GLEN IRIS ESTATE

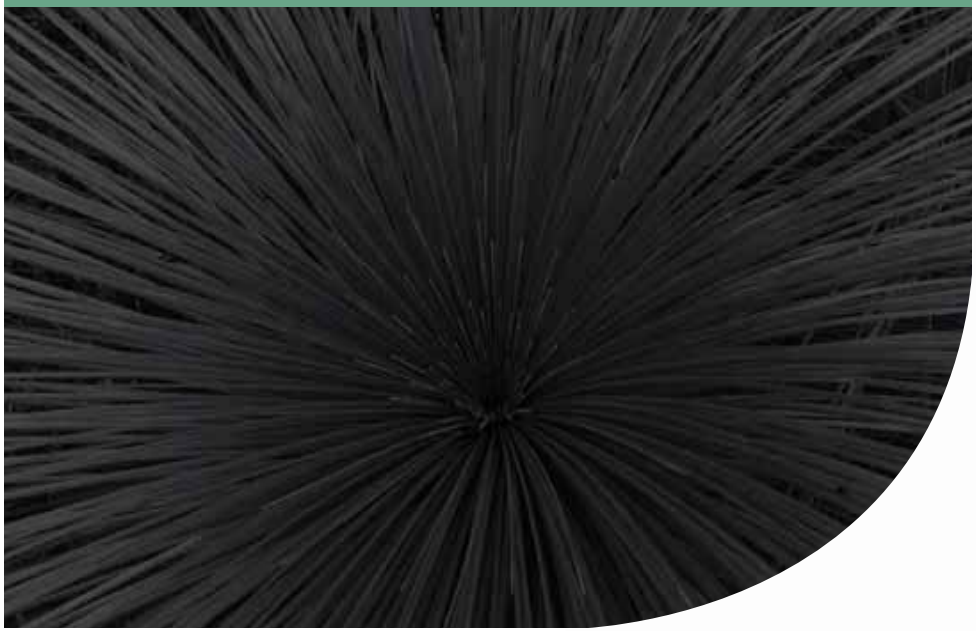
APPENDIX 8
PRINSEP PARK FLORA AND VEGETATION ASSESSMENT

Detailed Flora and Vegetation Assessment

Former Glen Iris Golf Course

Project No: EP20-009(03)

Prepared for ECP Acquisitions 6 Pty Ltd
October 2021



Document Control

Doc name:	Detailed Flora and Vegetation Assessment Former Glen Iris Golf Course				
Doc no.:	EP20-009(03)--002D RAW				
Version	Date	Author		Reviewer	
1	June 2020	Rachel Weber	RAW	Tom Atkinson	TAA
	Report prepared for client review				
A	April 2021	Rachel Weber	RAW	Tom Atkinson	TAA
	Minor updates to reflect change in site boundary				
B	June 2021	Rachel Weber	RAW	Tom Atkinson	TAA
	Minor updates to numeric decimal places				
C	September 2021	Sarah Paul	SKP	Tom Atkinson	TAA
	Updated to include targeted spring surveys for conservation significant species				
D	October 2021	Sarah Paul	SKP	Rachel Weber	RAW
	Updated to include additional targeted spring surveys for conservation significant species				

Executive Summary

Emerge Associates (Emerge) were engaged by ECP Acquisitions 6 Pty Ltd to conduct a 'detailed' and 'targeted' level assessment within the former Glen Iris Golf Course (referred to herein as the 'site') to provide information on the flora and vegetation values.

As part of the assessment a desktop review of relevant background information was completed, and site surveys were undertaken on 11 March 2020, 19 August, 9 September, 7 and 28 October 2021. Outcomes of the flora and vegetation assessment include the following:

- A total of 80 native and 51 non-native (weed) species were recorded in the site.
- Four plant communities were recorded within the site:
  - Plant community EmB extends over 1.9 ha (4% of the site) and comprises remnant native vegetation in 'very good', 'good' and 'degraded' condition. This vegetation occurs as scattered patches and is considered likely to represent floristic community type (FCT) 23a 'Central *Banksia attenuata – B. menziesii* woodlands'.
  - Plant community TdSt extends over 0.2 ha (<1% of the site) and comprises riparian vegetation that is likely planted or a combination of planted and naturally regenerated and was mapped as being in 'good – degraded' condition.
  - Plant community planted trees and shrubs extends over 13.6 ha (25% of the site) and comprises predominantly scattered non-native species in 'completely degraded' condition.
  - Plant community turf and bare ground extends over 35.7 ha (66% of the site) and comprises the previous golf fairway and bare ground in 'completely degraded' condition.
- The remainder of the site comprises artificial lakes, buildings and hardstand which extend over 2.3 ha (4% of the site) and were not assigned to a vegetation condition category.
- No threatened or priority flora species were recorded within the site and none are considered likely to occur.
- No threatened or priority ecological communities occur within the site and none are considered likely to occur.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

This page has been left blank intentionally.

Table of Contents

List of Tables

List of Plates

Figures

Appendices

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
EPA	Environmental Protection Authority
DBCA	Department of Biodiversity, Conservation and Attractions
DoW	Department of Water (now DWER)
DWER	Department of Water and Environmental Regulation
WALGA	Western Australia Local Government Association

Table A2: Abbreviations – General terms

General terms	
ESA	Environmentally sensitive area
FCT	Floristic community type
IBRA	Interim Biogeographic Regionalisation of Australia
MUW	Multiple use wetland
NVIS	National Vegetation Inventory System (ESCAVI 2003)
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
P5	Priority 5
PEC	Priority ecological community
T	Threatened
TEC	Threatened ecological community
UFI	Unique feature identifier

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*
BC Regs	*Biodiversity Conservation Regulations 2018*

Table A4: Abbreviations – planning

Planning terms	
MRS	Metropolitan region scheme

Table A5: Abbreviations – units of measurement

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

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

This page has been left blank intentionally.

1 Introduction

1.1 Project background

ECP Acquisitions 6 Pty Ltd intends to develop the former privately run Glen Iris Golf Course into a residential estate. The former Glen Iris Golf Course comprises Lots 6 and 7 Glen Iris Drive, Lots 3, 509 and 512 Dean Road and Lot 139 Imlah Court in Jandakot (referred to herein as the 'site').

The site is located approximately 16 kilometres (km) south of the Perth Central Business District within the City of Cockburn and is zoned 'urban' under the *Metropolitan Region Scheme* (MRS) and 'development contribution area 13 special use 1', 'development contribution area 13 special use 6', 'development contribution area 13 residential-R40' under the City of Cockburn *Town Planning Scheme No. 3*.

The site is approximately 53.7 hectares (ha) in size and is surrounded by residential subdivision, with a railway to the north and Kwinana Freeway to the west. The site comprises two areas separated by Berrigan Drive. The location and extent of the site is shown in Figure 1.

1.2 Purpose and scope of work

Emerge Associates (Emerge) were engaged by Acumen Development Solutions, on behalf of ECP Acquisitions 6 Pty Ltd, to provide environmental consultancy services to support the planning process for the site. The purpose of this survey is to provide sufficient information on the flora and vegetation values within the site to inform this process.

The scope of work was specifically to undertake a flora and vegetation assessment to the standard required of a detailed and a targeted survey with reference to the Environmental Protection Authority's (EPA's) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016).

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

- Desktop review of relevant background information pertaining to the site and surrounds, including database searches for threatened flora species and ecological communities.
- Compilation of a comprehensive list of flora species recorded as part of the field survey.
- Mapping of conservation significant flora and vegetation, plant communities and vegetation condition.
- Identification of potential habitat for conservation significant flora and vegetation and likelihood of occurrence.
- Targeted searches for conservation significant flora within areas of suitable habitat.
- Documentation of the desktop assessment, survey methodology and results into a report.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

2 Environmental Context

2.1 Climate

Climate has a strong influence on the types of vegetation that grow in a region and the life cycles of the flora present. It is therefore critical for a flora and vegetation survey to respond appropriately to climatic conditions to ensure that surveys are conducted during times when flora species are easiest to detect and identify.

The south-west of Western Australia experiences a Mediterranean climate of hot dry summers and cool wet winters. In Mediterranean type climates some flora species will typically spend part of their lifecycle as either underground storage organs or as seed. This is an adaptation to unfavourable environmental conditions such as excessive heat and drought that occur over the summer period. These species, known as 'geophytes' or 'annuals', tend to re-emerge during winter when favourable conditions return and are most visible during spring, which is the flowering period for a majority of plant species. Therefore, spring is the optimal time to complete flora and vegetation surveys in the south-west of WA.

An average of 719.6 millimetres (mm) of rainfall is recorded annually from the Jandakot Aero weather station, which is the closest weather station, located approximately 2 km east of the site. The majority of this rainfall is received between the months of May and September. Mean maximum temperatures at the Jandakot Aero weather station range from 18.0ºC in July to 31.6ºC in February, while mean minimum temperatures range from 6.9ºC in July to 17.2ºC in February (BoM 2020).

A total of 600.6 mm of rain was recorded between May and August 2021 prior to the surveys which is higher than the combined long-term average of 558.5 mm for the same months (BOM 2021). This high rainfall was considered to have been sufficient to promote the flowering and emergence of native flora.

2.2 Geomorphology and soils

Landform and soils influence vegetation types at regional and local scales. The site occurs on the Swan Coastal Plain, which is the geomorphic unit that characterises much of the Perth metropolitan area.

The Swan Coastal Plain is approximately 500 km long and 20 to 30 km wide and is roughly bound by the Indian Ocean to the west and the Darling Scarp to the east. Broadly the Swan Coastal Plain consists of two sedimentary belts of different origin. Its eastern side has formed from the deposition of alluvial material washed down from the Darling Scarp, while its western side is comprised of three dune systems that run roughly parallel to the Indian Ocean coastline (Seddon 2004). These dune systems, referred to as Quindalup, Spearwood and Bassendean associations, represent a succession of coastal deposition that has occurred since the late Quaternary period (approximately two million years ago) (Kendrick *et al.* 1991) and, as a result, they contain soils at different stages of leaching and formation.

Examination of broad scale soil mapping places the site within the Bassendean soil association (Churchward and McArthur 1980). The Bassendean association comprises sand plains with low dunes and occasional swamps, iron or humus podzols and areas of complex steep dunes.

Finer scale mapping by (Gozzard 2011) also places the site in Bassendean sand (S8) which was later confirmed during the field survey. The Bassendean sands typically very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin (Purdie *et al.* 2004).

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

2.3 Topography

The elevation of the site ranges from 25 m in relation to the Australian height datum (mAHD) in the southern portion to 40 mAHD in the northern portion of the site (DoW 2008) (Figure 2).

2.4 Hydrology and wetlands

Wetlands include "areas of seasonally, intermittently or permanently waterlogged soils or inundated land, whether natural or otherwise, fresh and saline, e.g. waterlogged soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries" (Wetlands Advisory Committee 1977). Wetlands can further 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. The following lists of important wetlands were checked as part of this assessment:

- *Ramsar List of Wetlands of International Importance* (DBCA 2017b)
- *A Directory of Important Wetlands in Australia* (DBCA 2018).

No Ramsar or listed 'important wetlands' are located within or near the site.

Examination of the Department of Water and Environmental Regulation (DWER) hydrography dataset (DWER 2018) shows that no wetland or water related features are mapped within the site.

On the Swan Coastal Plain DBCA (2017a) 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). The Department of Biodiversity, Conservation and Attractions (DBCA) maintains the *Geomorphic Wetlands of the Swan Coastal Plain* dataset (DBCA 2020a), which further categorises geomorphic wetland features into specific management categories to guide land use and conservation. Note that as this dataset was drafted at a regional scale the boundaries of mapped wetland features are often inconsistent with physical wetland boundaries.

A review of the *Geomorphic Wetlands, Swan Coastal Plain* dataset (DBCA 2020a) indicated that no wetland features are mapped within the site. Two 'multiple use' category wetland features (UFIs 6654 and 6655) occur adjacent to the south-western portion of the site.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

The locations of the geomorphic wetlands surrounding the site are shown in Figure 2.

2.5 Regional vegetation

Native vegetation is described and mapped at different scales in order to illustrate patterns in its distribution. At a continental scale the *Interim Biogeographic Regionalisation of Australia* (IBRA) divides the Swan Coastal Plain into two floristic subregions (Environment Australia 2000). The site is contained within the 'SWA02' or Perth subregion, which is characterised as mainly containing *Banksia* low woodland on leached sands with *Melaleuca* swamps where ill-drained; and woodland of *Eucalyptus gomphocephala* (tuart), *E. marginata* (jarrah) and *Corymbia calophylla* (marri) on less leached soils (Beard 1990). This subregion is recognised as a biodiversity hotspot and contains a wide variety of endemic flora and vegetation types.

Variations in native vegetation within the site can be further classified based on regional vegetation associations. Heddle *et al.* (1980) mapping shows the majority of the site as comprising the 'Bassendean central and south' complex, which is described as vegetation ranging from woodland of *Eucalyptus marginata - Allocasuarina fraseriana - Banksia* spp. to low woodland of *Melaleuca* spp. and sedgelands on the moister sites. This complex was determined to have 26.87% remaining in 2019, of which 2.15% is under formal protection (Government of Western Australia 2019).

2.6 Historic land use

Review of historical images available from 1953 (WALIA 2020) onwards shows that the northern and southern portions of the site, separated by Berrigan Drive, have been subject to vegetation clearing at different times.

The northern portion of the site supported native vegetation until construction of the central part of the Glen Iris Golf Course commenced, which is first visible in imagery from 1965. The remainder of the northern portion of the site was cleared of native vegetation by 1995 for further golf course construction. Scattered remnant native trees appear to have been retained between the golf course fairway but the majority of the vegetation was cleared during construction of the golf course.

The southern portion of the site supported native vegetation until construction of the golf course commenced, which is first visible in imagery from 1995. The entirety of the southern portion of the site, except two areas near the southern boundary, were completely cleared of native vegetation for the golf course.

The Glen Iris Golf Course was formally closed by the previous owners in March 2020 and has been in caretaker and maintenance ever since.

2.7 Significant flora and vegetation

2.7.1 Threatened and priority flora

Certain flora taxa that are considered to be rare or under threat warrant special protection under Commonwealth and/or State legislation. At a Commonwealth level, flora taxa may be listed as 'threatened' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Threatened flora species listed under the EPBC Act are assigned a conservation status according to attributes such as population size and geographic distribution. Any action likely to have a significant impact on a taxon listed under the EPBC Act requires Ministerial approval.

In Western Australia flora species may also be classed as 'threatened' under the *Biodiversity Conservation Act 2016* (BC Act). Similarly, it is an offence to 'take' or 'disturb' threatened flora listed under the BC Act without Ministerial approval.

Flora species that do not currently meet the criteria for listing as threatened but are potentially rare or threatened may be added to the DBCA's *Priority Flora List*. These species are classified into 'priority' levels based on threat. Whilst priority species are not under direct statutory protection, they are considered during State approval processes. Further information on threatened and priority species and their categories is provided in Appendix A.

2.7.2 Threatened and priority ecological communities

An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. An ecological community's structure, composition and distribution are influenced by environmental factors such as soil type, position in the landscape, altitude, climate and water availability (DoEE 2019b). 'Threatened ecological communities' (TECs) are ecological communities that are recognised as rare or under threat and therefore warrant special protection.

Selected TECs are afforded statutory protection at a Commonwealth level under the EPBC Act. Similar to flora species, TECs listed under the EPBC Act are assigned a conservation status. Any action likely to have a significant impact on a community listed under the EPBC Act requires Ministerial approval.

TECs are also listed within Western Australia under the BC Act and the BC Regulations. Their significance is also acknowledged through other state 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*.

A plant community that is under consideration for listing as a TEC in Western Australia, but does not yet meet survey criteria or has not been adequately defined, may be listed as a 'priority ecological community' (PEC). Listing as a PEC is similarly considered during State approval processes. Further information on categories of TECs and PECs is provided in Appendix A.

2.7.3 Local and regional significance

Flora species and ecological communities may be significant for a number of reasons irrespective of whether they have special protection under policy or legislation.

Two reasons that vegetation within the site may be significant are listed below:

- The vegetation within the site has potential value as habitat for threatened or priority fauna species including, in particular, Carnaby's black cockatoo and the forest red-tailed black cockatoo, which are listed as 'vulnerable' under the EPBC Act and 'endangered' under the BC Act.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

- The vegetation supports flora species Listed in *Bush Forever* 'significant flora' list for the Bassendean dunes (Government of WA 2000).

2.7.4 Weeds

The term 'weed' can refer to any plant that requires some form of action to reduce its effect on the economy, the environment, human health and amenity. Many non-native flora species and some native species are considered to be weeds.

A particularly invasive or detrimental weed species may be listed as a 'declared pest' pursuant to Western Australia's *Biosecurity and Agriculture Management Act 2007* (BAM Act), indicating that it warrants special management to limit its spread. At a National level, the Australian government has compiled a list of 32 *Weeds of National Significance* (WoNS) (DoEE 2019c). Whilst the WoNS list is non-statuatory, many WoNS are also listed under the BAM Act. Further information on categories of declared pests is provided in Appendix A.

Due to historical disturbance weed species are expected to be present at the site.

2.8 Bush Forever

The Government of Western Australia's *Bush Forever* policy is a strategic plan for conserving regionally significant bushland within the Swan Coastal Plain portion of the Perth Metropolitan Region. The objective of *Bush Forever* is to protect comprehensive representations of all original ecological communities by targeting a minimum of 10% of each vegetation complex for protection (Government of WA 2000). *Bush Forever* sites are representative of regional ecosystems and habitat and have a key role in the conservation of Perth's biodiversity.

No *Bush Forever* sites occur within the site. Multiple *Bush Forever* sites occur to the east and west of the site.

2.9 Ecological linkages

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. This exchange of genetic material between vegetation remnants improves the viability of those remnants by allowing greater access to breeding partners and food sources, refuge from disturbances such as fire and maintenance of genetic diversity of plant communities 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 Perth Biodiversity Project, supported by the Western Australia Local Government Association (WALGA), have identified and mapped regional ecological linkages within the Perth Metropolitan Region (WALGA and PBP 2004).

There are no mapped ecological linkages within the site. One biodiversity ecological linkage (no. 48) is located approximately 800 m to the north of the site and extends to the west and east.

2.10 Previous surveys

No previous flora and vegetation surveys are known to have been undertaken within the site.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

3 Methods

3.1 Desktop assessment

3.1.1 Database searches

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.

3.2 Field survey

An ecologist from Emerge visited the site on 11 March 2020, 19 August, 9 September, 7 and 28 October 2021 to conduct the flora and vegetation field surveys.

3.2.1 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 non-permanent relevés. Each relevé was completed over an approximately 10 x 10 m area. A total of three relevés were sampled and the position of each sample location was recorded with a hand-held GPS unit, as shown in Figure 3. The data recorded within each relevé 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, degree of disturbance and species present).

Additional plant taxa not observed within samples were recorded opportunistically as the ecologist 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 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 methods from Keighery (1994). 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' (TSSC 2016) 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 (TSSC 2016)	
		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%

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

3.3 Mapping and data analysis

3.3.1 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.

3.3.2 Plant community identification and description

The local 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) (ESCAVI 2003). 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 locations and notes recorded during the field survey to define areas with differing condition.

3.3.3 Floristic community type assignment

Where possible, each plant community was assigned a 'floristic community type' (FCT), as defined by Gibson *et al.* (1994). This was determined by comparing the flora species recorded within each sample to those in the regional datasets *A floristic survey of the southern Swan Coastal Plain* Gibson *et al.* (Gibson *et al.* 1994) and *Weed and Native Flora Data for the Swan Coastal Plain* (Keighery *et al.* 2012). No statistical FCT analysis was undertaken due to the high level of disturbance across most of the site and small size of vegetation patches in better quality.

Ultimately the flora species present and contextual information relating to the soils, landforms and known locations of FCTs within the region were used to determine the appropriate FCT for vegetation within the site.

3.3.4 Threatened and priority 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 provided in the following document:

- *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community (TSSC 2016).*

3.4 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	The broad scale contextual information described in Section 2 is adequate to place the site and vegetation in context.
		No previous relevant surveys are known to have been undertaken within the site.
	No limitation	Regarding assignment of FCTs, the authoritative Gibson *et al.* (1994) dataset was derived from a necessarily limited sample of vegetation from largely publicly owned land which is now more than 20 years out of date. Consequently, it is unknown to what degree official FCTs are appropriate reference to biodiverse vegetation across the Swan Coastal Plain. In lieu of an alternative and as recommended by DBCA, the Gibson *et al.* (1994) dataset was used to assign an FCT where possible. Comparison of species in the patches of vegetation in better condition with the Gibson *et al.* (1994) dataset, in combination with soils, landforms and known locations of FCTs within the region, was sufficient to assign an FCT.
Experience level of personnel	No limitation	This flora and vegetation assessment was undertaken by qualified botanists with 6-11 years of botanical experience in Western Australia. Technical review was undertaken by a senior environmental consultant with 18 years' experience in environmental science in Western Australia.
Suitability of timing	No limitation	The survey was conducted in March 2020 and August, September and October 2021 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 most plant species would have been in flower and/or visible at the time of survey. The degraded nature of most of the site limits the potential habitat for native geophytic plants such as orchids and the majority of threatened and priority flora species with potential to occur are perennial species. Nevertheless, some orchid species were recorded and able to be identified to species level. No unidentified specimens were collected. The survey timing was considered adequate to allow the detection of all species for which seasonal timing is critical.
Temporal coverage	No limitation	Comprehensive flora and vegetation assessments can require multiple visits, at different times of year, and over a period of multiple, to enable observation of all species present. The portions of the site containing native vegetation were visited five times over two years and three seasons.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

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

Constraint	Degree of limitation	Details
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 131 species were recorded, comprising 80 native and 51 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 form aerial imagery and therefore species reliant on fire to emerge may not have been visible. However, this was not considered a limitation in regards to determining the presence of threatened or priority flora species.
	No limitation	Historical ground disturbance was evident in the majority 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 General site conditions

The site is gently undulating and comprises sandy white-grey soils. The site was recently used as a golf course and the fairways and lakes were irrigated at the time of the survey.

The site has been highly modified for its use as a golf course and is dominated by non-native vegetation and unvegetated areas. Small areas of remnant native vegetation occur as scattered patches of varying quality.

4.2 Flora

4.2.1 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 Appendix B.

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

4.2.2 Species inventory

A total of 80 native and 51 non-native (weed) species were recorded within the site during the field survey, representing 45 families and 103 genera. The dominant families containing native taxa were

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

Myrtaceae (15 native taxa and 13 weed taxa) and Fabaceae (12 native taxa and four weed taxa). A complete species list is provided in Appendix C.

4.2.3 Threatened and priority flora

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

The EmB vegetation described in Section 4.3.2 comprises suitable habitat for the threatened and priority flora species identified in Table 4. Targeted searches were undertaken for these species during the optimal survey period and they were not recorded. Therefore, no threatened or priority flora species are considered likely to occur in the site.

The likelihood of occurrence assessment is provided in Appendix B.

4.2.4 Locally and regionally significant flora

No locally or regionally significant flora species were recorded within the site.

4.2.5 Declared pests

No species listed as declared pests pursuant to the BAM Act or weeds of national significance (WoNS) were recorded in the site.

4.3 Vegetation

4.3.1 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 Appendix D.

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 woodlands of the Swan Coastal Plain' PEC (P3)
- '*Banksia ilicifolia* woodlands, southern Swan Coastal Plain' PEC (P3)
- 'Northern Spearwood shrublands and woodlands' PEC (P3).

4.3.2 Plant communities

Four plant communities were identified within the site. Plant community EmB exists as scattered patches in the northern, central and south-western portions of the site. Plant community TdSt exists as multiple small patches on the edges of artificial lakes and is considered to be likely planted or a combination of planted and naturally generated vegetation. Plant communities planted trees and shrubs and turf and bare ground exist across the site and were likely previously installed for the sites' historic use as a golf course.

The remainder of the site supports multiple artificial lakes, buildings and hardstand (2.3 ha).

A description and the area of each plant community is provided in Table 5, representative photographs of each are provided in Plate 1 to Plate 4 and raw sample data is provided in Appendix E. The location of each plant community is shown in Figure 3.

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

Plant community	Description	Area (ha)
EmB	Woodland to open woodland *Eucalyptus marginata* subsp. *marginata*, *Banksia attenuata* and *Banksia menziesii* over mixed shrubland *Xanthorrhoea preissii*, *Allocasuarina humilis* and *Hibbertia hypericoides* over open sedgeland *Mesomelaena pseudostygia* over non-native grassland **Ehrharta calycina* (Plate 1).	1.9
TdSt	Closed sedgeland *Typha domingensis*, *Schoenoplectus tabernaemontani*, **Cortaderia selloana* and *Baumea* sp. (Plate 2).	0.2
Planted trees and shrubs	Predominantly scattered non-native planted trees and shrubs such as **Corymbia* spp., **Eucalyptus* spp., *Melaleuca* spp. and *Grevillea* spp. with occasional native plants (Plate 3).	13.6
Turf and bare ground	Closed non-native grassland (turf) and bare ground (Plate 4).	35.7

Plate 1: Plant community EmB in 'very good' condition

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

Plate 2: Plant community TdSt in 'good – degraded' condition

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

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

4.3.3 Vegetation condition

Plant community EmB comprises the most intact native vegetation within the site. Some of the EmB vegetation was mapped as being in 'very good' condition as they supported the general structure expected of a banksia woodland community and had moderate native species diversity. The remainder of the EmB vegetation was mapped as being in 'good' and 'degraded' condition where it was more disturbed with an altered structure, lower native species diversity and higher weed cover.

Plant community TdSt was mapped as being in 'good – degraded' condition as it comprises a combination of native and non-native species that only exist in the site due to the presence of the artificial lakes created for the previous golf course.

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 remainder of the site, which comprises artificial lakes, buildings and hardstand, were not assigned a condition category (2.3 ha).

The extent of vegetation by condition category is detailed in Table 6 and shown in Figure 4.

Table 6: Extent of vegetation condition categories within the site

Condition category (Keighery 1994)	Size (ha)
Pristine	0
Excellent	0
Very good	0.43
Good	0.69
Good – degraded	0.22
Degraded	0.80
Completely degraded	49.25

4.3.4 Floristic community types

Plant community EmB was determined to likely represent FCT 23a 'Central *Banksia attenuata – B. menziesii* woodlands'. This FCT is listed as 'well reserved' and 'low risk' by Gibson *et al.* (1994).

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

4.3.5 Threatened and priority ecological communities

The structure and composition of plant community EmB indicates that it has the potential to represent the Commonwealth listed TEC 'banksia woodlands of the Swan Coastal Plain' and the State listed PEC of the same name (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 2016).

As outlined in Table 7, the EmB vegetation does not satisfy the criteria to be considered a patch of the 'banksia woodland TEC' due to the small size of the patches.

Table 7: Criteria for determining presence of Banksia Woodlands of the Swan Coastal Plain TEC adapted from (TSSC 2016)

Criteria	Requirements for meeting criteria	Site implications
1. Must meet key diagnostic characteristics	A variety of factors relating to: • Location • Soils • Structure • Composition	• Site meets location and soils criteria. • The EmB vegetation includes the key diagnostic feature of a tree layer of *Banksia attenuata, Banksia menziesii* and *Banksia ilicifolia*. • The EmB 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.
2. Must meet condition thresholds	• A patch should at least meet the 'good' condition category (see Table 1)	• The EmB 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 patches of EmB vegetation that are adjacent to each other would be considered part of the same patch. Therefore, six 'patches' of EmB vegetation exist within the site.
3. 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 six patches of EmB vegetation are each less than 1 ha in size and do not meet this criterion.
4. 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)	• The patches of EmB vegetation are isolated from other banksia woodland and no relevant surrounding context considerations apply.
Result	The site does not support any vegetation that represents the banksia woodland 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 2020b). Since the EmB vegetation does not represent the banksia woodland TEC it also does not represent the PEC.

No other TECs or PECs occur within the site.

4.3.6 Locally and regionally significant vegetation

Plant communities EmB and planted trees and shrubs contain multiple foraging species for threatened species of black cockatoo. In addition, a small number of mature *Corymbia calophylla*, *Eucalyptus marginata* and **Eucalyptus* sp. trees with a diameter at breast height larger than 500 mm are also present within plant communities EmB and planted trees and shrubs. Due to their size these

trees have the potential to provide some value as foraging, roosting and breeding habitat values for black cockatoos, along with other ecological services.

5 Discussion

The site has been highly modified and approximately 92% supports vegetation in 'completely degraded' condition. Native vegetation exists as scattered patches that extend over approximately 4% of the site. The remaining 4% of the site comprises artificial lakes, buildings and hardstand. The highest quality vegetation exists within plant community EmB.

5.1 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 was most likely that they would have been found within the EmB 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 EmB 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 *Drakaea elastica*, *Thelymitra variegata* and *Caladenia huegelii* can be more difficult to detect. Intensive targeted searches were carried out in August, September and October 2021 to search for *Drakaea elastica*, *Thelymitra variegata* and *Caladenia huegelii*. The searches were conducted during the main growing and flowering period for these species and so they would have been visible, if present. Since these species were not recorded the surveys are considered sufficient to conclude that they do not occur in the site.

5.2 Vegetation condition

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 (2016).

Compound condition categories were applied where the patch of vegetation supported a mosaic of small areas in differing condition and at fine-scale unsuitable for mapping.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

5.3 Floristic community type assignment

Although no statistical FCT analysis was undertaken, the flora species within the EmB vegetation are similar to those recorded within Gibson *et al.* (1994) sites that represent 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.

5.4 Threatened and priority ecological communities

Arriving at the conclusion that the EmB vegetation does not represent the banksia woodland TEC/PEC was straightforward as the small patches of this vegetation do not meet defined size thresholds.

5.5 Wetlands

The two mapped multiple use wetlands located adjacent to the south-western portion of the site comprise residential lots and extend over portions of the Kwinana Freeway (UFI 6655) and Berrigan Drive (UFI 6654) (Figure 2). Neither of these mapped wetlands contain any native wetland vegetation in proximity to the site.

5.6 Local and regional significance

Suitable habitat for threatened species of black cockatoo were opportunistically recorded within the site. A separate fauna assessment has been undertaken to determine the fauna habitat within the site and whether other fauna species of conservation significance are likely to occur (Emerge Associates 2021).

6 Conclusions

Over 95% of the site has been highly disturbed and modified from its remnant state, with approximately 2.3 ha supporting artificial lakes, buildings and hardstand and 49.2 ha supporting non-native vegetation (planted trees and shrubs and turf and bare ground) in 'completely degraded' condition. The remainder of the site supports remnant native vegetation (1.9 ha) and riparian vegetation that is likely planted or a combination of planted and naturally regenerated (0.2 ha).

No threatened or priority flora species were recorded within the site and none are considered likely to occur.

No TECs or PECs occur within the site and none are considered likely to occur.

Prepared for ECP Acquisitions 6 Pty Ltd Doc No.: EP20-009(03)--002D RAW| Version: D
Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

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.

Churchward, H. M. and McArthur, W. M. 1980, *'Landforms and Soils of the Darling System, Western Australia'*, in Department of Conservation and Environment (ed.), *Atlas of Natural Resources Darling System Western Australia*, Department of Conservation and Environment.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017a, *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) 2017b, *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) 2020a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*.

Department of Biodiversity Conservation and Attractions (DBCA) 2020b, *Priority Ecological Communities for Western Australia Version 30*.

Department of the Environment and Energy (DoEE) 2016, *Banksia Woodlands of the Swan Coastal Plain in Community and Species Profile and Threats Database*, Canberra.

Department of Water (DoW) 2008, *LiDAR Elevation Dataset, Swan Coastal Plain*, Perth.

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

Emerge Associates 2021, *Level 1 Fauna Assessment - Former Glen Iris Golf Course*, EP20-009(04)--004A RAW, Version A.

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) 2016, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Perth.

ESCAVI 2003, *Australian Vegetation Attribute Manual: National Vegetation Information System, Version 6.0*, Department of the Environment and Heritage, Canberra.

Gibson, N., Keighery, B., Keighery, G., Burbidge, A. and Lyons, M. 1994, *A Floristic survey of the southern Swan Coastal Plain*, Department of Conservation and Land Management and the Conservation Council of Western Australia, Perth.

Government of WA 2000, *Bush Forever - Volume 1: Policies, principles and processes*, Perth.

Government of Western Australia 2019, *2018 South West Vegetation Complex Statistics. Current as of March 2019*, WA Department of Biodiversity, Conservation and Attractions, Perth.

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

Heddle, E. M., Loneragan, O. W. and Havel, J. J. 1980, *'Vegetation Complexes of the Darling System Western Australia'*, in Department of Conservation and Environment (ed.), *Atlas of Natural Resources Darling System Western Australia*, Perth.

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.

Keighery, B. J., Keighery, G. J., Longman, V. M. and Clarke, K. A. 2012, *Weed and Native Flora Data for the Swan Coastal Plain*, Departments of Environmental Protection and Conservation and Land Management, Western Australia.

Kendrick, G. W., Wyrwoll, K. H. and Szabo, B. J. 1991, *Pliocene-Pleistocene coastal events and history along the western margin of Australia*, Quaternary Science Reviews, 10: 419-439.

Purdie, B., Tille, P. and Schoknecht, N. 2004, *Soil-landscape mapping in south-Western Australia: an overview of methodology and outputs. Resource Management Technical Report 280*, State of Western Australia.

Seddon, G. 2004, *A Sense of Place: a response to an environment, the Swan Coastal Plain Western Australia*, Blooming Books, Melbourne.

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.

Threatened Species Scientific Committee (TSSC) 2016, *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community*.

Western Australian Local Government Association and Perth Biodiversity Project (WALGA and PBP) 2004, *Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region*, Perth.

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

7.2 Online references

Bureau of Meteorology (BoM) 2020, *Climate Averages,* viewed 20 May 2020, <http://www.bom.gov.au/climate/data/>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2020, *NatureMap,* viewed 27 March 2020 <https://naturemap.dbca.wa.gov.au/>.

Department of Agriculture, Water and the Environment (DAWE) 2020a, *Protected Matters Search Tool*, viewed 27 March 2020, <https://www.environment.gov.au/epbc/protected-matters-search-tool>.

Department of Agriculture, Water and the Environment (DAWE) 2020b, *Threatened Ecological Communities*, viewed 20 June 2020, <http://www.environment.gov.au/biodiversity/threatened/communities/about>.

Department of Agriculture, Water and the Environment (DAWE) 2020c, *Weeds of National Significance*, viewed 12 July 2020, <http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html>.

West Australian Land Information Authority (WALIA) 2020, *Landgate Map Viewer*, viewed 27 March 2020, <http://landgate.wa.gov.au>.

Western Australian Herbarium 2020, *FloraBase – the Western Australian Flora*, Department of Biodiversity, Conservation and Attractions (DBCA), viewed 20 May 2020 <https://florabase.dpaw.wa.gov.au/>.

Figures

Figure 1: Site Location

Project: Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course
Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)--F02
Drawn: RAW
Date: 18/05/2020
Checked: RAW
Approved: TAA
Date: 16/06/2020

0 100 200
Metres
Scale: 1:10,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

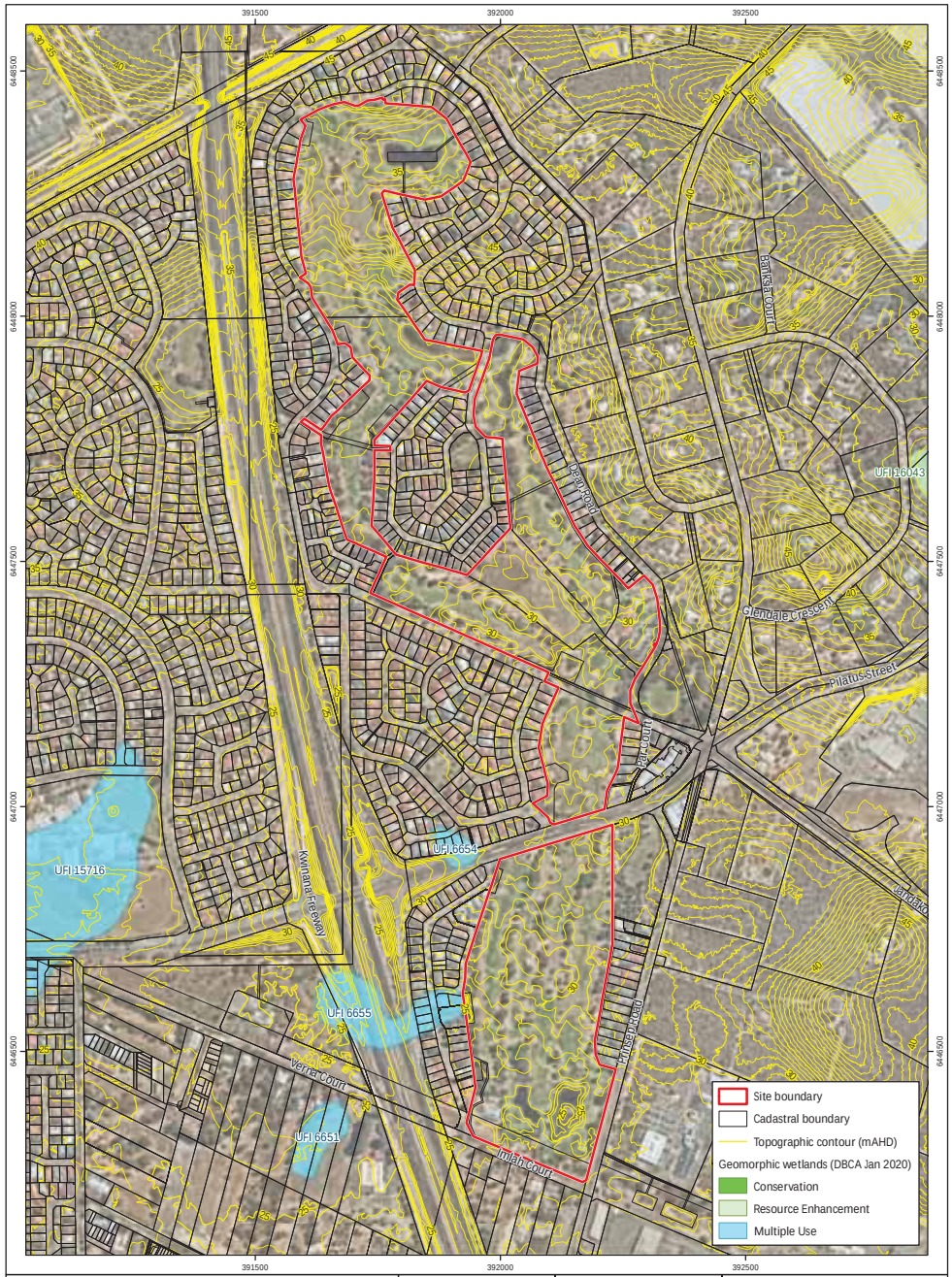


Figure 2: Environmental Features

Project: Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course
Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)--F03
Drawn: RAW
Date: 18/05/2020
Checked: RAW
Approved: TAA
Date: 16/06/2020

0 100 200
Metres
Scale: 1:10,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

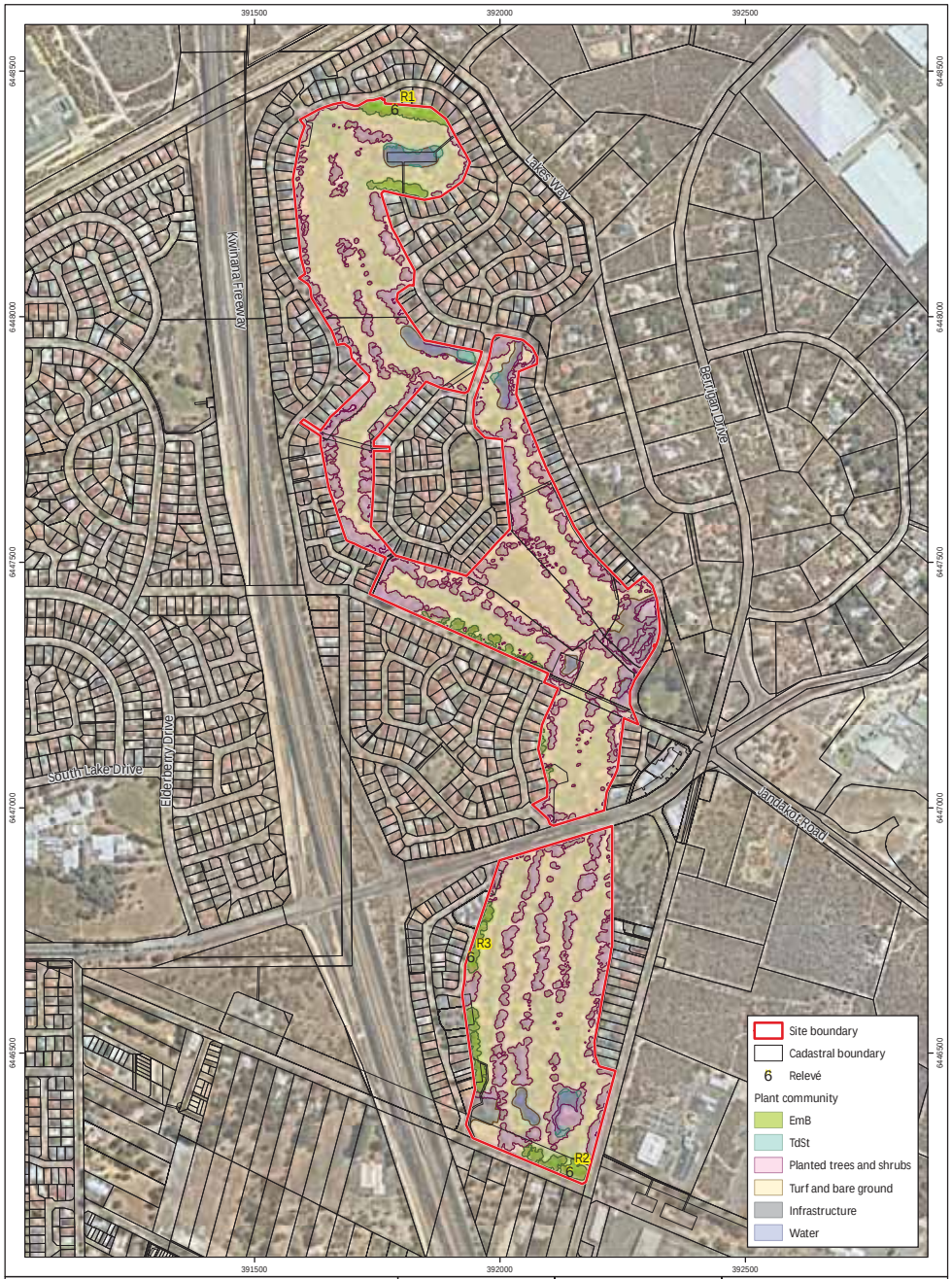


Figure 3: Plant Communities

Project: Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course

Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)--F04a
Drawn: GAR
Date: 14/09/2021
Checked: SKP
Approved: TAA
Date: 15/09/2021

0 100 200
Metres

Scale: 1:10,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

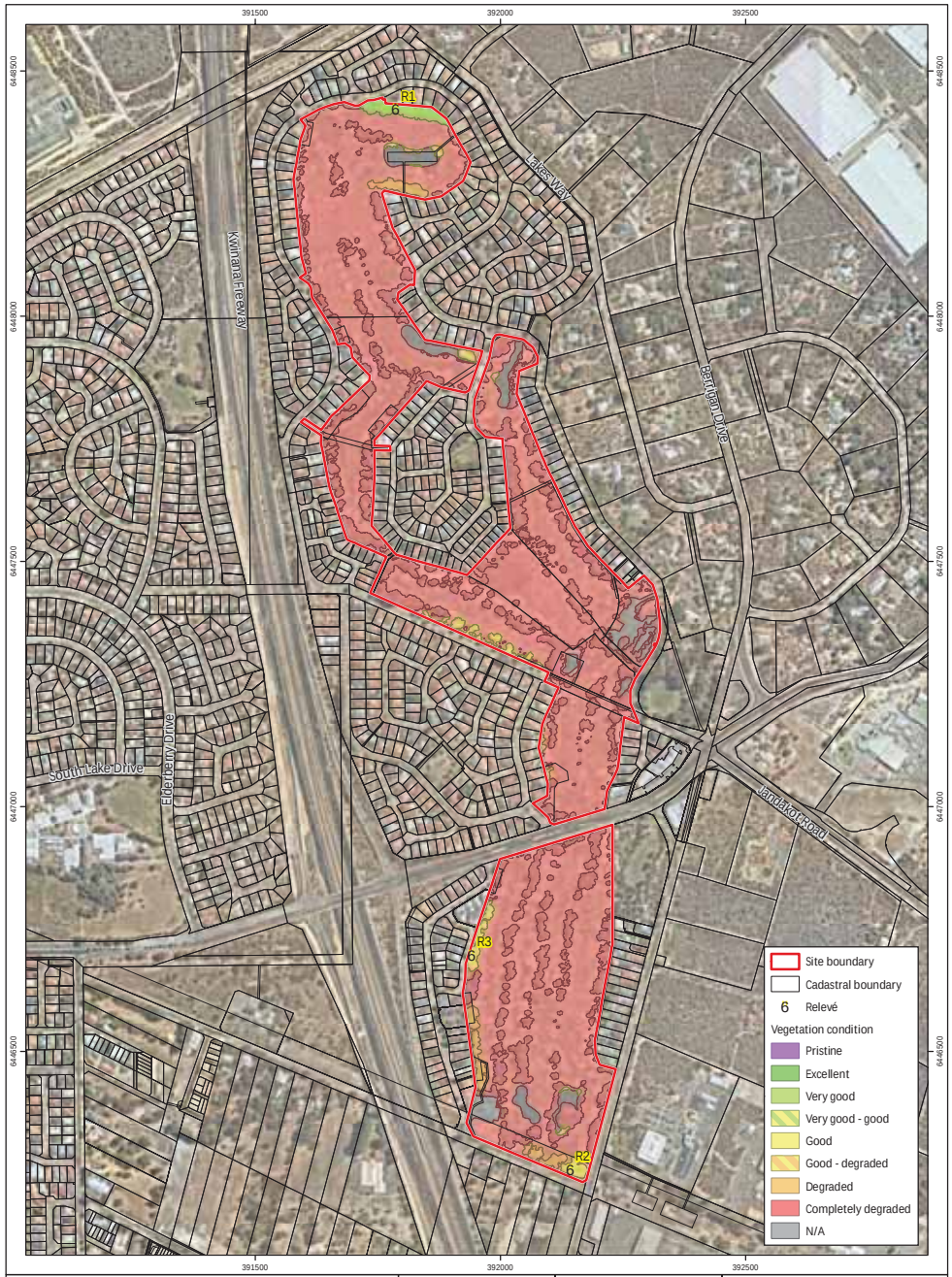


Figure 4: Vegetation Condition

Project: Detailed Flora and Vegetation Assessment
Former Glen Iris Golf Course
Client: ECP Acquisitions 6 Pty Ltd

Plan Number: EP20-009(03)--F05a
Drawn: GAR
Date: 14/09/2021
Checked: SKP
Approved: TAA
Date: 15/09/2021

0 100 200
Metres
Scale: 1:10,000@A4
GDA 1994 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 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Flora species considered 'threatened' pursuant to Schedule 1 of the EPBC Act are assigned categories according to their conservation status, as outlined in Table 1.

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. 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. The definition of threatened flora under the BC Act is provided in Table 1.

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.

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 2018c). Priority flora species are considered during State approval processes. Priority flora categories and definitions are listed in Table 1.

Version: EMRG_FloraReport_Appendix (V009)
Additional Background Information

Table 1: Definitions of conservation significant flora species pursuant to the EPBC Act and BC Act and on DBCA's Priority Flora List (DBCA 2018c)

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 recognised as 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.

Within Western Australia 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 endorsed by the State Minister are published by DBCA (DBCA 2018b).

TECs are assigned to one of the categories outlined in Table 2 according to their status (in relation to the level of threat). TECs are afforded direct statutory protection at a State level under the BC Act and BC Regulations. Ecological communities are listed under Section 27(1) and 33 of the BC Act. Their significance is also acknowledged through other state 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*.

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 that is under consideration for listing as a TEC, but does not yet meet survey criteria or has not been adequately defined may be listed as a 'priority ecological community' (PEC). PECs are categorised as priority category 1, 2 or 3 as described in Table 3. Ecological communities that are adequately known and are rare but not threatened, or meet criteria for 'near threatened', or that have been recently removed from the threatened list, are placed in 'priority 4'. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in 'priority 5' (DEC 2013). Listed PECs are published by DBCA (DBCA 2017b).

Version: EMRG_FloraReport_Appendix (V009)
Additional Background Information

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.

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 4. Species assigned to the 'declared pest, prohibited - s12' category are placed in one of three control categories, as described in Table 5.

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 6.

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

Version: EMRG_FloraReport_Appendix (V009)
Additional Background Information

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 (2017a) 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 7.

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

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 8.

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

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 2017a) 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

Version: EMRG_FloraReport_Appendix (V009)
Additional Background Information

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) 2017a, *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) 2017b, *Priority Ecological Communities for Western Australia Version 27*, Species and Communities Branch, Department of Biodiversity, Conservation and Attractions.

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

Department of Biodiversity, Conservation and Attractions (DBCA) 2018b, *List of Threatened Ecological Communities endorsed by the Western Australian Minister for Environment*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018c, *Threatened and Priority Flora List 16 January 2018*, 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 Environment and 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>.

Version: EMRG_FloraReport_Appendix (V009)
Additional Background Information

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

Appendix B

Conservation Significant Flora Species and Likelihood of Occurrence Assessment

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	P	Low woodland on grey, clayey sand with lateritic pebbles (Pinjarra Plain) near winter wet flats.	Sep-Nov	Unlikely
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	P	Low woodland on grey, clayey sand with lateritic pebbles (Pinjarra Plain) near winter wet flats.	Sep-Nov	Unlikely
Andersonia gracilis	V	E	P	Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep-Nov	Unlikely
Caladenia huegelii	CR	E	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov	Unlikely
Diuris purdiei	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
Drakaea elastica	CR	E	PG	Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps.	Late Sep-Oct/Nove (survey Jul-Aug)	Unlikely
Eucalyptus x balanites	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
Grevillea curviloba subsp. incurva	EN	E	P	Sand, sandy loam. Winter-wet heath.	Aug-Sep	Unlikely
Lepidosperma rostratum	EN	E	P	Peaty sand and clay amongst low heath, in winter-wet swamps.	May-Jun (survey late Jun-Aug)	Unlikely
Macarthuria keigheryi	E	E	P	Low-lying winter-wet damp gey/white sands in open patches.	Sep-Dec, Feb-Mar	Unlikely
Thelymitra dedmaniarum	CR	E	PG	Red brown sandy loam with dolerite and granite outcrops.	Oct-Nov	Unlikely

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

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Jacksonia gracillima	P3	-	P	Sand, often adjacent to winter wet areas	Sep-Dec	Unlikely
Phlebocarya pilosissima subsp. pilosissima	P3	-	P	White or grey sand, lateritic gravel.	Aug-Oct	Unlikely
Pimelea calcicola	P3	-	P	sand, limestone, coastal ridges	Sep-Nov	Unlikely
Schoenus benthamii	P3	-	P	White, grey ands, sandy clay in winter wet flats and swamps	Oct-Nov	Unlikely
Schoenus capillifolius	P3	-	A	Brown mud in claypans	Oct-Nov	Unlikely
Schoenus pennisetis	P3	-	A	Grey or peaty sand in swamps and winter-wet depressions.	Aug-Sep	Unlikely
Stylidium aceratum	P3	-	A	Sandy soils in swamp heathland.	Oct-Nov	Unlikely
Stylidium paludicola	P3	-	P	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland	Oct-Dec	Unlikely
Styphelia filifolia	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Unlikely
Aponogeton hexatepalus	P4	-	P	Mud. Freshwater: ponds, rivers, claypans.	Jul-Oct	Unlikely
Dodonaea	P4	-	P	Sand, outcropping limestone.	Jul-Oct	Unlikely
Drosera occidentalis	P4	-	P	Flat, brown/white/yellow moist	Oct-	Unlikely
Hydrocotyle	P4	-	A	Floating in swamps.	Aug-Oct	Unlikely
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb	Unlikely
Kennedia beckxiana	P4	-	P	Sand or loam on granite hills and	Sep-Dec	Unlikely
Microtis quadrata	P4	-	PG	Sand, loam or peat in winter wet areas	Oct-Dec	Unlikely
Ornduffia submersa	P4	-	A	Sandy clay in inundated	Aug-Nov	Unlikely
Stylidium longitubum	P4	-	A	Seasonal wetlands.	Oct-Dec	Unlikely
Tripterococcus sp.	P4	-	P	Winter-wet areas on grey sand.	Oct-Feb	Unlikely
Verticordia lindleyi subsp. lindleyi	P4	-	P	Sand and sandy clay in winter wet areas.	May or Nov-Jan	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

Appendix C

Flora Species List

Family	Status	Species
Aizoaceae		
	*	*Carpobrotus edulis*
Anacardiaceae		
	*	*Schinus terebinthifolia*
Anarthriaceae		
		Lyginia imberbis
Apocynaceae		
		?Alyxia buxifolia
	*	*Nerium oleander*
Arecaceae		
	*	*Washingtonia filifera*
Asparagaceae		
		Lomandra caespitosa
		Lomandra hermaphrodita
		Sowerbaea laxiflora
Asteraceae		
	*	*Conyza bonariensis*
	*	*Hypochaeris ?glabra*
	*	*Lactuca seriata*
	*	*Sonchus oleraceus*
	*	*Ursinia anthemoides*
Casuarinaceae		
		Allocasuarina fraseriana
		Allocasuarina humilis
Chenopodiaceae		
		Rhagodia baccata subsp. baccata
Colchicaceae		
		Burchardia congesta
Convolvulaceae		
	*	*Ipomoea cairica*
Cupressaceae		
		Callitris preissii
Cyperaceae		
		Baumea sp.
	*	*Cyperus congestus*
		Lepidosperma sp.
		Mesomelaena pseudostygia
		?Schoenus sp.
		Schoenoplectus tabernaemontani
Dasypogonaceae		
		Dasypogon bromeliifolius
Dilleniaceae		
		Hibbertia huegelii
		Hibbertia hypericoides
Droseraceae		
		Drosera erythrorhiza
		Drosera menziesii

Family	Status	Species
Ericaceae		
		Conostephium pendulum
		Leucopogon sp.
		Styphelia propinqua
Fabaceae		
	*	*Acacia baileyana*
	*	*Acacia longifolia*
		Acacia pulchella
		Acacia rostellifera
		Acacia saligna
		Acacia stenoptera
		Bossiaea eriocarpa
		Daviesia nudiflora
		Daviesia triflora
		Gastrolobium capitatum
		Gompholobium tomentosum
		Hardenbergia comptoniana
		Jacksonia furcellata
		Jacksonia sternbergiana
	*	*Robinia sp.*
	*	*Trifolium sp.*
Geraniaceae		
	*	*Pelargonium capitatum*
Goodeniaceae		
		Dampiera linearis
		Lechenaultia biloba
		Scaevola canescens
		Scaevola repens
Haemodoraceae		
		Conostylis aculeata
		Conostylis setigera
		Phlebocarya ciliata
Hemerocallidaceae		
		Arnocrinum preissii
		Corynotheca micrantha var. micrantha
		Tricoryne elatior
Iridaceae		
	*	*Gladiolus caryophyllaceus*
	*	*Patersonia occidentalis*
Juncaceae		
		Juncus pallidus
Lamiaceae		
	*	*Salvia rosmarinus*
Loranthaceae		
		Nuytsia floribunda
Malvaceae		
	*	*Lagunaria patersonia*
Meliaceae		

Family	Status	Species
	*	*Melia azedarach*
Myrtaceae		
		Agonis flexuosa
		?Calytrix sp
		Corymbia calophylla
	*Pl	*Corymbia citriodora*
	*Pl	*Corymbia ficifolia*
	*Pl	*Corymbia maculata*
		Eremaea pauciflora
	*Pl	*Eucalyptus caesia*
	*Pl	*Eucalyptus camaldulensis*
		Eucalyptus gomphocephala var. gomphocephala
	*Pl	*Eucalyptus grandis*
		Eucalyptus marginata subsp. marginata
	*Pl	*Eucalyptus sideroxylon*
	*Pl	*Eucalyptus sp. 1*
	*Pl	*Eucalyptus sp. 2*
		Eucalyptus todtiana
	*Pl	*Eucalyptus utilis*
		Hypocalymma angustifolium
		Hypocalymma robustum
		Kunzea glabrescens
	*	*Leptospermum laevigatum*
	*Pl	*Lophostemon confertus*
	*Pl	*Melaleuca sp.*
		?Melaleuca systena
		Melaleuca thymoides
		Regelia ciliata
		Regelia inops
		Scholtzia involucrata
Nyctaginaceae		
	*	*Bougainvillea sp.*
Oleaceae		
	*Pl	*Olea europaea subsp. europaea*
Orchidaceae		
		Caladenia latifolia
		Microtis media
Pinaceae		
	*Pl	*Pinus sp.*
Poaceae		
	*	*Avena barbata*
	*	*Briza maxima*
	*	*Bromus diandrus*
	*	*Cenchrus clandestinus*
	*	*Cortaderia selloana*
	*	*Cynodon dactylon*
	*	*Ehrharta calycina*
	*	*Eragrostis curvula*

Family	Status	Species
	*	*Lagurus ovatus*
	*	*Paspalum dilatatum*
	*	*Sporobolus africanus*
Portulacaceae		
		Portulaca oleracea
Proteaceae		
		Adenanthos cygnorum
		Banksia attenuata
		Banksia ilicifolia
		Banksia menziesii
	*Pl	*Grevillea sp.*
		Persoonia saccata
		Petrophile linearis
	*Pl	*Protea sp.*
		Stirlingia latifolia
Restionaceae		
		Desmocladus flexuosus
		Hypolaena exsulca
Santalaceae		
		Exocarpos sparteus
Simaroubaceae		
	*	*Ailanthus altissima*
Thymelaeaceae		
		Pimelea suaveolens
Typhaceae		
		Typha domingensis
Violaceae		
		Hybanthus calycinus
Xanthorrhoeaceae		
		Xanthorrhoea preissii
Zamiaceae		
		Macrozamia fraseri

Note: * denotes non-native species, Pl denotes planted

Appendix D

Conservation Significant Communities and Likelihood of Occurrence Assessment

Conservation significant communities known or likely to occur within 10 km of the site
Former Glen Iris Golf Course

Code	Community name	TEC/PEC	Level of significance	
			State	EPBC Act
	Clay pans of the Swan Coastal Plain	TEC	VU/EN	CR
	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	TEC	-	CR
SCP22	*Banksia ilicifolia* 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 woodlands of the Swan Coastal Plain	TEC/PEC	P3	EN
	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

Appendix E

Sample Data

Vegetation Sample Data
Former Glen Iris Golf Course

Sample Name: R1

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R1: Page 2 of 3

Quadrat and landform details

Sample type:	releve	Size:	other
NW corner easting:	391786	NW corner northing:	6448422
Altitude (m):	N/A	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	flat
Time since fire:	> 5 yrs	Disturbance:	moderate - weeds
Soil type/texture	sand/	Bare ground (%):	10
Rocks (%) and type:	No rocks	Soil colour:	brown/white
Litter:	30% (leaves,branches,)	Vegetation condition:	very good

Vegetation Sample Data
Former Glen Iris Golf Course

Sample Name: R1

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R1: Page 2 of 3

Species Data
* denotes non-native species

Status	Confirmed name
	Acacia pulchella
	Acacia stenoptera
	Allocasuarina humilis
	Banksia attenuata
	Banksia menziesii
*	*Carpobrotus edulis*
	Conostephium pendulum
	Conostylis ?aculeata
	Dampiera linearis
	Daviesia nudiflora
	Desmocladus flexuosus
*	*Ehrharta calycina*
*	*Eragrostis curvula*
	Eucalyptus marginata subsp. marginata
	Gastrolobium capitatum
	Gompholobium tomentosum
*Pl	*Grevillea sp.*
	Hardenbergia comptoniana
	Hibbertia hypericoides
	Jacksonia furcellata
	Jacksonia sternbergiana
	Lepidosperma sp.
*	*Leptospermum laevigatum*
	Lyginia imberbis
	Mesomelaena pseudostygia
*	*Nerium oleander*
	Patersonia occidentalis
*	*Pelargonium capitatum*
	Petrophile linearis
	Phlebocarya ciliata
	Scaevola canescens
	Stirlingia latifolia
	Xanthorrhoea preissii
	Pimelea ?suaveolens subsp. suaveolens
	Tricoryne elatior

Sample Name: R1

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R1: Page 3 of 3

Conostylis setigera
Hybanthus calycinus
Sowerbaea laxiflora
Drosera menziesii
Hypocalymma robustum
Lomandra caespitosa

* = non-native, Pl=planted

Sample Name: R2

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R2: Page 2 of 2

Quadrat and landform details

Sample type:	releve	Size:	other
NW corner easting:	392142	NW corner northing:	6446258
Altitude (m):	N/A	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	flat
Time since fire:	no evidence	Disturbance:	moderate - weeds
Soil type/texture	sand/	Bare ground (%):	30
Rocks (%) and type:	No rocks	Soil colour:	brown/white
Litter:	15% (leaves,twigs,)	Vegetation condition:	very good

Sample Name: R2

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R2: Page 2 of 2

Species Data
* denotes non-native species

Status	Confirmed name
*	*Acacia longifolia*
	Allocasuarina fraseriana
	Burchardia congesta
*	*Cynodon dactylon*
	Dasypogon bromeliifolius
*	*Ehrharta calycina*
	Hypolaena exsulca
	Kunzea glabrescens
*	*Lagurus ovatus*
	Lyginia imberbis
	Melaleuca thymoides
	Scholtzia involucrata
	Xanthorrhoea preissii

* = non-native

Sample Name: R3

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R3: Page 2 of 2

Quadrat and landform details

Sample type:	releve	Size:	other
NW corner easting:	391941	NW corner northing:	6446696
Altitude (m):	N/A	Geographic datum/zone:	GDA94/Zone 50
Soil water content:	dry	Landform:	flat
Time since fire:	> 5 yrs	Disturbance:	moderate - weeds
Soil type/texture	sand/	Bare ground (%):	20
Rocks (%) and type:	No rocks	Soil colour:	brown/white
Litter:	20% (leaves,branches,)	Vegetation condition:	very good

Vegetation Sample Data
Former Glen Iris Golf Course

Sample Name: R3

Project no.: EP20-009
Date: 11/03/2020, 19/08/21, 9/9/21 Status Non-permanent
Author: TAA,SKP R3: Page 2 of 2

Species Data
* denotes non-native species

Status	Confirmed name
	Adenanthos cygnorum
	Allocasuarina humilis
	Banksia attenuata
	Banksia menziesii
	Callitris preissii
*	*Carpobrotus edulis*
	Conostephium pendulum
	Daviesia nudiflora
	Daviesia triflora
*	*Ehrharta calycina*
*Pl	*Eucalyptus caesia*
	Eucalyptus marginata subsp. marginata
	Gastrolobium capitatum
	Gompholobium tomentosum
	Hibbertia hypericoides
	Hypocalymma angustifolium
	Jacksonia furcellata
	Lomandra hermaphrodita
	Lyginia imberbis
	Macrozamia fraseri
	Mesomelaena pseudostygia
	Patersonia occidentalis
*	*Pelargonium capitatum*
	Persoonia saccata
	Scaevola repens
	Scholtzia involucrata
	Stirlingia latifolia
	Styphelia propinqua
	Caladenia latifolia
	Hypocalymma robustum

* = non-native, Pl=planted