FOCUSED VISION consulting

CABLE ROUTE, BYFORD

DETAILED FLORA AND VEGETATION ASSESSMENT

PUBLIC TRANSPORT AUTHORITY

AUGUST 2022

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EXECUTIVE SUMMARY

Focused Vision Consulting Pty Ltd (FVC) was commissioned by the Public Transport Authority of Western Australia (PTA) to undertake a flora and vegetation assessment of the Cable Route (survey area), to inform the impact assessment process.

A two-phase, detailed (formerly referred to as 'Level 2') flora and vegetation assessment with targeted flora and vegetation survey was carried out in accordance with the *Technical Guide Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a), by experienced botanists and ecologists, during early September and late October 2021.

The key findings and conclusions of the flora and vegetation assessment of the survey area are as follows:

- No Threatened flora species were recorded; however, one State-listed Priority species, *Johnsonia pubescens* subsp. *cygnorum* (P2) was recorded within vegetation type CcXpKa.
- Previously recorded Threatened flora species, *Synaphea* sp. Serpentine (G.R. Brand 103) and *Synaphea* sp. Pinjarra Plain (A.S. George 17182) were not observed within the survey area. The lack of records for previously recorded species is considered possibly due to degradation or the old age of some of the records, which may, in turn, be attributable to poor accuracy of recorded locations.
- The survey area has been subject to historic disturbances and a large proportion (29.98%) of the survey area has been cleared.
- No plants listed as a Declared Pest (DP) plant under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) were recorded.
- Seven vegetation units (four of which are remnant vegetation; BaXp, CcXp, CcXpKa and EwTo) were described and mapped within the survey area, consisting of six woodlands and one rehabilitated vegetation unit, with eleven units (five of which are also represented within the survey area) defined and mapped in the broader region (within a 500 m buffer of the survey area corridor).
- Eight Commonwealth or State-listed Threatened Ecological Communities (TECs) were identified through database searches as potentially occurring within the survey area. Of these, based on mapped occurrences with buffers applied, four TECs were considered most likely to occur, being floristic community types (FCTs) SCP 3a, 3b and 20b (the latter being part of Banksia woodlands TEC).
- The Marri/Xanthorrhoea woodland (CcXp) and the Marri/Xanthorrhoea/Kingia woodlands (CcXpKa) vegetation units have been inferred to be representative of Floristic Community Type (FCT) Swan Coastal Plain (SCP) 3b, the *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain, which is a State-listed (Vulnerable) TEC.
- None of the other vegetation units are considered to be representative of any Commonwealth-listed TECs or State-listed Priority Ecological Communities (PECs).
- The condition of the vegetation in the survey area ranges from 'Completely Degraded' to 'Excellent', with only 16.90% observed to be in 'Good' or better condition.
- The desktop assessment, field survey and floristic analysis determined that of the nine TECs or PECs potentially occurring in the survey area, only FCT SCP 3b is represented, which occurs within vegetation units CcXp and CcXpKa, together comprising 15.05 hectares (ha) (63.10% of the 23.85 ha survey area).

1. INTRODUCTION

Background

Focused Vision Consulting Pty Ltd (FVC) was commissioned by the Public Transport Authority of Western Australia (PTA) to undertake a flora and vegetation assessment of the Cable Route (survey area), to inform the impact assessment process.

1.1 LOCATION

The Cable Route survey area consists of a narrow corridor extending from Cardup Siding Road, along the existing South Western Railway adjacent to Soldiers Road, to Mundijong Junction within the Shire of Serpentine-Jarrahdale. It is situated approximately 35 km south-southeast of the Perth Central Business District (CBD) and has a total area of 23.85 ha, which is hereafter referred to as the survey area (**Figure 1**).

1.2 SCOPE OF WORK

A two-phase, detailed (formerly referred to as 'Level 2') flora and vegetation assessment with targeted flora and vegetation survey was carried out in accordance with the *Technical Guide Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a), with the key objectives to:

- define and map the vegetation present and its floral species composition
- determine the presence or absence of Threatened and Priority Ecological Communities
- determine the presence or absence of significant flora.

The field survey included, but was not limited to:

1. Detailed vegetation unit mapping of the survey area.
2. Detailed vegetation condition mapping of the survey area.
3. Determination of the presence of critical habitat for and/or if the survey area hosts Threatened flora.
4. Compilation of an inventory of all flora taxa recorded within the survey area, including introduced species.
5. Photographs of representative FCTs.
6. Track log records included in the report as a figure for the survey area.
7. Adequate quadrat sampling to allow analysis of the data to be undertaken (as per Department of Biodiversity Conservation and Attractions (DBCA) 2021a, Draft *Vegetation survey methods and analysis to determine floristic community types on the southern Swan Coastal Plain*).

FCT analysis of the data collected was required to determine which of the Gibson *et al.* (1994) sites are most similar to the surveyed vegetation and hence which FCTs have greatest affinity to the vegetation, as per DBCA (2021a).

A comprehensive report (this report) was required to be prepared, outlining the following:

1. the findings of the desktop review
2. the field survey method(s) used
3. the field survey results
4. figures and track logs
5. conclusions regarding potential environmental impacts to flora and vegetation values.

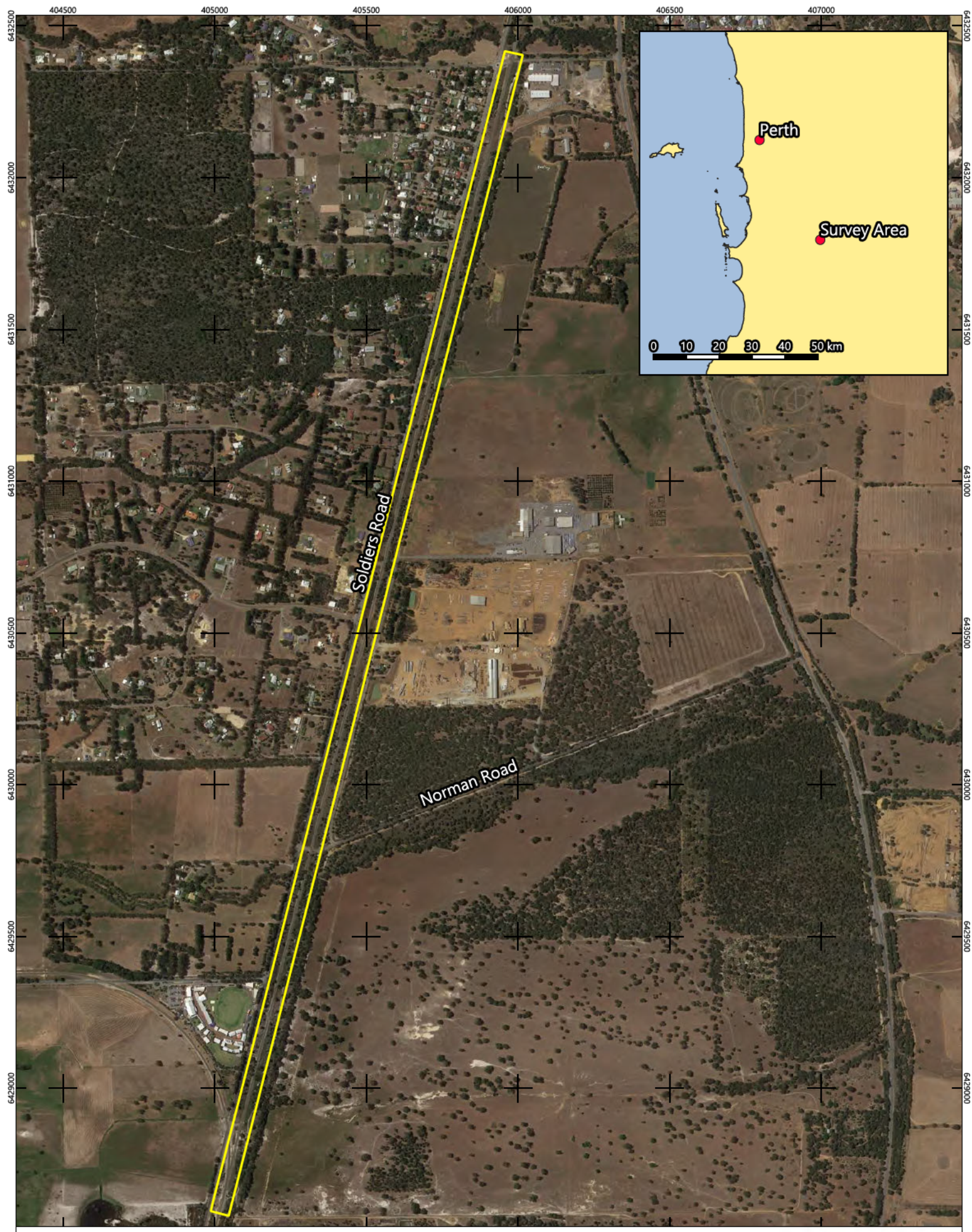

Figure 1 - Survey Area

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2. LEGISLATIVE CONTEXT

The flora and vegetation assessments were conducted in accordance with the following legislation:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Western Australian *Environmental Protection Act 1986* (EP Act)
- Western Australian *Biodiversity Conservation Act 2016* (BC Act).

The assessments complied with requirements for environmental survey and reporting in Western Australia, as outlined in:

- EPA (2008) *Guidance Statement No. 33: Environmental Guidance for Planning and Development*
- EPA (2016a) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*
- EPA (2016b) *Environmental Factor Guideline – Flora and Vegetation.*

2.1 THREATENED AND PRIORITY FLORA

The DBCA assigns conservation status to endemic plant species that are geographically restricted to few known populations or threatened by local processes. Allocating conservation status to plant species assists in protecting populations and conserving species from potential threats (DBCA 2018a).

The BC Act provides a statutory basis for the listing of threatened ecological communities (TECs), threatened and specially protected species, critical habitat and key threatening processes (DBCA 2021a). Whilst not awarded any statutory protection, the DBCA maintains the Priority flora list, for species of conservation concern. Therefore, both Threatened and Priority flora are important focuses of flora and vegetation surveys and their definitions are presented in **Table 1**.

Table 1 – Definitions of Threatened and Priority Flora Species (DBCA 2019)

Conservation Code	Category
T	**Threatened Species** Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the BC Act. Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
P1	**Priority 1 – Poorly Known Species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	**Priority 2 – Poorly Known Species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	**Priority 3 – Poorly Known Species** Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	**Priority 4 – Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species 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 species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Species at risk of extinction are recognised as Threatened at a Commonwealth level and are categorised according to the EPBC Act as summarised in **Table 2**.

Table 2 - Categories of EPBC Act Threatened Flora Species (DBCA 2019)

Conservation Code	Category
EX	**Extinct** Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
EW	**Extinct in the Wild** Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
CR	**Critically Endangered** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	**Endangered** Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	**Vulnerable** Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.

Any species listed in State and Commonwealth legislation as being of conservation significance is broadly considered to be a significant species. This incorporates species that are endangered, vulnerable and rare or covered by international conventions. Significance is not limited to species covered by State and Commonwealth legislation but also includes species of local significance and species showing significant range extensions or at the edge of their known range.

2.2 THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

Threatened Ecological Communities (TECs) are naturally occurring biological assemblages that occur in a particular type of habitat, which are subject to processes that threaten to destroy or significantly modify the assemblage across its range (DEC 2007).

The Minister for the Environment may list an ecological community as a TEC in one of the following categories: Presumed Totally Destroyed (PD), Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). A publicly available database listing TECs within Western Australia (WA) is maintained by DBCA.

TECs in WA are protected under the State BC Act and some are also protected under the Commonwealth EPBC Act. The TECs on the Commonwealth register are also listed on the Department of Agriculture, Water and Environment (DAWE) website, and in the Protected Matters Database (DAWE 2021b, 2021c).

Additional to TECs, ecological communities that are considered potentially of conservation significance (and potentially TECs) that do not currently meet survey criteria or that are not adequately defined, are rare but not threatened, have been recently removed from the TEC list or require regular monitoring, are considered to be PECs (DEC 2013) and are required to be taken into consideration during environmental impact assessments.

2.3 VEGETATION OF SIGNIFICANCE

Alongside and in addition to significance according to statutory listings, vegetation may be considered significant at a National, State, regional or local level.

2.3.1 Nationally Significant Vegetation

Vegetation communities may be considered to be of National significance where they support the following Commonwealth listed Matters of National Environmental Significance (MNES):

- populations of Threatened (EPBC listed) species
- TECs listed as nationally (EPBC) significant
- RAMSAR Wetlands of International Importance (DAWE 2021d).

2.3.2 State Significant Vegetation

Vegetation communities may be considered to be of State significance where they:

- support State listed Threatened flora, fauna and TECs afforded protection under the BC Act (EPA 2008, WALGA 2004a)
- occur within the State-managed conservation estate (areas protected under the *Conservation and Land Management Act 1984*) or areas that have been formally recommended by the DBCA for inclusion in the State conservation estate (EPA 2008).

2.3.3 Regionally Significant Vegetation

Vegetation communities may be considered to be of regional significance where they:

- support populations of Priority Flora or ecological communities (EPA 2016b, Government of Western Australia 2000a)
- are formally protected or recognised as Environmentally Sensitive Areas (ESAs), or under planning schemes for conservation, such as Bush Forever (EPA 2008, WALGA 2004a)
- support conservation category wetlands including associated vegetation (Government of Western Australia 2000a and 2000b)
- maintain important ecological processes or significant ecosystems (EPA 2016b)
- support high diversity of flora, fauna, communities, or community structure (Government of Western Australia 2000a)
- contain flora species of restricted distribution, species exhibiting range extensions and undescribed species (EPA 2016b)
- have a restricted regional distribution (EPA 2016b)
- are represented by less than 30% of their pre-European extent (Commonwealth of Australia 2001).

2.3.4 Locally Significant Vegetation

Vegetation communities may be considered to be locally significant where they:

- occur as small, isolated communities (Government of Western Australia 2000a, WALGA 2004a)
- have a restricted local extent (proportion) (EPA 2016b) and/or are locally restricted to only one or a few locations (WALGA 2004a).

2.4 VEGETATION CLEARING, EXTENT AND STATUS

Clearing of native vegetation is regulated in WA under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Any clearing of native vegetation is an offence, unless carried out under a clearing permit or if the clearing is for an exempt purpose (DWER 2018). A clearing permit may be required under Part V of the EP Act, whereby permit applications to clear native vegetation must be assessed against the '10 Clearing Principles' as outlined in the regulations (DER 2014).

Where clearing of native vegetation is proposed to occur, there are several key criteria applied to the assessment of clearing permit applications, in the interests of biodiversity conservation (DER 2014).

The objective of the EPA in relation to flora and vegetation is 'to protect flora and vegetation so that biological diversity and ecological integrity are maintained' (EPA 2016a). This objective is documented in the EPA Factor Guideline - Flora and Vegetation (EPA 2016a). The EPA considers it is important that ecological communities are maintained above the threshold level of 30% of the original pre-clearing extent of the community in unconstrained areas and 10% within 'constrained' areas (EPA 2008).

2.5 ENVIRONMENTALLY SENSITIVE AREAS

Environmentally Sensitive Areas (ESAs) are areas that require special protection due to aspects such as landscape, fauna or historical value and are generally considered to be areas of high conservation value. ESAs are declared in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, which was gazetted on 8 April 2005 (Government of Western Australia 2005).

There are several types of ESAs relating to flora and vegetation, declared under Part V of the EP Act, which include:

- a defined wetland and the area within 50 m of that wetland
- the area covered by vegetation within 50 m of rare (Threatened) flora, to the extent where the vegetation is continuous with the vegetation in which the rare (Threatened) flora is located
- the area covered by a TEC
- Bush Forever sites.

2.6 INTRODUCED FLORA

Over 1,200 introduced (weed) species have been recognised to occur within Western Australia (EPA 2007). Weeds are plants that are not indigenous to an area and have been introduced either directly or indirectly through human activity. They establish in natural ecosystems and adversely modify natural processes, have the potential to dominate and simplify the ecosystems and thus decrease habitat value provided for native fauna. Weeds pose a threat to many native flora species due to their ability to rapidly grow and out-compete for available water, space, sunlight, and nutrients (EPA 2007).

2.6.1 Weeds of National Significance

Under the National Weed Strategy, there are currently 32 weed species listed as Weeds of National Significance (WoNS) (DAWE 2021e). Each weed listed was considered for inclusion based on the following criteria:

- invasive tendencies
- impacts
- potential for spread
- socioeconomic and environmental values.

2.6.2 Declared Pest Plants

The Western Australian Organism List (WAOL) details organisms listed as Declared Pests (DPs), including pest plants, under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) (Department of Primary Industries and Regional Development (DPIRD) 2021). Under the BAM Act, DPs are listed under one of the following categories:

- **C1 (exclusion)**, that applies to pests not established in Western Australia; control measures are to be taken to prevent their entry and establishment
- **C2 (eradication)**, that applies to pests that are present in Western Australia but in low numbers or in limited areas where eradication is still a possibility
- **C3 (management)**, that applies to plants that should have some form of management applied that will alleviate the harmful impacts of the plant, reduce the numbers or distribution of the plant, or prevent or contain the spread of the plant (DPIRD 2017).

2.6.3 Environmental Weeds

Introduced flora species have also been ranked by a number of attributes, including invasiveness, distribution and environmental impacts in the various regions in the *Environmental Weed Strategy* (Department of Conservation and Land Management (CALM) 1999). To advance the above categorisation, the Invasive Plant Prioritisation Process for DBCA was developed in 2008 (Department of Parks and Wildlife (DPAW) 2013).

3. EXISTING ENVIRONMENT

3.1 CLIMATE

The survey area occurs on the Swan Coastal Plain, which has a warm Mediterranean climate, characterised by hot, dry summers and cool to mild wet winters (Mitchell *et al.* 2002). The Bureau of Meteorology (BoM) Jandakot Aero weather station (site 009172) is closest (approximately 19 km north-west) of the survey area and has been operating since 1972. The average annual long-term rainfall recorded at the station is 811.5 mm. The annual mean maximum temperature ranges from 19.1°C in winter to 31.5°C in summer (**Figure 2**). Rainfall data for the three months preceding the September field assessment indicates that July recorded well above average monthly rainfall, whilst June and August recorded below average monthly rainfall. Despite this, climatic conditions were considered optimal in the context of seasonal conditions for spring flora and vegetation assessments (**Figure 2**).

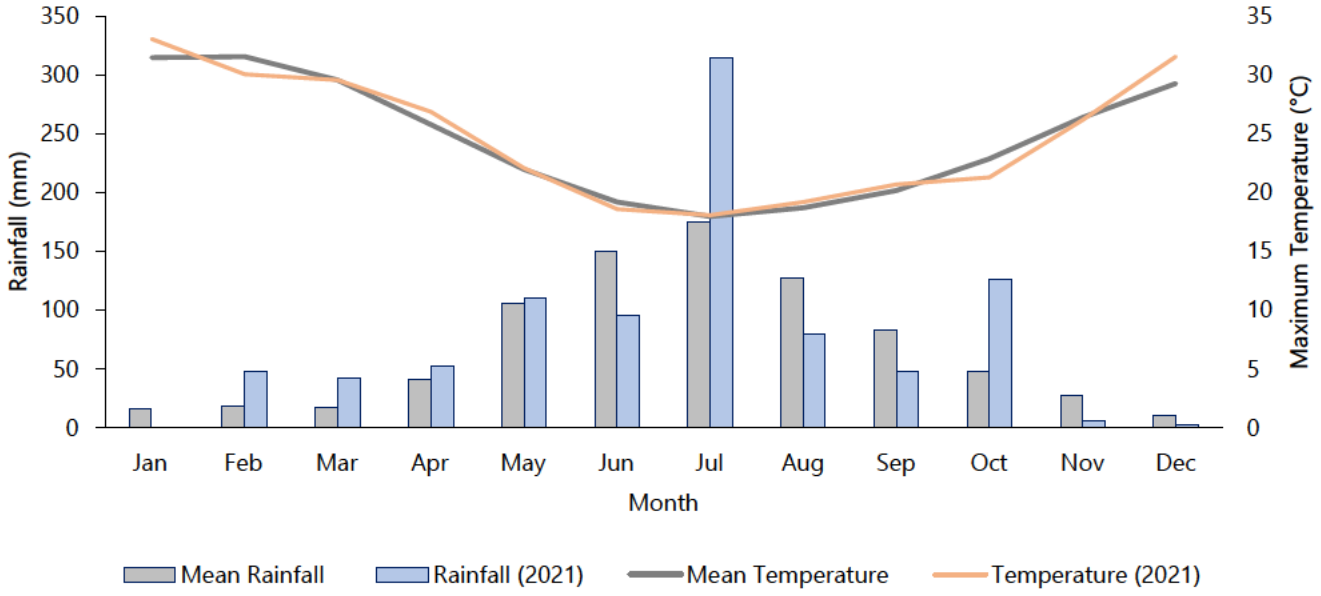

Figure 2 - Climate Data for Jandakot Aero Weather Station (Site 009172) (BoM 2021)

3.2 IBRA REGION

There are 89 recognised Interim Biogeographic Regionalisation for Australia (IBRA) regions across Australia that have been defined based on climate, geology, landforms and characteristic vegetation and fauna (DAWE 2021f). The survey area lies within the Swan Coastal Plain IBRA region (SWA) and, at a finer scale, within the Perth subregion (Mitchell *et al.* 2002).

The Swan Coastal Plain bioregion is a low-lying coastal plain, mainly covered with *Banksia* and Tuart woodlands on sandy soils. Swampy areas are dominated by paperbark, and outwash plains by *Casuarina obesa*. *Melaleuca* shrublands and *C. obesa* - Marri woodlands are located extensively in the south, while Jarrah woodland dominates duricrusted Mesozoic sediments to the east.

The Perth subregion is comprised of colluvial and aeolian sands, alluvial river flats, coastal limestone and heath and/or Tuart woodlands on limestone, *Banksia* and Jarrah-*Banksia* woodlands on Quaternary marine dunes of varying ages, Marri on colluvial and alluvial soils, and seasonal wetlands (Mitchell *et al.* 2002).

3.3 GEOLOGY AND SOILS

The Swan Coastal Plain supports five major geomorphological systems (landforms) that lie parallel to the coast. From west to east these are; Quindalup Dunes, Spearwood Dunes, Bassendean Dunes, Pinjarra Plain and Ridge Hill Shelf (Churchward and McArthur 1980; Gibson *et al.* 1994). The survey area is situated on the Forrestfield System and Bassendean System which are summarised in **Table 3**. The spatial extent of each system is presented in **Figure 3**.

Table 3 – Soil Systems of the Survey Area (Schoknecht *et al.* 2004)

System	Soil Unit	Description
Bassendean System	212Bs	Swan Coastal Plain from Busselton to Jurien. Sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths.
Forrestfield System	213Fo	Undulating foot slopes of the Darling and Whicher Scarps. Duplex sandy gravels, pale deep sands and grey deep sandy duplexes. Woodland of *E. marginata* (Jarrah), *C. calophylla* (marri), wandoo and some *Banksia grandis.*

Figure 3 - Soils of the Survey Area

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3.4 VEGETATION

Vegetation of the Swan Coastal Plain has been broadly mapped by Beard (1990), and later re-assessed by Shepherd *et al.* (2002) into vegetation associations. Mapping depicted the native vegetation as it was presumed to be at the time of European settlement and is referred to as pre-European vegetation mapping.

There is one vegetation association, 968, that occurs within the survey area. The remaining extent of vegetation association 968 across a range of contexts is presented in **Table 4** and spatially in **Figure 4**.

Table 4 - Pre-European Vegetation of the Survey Area (Beard 1990, DBCA 2018b)

Extent Context	Veg. Association No.	Broad Vegetation Description	Pre–European Extent (ha)	Current Extent (ha)	% Pre-European Extent Remaining
Western Australia	968	Medium woodland; jarrah, marri & wandoo	296,877.84	95,048.82	32.02
Swan Coastal Plain IBRA Region	968	Medium woodland; jarrah, marri & wandoo	136,188.20	9,017.32	6.62
Perth IBRA Subregion	968	Medium woodland; jarrah, marri & wandoo	136,188.20	9,017.32	6.62
Shire of Serpentine-Jarrahdale	968	Medium woodland; jarrah, marri & wandoo	24,351.49	1,121.13	4.60

The vegetation of the Swan Coastal Plain has also been characterised by Heddle *et al.* (1980) based on vegetation in association with landforms and underlying geology. The survey area is situated on the Guildford complex and the Forrestfield complex (Heddle *et al.* 1980) (**Table 5, Figure 5**). The Guildford complex covers the majority (90.31%, 21.53 ha) of the survey area (**Figure 5**). The vegetation ranges from a mixture of open forest to tall open forest of *Corymbia calophylla* (Marri) – *Eucalyptus wandoo* (Wandoo) – *Eucalyptus marginata* (Jarrah) and woodland of *Eucalyptus wandoo* (Wandoo) (with rare occurrences *of Eucalyptus lane-poolei* (Salmon White Gum)). Minor components include *Eucalyptus rudis* (Flooded Gum) and *Melaleuca rhaphiophylla* (Swamp Paperbark) (Heddle *et al.* 1980).

The Forrestfield complex covers 9.69% (2.31 ha) of the lower southern region of the survey area (Heddle *et al.* 1980) (**Figure 5**). The vegetation ranges from open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah) to open forest of *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species. There is also fringing woodland of *Eucalyptus rudis* (Flooded Gum) in the gullies that dissect this landform.

Table 5 - Remaining Extent of Forrestfield Complex and Guildford Complex (DBCA 2018c)

Location	Vegetation Complex	Pre–European Extent (ha)	Current Extent (ha)	% Remaining
Swan Coastal Plain	Guildford Complex	90,513.13	4,607.91	5.09
	Forrestfield Complex	22,812.92	2,803.36	12.29
Shire of Serpentine-Jarrahdale	Guildford Complex	12,986.67	552.25	4.25
	Forrestfield Complex	4,514.76	411.02	9.10

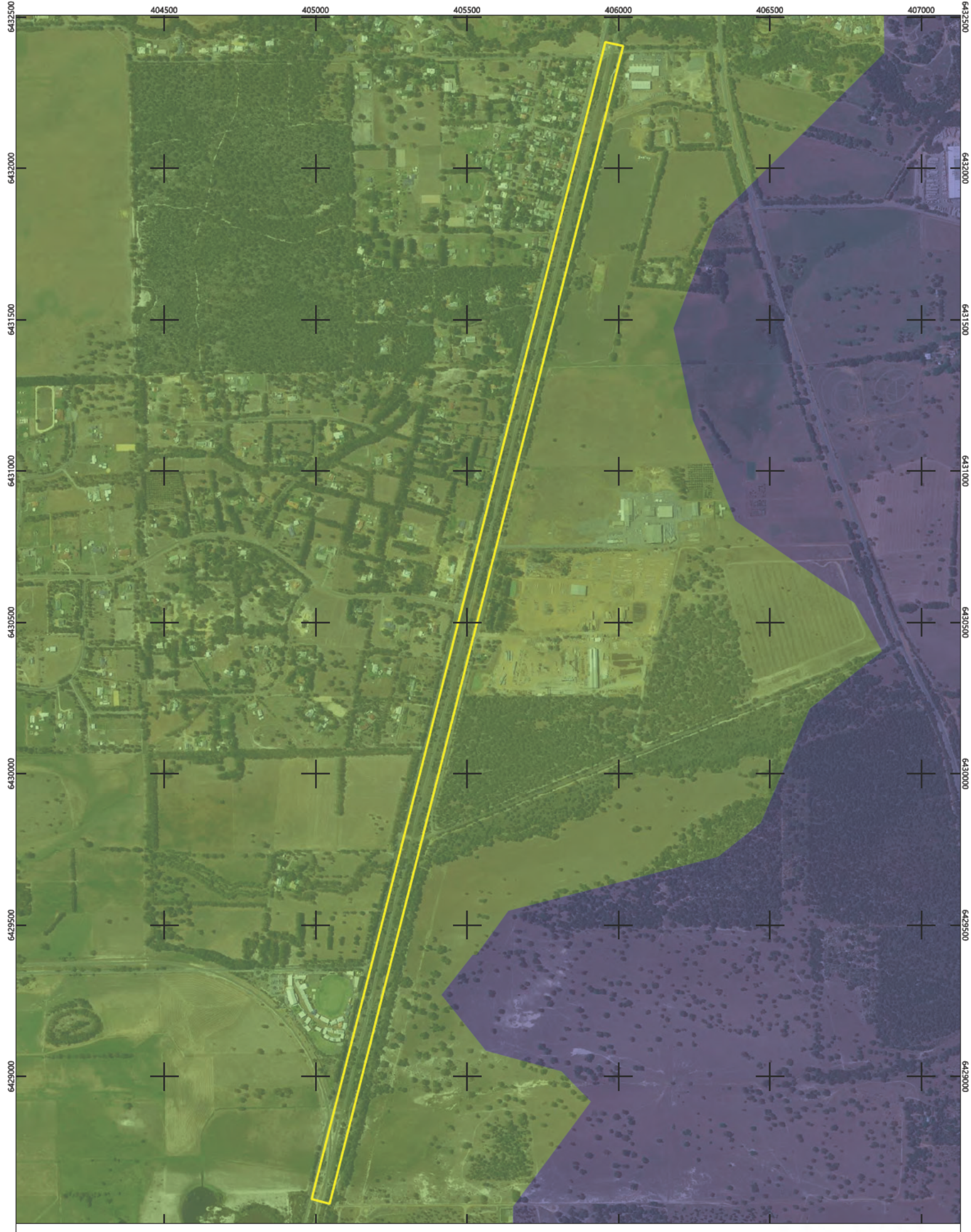

Figure 4 - Pre-European Vegetation

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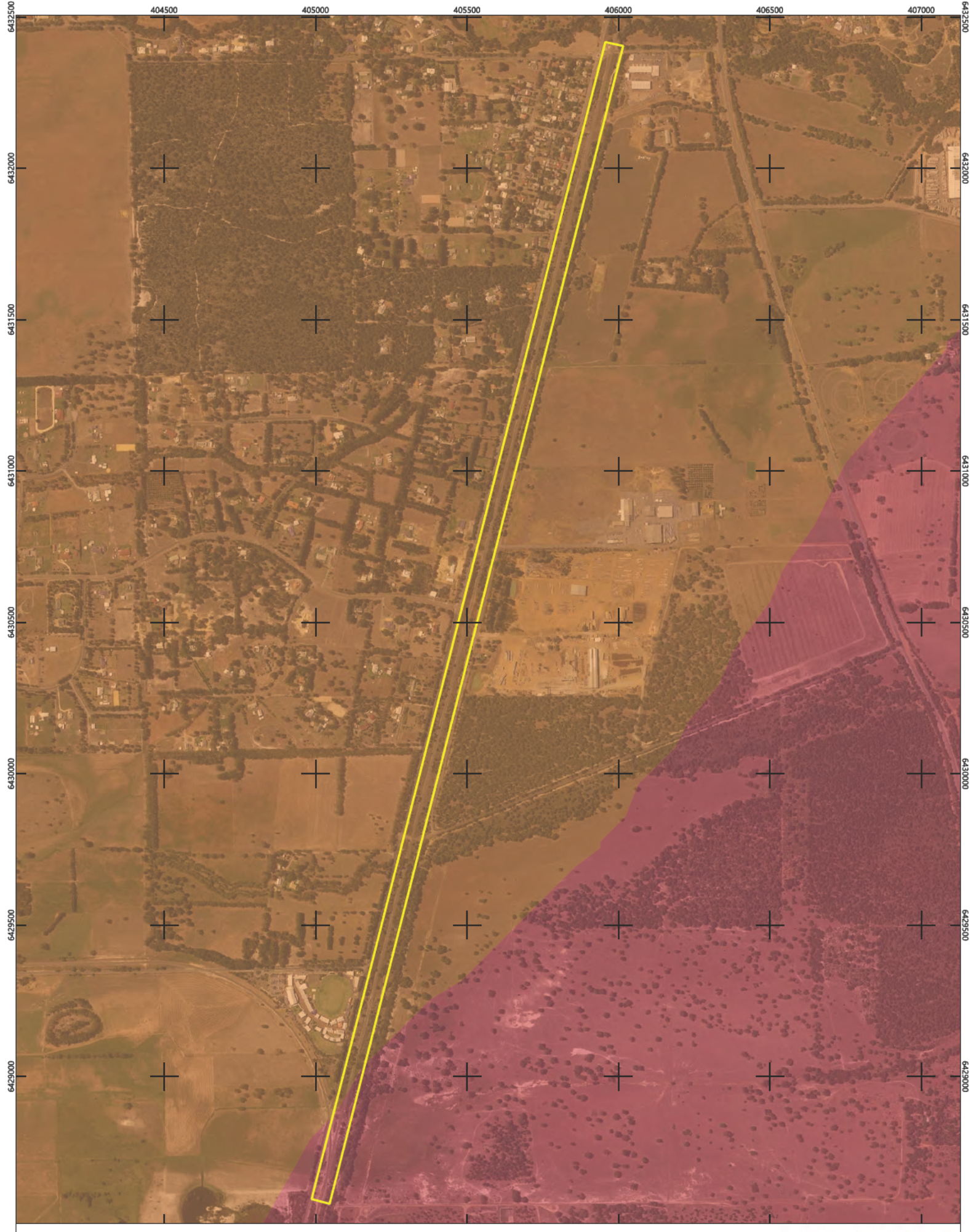

Figure 5 - Vegetation Complexes

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The objective of the Environmental Protection Authority (EPA) in relation to flora and vegetation is: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2016b). The EPA considers it is important that vegetation associations are maintained above a threshold level of 30% of unconstrained areas and 10% for constrained areas, of the original pre-clearing extent of each association (EPA 2008). A level of 30% pre-clearing extent is considered to be the level below which species loss appears to accelerate exponentially at the ecosystem level (EPA 2008).

The following key criteria are applied to vegetation clearing from a biodiversity perspective, which justifies the retention targets (EPA 2000):

- the 'threshold level' below which species loss appears to accelerate exponentially within an ecosystem level, is regarded as being at a level of 30% (of the pre-European, i.e. pre-1750 extent of the vegetation unit)
- a level of 10% of the original extent of a vegetation community is regarded as being a level representing Endangered
- clearing which would increase the threat level to a vegetation community should be avoided.

The remaining extents of the Beard vegetation association 968 (**Table 4**) and Heddle vegetation Forrestfield complex and Guildford complex (**Table 5**) within the Shire of Serpentine-Jarrahdale both fall below the 10% threshold of extent remaining.

3.4.1 Floristic Community Types

Regional floristic assessments conducted by Gibson *et al.* (1994) sampled a total of 509 quadrats across the Swan Coastal Plain. This survey considered the patterning of plant distributions on the Plain and assessed the presence or absence of individual species to define floristic groupings based on shared species with the aid of multivariant analysis (Keighery 1997). These floristic groupings are commonly referred to as Floristic Community Types (FCTs).

Analysis of the 509 quadrats distinguished four super groups (Foothills/Pinjarra Plain, Seasonal Wetlands, Uplands centred on Bassendean Dunes and Uplands centred on Spearwood and Quindalup Dunes), and within these supergroups a further 43 FCTs were classified.

The assessment conducted by *Gibson et al.* (1994) is the point of reference for characterisation of FCTs on the Swan Coastal Plain, which also assists in the classification of vegetation as representative of a range of TECs and PECs.

3.5 GEOMORPHIC WETLANDS OF THE SWAN COASTAL PLAIN

The Geomorphic Wetlands of the Swan Coastal Plain dataset displays the location, boundary, geomorphic classification (wetland type) and management category of wetlands on the Swan Coastal Plain. Wetland management categories are based on their ecological, hydrological and geomorphological significance, and the degree of disturbance that has occurred. The three Wetland Management Categories on the Swan Coastal Plain can be summarised as follows:

- Conservation Category (CC) – wetlands that support a high level of ecological attributes and functions (generally having intact vegetation and natural hydrological processes), or that have a reasonable level of functionality and are representative of wetland types that are rare or poorly protected.
- Resource Enhancement (RE) – wetlands that have been modified (degraded) but still support substantial ecological attributes (wetland dependant vegetation covering more than 10%) and functions (hydrological properties that support wetland dependent vegetation and associated fauna) and have some potential to be restored to CC quality. Typically, such wetlands still support some elements of the original native vegetation, and hydrological function.

- Multiple Use (MU) – wetlands that are assessed as possessing few remaining ecological attributes and functions. While such wetlands can still play an important role in regional or landscape ecosystem management, including water management, they are considered to have low intrinsic ecological value. Typically, they have very little or no native vegetation remaining (less than 10%).

Nine Geomorphic wetlands of the Swan Coastal Plain occur within the survey area, including three Conservation Category Wetlands (CCW) and six Multiple Use Wetlands (MUW) (**Table 6**). The wetland locations are spatially presented in **Figure 6**.

Table 6 – Wetlands within the Survey Area

UFI	Wetland Name	Wetland Classification	Management Category	Location within the Survey Area
14505	Byford Rail Reserve	Palusplain	Conservation	Occurs 97 km south of Daisy Road to 50 m north of Robertson Road, excluding the area within UFI 15015 and 16021.
15462	Unknown	Palusplain	Conservation	Occurs 63 m south of Norman Road to 196 m north of Mundijong Junction
15463	Unknown	Palusplain	Conservation	Occurs 63 m south of Norman Road to 234 m north of Mundijong Junction
14543	Unknown	Palusplain	Multiple Use	Occurs 53 m north of Robertson Road Turnoff to 135 m south of Karbro Drive
15015	Unknown	Palusplain	Multiple Use	Occurs adjacent to Soldiers Road 225 m south of Bushlark Close to 215 m north of Robertson Road turnoff
15382	Unknown	Palusplain	Multiple Use	Occurs within NE corner of survey area from Cardup Siding Road to Cardup Train Station
15383	Armadale Palusplain	Palusplain	Multiple Use	Occurs from Cardup Train Station to 97 m south of Daisy Road
15461	Unknown	Palusplain	Multiple Use	Occurs 63 m south of Norman Road along Soldiers Road to 254 m north of Mundijong Junction
16021	Unknown	Palusplain	Multiple Use	Occurs in a small triangular area 211 m south of Bushlark Close and in a narrow corridor encompassing rail line 63 m south of Norman Road to Mundijong Junction

3.6 DRAINAGE AND GROUNDWATER

Two non-perennial minor unnamed tributaries occur within the survey area (**Figure 6**). Cardup Brook occurs approximately 30 m north (**Figure 6**) and Manjedal Brook approximately 360 m south of the survey area. The survey area occurs above the Serpentine proclaimed groundwater area. Under the *Rights in Water and Irrigation Act 1914* (WA), it is illegal to take water from a watercourse or groundwater aquifer in a proclaimed area without a licence.

Data contained in the Perth Groundwater Map (DWER 2020) indicates that there is no available groundwater depth data. Data available for the Swan Coastal Plain indicates that the groundwater at the location of the survey area contains 1000-1500 mg/L Total Dissolved Solids (TDS) to the north and 1500-3000 mg/L. TDS to the south (DWER 2020).

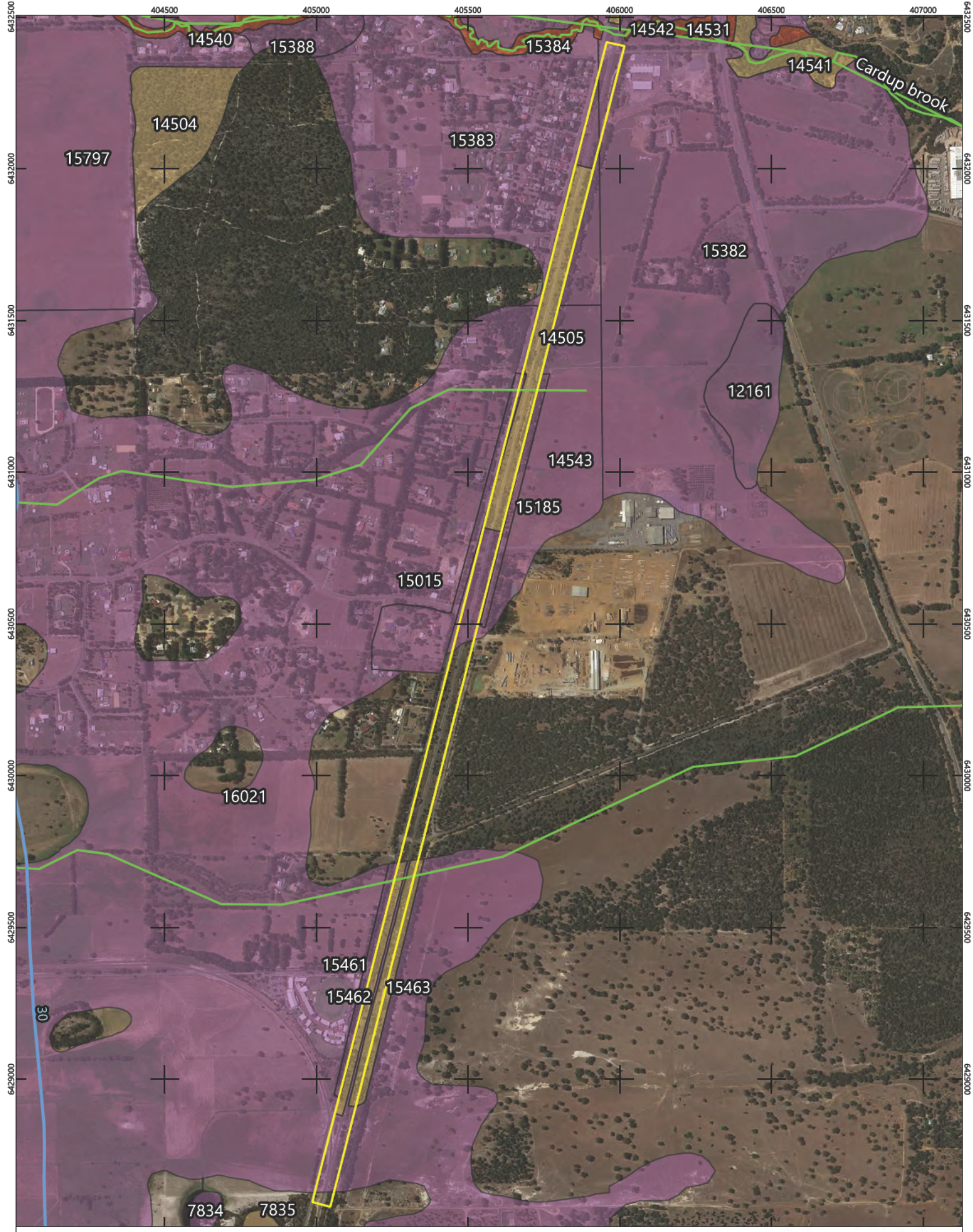


Figure 6 - Geomorphic Wetlands of the Swan Coastal Plain

3.7 RESERVES, CONSERVATION AREAS AND ENVIRONMENTALLY SENSITIVE AREAS

Under the Bush Forever Plan, 51,200 ha of regionally significant bushland areas are protected in 287 Bush Forever Sites in Western Australia (Government of Western Australia 2000a and 2000b). Bush Forever sites are also classified as Environmentally Sensitive Areas (ESAs).

The survey area is listed as a Bush Forever site (site 350; Serpentine Rail/Road Reserves and Adjacent Bushland) and is therefore an ESA (**Figure 7** and **Table 7**). Cardup Nature Reserve (Bush Forever site 352) adjacent to the survey area has also been listed as a Class A Nature Reserve and has been documented to support Commonwealth and State listed TECs. Class A reserves are afforded the greatest degree of protection under the *Land Administration Act 1997* and the listing is used solely to protect areas of high conservation or community value (Landgate 2018).

Table 7 – Summary of Reserves and Conservation Areas

Name	Conservation Type	Proximity to the Survey Area
Byford to Serpentine Rail/Road Reserves and Adjacent Bushland	Bush Forever site 350 Environmentally Sensitive Area	Encompasses entire survey area
Cardup Nature Reserve	Bush Forever site 352 Class A Nature Reserve Environmentally Sensitive Area	Approximately 20 m west of survey area, adjacent to Soldiers Road
	Bush Forever site 271 Environmentally Sensitive Area	Approximately 339 m east of survey area, adjacent to South Western Highway
Norman Road Bushland	Bush Forever site 361 Environmentally Sensitive Area	Approximately 21 m east of survey area, adjacent to Robertson Road and Norman Road
	Bush Forever site 354 Environmentally Sensitive Area	Approximately 21 m east of survey area, adjacent to Norman Road

3.8 DISTURBANCE HISTORY

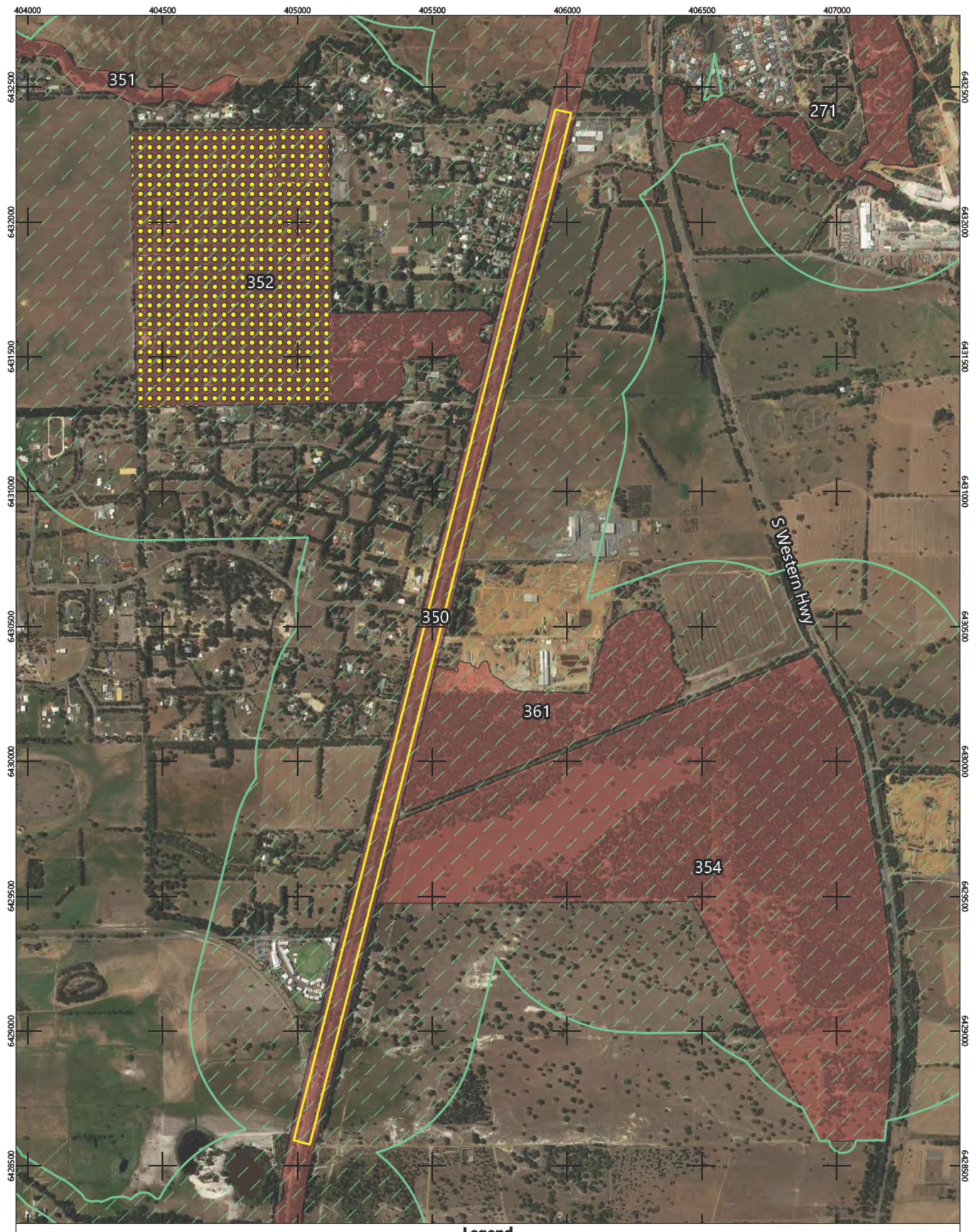
The survey area has a history of disturbance such as inappropriate fire regime (too frequent), weed invasion, potential clearing to upgrade the road or railway line, potential for altered surface drainage due to road grading and littering of rubbish (DEC 2012). The South Western Railway was constructed in 1893 from East Perth to Pinjarra later extended to Bunbury (Gunzburg and Austin 2008, Newland and Quinlan 2000). Open since 1894, the South Western Railway has been functional still to present day, where trains travel daily via this route.

Two gravel access roads have been constructed either side of the South Western Railway and run parallel to the railway tracks within the survey area. The long linear shape of the survey area coupled with frequent train movements, means it is vulnerable to weed invasion from adjacent agricultural paddocks and transport via vehicles (CALM 2003).

The survey site and adjacent Soldiers Road within the Byford to Serpentine Rail/Road Reserve are utilised for various recreational activities by bushwalkers, birdwatchers and picnickers and has subsequently been designated as a Flora Road by the Shire of Serpentine Jarrahdale (CALM 2003).

3.9 ECOLOGICAL CONNECTIVITY

The survey area forms part of the Perth Regional Ecological Linkages Network (WALGA 2004b). It is part of linkage 65 which runs in a north south direction and links the survey area with Bush Forever sites 321 (Brickwood Reserve), 350 and 365 (Byford to Serpentine Rail/Road Reserve and adjacent Bushland), 352 (Cardup Nature Reserve and adjacent Bushland), 361 (Norman Road Bushland) and 362 (Roman Road Bushland) (**Figure 7**). Linkage 65 also connects with linkage 64, 67, 68, 69, 70 and 71.



0 125 250 375 500 m

GDA 94 / MGA Zone 50

Legend

- Survey Area
- Nature Reserve
- Bush Forever Site
- Environmentally Sensitive Area

Figure 7 - Bush Forever, Reserves, Conservation Areas and ESAs

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4. METHODOLOGY

4.1 DESKTOP ASSESSMENT

The desktop assessment for significant flora and ecological communities considered a 2 km buffer around the survey area and incorporated a review of DBCA database search results (DBCA 2021b) for the survey area, as well as a NatureMap database search (DBCA 2021c), Atlas of Living Australia search and interrogation of the DAWE MNES search tool (DAWE 2021c). The database search results were compiled into a table that concluded the likelihood of occurrence of each of the significant species and communities based on habitat preferences of known recorded locations for each species. The likelihood of all significant flora occurring within the survey area was assessed based on known records and their age (currency), distance to the closest known DBCA record and the presence of suitable habitat within the survey area. Based on this assessment, each species was given a likelihood of occurrence category of 'likely to occur', 'may occur' or 'unlikely to occur' in the survey area. Where recent records and suitable species habitat occurs within or within less than 1 km of the survey area, these species were given a category of 'likely to occur'. For species occurring greater than 1 km from the survey area with limited suitable habitat, or for very old records, a category of 'unlikely to occur' or 'may occur' was applied, depending on record relevance.

Habitat preferences for all target species were determined during the desktop assessment and planning for the field assessment, to enable accurate targeted searching in the field.

The desktop assessment formed the foundation of the field surveys and ensured that the assessments were targeted to the areas potentially supporting conservation significant values.

4.2 FIELD PREPARATIONS

Field preparations included field safety planning, confirmation of site access permissions and the preparation of a detailed study plan, field guides for significant flora and ecological communities, field maps and equipment (including electronic devices for field data capture).

4.3 FIELD ASSESSMENT

4.3.1 Flora and Vegetation

A two-phase, detailed flora and vegetation field assessment was carried out within the survey area during spring 2021 by experienced botanists and ecologists as presented in **Section 8**. The phase 1 field survey was conducted on 15 and 16 September 2021 and phase 2 was conducted on 22 October 2021.

Flora and vegetation data were collected in the field at sampling points where vegetation was noted to be of differing floristic composition. Pegged quadrats were installed where native vegetation was found to be in 'Good' or better condition, in accordance with the requirements for flora and vegetation assessments as documented in EPA (2016a). Detailed data collection points (relevés) were recorded where vegetation was not in 'Good' or better condition.

During phase 1, a total of five quadrats were established in areas of 'Good' or better condition and two relevés were established in an area of poorer quality vegetation, as per the Technical Guidance (EPA 2016a). The locations of these are presented in **Figure 8**. Each sampled quadrat from the first phase was rescored as part of the second phase survey.

Sampled quadrats were demarcated with a peg (galvanised fence-dropper) at each corner and the north-west corner co-ordinates were recorded using GPS. During sampling, quadrats were marked by measuring tapes. Quadrat dimensions were 10 m x 10 m in accordance with the Technical Guidance (EPA 2016a) and in alignment with the Gibson *et al.* (1994) survey, and the data collected were used to characterise all of the intact native vegetation communities (vegetation in 'Good' or better condition).

The following information was collected at each quadrat and relevé:

- observer
- date
- GPS location (GDA 94)
- representative photograph
- soil type and colour
- topography
- vegetation condition/degradation/disturbances (e.g. grazing, weed invasion, fire)
- flora species observed, including average height and projected foliage cover of dominant species within each stratum
- vegetation community, described in accordance with the National Vegetation Information System (NVIS) (DEH 2003)
- vegetation condition, assessed against the currently accepted scale; an adaptation of the Keighery (1994) condition scale.

Observations and opportunistic data collection were also carried out during foot traverses within and throughout the survey area and track logs of all personnel were captured using GPS-enabled devices to demonstrate survey effort. These combined track logs for the survey area from the first phase of sampling are presented in the **Figure 9** series.

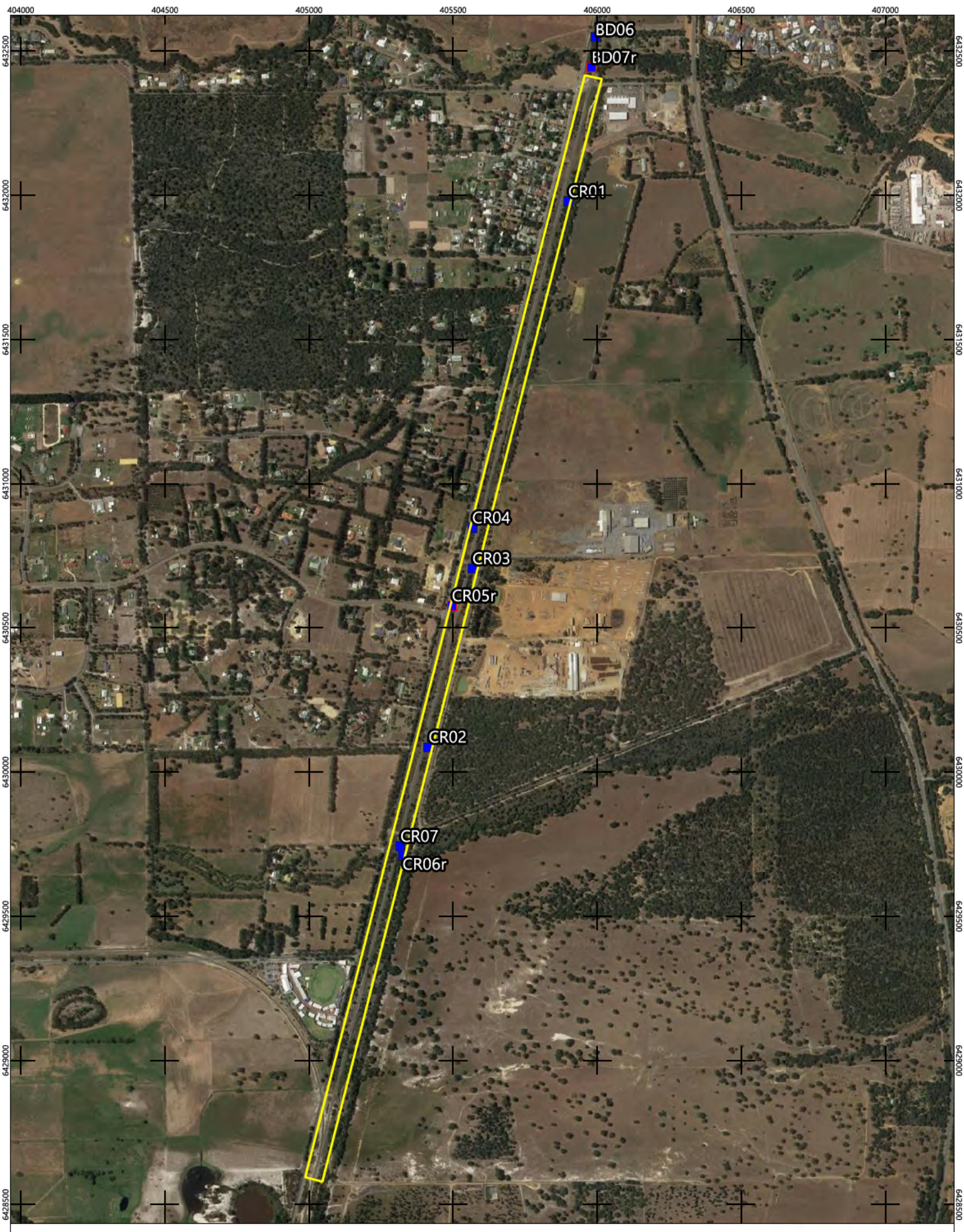
The first phase field assessment also included targeted searches for conservation significant flora potentially occurring in the survey area. Selective targeted searching was also carried out during the second phase survey whilst traversing between quadrats and in limited additional areas as appropriate, depending on flowering times and preferred habitats of target species. Any observed flora suspected to be Threatened or Priority was marked using GPS-enabled devices to enable inclusion in the report maps and spatial data layers. Suspected Threatened and Priority flora were collected for further taxonomic identification by FVC taxonomists and specialists at the Western Australian Herbarium.

Two sampling events within the optimal flowering period (spring) during September and October enabled the capturing of species in the second phase that may not have been present during the first phase, particularly annuals and other late spring flowering species.

The flora and vegetation data collected during the two-phase field assessment, from the combination of quadrats and continuous opportunistic observations, contributed to the flora inventory for the survey area. The vegetation units of the survey area have been defined by data collected within quadrats and opportunistically between, and how they relate to other environmental features such as soil type and landform. A map of the vegetation units was then developed using GIS. As per EPA (2016a) Guidelines, vegetation within a 500 m buffer of the linear survey area centreline was extrapolated and mapped utilising aerial imagery and ground truthing of adjacent vegetation units.

Vegetation condition was assessed using the current bushland condition scale, which is an adaptation of Keighery (1994) scale, as described in EPA (2016a). The spatial extent of the varying vegetation condition was mapped using GIS.

All field data was recorded using electronic tablets equipped with the mobile mapping software, Mappt™ and customised data collection forms, tailored to the electronic collection of quadrat and relevé data as well as targeted flora surveys. Draft vegetation unit and condition mapping were also prepared in shapefiles directly into Mappt™ whilst in the field, and this formed the basis of the mapping presented in this report.



0 125 250 375 500 m

GDA 94 / MGA Zone 50

Legend

- Survey Area
- Quadrat
- Releve

Figure 8 - Quadrat Locations

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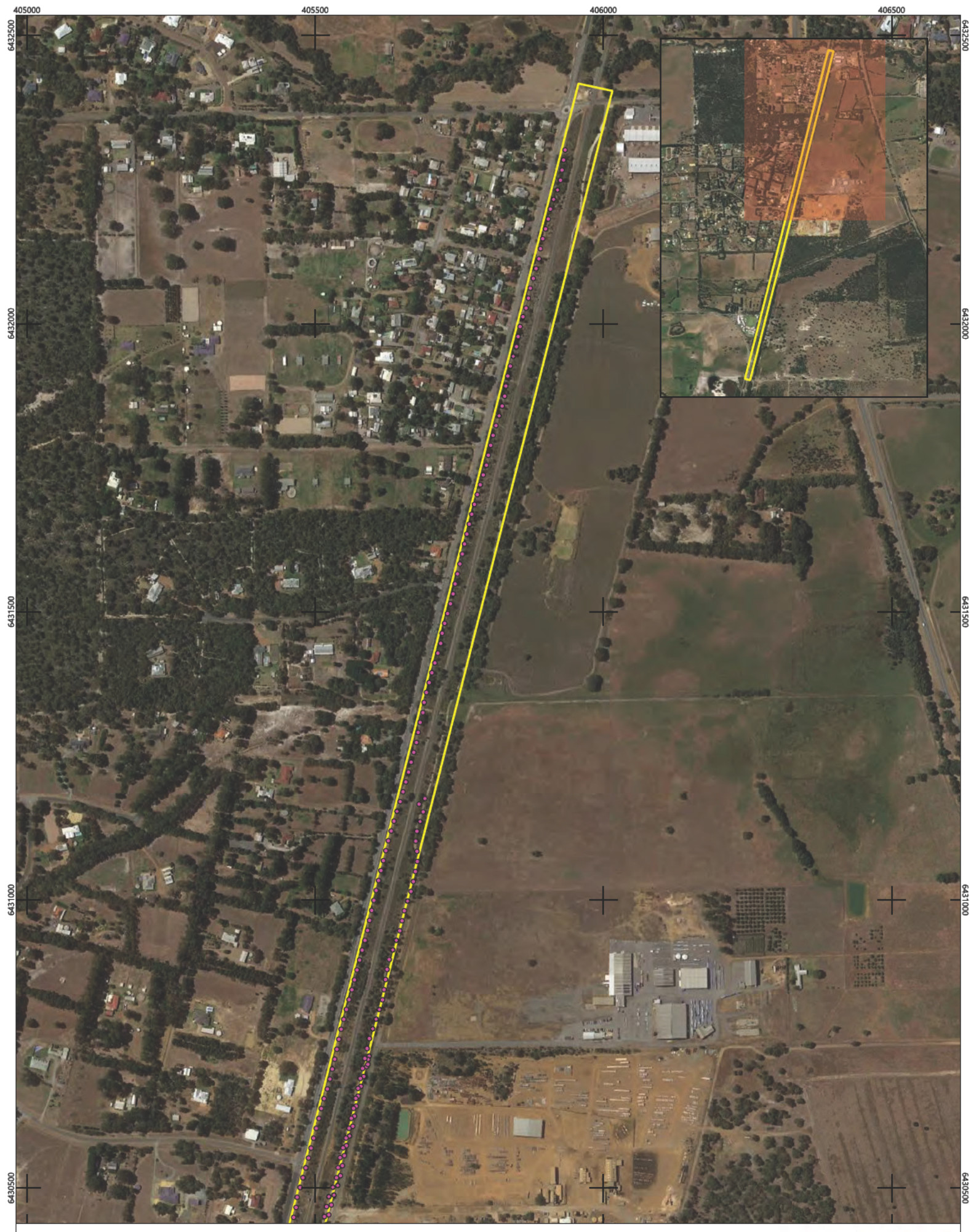

Figure 9a - Search Traverses

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Figure 9b - Search Traverses

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4.4 DATA PROCESSING AND ANALYSIS

4.4.1 Flora Identification

Flora identifications were undertaken by FVC's specialist taxonomists, Shibi Chandran and Kathya Tippur and verified by taxonomic specialist and Consulting Botanist, Malcolm Trudgen. Specimens were collected and dried in accordance with WA Herbarium protocols (DBCA 2020a). Specific plant group specialist taxonomists and group authorities were consulted for challenging identifications, where required. Taxonomy and nomenclature follow current protocols of the WA Herbarium. The data processing task allowed for the preparation of species lists, including those for collected flora specimens, once identified.

4.4.2 Floristic Analysis

The Gibson *et al.* (1994) and Keighery *et al.* (2012) studies were carried across the entire Swan Coastal Plain south from Gingin (Southern Swan Coastal Plain). Due to the large extent of that survey area, in order to determine more robust assignment of quadrats to a Floristic Community Type (FCT) a local subset of these sites was selected for inclusion in floristic analysis. These sites were selected based on proximity to the survey area and taking into account the geology and pre-European vegetation associations as analogous to the survey area, in order to produce the resulting dendrograms and statistical analysis.

Recorded quadrat data was analysed in accordance with the *Draft Vegetation survey methods and analysis to determine floristic community types on the southern Swan Coastal Plain* (DBCA 2021a). This methodology analysed data utilising PATN™ software (Belbin 2013), via multivariate cluster analysis of species presence/absence, in order to group sites of floristically similar composition within the survey area. In order to assign FCTs, quadrat data were analysed against the Gibson *et al.* (1994) and the Keighery *et al.* (2012) datasets, which were updated to the current species nomenclature as per the Western Australian Herbarium. Floristic analysis via single site insertion (SSI) (into the Gibson *et al.* (1994) and Keighery *et al.* (2012) datasets) was carried out for all quadrats within the survey area against a local subset of the entire suite of sites from the Gibson *et al.* (1994) survey.

All quadrat data was processed with singletons and annuals included, for comparison with Gibson *et al.* (1994) and Keighery *et al.* (2012) data (as per advice from Val English, pers. comm., DBCA). An inferred FCT was assigned to each quadrat based on the resulting dendrogram.

Quadrats were also analysed in PATN™ in comparison to the Gibson *et al.* (1994) and the Keighery *et al.* (2012) datasets utilising the Bray-Curtis Dissimilarity Index. Results range from 0 to 1, where 0 would indicate that the quadrats are identical (i.e. have zero dissimilarity) (Belbin 2013) and 1 indicating no shared species (Hao *et al.* 2019). The closer the value to 0, the greater the similarity. A dissimilarity index value of greater than 0.6 is considered to be high (Maguire *et al.* 2016) and tends to indicate little similarity.

Conclusions regarding relevant FCTs that would be assigned to each sampled quadrat were based on 'nearest neighbour' in the dendrograms, and where appropriate, were also further critically analysed by determining similarities to Gibson *et al.* (1994) sites based on some or all of the following characteristics: key dominant flora species, vegetation structure, habitat, geographical location, soils/landforms, vegetation complexes and site hydrological status. The collective results of the FCT analysis concluded with settling on an inferred FCT for each quadrat, with justifications provided.

Other analysis in reference to relevant conservation advice and available information for significant ecological communities was also carried out in order to determine whether TECs or PECs are supported by the survey area.

4.5 SURVEY LIMITATIONS

The current biological assessment was assessed against limitations outlined in the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) (**Table 8**).

Table 8 – Potential Survey Limitations and Constraints

Aspect	Constraint	Commentary
Availability of regional data, previously available information	No	Regional and local data for the Perth region is abundantly available, as evident in FloraBase records. The Gibson *et al.* (1994) survey results provide a reference for the FCTs of the Swan Coastal Plain. The survey area is classified as a Bush Forever Site (site 350) and as a result, is well documented (Government of Western Australia 2000a and 2000b). The presence of Commonwealth and State listed TECs (FCT 3a and 3b) within the survey area has been documented. Numerous documents such as Approved Conservation Advice (DEE 2017a) and Recovery Plans (DEC 2011b, DPaW 2011, DBCA 2020b) are publicly available for both FCTs to assist in defining them.
Scope (detail)	Minor	A two-phase, detailed flora and vegetation assessment was carried out in accordance with EPA (2016a). Seven vegetation units were defined within the survey area. Five quadrats were sampled within vegetation in 'Good' or better condition and two relevés were sampled in an area of 'Degraded' vegetation. Due to the high level of disturbance throughout the survey area and the insufficient area of 'Good' quality vegetation, none of the defined vegetation units contained three or more quadrats. Two quadrats were established within vegetation unit CcXp (Marri/*Xanthorrhoea* Woodland), whilst all of the remaining vegetation units were sampled from a single quadrat, relevé or visual observation. The data collected was considered adequate to define and map the two vegetation units in the relatively small area.
Competency/ Experience of personnel	No	The botanical field surveys were led by botanists who have a minimum of 18 years' experience. All personnel undertaking the field assessments, flora identifications, data analysis, vegetation mapping and reporting are experienced botanists, with specialist skills in their respective fields.
Survey effort/detail/ intensity	No	The two-phase, detailed flora and vegetation assessment was considered adequate to determine the floristic values within the survey area. Five quadrats were established in vegetation considered to be in 'Good' or better condition and two relevés was sampled in 'Degraded' vegetation, where some loss of structure and weed infestations has occurred. All quadrats were sampled during September 2021 and rescored in October 2021. The density of quadrats sampled is considered to be high, within a relatively small survey area and in small areas of each vegetation unit present.
Seasonal timing and climatic conditions	No	The flora and vegetation field assessments were conducted during spring (two days in September, one day in October), during the optimal spring season for biological surveys on the Swan Coastal Plain. Supplementary surveys for the South-West are typically undertaken after autumn rain in order to supplement data collected during the primary survey (EPA 2016a), although draft advice from DBCA (2021f) recommends an early spring and a late spring phase of survey for determination of FCTs on the Swan Coastal Plain. Cumulative rainfall in the three months preceding the September field assessment (June, July and August) was above average and near optimal (**Figure 2**). A total of 315 mm of rain was recorded during July 2021, well above the long-term mean (174.7 mm). The above average winter 2021 rainfall during the growth stage, would have promoted the production of new leaves and increase the number (and quality) of flowers and fruit (Chen *et al.* 2019).
Access	No	The majority of the survey area was easily accessible on foot and was traversed during September. Some of the survey areas were not traversed in detail due to the ability to good visibility which enabled easy verification of the vegetation by visual observations and the fact that these areas largely comprise of vegetation in 'Degraded-Good' or poorer condition. Visual observations were made throughout these areas, which enabled appropriate mapping of these locations and this approach is not considered to be a limitation of the survey.
Mapping reliability	No	Mapping has been prepared at a scale based on ground-truthed areas, with limited extrapolation given the good accessibility of the survey area. Therefore, mapping reliability is considered high.
Disturbances	Minor limitation	The survey area has a history of disturbance such as inappropriate fire regime (too frequent), weed invasion, potential clearing to upgrade the road or railway line, potential for altered surface drainage due to road grading and littering of rubbish (DEC 2012). Two gravel access roads have been constructed either side of the South Western Railway and run parallel to the railway tracks. As much

Aspect	Constraint	Commentary
		of the study area is quite degraded, this limited the areas within which quadrats could be sampled. As a result, some vegetation units that are only represented in poorer than 'Good' condition, or in small extents, or both, were only sampled by one relevé or fewer than three quadrats, as is required by the Guidance (EPA 2016).
Survey completeness	No	The survey area is classified as a Bush Forever Site (site 350) and as a result, is well documented (Government of Western Australia 2000a and 2000b). The majority of the survey area was easily accessible and data and other information for the region is abundant. Some of the survey areas were not traversed in detail due to the ability to easily verify the vegetation from visual observations and the fact that these areas largely comprised of vegetation in 'Degraded-Good' or poorer condition. Despite this, it is considered that the field assessments for the current survey were completed in sufficient detail for the entire survey area. Although not all vegetation units were sampled by at least three quadrats, given the small size of the survey area, the small area of the vegetation units, the degraded condition of much of the vegetation and the abundance of data available for the area, the survey is considered to have been adequate for defining the flora and vegetation values present.

5. RESULTS

5.1 DESKTOP ASSESSMENT

5.1.1 Threatened and Priority Flora

The DBCA database (DBCA 2021b), NatureMap (DBCA 2021c) and DAWE Protected Matters Search Tool (DAWE 2021c) identified 33 conservation significant flora species that have the potential to occur within the desktop assessment area (the survey area plus a 2 km buffer applied to the DBCA database search (**Appendix B**). The list of conservation significant taxa comprised 16 that are Threatened flora pursuant to the Commonwealth EPBC Act and State BC Act; one Priority 1, three Priority 2, nine Priority 3 and four Priority 4 species (**Table 9**, **Figure 10**). Based on known distribution, current records, preferred habitats and the habitats present in the survey area, 18 taxa were considered 'unlikely' to occur, 12 'may' occur, one was considered 'likely' to occur and two had previously been recorded within the survey area.

Table 9 – Threatened and Priority Flora Potentially Occurring within the Survey Area

Species	EPBC Act Conservation Status	BC Act/DBCA Conservation Status	Description	Preferred Habitat	Likelihood of Occurrence	Source of Record
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	Critically Endangered	Critically Endangered	Dense, clumped shrub growing to 0.3-0.6 m high and 0.4-0.8 m wide. Produces yellow flowers on erect spikes 0.07-0.24 m long from September to October.	Grey clayey sand soil with lateritic pebbles. Near winter-wet flats, low woodlands with weedy grasses.	May occur - specimen found 10.2 km from survey area.	PMST
Synaphea sp. Pinjarra Plain (A.S. George 17182)	Critically Endangered	Critically Endangered	Erect, clumping shrub growing to 0.8 m high. Produces yellow flowers from September to November.	Sand, loam and clay soils sometimes with laterite. Winter wet depressions and flats.	Previously recorded within survey area.	PMST, DBCA, NatureMap
Synaphea sp. Serpentine (G.R. Brand 103)	Critically Endangered	Critically Endangered	Erect, compact shrub to 0.3 m high. Produces yellow flowers from September to October.	Grey, yellow or brown sandy clay-loam soils. Edge of wetlands, slopes and flats.	Previously recorded within survey area.	PMST, DBCA, NatureMap
Drakaea elastica	Endangered	Critically Endangered	Tuberous, perennial herb growing to 0.1-0.3 m high with a single bright green, glossy, prostrate heart-shaped leaf. Produces distinctive flower with red and green-yellow parts from October to November.	Bare patches of white or grey sandy soils. Low-lying situations adjoining winter-wet swamps.	May occur - suitable habitat may occur. Specimen found 1.5 km from survey area.	PMST, NatureMap
Eucalyptus x balanites	Endangered	Critically Endangered	Mallee with rough flaky grey bark growing to 5-8 m high and 15 m wide. Produces white flowers from October to December or from January to February.	White-grey sand, brown sandy loam soils with lateritic gravel. Slopes.	May occur - suitable habitat may occur. Specimen found 6.7 km from survey area.	PMST, NatureMap
Lasiopetalum pterocarpum	Endangered	Critically Endangered	Low, open shrub growing to 1.5 m high with spreading branches. Produces pale pink or white, pendulous flowers from August to December. Distinct six-winged membranous fruit. Distinguished from *L. floribundum* by having discolorous and strongly lobed leaves.	Dark red-brown loam or clayey sand over granite. On sloping banks near creek lines.	Unlikely to occur - specimen found 10.1 km from survey area. No granite present within the survey area.	PMST
Diuris purdiei	Endangered	Endangered	Tuberous, perennial orchid growing to 0.15-0.45 m high. Produces distinct flattened yellow flowers with brown blotches on their underside from September to October.	Grey-black sand, sandy clay moist soils. Winter-wet swamps.	May occur – suitable habitat may occur. Specimen found 2.4 km from survey area.	PMST, NatureMap

Species	EPBC Act Conservation Status	BC Act/DBCA Conservation Status	Description	Preferred Habitat	Likelihood of Occurrence	Source of Record
Grevillea curviloba susbp. *incurva*	Endangered	Endangered	Variable, prostrate shrub with broad dark green leaves or tall erect shrub growing to 2 m high with greyish green leaves. Produces creamy-white flowers on short stalks in leaf axils from September to October.	Grey sand, sandy loam. Winter-wet heath.	Unlikely to occur - Specimen found approximately 55 km from survey area. Habitat of the survey area is not typically sandy.	PMST
Lepidosperma rostratum	Endangered	Endangered	Rhizomatous, tufted perennial grass-like sedge growing to 0.5 m high. Produces brown flowers in narrow, spike-like inflorescence and fruits in June to August.	Peaty sand, clay.	Unlikely to occur - suitable habitat unlikely to occur. Specimen found 3.6 km from survey area.	NatureMap, PMST
Thelymitra stellata	Endangered	Endangered	Tuberous perennial herb growing to 0.25 m high with a single lily-like leaf to 0.9 m long. Produces up to 6 golden-brown or yellow with orange striped flowers from September to November.	Sandy loam soils with lateritic gravel. Ridges, slopes and gullies in wandoo and jarrah woodland.	Unlikely to occur - suitable habitat unlikely to occur. Specimen found 7.2 km from survey area.	NatureMap, PMST
Andersonia gracilis	Endangered	Vulnerable	Slender, erect or open straggly shrub growing to 0.1-0.5 m high. Produces pink to pale mauve flowers in ovoid oblong groups of 4-14 on terminal heads from September to November.	White-grey sand, sandy clay, gravelly loam soils. Winter wet areas, near swamps.	Unlikely to occur - suitable habitat unlikely to occur Closest occurrence approximately 30 km north-west.	PMST
Drakaea micrantha	Vulnerable	Endangered	Tuberous, perennial herb growing to 0.15-0.3 m high with a single silvery-grey, prostrate heart-shaped leaf. Produces distinct flower with red and yellow parts from September to October.	Bare patches of white-grey sandy soils. Winter wet swamps, disturbed areas.	May occur - suitable habitat may occur. Closest occurrence near Forrestdale.	PMST
Anthocercis gracilis	Vulnerable	Vulnerable	Erect, spindly, almost leafless shrub growing to 0.6 m high. Produces yellowish-white or yellowish-green flowers from September to October and in April.	Sandy or loamy soils. Granite outcrops, gullies and slopes with granite on the Darling Scarp.	Unlikely to occur – suitable habitat unlikely to occur. Closest occurrence approx. 20 km south-east.	PMST

Species	EPBC Act Conservation Status	BC Act/DBCA Conservation Status	Description	Preferred Habitat	Likelihood of Occurrence	Source of Record
Diuris micrantha	Vulnerable	Vulnerable	Tuberous, perennial orchid growing to 0.3-0.6 m high with a basal tuft of narrow, linear leaves. Produces up to 7 yellow flowers with red-brown markings from August to October.	Brown/black sandy clay-loam and clayey soils. Winter-wet depressions and swamps, in shallow water.	Unlikely to occur – suitable habitat unlikely, closest occurrence approximately 14 km from survey area.	PMST
Eleocharis keigheryi	Vulnerable	Vulnerable	Tufted, clumping grass like sedge growing to 0.2-0.4 m high and 0.4 m wide with smooth, erect stems and leaves reduced to straw-coloured sheaths. Produces pale green flowers in a narrow, cylindrical flower spike from August to November (December in favourable conditions).	Clay, sandy loam soils. Emergent in freshwater creeks, claypans and wetlands.	Unlikely to occur - suitable habitat unlikely to occur.	PMST
Morelotia australiensis (formerly *Tetraria australiensis*)	Vulnerable	Vulnerable	Tufted perennial grass-like sedge growing to 1 m high with cylindrical stems. Produces brown flowers following fire.	Grey sand over clay soil. Winter wet depressions, swamps, drainage lines and swamp margins.	May occur – suitable habitat may occur. Known to occur within 2 km of the survey area.	PMST, NatureMap, DBCA
Acacia lasiocarpa var. *bracteolata*		Priority 1	Spinescent shrub growing between 0.4-1.5 m high. Produces yellow flowers in globular heads from May or August.	Grey or black sand over clay soils. Swampy areas, winter wet lowlands.	May occur – suitable habitat may occur. Specimen found 2.4 km from survey area.	NatureMap
Johnsonia pubescens subsp. *cygnorum*		Priority 2	Tufted, perennial, grass like herb (lily) growing to 0.25 m high. Produces greenish cream flowers from September to October.	Grey or yellow sand, sandy clayey soils. Gentle slopes and flats.	Likely to occur – suitable habitat may occur. Closest occurrence 470 m from survey area.	DBCA, NatureMap
Levenhookia pulcherrima		Priority 2	Annual ephemeral herb growing between 0.03-0.7 m high. Produces pink-red flowers from October to November.	Sand.	Unlikely to occur – closest occurrence approximately 90 km from survey area.	NatureMap
Millotia tenuifolia var. *laevis*		Priority 2	Erect to ascending annual herb growing to 0.1 m high. Produces yellow flowers from September to October.	Sandy soil. Slopes and flats sometimes with gravel.	May occur - suitable habitat may occur. Specimen found 4.2 km from survey area.	NatureMap
Angianthus drummondii		Priority 3	Erect annual herb growing to 0.1 m high. Produces yellow flowers in compound, hemispherical heads from October to December.	Grey or brown clay soils, ironstone. Seasonally wet flats.	Unlikely to occur – suitable habitat unlikely to occur. Specimen found 4.5 km from survey area.	NatureMap

Species	EPBC Act Conservation Status	BC Act/DBCA Conservation Status	Description	Preferred Habitat	Likelihood of Occurrence	Source of Record
Babingtonia urbana		Priority 3	Erect to sprawling shrub growing to 0.5 m high. Produces pink flowers from October to March.	Brown clay loam, sandy soils. Flats and winter wet depressions.	May occur – suitable habitat may occur. Specimen found 1.1 km from survey area.	NatureMap
Banksia kippistiana var. *paenepeccata*		Priority 3	Erect, prickly, lignotuberous shrub growing between 0.3-1.2 m high. Produces yellow-cream flowers from October to November.	Lateritic gravelly soils.	Unlikely to occur - suitable habitat unlikely to occur. Specimen found 6.4 km from survey area.	NatureMap
Jacksonia gracillima		Priority 3	Prostrate, spreading or scrambling spindly shrub growing to 0.5-1 m high and 1 m wide. Produces flowers with yellow, red and orange parts from October and November.	Grey sand. Seasonally wet poorly drained flat.	May occur – suitable habitat may occur. Specimen found 4.1 km from survey area.	NatureMap
Pithocarpa corymbulosa		Priority 3	Erect to scrambling, perennial herb growing between 0.5-1 m high. Produces white flowers from January to April.	Amongst granite outcrop ridges and slopes. Sandy loam, loamy clay soils with lateritic gravel.	Unlikely to occur - suitable habitat unlikely to occur.	NatureMap
Schoenus capillifolius		Priority 3	Semi-aquatic, tufted annual sedge growing to 0.05 m high. Produces green flowers from October to November.	Brown sand, clay. Claypans and seasonally wet depressions.	Unlikely to occur – suitable habitat unlikely to occur.	NatureMap
Schoenus pennisetis		Priority 3	Tufted annual sedge growing to 0.1-0.4 m high. Produces purple-black flowers from August to October.	Grey or brown peaty sand, sandy clay soils. Swamps, winter-wet depressions and flats.	Unlikely to occur - suitable habitat unlikely to occur.	NatureMap
Schoenus sp. *Waroona*		Priority 3	Tufted, annual grass-like herb growing to 0.06 m high. Produces brown flowers from October to November.	Clay, sandy clayey soils. Winter wet flats.	Unlikely occur - suitable habitat unlikely to occur. Specimen found 4.4 km from survey area.	NatureMap
Stylidium aceratum		Priority 3	Fibrous rooted annual herb growing to 0.1 m high with spathulate leaves. Produces pink-white flowers from October to November.	Black-grey sand and clayey soils. Swamp heathland and low lying depressions.	Unlikely to occur - suitable habitat unlikely to occur. Specimen found 4.6 km from survey area.	NatureMap
Acacia oncinophylla subsp. *patulifolia*		Priority 4	Shrub growing between 0.5-2.5 m high with 'minni-ritchi' bark and phyllodes 4-9 cm long, 3-6 mm wide. Produces yellow flowers in cylindrical heads from August to December.	Granitic soils, occasionally on laterite.	Unlikely to occur – suitable habitat unlikely to occur. Specimen found 6.4 km from survey area.	NatureMap

Species	EPBC Act Conservation Status	BC Act/DBCA Conservation Status	Description	Preferred Habitat	Likelihood of Occurrence	Source of Record
Drosera occidentalis		Priority 4	Fibrous-rooted, small red rosetted perennial herb growing to 0.02 m high. Produces white flowers from October to December.	Low lying flat. Grey sandy clay. Disturbed.	May occur - suitable habitat may occur. Specimen found 1.1 km from survey area.	NatureMap
Parsonsia diaphanophleba		Priority 4	Woody climber (vine). Produces cream-pale pink flowers from September to June.	Alluvial soils. Along rivers.	Unlikely to occur – suitable habitat unlikely to occur. Specimen found 6.4 km from survey area.	NatureMap
Verticordia lindleyi subsp. *lindleyi*		Priority 4	Erect shrub growing to 0.2 to 0.75 m high. Produces pink flowers with white fringes from November to January (also known from May).	Sand, sandy clay soils. Winter-wet depressions.	May occur - suitable habitat may occur. Specimen found 4.4 km from survey area.	NatureMap

0 125 250 375 500 m

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Figure 10 - Threatened and Priority Flora

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5.1.2 Threatened and Priority Ecological Communities

A review of DBCA Threatened and Priority Ecological Communities (TEC and PEC) database (DBCA 2021e) and the EPBC PMST (DAWE 2021c) identified the potential for nine TECs or PECs to occur in the survey area, including eight Commonwealth listed TECs (**Table 10**). Of these TECs and PECs, four occur (or their buffers do) within the survey area and surrounding region (desktop assessment area) as presented spatially in **Figure 11**.

Table 10 – Threatened and Priority Ecological Communities Potentially Occurring within the Survey Area (DBCA 2021e)

Abbreviated Identifier	Community Name	Commonwealth Category	State Category	Source
Clay Pans of the Swan Coastal Pain	Clay Pans of the Swan Coastal Pain	Critically Endangered	-	PMST
SCP 09	Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson *et* al (1994))	Critically Endangered	Vulnerable	DBCA
Tuart Woodlands and Forests	Tuart (*Eucalyptus gomphocephala)* Woodlands and Forests of the Swan Coastal Plain	Critically Endangered	Priority 3	PMST
Mound Springs SCP	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Endangered	Critically Endangered	DBCA
SCP 3a	*Corymbia calophylla – Kingia australis* woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson *et al.* (1994))	Endangered	Critically Endangered	PMST DBCA
SCP 3c	*Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson *et al.* (1994))	Endangered	Critically Endangered	PMST DBCA
SCP 3b	*Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson *et al.* (1994))	-	Vulnerable	DBCA
SCP 20b	*Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson *et al.* (1994))	(part) Endangered	Endangered (part Priority 3)	DBCA
Banksia WL SCP	Banksia dominated Woodlands of the Swan Coastal Plain IBRA Region	Endangered	Priority 3	PMST DBCA

5.1.2.1 Clay Pans of the Swan Coastal Plain

The Commonwealth listed 'Clay pans of the Swan Coastal Plain' TEC, comprises the four State listed TECs and one State listed PEC:

- SCP 07 – Herb rich saline shrublands in clay pans (Vulnerable)
- SCP 08 – Herb rich shrublands in clay pans (Vulnerable)
- SCP 09 – Dense shrublands on clay flats (Vulnerable)
- SCP 10a – Shrublands on dry clay flats (Endangered)
- Clay pans with mid dense shrublands of *Melaleuca lateritia* over herbs (Priority 1).

The species-diverse clay pan communities of the SCP occur where clay substrates are low in the landscape and form an impermeable layer close to the surface (DBCA 2019b). There are no specific suites of flora that characterise all the clay pans, but they share general characteristics of substrate, landform, hydrology and vegetation structure (DBCA 2019b).

5.1.2.2 SCP09 – Dense Shrublands on Clay Flats, Swan Coastal Plain, (TEC)

This community type consists of shrublands or low open woodlands on clay flats that are inundated for long periods because it usually occurs very low in the landscape. Sedges are more apparent in this ecological community and include *Chorizandra enodis* (black bristlerush), *Cyathochaeta avenacea*, *Lepidosperma longitudinale* (pithy sword-sedge) and *Leptocarpus coangustatus* (formerly *Meeboldina coangustata*). Shrubs include *Hakea varia* (variable-leaved hakea), *Melaleuca viminea* and occasionally *Xanthorrhoea preissii, X. drummondii* (grass trees) and *Kingia australis*. This vegetation community has a lower species richness and weed frequency than in the other clay pan community types, presumably because of the longer inundation times (DBCA 2019b).

5.1.2.3 Tuart *(Eucalyptus gomphocephala)* Woodlands and Forests of the Swan Coastal Plain

The *Tuart* (*Eucalyptus gomphocephala*) *Woodlands and Forests of the Swan Coastal Plain Ecological Community* (Tuart woodlands and forests TEC) occurs as woodland, forest or other structural forms associated with soils of the Swan Coastal Plain with a prominent tree layer of *Eucalyptus gomphocephala* (Tuart) as the defining feature (DEE 2019).

The Tuart woodlands and forests TEC occurs within the Swan Coastal Plain IBRA region within the Perth subregion, from Jurien, 200 km north of Perth, to Sabina River near Busselton, 225 km south of Perth (DEE 2019). The distribution of the ecological community is limited by the distribution of Tuart, although Tuart trees do also occur as a component of other vegetation communities, including the nationally listed Banksia woodlands TEC (DEE 2019).

5.1.2.4 Mound Springs SCP - Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)

The Mound Springs TEC is characterised by a continuous discharge of groundwater in raised areas of peat. Flora species recorded in this community include *Banksia littoralis, Melaleuca preissiana* and *Eucalyptus rudis* with *Agonis linearifolia, Pteridium esculetum, Astartea fascicularis* and *Cyclosorus interruptus*. Several non-vascular plants are also associated with this community (CALM 2006). This TEC has not been previously identified to occur within the survey area, however, a buffer for this TEC occurs 80 m north-west of the survey area boundary.

5.1.2.5 SCP 3a - *Corymbia calophylla – Kingia australis* woodlands on heavy soils, Swan Coastal Plain (TEC)

The *Corymbia calophylla – Kingia australis* woodlands on heavy soils of the Swan Coastal Plain ecological community is a woodland community located on heavy soils of the eastern side of the Swan Coastal Plain between Ruabon and Guildford (DEE 2017a). This TEC occurs on wetter sites than FCT SCP 3b or 3c and is associated with the median species richness, and lowest level of weed invasion and disturbance (DPaW 2011).

This TEC is typically dominated by; *Corymbia calophylla* (Marri); *Banksia dallanneyi, Philotheca spicata, Kingia australis* and *Xanthorrhoea preissii;* over herbs, rushes and sedges of *Cyathochaeta avenacea, Dampiera linearis, Haemodorum laxum, Desmocladus fasciculatus, Mesomelaena tetragona* and *Tetraria* (now *Morelotia*) *octandra* (DEE 2017a).

5.1.2.6 SCP 3b - *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (TEC)

The *Corymbia calophylla - Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain ecological community (SCP 3b) is characterised by an overstorey of dominated by both *Corymbia calophylla* (Marri) and *Eucalyptus marginata* (Jarrah) (DBCA 2020b). Other typical species include: *Bossiaea eriocarpa*, *Conostylis juncea, Hibbertia hypericoides, Tetraria* (now *Morelotia*) *octandra, Chamaescilla corymbosa, Desmocladus fasciculatus, Banksia dallanneyi, Mesomelaena tetragona, Babingtonia camphorosmae, Lepidosperma squamatum, Neurachne alopecuroidea, Philotheca spicata, Burchardia congesta, Caesia micrantha, Kingia australis, Drosera erythrorhiza, Lomandra hermaphrodita* and *Caladenia flava* (DBCA 2020b). This community is distributed between Wattle Grove and Harvey.

5.1.2.7 SCP 3c - *Corymbia calophylla – Xanthorrhoea preissii* woodlands and Swan Coastal Plain (TEC)

The SCP 3c community is found on heavy soils on the eastern side of the Swan Coastal Plain between Bullsbrook and Stratham. It is dominated by *Corymbia calophylla* and *Xanthorrhoea preissii* occasionally with *Eucalyptus wandoo*. The most common shrub species are *Gompholobium marginatum, Hypocalymma angustifolium* and *Banksia dallanneyi* (DBCA 2021d).

5.1.2.8 SCP 20b – *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (part of Banksia woodlands TEC)

This community occurs on sands at the base of the Darling Scarp primarily on Pinjarra Plain and Ridge Hill Shelf soils. The community comprises woodlands of *Banksia attenuata* often with *Eucalyptus marginata*. The presence of *Hakea stenocarpa, Conostylis setosa* and *Johnsonia pubescens* subsp. *cygnorum* is considered an indicator of this community (DEC 2012).

5.1.2.9 Banksia Woodlands TEC

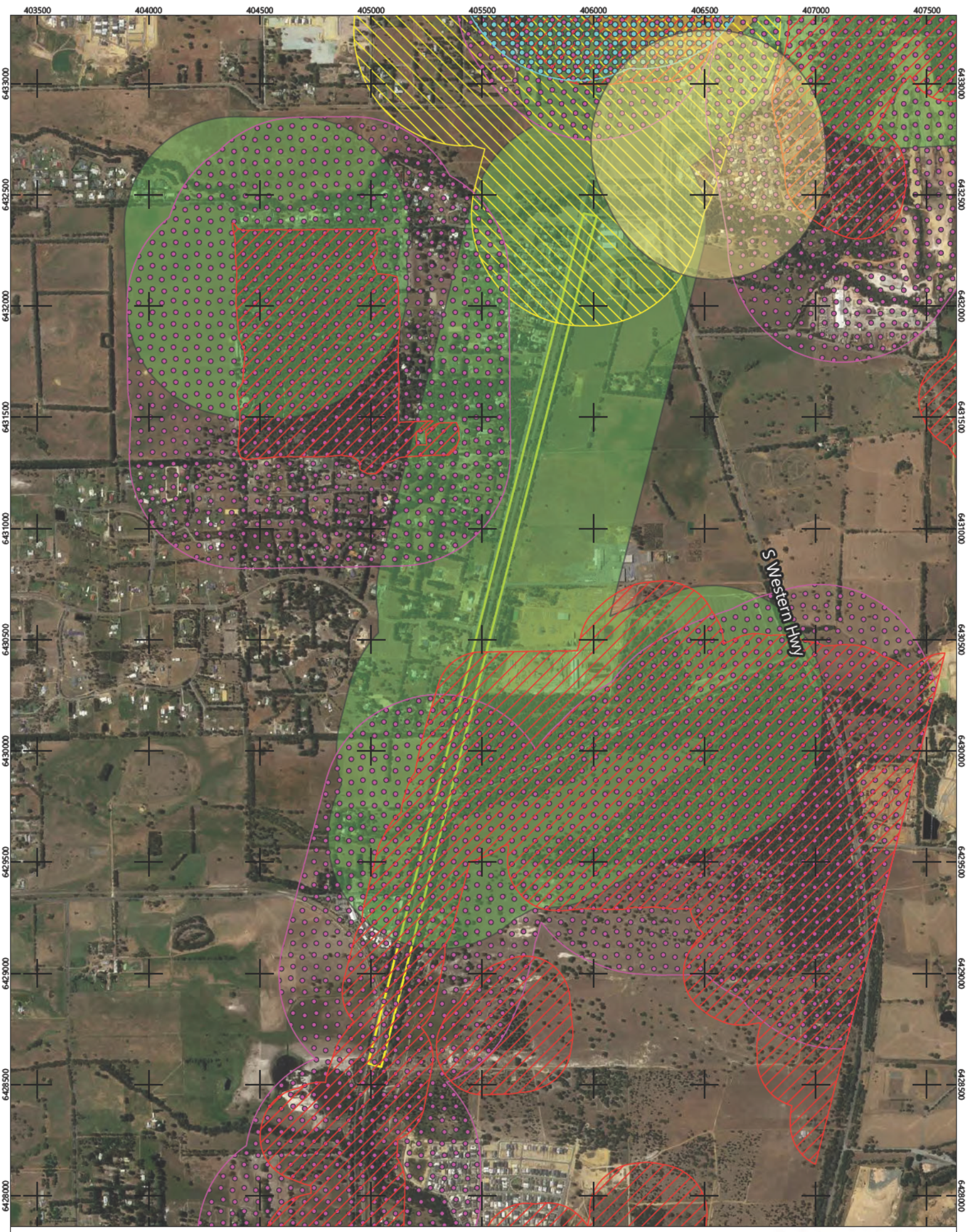
The *Banksia Woodlands of the Swan Coastal Plain Ecological Community* (Banksia woodlands TEC) was approved for inclusion as an Endangered TEC under the EPBC Act on 16 September 2016. This ecological community is woodland associated with some soils of the Swan Coastal Plain with a prominent tree layer of Banksia with scattered Eucalypts and other tree species among or emerging above the canopy. The understorey is comprised of a species rich mix of sclerophyllous shrubs, graminoids and forbs (TSSC 2016).

The Banksia woodlands TEC is largely restricted to the Swan Coastal Plain IBRA bioregion, within the Perth (SWA02) and Dandaragan (SWA01) sub-regions. It extends into the adjacent Jarrah Forrest IBRA region (JA01 and JA02 sub-regions) and areas of the Whicher and Darling escarpments where pockets of Banksia woodland may occur. This TEC mainly occurs on deep Bassendean and Spearwood sands or occasionally on Quindalup sands at the eastern edge (TSSC 2016).

Twenty-one Floristic Community Types (FCTs) described by Gibson *et al.* (1994) in Bush Forever (Government of Western Australia 2000), Keighery *et al.* (2012), and Urban Bushland Council (2011) best correspond to the Banksia woodlands TEC (TSSC 2016) which are summarised in **Table 11**.

Table 11 – Floristic Community Types Corresponding to the Banksia Woodlands TEC (TSSC 2016)

FCT	FCT Name	WA TEC/PEC	EPBC TEC
Supergroup 3 – Uplands centered on Bassendean Dunes and Dandaragan Plateau			
20a	*Banksia attenuata* woodlands over species rich dense shrublands	Endangered	
20b	Eastern *Banksia attenuata* and/or *Eucalyptus marginata* woodlands	Endangered	
20c	Eastern shrublands and woodlands	Critically Endangered	Endangered
21a	Central *Banksia attenuata - Eucalyptus marginata* woodlands		
21b	Southern *Banksia attenuata* woodlands	P3	
21c	Low lying *Banksia attenuata* woodlands or shrublands	P3	
22	*Banksia ilicifolia* woodlands	P3	
23a	Central *Banksia attenuata - Banksia menziesii* woodlands		
23b	Northern *Banksia attenuata - Banksia menziesii* woodlands	P3	
23c	North-eastern *Banksia attenuata - Banksia menziesii* woodlands		
S09	*Banksia attenuata* woodlands over dense low shrublands		
Supergroup 4 – Uplands centered on Spearwood and Quindalup Dunes			
24	Northern Spearwood shrublands and woodlands	P3	
25	Southern *Eucalyptus gomphocephala – Agonis flexuosa* woodlands	P3	
28	Spearwood *Banksia attenuata* or *Banksia attenuata – Eucalyptus* woodlands		
Whicher Scarp FCTs (Keighery *et al.* 2012)			
A1	Central Whicher Scarp Mountain Marri Woodland WHSFCT_A1	P1	
A2	North Whicher Scarp Jarrah and Woody Pear woodland WHSFCT_A2		
A3	North Whicher Scarp *Banksia* and Woody Pear woodland WHSFCT_A3		
A4	Whicher Scarp *Banksia grandis*, Jarrah and Marri woodland WHSFCT_A4		
B1	Swan Coastal Plain / North Whicher Scarp *Banksia attenuata* woodland WHSFCT_B1		
B2	West Whicher Scarp *Banksia attenuata* woodland WHSFCT_B2	P1	
C2	Whicher Scarp Jarrah woodland on deep coloured sands WHSFCT_C2	P1	



0 0.25 0.5 0.75 1 km

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Legend

- Survey Area
- Banksia WL SCP
- Mound Springs SCP
- SCP09
- SCP20b
- SCP3a
- SCP3b
- SCP3c

Figure 11 - Threatened and Priority Ecological Communities

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5.2 FIELD ASSESSMENT

5.2.1 Flora

A total of 96 flora species, from 69 genera and 29 families were recorded during the field survey. The dominant families were found to be Fabaceae (12 taxa), Myrtaceae (10 taxa) and Asparagaceae (eight taxa). The total is comprised of 83 (86.5%) native species and 13 (13.5%) introduced (weed) species. The full list of vascular flora species recorded within each vegetation unit (which includes opportunistic species records, additional to flora species recorded within quadrats and relevés) is presented in **Appendix C** and individual quadrat and relevé data is presented in **Appendix D**.

No species listed as Threatened flora under the BC Act or under the EPBC Act were recorded. One Priority flora species listed by DBCA, *Johnsonia pubescens* subsp. *cygnorum* (P2) was recorded in quadrat CR02 (**Figure 10**).

Two vascular flora species of conservation significance, *Synaphea* sp. Serpentine (G.R Brand 103) and *Synaphea* sp. Pinjarra Plain (A.S. George 17182) both listed as Critically Endangered under the EPBC Act and BC Act have been previously recorded from within the survey area (**Figure 10**). *Synaphea* sp. Serpentine (G.R Brand 103) was recorded from one location in 2011 and *Synaphea* sp. Pinjarra Plain (A.S. George 17182) was recorded from three locations in 2003, 2011 and 2012. None of the collected specimens from the survey area, including *Synaphea* spp., were confirmed to be representative of the Threatened taxa.

None of the flora recorded are exhibiting extensions of their currently known range as documented by the WA Herbarium (WAH 1998-).

Due to the limited number of quadrats sampled within the survey area, species accumulation curves were not able to be produced to assess the adequacy of sampling.

5.2.2 Vegetation

Seven vegetation units were defined and mapped within the survey area. This comprised of six Woodlands and one Planted Rehabilitation unit. Each vegetation unit is described in **Table 12** and their spatial extents within the survey area are presented in the **Figure 12** series.

Table 12 – Summary of Recorded Vegetation Units

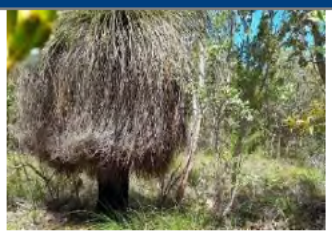
Vegetation Unit	Vegetation Description	Representative Photo	Site Number	Area (ha)	% of Survey Area
BsXp Banksia/ Xanthorrhoea Woodland	*Corymbia calophylla* Low Open Woodland over *Banksia* sessilis Tall Shrubland over *Xanthorrhoea preissii* Shrubland		CR04	0.25	1.05
CcXp Marri/ Xanthorrhoea Woodland	*Corymbia calophylla* and *Eucalyptus marginata* Low Woodland over *Xanthorrhoea preissii* and occasional *Kingia australis* Tall Sparse Shrubland over *Mesomelaena tetragona* Sedgeland		CR01 CR03	9.62	40.33
CcXpKa Marri/ Xanthorrhoea/ Kingia Woodland	*Corymbia calophylla* Low Open Woodland over *Xanthorrhoea preissii* and *Kingia australis* Tall Sparse Shrubland over *Laxmannia squarrosa* Low Forbland		CR02	5.43	22.77
EwTo Wandoo Woodland	*Eucalyptus wandoo* and *Corymbia calophylla* Low Woodland over *Trymalium odoratissimum* subsp. *odoratissimum, Kingia australis* and *Xanthorrhoea preissii* Shrubland *Mesomelaena tetragona* and *Laxmannia squarrosa* Sedgeland		CR07	0.56	2.35
Cc(P) Marri over weeds	*Corymbia calophylla* Open Woodland over grasses and weeds	No representative photo	NA	0.04	0.17
Er(P) *Eucalyptus rudis* over weeds	*Eucalyptus rudis* Open Woodland over *Trymalium odoratissimum* subsp. *odoratissimum* Shrubland over grassess and weeds		CR06r	0.03	0.12
Rehab	Rehabilitation with planted endemic and non endemic species		CR05r	0.77	3.23
			Cleared	7.15	29.98
			TOTAL	**23.85**	**100**

Figure 12a - Vegetation Units of the Survey Area

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Figure 12b - Vegetation Units

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Vegetation within a 500 m buffer of the survey area centreline was extrapolated, as per the requirements of EPA (2016). It was determined that the survey area plus the surrounding area supports eleven broad vegetation units, five of which (CcXp, CcXpKa, EwTo, Cc(P) and Rehab) are represented within the survey area, as summarised in **Table 13** and presented in the **Figure 13** series.

Table 13 – Summary of Recorded Vegetation Units Surrounding the Survey Area

Vegetation Unit	Vegetation Description
CcXp Marri/ Xanthorrhoea Woodland*	*Corymbia calophylla* and *Eucalyptus marginata* Low Woodland over *Xanthorrhoea preissii* and occasional *Kingia australis* Tall Sparse Shrubland over *Mesomelaena tetragona* Sedgeland
CcXpKa Marri/ Xanthorrhoea/ Kingia Woodland*	*Corymbia calophylla* Low Open Woodland over *Xanthorrhoea preissii* and *Kingia australis* Tall Sparse Shrubland over *Laxmannia squarrosa* Low Forbland
EwTo Wandoo Woodland*	*Eucalyptus wandoo* and *Corymbia calophylla* Low Woodland over *Trymalium odoratissimum* subsp. *odoratissimum, Kingia australis* and *Xanthorrhoea preissii* Shrubland *Mesomelaena tetragona* and *Laxmannia squarrosa* Sedgeland
BsXp Banksia /Xanthorrhoea Woodland*	*Corymbia calophylla* Low Open Woodland over *Banksia* sessilis Tall Shrubland over *Xanthorrhoea preissii* Shrubland
ErCc *Eucalyptus rudis* and *Corymbia calophylla* over weeds	*Eucalyptus rudis* and *Corymbia calophylla* Open Woodland *over grasses and weeds*
Cc(P) Marri over weeds*	*Corymbia calophylla* Open Woodland over grasses and weeds
KS *Kunzea* Shrubland	*Kunzea* spp. Shrubland over grasses and weeds
MS *Melaleuca* Shrubland	*Melaleuca* spp. Shrubland over grasses and weeds
Parkland	Isolated remnant trees or shrubs over grasses and other weeds
Planted	Planted endemic, non-endemic or garden species
Rehab*	Rehabilitation with planted endemic and non-endemic species
Water	Indundated areas devoid of vegetation

*also within the Cable Route survey area

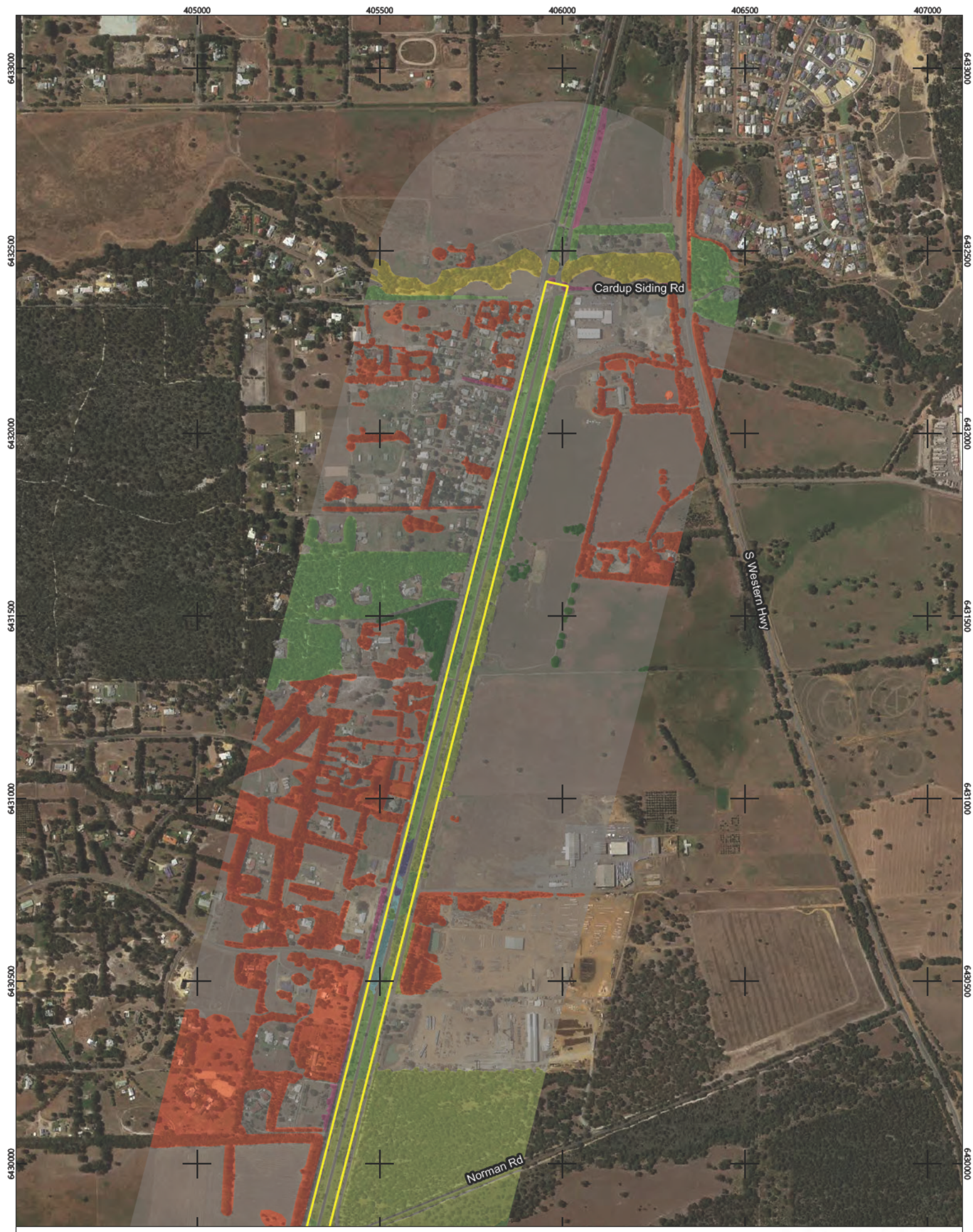

Figure 13a - Vegetation Units Surrounding the Survey Area

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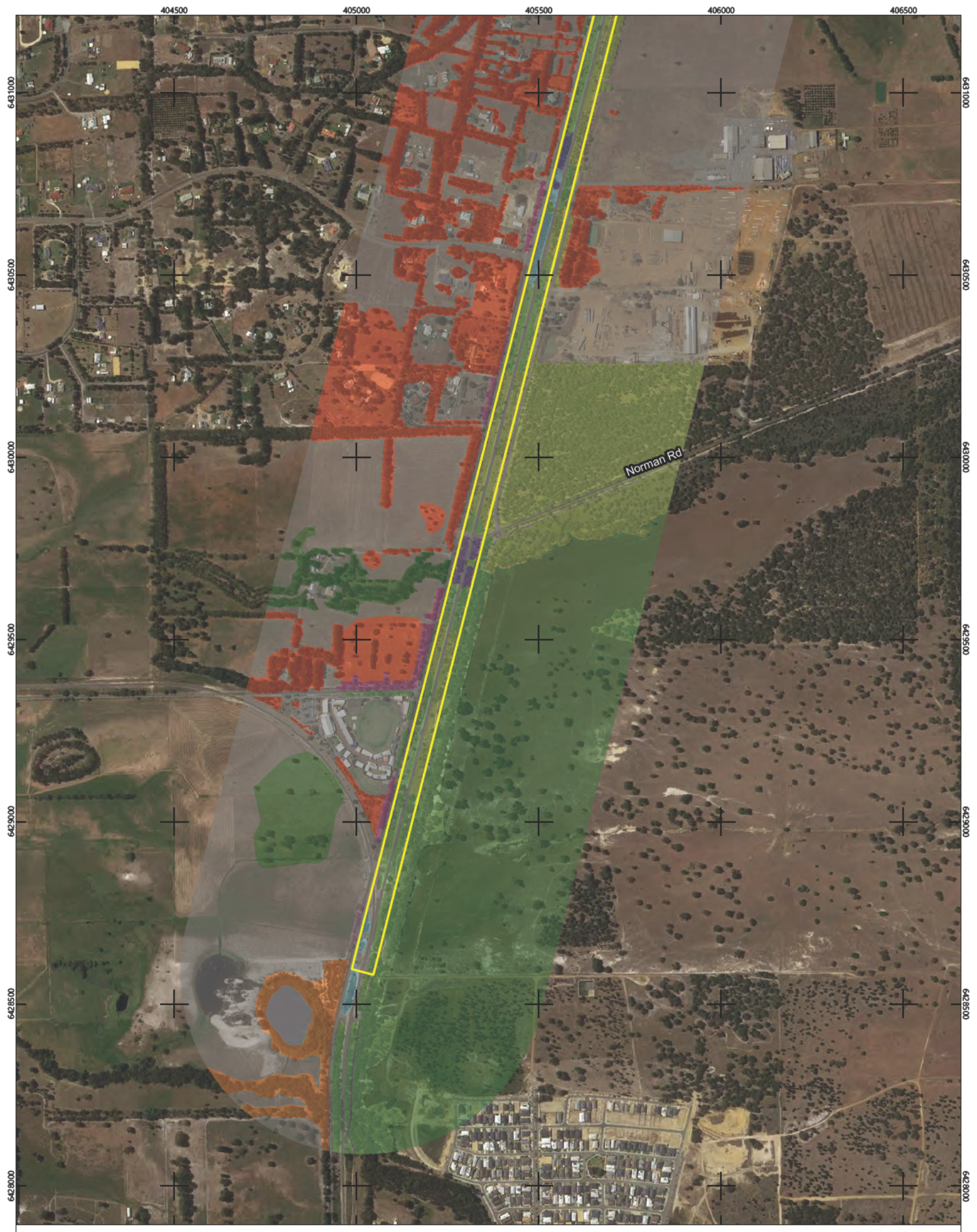

0 125 250 375 500 m

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Legend

- Survey Area
- BsXp
- CcXp
- CcXpKa
- Cleared
- Er(P)
- EwTo
- Rehab
- Parkland
- MS
- KS
- Planted
- Water

Figure 13b - Vegetation Units Surrounding the Survey Area

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5.2.2.1 Vegetation Condition

The condition of the vegetation within the survey area was found to range from 'Completely Degraded' to 'Very Good - Excellent', with only 16.9% observed to be in 'Good' or better condition. The areas of the varying vegetation condition are summarised in **Table 14** and the spatial extent of this is presented in the **Figure 14** series.

Table 14 – Summary of Vegetation Condition

Vegetation Condition Rating	Vegetation Unit	Area (ha)	Total Area (ha)	% of Survey Area
Excellent	CcXpKa	0.20	0.20	0.84
Very Good - Excellent	CcXp	0.12	0.12	0.50
Very Good	CcXpKa	0.78	0.82	3.44
	EwTo	0.04		
Good-Very Good	CcXp	0.74	1.37	5.74
	CcXpKa	0.51		
	EwTo	0.12		
Good	BsXp	0.05	1.52	6.38
	CcXp	0.88		
	CcXpKa	0.25		
	EwTo	0.34		
Degraded-Good	BsXp	0.15	3.26	13.67
	CcXp	1.04		
	CcXpKa	1.73		
	Rehab	0.34		
Degraded	BsXp	0.04	6.48	27.17
	CcXp	4.55		
	CcXpKa	1.86		
	EwTo	0.03		
Completely Degraded-Degraded	Cc(P)	0.04	2.71	11.36
	CcXp	2.14		
	CcXpKa	0.12		
	Er(P)	0.04		
	EwTo	0.02		
	Rehab	0.35		
Completely Degraded	CcXp	0.14	0.22	0.92
	Rehab	0.08		
		Cleared	7.15	29.98
		TOTAL	**23.85**	**100**

Figure 14a - Vegetation Condition

FOCUSED VISION consulting

PTA21002g 02 June 2022

Figure 14b - Vegetation Condition

FOCUSED VISION consulting

PTA21002g 02 June 2022

5.2.2.2 Assessment of Floristic Community Types

Analysis of all quadrats recorded within the survey area was first conducted using the full suite of FVC sampled quadrats (batch analysis) and then via single site insertion (SSI) into a local subset of Gibson *et al.* (1994) and Keighery *et al.* (2012) quadrats. Multivariate cluster analysis of species presence/absence in PATN™ was conducted in order to assign Gibson *et al.* (1994) or Keighery *et al.* (2012) FCTs that are most likely represented within each quadrat.

The dendrograms resulting from the SSI analysis are presented in **Appendix E** and the results of the analysis, including analysis of dissimilarity are presented in **Table 15**.

Interrogation of the results of the data analysis (**Table 15**) indicates that all quadrats sampled, excluding CR04, are considered to be representative of FCT SCP 3b which is a State-listed TEC. Based these results, the vegetation units described and mapped for the survey area which most closely align with the FCT SCP 3b TEC (*Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain) are:

- CcXp (Marri/Xanthorrhoea Woodland)
- CcXpKa (Marri/Xanthorrhoea/Kingia Woodland).

Table 15 – Summary of Single Site Insertion PATN™ Analysis Results

Vegetation Unit	Quadrat	Vegetation condition	SSI Dendrogram Result*	Dissimilarity values	SCP Quadrat	FCT	Dissimilarity values	SCP Quadrat	FCT	Dissimilarity values	SCP Quadrat	FCT	Inferred FCT	Reasoning
BsXp Banksia/ Xanthorrhoea Woodland	CR04	Good	3c, 3a, 3b	0.6768	CARD13	3b	0.7105	DUCK-2	3c	0.7263	HARRY-2	28	Inconclusive	Greatest similarity to FCT SCP 3b; however, CR04 has a mid-stratum dominated by *Banksia sessilis* (60%). Although often a disturbance opportunist, this species is not considered typical within FCT SCP 3a, 3b or 3c and often occurs on lateritic gravel. Based on the distribution of defined sites and the lack of characteristic Banksia species, it is considered unlikely for CR04 to be representative of FCT SCP 28
CcXp Marri/ Xanthorrhoea Woodland	CR01	Good	6, 3b, 3c, 3a	0.7200	CARD4	6	0.7381	Norm04	3b	0.7556	CARD13	3b	3b	Greatest overall similarity to FCT SCP 3b. FCT SCP 6 (CARD4), a weed dominated wetland on heavy soils, does not support the dominant species occurring within CR01. Dominant species of CR01 occur within FCT SCP 3a, 3b and 3c. Based on dissimilarity values and dendrogram results CR01 is representative of FCT SCP 3b.
	CR03	Very Good-Excellent	3b	0.6216	serp03	3b	0.6543	serp04	3b	06667	serp01	3b	3b	Consistently greatest similarity to FCT SCP 3b. Gibson *et. al* (1994) sites serp03, serp04 and serp01 occur near Serpentine approx. 10 km south of the survey area.
CcXpKa Marri/ Xanthor-rhoea/ Kingia Woodland	CR02	Good-Very Good	6, 3b, 3c, 3a	0.6667	CARD13	3b	0.6852	LAMB2	3a	0.6854	BRICK7	3a	3b	Greatest overall similarity to FCT SCP 3b. Dominant species of the quadrat occur within FCT SCP 3b. CARD13 (FCT SCP 3b) occurs within Cardup Nature Reserve approximately 1 km west of the survey area.
EwTo Wandoo Woodland	CR07	Good	3c, 3a, 3b	0.6346	CARD13	3b	0.6543	DUCK-2	3c	0.6545	LAMB2	3a	Inconclusive	Greatest similarity to FCT SCP 3b. The key dominant species of CR07 (*Eucalyptus wandoo*) has not been recorded within any of the SCP FCTs, besides 3c.. The dendrogram indicates clustering with FCT SCP 3c quadrats, however FCT SCP 3c has not been previously documented to occur within the desktop assessment area, whilst FCT SCP 3a and 3b quadrats and confirmed DBCA TEC locations do. A dominant understorey species within CR07, *Trymalium odroratissimum* subsp. *ordoratissimum* has not been previously recorded in FCTs SCP 3a, 3b or 3c. Vegetation of CR07 is not typical of the Swan Coastal Plain and not represented in Gibson *et al.* (1994) or Keighery *et al.* (2012).

*listed in order of nearest neighbour

5.2.3 Threatened and Priority Ecological Communities

The desktop assessment identified the following nine TECs and/or PECs that are known to occur within or in close proximity to the survey area:

- Clay Pans of the Swan Coastal Plain (Critically Endangered: EPBC Act)
- FCT SCP 09 – Dense Shrublands on Clay Flats, Swan Coastal Plain (Critically Endangered; EBPC Act, Vulnerable; BC Act)
- Tuart Woodlands and Forests (Critically Endangered: EPBC Act, Priority 3: DBCA)
- Mound Springs SCP – Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) (Endangered; EBPC Act, Critically Endangered; BC Act)
- FCT SCP 3a - *Corymbia calophylla – Kingia australis* woodlands on heavy soils, Swan Coastal Plain (Endangered: EPBC Act, Critically Endangered BC Act)
- FCT SCP 3b - *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (Vulnerable BC Act)
- FCT SCP 3c - *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (Endangered: EPBCA Act, Critically Endangered: BC Act)
- FCT SCP 20b - *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (Endangered BC Act)
- Banksia dominated Woodlands of the Swan Coastal Plain IBRA Region (Endangered: EPBC Act, Priority 3 DBCA).

5.2.3.1 Clay Pans of the Swan Coastal Plain

The EPBC PMST identified that the Clay Pans of the Swan Coastal Plain TEC is likely to occur within the defined search area (**Appendix B**). The DBCA Threatened and Priority Ecological Community database did not specifically identify the presence of the Commonwealth listed TEC, however it did identify State listed TECs; FCT SCP 09 – Dense shrublands on clay flats, which form part of the Commonwealth-listed Clay pans of the Swan Coastal Plain TEC, within or within 2 km of the survey area. As the Commonwealth-listed TEC is comprised of five State-listed TECs, including FCT SCP 09, then the Commonwealth listed TEC also occurs. The presence of State-listed FCT SCP 09 is reported in **Section 5.1.2.1**.

5.2.3.2 SCP09 – Dense Shrublands on Clay Flats, Swan Coastal Plain

The desktop assessment identified that FCT SCP 09 and its buffer, does not occur within the survey area; however, is located 600 m north of the survey area (**Figure 11**). PATN™ analyses carried out as part of this assessment did not infer that any of the defined vegetation units showed similarity to FCT SCP 09; therefore, are not representative of this FCT.

5.2.3.3 Tuart *(Eucalyptus gomphocephala)* Woodlands and Forests of the Swan Coastal Plain

The desktop assessment indicates that the Commonwealth-listed (Critically Endangered) Tuart woodlands TEC, also listed as a Priority 3 PEC by DBCA has the potential to occur within the survey area; however, the closest recorded occurrence is approximately 14 km from the survey area. The key species defining this TEC, *Eucalyptus gomphocephala* was not recorded within the survey area; therefore, none of the defined vegetation units are considered representative of this TEC.

5.2.3.4 Mound Springs - Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain

The Mound Springs TEC is characterised by a continuous discharge of groundwater in raised areas of peat. The maintenance of hydrological processes for quality and quantity of water to the mounds is essential to sustain the tumulus springs assemblages (DBCA 2013). The Mound Springs TEC distributed at isolated locations between Muchea and Oldbury.

DBCA Threatened Ecological Community database search indicates that the Mound Springs TEC and its buffer does not occur within the survey area; however, one known occurrence is located less 100 m north-east of the survey area (**Figure 11**). None of the defined vegetation units are considered to be representative of this TEC.

5.2.3.5 SCP 3a – *Corymbia calophylla – Kingia australis* woodlands on heavy soils

This FCT occurs on heavy soils on the eastern side of the Swan Coastal Plain. DBCA spatial data identified that this TEC and its buffer encompasses a small area in the northern portion of the survey area (**Figure 11**). PATN™ analyses carried out as part of this assessment did not infer that any of the defined vegetation units show the greatest similarity to FCT SCP 3a or are representative of this FCT.

5.2.3.6 SCP 3b – *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain

The desktop assessment identified that FCT SCP 3b encompasses a large proportion of the survey area and thus, DBCA data confirms the presence of this FCT within the survey area (**Figure 11**). Floristic analysis results indicate that quadrats CR01 and CR03 within CcXp (Marri/Xanthorrhoea Woodland) and quadrat CR02 within CcXPka (Marii/Xanthorrhoea/Kingia Woodland) show the greatest similarity to FCT SCP 3b. Interrogation of data from these quadrats indicates the presence of *Corymbia calophylla, Xanthorrhoea preissii* and *Kingia australis* as dominant species, all of which are considered typical of FCT SCP 3b. At quadrat CR01, the clay soils characteristic of FCT SCP 3b were observed. Therefore, based on PATN™ analysis results and the assessment of key dominant species and soils, it is considered that vegetation representative of FCT SCP 3b occurs within the survey area.

5.2.3.7 SCP 3c - Corymbia calophylla – Xanthorrhoea preissii woodlands and Swan Coastal Plain

DBCA data indicated that FCT SCP 3c does not occur within the survey area; however, two occurrences of this FCT (or a buffer of its occurrence) occur approximately 0.8 km north and 1.7 km south of the survey area (**Figure 11**). Based on PATN™ analysis results and the assessment of key dominant species and soils, it is considered that none of the vegetation is considered representative of FCT SCP 3c.

5.2.3.8 SCP 20b – *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain

DBCA data indicates that the *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain TEC (or a buffer of its occurrence) encompasses the southern portion of survey area (**Figure 11**). Floristic analysis of all quadrats indicates that none of the vegetation units in the survey area are representative of FCT SCP 20b and therefore, none of the defined vegetation units are considered to be representative of the FCT. Furthermore, characteristic species of FCT SCP 20b such as *Banksia attenuata* and *Xylomelum occidentale* were not recorded within the survey area.

5.2.3.9 Banksia Dominated Woodlands of the Swan Coastal Plain

DBCA TEC and PEC database results indicated that the Commonwealth-listed (Endangered) Banksia woodlands TEC, also listed as a Priority 3 PEC by DBCA (or a buffer of its occurrence), encompasses the southern portion of the survey area.

Floristic analysis of all quadrats inferred that none of the vegetation units in the survey area are representative of FCT SCP 20b and therefore none of the defined vegetation units are considered to be representative of the FCT. It is also considered that none of the defined vegetation units are representative of the Banksia woodlands TEC, due to a lack of characteristic species such as *Banksia attenuata*.

5.3 VEGETATION OF SIGNIFICANCE

5.3.1 Nationally Significant Vegetation

The National significance of the vegetation units was assessed based on presence of:

- populations of Threatened (EPBC listed) species
- TECs listed as nationally (EPBC) significant
- Ramsar Wetlands of International Importance (DAWE 2020a).

5.3.1.1 Threatened Flora

No EPBC-listed Threatened flora were recorded within the survey area and therefore, none of the recorded vegetation units are of National significance due to this factor.

5.3.1.2 Threatened Ecological Communities

None of the defined vegetation units, were considered to be representative of, or form part of an EPBC-listed TEC. Therefore, none of the vegetation units are considered to be of National significance due to this factor.

5.3.1.3 Ramsar Wetlands

No Ramsar wetlands occur within the survey area and therefore, none of the recorded vegetation units are of National significance due to this factor.

5.3.2 State Significant Vegetation

The State significance of the vegetation units was assessed based on presence of:

- State listed Threatened flora or TECs
- land within (or areas recommended by DBCA for inclusion) the State-managed conservation estate.

5.3.2.1 Threatened Flora

No State-listed Threatened flora were recorded within the survey area and therefore, none of the recorded vegetation units are of State significance due to this factor.

5.3.2.2 TECs

Two of the defined vegetation units, CcXp and CcXpKa, are considered to be representative of a State-listed TEC (SCP 3b). Therefore, these vegetation units are considered to be of State significance due to this factor.

5.3.2.3 Conservation Estate

No DBCA Conservation Reserves or Estate occur within survey area. Therefore, none of the defined vegetation units are considered to be of State significance due to this factor.

5.3.3 Regionally Significant Vegetation

The regional significance of the vegetation units was assessed based on:

- the presence of populations of Priority flora or ecological communities
- the presence of ESAs or areas relevant to a conservation scheme
- the presence of conservation category wetlands
- the presence of high diversity of flora, fauna, communities, or community structure
- the presence of flora species exhibiting range extensions or undescribed species
- having a restricted regional distribution
- being represented by less than 30% of the pre-European extent.

5.3.3.1 Priority Flora

No Priority flora were recorded and therefore, none of the recorded vegetation units are of regional significance due to this factor.

One State-listed priority flora species, *Johnsonia pubescens subsp. cygnorum* was recorded within quadrat CR02 defined as vegetation unit CcXpKa. Therefore, only vegetation unit CcXpKa is considered Regionally significant due to this factor.

5.3.3.2 Priority Ecological Communities

None of the vegetation units are considered to be representative of any PEC and therefore, none of the recorded vegetation units are of regional significance due to this factor.

5.3.3.3 ESAs or Conservation Areas

The survey area is a Bush Forever site (site 350), which is also therefore, an ESA. Therefore, all of the recorded vegetation units, (BsXp, CcXp, CcXpKa, EwTo, Er(P) and Cc(P)) which occupy the Bush Forever site and ESA are considered to be of regional significance due to this factor.

5.3.3.4 Conservation Category Wetlands

Three conservation category wetlands occur within the survey area and therefore, vegetation that intersects with the mapped wetland (BsXp, CcXp, CcXpKa EwTo and Er(P)) are considered to be of regional significance due to this factor.

5.3.3.5 High Diversity

A large proportion of the survey area (29.98%) has been cleared, therefore within the survey area, the species richness across the remaining remnant vegetation (average 5.67 species per hectare) is considered to be low and the diversity of the vegetation is not considered to be high given the size of the survey area. The floral composition and vegetation structure of the vegetation units are considered typical of the vegetation of the Swan Coastal Plain. None of the recorded vegetation units are considered to exhibit complex or diverse structure and are therefore not considered to be of regional significance due to this factor.

5.3.3.6 Range Extending/Undescribed Flora

None of the recorded flora are occurring beyond their known range and none are undescribed flora, therefore, none of the recorded vegetation units are considered to be of regional significance due to this factor.

5.3.3.7 Restricted Regional Representation and Distribution

The most important aspect in the consideration of regional significance of vegetation is the representation of that vegetation in the region. Within each IBRA Region, some regionally defined vegetation associations (Shepherd *et al.* 2002) comprise a very small proportion of the vegetation associations within that region. Vegetation units are considered significant if they are poorly represented regionally. The vegetation association

represented in the survey area (968) is not restricted in its representation or distribution, and therefore, none of the recorded vegetation units are considered to be of regional significance due to this factor.

5.3.3.8 Extent Remaining

The vegetation association (Beard 1990) represented within the survey area (968) falls below both the unconstrained (30%) and constrained (10%) area thresholds for retention in comparison to their pre-European extent for the Swan Coastal Plain. Therefore, all remnant vegetation units occurring within the survey area are considered to be of regional significance due to this factor.

The Guildford complex is represented by less than 10% of its original vegetation extent. Therefore, vegetation units occurring within the defined extent of the Guildford complex (BsXp, Cc(P), CcXp, CcXpKa, EwTo) are considered to be of regional significance due to this factor.

5.3.4 Locally Significant Vegetation

The local significance of the vegetation units was assessed based on:

- representing small, isolated communities
- their local extent (proportion) and distribution.

5.3.4.1 Small, Isolated Communities

Two of the recorded vegetation units BsXp (1.05%) and EwTo (2.35%) each occupy less than 3% of the survey area and occur as isolated occurrences. The combination of flora taxa occurring within these vegetation units are considered to be widespread across the Swan Coastal Plain and nearby regions and therefore, these units are not unique or of conservation significance, nor of local significance due to being limited in their extent and distribution. However, due to being represented within small, isolated occurrences within the survey area and in the context of the surrounding area (**Figure 13**), vegetation units BsXp and EwTo are considered be of local significance.

5.3.4.2 Limited Extent and Distribution

Despite vegetation units BsXp and EwTo being represented by small extents within the survey area, the combination of flora taxa occurring within these vegetation units are considered to be widespread across the Swan Coastal Plain and nearby regions. Based on literature, including the Gibson *et al.* (1994) distribution of sites and other anecdotal information, the recorded vegetation units are considered to be widely distributed and well-represented within the local area (Shire of Serpentine-Jarrahdale) and across the Swan Coastal Plain and surrounding regions. Therefore, none of the recorded vegetation units are considered to be of local significance due to this factor.

6. DISCUSSION

6.1 FLORA

The survey area occurs at the base of the Darling Scarp, on the eastern side of the Swan Coastal Plain where the level of historic clearing is very high, and the original populations of flora species have been greatly reduced in size and connectivity (Malcom Trudgen, pers. comm.). The survey area is a linear corridor, running parallel with the South Western Railway corridor. The corridor and areas surrounding it have been highly disturbed. Vegetation remains within the survey area, whilst there has been significant clearing in the surrounding areas. This has resulted in the survey area emerging as an ecological linkage, with retained vegetation joining reserves in the north, to larger vegetation remnants in the south. Consequently, the survey area may have high conservation value for native flora, whether or not the individual taxa recorded in the survey area are of particular conservation significance (Malcolm Trudgen pers. comm.).

A total of 96 flora species, from 69 genera and 29 families were recorded during the field survey. The dominant families were found to be Fabaceae (12 taxa), Myrtaceae (10 taxa) and Asparagaceae (eight taxa). The total is comprised of 85 (86.5%) native species and 13 (13.5%) introduced (weed) species, none of which are Declared Pest plants.

The species diversity within the survey area is considered low (5.67 species/ha) which is considered likely due to the linear alignment of the survey area, providing a larger edge to area ratio and therefore vulnerability to edge effects such as weed invasion, and a large proportion of the survey area being cleared. The survey area's disturbed and partially cleared nature, was a minor limitation of the study.

The presence of invasive weeds within the survey area can be attributed to the close proximity to existing infrastructure such as roads, railways and cleared pasture. Introduced species can out-compete native species, particularly adjacent to these high traffic areas. Poorer vegetation condition and higher weed abundance occurs adjacent to road and rail infrastructure where the edge effects from these activities are more pronounced.

6.1.1 Significant Flora

No species listed as Threatened flora under the BC Act or under the EPBC Act were recorded.

Two Threatened vascular flora species have been previously recorded from within the survey area: *Synaphea* sp. Serpentine (G.R Brand 103); and *Synaphea* sp. Pinjarra Plain (A.S. George 17182). Both species are listed as Critically Endangered under the EPBC and BC Acts.

Synaphea sp. Serpentine (G.R Brand 103) was recorded from one location in 2011 and *Synaphea* sp. Pinjarra Plain (A.S. George 17182) was recorded from three locations in 2003, 2011 and 2012 within the railway corridor adjacent to Soldiers Road. *Synaphea* sp. Serpentine (G.R Brand 103) is known from 38 FloraBase records, predominantly between Byford in the north to Serpentine in the south, with isolated locations at Yalgoo and Capel. *Synaphea* sp. Pinjarra Plain (A.S. George 17182) is known from 63 FloraBase records and is predominantly distributed from Byford to Pinjarra. *Synaphea* sp. Pinjarra Plain (A. S. George 17182) typically occurs within Open Woodland of *Corymbia calophylla, Xanthorrhoea preissii* over Open Shrubland of *Pericalymma ellipticum, Kunzea micrantha, Hakea varia, Adenanthos meisneri, Stirlingia latifolia Synaphea petiolaris* and *Synaphea gracillima* over Sedgelands of *Mesomelaena tetragona* and *Tetraria octandra* (DBCA 2016). Both species grow in a variety of habitats but commonly occur within *Corymbia calophylla* Woodlands and/or *Kunzea* or *Melaleuca* thickets and shrublands.

While suitable habitat for these two species occurs within survey area, neither of these species were recorded during the field assessment. This may be attributed to the length of time since these species were originally recorded (which may suggest poor accuracy of the recorded locations), or the 'Degraded' condition of the vegetation in which these species were previously recorded.

6.2 VEGETATION

Overall, only 16.9% of the vegetation within the survey area was recorded to be in 'Good' or better condition. This poorer quality of vegetation condition was expected due to the close proximity of the survey area to existing infrastructure and the largely cleared context in which it occurs. A large proportion of survey area has been subject to weed infestation, resulting in poorer quality vegetation.

6.2.1 Connectivity

While much of survey area is adjacent to cleared areas, the survey area acts as an ecological linkage between areas of native vegetation (**Section 3.10**). These linkages are important, as they connect continuous areas of native vegetation, and in effect, create a larger area of native vegetation when combined. The size of an area of native vegetation is directly related to the number of flora species that can survive there (Freudenberger *et al.* 1997), so these connections (by maintaining the larger size of the overall remnant) assist in maintaining flora species abundance and diversity in the survey area and the local region.

6.2.2 Floristic Community Types

The DBCA database search results suggested that TECs are likely to be present in the survey area. PATN™ analysis indicated that two of the vegetation units (CcXp and CcXpKa) that were defined and mapped within the survey areas are representative of FCT SCP 3b (*Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain), which is listed as a Vulnerable TEC at a State level. All other vegetation units in the survey area produced inconclusive results or were not aligned with an FCT due to their degraded nature.

Vegetation units CcXp (Marri/*Xanthorrhoea* woodland) and CcXpKa (Marri/*Xanthorrhoea/Kingia* woodland) showed the greatest similarity to FCT SCP 3b (**Table 14**) and the FCT SCP 3b quadrats recorded by Gibson *et al.* (1994) from Cardup Nature Reserve. Statistical analysis of quadrat data and interrogation of species composition from vegetation units BsXp (*Banksia/Xanthorrhoea* Woodland) and EwTo (*Wandoo* Woodland) provided inconclusive results.

More specifically, quadrats sampled within vegetation units CcXp (CR03) and CcXpKa (CR02) showed the greatest similarity to Gibson *et al.* (1990) quadrat CARD13 (FCT SCP 3b), which is located within the Cardup Nature Reserve. Statististical analysis indicated that quadrat CR01 showed the greatest similarity (with a dissimilarity value of 0.7255) to FCT SCP 06 (Weed dominated wetlands on heavy soils). Despite analysis indicating the greatest affinity of CR01 with FCT SCP 06, examination of species composition of FCT SCP 06 concluded that quadrat CR01 is unlikely to be representative of this FCT, due to the lack of dominant species in common. The alignment to this FCT from floristic analysis may be due to the presence of a similar suite of weed species. Clay soils were recorded at quadrat CR01, and whilst such soils are characteristic of FCT SCP 06, they are also characteristic of FCT SCP 3b. Overall, it was therefore concluded that CR01 also shows the greatest similarity to FCT SCP 3b.

Sampled quadrats within vegetation unit CcXp (Marri/Xanthorrhoea woodland) also showed affinity to FCTs defined as Banksia woodland communities (FCT SCP 20b and 21a). None of the charateristic Banksia species (predominantly *Banksia attenuata*) of both FCT SCP 20b and 21a occur within quadrats CR01 or CR03 and therefore, this vegetation unit is not considered to be representative of either of these Banksia woodland communities.

A representative image of vegetation unit CcXp from within the survey area, where FCT SCP 3b is considered to be represented, is provided in **Plate 1**.

Plate 1 – FCT SCP 3b, *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain

6.2.3 Threatened and Priority Ecological Communities

Interrogation of the DBCA TEC and PEC database search indicates that four TECs (FCTs SCP 3a, 3b, FCT 20b and therefore, the Commonwealth listed Banksia woodlands TEC) have been previously reported to occur within (or their buffers do) the survey area.

FCT SCP 3a and its associated buffer encompasses a portion of the northern section of the survey area, according to the DBCA database. The buffer extends beyond the bounds of the survey area and encompasses large areas of cleared paddock and areas devoid of remnant vegetation that could be representative of FCT SCP 3a. None of the vegetation units defined within the survey area are considered to be representative of this TEC.

FCT SCP3b was documented by DBCA to encompass the majority of the survey area. Vegetation units CcXp and CcXpKa within the survey areas are considered representative of FCT SCP 3b (*Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain).

Two DBCA verified locations of FCT SCP 20b and associated buffers occur within the survey area. Observations made during the field survey and statistical analysis of recorded flora identified that none of the vegetation units are representative of this TEC. In addition, no vegetation units considered to be representative of the Commonwealth listed Banksia woodlands TEC were recorded.

6.2.4 Summary of Vegetation Significance

The significance of the vegetation units of the survey area, along with the aspects determining their significance, is summarised in **Table 16**. The level of significance for each vegetation unit is broadly summarised in **Table 17**.

Table 16 – Summary of the Significance of the Recorded Vegetation Units

Scale	Significance Aspect	Vegetation Units
National Significance	Populations of Threatened (EPBC listed) species	-
	Presence of EPBC listed TECs	-
	Presence of Ramsar wetlands	-
State Significance	Presence of State-listed Threatened flora	-
	Presence of State-listed TECs	CcXp, CcXpKa
	Land within the Conservation Estate	-
Regional Significance	Presence of Priority flora	CcXpKa
	Presence of PECs	-
	Presence of ESAs or areas relevant to a conservation scheme	BsXp, CcXp, CcXpKa, EwTo, Cc(P), Er(P)
	Presence of conservation category wetlands	BsXp, CcXp, CcXpKa, EwTo, Er(P)
	High diversity of flora, fauna, communities, or community structure	-
	Presence of flora species exhibiting a range extension	-
	Presence of undescribed flora	-
	Having a restricted regional representation and distribution	-
	Represented by less than 30% of the pre-European extent	BsXp, CcXp, CcXpKa, EwTo, Cc(P), Er(P)
Local Significance	Small, isolated communities	BsXp and EwTo
	Having a limited local extent	-
	Having a limited distribution	-

Table 17 – Summary of Level of Potential Significance of Vegetation Units in the Survey Area

Vegetation Unit	Vegetation Description	Area (ha)	% of Survey Area
BsXp Banksia /Xanthorrhoea Woodland	Regional significance – within an ESA Regional significance – within a conservation category wetland Regional significance – Represented by <30% of pre-European extent Local significance – Small isolated communities	0.25	1.05
CcXp Marri/ Xanthorrhoea Woodland	State significance – presence of State-listed TEC Regional significance – within an ESA Regional significance – within a conservation category wetland Regional significance – Represented by <30% of pre-European extent	9.62	40.33
CcXpKa Marri/ Xanthorrhoea/ Kingia Woodland	State significance – presence of State-listed TEC Regional significance – presence of Priority flora Regional significance – within an ESA Regional significance – within a conservation category wetland Regional significance – Represented by <30% of pre-European extent	5.43	22.77
EwTo Wandoo Woodland	Regional significance – within an ESA Regional significance – within a conservation category wetland Regional significance – Represented by <30% of pre-European extent Local significance – Small isolated communities	0.56	2.35
Cc(P) Marri over weeds	Regional significance – within an ESA Regional significance – Represented by <30% of pre-European extent	0.04	0.17
Er(P) *Eucalyptus rudis* over weeds	Regional significance – within an ESA Regional significance – within a conservation category wetland Regional significance – Represented by <30% of pre-European extent	0.03	0.12
	TOTAL	**15.93**	**66.79**

7. CONCLUSIONS

The key findings and conclusions of the flora and vegetation assessment of the survey area are as follows:

- No Threatened flora species were recorded; however, one State-listed Priority species, *Johnsonia pubescens* subsp. *cygnorum* (P2) was recorded within vegetation type CcXpKa.
- Previously recorded Threatened species, *Synaphea* sp. Serpentine (G.R. Brand 103) and *Synaphea* sp. Pinjarra Plain (A.S. George 17182) were not observed within the survey area.. The lack of records for previously recorded species is considered possibly due to degradation or the old age of some of the records, which may, in turn, be attributable to poor accuracy of recorded locations.
- The survey area has been subject to historic disturbances and a large proportion (29.98%) of the survey area has been cleared.
- No plants listed as a DP plant under the BAM Act were recorded.
- Seven vegetation units (four of which are remnant vegetation, BaXp, CcXp, CcXpKa and EwTo) were described and mapped within the survey area, consisting of six woodlands and one rehabilitated vegetation unit, with eleven units (five of which are also represented within the survey area) defined and mapped in the broader region (within a 500 m buffer of the survey area corridor).
- Eight Commonwealth or State-listed TECs were identified through database searches as potentially occurring within the survey area. Of these, based on mapped occurrences with buffers applied, four TECs were considered most likely to occur, being FCTs SCP 3a, 3b and 20b (the latter being part of Banksia woodlands TEC).
- The Marri/Xanthorrhoea woodland (CcXp) and the Marri/Xanthorrhoea/Kingia woodlands (CcXpKa) vegetation units have been inferred to be representative of FCT SCP 3b, the *Corymbia calophylla – Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain, which is a State-listed (Vulnerable) TEC.
- None of the other vegetation units are considered to be representative of any Commonwealth-listed TECs or State-listed PECs.
- The condition of the vegetation in the survey area ranges from 'Completely Degraded' to 'Excellent', with only 16.90% observed to be in 'Good' or better condition.
- The desktop assessment, field survey and floristic analysis determined that of the nine TECs or PECs potentially occurring in the survey area, only FCT SCP 3b is represented, which occurs within vegetation units CcXp and CcXpKa, together comprising 15.05 ha (63.10% of the 23.85 ha survey area).

8. LIST OF PARTICIPANTS

The personnel who contributed to the project are summarised in **Table 18**.

Table 18 – Project Team

Name	Qualification	Years of Relevant Experience	Role
Kellie Bauer–Simpson Principal Ecologist	BSc. (Biological Science)	23	Project manager, field assessment, GIS mapping, technical and authorisation review
Lisa Chappell Senior Botanist/Environmental Scientist	BEnvSc. (Hons) (Environmental Science)	18	Data management, floristic analysis, GIS mapping, report preparation
Kylie Del Fante Principal Botanist	BSc. (Biological Science)	24	Field assessment
Kristen Bleby Senior Ecologist	B.Sc. (Hons) Natural Resource Management PhD (Ecology)	10	Report technical review
Yasmin Skinner Graduate Ecologist	BSc. (Zoology and Conservation Biology)	1	Report preparation
Kelly Hopkinson Graduate Ecologist	BSc. (Biological Science and Conservation Biology)	1	Report preparation
Shibi Chandran Botanical Taxonomist	BSc. (Zoology) MSc. (Fisheries and Aquaculture)	11	Flora identifications
Kathya Tippur Botanist / Taxonomist	BSc. (Chemistry, Botany, Zoology) MSc. (Botany)	9	Flora identifications
Will Bauer–Simpson Technician/Advisor	Cert IV (Health and Safety)	10	Field assistance, field safety and logistics planning, GIS mapping, spatial analysis, spatial data management
Megan Meadowcroft Administration		5	Data entry, editorial support

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APPENDIX A - DBCA NATUREMAP SEARCH REPORT

NatureMap
Mapping Western Australia's biodiversity

Cable Route 10km Buffer Report

Created By Guest user on 22/03/2022

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 59' 50" E,32° 15' 24" S
Buffer 10km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	1322	20412
Other specially protected fauna	3	24
Presumed extinct	2	6
Priority 1	1	2
Priority 2	3	9
Priority 3	19	65
Priority 4	10	71
Protected under international agreement	3	7
Rare or likely to become extinct	22	973
TOTAL	**1385**	**21569**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24162	*Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)*		T	
2.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
3.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
4.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
5.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
6.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
7.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
8.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
9.	1637	*Diuris purdiei (Purdie's Donkey Orchid)*		T	
10.	1639	*Drakaea elastica (Glossy-leaved Hammer Orchid)*		T	
11.	13090	*Eucalyptus x balanites (Cadda Road Mallee)*		T	
12.	24557	*Leipoa ocellata (Malleefowl)*		T	
13.	942	*Lepidosperma rostratum*		T	
14.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
15.	24166	*Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)*		T	
16.	24145	*Setonix brachyurus (Quokka)*		T	
17.	30751	*Synaphea sp. Pinjarra Plain (A.S. George 17182)*		T	
18.	28354	*Synaphea sp. Serpentine (G.R. Brand 103)*		T	
19.	1033	*Tetraria australiensis*		T	
20.	10862	*Thelymitra stellata (Star Orchid)*		T	
21.	24157	*Trichosurus vulpecula subsp. arnhemensis (northern brushtail possum (Kimberley))*		T	
22.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Presumed extinct					
23.	24155	*Perameles eremiana (Desert Bandicoot, walilya)*		X	
24.	24164	*Potorous platyops (Broad-faced Potoroo)*		X	
Protected under international agreement					
25.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
26.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
27.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Other specially protected fauna					
28.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
29.	25508	*Phascogale tapoatafa (Brush-tailed Phascogale)*		S	
30.	48070	*Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)*		S	
Priority 1					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
31.	14932	*Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)*		P1	
Priority 2					
32.	19272	*Johnsonia pubescens subsp. cygnorum*		P2	
33.	7675	*Levenhookia pulcherrima (Beautiful Stylewort)*		P2	
34.	14337	*Millotia tenuifolia var. laevis*		P2	
Priority 3					
35.	25242	*Acanthophis antarcticus (Southern Death Adder)*		P3	
36.	18195	*Amanita carneiphylla*		P3	
37.	43543	*Amanita fibrillopes*		P3	
38.	46334	*Amanita kalamundae (Kalamunda Lepidella)*		P3	
39.	43542	*Amanita wadjukiorum*		P3	
40.	7829	*Angianthus drummondii*		P3	
41.	45402	*Babingtonia urbana (Coastal Plain Babingtonia)*		P3	
42.	32216	*Banksia kippistiana var. paenepeccata*		P3	
43.	48579	*Euoplos inornatus (inornate trapdoor spider (northern Jarrah Forest))*		P3	
44.	34114	*Glacidorbis occidentalis (Jarrah forest freshwater snail, freshwater snail)*		P3	
45.	48935	*Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)*		P3	
46.	20462	*Jacksonia gracillima*		P3	
47.	25147	*Lerista lineata (Perth Slider, Lined Skink)*		P3	
48.	24165	*Petropseudes dahli (Rock Ringtail Possum, Wogoit)*		P3	
49.	8163	*Pithocarpa corymbulosa (Corymbose Pithocarpa)*		P3	
50.	980	*Schoenus capillifolius*		P3	
51.	1008	*Schoenus pennisetis*		P3	
52.	17731	*Schoenus sp. Waroona (G.J. Keighery 12235)*		P3	
53.	18564	*Stylidium aceratum*		P3	
Priority 4					
54.	14131	*Acacia oncinophylla subsp. patulifolia*		P4	
55.	25035	*Ctenotus delli (Dell's skink, Darling Range southwest Ctenotus)*		P4	
56.	3115	*Drosera occidentalis (Western Sundew)*		P4	
57.	24189	*Falsistrellus mackenziei (Western False Pipistrelle, Western Falsistrelle)*		P4	
58.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
59.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
60.	48024	*Notamacropus eugenii subsp. derbianus (Tammar Wallaby, Tammar)*		P4	
61.	48022	*Notamacropus irma (Western Brush Wallaby)*		P4	
62.	6573	*Parsonsia diaphanophleba*		P4	
63.	14714	*Verticordia lindleyi subsp. lindleyi*		P4	
Non-conservation taxon					
64.		*?Hypolaena exsulca*			Y
65.		*?Persoonia saccata*			Y
66.	15429	*Acacia alata var. alata*			
67.	15466	*Acacia applanata*			
68.	3233	*Acacia barbinervis*			
69.	15469	*Acacia barbinervis subsp. barbinervis*			
70.	3294	*Acacia dentifera*			
71.	3307	*Acacia divergens*			
72.	3310	*Acacia drewiana*			
73.	11926	*Acacia drewiana subsp. drewiana*			
74.	3374	*Acacia huegelii*			
75.	3409	*Acacia lasiocarpa (Panjang)*			
76.	11519	*Acacia lasiocarpa var. bracteolata*			
77.	3410	*Acacia lateriticola*			
78.	3442	*Acacia microbotrya (Manna Wattle, Kalyang)*			
79.	3454	*Acacia nervosa (Rib Wattle)*			
80.	17860	*Acacia podalyriifolia*	Y		
81.	3502	*Acacia pulchella (Prickly Moses)*			
82.	15481	*Acacia pulchella var. glaberrima*			
83.	15483	*Acacia pulchella var. pulchella*			
84.	15480	*Acacia pulchella var. reflexa*			
85.	30032	*Acacia saligna subsp. saligna*			
86.	3541	*Acacia sessilis*			
87.		*Acacia sp.*			
88.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
89.	3574	*Acacia teretifolia*			
90.	3591	*Acacia urophylla*			
91.	3602	*Acacia willdenowiana (Grass Wattle)*			
92.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
93.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
94.	24262	*Acanthiza inornata (Western Thornbill)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
95.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
96.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
97.		*Acariformes sp.*			
98.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
99.	25536	*Accipiter fasciatus (Brown Goshawk)*			
100.	24282	*Accipiter fasciatus subsp. fasciatus (Brown Goshawk)*			
101.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
102.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
103.	6205	*Actinotus leucocephalus (Flannel Flower)*			
104.	14970	*Adenanthos barbiger*			
105.	1775	*Adenanthos cygnorum (Common Woollybush)*			
106.	1790	*Adenanthos meisneri*			
107.	1791	*Adenanthos obovatus (Basket Flower)*			
108.	25	*Adiantum aethiopicum (Common Maidenhair)*			
109.		*Adoxotoma chionopogon*			
110.		*Adoxotoma embolica*			Y
111.		*Adoxotoma nitida*			Y
112.		*Aeshnidae sp.*			
113.	23474	*Agrostocrinum hirsutum*			
114.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
115.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
116.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
117.	186	*Aira elegantissima*	Y		
118.	187	*Aira praecox (Early Hairgrass)*	Y		
119.	48513	*Aizoon pubescens*	Y		
120.		*Akamptogonus novarae*			
121.		*Aleurina ferruginea*			
122.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
123.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
124.	1734	*Allocasuarina microstachya*			
125.	1739	*Allocasuarina thuyoides (Horned Sheoak)*			
126.	48786	*Amanita hiltonii*			
127.	38755	*Amanita ochroterrea*			
128.		*Ambicodamus marae*			
129.		*Amblyomma triguttatum*			
130.	13380	*Amphibromus nervosus*			
131.	197	*Amphipogon debilis*			
132.	198	*Amphipogon laguroides*			
133.	199	*Amphipogon strictus (Greybeard Grass)*			
134.	200	*Amphipogon turbinatus*			
135.	13267	*Amyema linophylla subsp. linophylla*			
136.	2380	*Amyema miquelii (Stalked Mistletoe)*			
137.		*Aname mainae*			
138.		*Aname tepperi*			
139.	1058	*Anarthria gracilis*			
140.	1059	*Anarthria humilis*			
141.	1060	*Anarthria laevis*			
142.	24312	*Anas gracilis (Grey Teal)*			
143.	24315	*Anas rhynchotis (Australasian Shoveler)*			
144.	24316	*Anas superciliosa (Pacific Black Duck)*			
145.		*Ancylidae sp.*			
146.	6300	*Andersonia aristata (Rice Flower)*			
147.	6314	*Andersonia lehmanniana*			
148.	1409	*Anigozanthos humilis (Catspaw)*			
149.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
150.	11261	*Anigozanthos manglesii subsp. manglesii*			
151.	29487	*Anigozanthos manglesii var. x angustifolius*			
152.	1416	*Anigozanthos viridis (Green Kangaroo Paw, Kurulbardang)*			
153.	11566	*Anigozanthos viridis subsp. viridis*			
154.	25449	*Antechinus flavipes (Yellow-footed Antechinus)*			
155.	24088	*Antechinus flavipes subsp. leucogaster (Yellow-footed Antechinus, Mardo)*			
156.	24561	*Anthochaera carunculata (Red Wattlebird)*			
157.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
158.	7411	*Anthotium humile (Dwarf Anthotium)*			
159.	12724	*Anthotium junciforme*			
160.	25670	*Anthus australis (Australian Pipit)*			
161.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
162.	3686	*Aotus cordifolia*			
163.	3688	*Aotus gracillima*			
164.	3692	*Aotus procumbens*			

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165.	1117	*Aphelia cyperoides*			
166.	1119	*Aphelia nutans*			
167.	17845	*Apodasmia ceramophila*			
168.	24990	*Aprasia pulchella (Granite Worm-lizard)*			
169.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
170.	24285	*Aquila audax (Wedge-tailed Eagle)*			
171.		*Arachnura higginsi*			
172.		*Araneus amblycyphus*			Y
173.		*Araneus cyphoxis*			
174.		*Araneus eburneiventris*			
175.		*Araneus senicaudatus*			
176.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
177.	24337	*Ardea garzetta subsp. nigripes (Little Egret)*			
178.	24340	*Ardea novaehollandiae (White-faced Heron)*			
179.	24341	*Ardea pacifica (White-necked Heron)*			
180.	24610	*Ardeotis australis (Australian Bustard)*			
181.		*Argiope trifasciata*			
182.	207	*Aristida contorta (Bunched Kerosene Grass)*			
183.	210	*Aristida holathera*			
184.		*Aristida sp.*			
185.	1264	*Arnocrinum preissii*			
186.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
187.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
188.		*Artoria flavimana*			
189.		*Artoria linnaei*			
190.		*Artoria schizocoides*			
191.		*Asadipus kunderang*			
192.	6580	*Asclepias curassavica (Redhead Cottonbush)*	Y		
193.	8779	*Asparagus asparagoides (Bridal Creeper)*	Y		
194.		*Astartea aff. fascicularis sthcst*			
195.	20350	*Astartea affinis (West-coast Astartea)*			
196.	20283	*Astartea scoparia (Common Astartea)*			
197.		*Asteraceae sp.*			
198.	6334	*Astroloma pallidum (Kick Bush)*			
199.	6337	*Astroloma stomarrhena (Red Swamp Cranberry)*			
200.		*Austracantha minax*			
201.		*Australomimetus aurioculatus*			
202.		*Australomimetus dunlopi*			
203.		*Austrochthonius muchmorei*			
204.	17233	*Austrostipa campylachne*			
205.	17234	*Austrostipa compressa*			
206.	17237	*Austrostipa elegantissima*			
207.	17253	*Austrostipa semibarbata*			
208.		*Austrostipa semibarbata/campylachne*			Y
209.	17257	*Austrostipa variabilis*			
210.	231	*Avellinia michelii*	Y		
211.	233	*Avena barbata (Bearded Oat)*	Y		
212.	235	*Avena sativa (Common Oat)*	Y		
213.	24318	*Aythya australis (Hardhead)*			
214.	18279	*Babiana angustifolia*	Y		
215.	18280	*Babiana nana*	Y		
216.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
217.		*Backobourkia brounii*			
218.		*Backobourkia heroine*			
219.		*Baetidae sp.*			
220.		*Baiami volucripes*			
221.		*Ballarra longipalpus*			
222.	32682	*Banksia armata var. armata*			
223.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
224.	32678	*Banksia bipinnatifida subsp. bipinnatifida*			
225.	32576	*Banksia dallanneyi (Couch Honeypot)*			
226.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
227.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
228.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
229.	32214	*Banksia kippistiana*			
230.	1834	*Banksia menziesii (Firewood Banksia)*			
231.	32202	*Banksia nivea (Honeypot Dryandra, Pudjarn)*			
232.	32053	*Banksia undata (Urchin Dryandra)*			
233.		*Barnardius zonarius*			
234.	739	*Baumea acuta (Pale Twig-rush)*			

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235.	740	*Baumea arthrophylla*			
236.	743	*Baumea juncea (Bare Twigrush)*			
237.	5387	*Beaufortia macrostemon (Darling Range Beaufortia)*			
238.	7046	*Bellardia trixago (Bellardia)*	Y		
239.	48868	*Bellardia viscosa*	Y		
240.	25788	*Billardiera fraseri (Elegant Pronaya)*			
241.	25798	*Billardiera fusiformis (Australian Bluebell)*			
242.	3165	*Billardiera variifolia*			
243.	24319	*Biziura lobata (Musk Duck)*			
244.		*Boletellus obscurecoccineus*			
245.		*Boletus sp.*			
246.	11503	*Boronia crenulata subsp. crenulata var. crenulata*			
247.	4420	*Boronia fastigiata (Bushy Boronia)*			
248.	4429	*Boronia molloyae (Tall Boronia)*			
249.	1272	*Borya scirpoidea*			
250.	1273	*Borya sphaerocephala (Pincushions)*			
251.	48782	*Bossiaea angustifolia*			
252.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
253.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
254.	10915	*Brachychiton populneus (Kurrajong)*	Y		
255.	8661	*Brachypodium distachyon (False Brome)*	Y		
256.	7867	*Brachyscome bellidioides*			
257.	7883	*Brachyscome pusilla*			
258.	244	*Briza maxima (Blowfly Grass)*	Y		
259.	245	*Briza minor (Shivery Grass)*	Y		
260.	249	*Bromus diandrus (Great Brome)*	Y		
261.	1366	*Bulbine semibarbata (Leek Lily)*			
262.	1383	*Burchardia bairdiae*			
263.	12770	*Burchardia congesta*			
264.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
265.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
266.	25715	*Cacatua roseicapilla (Galah)*			
267.	25716	*Cacatua sanguinea (Little Corella)*			
268.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
269.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
270.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
271.		*Caenidae sp.*			
272.	1276	*Caesia micrantha (Pale Grass Lily)*			
273.	1277	*Caesia occidentalis*			
274.		*Caesia sp.*			
275.	1586	*Caladenia discoidea (Dancing Orchid)*			
276.	1592	*Caladenia flava (Cowslip Orchid)*			
277.	15348	*Caladenia flava subsp. flava*			
278.	1602	*Caladenia longicauda (Common White Spider Orchid)*			
279.	15365	*Caladenia longicauda subsp. longicauda*			
280.	1605	*Caladenia marginata (White Fairy Orchid)*			
281.	1613	*Caladenia reptans (Little Pink Fairy Orchid)*			
282.	15379	*Caladenia serotina*			
283.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
284.	1214	*Calectasia grandiflora (Blue Tinsel Lily)*			
285.	19309	*Calectasia narragara*			
286.	4717	*Callitriche stagnalis (Common Starwort)*	Y		
287.	36600	*Callitris pyramidalis (Swamp Cypress)*			
288.	5411	*Calothamnus hirsutus*			
289.	5415	*Calothamnus lateralis*			
290.	35797	*Calothamnus lateralis var. lateralis*			
291.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
292.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
293.	5439	*Calytrix angulata (Yellow Starflower)*			
294.	5441	*Calytrix aurea*			
295.	5458	*Calytrix flavescens (Summer Starflower)*			
296.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
297.	38767	*Campanella gregaria*			
298.	7909	*Carduus pycnocephalus (Slender Thistle)*	Y		
299.	43241	*Carex thecata*			
300.	2795	*Carpobrotus edulis (Hottentot Fig)*	Y		
301.	2951	*Cassytha flava (Dodder Laurel)*			
302.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
303.	2954	*Cassytha micrantha*			
304.	2956	*Cassytha pomiformis (Dodder Laurel)*			

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305.	2957	*Cassytha racemosa (Dodder Laurel)*			
306.	18321	*Casuarina glauca*	Y		
307.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
308.	6539	*Centaurium erythraea (Common Centaury)*	Y		
309.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
310.	1123	*Centrolepis caespitosa*			
311.	13122	*Centrolepis cephaloformis subsp. cephaloformis*			
312.	1125	*Centrolepis drummondiana*			
313.	1130	*Centrolepis humillima (Dwarf Centrolepis)*			
314.	1132	*Centrolepis mutica*			
315.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
316.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
317.		*Ceratopogonidae sp.*			
318.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
319.		*Cercophonius sulcatus*			
320.		*Cethegus fugax*			
321.	17685	*Chaetanthus aristatus*			
322.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
323.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
324.	18156	*Chamaecytisus palmensis (Tagasaste)*	Y		
325.	1280	*Chamaescilla corymbosa (Blue Squill)*			
326.	11299	*Chamaescilla corymbosa var. corymbosa*			
327.	8788	*Chamaescilla versicolor*			
328.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
329.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
330.	31	*Cheilanthes austrotenuifolia*			
331.	12818	*Cheilanthes sieberi subsp. sieberi*			
332.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
333.	33939	*Cherax cainii (Marron)*			
334.		*Cherax quinquecarinatus*			
335.		*Chironominae sp.*			
336.	267	*Chloris gayana (Rhodes Grass)*	Y		
337.	17706	*Chordifex sinuosus*			
338.	763	*Chorizandra enodis (Black Bristlerush)*			
339.	8971	*Chorizema cordatum*			
340.	3753	*Chorizema dicksonii (Yellow-eyed Flame Pea)*			
341.	12765	*Chorizema nanum*			
342.	3761	*Chorizema rhombeum*			
343.		*Chroicocephalus novaehollandiae*			
344.	11900	*Chrysanthemoides monilifera subsp. monilifera*	Y		
345.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
346.	25601	*Chrysococcyx lucidus (Shining Bronze Cuckoo)*			
347.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
348.	7935	*Cichorium intybus (Chicory)*	Y		
349.	24288	*Circus approximans (Swamp Harrier)*			
350.	7937	*Cirsium vulgare (Spear Thistle, Scotch Thistle)*	Y		
351.	48177	*Cladia muelleri*			
352.	28208	*Cladonia cervicornis subsp. verticillata*			
353.		*Clynotis severus*			
354.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
355.	24613	*Colluricincla harmonica subsp. rufiventris (Grey Shrike-thrush)*			
356.	38771	*Coltriciella dependens*			
357.	24399	*Columba livia (Domestic Pigeon)*	Y		
358.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
359.	4551	*Comesperma ciliatum*			
360.	4564	*Comesperma virgatum (Milkwort)*			
361.	1882	*Conospermum stoechadis (Common Smokebush)*			
362.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
363.	6348	*Conostephium pendulum (Pearl Flower)*			
364.	6349	*Conostephium preissii*			
365.	1418	*Conostylis aculeata (Prickly Conostylis)*			
366.	11826	*Conostylis aculeata subsp. aculeata*			
367.	12109	*Conostylis aculeata subsp. preissii*			
368.	1420	*Conostylis androstemma (Trumpets)*			
369.	1423	*Conostylis aurea (Golden Conostylis)*			
370.	1429	*Conostylis caricina*			
371.	1436	*Conostylis juncea*			
372.	1454	*Conostylis setigera (Bristly Cottonhead)*			
373.	11597	*Conostylis setigera subsp. setigera*			
374.	1455	*Conostylis setosa (White Cottonhead)*			

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375.	7941	*Conyza parva*	Y		
376.		*Conyza sp.*			
377.		*Conyza sp. Mud07*			Y
378.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
379.	24362	*Coracina novaehollandiae subsp. novaehollandiae (Black-faced Cuckoo-shrike)*			
380.		*Corixidae sp.*			
381.		*Cormocephalus aurantiipes*			
382.		*Cormocephalus hartmeyeri*			
383.		*Cortinarius australiensis*			
384.	38776	*Cortinarius phalarus*			
385.	25592	*Corvus coronoides (Australian Raven)*			
386.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
387.	25593	*Corvus orru (Torresian Crow)*			
388.	24419	*Corvus splendens (House Crow)*			
389.	17104	*Corymbia calophylla (Marri)*			
390.	7946	*Cotula cotuloides (Smooth Cotula)*			
391.	24671	*Coturnix pectoralis (Stubble Quail)*			
392.	25701	*Coturnix ypsilophora (Brown Quail)*			
393.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
394.	25595	*Cracticus tibicen (Australian Magpie)*			
395.	25596	*Cracticus torquatus (Grey Butcherbird)*			
396.	13354	*Craspedia variabilis*			
397.	3136	*Crassula alata*	Y		
398.	17701	*Crassula closiana*			
399.	3137	*Crassula colorata (Dense Stonecrop)*			
400.	11563	*Crassula colorata var. colorata*			
401.	3138	*Crassula decumbens (Rufous Stonecrop)*			
402.	20271	*Crassula extrorsa*			
403.	15706	*Crassula natans var. minus*	Y		
404.	3144	*Crassula peduncularis (Purple Stonecrop)*			
405.	7953	*Crepis foetida (Foetid Hawksbeard)*	Y		
406.	29054	*Crepis foetida subsp. foetida (Stinking Hawksbeard)*	Y		
407.	25398	*Crinia georgiana (Quacking Frog)*			
408.	25399	*Crinia glauerti (Clicking Frog)*			
409.	25400	*Crinia insignifera (Squelching Froglet)*			
410.	35838	*Cristonia biloba subsp. biloba*			
411.		*Crustulina bicruciata*			
412.	4792	*Cryptandra arbutiflora (Waxy Cryptandra)*			
413.	30893	*Cryptoblepharus buchananii*			
414.		*Cryptoerithus melindae*			
415.	24883	*Ctenophorus ornatus (Ornate Crevice-Dragon)*			
416.	25027	*Ctenotus australis*			
417.	25039	*Ctenotus fallens*			
418.	25047	*Ctenotus impar*			
419.	25049	*Ctenotus labillardieri*			
420.	6663	*Cuscuta epithymum (Lesser Dodder, Greater Dodder)*	Y		
421.	51	*Cyathea cooperi*	Y		
422.	768	*Cyathochaeta avenacea*			
423.		*Cyclosa bacilliformis*			Y
424.		*Cyclosa trilobata*			
425.	40661	*Cycnogeton lineare*			
426.	24322	*Cygnus atratus (Black Swan)*			
427.	283	*Cynodon dactylon (Couch)*	Y		
428.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
429.		*Cyrtophora parnasia*			
430.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
431.	38781	*Dacryopinax spathularia*			
432.	7420	*Dampiera alata (Winged-stem Dampiera)*			
433.	7454	*Dampiera linearis (Common Dampiera)*			
434.	7462	*Dampiera pedunculata*			
435.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
436.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
437.	5531	*Darwinia thymoides*			
438.	18193	*Darwinia thymoides subsp. thymoides*			
439.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
440.	1220	*Dasypogon obliquifolius*			
441.	6218	*Daucus glochidiatus (Australian Carrot)*			
442.	3799	*Daviesia cordata (Bookleaf)*			
443.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			
444.	19747	*Daviesia decurrens subsp. decurrens*			

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445.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
446.	16585	*Daviesia nudiflora subsp. nudiflora*			
447.	3832	*Daviesia physodes*			
448.	3835	*Daviesia preissii*			
449.	3839	*Daviesia rhombifolia*			
450.	3845	*Daviesia triflora*			
451.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
452.		*Demadiana cerula*			
453.	38785	*Descomyces angustisporus*			
454.	17663	*Desmocladus asper*			
455.	17691	*Desmocladus fasciculatus*			
456.	16595	*Desmocladus flexuosus*			
457.	46362	*Desmocladus lateriflorus*			
458.	1259	*Dianella revoluta (Blueberry Lily)*			
459.	11636	*Dianella revoluta var. divaricata*			
460.		*Diaprograpta striola*			
461.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
462.	306	*Dichelachne crinita (Longhair Plumegrass)*			
463.	1287	*Dichopogon capillipes*			
464.	17838	*Dielsia stenostachya*			
465.		*Dingosa serrata*			
466.		*Dinocambala ingens*			
467.	1509	*Dioscorea hastifolia (Warrine, Wararn)*			
468.	24939	*Diplodactylus polyophthalmus*			
469.	19649	*Disa bracteata*	Y		
470.	7054	*Dischisma arenarium*	Y		
471.	7055	*Dischisma capitatum (Woolly-headed Dischisma)*	Y		
472.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
473.	12943	*Diuris brumalis*			
474.	10791	*Diuris carinata (Bee Orchid)*			
475.	11049	*Diuris corymbosa*			
476.	1632	*Diuris emarginata (Tall Donkey Orchid)*			
477.	1634	*Diuris laxiflora (Bee Orchid)*			
478.	1635	*Diuris longifolia (Common Donkey Orchid)*			
479.	12939	*Diuris magnifica*			
480.	46859	*Diuris ostrina*			
481.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
482.		*Dolichopodidae sp.*			
483.	1640	*Drakaea glyptodon (King-in-his-carriage)*			
484.	11156	*Drakaea livida*			
485.	24470	*Dromaius novaehollandiae (Emu)*			
486.	3092	*Drosera bulbosa (Red-leaved Sundew)*			
487.	48751	*Drosera drummondii*			
488.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
489.	48747	*Drosera geniculata*			
490.	3097	*Drosera gigantea (Giant Sundew)*			
491.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
492.	3101	*Drosera heterophylla (Swamp Rainbow)*			
493.	48769	*Drosera indumenta*			
494.	3106	*Drosera macrantha (Bridal Rainbow)*			
495.	3109	*Drosera menziesii (Pink Rainbow)*			
496.	3114	*Drosera nitidula (Shining Sundew)*			
497.	13189	*Drosera oreopodion*			
498.	3118	*Drosera pallida (Pale Rainbow)*			
499.	29178	*Drosera porrecta*			
500.	8911	*Drosera rosulata*			
501.		*Drosera sp. "climbing"*			
502.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
503.	13185	*Drosera spilos*			
504.	3131	*Drosera stolonifera (Leafy Sundew)*			
505.	3133	*Drosera subhirtella (Sunny Rainbow)*			
506.		*Dytiscidae sp.*			
507.	25096	*Egernia kingii (King's Skink)*			
508.	25100	*Egernia napoleonis*			
509.		*Egretta novaehollandiae*			
510.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
511.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
512.		*Elanus axillaris*			
513.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
514.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			

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515.	32356	*Entosthodon subnudus*			
516.		*Eolophus roseicapillus*			
517.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
518.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
519.	11756	*Epilobium billardiereanum subsp. cinereum (Variable Willow Herb)*			
520.	6132	*Epilobium ciliatum*	Y		
521.	24567	*Epthianura albifrons (White-fronted Chat)*			
522.	376	*Eragrostis curvula (African Lovegrass)*	Y		
523.	379	*Eragrostis elongata (Clustered Lovegrass)*			
524.	13949	*Eremaea asterocarpa*			
525.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
526.	5541	*Eremaea pauciflora*			
527.	14104	*Eremaea pauciflora var. pauciflora*			
528.	7189	*Eremophila clarkei (Turpentine Bush)*			
529.		*Eremophila sp.*			
530.		*Erigone prominens*			
531.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
532.	15413	*Eriochilus dilatatus subsp. undulatus*			
533.		*Eriophora biapicata*			
534.	4332	*Erodium botrys (Long Storksbill)*	Y		
535.	4335	*Erodium cygnorum (Blue Heronsbill)*			
536.	15446	*Eryngium pinnatifidum subsp. pinnatifidum*			
537.	5688	*Eucalyptus laeliae (Darling Range Ghost Gum)*			
538.	5690	*Eucalyptus lane-poolei (Salmon White Gum)*			
539.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
540.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
541.	13548	*Eucalyptus marginata subsp. thalassica (Blue-leaved Jarrah)*			
542.	5739	*Eucalyptus patens (Swan River Blackbutt, Dwuda)*			
543.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
544.	13511	*Eucalyptus rudis subsp. rudis*			
545.	5797	*Eucalyptus wandoo (Wandoo, Wondu)*			
546.	12906	*Eucalyptus wandoo subsp. wandoo*			
547.	3872	*Euchilopsis linearis (Swamp Pea)*			
548.		*Eucyrtops latior*			
549.		*Eukoenenia mirabilis*			Y
550.	13753	*Euphorbia dallachyana*			
551.	29940	*Euphorbia maculata*	Y		
552.	34757	*Euphorbia prostrata*	Y		
553.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
554.	3880	*Eutaxia virgata*			
555.	835	*Evandra pauciflora*			
556.	25621	*Falco berigora (Brown Falcon)*			
557.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
558.	25623	*Falco longipennis (Australian Hobby)*			
559.	24476	*Falco subniger (Black Falcon)*			
560.	24041	*Felis catus (Cat)*	Y		
561.	27748	*Flavoparmelia rutidota*			
562.	18392	*Freesia alba x leichtlinii*	Y		
563.	25727	*Fulica atra (Eurasian Coot)*			
564.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			
565.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
566.	32370	*Funaria hygrometrica*			
567.	899	*Gahnia ancistrophylla (Hooked-leaf Saw Sedge)*			
568.	900	*Gahnia aristata*			
569.	7321	*Galium divaricatum*	Y		
570.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
571.	24765	*Gallirallus philippensis subsp. mellori (Buff-banded Rail)*			
572.	434	*Gastridium phleoides (Nitgrass)*	Y		
573.	20475	*Gastrolobium capitatum*			
574.	20473	*Gastrolobium ebracteolatum*			
575.	3910	*Gastrolobium obovatum (Boat-leaved Poison)*			
576.	3924	*Gastrolobium spinosum (Prickly Poison)*			
577.	42314	*Gavicalis virescens (Singing Honeyeater)*			
578.	24959	*Gehyra variegata*			
579.	18143	*Genista monspessulana*	Y		
580.	25404	*Geocrinia leai (Ticking Frog)*			
581.		*Geogarypus taylori*			
582.	4340	*Geranium retrorsum*			
583.	25530	*Gerygone fusca (Western Gerygone)*			
584.	1518	*Gladiolus angustus (Long Tubed Painted Lady)*	Y		

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585.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
586.	6143	*Glischrocaryon aureum (Common Popflower)*			
587.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
588.	7991	*Gnephosis drummondii*			
589.		*Gomphidae sp.*			
590.	6587	*Gomphocarpus fruticosus (Narrowleaf Cottonbush)*	Y		
591.	3945	*Gompholobium aristatum*			
592.	10909	*Gompholobium confertum*			
593.	3950	*Gompholobium knightianum*			
594.	3951	*Gompholobium marginatum*			
595.	3954	*Gompholobium polymorphum*			
596.	3955	*Gompholobium preissii*			
597.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
598.	16746	*Gonocarpus benthamii subsp. benthamii*			
599.	6149	*Gonocarpus cordiger*			
600.	6160	*Gonocarpus paniculatus*			
601.	6161	*Gonocarpus pithyoides*			
602.	29362	*Goodenia coerulea*			
603.	12551	*Goodenia micrantha*			
604.	7538	*Goodenia pulchella*			
605.	24443	*Grallina cyanoleuca (Magpie-lark)*			
606.	14282	*Gratiola pubescens*			
607.	1964	*Grevillea bipinnatifida (Fuchsia Grevillea)*			
608.	19628	*Grevillea bipinnatifida subsp. bipinnatifida*			
609.	1997	*Grevillea endlicheriana (Spindly Grevillea)*			
610.	2066	*Grevillea pilulifera (Woolly-flowered Grevillea)*			
611.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
612.	14421	*Grevillea synapheae subsp. synapheae*			
613.	2102	*Grevillea tenuiflora (Tassel Grevillea)*			
614.	2122	*Grevillea wilsonii (Native Fuchsia)*			
615.		*Gripopterygidae sp.*			
616.		*Gymnopilus allantopus*			
617.		*Gyrinidae sp.*			
618.	1464	*Haemodorum brevisepalum*			
619.	1465	*Haemodorum discolor*			
620.	1468	*Haemodorum laxum*			
621.	1472	*Haemodorum simplex*			
622.	1474	*Haemodorum sparsiflorum*			
623.	1475	*Haemodorum spicatum (Mardja)*			
624.	438	*Hainardia cylindrica (Common Barbgrass)*	Y		
625.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
626.	2131	*Hakea auriculata*			
627.	2137	*Hakea ceratophylla (Horned Leaf Hakea)*			
628.	2152	*Hakea cyclocarpa (Ramshorn)*			
629.	2166	*Hakea incrassata (Marble Hakea)*			
630.	2175	*Hakea lissocarpha (Honey Bush)*			
631.	2179	*Hakea marginata*			
632.	45333	*Hakea neospathulata*			
633.	2197	*Hakea prostrata (Harsh Hakea)*			
634.	2203	*Hakea ruscifolia (Candle Hakea)*			
635.	2206	*Hakea stenocarpa (Narrow-fruited Hakea)*			
636.	2212	*Hakea sulcata (Furrowed Hakea)*			
637.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
638.	2215	*Hakea undulata (Wavy-leaved Hakea)*			
639.	2216	*Hakea varia (Variable-leaved Hakea)*			
640.	24295	*Haliastur sphenurus (Whistling Kite)*			
641.	25410	*Heleioporus eyrei (Moaning Frog)*			
642.	25412	*Heleioporus psammophilus (Sand Frog)*			
643.	6839	*Hemiandra pungens (Snakebush)*			
644.	25115	*Hemiergis initialis subsp. initialis*			
645.	6856	*Hemigenia incana (Silky Hemigenia)*			
646.	1293	*Hensmania turbinata*			
647.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
648.	5109	*Hibbertia amplexicaulis*			
649.	5114	*Hibbertia commutata*			
650.	20051	*Hibbertia diamesogenos*			
651.	5129	*Hibbertia glomerata*			
652.	19778	*Hibbertia glomerata subsp. darlingensis*			
653.	5134	*Hibbertia huegelii*			
654.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			

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655.	45534	*Hibbertia hypericoides subsp. hypericoides*			
656.	5161	*Hibbertia quadricolor*			
657.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
658.	5169	*Hibbertia serrata (Serrate Leaved Guinea Flower)*			
659.	11481	*Hibbertia spicata subsp. spicata*			
660.	48381	*Hibbertia striata*			
661.	5173	*Hibbertia subvaginata*			
662.	5176	*Hibbertia vaginata*			
663.	47965	*Hieraaetus morphnoides (Little Eagle)*			
664.	25734	*Himantopus himantopus (Black-winged Stilt)*			
665.	24491	*Hirundo neoxena (Welcome Swallow)*			
666.		*Hogna crispipes*			
667.		*Holconia westralia*			
668.	445	*Holcus setiger (Annual Fog)*	Y		
669.		*Holoplatys dejongi*			
670.	6222	*Homalosciadium homalocarpum*			
671.	450	*Hordeum marinum*	Y		
672.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
673.	3966	*Hovea pungens (Devil's Pins, Puyenak)*			
674.	3968	*Hovea trisperma (Common Hovea)*			
675.	12859	*Hovea trisperma var. trisperma*			
676.	12741	*Hyalosperma cotula*			
677.	12742	*Hyalosperma demissum*			
678.	5216	*Hybanthus calycinus (Wild Violet)*			
679.	5221	*Hybanthus floribundus*			
680.	12007	*Hybanthus floribundus subsp. floribundus*			
681.		*Hydnoplicata convoluta*			
682.		*Hydrobiosidae sp.*			
683.	6223	*Hydrocotyle alata*			
684.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
685.	6229	*Hydrocotyle diantha*			
686.	6236	*Hydrocotyle pilifera*			
687.		*Hydrophilidae sp.*			
688.		*Hydropsychidae sp.*			
689.		*Hydroptilidae sp.*			
690.	5181	*Hypericum japonicum (Matted St John's Wort)*			
691.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
692.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
693.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
694.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
695.	9352	*Hypochaeris radicata (Flat Weed, Cats-ear)*	Y		
696.	1070	*Hypolaena exsulca*			
697.	1071	*Hypolaena fastigiata*			
698.		*Idiommata blackwalli*			
699.	44926	*Ileodictyon gracile*			
700.	48508	*Inocybe brunneidisca*			
701.	40870	*Inocybe rufuloides*	Y		
702.	11	*Isoetes drummondii (Quillwort)*			
703.	910	*Isolepis cernua (Nodding Club-rush)*			
704.	20200	*Isolepis cernua var. setiformis*			
705.	911	*Isolepis congrua*			
706.	912	*Isolepis cyperoides*			
707.	14540	*Isolepis hystrix*	Y		
708.	917	*Isolepis marginata (Coarse Club-rush)*			
709.	919	*Isolepis oldfieldiana*			
710.	924	*Isolepis stellata (Star Club-rush)*			
711.		*Isopeda leishmanni*			
712.	2221	*Isopogon asper*			
713.	2237	*Isopogon sphaerocephalus (Drumstick Isopogon)*			
714.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
715.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
716.	1534	*Ixia polystachya (Variable Ixia)*	Y		
717.	3997	*Jacksonia alata*			
718.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
719.	4018	*Jacksonia lehmannii*			
720.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
721.	1298	*Johnsonia pubescens (Pipe Lily)*			
722.	19632	*Johnsonia pubescens subsp. pubescens*			
723.	1178	*Juncus bufonius (Toad Rush)*	Y		
724.	1180	*Juncus capitatus (Capitate Rush)*	Y		

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725.	1184	*Juncus holoschoenus (Jointleaf Rush)*			
726.	1186	*Juncus microcephalus*	Y		
727.	1188	*Juncus pallidus (Pale Rush)*			
728.	1195	*Juncus subsecundus (Finger Rush)*			
729.		*Karaops ellenae*			
730.	4037	*Kennedia coccinea (Coral Vine)*			
731.	4041	*Kennedia microphylla*			
732.	4044	*Kennedia prostrata (Scarlet Runner)*			
733.	1221	*Kingia australis (Kingia, Pulonok)*			
734.	5832	*Kunzea ericifolia (Spearwood, Pondil)*			
735.	15498	*Kunzea glabrescens (Spearwood)*			
736.	5835	*Kunzea micrantha*			
737.	17461	*Kunzea micrantha subsp. micrantha*			
738.	5841	*Kunzea recurva*			
739.	3669	*Labichea punctata (Lance-leaved Cassia)*			
740.		*Laccaria lateritia*			
741.	13562	*Lachenalia aloides*	Y		
742.	19955	*Lachnagrostis plebeia*			
743.	18585	*Lagenophora huegelii*			
744.	14083	*Lambertia multiflora var. darlingensis*			
745.		*Lampona brevipes*			
746.		*Lampona yanchep*			
747.		*Lamponella ainslie*			
748.		*Lamponusa gleneagle*			
749.		*Laperousea blattifera*			
750.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
751.	5033	*Lasiopetalum floribundum (Free Flowering Lasiopetalum)*			
752.		*Latrodectus hasseltii*			
753.	1307	*Laxmannia ramosa (Branching Lily)*			
754.	11911	*Laxmannia ramosa subsp. ramosa*			
755.	11464	*Laxmannia sessiliflora subsp. australis*			
756.	1309	*Laxmannia squarrosa*			
757.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
758.	7572	*Lechenaultia expansa*			
759.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
760.	39038	*Leocarpus fragilis*			
761.	44490	*Leontodon rhagadioloides*	Y		
762.	1075	*Lepidobolus preissianus*			
763.	18074	*Lepidobolus preissianus subsp. preissianus*			
764.		*Lepidosperma aff. coastale (#134)*			Y
765.		*Lepidosperma aff. pubisquameum (#166)*			
766.		*Lepidosperma aff. resinosum*			
767.	925	*Lepidosperma angustatum*			
768.	42741	*Lepidosperma apricola*			
769.	41620	*Lepidosperma asperatum*			
770.	929	*Lepidosperma carphoides (Black Rapier Sedge)*			
771.	930	*Lepidosperma costale*			
772.		*Lepidosperma eastern terete scps (BJK&NG 232)*			
773.	936	*Lepidosperma leptostachyum*			
774.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
775.	940	*Lepidosperma pubisquameum*			
776.		*Lepidosperma pubisquameum "flat form"*			
777.	941	*Lepidosperma resinosum*			
778.	944	*Lepidosperma scabrum*			
779.		*Lepidosperma sp.*			
780.	29141	*Lepidosperma sp. Gosnells (A. Markey 1145)*			
781.	29150	*Lepidosperma sp. Margaret River (B.J. Lepschi 1841)*			
782.		*Lepidosperma sp. Mud3*			Y
783.	945	*Lepidosperma squamatum*			
784.	948	*Lepidosperma tetraquetrum*			
785.	1653	*Leporella fimbriata (Hare Orchid)*			
786.	1077	*Leptocarpus canus (Hoary Twine-rush)*			
787.	1078	*Leptocarpus coangustatus*			
788.	46375	*Leptocarpus decipiens*			
789.	46380	*Leptocarpus kraussii*			
790.		*Leptoceridae sp.*			
791.	2342	*Leptomeria cunninghamii*			
792.	2355	*Leptomeria squarrulosa*			
793.		*Leptophlebiidae sp.*			
794.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		

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795.	1085	*Lepyrodia glauca*			
796.	1088	*Lepyrodia macra (Large Scale Rush)*			
797.	1090	*Lepyrodia muirii*			
798.	25131	*Lerista distinguenda*			
799.	25133	*Lerista elegans*			
800.	6360	*Leucopogon australis (Spiked Beard-heath)*			
801.	6367	*Leucopogon capitellatus*			
802.	6374	*Leucopogon conostephioides*			
803.	6400	*Leucopogon gracillimus*			
804.	6436	*Leucopogon propinquus*			
805.	6439	*Leucopogon pulchellus (Beard-heath)*			
806.	28302	*Leucopogon sp. Parkerville (A. Meebold 11654)*			
807.	6445	*Leucopogon squarrosus*			
808.	6454	*Leucopogon verticillatus (Tassel Flower)*			
809.	7676	*Levenhookia pusilla (Midget Stylewort)*			
810.	7677	*Levenhookia stipitata (Common Stylewort)*			
811.	25005	*Lialis burtonis*			
812.		*Libellulidae sp.*			
813.	31280	*Lichenomphalia chromacea*			
814.	31333	*Lichenomphalia umbellifera*			
815.	25661	*Lichmera indistincta (Brown Honeyeater)*			
816.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
817.	4363	*Linum trigynum (French Flax)*	Y		
818.	25388	*Litoria moorei (Motorbike Frog)*			
819.	7407	*Lobelia rhytidosperma (Wrinkled-seeded Lobelia)*			
820.	7408	*Lobelia tenuior (Slender Lobelia)*			
821.	9356	*Logfia gallica*	Y		
822.	476	*Lolium perenne (Perennial Ryegrass)*	Y		
823.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
824.		*Lolium sp.*			
825.		*Lomandra ?caespitosa*			
826.	1222	*Lomandra brittanii*			
827.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
828.	1228	*Lomandra hermaphrodita*			
829.	1229	*Lomandra integra*			
830.	1232	*Lomandra micrantha (Small-flower Mat-rush)*			
831.	1234	*Lomandra nigricans*			
832.	1236	*Lomandra odora (Tiered Matrush)*			
833.	1239	*Lomandra preissii*			
834.	1240	*Lomandra purpurea (Purple Mat Rush)*			
835.	1243	*Lomandra sericea (Silky Mat Rush)*			
836.		*Lomandra sp.*			
837.	1245	*Lomandra spartea*			
838.	1246	*Lomandra suaveolens*			
839.		*Longepi woodman*			
840.		*Longrita insidiosa*			
841.		*Lophoictinia isura*			
842.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
843.		*Lotus sp. Mud3*			Y
844.	8564	*Lotus subbiflorus*	Y		
845.	1092	*Loxocarya cinerea*			
846.		*Lycosa ariadnae*			
847.	1097	*Lyginia barbata*			
848.		*Lyginia barbata/imberbis*			
849.	18049	*Lyginia imberbis*			
850.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
851.	36373	*Lysimachia minima*	Y		
852.	6456	*Lysinema ciliatum (Curry Flower)*			
853.	6458	*Lysinema elegans*			
854.	2839	*Macarthuria australis*			
855.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
856.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
857.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
858.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
859.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
860.	25654	*Malurus splendens (Splendid Fairy-wren)*			
861.	24552	*Malurus splendens subsp. splendens (Splendid Fairy-wren)*			
862.	24583	*Manorina flavigula (Yellow-throated Miner)*			
863.		*Maratus pavonis*			
864.	17637	*Marianthus candidus (White Marianthus)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
865.	17630	*Marianthus tenuis*			
866.	25758	*Megalurus gramineus (Little Grassbird)*			
867.		*Megapodagrionidae sp.*			
868.	34676	*Meionectes brownii (Swamp Raspwort)*			
869.	37580	*Melaleuca acutifolia*			
870.	36296	*Melaleuca armillaris subsp. armillaris*	Y		
871.	5925	*Melaleuca lateriflora (Gorada)*			
872.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
873.	20297	*Melaleuca osullivanii*			
874.	18394	*Melaleuca parviceps*			
875.	5946	*Melaleuca pauciflora*			
876.	5952	*Melaleuca preissiana (Moonah)*			
877.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
878.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
879.	5964	*Melaleuca seriata*			
880.	5978	*Melaleuca teretifolia (Banbar)*			
881.	5980	*Melaleuca thymoides*			
882.	5984	*Melaleuca uncinata (Broom Bush, Kwidjard)*			
883.	5987	*Melaleuca viminea (Mohan)*			
884.	13280	*Melaleuca viminea subsp. viminea*			
885.	47997	*Melanodryas cucullata (Hooded Robin)*			
886.	14985	*Melinis repens*	Y		
887.	24586	*Melithreptus brevirostris subsp. leucogenys (Brown-headed Honeyeater)*			
888.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
889.	25184	*Menetia greyii*			
890.	6885	*Mentha suaveolens (Apple Mint)*	Y		
891.	24598	*Merops ornatus (Rainbow Bee-eater)*			
892.	955	*Mesomelaena pseudostygia*			
893.	956	*Mesomelaena stygia*			
894.	11473	*Mesomelaena stygia subsp. stygia*			
895.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
896.		*Microcarbo melanoleucos*			
897.		*Microctenonyx subitaneus*			
898.	25693	*Microeca fascinans (Jacky Winter)*			
899.	485	*Microlaena stipoides (Weeping Grass)*			
900.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
901.	10954	*Microtis media (Tall Mignonette Orchid)*			
902.	15419	*Microtis media subsp. media*			
903.	8105	*Millotia myosotidifolia*			
904.	14344	*Millotia tenuifolia var. tenuifolia (Soft Millotia)*			
905.	4090	*Mirbelia dilatata (Holly-leaved Mirbelia)*			
906.	4100	*Mirbelia spinosa*			
907.	486	*Miscanthus sinensis (Eulalia)*	Y		
908.	7085	*Misopates orontium (Lesser Snapdragon)*	Y		
909.		*Missulena granulosa*			
910.		*Mituliodon tarantulinus*			
911.		*Miturga agelenina*			Y
912.		*Miturga catograpta*			
913.		*Molycria quadricauda*			
914.	7410	*Monopsis debilis*	Y		
915.	37440	*Monopsis debilis var. depressa*	Y		
916.	4662	*Monotaxis grandiflora (Diamond of the Desert)*			
917.	19585	*Monotaxis grandiflora var. grandiflora*			
918.	4666	*Monotaxis occidentalis*			
919.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
920.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
921.	25192	*Morethia obscura*			
922.	24223	*Mus musculus (House Mouse)*	Y		
923.	24042	*Mustela putorius (European Polecat, Ferret)*	Y		
924.		*Muziris carinatus*			
925.		*Myandra bicincta*			
926.	25610	*Myiagra inquieta (Restless Flycatcher)*			
927.		*Nannoperca vittata*			
928.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
929.	24738	*Neophema elegans (Elegant Parrot)*			
930.		*Neostorena vituperata*			Y
931.		*Nephila edulis*			
932.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
933.	25252	*Notechis scutatus (Tiger Snake)*			
934.		*Notonectidae sp.*			

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935.		*Novakiella trituberculosa*			
936.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
937.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
938.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
939.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
940.	41424	*Nyctophilus major (Greater Long-eared Bat)*			
941.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
942.		*Oecobius putus*			
943.	6137	*Oenothera affinis (Longflower Evening Primrose)*	Y		
944.	6140	*Oenothera mollissima*	Y		
945.	14292	*Oenothera stricta subsp. stricta*	Y		
946.	2365	*Olax benthamiana*			
947.	8133	*Olearia elaeophila*			
948.	32716	*Olearia lehmanniana*			
949.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
950.		*Oligochaeta sp.*			
951.		*Ommatoiulus moreletii*			
952.	18254	*Opercularia apiciflora*			
953.	7346	*Opercularia echinocephala (Bristly Headed Stink Weed)*			
954.	18255	*Opercularia vaginata (Dog Weed)*			
955.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
956.	4114	*Ornithopus pinnatus (Slender Serradella)*	Y		
957.		*Orthocladiinae sp.*			
958.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
959.		*Ostearius melanopygius*			
960.	4352	*Oxalis glabra*	Y		
961.	4355	*Oxalis perennans*			
962.	4356	*Oxalis pes-caprae (Soursob)*	Y		
963.		*Oxyopes gracilipes*			
964.		*Oxyopes rubicundus*			
965.		*Ozarchaea westraliensis*			
966.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
967.	27892	*Pannoparmelia wilsonii*			
968.		*Paralampona marangaroo*			
969.		*Paraplatoides nigrum*			
970.	3618	*Paraserianthes lophantha (Albizia)*			
971.	17114	*Paraserianthes lophantha subsp. lophantha*			
972.		*Parastacidae sp.*			
973.	25253	*Parasuta gouldii*			
974.	25255	*Parasuta nigriceps*			
975.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
976.	24625	*Pardalotus punctatus subsp. punctatus (Spotted Pardalote)*			
977.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
978.	25682	*Pardalotus striatus (Striated Pardalote)*			
979.	24630	*Pardalotus striatus subsp. westraliensis (Striated Pardalote)*			
980.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
981.	1542	*Patersonia babianoides*			
982.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
983.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
984.	30476	*Patersonia occidentalis var. latifolia*			
985.	30472	*Patersonia occidentalis var. occidentalis*			
986.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
987.	43760	*Pauridia occidentalis*			
988.	24674	*Pavo cristatus (Common Peafowl, Indian Peafowl)*	Y		
989.		*Pediana occidentalis*			
990.	4346	*Pelargonium littorale*			
991.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
992.		*Penemideopsis pusilla*			Y
993.	40424	*Pentameris airoides subsp. airoides*	Y		
994.	6245	*Pentapeltis peltigera*			
995.		*Pentasteron securifer*			
996.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
997.	16477	*Pericalymma ellipticum var. ellipticum*			
998.	16478	*Pericalymma ellipticum var. floridum*			
999.	15501	*Pericalymma spongiocaule*			
1000.	2255	*Persoonia angustiflora*			
1001.	2273	*Persoonia saccata (Snottygobble)*			
1002.	27947	*Pertusaria gibberosa*			
1003.	48060	*Petrochelidon ariel (Fairy Martin)*			
1004.	48061	*Petrochelidon nigricans (Tree Martin)*			

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1005.	48066	*Petroica boodang (Scarlet Robin)*			
1006.	24659	*Petroica goodenovii (Red-capped Robin)*			
1007.	20391	*Petrophile juncifolia*			
1008.	2299	*Petrophile linearis (Pixie Mops)*			
1009.	2301	*Petrophile macrostachya*			
1010.	2308	*Petrophile seminuda*			
1011.	2311	*Petrophile squamata*			
1012.	2312	*Petrophile striata*			
1013.	25697	*Phalacrocorax carbo (Great Cormorant)*			
1014.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
1015.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
1016.	24409	*Phaps chalcoptera (Common Bronzewing)*			
1017.	25587	*Phaps elegans (Brush Bronzewing)*			
1018.		*Phenasteron longiconductor*			
1019.	18529	*Philotheca spicata (Pepper and Salt)*			
1020.	1172	*Philydrella drummondii*			
1021.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
1022.	14306	*Philydrella pygmaea subsp. pygmaea*			
1023.		*Phlebia subceracea*			
1024.	1478	*Phlebocarya ciliata*			
1025.	1479	*Phlebocarya filifolia*			
1026.	554	*Phleum pratense (Timothy)*	Y		
1027.		*Pholiota communis*			
1028.		*Phryganoporus nigrinus*			
1029.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
1030.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
1031.	16825	*Phyllangium divergens*			
1032.	16177	*Phyllangium paradoxum*			
1033.	4675	*Phyllanthus calycinus (False Boronia)*			
1034.	13405	*Phyllopodium cordatum*	Y		
1035.	4141	*Phyllota gracilis*			
1036.		*Phytophthora cinnamomi*			
1037.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
1038.	11404	*Pimelea imbricata var. major*			
1039.	11402	*Pimelea imbricata var. piligera*			
1040.	5266	*Pimelea suaveolens (Scented Banjine)*			
1041.	12041	*Pimelea suaveolens subsp. suaveolens*			
1042.	5269	*Pimelea sylvestris*			
1043.		*Pinkfloydia harveii*			
1044.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
1045.		*Platorish gelorup*			
1046.	25720	*Platycercus icterotis (Western Rosella)*			
1047.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
1048.	24747	*Platycercus spurius (Red-capped Parrot)*			
1049.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
1050.	24750	*Platycercus zonarius subsp. semitorquatus (Twenty-eight Parrot)*			
1051.	38825	*Pluteus pauperculus*			
1052.	571	*Poa annua (Winter Grass)*	Y		
1053.	573	*Poa drummondiana (Knotted Poa)*			
1054.	577	*Poa poiformis (Coastal Poa)*			
1055.	25703	*Podargus strigoides (Tawny Frogmouth)*			
1056.	25704	*Podiceps cristatus (Great Crested Grebe)*			
1057.	8175	*Podolepis gracilis (Slender Podolepis)*			
1058.		*Podotheca ?gnaphalioides*			
1059.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
1060.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
1061.		*Poecilipta smaragdinea*			
1062.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
1063.	8188	*Pogonolepis stricta*			
1064.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
1065.	2419	*Polygonum aviculare (Wireweed)*	Y		
1066.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
1067.	583	*Polypogon tenellus*			
1068.		*Polypompholyx tenella scps*			
1069.	25722	*Polytelis anthopeplus (Regent Parrot)*			
1070.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
1071.	4691	*Poranthera microphylla (Small Poranthera)*			
1072.		*Poranthera microphylla/moorokatta*			
1073.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
1074.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			

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1075.	24771	*Porzana tabuensis (Spotless Crake)*			
1076.	111	*Potamogeton ochreatus (Blunt Pondweed)*			
1077.	1669	*Prasophyllum cyphochilum (Pouched Leek Orchid)*			
1078.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
1079.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
1080.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
1081.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
1082.		*Prionosternum nitidiceps*			
1083.		*Prionosternum scutatum*			
1084.		*Pseudolampona jarrahdale*			
1085.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
1086.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
1087.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
1088.	13255	*Pterochaeta paniculata*			
1089.	24702	*Pterodroma brevirostris (Kerguelen Petrel)*			
1090.		*Pterostylis aff. nana*			
1091.	48675	*Pterostylis atrosanguinea*			
1092.	1686	*Pterostylis barbata (Bird Orchid)*			
1093.	1693	*Pterostylis recurva (Jug Orchid)*			
1094.	12217	*Pterostylis sanguinea*			
1095.	1698	*Pterostylis vittata (Banded Greenhood)*			
1096.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
1097.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
1098.	4181	*Pultenaea reticulata*			
1099.		*Purpureicephalus spurius*			
1100.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
1101.	8195	*Quinetia urvillei*			
1102.	28224	*Ramalina inflata subsp. australis*			
1103.		*Ramaria lorithamnus*			
1104.	2938	*Ranunculus trilobus (Buttercup)*	Y		
1105.	24245	*Rattus rattus (Black Rat)*	Y		
1106.		*Raveniella cirrata*			
1107.		*Raveniella peckorum*			
1108.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
1109.	6012	*Regelia ciliata*			
1110.	48096	*Rhipidura albiscapa (Grey Fantail)*			
1111.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
1112.	24454	*Rhipidura leucophrys subsp. leucophrys (Willie Wagtail)*			
1113.	13300	*Rhodanthe citrina*			
1114.	13234	*Rhodanthe manglesii*			
1115.		*Richardsonianidae sp.*			
1116.		*Rickenella fibula*			
1117.	1556	*Romulea rosea (Guildford Grass)*	Y		
1118.	10931	*Rosa chinensis x moschata*	Y		
1119.	3191	*Rubus ulmifolius (Blackberry)*	Y		
1120.	2429	*Rumex acetosella (Sorrel)*	Y		
1121.	40431	*Rytidosperma acerosum*			
1122.	40425	*Rytidosperma caespitosum*			
1123.	40426	*Rytidosperma occidentale*			
1124.	40430	*Rytidosperma pilosum*			
1125.	40427	*Rytidosperma setaceum*			
1126.		*Sandalodes scopifer*			
1127.	7602	*Scaevola calliptera*			
1128.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
1129.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
1130.	7635	*Scaevola pilosa (Hairy Fan-flower)*			
1131.	13182	*Scaevola repens var. repens*			
1132.	17055	*Schinus molle*	Y		
1133.	6263	*Schoenolaena juncea*			
1134.		*Schoenus aff. brevisetis (Mud2, #135)*			
1135.	975	*Schoenus bifidus*			
1136.	978	*Schoenus brevisetis*			
1137.	979	*Schoenus caespititius*			
1138.	982	*Schoenus clandestinus*			
1139.	984	*Schoenus curvifolius*			
1140.	986	*Schoenus efoliatus*			
1141.	991	*Schoenus grammatophyllus*			
1142.	1002	*Schoenus nanus (Tiny Bog Rush)*			
1143.	1006	*Schoenus odontocarpus*			
1144.	17614	*Schoenus plumosus*			

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1145.	1011	*Schoenus rigens*			
1146.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
1147.		*Schoenus sp. aff. breviculmis sthcst*			Y
1148.	1016	*Schoenus subbarbatus (Bearded Bog-rush)*			
1149.	1017	*Schoenus subbulbosus*			
1150.	1019	*Schoenus subflavus (Yellow Bog-rush)*			
1151.	1020	*Schoenus sublateralis*			
1152.	1023	*Schoenus tenellus*			
1153.	1026	*Schoenus unispiculatus*			
1154.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
1155.		*Scolopendra laeta*			
1156.	6	*Selaginella gracillima (Tiny Clubmoss)*			
1157.	20663	*Senecio multicaulis subsp. multicaulis*			
1158.	25884	*Senecio pinnatifolius var. latilobus*			
1159.	8217	*Senecio quadridentatus*			
1160.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
1161.	11880	*Setaria pumila subsp. pumila*	Y		
1162.	613	*Setaria verticillata (Whorled Pigeon Grass)*	Y		
1163.	2909	*Silene gallica (French Catchfly)*	Y		
1164.	8224	*Siloxerus filifolius*			
1165.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
1166.	14583	*Siloxerus multiflorus*			
1167.		*Simuliidae sp.*			
1168.	30948	*Smicrornis brevirostris (Weebill)*			
1169.	24108	*Sminthopsis crassicaudata (Fat-tailed Dunnart)*			
1170.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
1171.	7020	*Solanum linnaeanum (Apple of Sodom)*	Y		
1172.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
1173.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
1174.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
1175.		*Sondra aurea*			
1176.		*Sondra tristicula*			
1177.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
1178.	1558	*Sparaxis bulbifera*	Y		
1179.	4207	*Sphaerolobium medium*			
1180.	4211	*Sphaerolobium vimineum (Leafless Globe Pea)*			
1181.	4716	*Stachystemon vermicularis*			
1182.	4733	*Stackhousia monogyna*			
1183.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
1184.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
1185.	2918	*Stellaria media (Chickweed)*	Y		
1186.	19403	*Stenopetalum gracile*			
1187.	2316	*Stirlingia latifolia (Blueboy)*			
1188.		*Storena formosa*			
1189.		*Storosa tetrica*			
1190.	25597	*Strepera versicolor (Grey Currawong)*			
1191.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
1192.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
1193.		*Stylidium aff. androsaceum*			
1194.	7681	*Stylidium affine (Queen Triggerplant)*			
1195.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
1196.	30278	*Stylidium androsaceum*			
1197.	25831	*Stylidium araeophyllum (Stilt Walker)*			
1198.		*Stylidium araeophyllum/neurophyllum*			
1199.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
1200.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
1201.	7696	*Stylidium calcaratum (Book Triggerplant)*			
1202.	7699	*Stylidium carnosum (Fleshy-leaved Triggerplant)*			
1203.	7702	*Stylidium ciliatum (Golden Triggerplant)*			
1204.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
1205.	7713	*Stylidium dichotomum (Pins-and-needles)*			
1206.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
1207.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
1208.	7718	*Stylidium diversifolium (Touch-me-not)*			
1209.	7719	*Stylidium ecorne (Foot Triggerplant)*			
1210.	7736	*Stylidium hispidum (White Butterfly Triggerplant)*			
1211.	7742	*Stylidium inundatum (Hundreds and Thousands)*			
1212.	7749	*Stylidium leptophyllum (Needle-leaved Triggerplant)*			
1213.	7752	*Stylidium lineatum (Sunny Triggerplant)*			
1214.	25829	*Stylidium neurophyllum (Coastal Plain Triggerplant)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1215.	7768	*Stylidium obtusatum (Pinafore Triggerplant)*			
1216.	7773	*Stylidium petiolare (Horn Triggerplant)*			
1217.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
1218.	7782	*Stylidium pulchellum (Thumbelina Triggerplant)*			
1219.	33106	*Stylidium recurvum*			
1220.	7785	*Stylidium repens (Matted Triggerplant)*			
1221.		*Stylidium roseo-alatum*			
1222.	7790	*Stylidium roseoalatum (Pink-wing Triggerplant)*			
1223.	7798	*Stylidium schoenoides (Cow Kicks)*			
1224.		*Stylidium sp.*			
1225.	45594	*Stylidium tenue subsp. majusculum (Showy Fountain Triggerplant)*			
1226.	23511	*Stylidium thesioides (Delicate Triggerplant)*			
1227.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			
1228.		*Stylopauropoides wungongensis*			Y
1229.	1260	*Stypandra glauca (Blind Grass)*			
1230.	6476	*Styphelia tenuiflora (Common Pinheath)*			
1231.		*Supunna funerea*			
1232.		*Supunna picta*			
1233.	24259	*Sus scrofa (Pig)*	Y		
1234.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
1235.		*Symphytognatha picta*			
1236.	2321	*Synaphea acutiloba (Granite Synaphea)*			
1237.	2323	*Synaphea gracillima*			
1238.	2324	*Synaphea petiolaris (Synaphea)*			
1239.	16864	*Synaphea petiolaris subsp. petiolaris*			
1240.	2325	*Synaphea pinnata (Helena Synaphea)*			
1241.	29186	*Synaphea sp. Udumung (A.S. George 17058)*			
1242.		*Synothele durokoppin*			
1243.		*Synothele longbottomi*			
1244.		*Synothele michaelseni*			
1245.	32439	*Syntrichia papillosa*			
1246.		*Tabanidae sp.*			
1247.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1248.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1249.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
1250.	30870	*Taeniopygia guttata (Zebra Finch)*			
1251.	20024	*Tagetes erecta (Marigold)*	Y		
1252.		*Tanypodinae sp.*			
1253.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1254.		*Tasmanicosa leuckartii*			
1255.	20135	*Taxandria linearifolia*			
1256.	1034	*Tetraria capillaris (Hair Sedge)*			
1257.	1036	*Tetraria octandra*			
1258.	667	*Tetrarrhena laevis (Forest Ricegrass)*			
1259.	4535	*Tetratheca hirsuta (Black Eyed Susan)*			
1260.	48342	*Tetratheca hirsuta subsp. hirsuta*			
1261.	48341	*Tetratheca hirsuta subsp. viminea*			
1262.	4537	*Tetratheca nuda*			
1263.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
1264.	1702	*Thelymitra campanulata (Shirt Orchid)*			
1265.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
1266.	11053	*Thelymitra macrophylla*			
1267.	673	*Themeda triandra*			
1268.	5080	*Thomasia foliosa*			
1269.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
1270.	1318	*Thysanotus arbuscula*			
1271.	1319	*Thysanotus arenarius*			
1272.	1328	*Thysanotus dichotomus (Branching Fringe Lily)*			
1273.	1330	*Thysanotus fastigiatus*			
1274.	1338	*Thysanotus manglesianus (Fringed Lily)*			
1275.		*Thysanotus manglesianus/patersonii complex*			
1276.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
1277.	1343	*Thysanotus patersonii*			
1278.	46055	*Thysanotus sp. Coastal plain (N.H. Brittan 66/63)*			
1279.	1351	*Thysanotus sparteus*			
1280.	1354	*Thysanotus tenellus*			
1281.	1357	*Thysanotus thyrsoideus*			
1282.	1358	*Thysanotus triandrus*			
1283.	25203	*Tiliqua occipitalis (Western Bluetongue)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1284.	25519	*Tiliqua rugosa*			
1285.		*Tinytrema yarra*			
1286.		*Tipulidae sp.*			
1287.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
1288.	8248	*Tolpis barbata (Yellow Hawkweed)*	Y		
1289.		*Trachycosmus sculptilis*			
1290.	19041	*Trachymene coerulea subsp. coerulea*			
1291.	6280	*Trachymene pilosa (Native Parsnip)*			
1292.		*Trachytrema castaneum*			
1293.	38845	*Trechispora farinacea*			
1294.	1481	*Tribonanthes australis (Southern Tiurndin)*			
1295.	1482	*Tribonanthes brachypetala (Nodding Tiurndin)*			
1296.	1483	*Tribonanthes longipetala (Branching Tiurndin)*			
1297.	1485	*Tribonanthes violacea (Violet Tiurndin)*			
1298.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
1299.	8251	*Trichocline spathulata (Native Gerbera)*			
1300.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
1301.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
1302.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
1303.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
1304.	1362	*Tricoryne humilis*			
1305.	1363	*Tricoryne tenella*			
1306.	1038	*Tricostularia neesii*			
1307.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
1308.	4291	*Trifolium arvense (Hare's Foot Clover)*	Y		
1309.	4292	*Trifolium campestre (Hop Clover)*	Y		
1310.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
1311.	4293	*Trifolium cernuum (Drooping Flower Clover)*	Y		
1312.	4295	*Trifolium dubium (Suckling Clover)*	Y		
1313.	17541	*Trifolium incarnatum var. incarnatum*	Y		
1314.	4313	*Trifolium subterraneum (Subterranean Clover)*	Y		
1315.	18587	*Triglochin nana*			
1316.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
1317.	1139	*Trithuria bibracteata*			
1318.	1141	*Trithuria submersa*			
1319.	1561	*Tritonia crocata*	Y		
1320.	13479	*Trymalium ledifolium var. rosmarinifolium*			
1321.	33418	*Trymalium odoratissimum subsp. odoratissimum*			
1322.	39103	*Tubifera ferruginosa*			
1323.	48147	*Turnix varius (Painted Button-quail)*			
1324.	24851	*Turnix velox (Little Button-quail)*			
1325.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
1326.	24983	*Underwoodisaurus milii (Barking Gecko)*			
1327.		*Urodacus novaehollandiae*			
1328.		*Urodacus planimanus*			
1329.		*Urodacus woodwardii*			
1330.	8255	*Ursinia anthemoides (Ursinia)*	Y		
1331.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
1332.	28227	*Usnea scabrida subsp. scabrida*			
1333.	7153	*Utricularia tenella*			
1334.	7157	*Utricularia violacea (Violet Bladderwort)*			
1335.	24386	*Vanellus tricolor (Banded Lapwing)*			
1336.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
1337.		*Veliidae sp.*			
1338.	7665	*Velleia trinervis*			
1339.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
1340.		*Venator immansueta*			
1341.	7107	*Verbascum virgatum (Twiggy Mullein)*	Y		
1342.	6070	*Verticordia acerosa*			
1343.	15431	*Verticordia acerosa var. acerosa*			
1344.	12388	*Verticordia acerosa var. preissii*			
1345.	6076	*Verticordia densiflora (Compacted Featherflower)*			
1346.	15432	*Verticordia densiflora var. densiflora*			
1347.	6088	*Verticordia huegelii (Variegated Featherflower)*			
1348.	15433	*Verticordia huegelii var. huegelii*			
1349.	12430	*Verticordia huegelii var. stylosa*			
1350.	6107	*Verticordia pennigera*			
1351.	6110	*Verticordia plumosa (Plumed Featherflower)*			
1352.	12449	*Verticordia plumosa var. brachyphylla*			
1353.	15618	*Verticordia plumosa var. plumosa*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1354.	24206	*Vespadelus regulus (Southern Forest Bat)*			
1355.	4320	*Vicia hirsuta (Hairy Vetch)*	Y		
1356.	12070	*Vicia sativa subsp. sativa*	Y		
1357.	4325	*Viminaria juncea (Swishbush, Koweda)*			
1358.	24040	*Vulpes vulpes (Red Fox)*	Y		
1359.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
1360.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
1361.	33101	*Vulpia myuros forma myuros*	Y		
1362.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
1363.	7386	*Wahlenbergia gracilenta (Annual Bluebell)*			
1364.	7389	*Wahlenbergia preissii*			
1365.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
1366.	17910	*Washingtonia filifera*	Y		
1367.	13103	*Watsonia borbonica*	Y		
1368.	1566	*Watsonia marginata*	Y		
1369.	1567	*Watsonia meriana (Bulbil Watsonia)*	Y		
1370.	18108	*Watsonia meriana var. bulbillifera*	Y		
1371.	18118	*Watsonia meriana var. meriana*	Y		
1372.		*Watsonia sp. Mud09*			Y
1373.	12072	*Wurmbea dioica subsp. alba*			
1374.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1375.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1376.		*Xanthorrhoea sp.*			
1377.		*Xanthosia ?huegelii*			Y
1378.	6284	*Xanthosia candida*			
1379.	6285	*Xanthosia ciliata*			
1380.	6289	*Xanthosia huegelii*			
1381.	2331	*Xylomelum occidentale (Woody Pear, Djandin)*			
1382.	15819	*Xyris atrovirida*			
1383.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
1384.		*Zebraplatys fractivittata*			
1385.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX B - EPBC PROTECTED MATTERS SEARCH REPORT

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 21-Mar-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	2
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	28
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	4
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	18
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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

Ramsar Site Name	Proximity	Buffer Status
Forrestdale and thomsons lakes	Within 10km of Ramsar site	In feature area
Peel-yalgorup system	30 - 40km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In feature area
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area	In feature area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Bettongia penicillata ogilbyi Woylie [66844]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area	In feature area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In feature area
Anthocercis gracilis Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area	In feature area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area	In feature area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area	In feature area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat likely to occur within area	In feature area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area	In feature area
Lasiopetalum pterocarpum Wing-fruited Lasiopetalum [64922]	Endangered	Species or species habitat may occur within area	In feature area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Synaphea sp. Fairbridge Farm (D. Papenfus 696)			
Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Synaphea sp. Pinjarra Plain (A.S. George 17182)			
[86878]	Endangered	Species or species habitat known to occur within area	In feature area
Synaphea sp. Serpentine (G.R. Brand 103)			
[86879]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Tetraria australiensis			
Southern Tetraria [10137]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thelymitra stellata			
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [51517]	WA	In feature area
Commonwealth Land - [51380]	WA	In feature area
Commonwealth Land - [50876]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Cardup	Nature Reserve	WA	In feature area
Unnamed WA46818	Nature Reserve	WA	In buffer area only
Unnamed WA51963	Conservation Park	WA	In buffer area only
Watkins Road	Nature Reserve	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

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

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Byford Rail Extension, Byford, WA	2020/8764	Controlled Action	Post-Approval	In buffer area only
Tonkin Highway Extension ??? Thomas Road to South Western Highway	2019/8608	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Abernethy Road upgrade (Kardan, Tourmaline & Soldiers) Byford, WA	2015/7441	Not Controlled Action	Completed	In buffer area only
BaptistCare Byford Aged Care Facility	2021/9111	Not Controlled Action	Completed	In feature area
Bristile Holdings Pty Ltd, Cardup Brickworks, South of Byford	2020/8834	Not Controlled Action	Completed	In feature area
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In buffer area only
Gold Fusion Pty Ltd /Residential development/South Western Highway 40km southeast of Perth /WA/Develop approximately 473ha of land for residential and commercial development	2014/7185	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Residential Development, Lots 3, 5 and 900 Taylor Rd Mundijong, WA	2019/8457	Not Controlled Action	Completed	In feature area
Residential development at Lot 54 Cockram Street and Lot 119 Sparkman Road, Mundijong	2020/8618	Not Controlled Action	Completed	In buffer area only
Residential development at Taylor Road and Adams Street, Mundijong, WA	2020/8780	Not Controlled Action	Completed	In buffer area only
Residential Development Various Lots Doley Road, Orton Road and Lawrence Way, Beenyup Grove Byford, Western Australia	2020/8779	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Undertake a Controlled Fuel Reduction Burn	2008/4262	Not Controlled Action	Completed	In feature area
Urban development of Lots 9049 and 9063, The Glades, Byford, WA	2015/7607	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Residential Subdivision on Abernethy Road, Byford	2009/4767	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Residential Development Doley Road, Orton Road and Lawrence Way	2020/8679	Referral Decision	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX C - FLORA SPECIES BY VEGETATION UNIT

*denotes introduced (weed) species

Family	N/I	Species	Veg Unit						
			BsXp	CcXp	CcXpKa	EwTo	Rehab	Er(P)	Cc(P)
Amaranthaceae		*Ptilotus manglesii*			+				
Apiaceae		*Pentapeltis peltigera*		+					
Apiaceae		*Xanthosia atkinsoniana*		+					
Asparagaceae		*Laxmannia squarrosa*	+	+	+	+			
Asparagaceae		*Lomandra drummondii*		+					
Asparagaceae		*Lomandra hermaphrodita*	+	+		+			
Asparagaceae		*Lomandra preissii*	+	+	+				
Asparagaceae		*Lomandra sonderi*		+	+	+			
Asparagaceae		*Lomandra* sp.				+			
Asparagaceae		*Thysanotus gracilis*			+				
Asparagaceae		*Thysanotus patersonii*			+				
Asteraceae		*Trichocline spathulata*		+					
Asteraceae		*Ursinia anthemoides*		+	+	+			
Casuarinaceae		*Allocasuarina humilis*				+			
Colchicaceae		*Burchardia congesta*	+	+		+			
Cyperaceae		*Cyathochaeta avenacea*		+	+	+			
Cyperaceae		*Mesomelaena tetragona*		+		+			
Cyperaceae		*Morelotia octandra*	+	+	+	+			
Dasypogonaceae		*Kingia australis*		+	+	+			
Dilleniaceae		*Hibbertia hypericoides*		+		+			
Droseraceae		*Drosera erythrorhiza*	+	+					
Droseraceae		*Drosera macrantha*	+	+	+	+			
Fabaceae		*Acacia lateriticola*	+	+	+	+			
Fabaceae		*Acacia pulchella*				+	+		
Fabaceae		*Acacia saligna*					+		
Fabaceae	*	*Chamaecytisus palmensis*		+					
Fabaceae		*Chorizema dicksonii*				+			
Fabaceae		*Daviesia decipiens*		+					
Fabaceae		*Daviesia decurrens*	+						
Fabaceae		*Daviesia physodes*		+					
Fabaceae		*Gompholobium marginatum*	+	+	+	+			
Fabaceae		*Gompholobium tomentosum*	+				+		
Fabaceae		*Sphaerolobium medium*		+					
Fabaceae	*	*Trifolium* sp.		+		+		+	
Goodeniaceae		*Dampiera decurrens*		+					
Goodeniaceae		*Dampiera linearis*	+						
Goodeniaceae		*Lechenaultia biloba*	+	+	+	+	+		
Haemodoraceae		*Anigozanthos manglesii*	+	+	+		+		
Haemodoraceae		*Conostylis aculeata*			+				
Haemodoraceae		*Conostylis setigera*	+	+	+				
Haemodoraceae		*Haemodorum laxum*	+			+			
Haemodoraceae		*Haemodorum* sp.				+			
Hemerocallidaceae		*Caesia micrantha*				+			
Hemerocallidaceae		*Caesia occidentalis*	+	+					
Hemerocallidaceae		*Chamaescilla corymbosa*	+	+	+				
Hemerocallidaceae		*Johnsonia pubescens* subsp. *cygnorum*			+				
Iridaceae	*	*Freesia alba* x *leichtlinii*		+					
Iridaceae		*Patersonia occidentalis*		+		+			
Iridaceae		*Patersonia pygmaea*		+					
Iridaceae	*	*Romulea rosea*			+				
Iridaceae	*	*Watsonia meriana*		+		+		+	

Family	N/I	Species	Veg Unit						
			BsXp	CcXp	CcXpKa	EwTo	Rehab	Er(P)	Cc(P)
Lamiaceae		*Hemiandra pungens*		+					
Lauraceae		*Cassytha racemosa*			+	+			
Loranthaceae		*Nuytsia floribunda*			+	+			
Myrtaceae		*Babingtonia camphorosmae*		+					
Myrtaceae		*Beaufortia elegans*					+		
Myrtaceae		*Corymbia calophylla*	+	+	+	+			+
Myrtaceae		*Darwinia citriodora*				+			
Myrtaceae		*Eucalyptus drummondii*		+					
Myrtaceae		*Eucalyptus marginata*		+					
Myrtaceae		*Eucalyptus rudis*						+	
Myrtaceae		*Eucalyptus* sp.					+		
Myrtaceae		*Eucalyptus wandoo*				+			
Myrtaceae	*	*Leptospermum laevigatum*	+				+		
Orchidaceae		*Caladenia latifolia*	+						
Orchidaceae		*Cyanicula sericea*				+			
Orchidaceae	*	*Disa bracteata*			+				
Orchidaceae		*Prasophyllum macrostachyum*		+					
Orchidaceae		*Thelymitra* sp.	+						
Orchidaceae		*Thelymitra benthamiana*			+				
Oxalidaceae	*	*Oxalis ? glabra*		+					
Phyllanthaceae		*Phyllanthus calycinus*				+			
Phyllanthaceae		*Poranthera microphylla*	+						
Poaceae		*Amphipogon turbinatus*		+					
Poaceae		*Austrostipa nitida*		+	+				
Poaceae	*	*Briza maxima*	+	+	+	+			+
Poaceae	*	*Briza minor*	+		+	+			
Poaceae	*	*Ehrharta calycina*	+	+	+	+	+	+	+
Poaceae	*	*Eragrostis curvula*	+			+		+	+
Poaceae		*Neurachne alopecuroidea*	+	+	+	+	+		
Polygalaceae		*Comesperma calymega*	+						
Proteaceae		*Banksia dallanneyi*		+		+			
Proteaceae		*Banksia sessilis*	+				+		
Proteaceae		*Grevillea pilulifera*		+					
Proteaceae		*Hakea lissocarpha*		+					
Proteaceae		*Hakea undulata*				+	+		
Proteaceae		*Stirlingia latifolia*			+				
Proteaceae		*Synaphea gracillima*				+			
Restionaceae		*Desmocladus fasciculatus*		+	+				
Rhamnaceae		*Trymalium odoratissimum* subsp. *odoratissimum*				+		+	
Stylidiaceae		*Levenhookia pusilla*	+						
Stylidiaceae		*Stylidium ? rhipidium*			+				
Stylidiaceae		*Stylidium piliferum*			+				
Stylidiaceae		*Stylidium repens*			+				
Xanthorrhoeaceae		*Xanthorrhoea gracilis*	+						
Xanthorrhoeaceae		*Xanthorrhoea preissii*	+	+	+	+			

APPENDIX D – VEGETATION SITE DATA

Site CR01

Date	15 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405900mE 6431979mN
Vegetation Unit	CcXp - *Corymbia calophylla* and *Eucalyptus marginata* Low Woodland over *Xanthorrhoea preissii* with occasional *Kingia australis* Tall Sparse Shrubland over *Mesomelaena tetragona* Sedgeland
Slope	Gentle
Landform	Lower slope/ foothills
Soil Colour	Pale brown
Soil Type	Sandy loamy clay
Litter	70%
Bare Ground	0%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Phase 1

Phase 2

Species	Height (m)	% Cover
Corymbia calophylla	10	8
Eucalyptus drummondii	8	15
Kingia australis	3	2
Xanthorrhoea preissii	2	10
**Ehrharta calycina*	1	1
Mesomelaena tetragona	0.7	2
**Briza maxima*		+
Caesia occidentalis		+
**Chamaecytisus palmensis*		+
Chamaescilla corymbosa		+
Cyathochaeta avenacea		+
Drosera macrantha		+
**Freesia alba* x *leichtlinii*		+
Hakea lissocarpha		+
Laxmannia squarrosa		+
Lomandra drummondii		+
Lomandra hermaphrodita		+
Lomandra preissii		+
Morelotia octandra		+
Neurachne alopecuroidea		+
**Oxalis ? glabra*		+
Prasophyllum macrostachyum		+
**Trifolium* sp.		+
**Ursinia anthemoides*		+

Site CR02

Date	15 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405415mE 6430087mN
Vegetation Unit	CcXpKa - *Corymbia calophylla* Low Open Woodland over *Xanthorrhoea preissii* and *Kingia australis* Tall Sparse Shrubland over *Laxmannia squarrosa* Low Forbland
Slope	Flat
Landform	Lower slope/ foothills
Soil Colour	Pale brown
Soil Type	Sand
Litter	25%
Bare Ground	5%
Fire Age	>10 Years
Vegetation Condition	Good – Very Good
Disturbances/Impacts	Weeds

Phase 1

Phase 2

Species	Height (m)	% Cover
Corymbia calophylla	6	8
Kingia australis	3	2
Xanthorrhoea preissii	2	6
Laxmannia squarrosa	0.01	70
Acacia lateriticola		+
Anigozanthos manglesii		+
Austrostipa nitida		+
**Briza maxima*		+
**Briza minor*		+
Cassytha racemosa		+
Chamaescilla corymbosa		+
Conostylis aculeata		+
Conostylis setigera		+
Cyathochaeta avenacea		+
Desmocladus fasciculatus		+
**Disa bracteata*		+
Drosera macrantha		+
Drosera macrantha		+
**Ehrharta calycina*		+
Gompholobium marginatum		+
Johnsonia pubescens subsp. *cygnorum*		+
Lechenaultia biloba		+
Lomandra preissii		+
Lomandra sonderi		+
Morelotia octandra		+
Neurachne alopecuroidea		+
Nuytsia floribunda		+
Ptilotus manglesii		+
**Romulea rosea*		+
Stirlingia latifolia		+
Stylidium ? rhipidium		+
Stylidium piliferum		+
Stylidium repens		+
Thelymitra benthamiana		+
Thysanotus gracilis		+
Thysanotus patersonii		+
**Ursinia anthemoides*		+

Site CR03

Date	15 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405567mE 6430706mN
Vegetation Unit	CcXp - *Corymbia calophylla* and *Eucalyptus marginata* Low Woodland over *Xanthorrhoea preissii* with occasional *Kingia australis* Tall Sparse Shrubland over *Mesomelaena tetragona* Sedgeland
Slope	Flat
Landform	Lower slope/ foothills
Soil Colour	Brown
Soil Type	Sand
Litter	70%
Bare Ground	0%
Fire Age	>10 Years
Vegetation Condition	Very Good-Excellent
Disturbances/Impacts	Weeds

Phase 1

Phase 2

Species	Height (m)	% Cover
Corymbia calophylla	8	15
Eucalyptus marginata	8	15
Xanthorrhoea preissii	1.5	5
Mesomelaena tetragona	0.4	1
Cyathochaeta avenacea	0.2	1
Morelotia octandra	0.2	1
Acacia lateriticola		+
Amphipogon turbinatus		+
Anigozanthos manglesii		+
Austrostipa nitida		+
Babingtonia camphorosmae		+
Banksia dallanneyi		+
Burchardia congesta		+
Burchardia congesta		+
Chamaescilla corymbosa		+
Conostylis setigera		+
Dampiera decurrens		+
Daviesia decipiens		+
Daviesia physodes		+
Desmocladus fasciculatus		+
Drosera erythrorhiza		+
Gompholobium marginatum		+
Grevillea pilulifera		+
Hakea lissocarpha		+
Hemiandra pungens		+
Hibbertia hypericoides		+
Laxmannia squarrosa		+
Lechenaultia biloba		+
Lomandra hermaphrodita		+
Lomandra sonderi		+
Patersonia occidentalis		+
Patersonia pygmaea		+
Pentapeltis peltigera		+
Sphaerolobium medium		+
Trichocline spathulata		+
Xanthosia atkinsoniana		+

Site CR04

Date	16 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405566mE 6430847mN
Vegetation Unit	BsXp - *Corymbia calophylla* Low Open Woodland over *Banksia sessilis* Tall Shrubland over *Xanthorrhoea preissii* Shrubland
Slope	Flat
Landform	Lower slope/ foothills
Soil Colour	Brown
Soil Type	Sandy loamy gravel
Litter	60%
Bare Ground	2%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds, historic clearing

Phase 1

Phase 2

Species	Height (m)	% Cover
Corymbia calophylla	10	5
Banksia sessilis	3	60
Xanthorrhoea preissii	1.5	3
**Ehrharta calycina*	0.2	40
Acacia lateriticola		+
Anigozanthos manglesii		+
**Briza maxima*		+
**Briza minor*		+
Burchardia congesta		+
Caesia occidentalis		+
Caladenia latifolia		+
Chamaescilla corymbosa		+
Comesperma calymega		+
Conostylis setigera		+
Dampiera linearis		+
Daviesia decurrens		+
Drosera erythrorhiza		+
Drosera macrantha		+
**Eragrostis curvula*		+
Gompholobium marginatum		+
Gompholobium tomentosum		+
Haemodorum laxum		+
Laxmannia squarrosa		+
Lechenaultia biloba		+
**Leptospermum laevigatum*		+
Levenhookia pusilla		+
Lomandra hermaphrodita		+
Lomandra preissii		+
Morelotia octandra		+
Neurachne alopecuroidea		+
Poranthera microphylla		+
Thelymitra sp.		+
Xanthorrhoea gracilis		+

Site CR05r

Date	16 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405497mE 6430576mN
Vegetation Unit	Rehab - Rehabilitation with planted endemic and non species
Slope	Flat
Landform	Lower slope/ foothills
Soil Colour	Brown
Soil Type	Sandy loamy gravel
Litter	40%
Bare Ground	5%
Fire Age	>10 Years
Vegetation Condition	Degraded-Good
Disturbances/Impacts	Historic clearing

Species	Height (m)	% Cover
Eucalyptus sp.	4	2
Banksia sessilis	3	50
Acacia saligna	3	2
Acacia pulchella	1.5	2
**Ehrharta calycina*	0.2	20
Anigozanthos manglesii		+
Beaufortia elegans		+
Gompholobium tomentosum		+
Hakea undulata		+
Leschenaultia biloba		+
**Leptospermum laevigatum*		+
Neurachne alopecuroidea		+

Site CR06r

Date	16 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405324mE 6429714mN
Vegetation Unit	Er(P) - *Eucalyptus rudis* Open Woodland over *Trymalium odoratissimum* subsp. *odoratissimum* Shrubland over grassess and weeds
Slope	Moderate
Landform	Medium drainage line
Soil Colour	Pale brown
Soil Type	Sandy loamy gravel
Litter	5%
Bare Ground	40%
Fire Age	>10 Years
Vegetation Condition	Completely Degraded-Degraded
Disturbances/Impacts	Weeds, clearing, erosion

Species	Height (m)	% Cover
Eucalyptus rudis	14	10
Trymalium odoratissimum subsp. *odoratissimum*	3	40
**Watsonia meriana*	0.8	30
**Ehrharta calycina*	0.3	10
**Eragrostis curvula*		+
**Trifolium* sp.		+

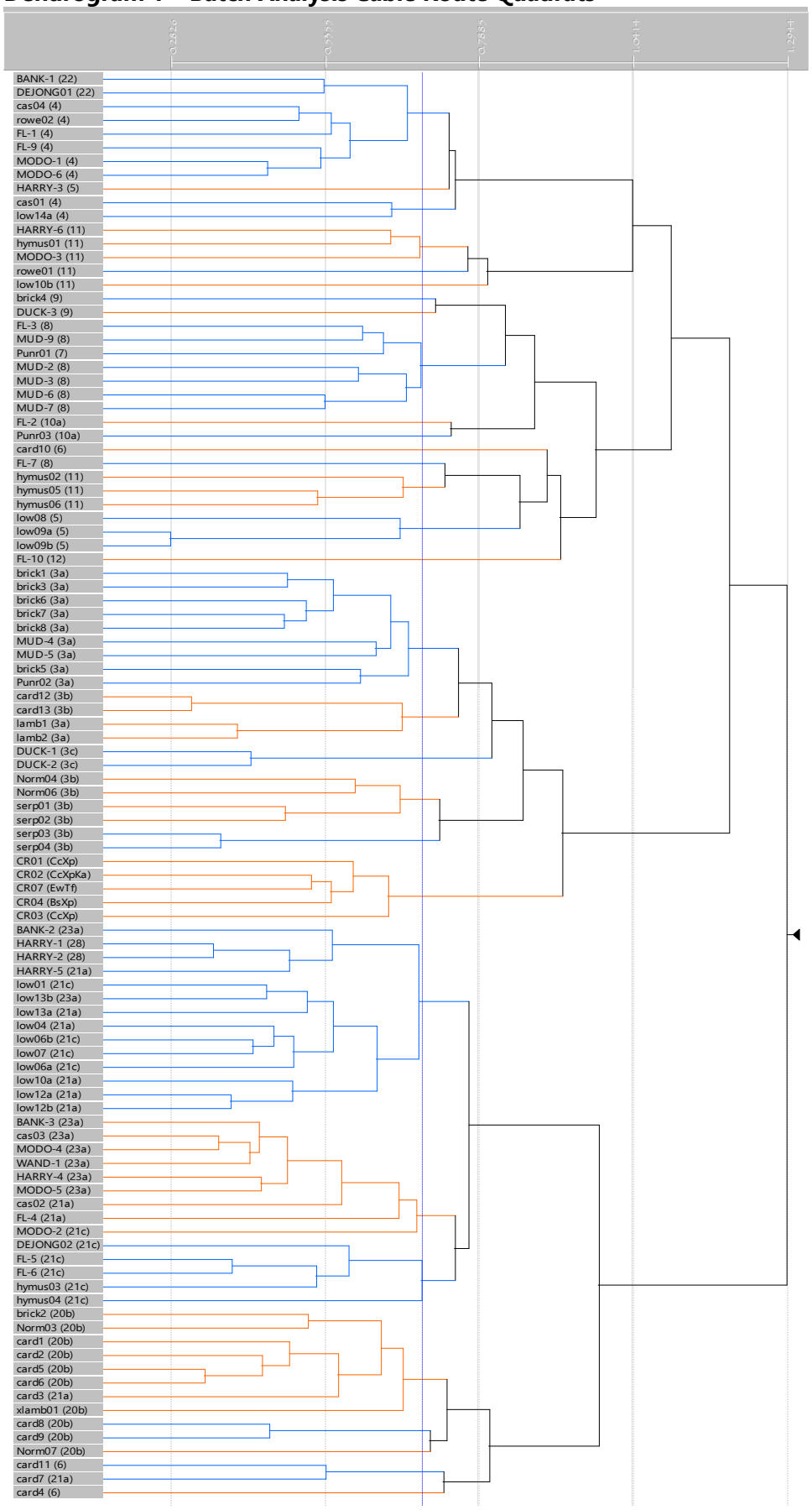
Site CR07

Date	16 September 2021
Botanist	Kellie Bauer-Simpson
Quadrat Size	10 x 10 m
NW Corner Coordinates	405317mE 6429743mN
Vegetation Unit	EwTo - *Eucalyptus wandoo* and *Corymbia calophylla* Low Woodland over *Trymalium odoratissimum* subsp. *odoratissimum*, *Kingia australis* and *Xanthorrhoea preissii* Shrubland *Mesomelaena tetragona* and *Laxmannia squarrosa* Sedgeland
Slope	Gentle
Landform	Midslope
Soil Colour	Pale brown
Soil Type	Sandy loamy gravel
Litter	30%
Bare Ground	2%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

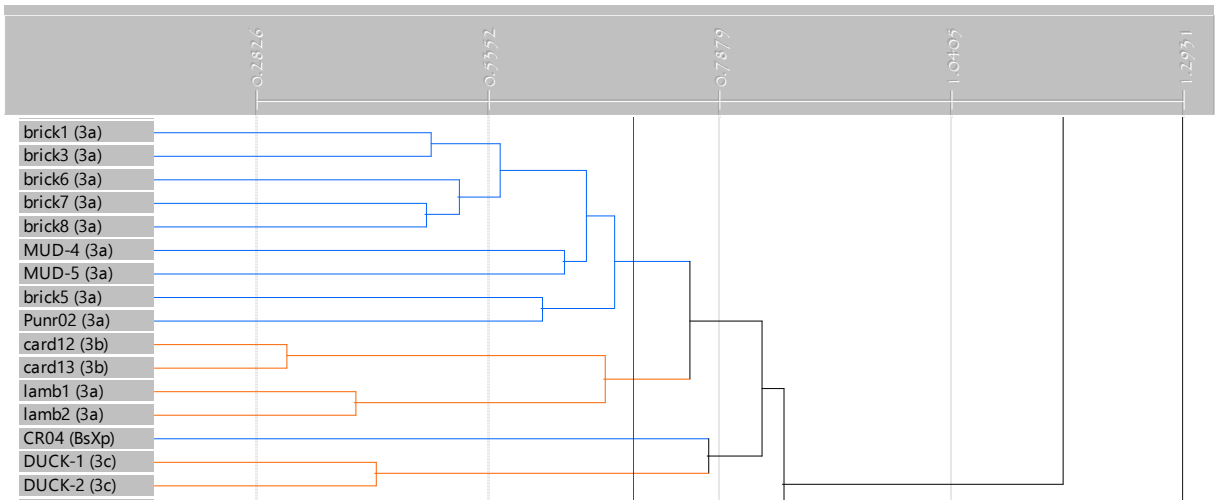
Species	Height (m)	% Cover
Eucalyptus wandoo	8	15
Corymbia calophylla	5	4
Trymalium odoratissimum subsp. *odoratissimum*	2	40
Kingia australis	1	5
Xanthorrhoea preissii	0.8	5
Mesomelaena tetragona	0.4	6
Laxmannia squarrosa	0.01	4
Acacia lateriticola		+
Acacia pulchella		+
Banksia dallanneyi		+
**Briza maxima*		+
**Briza minor*		+
Burchardia congesta		+
Caesia micrantha		+
Cassytha racemosa		+
Chorizema dicksonii		+
Cyanicula sericea		+
Cyathochaeta avenacea		+
Darwinia citriodora		+
Drosera macrantha		+
**Ehrharta calycina*		+
**Eragrostis curvula*		+
Gompholobium marginatum		+
Haemodorum laxum		+
Haemodorum sp.		+
Hakea undulata		+
Hibbertia hypericoides		+
Lechenaultia biloba		+
Lomandra hermaphrodita		+
Lomandra sonderi		+
Lomandra sp.		+
Morelotia octandra		+
Neurachne alopecuroidea		+
Nuytsia floribunda		+
Patersonia occidentalis		+
Phyllanthus calycinus		+
Synaphea gracillima		+
**Trifolium* sp.		+
**Ursinia anthemoides*		+
**Watsonia meriana*		+
Allocasuarina humilis		Associated

APPENDIX E – FLORISTIC ANALYSIS RESULTS (DENDROGRAMS)

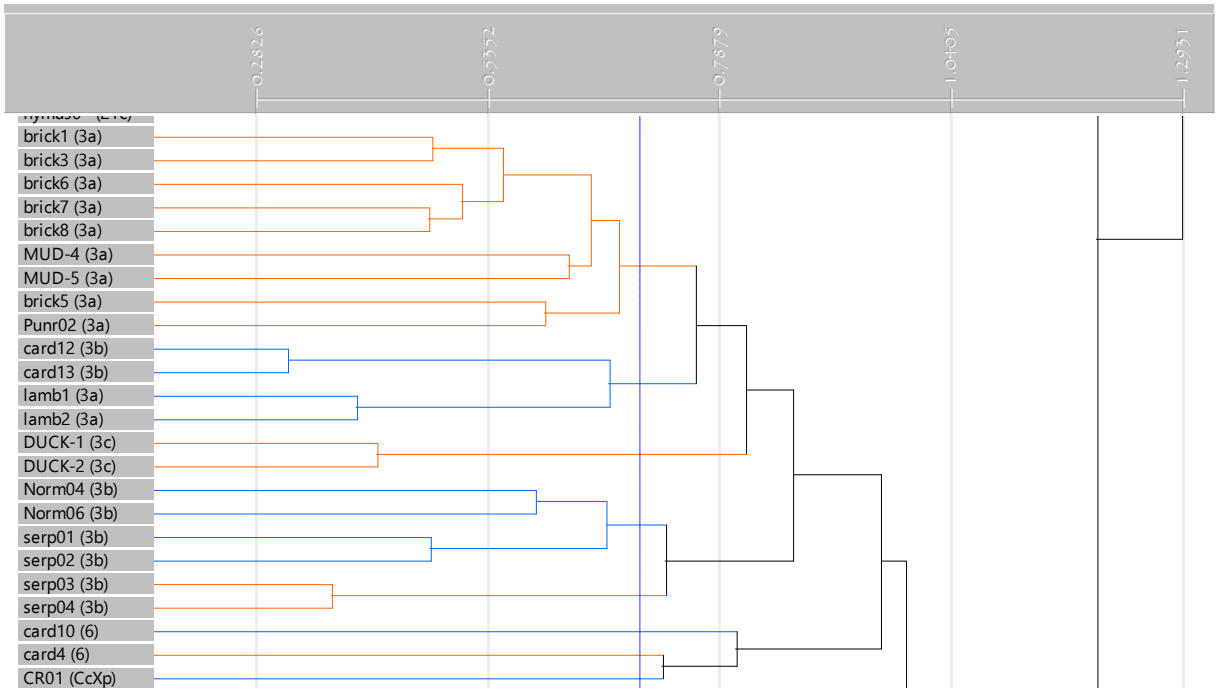
Dendrogram 1 – Batch Analysis Cable Route Quadrats



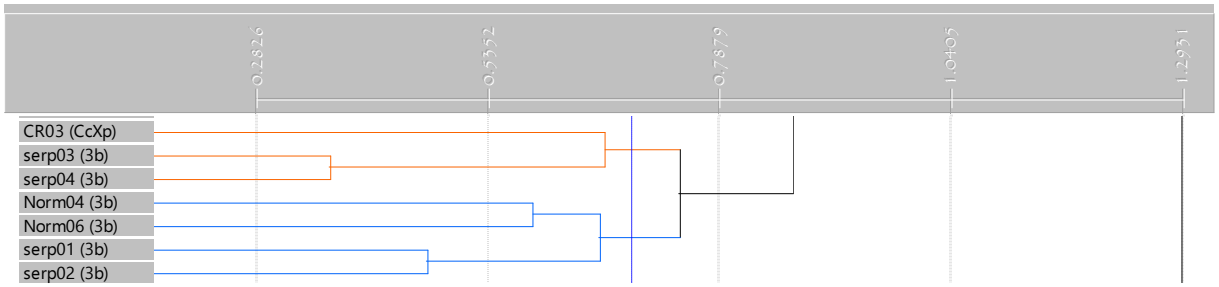
Dendrogram 2 – BsXp SSI CR04



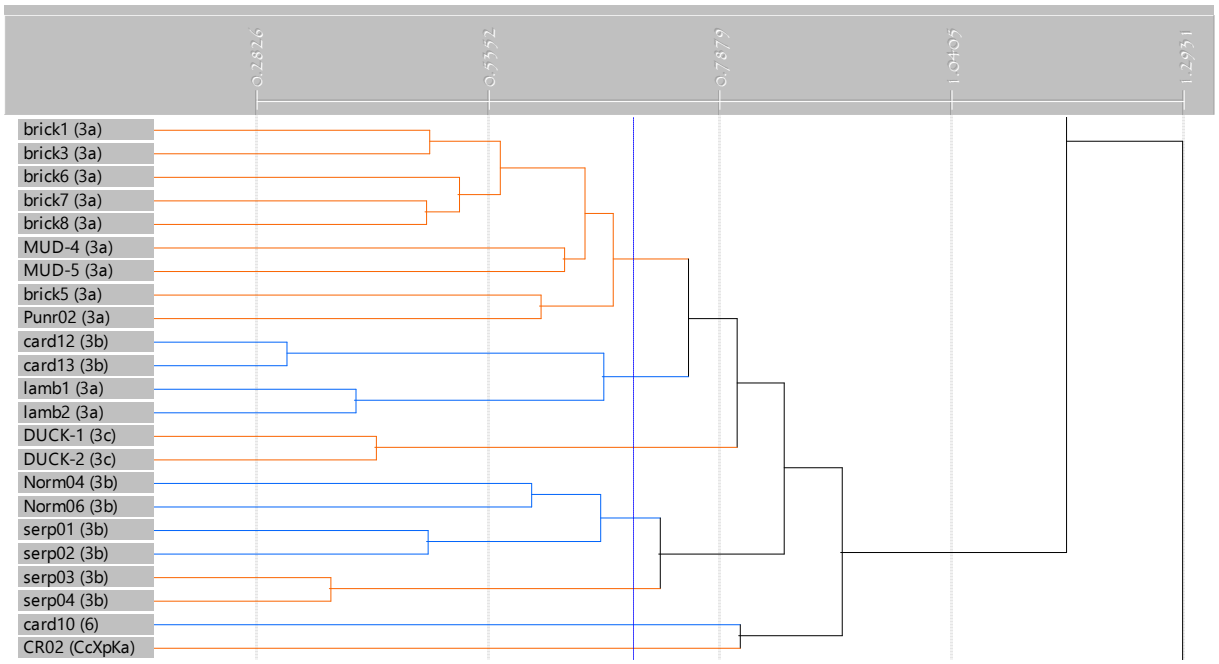
Dendrogram 3 – CcXp SSI CR01



Dendrogram 4 – CcXp SSI CR03



Dendrogram 5 – CcXpKa SSI CR02



Dendrogram 6 – EwTf SSI CR07