

GLEN IRIS ESTATE



APPENDIX 8 PRINSEP PARK FLORA AND VEGETATION ASSESSMENT



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Dear Jarrod,

DETAILED FLORA AND VEGETATION ASSESSMENT – PRINSEP PARK JANDAKOT

INTRODUCTION

1.1 Project background

Emerge Associates (Emerge) were engaged by ECP Acquisitions 6 Pty Ltd to characterise the flora and vegetation values within Prinsep Park (R 4676) in Jandakot. This reserve (referred to herein as the ‘site’) is located approximately 16 kilometres (km) south of the Perth Central Business District within the City of Cockburn.

The site is approximately 2.2 hectares (ha) in size and is bounded by Prinsep Road to the east, Berrigan Drive to the north, the former Glen Iris Golf Course to the west and residential lots to the south. The location and extent of the site is shown in **Figure 1**.

1.2 Purpose and scope of work

The scope of work was specifically to undertake a flora and vegetation assessment within the site to the standard required of a detailed survey with reference to the Environmental Protection Authority’s (EPA’s) technical guidance (EPA 2016).

As part of this scope of work, the following tasks were undertaken:

- A desktop assessment of threatened and priority flora species and ecological communities that may be present within the site.
- A field survey to record a comprehensive list of flora species and assess vegetation type and condition.
- Mapping of plant communities, vegetation condition and conservation significant flora and vegetation.
- Identification of potential habitat for conservation significant flora and vegetation and an assessment of likelihood of occurrence.
- Targeted searches for conservation significant flora within areas of suitable habitat.
- Documentation of the methodology, field survey and results into a letter report.

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METHODS

2.1 Desktop assessment

A search was conducted for threatened and priority flora that may occur or have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DAWE 2020a) and *NatureMap* (DBCA 2020).

A search was also conducted for TECs and PECs that may occur or have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DAWE 2020a) and the *Weed and Native Flora Dataset* (Keighery *et al.* 2012).

Prior to undertaking the field survey, information on the habitat preferences of threatened and priority flora species and communities identified from database searches was reviewed. This was compared to existing environmental information available for the site, such as geomorphology, soils, regional vegetation and historic land use, to identify species and communities for which habitat may occur in the site.

2.2 Field survey

Two botanists from Emerge visited the site on 19 August, 9 September, 7 and 28 October 2021 to conduct the flora and vegetation field surveys.

2.2.1 Flora and vegetation

The site was traversed on foot and the composition and condition of vegetation was recorded.

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 bound 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 of each sample was recorded with a hand-held GPS unit.

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 class, litter layer, topographical position, time since last fire event)
- biological information (vegetation structure and condition, ‘foliage projective cover’ (FPC), degree of disturbance and species present).

Additional plant taxa not observed within samples were recorded opportunistically as the botanist traversed the site. Photographs were taken throughout the field visit to show particular site conditions.

The suitability of habitat within the site for conservation significant species identified in the desktop assessment was assessed (refer **Section 2.3.1**). Areas of suitable habitat were searched for conservation significant species as required.

All plant specimens collected during the field survey were dried, pressed and then named in accordance with requirements of the Western Australian Herbarium. Identification of specimens occurred through comparison with named material and through the use of taxonomic keys. Flora species not native to Western Australia are denoted by an asterisk (*) in text and raw data.

Vegetation condition was assigned at each sample and changes in vegetation condition were also noted and mapped across the site. The condition of the vegetation was assessed using the Keighery (1994) scale (**Table 1**). For vegetation in the site containing *Banksia* spp., the condition scale provided in the

conservation advice for the ‘banksia woodlands of the Swan Coastal Plain TEC’ (DoEE 2016a) was applied in addition to the Keighery scale, as shown in **Table 1**.

Table 1: Vegetation condition scale applied during the field assessment

Condition category	Definition (Keighery 1994)	Indicator (DoEE 2016a)	
		Typical native vegetation composition	Typical weed cover
Pristine	Pristine or nearly so, no obvious signs of disturbance.	Native plant species diversity fully retained or almost so	Zero or close to
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.	High native plant species diversity	Less than 10%
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.	Moderate native plant species diversity	5-20%
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.	Low native plant species diversity	5-50%
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.	Very low native plant species diversity	20-70%
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.	Very low to no native species diversity	Greater than 70%

2.3 Mapping and analysis

2.3.1 Likelihood of occurrence of conservation significant flora and vegetation

Information on the habitat preferences of threatened and priority flora species and communities identified from database searches was reviewed. Based on existing conditions such as plant community, vegetation condition, land use and disturbance, an assessment of the likelihood of occurrence of threatened and priority flora species and communities within the site was undertaken using the categories outlined in **Table 2**.

Table 2: Likelihood of occurrence assessment categories and definitions

Likelihood	Definition
Recorded	The species was recorded during the current field survey.
Likely	The site contains suitable habitat for the species and it is likely the species may occur based on presence of a recent historical record within or close to the site.
Possible	The site contains suitable habitat for the species but there is no other information to suggest that the species may occur within or close to the site.
Unlikely	The site does not contain suitable habitat for the species or the site contains suitable habitat for the species within which thorough targeted searches were completed and conclusion has been made that the species is unlikely to be present.

2.3.2 Plant community identification and description

The plant communities within the site were identified from the sample data collected during the field survey. 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). The identified plant communities were mapped on aerial photography from the sample locations and boundaries were interpreted from aerial photography and notes taken in the field. Vegetation condition was mapped on aerial photography based on the samples and notes recorded during the field survey to define areas with differing condition.

2.3.3 Floristic community type assignment

The identified plant communities were then compared to the regional ‘floristic community type’ (FCT) dataset *A floristic survey of the southern Swan Coastal Plain* by Gibson *et al.* (1994). The sample data (presence/absence) was reconciled with Gibson *et al.* (1994) by standardising the names of taxa with those used in the earlier study. This was necessary due to changes in nomenclature in the intervening period. Taxa that were only identified to genus level were excluded, while some infra-species that have been identified since 1994 were reduced to species level. The combined dataset was then imported into the statistical analysis package PRIMER v6 (Clarke and Gorley 2006).

As data from a localised survey is often spatially correlated, data for each sample was compared to Gibson *et al.* (1994) separately. This removed the influence of spatial correlation when assigning an FCT. The analysis included the compilation of a resemblance matrix using the Bray-Curtis distance measure which provided the percentage similarity between all pairs of samples. Subsequently, a cluster analysis was undertaken using the resemblance matrix and hierarchical agglomerative clustering, to produce a dendrogram.

Where the sample tended to cluster with a grouping of different FCTs, samples were assessed separately to differentiate between FCTs. Ultimately the cluster analysis, as well as contextual information relating to the soils, landforms and known locations of FCTs within the region, was considered in the final determination of an FCT for vegetation within the site.

FCT analysis was not undertaken for samples located within disturbed vegetation with low native species diversity as the vegetation was considered unlikely to currently represent an FCT.

2.3.4 Threatened and ecological communities

Areas of native vegetation potentially representing a TEC were assessed against key diagnostic characteristics and, if available, size and/or vegetation condition thresholds.

2.3.5 Species accumulation curve

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. PRIMER v6 also offers a range of estimators to predict minimum species richness (Clarke and Gorley 2006). Both the Jackknife1 and Chao2 non-parametric estimators are reported, as these are known to perform well in comparison to simulated and real data sets and are also recommended for small sample sizes (Gotelli and Colwell 2011). Comparison between actual and estimated species accumulation assists in evaluating the adequacy of sampling effort.

2.4 Survey limitations

It is important to note the specific constraints imposed on surveys and the degree to which these may have limited survey outcomes. An evaluation of the survey methodology against standard constraints

outlined in the EPA document *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) is provided in **Table 3**.

Table 3: Evaluation of survey methodology against standard constraints outlined in EPA (2016)

Constraint	Degree of limitation	Details
Availability of contextual information	No Limitation	A full review of background information has not been undertaken as part of this assessment.
Experience level of personnel	No limitation	This flora and vegetation assessment was undertaken by qualified botanists with ten years of botanical experience in Western Australia. Technical review was undertaken by a senior environmental consultant and botanist with over 18 years' experience in environmental science in Western Australia.
Suitability of timing	No limitation	The survey was conducted between August and October and thus within the main flowering season. High rainfall was recorded from May to August 2021 in the months preceding the site visits. 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 all 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 in August, September and October 2021. The August site visits provided an insight into the vegetation condition and composition out of the main flowering period. 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 125 species were recorded, comprising 82 native and 43 non-native species. These species were recorded from three sample locations and opportunistic observations across the site. Considering the high level of disturbance within the majority of the site and the small size of the areas of remnant native vegetation, the number of native species recorded was considered sufficient to classify the vegetation for the purposes of this assessment.
Influence of disturbance	Minor limitation	Time since fire is greater than 60 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 comprises a mixture of native regrowth and planted native and non-native species. 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.

RESULTS

3.1 General site conditions

The site comprises vegetation on white-grey sands around the periphery, sloping down to a turfed oval in the central portion of the site.

3.2 Flora

3.2.1 Desktop assessment

The database search results identified a total of 16 threatened and 34 priority flora species occurring or potentially occurring within a 10 km radius of the site. Information on these species including their habitat preferences is provided in **Attachment 1**.

Based on background information available for the site, two threatened flora species and five priority flora species were identified as having potential to occur within the site as shown in **Table 4**.

Table 4: Conservation significant flora species considered to have potential to occur in the site based on known habitat preferences

Species	Level of significance		Life strategy	Habitat	Flowering period
	State	EPBC Act			
<i>Caladenia huegelii</i>	CR	E	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov
<i>Macarthuria keigheryi</i>	E	E	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec, Feb-Mar
<i>Stenanthemum sublineare</i>	P2	-	P	White sand on coastal plains.	Oct-Dec
<i>Thelymitra variegata</i>	P2	-	PG	Sandy clay, sand, laterite.	Jun-Sep
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3	-	P	White or grey sand, lateritic gravel.	Aug-Oct
<i>Styphelia filifolia</i>	P3	-	P	Brown over pale yellow sand.	Feb-Apr
<i>Jacksonia sericea</i>	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb

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

3.2.2 Species inventory

A total of 82 native and 43 non-native (weed) species were recorded within the site during the field survey, representing 41 families and 98 genera. The dominant families containing native taxa were Myrtaceae (12 native taxa, six weed taxa) and Fabaceae (11 native taxa and seven weed taxa). The most common genus was *Acacia* and *Banksia* with five taxa each.

A complete species list is provided in **Attachment 2**.

3.2.3 Threatened and priority flora

No occurrences of threatened or priority flora species were recorded within the site.

The threatened and priority flora species identified in the desktop assessment are not considered to occur in the site due to lack of suitable habitat and/or because they were not recorded during the targeted searches. The likelihood of occurrence assessment is provided in **Attachment 1**.

3.3 Vegetation

3.3.1 Desktop assessment

The database search results identified four TECs and three PECs occurring or potentially occurring within a 10 km radius of the site. Information on these communities is provided in **Attachment 3**.

Based geomorphology, soils and regional vegetation patterns, the following one TEC and three PECs were considered to have potential to occur in the site:

- ‘Banksia woodlands of the Swan Coastal Plain’ TEC which is listed as ‘endangered’ under EPBC Act.
- ‘Banksia dominated woodlands of the Swan Coastal Plain IBRA region’ PEC (P3)
- ‘*Banksia ilicifolia* woodlands, southern Swan Coastal Plain’ PEC (P3)
- ‘Northern Spearwood shrublands and woodlands’ PEC (P3).

3.3.2 Plant communities

A total of three locations were sampled, comprised of one quadrat and two relevés, as shown in **Figure 2**.

Four plant communities were identified within the site. Plant community **EmBaBm** exists across the eastern portion of the site and extends over 0.39 ha. Plant community **ECCq** occurs in the western portion of the site and surrounding the oval. This community extends over 0.94 ha of the site. Plant community **planted trees and shrubs** occur on the western edge of the site bordering the former Glen Iris Golf Course and **turf and bare ground** exist in the central oval and various tracks across the site.

A description and the area of each plant community is provided in **Table 5** and representative photographs of each are provided in **Plate 1** to **Plate 4**. The location of each plant community is shown in **Figure 2**. A matrix of species recorded within each plant community is provided in **Attachment 4** and raw sample data in **Attachment 5**.

Table 5: Description and extent of plant communities identified within the site

Plant community	Description	Area (ha)
EmBaBm	Woodland to open woodland <i>Eucalyptus marginata</i> subsp. <i>marginata</i> , <i>Banksia attenuata</i> and <i>Banksia menziesii</i> over mixed shrubland <i>Xanthorrhoea preissii</i> , <i>Allocasuarina humilis</i> , <i>Hibbertia hypericoides</i> and <i>Daviesia</i> spp. over forbland of <i>Patersonia occidentalis</i> , <i>Lyginia</i> spp., <i>Desmodium flexuosa</i> , <i>Mesomelaena pseudostygia</i> , <i>*Hypochaeris glabra</i> , <i>*Fumaria capreolata</i> , <i>*Briza maxima</i> and <i>Crassula</i> sp. (Plate 1).	0.41
ECCq	<i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> , <i>Allocasuarina fraseriana</i> , <i>*Corymbia ficifolia</i> , <i>*Agonis flexuosa</i> , <i>*Eucalyptus camaldulensis</i> woodland to open forest over open shrubland <i>*Acacia</i> spp., <i>Calothamnus quadrifidus</i> , <i>Xanthorrhoea preissii</i> , <i>*Pelargonium capitatum</i> over sparse to open forbland of <i>*Vicia</i> sp., <i>Dasypogon bromeliifolius</i> , <i>Conostylis aculeata</i> and <i>*Arctotheca calendula</i> (Plate 2)	0.92
Planted trees and shrubs	Non-native planted trees and shrubs such as <i>*Leptospermum laevigatum</i> and <i>*Bougainvillea</i> sp. over weeds (Plate 3).	0.03
Turf and bare ground	Closed non-native grassland (turf) and bare ground (Plate 4).	0.84



Plate 1: Plant community EmBaBm in ‘very good’ condition



Plate 2: Plant community ECCq in ‘degraded’ condition



Plate 3: Planted shrubs and trees in 'completely degraded' condition



Plate 4: Turf and bare ground in 'completely degraded' condition

3.3.3 Vegetation condition

The most intact native vegetation was located in the eastern portion of the site (approximately 0.26 ha of the **EmBaBm** plant community). Some of the **EmBaBm** vegetation was mapped as being in 'very good' condition as it retains the structure expected of a banksia woodland community and has moderate native species diversity. Past disturbance of these areas is evident from historical aerial photography and through the presence of weed species. Portions of the **EmBaBm** vegetation in the north-western and south-eastern portion of the site were mapped as being in 'good' condition due to higher weed cover with lower native species cover or smaller size of the patch. The edges of some areas of the **EmBaBm** vegetation was mapped as being in 'degraded' condition and had higher weed cover and lower native species cover.

The areas of **ECCq** vegetation in the eastern portion of the site consists of a mixture of planted and remnant native and non-native trees and shrubs over isolated native shrubs and herbs as well as some pasture weeds. This vegetation was mapped as being in 'degraded' condition as it lacks understory structure, has low species diversity and contains a high degree of planted non-native species or native species that would not occur naturally in the site. Past disturbance and clearing is particularly significant in these areas.

The **planted trees and shrubs** and the **turf and bare ground** communities were mapped as being in 'completely degraded' condition as they are dominated by non-native species or comprise unvegetated areas. The extent of vegetation by condition category is detailed in **Table 6** and shown in **Figure 3**.

Table 6: Extent of vegetation condition categories within the site

Condition category (Gibson <i>et al.</i> 1994)	Size (ha)
Pristine	0
Excellent	0
Very good	0.26
Good	0.13
Degraded	0.18
Completely degraded	0.87

3.3.4 Floristic community types

Plant community **EmBaBm** was considered to represent FCT 23a 'Central *Banksia attenuata* – *B. menziesii* woodlands'. This FCT is listed as 'well reserved' and 'low risk' by Gibson *et al.* (1994). Sample Q1 grouped with FCT 24 in the cluster analysis but was most similar to a Gibson *et al.* (1994) site representing FCT 23a with 50% similarity (**Table 7**).

Other plant communities in the site were considered too degraded to assign to an FCT.

Table 7: Plant community and likely FCT represented within the site for each sample

Plant community	Sample unit	Most similar Gibson <i>et al.</i> (1994) sites	Similarity (%)	Most likely floristic community type (FCT)	Reservation and conservation status (Gibson <i>et al.</i> 1994)
EmBaBm	Q1	WIRR-2 (FCT 23a)	50^	FCT 23a: Central <i>Banksia attenuata</i> – <i>B. menziesii</i> woodlands	Well reserved Low risk
		KING-2 (FCT 28)	48^		
		NEER-3 (FCT 28)	47^		
		THOM-4 (FCT 24)	46^		

Note: ^ shows percent similarity to individual Gibson *et al.* (1994) samples rather than similarity to a cluster of samples.

3.3.5 Threatened and priority ecological communities

The following TECs and PECs were identified within the site:

- ‘Banksia woodlands of the Swan Coastal Plain’ TEC.
- ‘Banksia woodlands of the Swan Coastal Plain’ PEC.

The locations of the TECs and PECs within the site are shown in **Figure 4**.

The structure and composition of plant community **EmBaBm** indicates that it has the potential to represent the Commonwealth listed TEC ‘banksia woodlands of the Swan Coastal Plain’ and the State listed PEC ‘banksia dominated woodlands of the Swan Coastal Plain IBRA region’ (P3).

The above TEC, herein referred to as the ‘banksia woodland TEC’, is listed as ‘endangered’ under the EPBC Act. Whether a patch of vegetation is considered to represent the banksia woodland TEC depends on a number of diagnostic criteria including geographic location, soils, landform, structure, composition, condition and patch size (DoEE 2016b).

The proximity of plant community **EmBaBm** in the eastern portion of the site to vegetation on the eastern side of Prinsep Road indicates that it represents the Commonwealth listed ‘banksia woodlands of the Swan Coastal Plain’ TEC, as outlined in **Table 8**.

Table 8: Criteria for determining presence of Banksia Woodlands of the Swan Coastal Plain TEC adapted from DoEE (2016a)

Criteria	Requirements for meeting criteria	Site implications
Must meet key diagnostic characteristics	A variety of factors relating to: • Location • Soils • Structure • Composition	• Site meets location and soils criteria. • The EmBaBm vegetation includes the key diagnostic feature of a tree layer of <i>Banksia attenuata</i>, <i>Banksia menziesii</i> and <i>Banksia ilicifolia</i>. • The EmBaBm vegetation within site also meets structure and composition criterion. It is likely to represent FCT 23a which is identified as one of the FCTs comprising the banksia woodland TEC.
Must meet condition thresholds	A patch should at least meet the ‘good’ condition category (see Table 1)	• The EmBaBm vegetation is present in ‘very good’, ‘good’ and ‘degraded’ condition, which meets this criterion. The conservation advice indicates that a single patch may include areas of variable condition, meaning the ‘degraded’ condition may still be considered the TEC. • The areas of EmBaBm vegetation that are adjacent to each other would be considered part of the same patch. Therefore, two ‘patches’ of EmBaBm vegetation exist within the site.
Must meet minimum patch size	Minimum size of patch: • Pristine=no minimum size • Excellent=0.5 ha • Very Good=1 ha • Good=2 ha	• The two patches of EmBaBm vegetation are each less than 1 ha in size and do <u>not</u> meet this criterion.

Table 9: Criteria for determining presence of Banksia Woodlands of the Swan Coastal Plain TEC adapted from DoEE (2016a) (cont.)

Criteria	Requirements for meeting criteria	Site implications
Must incorporate surrounding context	• Breaks (e.g. tracks) < 30 m do not separate vegetation into separate patches • Buffer zones may apply (20-50 m recommended from patch edge) • The site should be thoroughly sampled (2 surveys in same spring). • Survey timing should be appropriate. • Surrounding environment should be considered (e.g. connectivity, conservation values, fauna habitat)	• Breaks less than 30 m exist within both patches. • The north-western patch is isolated from other banksia woodland. • The south-eastern patch of EmBaBm vegetation is located 25 m west of banksia woodland vegetation on the eastern side of Prinsep Road. As such, these areas of the EmBaBm vegetation are considered to be contiguous with a larger patch to the east of the site. • Sampling was undertaken in August and September 2021.
Result	The site supports 0.31 ha of the banksia woodland of the Swan Coastal Plain TEC.	

DBCA’s *Priority Ecological Community* list indicates that the description, area and condition thresholds that apply to the Commonwealth-listed TEC of the same name also apply to the ‘banksia woodlands of the Swan Coastal Plain’ PEC (DBCA 2020). Since the **EmBaBm** vegetation in the eastern portion of the site represents the banksia woodland TEC it also represents the PEC.

DISCUSSION

The vegetation within the site has been subject to significant past disturbance and approximately 82% of the site is in degraded and completely degraded condition.

The most intact native vegetation occurs in the eastern and north-western portion of the site where the **EmBaBm** plant community is present. This vegetation was considered most likely to represent FCT 23a. A relatively small area of **EmBaBm** vegetation in good and very good condition remains (18% of the sites area). Despite being mapped as good and very good condition, the **EmBaBm** vegetation includes notable weed cover. Nonetheless it also retains a woodland structure and a moderate level of native species diversity.

The **ECCq** vegetation in the western portion of the site and directly surrounding the oval in the centre of the site has been subject to considerable disturbance from clearing and planting of native and non-native species. A number of native species are not considered likely to naturally occur within the site and have been planted. These include *Adenanthos cuneata*, *Agonis flexuosa*, *Banksia grandis*, *Banksia armata*, *Callitris preissii* and *Corymbia calophylla*.

4.1 Threatened and priority flora

Based on the desktop assessment, it was considered that two threatened and five priority flora species had potential to occur within the site. If these species were to occur it is most likely that they would have been found within the **EmBaBm** vegetation, which, while disturbed, is the most intact remnant vegetation in the site.

Intensive targeted searches were undertaken in August, September and October 2021 across the **EmBaBm** vegetation and none of the identified threatened or priority flora species were recorded. The absence of the larger perennial species such as *Jacksonia gracillima*, *Verticordia lindleyi* subsp. *lindleyi* and *Andersonia gracilis* was relatively easy to confirm. However, due to their size and seasonal lifeform, smaller annual or geophytic species such as *Caladenia huegelii*, *Drakaea elastica* and *Thelymitra variegata* can be more difficult to detect.

The targeted searches in August, September and October 2021 are considered a sufficient basis to conclude that *Drakaea elastica*, *Thelymitra variegata* and *Caladenia huegelii* do not occur. The targeted searches were conducted during the main growing and flowering period for these species.

4.2 Vegetation condition

Assigning condition using a categorical scale is always most difficult when vegetation qualities are close to the boundary between two categories. Categorical schemes may also invariably yield different results when applied by different assessors, because of differences in skill levels or personal bias.

A vegetation condition score has the greatest implications when the condition of vegetation is close the boundary between ‘good’ and ‘degraded’. This is because good condition is typically accepted as the threshold for conservation significance, while ‘degraded’ condition implies a low conservation requirement. Separating these two condition categories is further complicated by the fact that good condition is more correctly understood to mean ‘average’ condition. Applying the Keighery (1994) condition scale good condition vegetation can be expected to be significantly altered, with very obvious disturbance and the presence of aggressive weeds at high density. Therefore good does not literally mean “good” as the label implies.

The method applied to assess vegetation condition was robust, as it combined the standard qualitative, categorical scheme of Keighery (1994), with the additional indicators for diversity and weed cover outlined in DoEE (2016b).

4.3 Floristic community type assignment

The results of the FCT cluster analysis were not conclusive, with the samples within plant community **EmBaBm** clustering with FCT 24 and showing high similarity to multiple FCTs. FCT 24 generally represents heaths on the Spearwood dune system, whereas the **EmBaBm** vegetation comprises a woodland located on the Bassendean dune system. FCT 23a is considered to be the most likely FCT present over the site as sample Q1 represents the best condition vegetation present within the site and showed highest similarity to a Gibson *et al.* (1994) site comprising FCT 23a. A total of 15 Gibson *et al.* (1994) and Keighery *et al.* (2012) samples that represent FCT 23a occur within approximately four kilometres of the site and the soils and landform within the site also align with that described for FCT 23a.

4.4 Threatened and priority ecological communities

With regard to the Commonwealth banksia woodlands TEC, the **EmBaBm** vegetation includes the key diagnostic feature of a tree layer of *Banksia attenuata*, *B. menziesii* and *B. ilicifolia*. It also showed high similarity (44-50%) with a FCT (FCT 23a) that is one of the regional FCTs identified in the banksia woodland TEC conservation advice (DoEE 2016). However, to be considered the banksia woodland TEC a patch of banksia vegetation must also meet thresholds for condition and minimum patch size. The conservation advice states that a patch may include areas of variable condition and that the condition that is most representative should be used to assign overall condition of a patch.

For the **EmBaBm** community, 0.26 ha was mapped as very good and 0.13 ha was mapped as good, while 0.02 ha was mapped as degraded. As there is a break of over 30 m between the eastern and north-western areas of the **EmBaBm** vegetation, these areas were understood as two individual patches. Both patches were assessed as being in very good condition. The DoEE (2016b) conservation advice states that a patch of banksia woodland vegetation in very good condition must be greater than 1 ha in size for it to be considered the TEC. Based on this, neither of the patches of the **EmBaBm** vegetation within the site meet the minimum patch size threshold independently.

Vegetation likely to comprise ‘banksia woodland’ is present in proximity to the site, particularly to on the eastern side of Prinsep Road. The break between the eastern patch of **EmBaBm** vegetation within the site and banksia woodland vegetation to the east of the site is approximately 25 m. Based on this, the eastern

EmBaBm vegetation is contiguous with the larger area of banksia woodland to the east of the site. As such, the Commonwealth banksia woodland TEC is considered to be present within the site and is represented by 0.31 ha of the **EmBaBm** vegetation. The western patch of **EmBaBm** is not contiguous with any banksia woodland and thus does not represent the TEC.

DBCA’s *Priority Ecological Community* list indicates that the description, area and condition thresholds that apply to the Commonwealth-listed TEC of the same name also apply to the ‘banksia woodlands of the Swan Coastal Plain’ PEC (DBCA 2020). Since the **EmBaBm** vegetation in the eastern portion of the site represents the banksia woodland TEC it also represents the PEC.

CONCLUSIONS

Over half of the site is highly disturbed and modified, with approximately 0.87 ha of the site containing ‘completely degraded’, non-native vegetation. The remaining 1.33 ha of the site includes native vegetation that is present in ‘degraded’ to ‘very good’ condition.

No threatened or priority flora species were recorded within the site.

The site contains 0.41 ha of banksia woodland vegetation (plant community **EmBaBm**), that is considered to most likely represent FCT 23a. This vegetation is present in two patches that do not meet the threshold minimum patch size of the EPBC Act listed banksia woodlands TEC independently. However, the eastern portion of **EmBaBm** vegetation (0.31 ha) is contiguous with banksia woodland present on the eastern side of Prinsep Road and thus forms a small part of a larger patch to the east of the site. This vegetation is also considered to represent the State listed PEC ‘Banksia dominated woodlands of the Swan Coastal Plain IBRA region’ (P3).

Yours sincerely
Emerge Associates



Tom Atkinson
PRINCIPAL ENVIRONMENTAL CONSULTANT

- Encl: Figure 1: Site Locality
Figure 2: Plant Communities
Figure 3: Vegetation Condition
Figure 4: Threatened and Priority Ecological Communities
Attachment 1: Likelihood of occurrence of conservation significant flora species
Attachment 2: Flora species List
Attachment 3: Likelihood of occurrence of conservation significant communities
Attachment 4: Species x Community Matrix
Attachment 5: Raw Survey Data

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Figures



Figure 1: Site Locality

Figure 2: Plant Communities

Figure 3: Vegetation Condition

Figure 4: Threatened and Priority Ecological Communities

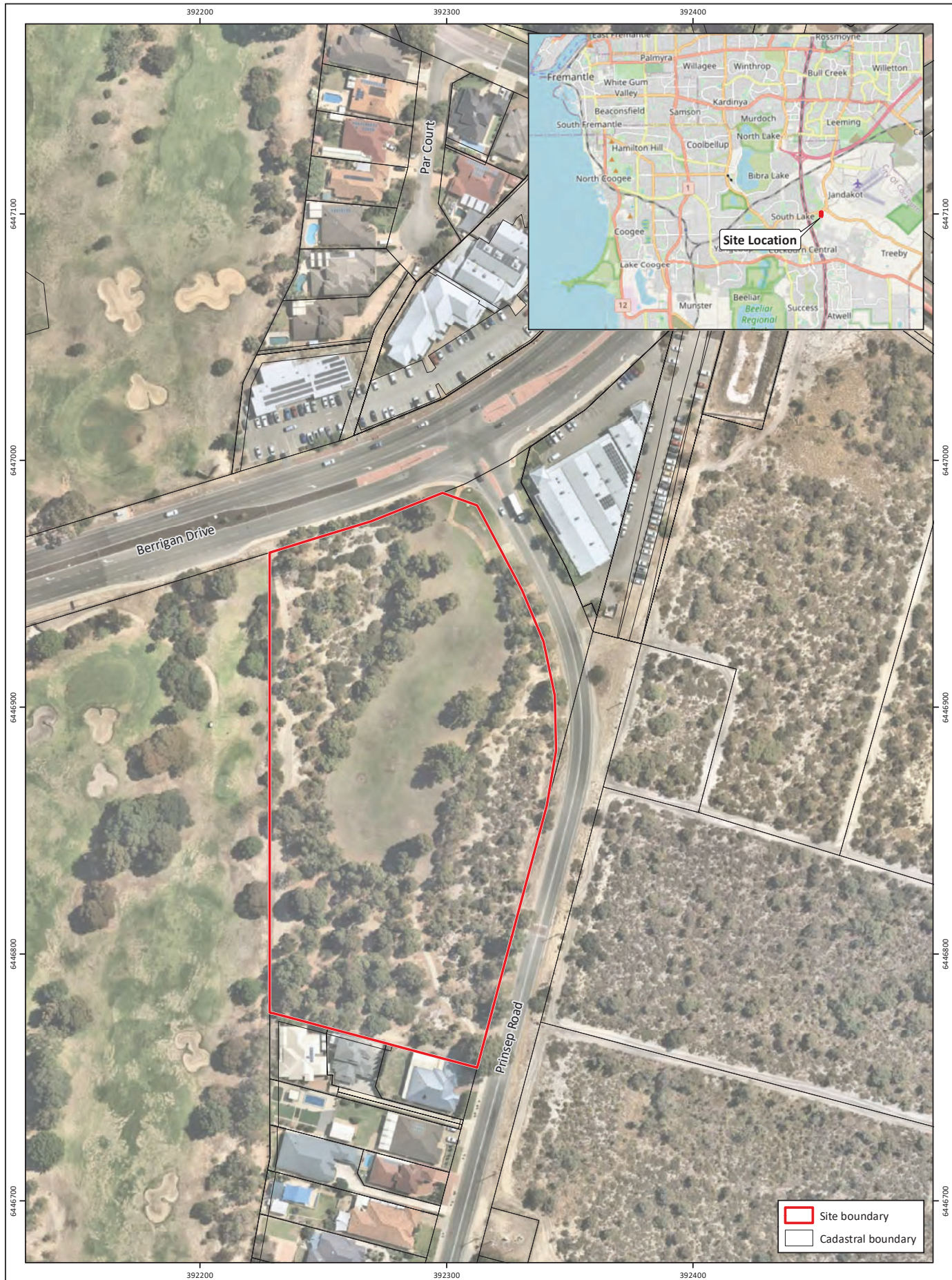


Figure 1: Site Location

Project: Flora and Vegetation Assessment
 Prinsep Park, Jandakot
 Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)-F46
 Drawn: GAR
 Date: 14/09/2021
 Checked: SKP
 Approved: TAA
 Date: 16/09/2021

Scale: 1:2,000@A4
 GDA 1994 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used



Figure 2: Plant Communities

Project: Flora and Vegetation Assessment
 Prinsep Park, Jandakot
 Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)-F47
 Drawn: GAR
 Date: 14/09/2021
 Checked: SKP
 Approved: TAA
 Date: 16/09/2021

Scale: 1:1,250@A4
 GDA 1994 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used

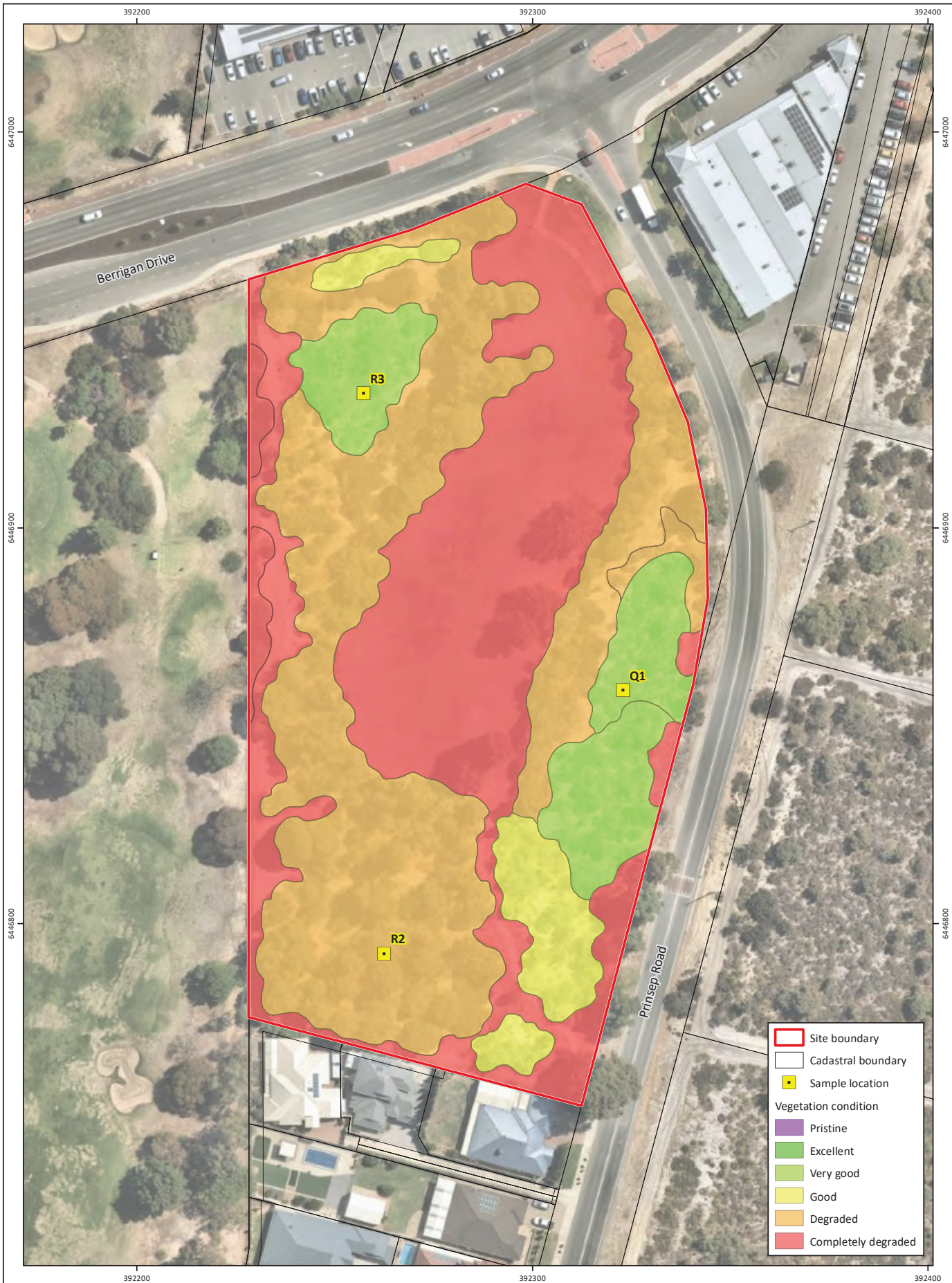


Figure 3: Vegetation Condition

Project: Flora and Vegetation Assessment
Prinsep Park, Jandakot
Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)-F48
Drawn: GAR
Date: 14/09/2021
Checked: SKP
Approved: TAA
Date: 16/09/2021



0 10 20 30
Metres
Scale: 1:1,250@A4
GDA 1994 MGA Zone 50



Figure 4: Threatened and Priority Ecological Communities

Project: Flora and Vegetation Assessment
Prinsep Park, Jandakot
Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)-F49
Drawn: GAR
Date: 16/09/2021
Checked: SKP
Approved: TAA
Date: 16/09/2021



0 10 20 30
Metres
Scale: 1:1,250@A4
GDA 1994 MGA Zone 50



Attachment 1

Likelihood of Occurrence of Conservation Significant Flora Species



Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Synaphea sp. Fairbridge Farm</i> (<i>D. Papenfus</i> 696)	CR	CR	P	Low woodland on grey, clayey sand with lateritic pebbles (Pinjarra Plain) near winter wet flats.	Sep-Nov	Unlikely
<i>Andersonia gracilis</i>	V	E	P	Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep-Nov	Unlikely
<i>Caladenia huegelii</i>	CR	E	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov	Possible
<i>Diuris purdiei</i>	E	E	PG	Sand to sandy clay soils in areas subject to winter inundation.	late Sep-mid-Oct, only after a summer or early autumn fire	Unlikely
<i>Drakaea elastica</i>	CR	E	PG	Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps.	Late Sep-Oct/Nov (survey Jul-Aug)	Unlikely
<i>Eucalyptus x balanites</i>	CR	E	P	Light coloured sandy soils over laterite. Habitat consists of gently sloping heathlands; open mallee woodland over shrubland (Population 2) or heathland with emergent mallees (population 1)	Oct - Feb	Unlikely
<i>Grevillea curviloba subsp. incurva</i>	EN	E	P	Sand, sandy loam. Winter-wet heath.	Aug-Sep	Unlikely
<i>Lepidosperma rostratum</i>	EN	E	P	Peaty sand and clay amongst low heath, in winter-wet swamps.	May-Jun (survey late Jun-Aug)	Unlikely
<i>Macarthuria keigheryi</i>	E	E	P	Low-lying winter-wet damp gey/white sands in open patches.	Sep-Dec, Feb-Mar	Unlikely
<i>Thelymitra dedmaniarum</i>	CR	E	PG	Red brown sandy loam with dolerite and granite outcrops.	Oct-Nov	Unlikely
<i>Thelymitra stellata</i>	E	E	PG	Sandy loam, clay or gravel over laterite or gravel.	Sep-Nov	Unlikely
<i>Diuris drummondii</i>	V	V	PG	In low-lying depressions in peaty and sandy clay swamps.	Nov-Jan	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Diuris micrantha</i>	V	V	PG	Dark grey-black sandy clay-loam in winter wet depressions or swamps. Often in shallow standing water.	Aug/Sep-early Oct	Unlikely
<i>Drakaea micrantha</i>	E	V	PG	Open sandy patches often adjacent to winter-wet swamps.	Sept- early Oct	Unlikely
<i>Eleocharis keigheryi</i>	V	V	P	Clay or sandy loam in freshwater creeks and transient waterbodies such as seasonally	Aug-Dec	Unlikely
<i>Austrostipa jacobiana</i>	CR	-	P	Grey sandy clay.	Nov-Jan	Unlikely
<i>Eremophila glabra</i> subsp. <i>chlorella</i>	EN	-	P	Sandy clay. Winter-wet depressions.	Jul-Nov	Unlikely
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant (G.J. Keighery 5026)	P1	-	P	Grey or black sand over clay in winter wet areas.	May-Aug	Unlikely
<i>Hydrocotyle striata</i>	P1	-	A	Sand and clay in springs and creeklines.	Nov	Unlikely
<i>Acacia benthamii</i>	P2	-	P	Sand, typically on limestone breakaways	Aug - Sept	Unlikely
<i>Poranthera moorokatta</i>	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes.	Oct or Feb	Unlikely
<i>Stenanthemum sublineare</i>	P2	-	P	White sand on coastal plains.	Oct-Dec	Unlikely
<i>Thelymitra variegata</i>	P2	-	P	Sandy clay, sand, laterite.	Jun-Sep	Unlikely
<i>Thysanotus</i> sp. <i>Badgingarra</i> (E.A. Griffin 2511)	P2	-	P	Grey sand with lateritic gravel.	Dec	Unlikely
<i>Angianthus micropodioides</i>	P3	-	A	Saline sandy soils on edge of rivers, depressions and clay pans.	Nov-Dec or Jan-Feb	Unlikely
<i>Byblis gigantea</i>	P3	-	P	Sandy-peat swamps. Seasonally wet areas.	Sep-Jan	Unlikely
<i>Cyathochaeta teretifolia</i>	P3	-	P	Grey sand, sandy clay in swamps and creek edges.	Oct-Jan	Unlikely
<i>Dampiera triloba</i>	P3	-	P	Damp peat/loam soil.	Aug-Dec	Unlikely
<i>Dillwynia dillwynioides</i>	P3	-	P	Winter wet depressions on sandy soils	Aug - Dec	Unlikely
<i>Jacksonia gracillima</i>	P3	-	P	Sand, often adjacent to winter wet areas	Sep-Dec	Unlikely
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3	-	P	White or grey sand, lateritic gravel.	Aug-Oct	Unlikely
<i>Pimelea calcicola</i>	P3	-	P	sand, limestone, coastal ridges	Sep-Nov	Unlikely

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
<i>Schoenus benthamii</i>	P3	-	P	White, grey ands, sandy clay in winter wet flats and swamps	Oct-Nov	Unlikely
<i>Schoenus capillifolius</i>	P3	-	A	Brown mud in claypans	Oct-Nov	Unlikely
<i>Schoenus pennisetis</i>	P3	-	A	Grey or peaty sand in swamps and winter-wet depressions.	Aug-Sep	Unlikely
<i>Stylidium aceratum</i>	P3	-	A	Sandy soils in swamp heathland.	Oct-Nov	Unlikely
<i>Stylidium paludicola</i>	P3	-	P	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland	Oct-Dec	Unlikely
<i>Styphelia filifolia</i>	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Unlikely
<i>Aponogeton hexatepalus</i>	P4	-	P	Mud. Freshwater: ponds, rivers, claypans.	Jul-Oct	Unlikely
<i>Dodonaea hackettiana</i>	P4	-	P	Sand, outcropping limestone.	Jul-Oct	Unlikely
<i>Drosera occidentalis</i>	P4	-	P	Flat, brown/white/yellow moist	Oct-	Unlikely
<i>Hydrocotyle lemnoides</i>	P4	-	A	Floating in swamps.	Aug-Oct	Unlikely
<i>Jacksonia sericea</i>	P4	-	P	Calcareous and sandy soils on	Dec-Feb	Unlikely
<i>Kennedia becxiana</i>	P4	-	P	Sand or loam on granite hills and outcrops.	Sep-Dec	Unlikely
<i>Microtis quadrata</i>	P4	-	PG	Sand, loam or peat in winter	Oct-Dec	Unlikely
<i>Ornduffia submersa</i>	P4	-	A	Sandy clay in inundated wetland/creek.	Aug-Nov	Unlikely
<i>Stylidium longitubum</i>	P4	-	A	Seasonal wetlands.	Oct-Dec	Unlikely
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	P4	-	P	Winter-wet areas on grey sand.	Oct-Feb	Unlikely
<i>Verticordia lindleyi</i>	P4	-	P	Sand and sandy clay in winter	May or	Unlikely

Note: T=threatened, CE=critically endangered, E=endangered, V=vulnerable, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4, P=perennial, PG=perennial geophyte, A=annual. Species considered to potentially occur within the site are shaded green

Attachment 2

Flora species list



Flora List Prinsep Park Jandakot

Page 1 of 4

Family	Status	Species
Aizoaceae	*	<i>Carpobrotus edulis</i>
Anacardiaceae	*, PI	<i>Schinus terebinthifolia</i>
Anarthriaceae		<i>Lyginia barbata</i> <i>Lyginia imberbis</i>
Araceae	*, DP	<i>Zantedeschia aethiopica</i>
Araliaceae		<i>Trachymene pilosa</i>
Asparagaceae		<i>Lomandra caespitosa</i> <i>Lomandra hermaphrodita</i> <i>Lomandra preissii</i> <i>Thysanotus</i> sp.
Asphodelaceae	*	<i>Trachyandra divaricata</i>
Asteraceae	*	<i>Arctotheca calendula</i>
	*	<i>Hypochaeris glabra</i>
		<i>Senecio</i> sp.
	*	<i>Sonchus oleraceus</i>
	*	<i>Ursinia anthemoides</i>
Brassicaceae	*	<i>Brassica</i> sp.
Caryophyllaceae	*	<i>Silene gallica</i>
	*	<i>Stellaria media</i>
Casuarinaceae		<i>Allocasuarina fraseriana</i> <i>Allocasuarina humilis</i>
Colchicaceae		<i>Burchardia congesta</i>
Crassulaceae		<i>Crassula</i> sp.
Cupressaceae	PI	<i>Callitris preissii</i>
Cyperaceae		<i>Isolepis</i> sp. <i>Lepidosperma pubisquameum</i> <i>Mesomelaena pseudostygia</i> <i>Schoenus clandestinus</i>
Dasypogonaceae		<i>Dasypogon bromeliifolius</i>
Dilleniaceae		<i>Hibbertia hypericoides</i> <i>Hibbertia subvaginata</i>

Family	Status	Species
Droseraceae		<i>Drosera erythrorhiza</i>
Ericaceae		<i>Conostephium pendulum</i> <i>Leucopogon conostephioides</i>
Euphorbiaceae	*	<i>Euphorbia terracina</i>
	*, Pl	<i>Ricinus pinifolius</i>
Fabaceae	*	<i>Acacia iteaphylla</i>
	*	<i>Acacia longifolia</i>
	*	<i>Acacia podalyriifolia</i>
		<i>Acacia pulchella</i>
		<i>Acacia saligna</i>
		<i>Aotus procumbens</i>
		<i>Bossiaea eriocarpa</i>
	*	<i>Chamaecytisus palmensis</i>
		<i>Daviesia nudiflora</i>
		<i>Daviesia triflora</i>
		<i>Gastrolobium capitatum</i>
		<i>Gompholobium tomentosum</i>
		<i>Hardenbergia comptoniana</i>
		<i>Jacksonia furcellata</i>
		<i>Kennedia prostrata</i>
	*	<i>Lupinus cosentinii</i>
	*, Pl	<i>Retama raetam</i>
	*	<i>Vicia</i> sp.
Geraniaceae	*	<i>Erodium botrys</i>
	*	<i>Pelargonium capitatum</i>
Goodeniaceae		<i>Dampiera linearis</i>
Haemodoraceae		<i>Conostylis aculeata</i> <i>Conostylis setigera</i> <i>Haemodorum spicatum</i> <i>Phlebocarya ciliata</i>
Iridaceae	*	<i>Gladiolus caryophyllaceus</i> <i>Patersonia occidentalis</i>
Loranthaceae		<i>Amyema</i> sp. <i>Nuytsia floribunda</i>
Myrtaceae	*, Pl	<i>Agonis flexuosa</i>
	Pl	<i>Calothamnus quadrifidus</i>
		<i>Calytrix ?flavescens</i>
	Pl	<i>Corymbia calophylla</i>

Family	Status	Species
	*, Pl	<i>Corymbia ficifolia</i> <i>Eremaea pauciflora</i>
	*, Pl	<i>Eucalyptus camaldulensis</i> <i>Eucalyptus marginata</i> subsp. <i>marginata</i> <i>Eucalyptus todtiana</i> <i>Hypocalymma robustum</i>
	*, Pl	<i>Leptospermum laevigatum</i>
	*, Pl	<i>Melaleuca nesophila</i> <i>Melaleuca preissiana</i> <i>Melaleuca thymoides</i>
	*, Pl	<i>Melaleuca</i> sp. <i>Regelia ciliata</i> <i>Regelia inops</i> <i>Scholtzia involucrata</i>
Nyctaginaceae	*, Pl	<i>Bougainvillea</i> sp.
Oleaceae	*, Pl	<i>Olea europaea</i> subsp. <i>europaea</i>
Orchidaceae		<i>Caladenia flava</i> <i>Caladenia latifolia</i> <i>Diuris corymbosa</i>
Papaveraceae	*	<i>Fumaria capreolata</i>
Poaceae	*	<i>Avena barbata</i>
	*	<i>Briza maxima</i>
	*	<i>Bromus diandrus</i>
	*	<i>Cynodon dactylon</i>
	*	<i>Ehrharta calycina</i>
Primulaceae	*	<i>Lysimachia arvensis</i>
Proteaceae	*, Pl	<i>Adenanthos cuneatus</i> <i>Adenanthos cygnorum</i>
	Pl	<i>Banksia armata</i> <i>Banksia attenuata</i>
	Pl	<i>Banksia grandis</i> <i>Banksia ilicifolia</i> <i>Banksia menziesii</i> <i>Petrophile linearis</i> <i>Stirlingia latifolia</i> <i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>
Restionaceae		<i>Desmocladius flexuosus</i> <i>Hypolaena exsulca</i>
Rutaceae		<i>Philothea spicata</i>

Family	Status	Species
Solanaceae		<i>Solanum nigrum</i>
Thymelaeaceae		<i>Pimelea rosea</i> <i>Pimelea suaveolens</i>
Xanthorrhoeaceae		<i>Xanthorrhoea brunonis</i> <i>Xanthorrhoea preissii</i>

Note: * denotes non-native species, PI denotes planted, DP denotes declared pests

Attachment 3

Likelihood of occurrence of conservation significant communities



Code	Community name	TEC/PEC	Level of significance	
			State	EPBC Act
	Clay pans of the Swan Coastal Plain	TEC	VU/EN	CR
	Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain	TEC	-	CR
SCP22	<i>Banksia ilicifolia</i> woodlands, southern Swan Coastal Plain	TEC/PEC	P3	EN (Banksia woodlands of the Swan Coastal Plain)
SCP24	Northern Spearwood shrublands and woodlands	TEC/PEC	P3	
	Banksia dominated woodlands of the Swan Coastal Plain IBRA region	TEC/PEC	P3	
	Subtropical and temperate coastal saltmarsh	TEC	-	VU
Note: TEC=threatened ecological community, PEC=priority ecological community, CR=critically endangered, EN=endangered, VU=vulnerable, P3=priority 3				

Attachment 4
Species x Community Matrix



Flora Species x Plant Community Matrix - Prinsep Park Jandakot

Species	Plant community			
	EmBaBm	ECCq	Planted trees and shrubs	Turf and bare ground
<i>Acacia iteaphylla</i>		X		
<i>Acacia longifolia</i>		X		
<i>Acacia podalyriifolia</i>		X		
<i>Acacia pulchella</i>	X			
<i>Acacia saligna</i>		X		
<i>Adenanthos cuneatus</i>	X			
<i>Adenanthos cygnorum</i>		X		
<i>Agonis flexuosa</i>		X		
<i>Allocasuarina fraseriana</i>	X			
<i>Allocasuarina humilis</i>	X			
<i>Amyema sp.</i>		X		
<i>Aotus procumbens</i>		X		
<i>Arctotheca calendula</i>	X	X		
<i>Banksia armata</i>		X		
<i>Banksia attenuata</i>	X			
<i>Banksia grandis</i>		X		
<i>Banksia ilicifolia</i>	X			
<i>Banksia menziesii</i>	X			
<i>Bossiaea eriocarpa</i>	X			
<i>Bougainvillea sp.</i>		X	X	
<i>Brassica sp.</i>	X			
<i>Briza maxima</i>	X		X	X
<i>Burchardia congesta</i>	X			
<i>Caladenia flava</i>	X			
<i>Caladenia latifolia</i>		X		
<i>Callitris preissii</i>		X		
<i>Calothamnus quadrifidus</i>	X	X		X
<i>Calytrix ?flavescens</i>	X			
<i>Carpobrotus edulis</i>	X	X		
<i>Chamaecytisus palmensis</i>		X		
<i>Conostephium pendulum</i>	X			
<i>Conostylis aculeata</i>	X	X		
<i>Conostylis setigera</i>	X			
<i>Corymbia calophylla</i>		X		X
<i>Corymbia ficifolia</i>		X		X
<i>Crassula sp.</i>	X	X		X
<i>Cynodon dactylon</i>				X
<i>Dampiera linearis</i>	X			
<i>Dasypogon bromeliifolius</i>		X		
<i>Daviesia nudiflora</i>	X			
<i>Daviesia triflora</i>	X	X		
<i>Desmocladius flexuosus</i>	X			
<i>Diuris corymbosa</i>	X			
<i>Drosera erythrorhiza</i>	X			
<i>Ehrharta calycina</i>	X	X		X
<i>Eremaea pauciflora</i>	X			

Flora Species x Plant Community Matrix - Prinsep Park Jandakot

Species	Plant community			
	EmBaBm	ECCq	Planted trees and shrubs	Turf and bare ground
<i>Erodium botrys</i>	X			X
<i>Eucalyptus camaldulensis</i>		X		X
<i>Eucalyptus marginata subsp. marginata</i>	X			X
<i>Euphorbia terracina</i>	X	X		
<i>Fumaria capreolata</i>	X	X		X
<i>Gastrolobium capitatum</i>	X			
<i>Gladiolus caryophyllaceus</i>	X	X		
<i>Gompholobium tomentosum</i>	X			
<i>Haemodorum spicatum</i>	X			
<i>Hardenbergia comptoniana</i>	X	X		
<i>Hibbertia hypericoides</i>	X			
<i>Hibbertia subvaginata</i>	X			
<i>Hovea ellipticum</i>	X			
<i>Hypocalymma robustum</i>	X			
<i>Hypochaeris glabra</i>	X	X	X	X
<i>hypolaena exsulca</i>	X			
<i>Isolepis sp.</i>	X			
<i>Jacksonia furcellata</i>	X			
<i>Kennedia prostrata</i>		X		
<i>Lepidosperma pubisquameum</i>	X			
<i>Leptospermum laevigatum</i>		X	X	
<i>Leucopogon conostephioides</i>	X			
<i>Lomandra caespitosa</i>	X			
<i>Lomandra hermaphrodita</i>	X	X		
<i>Lomandra preissii</i>	X			
<i>Lupinus cosentinii</i>	X	X		X
<i>Lyginia barbata</i>	X			
<i>Lyginia imberbis</i>	X			
<i>Lysimachia arvensis</i>	X			
<i>Melaleuca nesophila</i>		X		
<i>Melaleuca preissiana</i>		X		
<i>Melaleuca sp.</i>		X		
<i>Melaleuca thymoides</i>	X			
<i>Mesomelaena pseudostygia</i>	X			
<i>Nuytsia floribunda</i>	X	X		
<i>Patersonia occidentalis</i>	X			
<i>Pelargonium capitatum</i>		X		
<i>Petrophile linearis</i>	X			
<i>Philothea spicata</i>	X			
<i>Phlebocarya ciliata</i>	X			
<i>Pimelea ?suavolens</i>	X			
<i>Pimelea rosea</i>	X			
<i>Pimelea suavolens</i>	X			
<i>Regelia ciliata</i>	X			
<i>Regelia inops</i>	X			
<i>Retama raetam</i>		X		

Flora Species x Plant Community Matrix - Prinsep Park Jandakot

Species	Plant community			
	EmBaBm	ECCq	Planted trees and shrubs	Turf and bare ground
<i>Ricinocarpos pinifolius</i>	X			
<i>Schinus terabinthifolius</i>		X		
<i>Schoenus clandestinus</i>	X			
<i>Scholtzia involucrata</i>	X	X		
<i>Senecio sp.</i>		X		
<i>Silene gallica</i>	X			
<i>Solanum nigrum</i>	X	X		
<i>Sonchus oleraceus</i>	X			
<i>Stellaria media</i>	X			
<i>Stirlingia latifolia</i>		X		
<i>Synaphea spinulosa subsp. spinulosa</i>	X			
<i>Thysanotus sp.</i>	X			
<i>Trachyandra divaricata</i>		X		
<i>Trachymene pilosa</i>	X			
<i>Ursinia anthemoides</i>	X			
<i>Vicia sp.</i>	X	X		
<i>Xanthorrhoea brunonis</i>	X			
<i>Xanthorrhoea preissii</i>	X			
<i>Zantedeschia aethiopica</i>		X		

Attachment 5

Survey Data



Sample Name: Q1

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Status Permanent

Author: SKP,other

Q1: Page 1 of 3

Quadrat and landform details

Sample type: quadrat	Size: 10 m x 10 m
NW corner easting: 392323	NW corner northing: 6446859
Altitude (m): 0	Geographic datum/zone: GDA94/Zone 50
Soil water content: damp	Landform: flat
Time since fire: no evidence	Disturbance: moderate - weeds, adj to road
Soil type/texture sand/	Bare ground (%): 10
Rocks (%) and type: No rocks	Soil colour: brown/grey
Litter: 10% (leaves,twigs,)	Vegetation condition: very good



Sample Name: Q1

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Status Permanent

Author: SKP,other

Q1: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name	Cover
	<i>Acacia pulchella</i>	0.5
	<i>Allocasuarina fraseriana</i>	opp
	<i>Allocasuarina humilis</i>	30
	<i>Banksia attenuata</i>	2
	<i>Banksia menziesii</i>	7
	<i>Bossiaea eriocarpa</i>	2
*	<i>Brassica sp.</i>	0.5
*	<i>Briza maxima</i>	2
	<i>Caladenia flava</i>	opp
	<i>Caladenia sp.</i>	0.5
	<i>Calytrix ?flavescens</i>	0.5
	<i>Conostephium pendulum</i>	0.5
	<i>Conostylis aculeata</i>	1
	<i>Conostylis setigera</i>	opp
*	<i>Crassula sp.</i>	4
	<i>Dampiera linearis</i>	0.5
	<i>Daviesia nudiflora</i>	2
	<i>Daviesia triflora</i>	10
	<i>Desmocladius flexuosus</i>	1
*	<i>Ehrharta calycina</i>	0.5
	<i>Eremaea pauciflora</i>	1
	<i>Eucalyptus marginata subsp. marginata</i>	opp
*	<i>Euphorbia terracina</i>	0.5
*	<i>Fumaria capreolata</i>	2
	<i>Gastrolobium capitatum</i>	opp
*	<i>Gladiolus caryophyllaceus</i>	0.5
	<i>Gompholobium tomentosum</i>	1
	<i>Haemodorum spicatum</i>	opp
	<i>Hardenbergia comptoniana</i>	0.5
	<i>Hibbertia hypericoides</i>	10
	<i>Hovea ellipticum</i>	opp
	<i>Hypocalymma robustum</i>	opp
*	<i>Hypochaeris sp.</i>	3

* = non-native, Pl=planted

Sample Name:Q1

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Author: SKP and ASF

Status Permanent

Q1: Page 3 of 3

Species Data		
* denotes non-native species		
Status	Confirmed name	
	<i>hypolaena exsulca</i>	0.5
	<i>Isolepis sp.</i>	0.5
	<i>Leucopogon conostephioides</i>	0.5
	<i>Lomandra hermaphrodita</i>	0.5
	<i>Lomandra hermaphrodita</i>	0.5
	<i>Lomandra preissii</i>	0.5
	<i>Lyginia barbata</i>	2
	<i>Lyginia imberbis</i>	1
	<i>Mesomelaena pseudostygia</i>	1
	<i>Patersonia occidentalis</i>	1
	<i>Petrophile linearis</i>	0.5
	<i>Philotheca spicata</i>	0.5
	<i>Pimelea ?suavolens</i>	opp
	<i>Pimelea suavolens</i>	1
	<i>Schoenus clandestinus</i>	0.5
	* <i>Silene gallica</i>	0.5
	* <i>Sonchus oleraceus</i>	0.5
	<i>Synaphea spinulosa subsp. spinulosa</i>	0.5
	<i>Thysanotus sp.</i>	0.5
	<i>Trachymene pilosa</i>	0.5
	* <i>Ursinia anthemoides</i>	0.5
	<i>Xanthorrhoea preissii</i>	0

* = non-native, Pl=planted

Sample Name:R2

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Author: SKP,other

Status Non-permanent

R2: Page 1 of 3

Quadrat and landform details	
Sample type: releve	Size: other
NW corner easting: 392262	NW corner northing: 6446792
Altitude (m): 0	Geographic datum/zone: GDA94/Zone 50
Soil water content: damp	Landform: flat
Time since fire: > 5 yrs	Disturbance: high - planted, weeds, loss of u/s
Soil type/texture sand/	Bare ground (%): 1
Rocks (%) and type: No rocks	Soil colour: brown/
Litter: 95% (leaves,branches,)	Vegetation condition: Degraded



Sample Name:

R2

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Author: SKP,other

Status Non-permanent

R2: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name
	<i>Acacia iteaphylla</i>
	<i>Acacia podalyriifolia</i>
	<i>Acacia saligna</i>
	<i>Adenanthos cygnorum</i>
	<i>Amyema sp.</i>
	<i>Aotus procumbens</i>
	* <i>Arctotheca calendula</i>
Pl	<i>Banksia grandis</i>
	* <i>Bougainvillea sp.</i>
	<i>Caladenia latifolia</i>
Pl	<i>Calothamnus quadrifidus</i>
	* <i>Carpobrotus edulis</i>
	<i>Conostylis aculeata</i>
Pl	<i>Corymbia calophylla</i>
*, Pl	<i>Corymbia ficifolia</i>
	* <i>Crassula sp.</i>
	<i>Dasypogon bromeliifolius</i>
	<i>Daviesia triflora</i>
	* <i>Ehrharta calycina</i>
	<i>Eucalyptus todtiana</i>
	* <i>Euphorbia terracina</i>
	* <i>Fumaria capreolata</i>
	* <i>Gladiolus caryophyllaceus</i>
	<i>Hardenbergia comptoniana</i>
	* <i>Hypochaeris glabra</i>
	<i>Kennedia prostrata</i>
	<i>Lomandra hermaphrodita</i>
	* <i>Lupinus cosentinii</i>
*, Pl	<i>Melaleuca nesophila</i>
	* <i>Melaleuca sp.</i>
	* <i>Pelargonium capitatum</i>
	* <i>Retama raetam</i>
*, Pl	<i>Schinus terebinthifolius</i>

* = non-native

Sample Name:

R2

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Author: SKP and ASF

Status Non-permanent

R2: Page 3 of 3

Species Data

* denotes non-native species

Status	Confirmed name
	<i>Scholtzia involucrata</i>
	* <i>Solanum nigrum</i>
	* <i>Trachyandra divaricata</i>
	* <i>Vicia sp.</i>

* = non-native

Sample Name: R3

Project no.: EP20-009
Date: 19/08/2021, 09/09/2021
Author: SKP,other
Status Non-permanent
R3: Page 1 of 3

Quadrat and landform details

Sample type: releve	Size: other
NW corner easting: 392257	NW corner northing: 6446934
Altitude (m): 0	Geographic datum/zone: GDA94/Zone 50
Soil water content: damp	Landform: flat
Time since fire: > 5 yrs	Disturbance: moderate - planted, weeds
Soil type/texture sand/	Bare ground (%): 10
Rocks (%) and type: No rocks	Soil colour: grey/white
Litter: 10% (leaves,branches,)	Vegetation condition: very good



Sample Name: R3

Project no.: EP20-009
Date: 19/08/2021, 09/09/2021
Author: SKP,other
Status Non-permanent
R3: Page 2 of 3

Species Data

* denotes non-native species

Status	Confirmed name
	<i>Allocasuarina humilis</i>
*	<i>Arctotheca calendula</i>
	<i>Banksia menziesii</i>
	<i>Bossiaea eriocarpa</i>
*	<i>Briza maxima</i>
	<i>Burchardia congesta</i>
	<i>Caladenia flava</i>
	<i>Calytrix ?flavescens</i>
*	<i>Carpobrotus edulis</i>
	<i>Conostephium pendulum</i>
	<i>Conostylis aculeata</i>
*	<i>Crassula sp.</i>
	<i>Dampiera linearis</i>
	<i>Daviesia nudiflora</i>
	<i>Daviesia triflora</i>
	<i>Desmocladius flexuosus</i>
	<i>Drosera erythrorhiza</i>
*	<i>Ehrharta calycina</i>
	<i>Eremaea pauciflora</i>
*	<i>Erodium botrys</i>
	<i>Eucalyptus marginata subsp. marginata</i>
*	<i>Fumaria capreolata</i>
*	<i>Gladiolus caryophyllaceus</i>
	<i>Gompholobium tomentosum</i>
	<i>Hardenbergia comptoniana</i>
	<i>Hibbertia hypericoides</i>
	<i>Hibbertia subvaginata</i>
	<i>Hypocalymma robustum</i>
*	<i>Hypochaeris glabra</i>
	<i>Jacksonia furcellata</i>
	<i>Lepidosperma pubisquameum</i>
*	<i>Lupinus cosentinii</i>
	<i>Lyginia imberbis</i>
*	<i>Lysimachia arvensis</i>

* = non-native, Pl=planted



Sample Name: R3

Project no.: EP20-009

Date: 19/08/2021, 09/09/2021

Author: SKP and ASF

Status Non-permanent

R3: Page 3 of 3

Species Data	
* denotes non-native species	
Status	Confirmed name
	<i>Nuytsia floribunda</i>
	<i>Patersonia occidentalis</i>
	<i>Phlebocarya ciliata</i>
	<i>Scholtzia involucrata</i>
	* <i>Solanum nigrum</i>
	* <i>Sonchus oleraceus</i>
	* <i>Stellaria media</i>
	<i>Trachymene pilosa</i>
	* <i>Ursinia anthemoides</i>
	<i>Xanthorrhoea preissii</i>
* = non-native, Pl=planted	

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