude (m):	242	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	waterway
Time since fire:	no evidence	Disturbance:	moderate -
Soil type/texture	/ with organic layer	Bare ground (%):	2
Rocks (%) and type:	No rocks	Soil colour:	brown/
Litter:	30% (leaves,branches,twigs)	Vegetation condition:	very good

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name: R15

Project no.: EP23-044
Date: 29/10/2024 **Status** Non-permanent
Author: RAW, R15: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover (%)
*	*Aira cupaniana*	
	Allocasuarina huegeliana	
	Banksia nivea	
*	*Briza maxima*	
	Caesia micrantha	
	Dampiera alata	
	Dichopogon capillipes	
	Haemodorum ?simplex	
	Hakea lissocarpha	
	Hakea prostrata	
	Hibbertia commutata	
	Hypocalymma angustifolium	
	Lepidosperma leptostachyum	
	Leucopogon capitellatus	
	Neurachne alopecuroidea	
*	*Romulea rosea*	
	Rytidosperma setaceum	
	Stylidium uniflorum	
	Stylidium crassifolium	
	Styphelia discolor	
	Thysanotus thyrsoideus	

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name: Q16

Project no.: EP23-044
Date: 20/11/2024 **Status** Permanent
Author: MS,

Quadrat and landform details

Sample type:	quadrat	Size:	10 m x 10 m
NW corner easting:	451080.6485	NW corner northing:	6368384.721
Altitude (m):	248	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	damp	Landform:	lower slope
Time since fire:	no evidence	Disturbance:	high - weeds, clearing
Soil type/texture	clay/silt	Bare ground (%):	5
Rocks (%) and type:	No rocks	Soil colour:	brown/orange
Litter:	50% (leaves,branches,bark)	Vegetation condition:	good

Vegetation Sample Data

Part Lot 500 on DP421144, Boddington

Sample Name: Q16

Project no.: EP23-044
Date: 20/11/2024 **Status** Non-permanent
Author: MS, Q16: Page 2 of 3

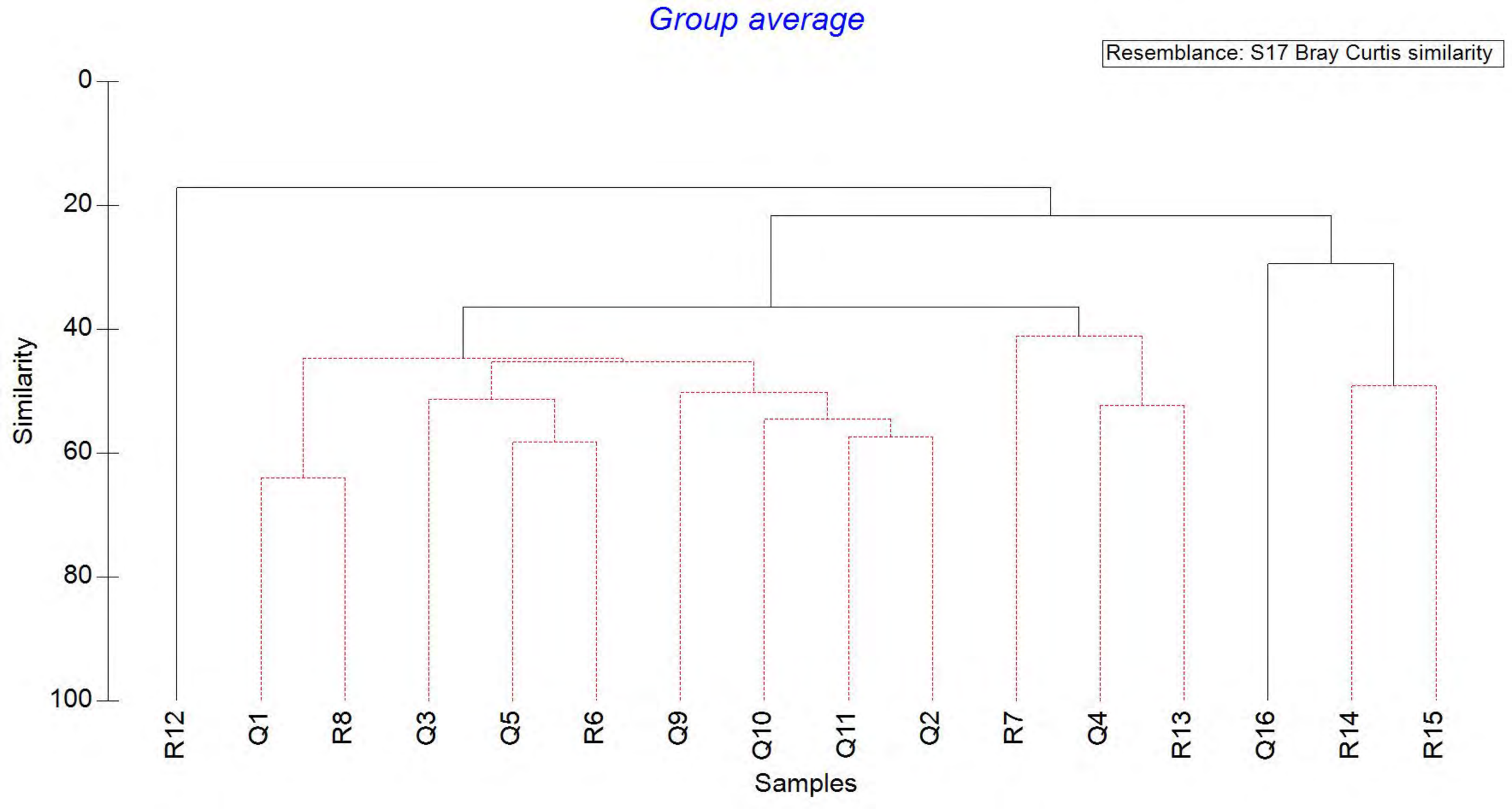
Species Data

* denotes non-native species

Status		Confirmed name	Cover (%)
	*	*Acacia baileyana*	0.1
		Acacia saligna	5
	*	*Aira cupaniana*	10
		Allocasuarina huegeliana	0.5
		Austrostipa elegantissima	0.1
	*	*Bartsia trixago*	0.1
		Bossiaea eriocarpa	0.1
	*	*Brachypodium distachyon*	0.5
	*	*Briza maxima*	0.1
	*	*Briza minor*	1
		Chorizandra enodis	0.2
	*	*Disa bracteata*	35
	*	*Ehrharta longiflora*	0.1
		Eucalyptus rudis	1
		Gompholobium marginatum	20
		Hakea prostrata	0.1
		Hakea varia	0.1
	*	*Hypochaeris radicata*	1
		Kennedia prostrata	0.1
	*	*Lotus angustissimus*	opp
	*	*Lysimachia arvensis*	0.1
		Melaleuca rhaphiophylla	0.1
	*	*Moraea flaccida*	20
		Neurachne alopecuroidea	5
	*	*Romulea rosea*	0.1
		Rytidosperma setaceum	0.5
		?*Thelymitra* sp.	0.1

Appendix F

Cluster Dendrogram


Group average
Resemblance: S17 Bray Curtis similarity
Similarity
0
20
40
60
80
100
R12
Q1
R8
Q3
Q5
R6
Q9
Q10
Q11
Q2
R7
Q4
R13
Q16
R14
R15
Samples