FLORA AND VEGETATION ASSESSMENT OF MANNING PARK RESERVE

CITY OF COCKBURN

MAY 2024

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Focused Vision Consulting Pty Ltd (FVC) was commissioned by the City of Cockburn (the City) to undertake a flora and vegetation assessment of Manning Park Reserve.

The scope of work required a detailed flora and vegetation survey and targeted survey for Threatened and Priority Flora and ecological communities within Manning Park Reserve (the study area). The assessments were completed as per the Environmental Protection Authority (EPA) Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a), and in accordance with an established method utilised by the City for annual reserve assessments, which includes using the Local Government Natural Area Initial Assessment (NAIA) forms to produce a NAIA report. Field assessment data collection focused on the key components of a floristic survey: flora inventory, vegetation/floristic community mapping, vegetation condition mapping, weed mapping, targeted Threatened Ecological Community (TEC) and Priority Ecological Community (PEC) assessment.

The flora and vegetation assessment (desktop assessment and field assessment) was completed during spring (October - November) 2023 by experienced personnel.

The key findings, conclusions and recommendations arising from the flora and vegetation assessment within the study area are as follows:

- The timing of the field assessment (October - November) was considered optimal for the identification of flowering flora or annual and ephemeral species.
- No Threatened flora were recorded within the study area.
- Two Priority flora, *Pimelea calcicola* (Priority 3), and *Dodanoaea hackettiana* (Priority 4) were recorded within vegetation units ArSgS Sand MhTrS.
- Two of the recorded weed species, Bridal Creeper (**Asparagous asparagoides*) and Common Lantana (**Lantana camara*) are listed as a Declared Pest (DP) plant under the *Biosecurity and Agricultural Management Act 2007* (BAM Act) (DPIRD 2017a) and as a Weeds of National Significance (WoNS) (CISS 2021); however, as it is listed under the "Exempt' category, landholders are under no obligation to control infestations.
- None of the recorded flora species are exhibiting an extension beyond their currently documented range and no flora species were undescribed.
- A total of six intact vegetation communities AcBsS, ArSgS, EdSgW, EgSgW, MhTrS, and MrGtW were recorded and mapped for the study area.
- The vegetation condition within the study area was found to range from 'Completely Degraded' to 'Excellent', with the majority (29.43%) in 'Good' condition.
- The desktop assessment identified three Threatened Ecological Communities (TECs) and/or Priority Ecological Communities (PECs) and or their buffers that occur within the study area, but did not report that Floristic Community Type (FCT) *SCP 24 Northern Spearwood shrublands and woodlands* (a PEC) occurs within the study area.
- One vegetation unit, EgSgW, was found to meet key diagnostic criteria, and therefore be representative of the Commonwealth-Listed ecological community, Tuart woodlands and forests TEC. Three patches of Tuart woodlands and forests were confirmed to be part of the nationally protected ecological community, as they meet minimum condition and biotic thresholds.
- One vegetation unit MhTrS was found to meet diagnostic criteria, and therefore be representative of the Commonwealth-listed ecological community, Honeymyrtle shrubland TEC. Six patches of Honeymyrtle shrubland were mapped and all of these were confirmed to be part of the nationally protected ecological community as they meet the minimum condition threshold.

- One vegetation unit, MhTrS was considered representative of SCP 26a, which is a State-listed TEC.
- Portions of one vegetation unit, EgSgW that are in 'Good' or better condition are considered representative of the State-listed Priority 3 PEC, SCP 24 – Northern Spearwood Shrublands.
- Vegetation representing one or more of the three TECs and two PECs was determined to occur across 53.94 ha (50.15%) of the study area, comprised of:
    - Tuart Woodlands and Forests TEC (Commonwealth-listed), covering 27.75 ha (25.78%) across vegetation unit EgSgW, and 'Parkland', 'Revegetation' and 'Other Uses' areas
    - Honeymyrtle Shrublands TEC (Commonwealth-listed), covering 23.25 ha (21.60%) across vegetation unit MhTrS
    - SCP 26a TEC (State-listed), covering 19.72 ha (18.32%) across 'Good' or better condition areas of vegetation unit MhTrS
    - Tuart Woodlands and Forest PEC (State-listed), covering 12.07 ha (11.21%) across areas eligible as the Tuart Woodlands and Forest TEC (Commonwealth-listed), associated with vegetation unit EgSgW where vegetation occurs as a native assemblage.
    - SCP 24 PEC (State-listed), covering 5.44 ha (5.05%) across 'Good' or better condition areas of vegetation unit EdSgW.
- All areas of vegetation supporting Priority flora, representative of TECs or PECs, and in 'Very Good' or better condition are considered areas of significant floristic value.

The following recommendations are suggested in relation to the development or enhancement of recreational facilities in Manning Park Reserve:

- Where possible, avoid any clearing of native vegetation
- Avoid clearing any 'Areas of Significant Floristic Value'
- Develop an environmental management plan to manage the impacts of recreational use of the park.

1 INTRODUCTION

1.1 BACKGROUND

Focused Vision Consulting Pty Ltd (FVC) was commissioned by the City of Cockburn (the City) to undertake a detailed flora and vegetation survey and targeted survey for Threatened and Priority Flora and ecological communities within Manning Park Reserve. These assessments will contribute to a full evaluation of the biodiversity and environmental values in Manning Park Reserve, in order to inform potential development plans for a mountain bike trail, as well as management practices to protect and enhance the biodiversity of the Reserve.

1.2 LOCATION

Manning Park Reserve (the study area) is situated within Hamilton Hill, approximately 16 km south-west of the Perth central business district (CBD) and 1 km from the coast. Nestled against Cockburn Road and Azelia Road, the study area is part of the larger Beeliar Regional Park that encompasses Manning Lake and the limestone ridge to the west of the wetland. The study area encompasses 107.63 hectares (ha) (**Figure 1**).

1.3 SCOPE OF WORK

The scope of work required for the flora and vegetation assessment was to undertake a desktop assessment and a detailed flora and vegetation field survey, plus a targeted field survey for Threatened and Priority Flora and ecological communities in the study area. The assessments were completed as per the Environmental Protection Authority (EPA) (2016a) Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* and in accordance with an established method utilised by the City for reserve assessments, which includes using the Local Government Natural Area Initial Assessment (NAIA) forms to produce a NAIA report. Field assessment data collection focused on the key components of a floristic survey: flora inventory, vegetation/floristic community mapping, vegetation condition mapping, weed mapping, and a targeted Threatened Ecological Community (TEC) and Priority Ecological Community (PEC) assessment.

Figure 1 - Study Area

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2 LEGISLATIVE CONTEXT

Flora and vegetation assessments are required to be 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

Under the Commonwealth EPBC Act, actions that have, or are likely to have, a significant impact on a Matter of National Environmental Significance (MNES) require approval from the Federal Minster for the Environment, as administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW 2022).

At a Commonwealth level, flora species at risk of extinction are recognised as Threatened (T) and are categorised according to the EPBC Act, as summarised in **Table 1**.

In Western Australia, the State BC Act provides a statutory basis for the listing of Threatened species. The Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a Priority (P) flora list, for species of conservation concern. The DBCA assigns conservation status to endemic plant species that are geographically restricted to few known populations or threatened by local processes. Although Priority listed flora are not awarded any statutory protection, allocating conservation status to these species assists in conserving populations and protecting species from potential threats (DBCA 2020a). Priority flora are given consideration in environmental impact assessments (EIAs) and in the assessment of clearing permit applications, in accordance with the ten clearing principles (DER 2019).

Threatened and Priority flora are an important focus of surveys conducted to inform the EIA process, and their definitions are presented in **Table 2**.

Any flora species listed under Commonwealth and State legislation as being of conservation significance, and any DBCA listed Priority flora species, is broadly considered to be a significant species. This incorporates species that are endangered, vulnerable and rare or covered by international conventions. A flora Species may also be considered significant within a study area based on being (EPA 2016a):

- a new or unusual species (or subspecies, variety or hybrid)
- locally endemic or associated with a restricted habitat type
- representative of the range of a species (particularly, at the extremes of range recently discovered range extensions, or isolated outliers of the main range)
- relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

Table 1 – Categories of Commonwealth (EPBC Act) Listed Threatened Flora Species

Conservation Code	Category
EX	**Extinct** Species where "there is no reasonable doubt that the last member of the species has died" (section 179(1) of the EPBC 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 179(2) of the EPBC Act).
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 the prescribed criteria" (section 179(3) of the EPBC Act).
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 the prescribed criteria" (section 179(4) of the EPBC Act).
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 the prescribed criteria" (section 179(5) of the EPBC Act).

Table 2 – Definitions of State (BC Act) Threatened Species and DBCA listed Priority Species

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.
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.

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 Commonwealth Environment Minister 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). The categories and the criteria for defining TECs have been described by English and Blyth (1997). 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 DCCEEW website, and in the Protected Matters Database (DCCEEW 2023a; b).

Department of Biodiversity, Conservation and Attractions listed Priority Ecological Communities (PECs) are ecological communities considered of potential conservation significance (and are potentially TECs). They do not currently meet survey criteria or are not adequately defined, are rare but not threatened, or have been recently removed from the TEC list or require regular monitoring (DEC 2013).

Commonwealth and State listed TECs and DBCA listed PECs are required to be taken into consideration during environmental impact assessments (EPA 2016b).

2.3 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 (DER 2015). A clearing permit may be applied for under Part V of the EP Act. 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 Guideli–e - Flora and Vegetation (EPA 2016b). 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).

2.4 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 (State 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.

2.5 VEGETATION OF SIGNIFICANCE OR POTENTIAL SIGNIFICANCE

Alongside and in addition to significance according to statutory and DBCA listings, vegetation may be considered significant at a National, State, regional or local level. Whilst not applicable to any legislation or statutory protection, the significance, or potential significance of vegetation is an important consideration in the environmental impact assessment process. The assessment of vegetation of significance (or potential significance) highlights vegetation units that should be considered further as part of project-specific impact assessment, impact avoidance and further survey, where appropriate.

2.5.1 Nationally Significant Vegetation

Vegetation communities may be of National significance where they support the following Commonwealth-listed MNES:

- populations of Threatened (EPBC listed) species
- TECs listed as nationally (EPBC) significant
- RAMSAR Wetlands of International Importance (DCCEEW 2023c).

2.5.2 State Significant Vegetation

Vegetation communities may be of State significance where they:

- support State-listed Threatened flora, fauna and TECs afforded protection under the BC Act
- 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 DBCA for inclusion in the State conservation estate (EPA 2008).

2.5.3 Regionally Significant Vegetation

Vegetation communities may 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 2004)
- support conservation category wetlands including associated vegetation (Government of Western Australia 1997, 2000b)
- maintain important ecological processes (EPA 2016b)
- contain flora species exhibiting range extensions or 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).

2.5.4 Locally Significant Vegetation

Vegetation communities may be locally significant where they:

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

2.6 INTRODUCED FLORA

A total of 1,1,348 introduced (weed) species have been recognised to occur within Western Australia by Florabase's 2023 Flora Statistics (Western Australian Herbarium (WAH) 1998-). 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) (CISS 2023). 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) (CISS 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 established pests where it is not feasible or desirable to manage them to limit their damage.

3 EXISTING ENVIRONMENT

3.1 CLIMATE

The study 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 the closest to the study area, operating since 1972. Average annual long-term rainfall recorded at the station is 813 mm. Annual mean maximum temperatures range from 18.1°C in winter to 31.6°C in summer (BoM 2024). In 2023, monthly rainfall from July to October was lower compared to the long-term average for those months (**Figure 2**).

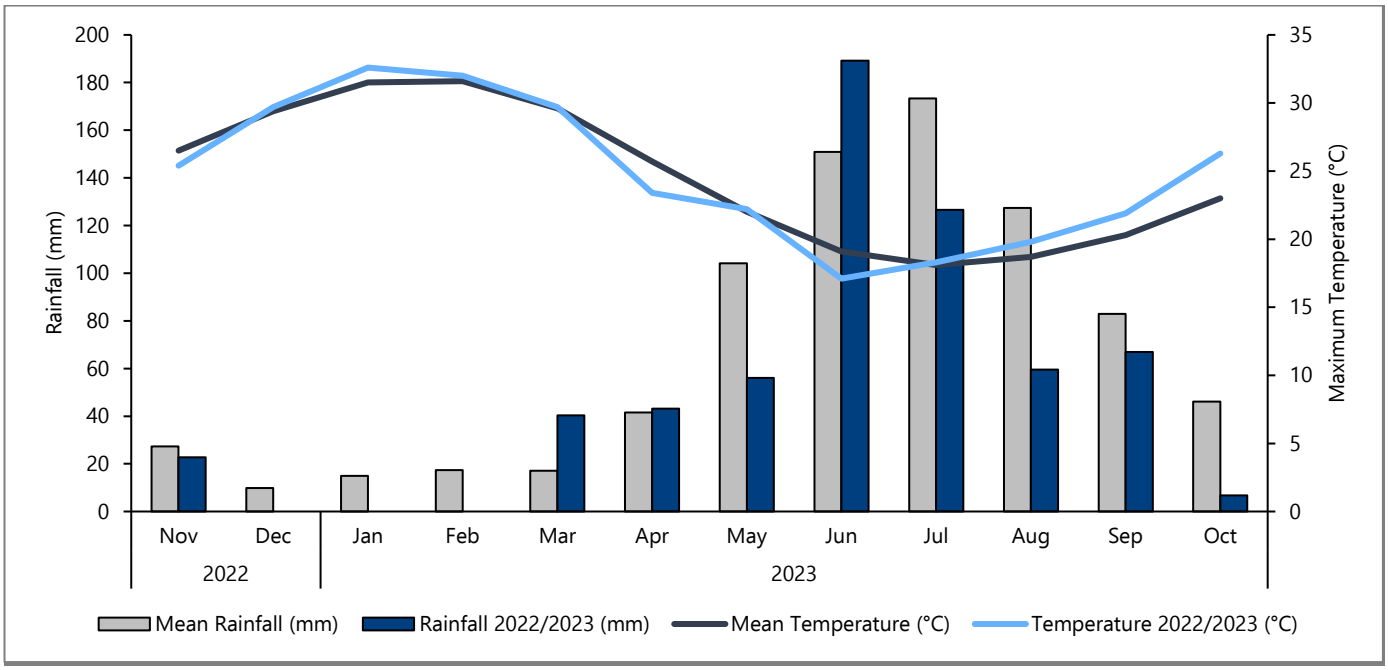

Figure 2 - Climate Data for Jandakot Aero (Site 009172) (BoM 2024)

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 (DCCEEW 2021). The study area lies within the Swan Coastal Plain (SWA) IBRA region and, at a finer scale, within the Perth subregion (SWA2) (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. The Perth subregion is composed of colluvial and aeolian sands, alluvial river flats, coastal limestone, as well as heath and/or Tuart woodlands on limestone, Banksia and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, Marri on colluvial and alluvials (Mitchell *et al.* 2002).

3.3 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 study area is situated on the Spearwood and Pinjarra Systems (Government of Western Australia 2000b).

The Spearwood System is categorised as sand dunes and plains with yellow deep sands, pale deep sands and yellow/brown shallow sands. The Pinjarra System is categorised as Swan Coastal Plain from Perth to Capel. Poorly drained coastal plain with variable alluvial and aeolian soils. Variable vegetation includes jarrah, marri, wandoo, paperbark, sheoaks and flooded gum (Government of Western Australia 2000b) (**Figure 3**).

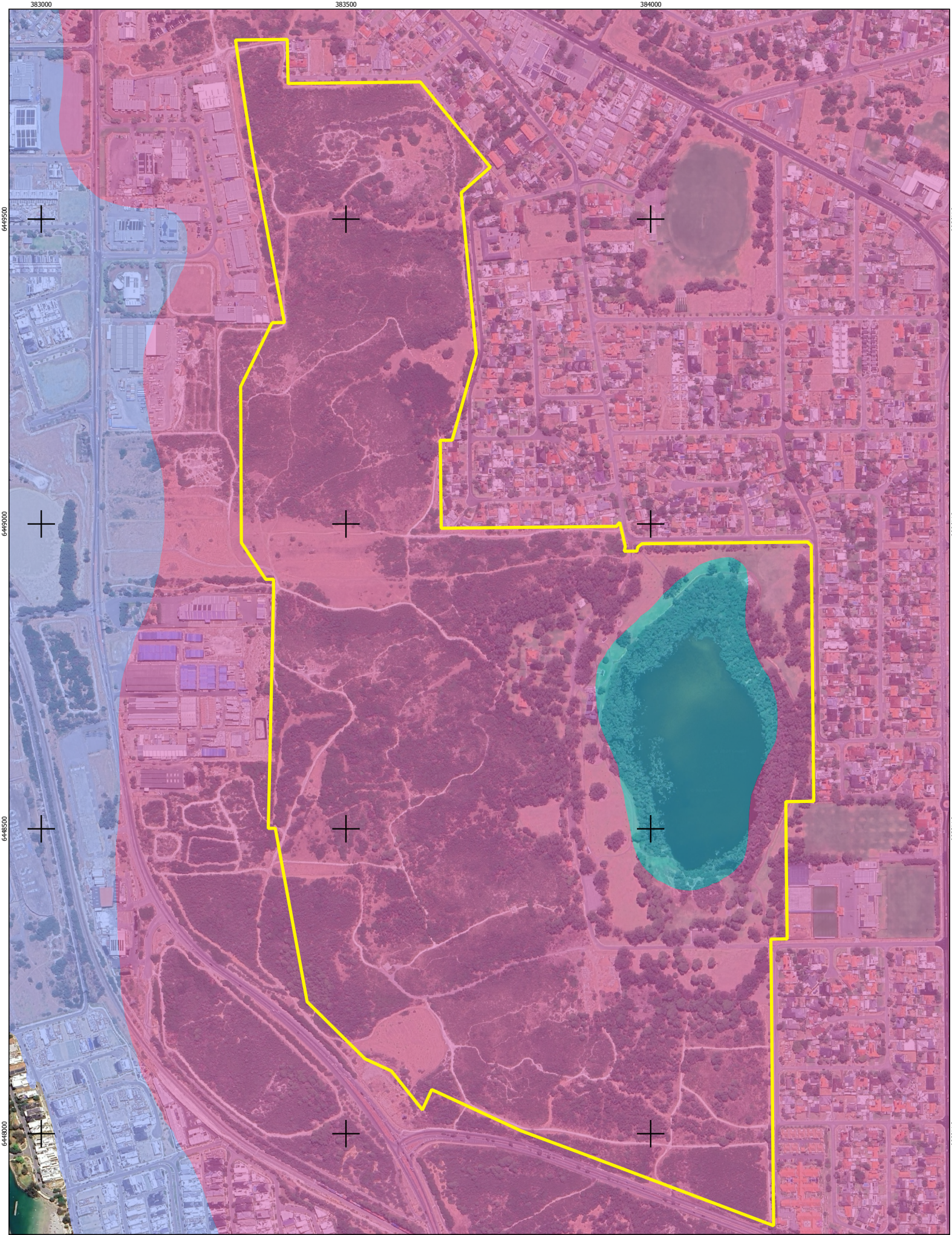

Figure 3 - Soils

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3.4 VEGETATION

The following key criteria are applied to vegetation clearing from a biodiversity perspective, which justifies the current retention targets as introduced in **Section 2.3** (EPA 2008):

- 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 retention of the vegetation type).
- A level of 10% of the original extent of a vegetation community is regarded as being a level representing Endangered status.
- Clearing which would increase the threat level to a vegetation community should be avoided.

The study area is considered to be a constrained area, as it is within an urban context; therefore, retention of remnant vegetation above a threshold of 10% of the pre-European extent applies.

3.4.1 Pre-European 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. This 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. One vegetation association, 998, occurs within the study area. This vegetation association only occurs on the Swan Coastal Plain. It is described as medium tuart woodland (Beard 1990). The remaining extents of Beard vegetation association 998 on the Swan Coastal Plain and in the City of Cockburn are presented in **Table 3** and spatially in **Figure 4**.

The remaining extent of Beard vegetation association 998 exceeds 10% of its pre-European extent in the State (Western Australia), IBRA Region (Swan Coastal Plain), IBRA Sub-Region (Perth), and Local Government Area (City of Cockburn) contexts (**Table 3**).

Table 3 - Pre-European Vegetation of the Study Area (DPIRD 2023)

Veg. Association No.	Veg. System Association	Broad Vegetation Description	Extent Context	Pre–European Extent (ha)	Current Extent (ha)	% Pre-European Extent Remaining	% Current Extent Protected (IUCN I –IV)
998	Spearwood	Medium woodland; tuart	Western Australia	51,015.33	18,492.63	36.25	13.26
			Swan Coastal Plain	50,867.50	18,492.32	36.35	13.30
			Perth IBRA Sub-Region	50,867.50	18,492.32	36.35	13.30
			City of Cockburn	4,464.34	845.02	18.92	6.50

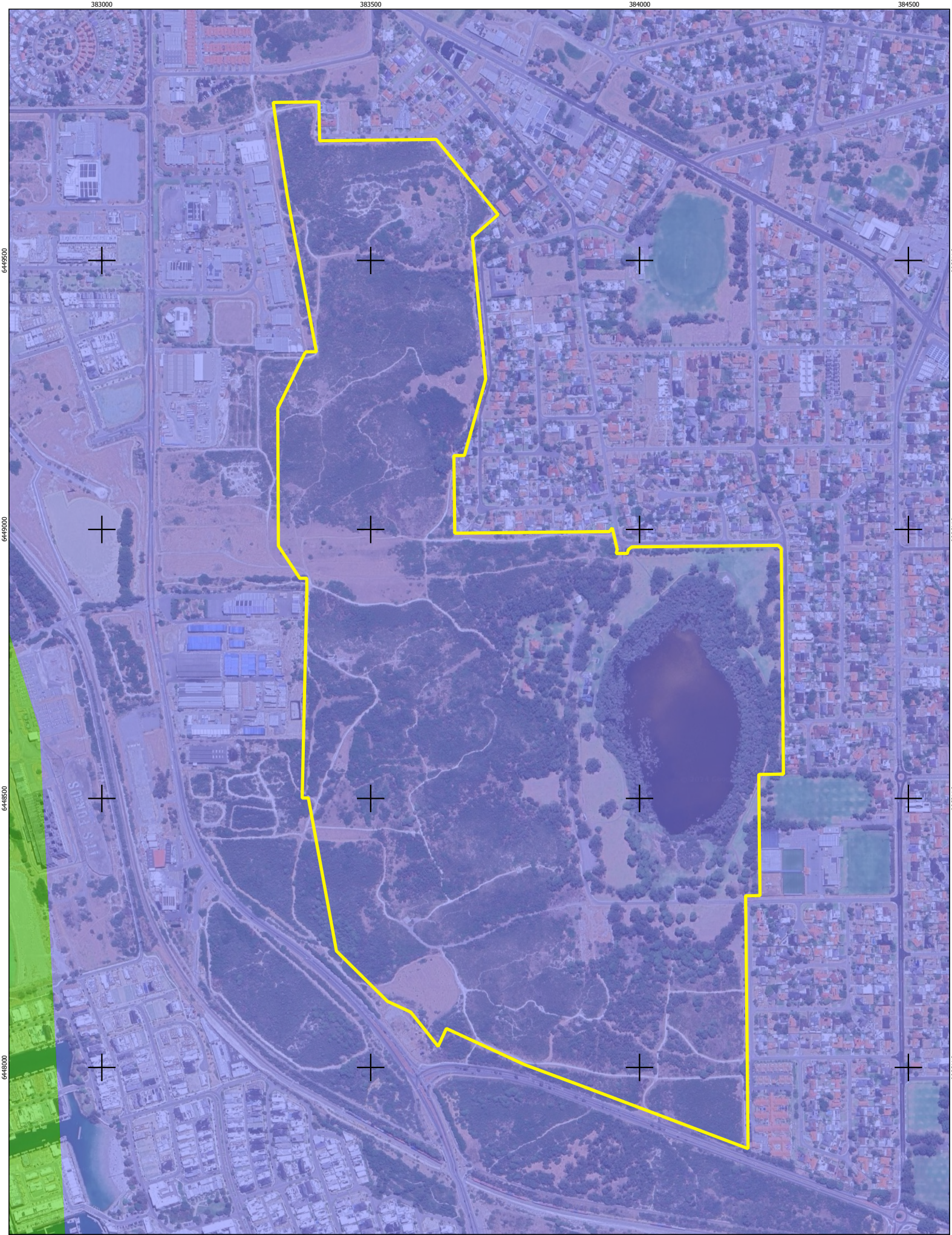

Figure 4 - Pre-European Vegetation

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3.4.2 Vegetation Complexes

Vegetation of the Swan Coastal Plain has also been characterised by Heddle *et al.* (1980) based on vegetation complexes in association with landforms and underlying geology. The study area is situated on vegetation complex, the *Cottesloe complex – central and south.* This complex is described as a mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest *of Eucalyptus gomphocepha–a - Eucalyptus marginata* (Jarra–) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops (Heddle *et al.* 1980; Government of Western Australia 2019). The remaining extent of this complex on the Swan Coastal Plain and in the City of Cockburn are presented in **Table 4** and spatially in **Figure 5**. The remaining extent of the *Cottesloe complex – central and south* is greater than 10% of its pre-European extent on the Swan Coastal Plain and within the City of Cockburn (**Table 4**).

Table 4 - Remaining Extent of the Vegetation Complex in the Study Area (DBCA 2018)

Location	Vegetation Complex	Pre–European Extent (ha)	Current Extent (ha)	% Remaining
Swan Coastal Plain	Cottesloe Complex – central and south	45,299.61	14,567.87	32.16
City of Cockburn	Cottesloe Complex – central and south	4,990.60	961.70	19.27

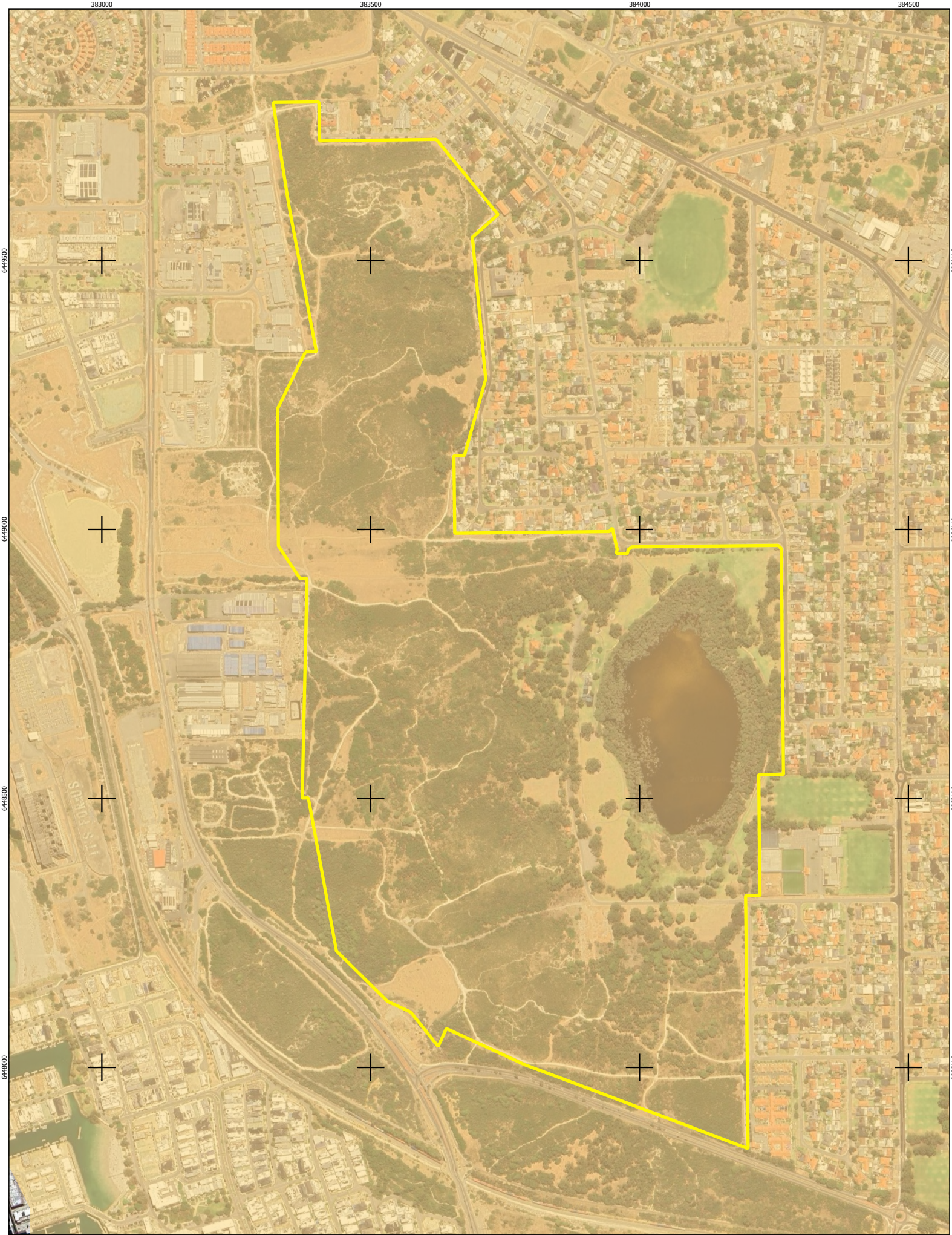

Figure 5 - Vegetation Complexes

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3.5 WETLANDS

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 defined by the DBCA (DBCA 2017b) 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%).

Interrogation of the Geomorphic Wetlands Swan Coastal Plain dataset identified three wetlands that occur within the study area, as summarised in **Table 5** and spatially presented in **Figure 6**.

Table 5 – Geomorphic Wetlands of the Swan Coastal Plain within the Study Area (DBCA 2019)

Unique Field Identifier	Wetland Name	Wetland Classification	Wetland Evaluation
6216	Manning Lake	Basin	Conservation
6217	Manning Lake	Basin	Multiple Use
6218	Manning Lake	Basin	Multiple Use

Ramsar wetlands are listed under the Ramsar Convention as wetlands considered to be of international importance. These internationally important (Ramsar) wetlands are those that are representative, rare or unique wetlands, or are important for conserving biological diversity (DCCEEW 2023c). No Ramsar wetlands are located within the study area (DBCA 2017a).

3.6 RESERVES, CONSERVATION AREAS AND ENVIRONMENTALLY SENSITIVE AREAS

Under the *State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region*, 51,200 ha of regionally significant bushland areas are protected in 287 Bush Forever Sites in Western Australia (State of Western Australia 2010). One Bush Forever site, site 287 (Manning Lake and Adjacent Bushland, Hamilton Hill/Spearwood), occurs within the study area and is also classified as an ESA (State of Western Australia 2005) (**Figure 6**).

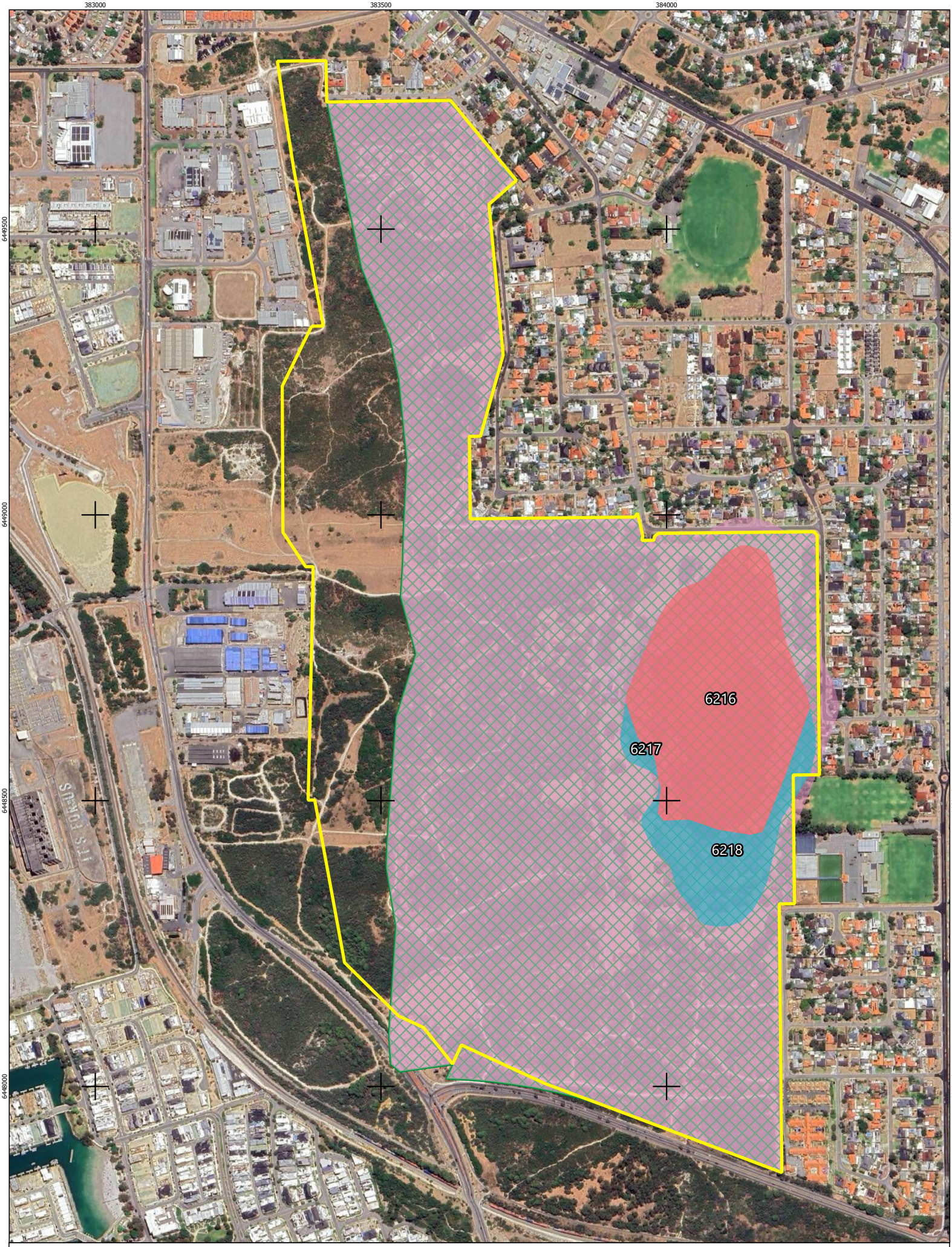

Figure 6 - Wetlands, Reserves and ESAs

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4 METHODOLOGY

4.1 DESKTOP ASSESSMENT

4.1.1 Literature Review

Previous survey reports within the study area were reviewed as part of the desktop assessment. These surveys are listed below, and their results have been summarised in **Section 4.1.1**:

- FVC (2021) *Biological Survey of Manning Park*
- Eco Logical Australia (ELA) (2018) *Vegetation Condition, Floristic Community Mapping and Weed Mapping in the City of Cockburn*.

4.1.2 Database Searches

A desktop assessment was undertaken for Threatened and Priority flora and Threatened and Priority Ecological Communities potentially occurring within the study area. The desktop assessment refers to NatureMap (**Appendix A**), DBCA Threatened and Priority flora (DBCA ref: 61-1023FL) and ecological communities databases (DBCA ref: 35-1023EC) and the Commonwealth Protected Matters Search Tool (PMST) for MNES (DCCEEW 2023b) (**Appendix B**). All database searches were performed for the study area, plus a 10 km buffer (desktop assessment area).

Prior to the field assessment, the occurrence of potential vegetation was assessed in reference to regional vegetation data, aerial imagery, and results from the Threatened and Priority Database (TPFL) and the Western Australian Herbarium (WAH) database provided by the Species and Communities Branch within DBCA.

The likelihood of occurrence of flora and vegetation of conservation significance was evaluated based on four criteria: the presence of suitable habitat within the study area, age of previous records, proximity of previous records to the study area, and the current condition of the study area (**Table 6**).

Based on this assessment, each species was given a likelihood of occurrence category of 'likely to occur', 'may occur' or 'unlikely to occur'. Where recent records and suitable habitat is provided for a species within or near the study area, these species were given a category of 'likely to occur'. Whilst species occurring a greater distance from the study 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 (proximity and habitat suitability). The likelihood of occurrence assessment was then repeated following the field assessment, based on the field observations made, focused on habitat provided and the condition of those habitats.

Table 6 – Likelihood of Occurrence Criteria

Criteria	Explanation
Suitable habitat	The likelihood of suitable habitat being present within the study area was based on known habitat information gathered from Florabase (WAH 1998-) and literature sourced from the Species Profile and Threats Database (SPRAT) (DCCEEW 2023a) (e.g., recovery plans, conservation advice).
Age of previous records	The age of previous records for significant species resulting from the desktop assessment was evaluated to determine how likely the species was to still occur in the study area (i.e., habitat of species recorded decades ago may no longer occur or a species may be locally extinct).
Proximity of previous records	The proximity of previous significant flora and vegetation results in relation to the study area contributed to the likelihood of occurrence results, with those previously recorded close by considered more likely to occur within the study area. It is noted that species identified from the PMST have not necessarily been recorded within proximity to the study area and may have resulted due to habitat possibly occurring within the area.
Current condition of study area	Highly modified and degraded environments usually represent a lower likelihood of the occurrence of significant flora, whilst intact remnants are known to harbour significant species and communities that may have otherwise been cleared or impacted throughout their range.

4.2 FIELD ASSESSMENT

A targeted and detailed flora and vegetation survey were undertaken by Botanist/Ecologists, Taryn Brebner, Megan Gray and Olga Nazarova, and Graduate Ecologists, Sarah Beckwith and Aishwarya Gujarathi, from 31 October to 2 November 2023.

The field assessment was recorded and reported in accordance with:

- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a)
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Methods for survey and identification of the Western Australian ecological communities* (DBCA 2023b)
- *Approved Conservation Advice for Honeymyrtle shrublands on limestone ridges of the Swan Coastal Plain Bioregion* (DCCEEW 2023d)
- *Approved Conservation Advice (incorporating listing advice) for the Tuart* Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community* (DEE 2019a).

Field data collection (via spatial mapping on the basis of aerial imagery, and collection of quadrat-based data and observations made during site traverses) focused on the key components of the study; flora inventory, vegetation/floristic community mapping, vegetation condition mapping, weed mapping, targeted TEC/PEC assessment. These are described in more detail in the following sections.

4.2.1 Vegetation and Floristic Community Mapping

Identification and mapping of vegetation and floristic communities in the study area was achieved via a combination of the collection of quadrat-based data for each floristic community present, spatial mapping of floristic community extents observed during site traverses walked by field personnel, and extrapolation of spatial mapping in reference to aerial imagery.

The likely extent and variation in floristic communities across the study area was reviewed during the desktop assessment, initially by consulting data from the ELA (2018) and the FVC (2021) studies, and also by examining current, high-resolution aerial imagery. Draft boundaries of differing floristic communities were mapped as part of the desktop assessment, that helped plan the locations of quadrats for the sampling of floristic communities.

The Technical Guidance (2016a) recommends at least three quadrats for each intact remnant floristic community. However, the methodology adopted by the City uses data from one quadrat per floristic community. Therefore, since the vegetation of the study area has been previously well-defined, one to two additional quadrats (to the six quadrats and one relevé that was sampled during the 2020 survey) were installed and sampled by FVC in 2023 for each floristic community present, in order to confirm the floristic composition of the vegetation of the study area.

Thirteen quadrats were installed and recorded where native vegetation was found to be in 'Good' or better condition, in accordance with the Technical Guidance (EPA 2016a), and five relevés were sampled where vegetation is in 'Degraded' or poorer condition (**Figure 7**). Relevés are a low intensity survey technique for gathering information for flora and vegetation reconnaissance surveys, or as part of detailed surveys, in areas of vegetation that are not in 'Good' or better condition. Developed areas (e.g. grassed/recreation) were not characterised by quadrats or relevés, and aquatic vegetation was not documented or mapped.

Sampled quadrats were demarcated with a peg (galvanised fence-dropper) at the north-west corner and geographic 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) study. Where a relevé was sampled, an area equivalent to a quadrat (100 m^2) was assessed; however, relevés were not bounded by measuring tapes while sampled.

The following information was recorded from each sampled quadrat or relevé:

- GPS location (GDA 94) of north-west corner (quadrat)
- observer
- date
- location/site/reserve
- representative photograph (from north-west corner)
- soil type and colour
- topography
- degradation/disturbances (e.g. weed invasion, fire)
- vegetation condition, assessed against the currently accepted scale; an adaptation of the Keighery (1994) condition scale
- flora inventory, including average height and projected foliage cover of the dominant species of each stratum.

Observations and opportunistic data collection were also carried out continuously while traversing between quadrats, within and throughout the reserve, to enable spatial mapping of each floristic community. Field navigation was achieved using the GPS of each electronic device (tablet) carried by each of the field personnel. Track logs recorded by field personnel are presented in **Figure 8**.

In addition, particular focus was also paid where known or suspected TECs or PECs occur, with the appropriate sections of the NAIA forms (Part B) that address TECs populated for these locations.

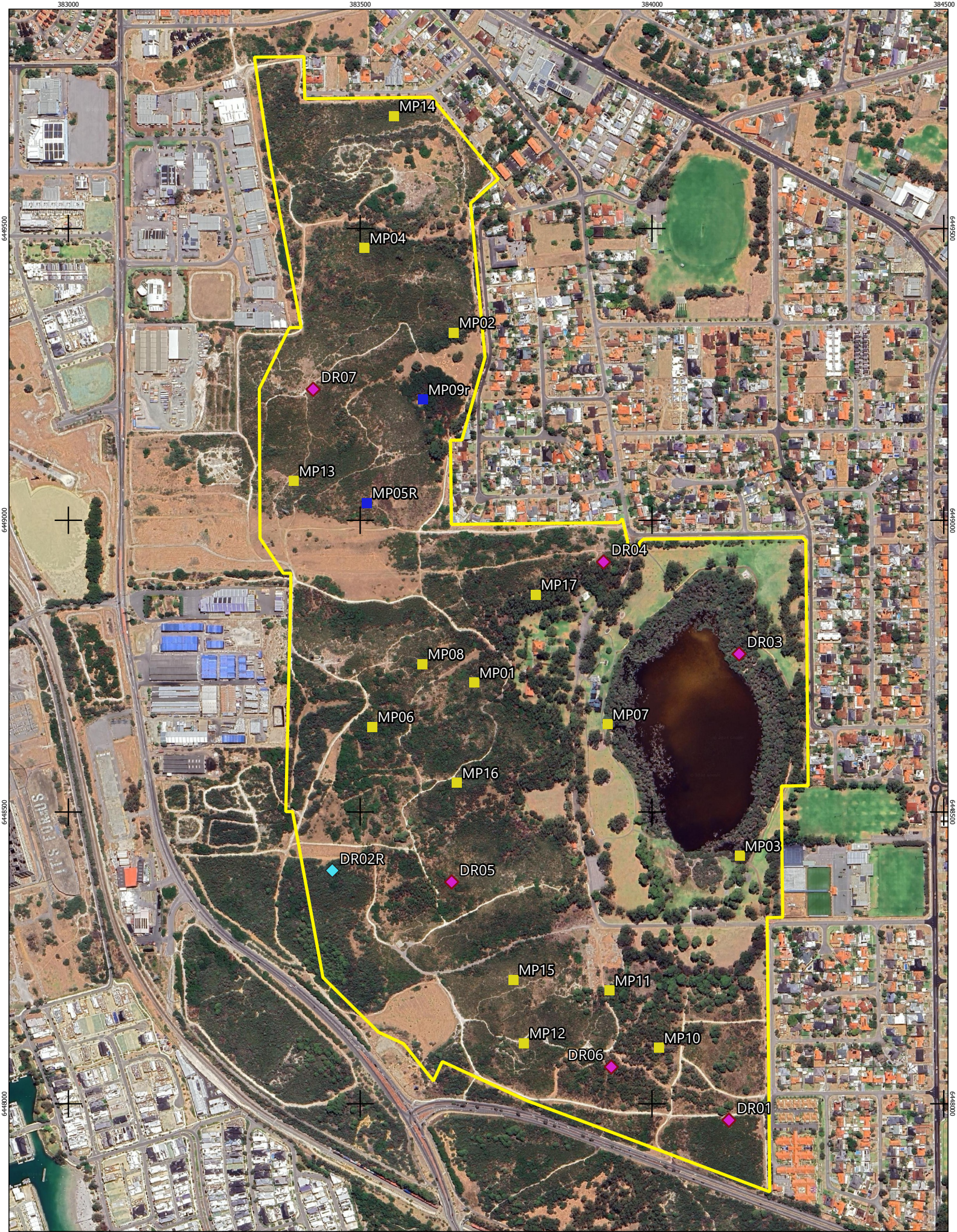

Figure 7 - Quadrat and Relevé Locations

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Figure 8 - Survey Effort

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4.2.2 Vegetation Condition Mapping

Vegetation condition mapping was carried out within the study area in accordance with the currently accepted scale of EPA's Technical Guidance (2016a), which is an adaptation of the Keighery (1994) scale.

Field personnel traversed the study area at a suitable intensity, typically a grid of traverses spaced approximately 40 m apart, along which individual vegetation condition observations were made. Whilst traversing the study area, vegetation condition ratings were scored in accordance with the Keighery (1994) scale and entered spatially (mapped) into tablets using Mappt™ software. Condition rating applied were based on the ratio of weeds to natives, the types (aggressiveness) of the weeds present, intactness of vegetation structure, degree and type of disturbances and other relevant observations.

4.2.3 Weed Mapping

In order to map weeds within the study area, field personnel traversed the study area along transects of 40 m and collected individual weed observations at suitable intervals. Weed were recorded based on densities and species, as per density categories and species lists provided by the City (**Tables 7** and **8**). Weed occurrences were mapped as point and/or polygons. Following data processing, recorded weed data was able to be mapped for each density category, and also categorising weed species in categories of 'Woody', 'Bulbous', 'Grass', 'Aquatic' and 'Other' (**Table 8**). Weed species which were not listed to be mapped were recorded as present when observed, to ensure a detailed flora inventory is provided (**Appendix C**).

Table 7 – Weed Density Categories

Weed Density Categories (%)	Value
< 5%,	1
6 –30%,	2
31- 60%,	3
>61%	4

Table 8 – Weed Species Type and Mapping Method

Weed Type	Scientific Name	Common Name		Mapping Method
P = Point Mapping D = Density Mapping				
Grass Weeds	*Ammophila arenaria*	Marram Grass		P and D
	Cenchrus sp.	Buffel Grass, Burr Grass		P and D
	Cortaderia selloana	Pampas Grass		P
	Hyparrhenia hirta	Tambookie Grass		P
	Ehrharta villosa	Pyp Grass		D
	Eragrostis curvula	African Lovegrass		D
	Ehrharta calycina	Perennial Veldt Grass		D
	Pennisetum setaceum	Fountain Grass		P and D
	Thinopyrum distichum	Sea Wheat		D
	Cenchrus clandestinus	Kikuyu	Rhizomatous grass	D – map as a single entity
	Cynodon dactylon	Couch		
	Stenotraphum secundatum	Buffalo		
Woody Weeds	*Acacia longifolia*	Sydney Golden Wattle		P
	Ficus carica	Edible Fig		P
	Gaudium laevigatum	Victorian Tea Tree		P
	Melaleuca nesophila	Mindiyed		P

Weed Type	Scientific Name	Common Name	Mapping Method
P = Point Mapping D = Density Mapping			
	Melia azedarach	Cape Lilac	P
	Olea europea	Olive	P
	Schinus terebinthifolia	Japanese Pepper	P
	Solanum linnaeanum	Apple of Sodom	P
Bulbous Weeds	*Asphodelus fistulosus*	Onion Weed	P and D
	Chasmanthe floribunda	African Cornflag	P and D
	Ferraria crispa	Black Flag	P and D
	Freesia hybrid	Freesia	P and D
	Gladiolus caryophyllaceus	Gladiolus	P and D
	Lachenalia reflexa, Lachenalia sp.	Yellow Soldiers, Soldiers	P and D
	Moraea flaccida	One-Leaf Cape Tulip	P and D
	Trachyandra divaricata	Dune Onion Weed	P and D
	Watson26tilized26eraera	Watsonia	P and D
	Zantedeschia aethiopica	Arum Lily	P and D
Other Weeds	*Anredera cordifolia*	Potato Creeper, Madeira Vine	P
	Asparagus asparagoides	Bridal Creeper	P and D
	Cakile maritima	Sea Rocket	D
	Carpobrotus edulis	Pigface	D
	Chrysanthemoides monilifera	Boneseed	P and D
	Cirsium vulgare	Spearthistle	P and D
	Echium plantagineum	Paterson's Curse	D
	Emex australis	Doublegee	P
	Euphorbia paralias	Sea Spurge	D
	Euphorbia terracina	Geraldton Carnation	D
	Foeniculum vulgare	Fennel	P
	Fumaria bastardii/capreolata/muralis	Fumitory	D – map as a single entity
	Gomphocarpus fruticosus	Narrow Leaf Cotton Bush	P
	Lupinus cosentinii	Sandplain Lupin	P and D
	Lycium ferocissimum	African Boxthorn	P and D
	Juncus acutus	Spiny Rush	P and D
	Pelargonium capitatum	Rose Pelargonium	D
	Opuntia stricta	Prickly Pear	P
	Persicaria maculosa	Redshank	D
	Raphanus raphanistrum	Wild Raddish	D
	Retama raetam	White Broom	P
	Ricinus communis	Castor Oil	P
	Rubus discolor	Blackberry	P
	Tetragonia decumbens	Sea Spinach	D
	Tribulus terrestris	Caltrop	D
	Typha orientalis #	Bulrush	D
	Vicia sativa	Vetch	P and D
Aquatic Weeds	*Bacopa monnieri*	Bacopa	P and D
	Eichhornia crassipes	Water hyacinth	P
	Hydrocotyle bonariensis	Large Leaf Pennywort	P
	Limnobium laevigatum	Amazon Frogbit	P and D

4.2.4 Threatened and Priority Ecological Communities

Where known or suspected areas of TECs or PECs were considered likely to occur, particularly the Tuart Woodlands and Forests of the Swan Coastal Plain TEC (Tuart woodlands and forests TEC) and the Honeymyrtle shrubland on Limestone ridges of the Swan Coastal Plain TEC (Honeymyrtle shrubland TEC), adequate data was collected in order to diagnose the community based on appropriate Conservation Advice (DEE 2019a; DCCEEW 2023d).

4.2.5 Threatened and Priority Flora

The study area was traversed on foot to search for Threatened and Priority flora potentially supported by the study area. If any conservation-significant flora were observed, location were recorded using a GPS-enabled device. Habitat preferences for Threatened and Priority flora species were determined during the desktop assessment, to enable targeted searching in the field.

4.2.6 Flora Inventory

The flora and vegetation data collected from the combination of quadrats relevés, traverses and continuous opportunistic observations contributed to the flora inventory for the survey, including weeds (**Appendix C**).

4.3 DATA PROCESSING/ANALYSIS AND REPORTING

Although field botanists/ecologists are able to identify most flora whilst in the field, to ensure accuracy of identifications, some specimens required collection for later identification. Flora specimens collected and dried were done so in accordance with WA Herbarium protocols (DBCA 2020b, 2021).

Identifications were undertaken by FVC botanists, Olga Nazarova and Taryn Brebner, with independent botanist, Margaret Collins, confirming the collected specimen of the Priority species, *Pimelea calcicole* (P3). Flora taxonomy and nomenclature followed current protocols of the WAH (1998-). The combined Gibson *et al.* (1994) and Keighery *et al.* (2012) datasets used for floristic analysis were updated with current species nomenclature, and are current at the time of this report.

Field data from quadrats were recorded electronically, entered directly into tablet devices. Boundaries of floristic communities, as well as other important observations, were recorded spatially in the field using the Mappt™ program. Since field data collection included the use of electronic equipment and customised data collection forms, field data was uploaded and filed following the return from the field assessments.

All quadrat data was analysed with singletons and annuals included, for comparison with Gibson *et al.* (1994) and Keighery *et al.* (2012) data (as per previous advice from Val English, DBCA). Data analysis was in accordance with the *Methods for survey and identification of the Western Australian threatened ecological communities* (DBCA 2023b) to determine floristic community types on the southern Swan Coastal Plain. This methodology analysed data utilising PATN™ software (Belbin and Collins 2006), via multivariate cluster analysis of species presence/absence, in order to group sites of floristically similar composition within the study area. Flexible unweighted pair group mean average (UPGMA) fusion was used to generate the site classification (beta = -0.1) and to group the quadrats data into clusters based on species similarities. Following this, floristic analysis of quadrats in comparison to reference datasets by Gibson *et al.* (1994) and Keighery *et al.* (2012) were carried out, in order to assign relevant Floristic Community Types (FCTs). 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 and relevés within the study area.

Dissimilarities between recorded quadrat data and that of the quadrat data from the Gibson *et al.* (1994) and Keighery *et al.* (2012) dataset were analysed to produce an association matrix. In such matrices, results range from 0 to 1, where 0 would indicate that the quadrats are identical (have zero dissimilarity) (Belbin and Collins 2006) 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 high (Maguire *et al.* 2016) and tends to indicate little similarity.

An inferred FCT was assigned to each quadrat based on the results of clustering in the dendrogram and position in the association matrix (dissimilarity value). Conclusions from the dendrogram were based on 'nearest neighbour' in the resulting clusters. Where appropriate, they were also further critically analysed by determining similarities to the Gibson *et al.* (1994) and Keighery *et al.* (2012) 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.

Floristic communities were named in accordance with the City's requested format: acronyms for 'Genus name' + 'species name' + 'vegetation structure code', which also follows the protocols of the National Vegetation Information System (NVIS) Structural Vegetation Classifications, (NVIS Technical Working Group 2017) (**Appendix D**).

Using QGIS, a map of the floristic communities and vegetation condition was confirmed based on the field mapping and field results from previous assessments, refined as appropriate, in reference to aerial imagery, and presented in the report.

The weed mapping data collected from systematic field traverses was used to prepare points and polygon mapping of the weed densities for each weed type across the study area, in accordance with the colours specified for each density category as per the City's established methodology. Maps were produced for each of the weed types (woody, bulbous, grass aquatic and other), plus the total combined weed cover across the study area. The total weed occurrence and density shapefiles and maps for the study area were created in QGIS by creating a union/intersect between each of the species' spatial records.

Data collected from locations of known or suspected TECs were also analysed against the diagnostic criteria as listed in the appropriate Conservation Advice (DEE 2019a; DCCEEW 2023d) which further supports any conclusions made regarding the presence and extent of these TECs.

The Assessment A section of the NAIA forms was completed for delivery with the report, with the Assessment B section also completed where Threatened flora or TECs are represented. The 'Recommendations for Management' section, focused on actions relevant to vegetation condition and weeds, was also completed.

Field botanists/ecologists prepared the draft report following the completion of field surveys, data processing and mapping. Experienced ecologists from the FVC team have undertaken technical reviews of the completed draft report, before submission to the City. The report format and layout is based on a combination of previous Vegetation Condition and Weed Mapping reports prepared for the City and standard flora and vegetation assessment reports prepared in accordance with the Technical Guidance (EPA 2016a).

4.4 LIMITATIONS

The current biological survey was assessed against limitations imposed by many variables as outlined in the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) (**Table 9**).

Table 9 – Potential Survey Limitations and Constraints

Aspect	Constraint?	Commentary
Availability of regional data, previously available information	No	The ELA (2018) and FVC (2021) reports provided previous spatial data, literature, and other information specifically relevant to Manning Park Reserve. Results of the DBCA database search for Threatened and Priority flora within the desktop assessment area returned few records, which is likely due to the highly developed nature of the local region, and interrogation of NatureMap and the PMST assisted in the development of a list of Threatened and Priority flora potentially occurring within the study area.
Scope (detail)	No	The detailed flora and vegetation assessment was carried out in accordance with the EPA (2016a). Thirteen quadrats were sampled within areas of vegetation considered to be in 'Good' condition or better and five relevés in 'Degraded' (more disturbed) vegetation. This data supplemented previous information collected by ELA (2018) and FVC (2021) and such a level of survey detail was adequate for the assessment of floristic values as per the scope.
Competency/ Experience of personnel	No	All personnel undertaking the relevant study and reporting aspects are experienced ecologists/botanists, with specialist skills in their respective fields. All personnel who led the field flora and vegetation survey have a NAIA skill level of 5b or 6b, with assisting (Graduate) personnel's skills levels being 4b (see **Appendix H**).
Survey effort/detail/ intensity	No	Similarly, as per the 'Scope (detail)' aspect above, the detailed flora and vegetation assessment was adequate to determine floristic values of the study area, which is set amongst a largely developed, built-up environment. Thirteen quadrats were established in vegetation considered to be in 'Good' or better condition, and five relevé were recorded in areas of 'Degraded' remnant vegetation. The level of degradation in some sections (and therefore poorer vegetation condition) of the study area determined that sampling of quadrats was not required.
Seasonal timing and climatic conditions	No	The flora and vegetation field assessment was conducted during spring, which is the optimal season for flora and vegetation surveys on the Swan Coastal Plain, as per the Technical Guidance (EPA 2016a).
Access	No	Most of the study area was easily accessible on foot, other than small areas of dense foliage. Extrapolation of biological values therein were able to be made.
Mapping reliability	No	The mapping was prepared at a scale based on ground-truthed areas, with limited extrapolation given the good accessibility to most of the study area and the high-intensity of survey effort on the ground, required for the weed mapping task. Therefore, mapping reliability is considered high.
Disturbances	No	A large proportion of the study area has been subject to a moderate to high degree of disturbance and is bounded by commercial and urban areas. This degradation did not impede the definition of biological values present within the areas of better-quality vegetation present.
Survey completeness	No	Previous biological assessments have been conducted within the study area, with ELA (2018) and FVC (2021) the focus of the literature review and their results providing a basis for the results reported herein. Data and other information for the region is also readily available. Most areas, except dense shrubbery, were easily accessible, with existing tracks able to 29tilizedsed, enabling the survey to be completed in thorough detail.

5 RESULTS

5.1 DESKTOP REVIEW

5.1.1 Literature Review

A summary of findings of the literature review of the two previous surveys undertaken as part of the desktop assessment to identify flora and vegetation values previously recorded in the study area, is provided in **Table 10**.

Table 10 – Summary of Results of Previous Surveys Within Study Area

Reference	Survey Methodology	Key Results
Biological Survey of Manning Park (FVC 2021)	Detailed Flora and Vegetation Assessment, November 2020 Six quadrats, 1 relevé	• 77 flora taxa, 62 genera, 31 families • 23 weed species • No Threatened flora • Two Priority flora species *Pimelea calcicola* (P3), and *Dodonaea hackettiana* (P4) • One DP and WoNS species, Bridal creeper (**Asparagus asparagoides*) • No range extensions or undescribed flora • Six vegetation units • Vegetation condition ranged from 'Completely Degraded' to 'Very Good' • Commonwealth-listed TEC Tuart woodlands and forests present within the site represented by three patches • One floristic community (EfOF) representative of PEC SCP 24 • One floristic community (MhTrAtOH) representative of TEC SCP 26a
Vegetation Condition, Floristic Community Mapping and Weed Mapping in the City of Cockburn (ELA 2018)	Detailed Flora and Vegetation Assessment, October 2017 Six quadrats	• 49 weed species • Six floristic communities • Vegetation Condition ranged from 'Completely Degraded' to 'Very Good' • No significant taxa or communities were recorded • One DP and WoNS species, Bridal creeper (**Asparagus asparagoides*)

5.1.2 Threatened and Priority Flora

The desktop assessment identified thirty-eight Threatened and Priority flora species that have the potential to occur within the study area (**Table 11**). Of these, 14 are Commonwealth-listed and/or State-listed Threatened flora, with two Priority 1, one Priority 2, twelve Priority 3, and nine Priority 4 species. Of these, it was determined that two species, *Dodonaea hackettiana* and *Pimelea calcicola,* are known to occur in the study area as they have been recorded previously in 2020 (FVC 2021) (**Figure 9**). For the remaining species, it was determined three are likely to occur, 11 may occur and 22 are considered unlikely to occur.

Table 11 –Threatened and Priority Flora with the Potential to occur within the Study Area

Species	EPBC Cons. Status	WA Cons. Status	Description	Preferred Habitat	Likelihood of Occurrence in the Study Area	Source
Grevillea thelemanniana	Critically Endangered	Critically Endangered	Spreading, lignotuberous shrub growing between 0.3 to 1.5 m high. Produces red to pink flowers from May to November.	Sand, sandy clay soils. Winter-wet low-lying flats.	May occur – Closest occurrence recorded 7.2 km north of the study area, however, the geology of preferred habitat differs from the study area. Suitable habitat may to occur within the study area.	NatureMap, DBCA, PMST
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	Critically Endangered	Critically Endangered	Dense, clumped shrub growing from 0.3 to 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.	Unlikely to occur – one record occurs 13 km north-east of the study area, where the pre-European vegetation differs from the study area. Suitable habitat is unlikely to occur within the study area.	PMST
Caladenia huegelii	Endangered	Critically Endangered	Tuberous, perennial herb growing from 0.25 to 0.6 m high with a single pale green, hairy leaf. Produces 1 to 2 (rarely 3) distinctive flowers with red and green to cream parts from September to October.	Grey, white, or brown sand, clay loam soils. Margins of swamps, low depressions, and flats. Mixed jarrah and Banksia woodlands.	Unlikely to occur – Closest occurrence recorded 6 km south-east of the study area, on a different geology than that of the study area. Suitable habitat is unlikely to occur within the study area.	PMST
Drakaea elastica	Endangered	Critically Endangered	Tuberous, perennial herb growing from 0.1 to 0.3 m high with a single bright green, glossy, prostrate heart to shaped leaf. Produces distinctive flower with red and green to yellow parts from October to November.	Bare patches of white or grey sandy soils. Low-lying situations adjoining winter-wet swamps.	Unlikely to occur – Closest occurrence recorded 14 km south-east of the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA, PMST
Diuris purdiei	Endangered	Endangered	Tuberous, perennial orchid growing from 0.15 to 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.	Unlikely to occur – Closest occurrence recorded 15 km east of the study area. Suitable habitat is unlikely to occur within the study area.	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 – one record occurs 13 km north-east of the study area, the pre-European vegetation differs from the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA, PMST
Macarthuria keigheryi	Endangered	Endangered	Small, erect shrub growing to 0.4 m high with bright yellow to green stems. Leaves mainly at the base of stems and on young growth. Produces flowers with white and	Open patches of white or grey sandy soil. Winter wet depressions, jarrah, and banksia woodlands.	Unlikely to occur – Closest occurrence recorded 16 km north-east of the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA

Species	EPBC Cons. Status	WA Cons. Status	Description	Preferred Habitat	Likelihood of Occurrence in the Study Area	Source
			green parts from September to December and February to March.			
Banksia mimica	Endangered	Vulnerable	Prostrate, lignotuberous shrub growing from 0.15 to 0.4 m high with leaves growing to 0.4 m long. Produces yellow to brown flowers from December to February.	White or grey sand, sandy loam soils over laterite. Slopes and flats.	Unlikely to occur – Closest occurrence recorded 22.5 km east of the study area. Laterite geology is not known to occur within the survey area and therefore suitable habitat is unlikely to occur within the survey area.	DBCA
Diuris drummondii	Vulnerable	Endangered	Tuberous, perennial tall orchid growing from 0.5 to 1 m high. Produces 3 to 8 pale yellow flowers from November to January.	Brown sandy clay, moist peat soils. Low lying depressions, swamps.	Unlikely to occur – Closest occurrence recorded 7.2 km south-east of the study area, on a different geology than that of the study area. Suitable is unlikely to occur within the study area.	NatureMap, DBCA
Drakaea micrantha	Vulnerable	Endangered	Tuberous, perennial herb growing from 0.15 to 0.3 m high with a single silvery to grey, prostrate heart to 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.	Unlikely to occur – Closest occurrence recorded 14 km south-east of the study area. Suitable habitat is unlikely to occur within the study area.	PMST
Conospermum undulatum	Vulnerable	Vulnerable	Erect, compact shrub growing from 1.5 to 2 m high with distinctive fibrous, longitudinally fissured stems and hairless, wavy leaves to 0.12 m long. Produces white flowers held above the leaves from May to October.	Grey or yellow-orange clayey sand soils. Flats and slopes often over laterite and occasionally in slightly swampy areas.	Unlikely to occur – Closest occurrence recorded 20 km east of the study area. Suitable habitat is unlikely to occur within the study area.	PMST
Diuris micrantha	Vulnerable	Vulnerable	Tuberous, perennial orchid growing from 0.3 to 0.6 m high with a basal tuft of narrow, linear leaves. Produces up to 7 yellow flowers with red to 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 – Closest occurrence recorded 17 km south-east of the study area. Suitable habitat is unlikely to occur within the study area.	PMST
Eleocharis keigheryi	Vulnerable	Vulnerable	Tufted, clumping grass like sedge growing from 0.2 to 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 – Closest occurrence recorded 20 km south-east of the study area. Suitable habitat is unlikely to occur within the study area.	PMST

Species	EPBC Cons. Status	WA Cons. Status	Description	Preferred Habitat	Likelihood of Occurrence in the Study Area	Source
Thelymitra variegata	-	Critically Endangered	Tuberous, perennial herb growing from 0.1 to 0.35 m high. Produces conspicuous purple-red flowers with dark purple blotches and yellow parts from June to September.	Sandy clay or sandy soils. Associated with laterite.	Unlikely to occur – one record occurs more than 20 km north-east of the study area, the pre-European vegetation differs from the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Acacia lasiocarpa var. *bracteolata* long peduncle variant (G.J. Keighery 5026)	-	Priority 1	Spinescent shrub growing between 0.4 to 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 occ–r - The closest occurrence recorded 4.7 km east of the study area on different geology than that of the study area. Suitable habitat may occur within the study area in association with Manning Lake.	DBCA
Hydrocotyle striata	-	Priority 1	Annual herb growing from 0.1 to 0.3 m high. Produces cream flowers from December (likely longer period).	Sandy peaty soil. Winter wet drainage lines and depressions.	May occur – Closest occurrence recorded 9.7 km north-east of the study area and is the most southern record of the species. Suitable habitat may occur in association with Manning Lake.	NatureMap, DBCA
Bossiaea modesta	-	Priority 2	Slender, trailing, and twining shrub. Produces flowers with yellow and red parts from October to December.	Clayey loam, loamy soils. Riparian areas.	Unlikely to occur – Closest occurrence recorded 20 km south of the study area. The species has not been recorded on the Swan Coastal Plain and therefore, suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Angianthus micropodioides	-	Priority 3	Erect or decumbent annual herb growing from 0.05 to 0.15 m high. Produces yellow to white flowers from November to February.	Sandy, clay, loam soils. River edges, saline depressions and claypans.	Unlikely to occur – One occurrence recorded 6.5 km north-east of the study area found on a different geology than the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Austrostipa mundula	-	Priority 3	Erect, fine perennial grass growing to 0.6 m high with mostly basal leaves. Produces brown flowers in a linear or elliptic panicle 5 to 12 cm long from September to November.	Grey sandy soil with limestone. Dune slopes, coastal cliffs, plains.	May occur – Two occurrence recorded, one 6 km north and 9 km south of the study area on a similar soil system as that of the study area. Suitable limestone and sandy soil habitat may occur within the survey area.	NatureMap, DBCA
Beyeria cinerea subsp. *cinerea*	-	Priority 3	Low spreading shrubs to 0.3 m, narrow lime green leaves with pale underside and tuberculate fruits.	Limestone ridges, slopes and hilltops, sand over limestone.	May occur – Closest occurrence recorded 20 km south of the study area. The study area is within the species known	NatureMap, DBCA

Species	EPBC Cons. Status	WA Cons. Status	Description	Preferred Habitat	Likelihood of Occurrence in the Study Area	Source
					distribution and suitable limestone slopes may occur within the study area.	
Cyathochaeta teretifolia	-	Priority 3	Rhizomatous, clumped, perennial sedge growing to 2 m high and 1.0 m wide. Produces brown-straw flowers from September to January.	Grey sand, sandy clay soil. Lowlands, swamps, creek edges and drainage lines.	Unlikely to occur – Closest occurrence recorded 10 km south-east of the study area, on a different geology than that of the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Dampiera triloba	-	Priority 3	Erect perennial, herb or shrub growing to 0.5 m high. Produces blue flowers from August to December.	Dark brown/black peaty, dry grey loamy soils. Wetlands, swamps, slopes, and flats.	Unlikely to occur – Closest occurrence recorded 6 km south-east of the study area, on a different geology than that of the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Hibbertia leptotheca	-	Priority 3	Small shrub growing from 0.3 to 0.5 m high. Produces yellow flowers from August to October.	Coastal and near coastal sites on sand with limestone. Limestone ridges (Tamala limestone), outcrops, slopes, and dunes.	Likely occur – Closest occurrence recorded 4 km north-west of the study area on the same soil system present within the study area. The study area is a near coastal site and occurs on the Tamala Limestone geology unit. Suitable limestone habitat is likely to occur.	NatureMap, DBCA
Jacksonia gracillima	-	Priority 3	Prostrate, spreading or scrambling spindly shrub growing from 0.5 to 1 m high and 1 m wide. Produces flowers with yellow, red, and orange parts from October and November.	Sand and loam soils. Wetlands, winter wet flats, slopes, and flats.	Unlikely to occur – Closest occurrence recorded 6 km east of the study area, however, the geology and soil system differs from the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Phlebocarya pilosissima subsp. *pilosissima*	-	Priority 3	Compactly tufted, rhizomatous perennial grass-like shrub growing from 0.15-0.4 m high. Produces cream-white flowers from August to October.	White or grey sandy soil, sometimes with lateritic gravel. Slopes.	May occur – Closest occurrence recorded 7.5 km east of the study area on geology that differs from the study area. Suitable habitat may occur within the study area.	DBCA
Pimelea calcicola	-	Priority 3	Erect to spreading shrub growing from 0.2 to 1 m high. Produces white flowers with some pink from September to November.	Brown sandy loam, white-grey sandy soil associated with limestone. Coastal limestone ridges.	Known to occur – One DBCA record within the study area. FCV also recorded six individuals within the study area (FVC 2020).	NatureMap, DBCA, (FVC 2020)
Stylidium maritimum	-	Priority 3	Caespitose perennial, herb 0.3 to 0.7 m with white/purple flowers between September to November.	Sand over limestone on dune slopes and flats. Coastal heath	May occur – Closest occurrence recorded 4.5 km north of the study area, general preferred habitat is present in study area,	NatureMap, DBCA

Species	EPBC Cons. Status	WA Cons. Status	Description	Preferred Habitat	Likelihood of Occurrence in the Study Area	Source
				and shrubland, open Banksia woodland.	however, the geology differs from the study area.	
Stylidium paludicola	-	Priority 3	Reed-like perennial herb growing from 0.35 to 1 m high. Produces pink flowers from October to December.	Peaty sand over clay soils. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.	Unlikely to occur – four occurrences recorded within 10 km of the study area, the closest being 7 km north-east of the study area. All four occurrences were recorded on geology that differs from the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Styphelia filifolia	-	Priority 3	Shrub to 0.3 m high with green asymmetric fruit. Produces white flowers in February and April.	Sandplain and mid-slopes with yellow or grey sand. Banksia woodland.	Unlikely to occur – although one record occurs 7 km east of the study area, the pre-European vegetation differs from the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Calothamnus graniticus subsp. *leptophyllus*	-	Priority 4	Erect, multi-stemmed shrub growing to 2 m high. Produces red flowers from June to November.	Grey/brown sand, loam, clay, lateritic soils. Granite outcrops, hillsides, slopes, and flats.	Unlikely to occur – Closest occurrence recorded 8 km north of the study area, however, the geology differs from the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA
Dodonaea hackettiana	-	Priority 4	Erect shrub or tree growing from 1 to 5 m high. Produces yellow flowers with green and red parts mainly between July to October.	Sandy soils, associated with limestone outcropping. Limestone ridges, slopes, and dunes.	Known to occur – Closest other documented occurrence 2 km east of the study area on a similar soil system and vegetation as that of the study area. Known to be locally abundant.	NatureMap, DBCA, (FVC 2020)
Eucalyptus foecunda subsp. *foecunda*	-	Priority 4	Erect mallee form shrub growing to 4 m high with rough, flaky blackish bark.	Brown sandy soil. Limestone	Likely to occur – Closest occurrence recorded 2.5 km north-west of the study area, suitable geology occurs within the study area. Suitable habitat is likely to occur within the study area.	NatureMap, DBCA
Grevillea olivacea	-	Priority 4	Erect, non to lignotuberous shrub, 1 to 4.5 m high. Flowers red/red to pink, June to September.	White or grey sand. Coastal dunes, limestone rocks.	May occur – Closest occurrence recorded 4 km south-west of the study area, however, suitable geology likely occurs within the study area, this species records are mainly from revegetation planting.	NatureMap
Hydrocotyle lemnoides	-	Priority 4	Aquatic, floating annual herb. Produces purple flowers from August to October.	Permanent water in swamps.	May occur – Closest occurrence recorded 8.6 km north-east of the study area.	NatureMap, DBCA

Species	EPBC Cons. Status	WA Cons. Status	Description	Preferred Habitat	Likelihood of Occurrence in the Study Area	Source
					Suitable permanent water is likely to occur within the study area.	
Jacksonia sericea	-	Priority 4	Low spreading shrub growing to 0.6 m high. Produces flowers with yellow and red and orange parts usually from December to February.	Grey to white, yellow or brown sandy loam soils, often associated with limestone. Limestone ridges, slopes, and flats.	Likely to occur – Closest occurrence recorded 4.3 km north-east of the study area on a similar soil system and vegetation as that of the study area. Locally common.	PMST
Microtis quadrata	-	Priority 4	Erect herb growing to 0.4 m high. Produces cream-white flowers from October to December.	Sand, clay, loam soils. Winter wet flats, near wetlands, drainage lines, slopes.	May occur – Closest occurrence recorded 6 km south-east of the study area, however, the geology differs from the study area. Suitable habitat may occur in association with Manning Lake.	NatureMap, DBCA
Stylidium longitubum	-	Priority 4	Erect annual (ephemeral) herb growing from 0.05 to 0.12 m high. Produces pink flowers with white markings from October to December.	Sandy clay, clay soils. Seasonal wetlands.	May occur – Closest occurrence recorded 6.5 km south-east of the study area, however, the geology differs from the study area. Suitable habitat may occur in association with Manning Lake.	PMST
	-	Priority 4	Slender, erect, multi-stemmed perennial herb to 0.6 m high. Produces orange-yellow flowers from October to February.	Grey-white sand, peaty sand over clay soils. Winter wet flats, shallow depressions, dry flats, and slopes.	Unlikely to occur – one record occurs more than 13 km east of the study area, and the pre-European vegetation differs from that of the study area. Suitable habitat is unlikely to occur within the study area.	NatureMap, DBCA

Figure 9 - DBCA Threatened and Priority Flora

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5.1.3 Threatened and Priority Ecological Communities

A review of DBCA's TEC and PEC database and the PMST report (DCCEEW 2023b) found that ten Threatened and/or Priority Ecological Communities or their buffers occur within the desktop assessment area (**Table 12**). Of these, three TECs and/or PECs and their buffers intersect, or are known to occur within the study area (**Figure 10**), these being; Tuart Woodlands and Forest, SCP 26a and SCP 24. Previous surveys (FVC 2021) identified these three TECs and PECs to occur within the study area.

Since the previous surveys were conducted, the '*Honeymyrtle shrubland on limestone ridges of the SCP*' TEC was listed as a Critically Endangered TEC under the EBPC Act in November 2023 (DCCEEW 2023e; d). The SCP 26a community corresponds to the '*Honeymyrtle shrubland on limestone ridges of the SCP*' (DCCEEW 2023d; State of Western Australia 2023). Based on known geology and previously defined vegetation units, at the time of the desktop assessment this TEC was also considered likely to occur within the study area.

Table 12 – Threatened and Priority Ecological Communities Potentially Occurring within the Desktop Assessment Area

Abbreviated Identifier	Community Name	EPBC Cons. Status	WA Cons. Status
Tuart Woodlands and Forests	Tuart (*Eucalyptus gomphocephala*) Woodlands and Forest of the Swan Coastal Plain Ecological Community	Critically Endangered	Priority 3
Honeymyrtle shrubland on limestone ridges of the SCP	Honey myrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion (corresponds to SCP26a).	Critically Endangered	-
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Priority 3
SCP22	*Banksia ilicifolia* woodlands	Endangered	Priority 3
^*Empodisma* peatlands of southwestern Australia	*Empodisma* peatlands of southwestern Australia	Endangered	-
Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Priority 3
SCP26a	*Melaleuca huegelii – M. systena* shrublands of limestone ridges (floristic community type 26 a as originally described in (Gibson *et al.* 1994)) (corresponds to Honeymyrtle shrubland on limestone ridges of the SCP)	-	Critically Endangered
SCP30a	*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in (Gibson *et al.* 1994)	-	Critically Endangered
Wooded waterbird wetlands	Wooded wetlands which support colonial waterbird nesting areas	-	Priority 2
SCP24	Northern Spearwood shrublands and woodlands	-	Priority 3

^Denotes ecological community/ies identified by PMST only, therefore not depicted in **Figure 10**

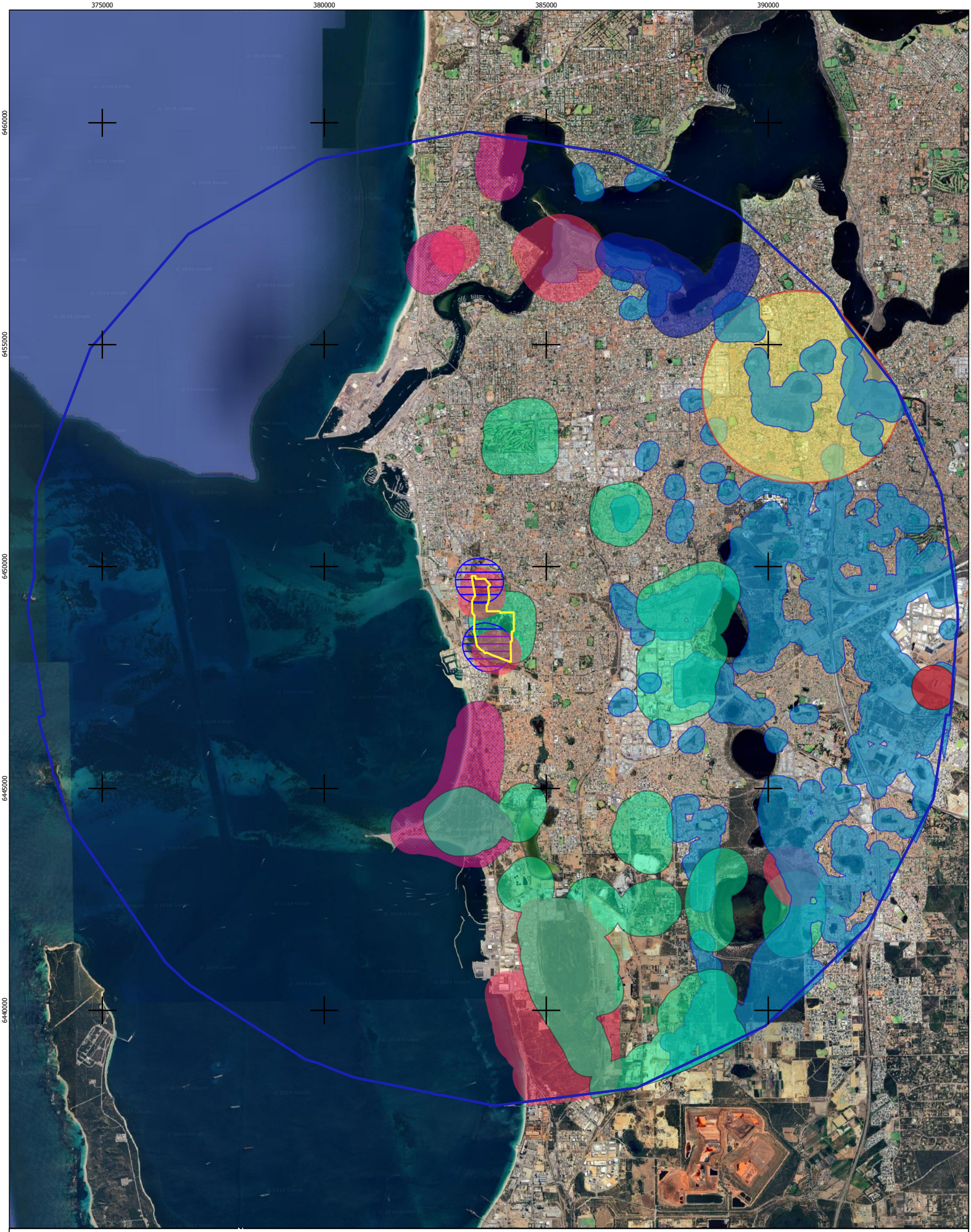

Figure 10a - DBCA Threatened and Priority Ecological Communities

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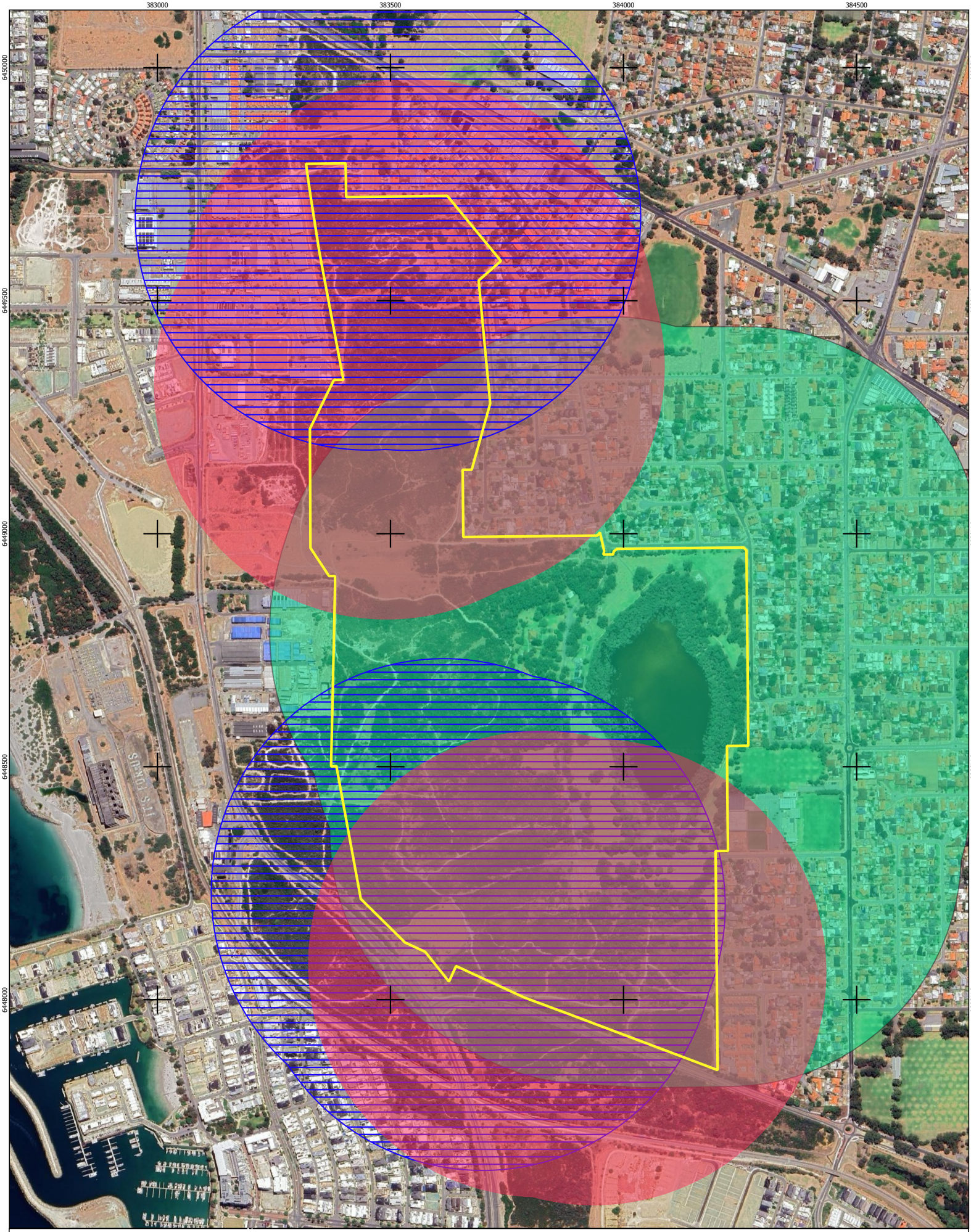

Figure 10b - DBCA Threatened and Priority Ecological Communities

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5.2 FIELD ASSESSMENT

5.2.1 Flora

A total of 156 flora species, from 118 genera and 56 families were recorded during the field survey. The dominant families were found to be Poaceae (Grass family – 21 taxa), Fabaceae (Pea family – 18 taxa) and Myrtaceae (12 taxa). The total includes 80 (51.28%) native species and 76 (48.72%) introduced (weed) species. The full list of vascular flora within each vegetation unit recorded is presented in **Appendix E** and individual quadrat data is presented in **Appendix F**.

No species listed as Threatened under the EPBC Act or BC Act were recorded during the survey. A total of 61 individuals of the Priority 3 species, *Pimelea calcicola*, were recorded within the study area during the 2020 (16 individuals) and 2023 (45 individuals) field assessments (**Figure 11**). This species was recorded within floristic communities MhTrS, ArSgS and AcBsS.

One individual of the Priority 4 species, *Dodonaea hackettiana*, was opportunistically recorded in 2020 in the north of the study area (**Figure 11**), within floristic community MhTrS. *Dodonaea hackettiana* has been historically incorporated into the City's revegetation programs; however, in this location, it is possible it could be occurring naturally.

One of the 37 recorded introduced (weed) species, **Asparagus asparagoides* is listed as a Weed of National Significance (WoNS) and is also listed as a Declared Pest (s22(2)) plant under the BAM Act, and was recorded within the study area supporting vegetation units: AcBsS, ArSgS , EdSgW , EgSgW and MhTrS (CISS 2021; DPIRD 2022) (**Figure 13**).

None of the recorded, naturally occurring flora are exhibiting an extension beyond their currently documented range, in accordance with records of the Western Australian Herbarium (WAH 1998-), and no undescribed flora were recorded.

The results of the assessment of targeted weed species mapping in relation to locations and densities is discussed in more detail in **Section 4.2.2**.

Figure 11 - Recorded Priority Flora Locations

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5.2.2 Weed Mapping

Of the 61 flora recorded within the study area, 36 are weeds, recorded across the five weed categories. The total weed coverage across the study area is presented in **Figure 12**. Two species listed as both WoNS and DP plants under the BAM Act were recorded, **Asparagus asparagoides* and **Lantana camara* (**Figure 13**).

Spatial presentation of each weed category are as follows:

- Bulbous Weed Density and Locations (**Figure 14**)
- Grass Weeds Density and Locations (**Figure 15** series)
- Aquatic Weeds Density and Locations (**Figure 16**)
- Woody Weed Density and Locations (**Figure 17** series)
- Other Weeds Density and Locations (**Figure 18** series).

The most commonly recorded species were 'Other' and 'Woody' weeds, with **Euphorbia terracina, *Pelargonium capitatum, *Asparagus asparagoides, *Gaudium laevigatum* (syn. **Leptospermum laevigatum*) and **Schinus terebinthifolia* recorded throughout the survey area.

Weed species encountered that were not on the target list, were still recorded to ensure a detailed flora inventory, a total of 39 weed species were recorded in addition to those recorded for weed mapping.

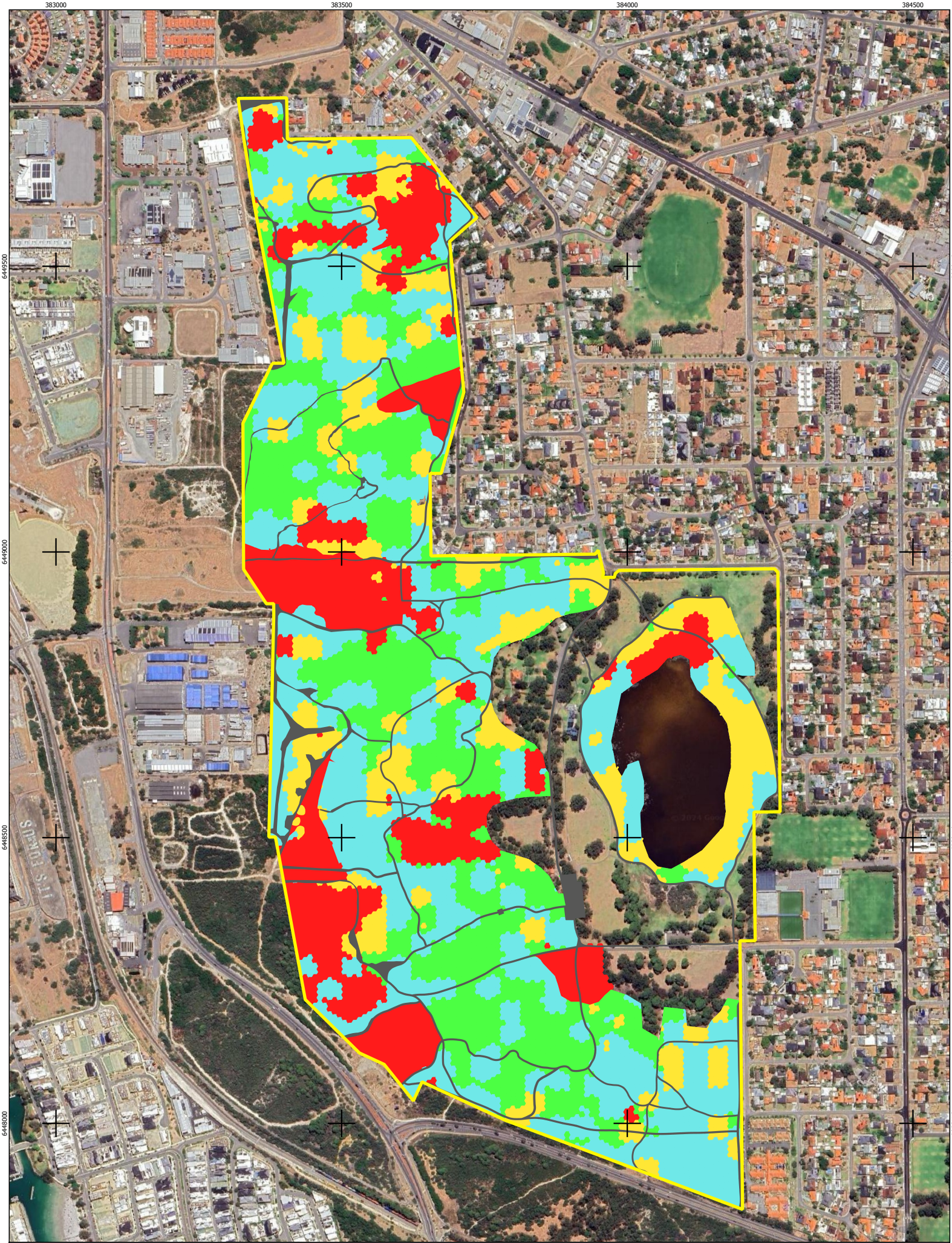

Figure 12 - Combined Weed Coverage

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Figure 13 - Declared Pest Plants and Weeds of National Significance

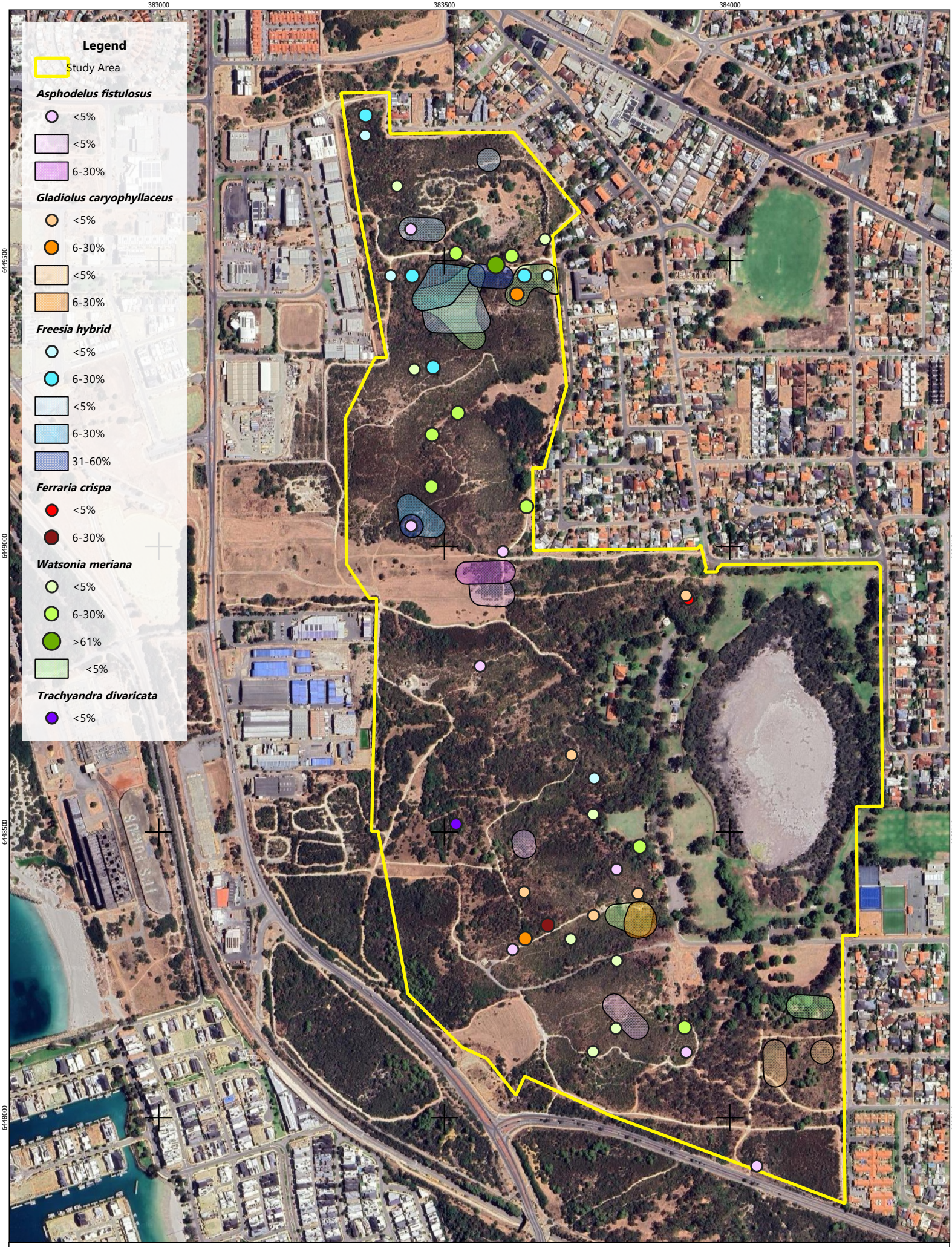

Figure 14 - Bulbous Weed Density and Locations

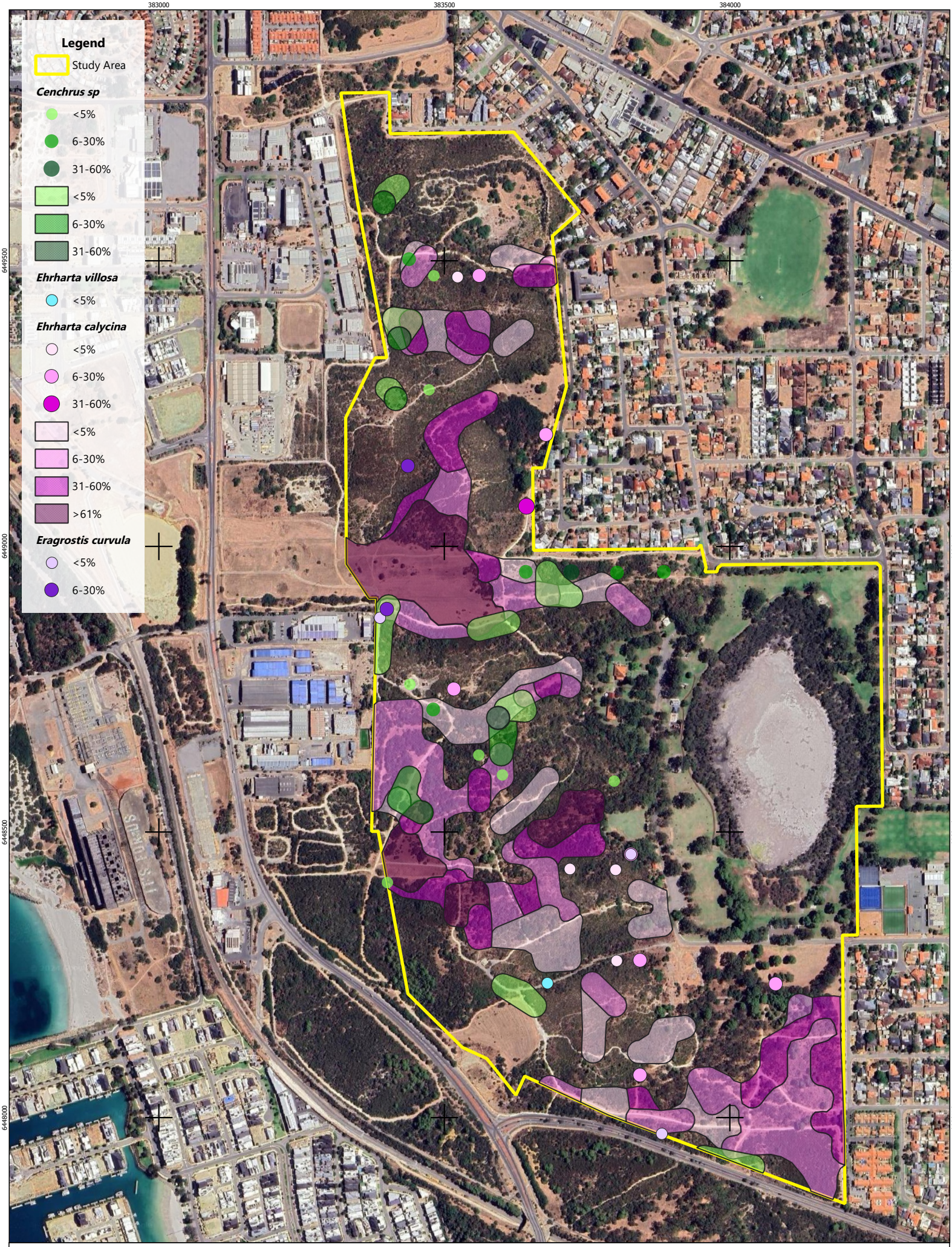

Figure 15a - Grass Weeds Density and Locations

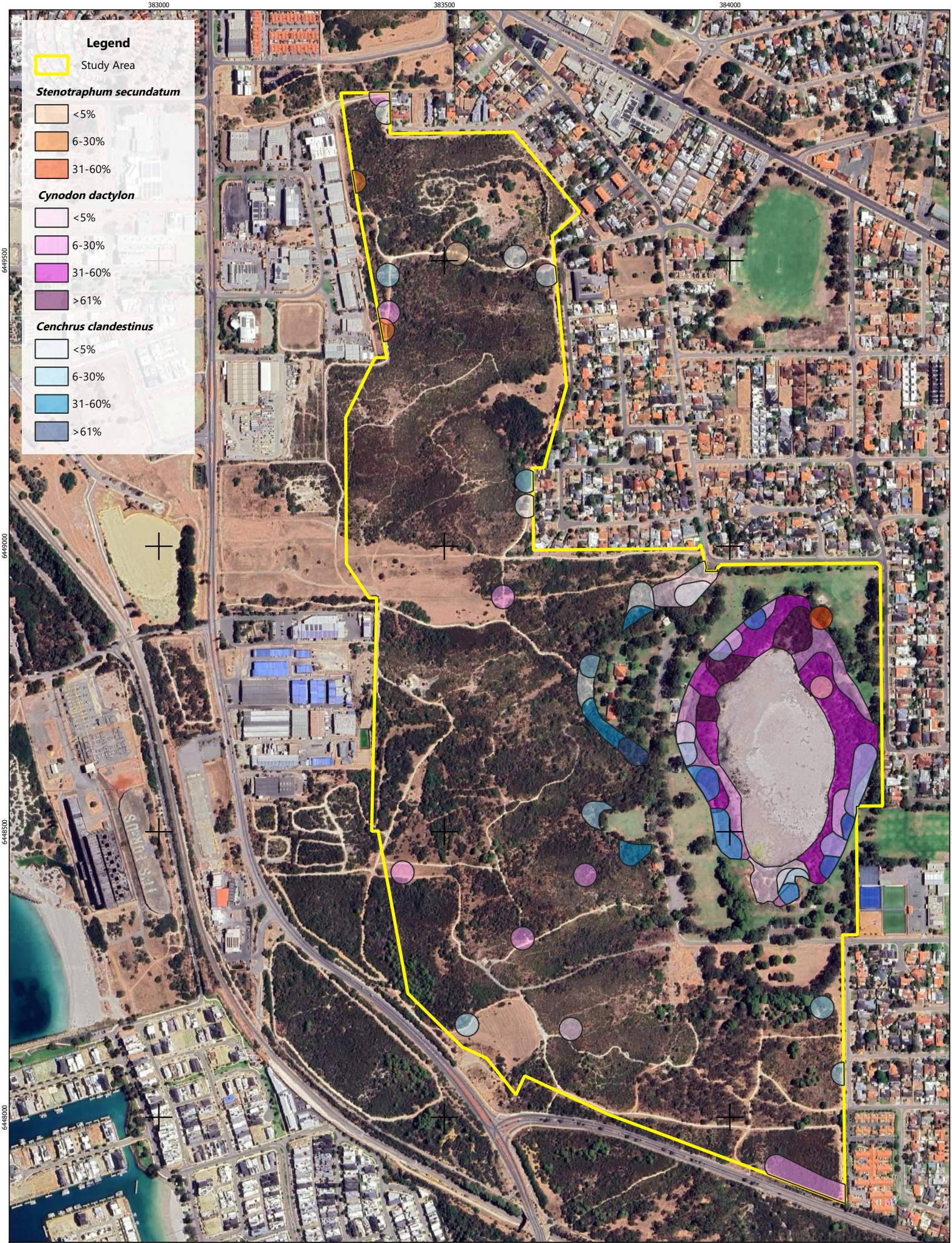

Figure 15b - Grass Weeds Density and Locations

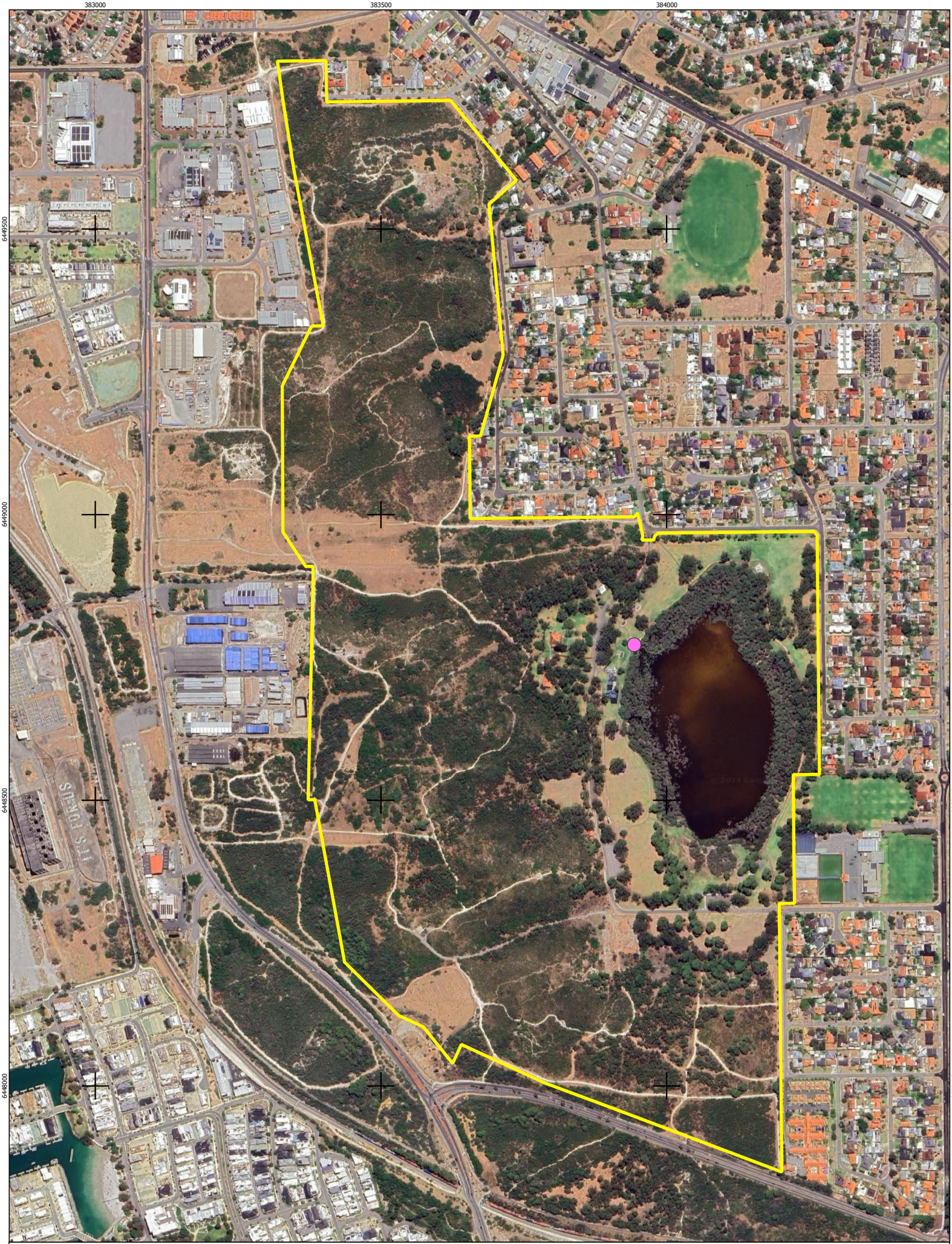

Figure 16 - Aquatic Weeds Density

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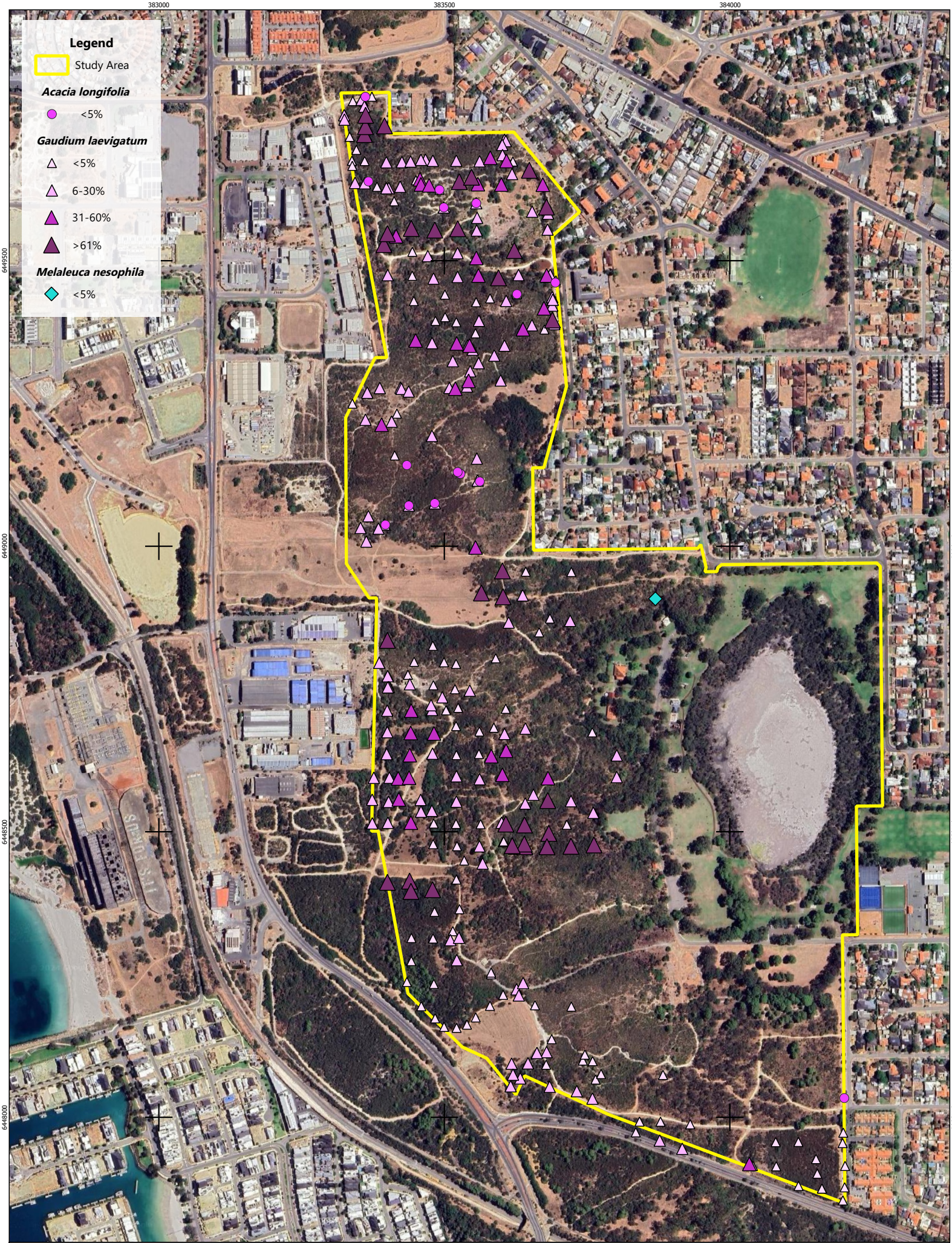


Figure 17a - Woody Weed Density and Locations

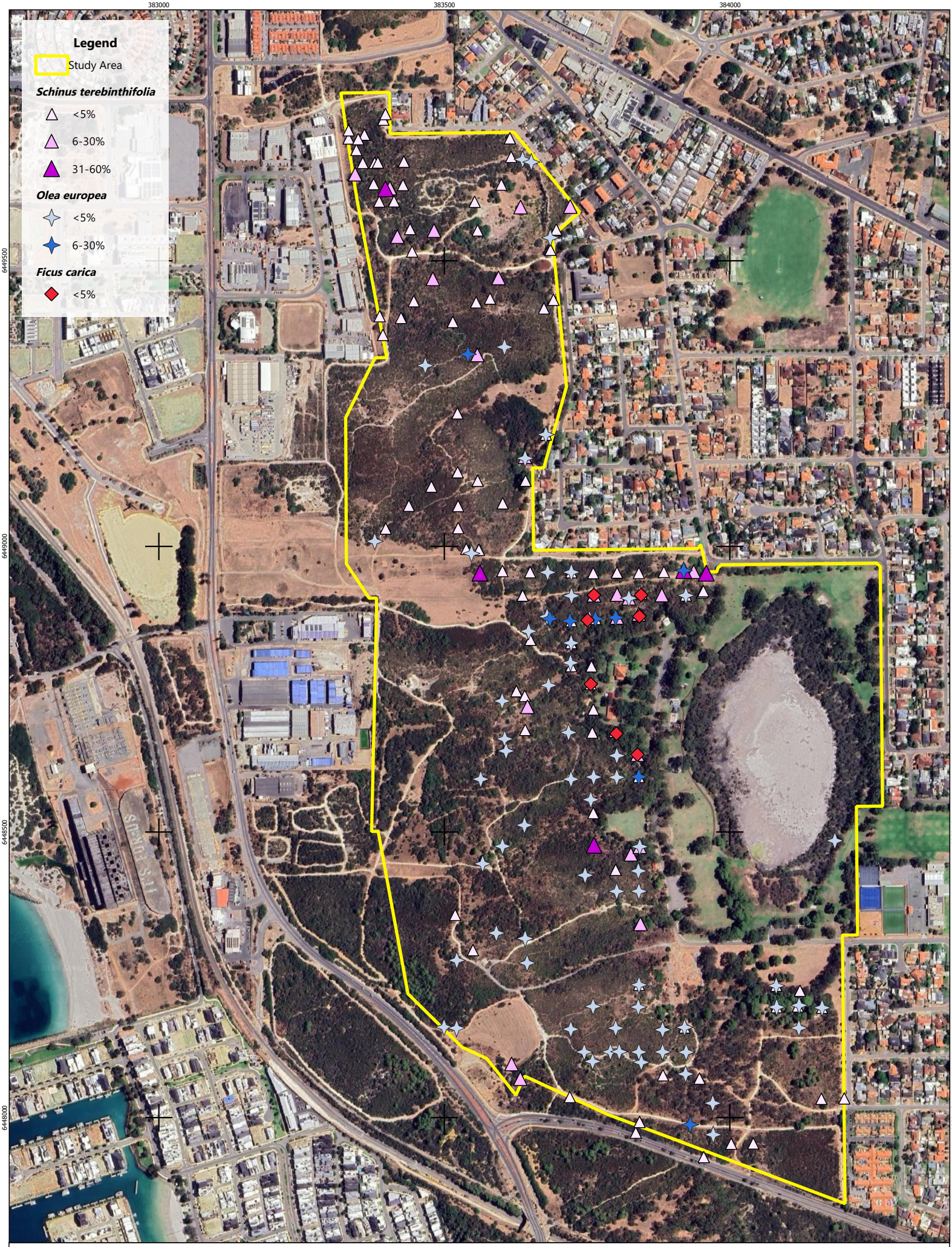


Figure 17b - Woody Weed Density and Locations

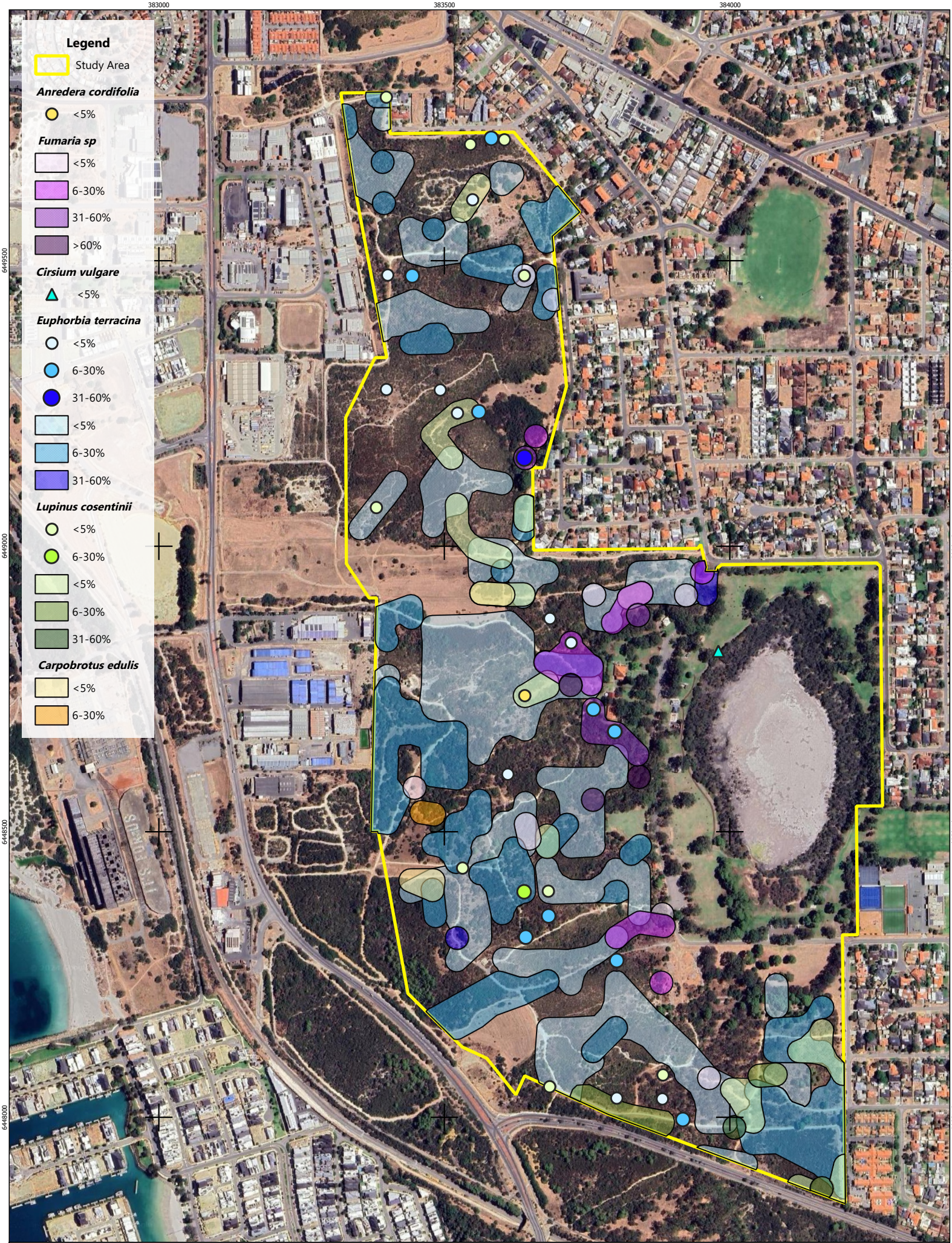


Figure 18a - Other Weed Density and Locations

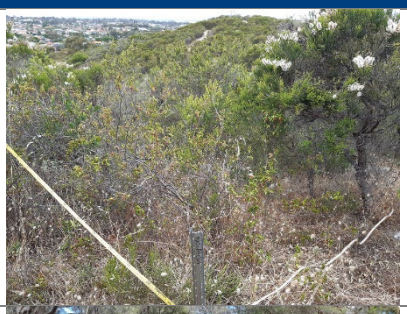
Figure 18b - Other Weed Density and Locations

5.2.3 Vegetation Units

Six vegetation units (AcBsS, ArSgS, EdSgW, EgSgW, MhTrS and MrGtW) were defined and mapped across the study area, based on data collected in both the 2023 and 2020 FVC surveys. A summary of the units if presented in **Table 13**, and their spatial extent is presented in **Figure 19**. Nearly a quarter of the study area is occupied by the *Melaleuca huegelii* shrubland (MhTrS) unit, accounting for 23.30% (25.08 ha) of the total study area. The modified areas, including parkland, revegetated, cleared, firebreaks, and tracks, account for 33.28% (35.82 ha) of the study area.

Table 13 – Summary of Recorded Vegetation Units within the Study Area

Vegetation Unit Code	Vegetation Type and Description	Representative Photo	Quadrat or Relevé	Area (ha)	Area (%)
AcBsS	***Acacia cyclops* shrubland** *Acacia cyclops* and *Banksia sessilis* tall shrubland over **Euphorbia terracina* and **Pelargonium capitatum* isolated herbs and **Ehrharta calycina* isolated grasses		DR01 MP05r	11.71	10.88
ArSgS	***Acacia rostellifera* shrubland** *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs		DR02r DR05 MP06 MP08 MP09r MP12	17.01	15.80
EdSgW	***Eucalyptus decipiens* woodland** *Eucalyptus decipiens* low woodland over *Spyridium globulosum* and *Xanthorrhoea preissii* open shrubland over *Hibbertia hypericoides* and *Tricoryne elatior* low sparse shrubland over **Ehrharta calycina* sparse grassland over *Mesomelaena pseudostygia* sparse sedgeland		DR06 MP10 MP11r	6.18	5.74
EgSgW	***Eucalyptus gomphocephala* woodland** *Eucalyptus gomphocephala* open woodland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over **Euphorbia terracina* isolated herbs		DR04 MP02 MP17	6.56	6.10

Vegetation Unit Code	Vegetation Type and Description	Representative Photo	Quadrat or Relevé	Area (ha)	Area (%)
MhTrS	***Melaleuca huegelii* shrubland** *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland		DR07 MP01 MP04 MP13r MP14 MP15 MP16	25.08	23.30
MrGtW	***Melaleuca rhaphiophylla* woodland** *Melaleuca rhaphiophylla* woodland over *Gahnia trifida* and *Juncus kraussii* sedgeland over *Cynodon dactylon* grassland		DR03 MP03 MP07r	5.27	4.90
Open Water				5.31	4.93
Other Uses (includes cleared, firebreak/tracks, paths)				13.69	12.72
Parkland				14.16	13.16
Revegetated				2.66	2.47
			TOTAL	**107.63**	**100**

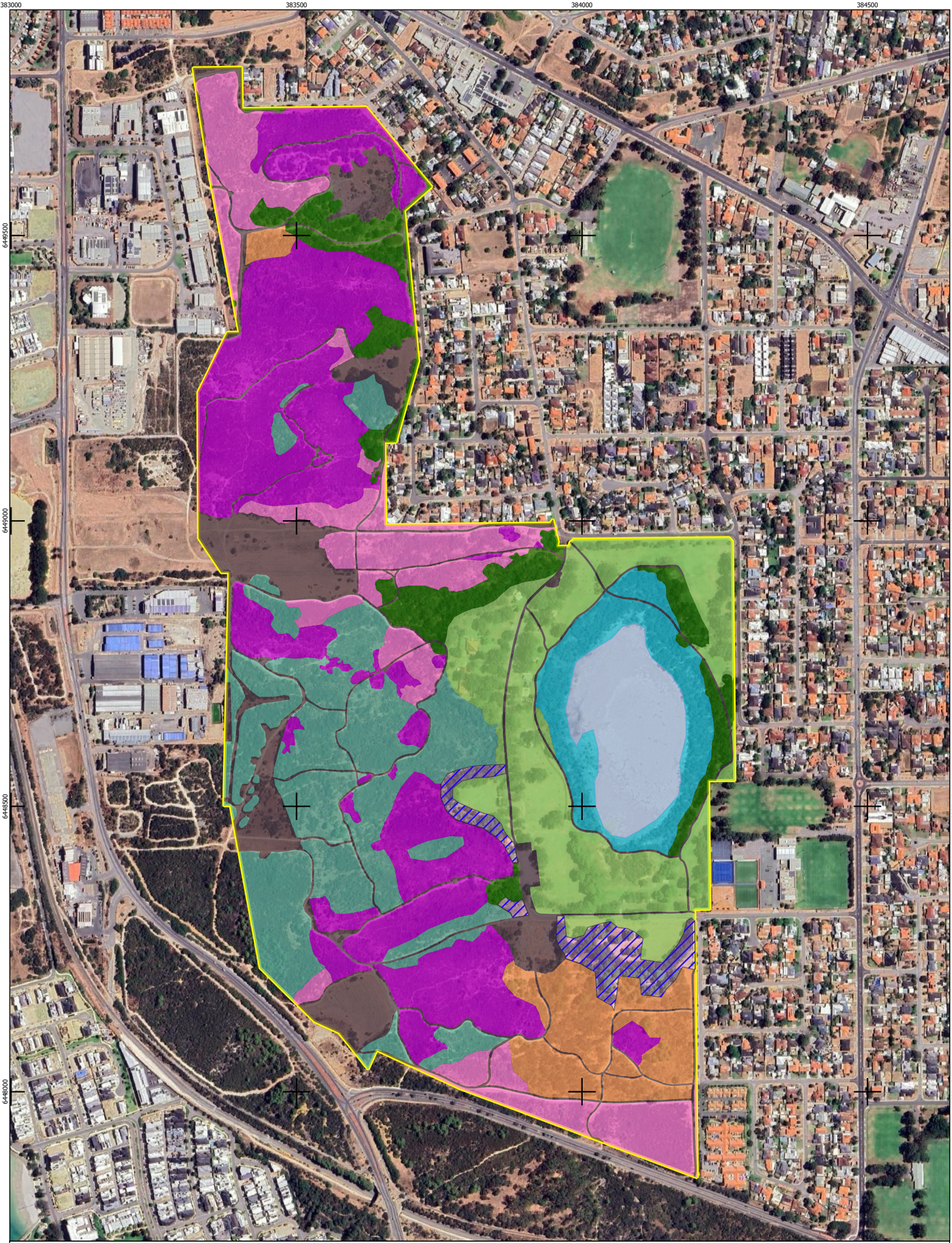


Figure 19 - Vegetation Units

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COC22001 22 February 2024

5.2.3.1 *Floristic Community Types*

Analysis of the full suite of quadrats and relevés sampled in the study area was conducted against the Gibson *et al.* (1994) and Keighery *et al.* (2012) datasets, utilising multivariate cluster analysis of species presence/absence in PATN™. This was conducted in order to assign the FCT that is most likely to be represented within each quadrat and relevé. Batch analysis and excerpts of SSI dendrograms are presented in **Appendix G** and the results, including dissimilarity indices, are summarised in **Table 14**.

Based on the floristic analysis results (**Table 14**), the vegetation units described and mapped for the survey best align to the following FCTs:

- AcBsS (*Acacia cyclops* shrubland) analysis was inconclusive
- ArSgS (*Acacia rostellifera* shrubland) is considered most comparable to FCT S11
- EdSgW (*Eucalyptus decipiens* woodland) is considered most comparable to FCT 24, a State-listed Priority 3 PEC
- EgSgW (*Eucalyptus gomphocephala* woodland) is considered most comparable to FCT S11, which corresponds to a State-Listed Critically Endangered TEC
- MhTrS (*Melaleuca huegelii* shrubland) is considered most comparable to FCT 26a, a State-listed Critically Endangered TEC
- MrGtW (*Melaleuca rhaphiophylla* woodland) is considered most comparable to FCT S17.

Table 14 – Summary of PATN™ Analysis Results

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
AcBsS	DR01	bold12 (24) BOLD-4 (24) MHENRY-2 (30a2)	0.7297 0.7600 0.7619	25/ S15/ 24	Inconclusive	The resulting dissimilarity values are notably high, suggesting a poor fit of the quadrat species with the Gibson *et al.* (1994) and Keighery *et al.* (2012) datasets. Lowest dissimilarity to FCT 24, defined as 'Northern Spearwood shrublands and woodlands' and has been described as heaths with *Banksia attenuata* and *Banksia menziesii* with scattered *Eucalyptus gomphocephala with heathlands including Dryandra* (*Banksia*) *sessilis*, *Calothamnus quadrifidus* and *Schoenus grandiflorus* (DCCEEW 2016). The resulting dendrogram indicates some affinity to FCT 25 and S15, however is not considered representative of either due to the lack of characteristic species and the typical FCT distribution. The quadrat contains species (*Acacia cyclops, Banksia sessilis, Ehrharta calycina, Euphorbia terracina, Pelargonium capitatum, Petrorhagia dubia, Urospermum picroides* and *Hypochaeris glabra*) common with FCT 24 (DEE 2019a; DCCEEW 2023d). However, due to the lack of characteristic species such as scattered *Eucalyptus gomphocephala, Banksia attenuata* and *Banksia menziesii* it is not considered representative of FCT 24.
	MP05r	MI22 (S13) Bold17 (S15) TR03 (S13)	0.7778 0.8125 0.8125	20b/ S14	-	Degraded. Not considered representative of any FCT.
ArSgS	DR02r	TR06 (S11) bold10 (29b) bold17 (S15)	0.8333 0.8571 0.8571	20b	S11	This site is Degraded, and the resulting dissimilarity values are notably high, suggesting a poor fit of the quadrat species with the Gibson *et al.* (1994) and Keighery *et al.* (2012) datasets. Lowest dissimilarity to FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. The quadrat contains *Acacia rostellifera* and **Ehrharta longiflora* common to FCT S11 (DEE 2019a; DCCEEW 2023d).
	DR05	TRIG-5 (24) BOLD-4 (24) NEER-9 (24)	0.5281 0.5904 0.596	24/ 26b	S11	Lowest dissimilarity to FCT 24, defined as 'Northern Spearwood shrublands and woodlands'. This could be attributed to the high complexity of species within this quadrat. Nearest neighbour in the dendrogram is also FCT 24. However, species composition of the quadrat is not a match for FCT 24. The presence of the dominant *Acacia rostellifera* and *Melaleuca systena* along with other species (*Acanthocarpus preissii, Lysiandra calycina, Spyridium globulosum, Templetonia retusa* and more) commonly found in FCT S11, suggests that this quadrat is more closely aligned with this community. FCT S11 is defined as *'Northern* Acacia rostellifera – Melaleuca acerosa (syn. Melaleuca systena) *shrublands'*. (DEE 2019a; DCCEEW 2023d).

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
ArSgS (cont.)	MP06	m4601 (S11)	0.6410	S11/ 30a2	S11	Lowest dissimilarity to FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. The resulting dendrogram indicates affinity to FCT S11. The quadrat contains *Acacia rostellifera*, *Melaleuca systena* and other species common to FCT S11 (DEE 2019a; DCCEEW 2023d).
		TRIG-1 (29b)	0.7000			
		SW10 (S11)	0.7222			
	MP08	tokyu07 (29b)	0.5357	29b/ S11/ 30a2	S11	Lowest dissimilarity value and showed the greatest affinity in the dendrogram to FCT 29b, defined as 'Acacia shrubland on taller dunes'. However, based on the next nearest neighbour in the dendrogram, structure and dominant species, it was concluded that the quadrat is most similar to S11 which is defined as 'Northern *Acacia rostellifera-Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. The quadrat contains *Acacia rostellifera*, *Melaleuca systena* and other species common to FCT S11 (Gibson *et al.* 1994)
		Bold06 (30a2)	0.5745			
		BURN-1 (29a)	0.6232			
	MP09r	m4601 (S11)	0.6250	30a2/ 24	S11	Due to the degraded condition, data was recorded utilising a relevé. The high number of weeds may affect the analysis results. Lowest dissimilarity to FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. Nearest neighbour in the dendrogram in FCT 30a2 is described as *Callitris preissii* and/or *Melaleuca lanceolata* forest and woodlands. Neither *Callitris preissii* or *Melaleuca lanceolata* were recorded and therefore, the quadrat is not representative of FCT 30a2. The quadrat contains *Acacia rostellifera* and species (**Asparagus asparagoides, *Ehrharta longiflora, *Euphorbia terracina* and **Fumaria capreolata*) common to FCT S11 (DEE 2019a; DCCEEW 2023d).
		WOODP-1 (30a2)	0.7241			
		TR06 (S11)	0.7692			
	MP12	SW10 (S11)	0.6667	S11/ 30a2	S11	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. FCT 30a2 is described as *Callitris preissii* and/or *Melaleuca lanceolata* forest and woodlands. Neither, *Callitris preissii* or *Melaleuca lanceolata* were recorded and therefore' the quadrat is not representative of FCT 30a2. The quadrat contains *Acacia rostellifera*, *Melaleuca systena* and other species common to FCT S11 (DEE 2019a; DCCEEW 2023d).
		WHILL-2 (29b)	0.6667			
		MI05 (S11)	0.6744			
EdSgW	DR06	TRIG-5 (24)	0.5904	S15/ 25	24	Lowest dissimilarity to FCT 24, defined as 'Northern Spearwood shrublands and woodlands'. The quadrat contains typical (**Lysimachia arvensis, *Briza maxima,* and *Desmocladus flexuosus*) and common (*Dianella revoluta, Hardenbergia comptoniana, Melaleuca systena* and *Xanthorrhoea preissii*) species for FCT 24 (DEE 2019a; DCCEEW 2023d). FCT S15 is the nearest neighbour within the dendrogram, however, is described by Keighery *et al.* (2012) as a weed group and the key dominant species recorded within the quadrat (*Eucalyptus decipiens, Acacia rostellifera* and *Spyridium globulosum*) are not present within S15.
		xbeer01 (24)	0.6119			
		bold07 (24)	0.6452			

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
EdSgW (cont.)	MP10	TRIG-5 (24)	0.4865	24/ 29b	24	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT 24, defined as 'Northern Spearwood shrublands and woodlands'. The quadrat contains species typical of (**Briza maxima,* and *Desmocladus flexuosus*) and common to (*Austrostipa flavescens, Dianella revoluta, Hardenbergia comptoniana, Lomandra maritima* and *Xanthorrhoea preissii*) FCT 24 (DEE 2019a; DCCEEW 2023d).
		Hepb02 (26b)	0.6203			
		star01 (24)	0.6216			
	MP11r	WOODP-1 (30a2)	0.7241	29a/ 19a/ S13	-	Due to the degraded condition, data was recorded utilising a relevé. The resulting dissimilarity values are notably high, suggesting a poor fit with the quadrats of Gibson *et al.* (1994) and Keighery *et al.* (2012) datasets. Not considered representative of any FCT.
		TR05 (S13)	0.7273			
		MHENRY-1 (30a2)	0.7576			
EgSgW	DR04	trigg08 (S15)	0.7143	S11/ S15	S11	The resulting dissimilarity values are notably high, suggesting a poor fit with the Gibson *et al.* (1994)and Keighery *et al.* (2012) datasets. Lowest dissimilarity to FCT S15; 'Weed group. Not allied with any supergroup'. FCT 17 has next lowest dissimilarity value, defined as '*Melaleuca rhaphiophylla – Gahnia trifida* seasonal wetlands'. However, the quadrat does not contain any *Melaleuca* species or sedges (Gibson *et al.* 1994). High dissimilarity values attributed to the high presence of weeds within the quadrat. The SSI dendrogram indicates affinities to FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. All dominant quadrat species, and most in the quadrat are shared with FCT 11.
		Bold17 (S15)	0.7778			
		cool 04 (17)	0.7838			
	MP02	m4601 (S11)	0.641	S11/ 30a2/ 24	S11	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. All dominant quadrat species, *Eucalyptus gomphocephala, Spyridium globulosum* and most of present in the quadrat are shared with FCT 11 (DEE 2019a; DCCEEW 2023d).
		Tokyu07 (29b)	0.6735			
		GARD04 (30a2)	0.6842			
	MP17	m4601 (S11)	0.6098	30a2/ S11	S11	Lowest dissimilarity to and some affinity in the dendrogram with FCT S11, defined as 'Northern *Acacia rostellifera – Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. All dominant quadrat species, **Asparagus asparagoides, Eucalyptus gomphocephala, *Euphorbia terracina, Templetonia retusa, Spyridium globulosum,* and most present in the quadrat are shared with FCT 11 (DEE 2019a; DCCEEW 2023d).
		MHENRY-1 (30a2)	0.6667			
		bold06 (30a2)	0.6842			

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
MhTrS	DR07	NEER-10 (24)	0.6500	24/ 30a2/ S11	26a	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT 24, defined as 'Northern Spearwood shrublands and woodlands'. This FCT forms part of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC. However, quadrat DR07 lacks the key characteristic Banksia tree species of this TEC, so is not representative of FCT 24. FCT 30a2 is described as *Callitris preissii* and/or *Melaleuca lanceolata* forest and woodlands. Neither *Callitris preissii* or *Melaleuca lanceolata* were recorded, and therefore, it is not representative of FCT 30a2. Floristic community type 26b 'Woodlands and mallees on limestone; and FCT 24 (the FCT that floristics most strongly indicate is represented) both co-occur with, or intergrade with the Honeymyrtle shrubland (DEE 2019a; DCCEEW 2023d). Quadrat DR07 contains species typical of the Honeymyrtle shrubland, occurs on limestone ridges, and has been diagnosed as the Commonwealth TEC using the relevant criteria, so is therefore inferred to be representative of FCT 26a.
		BOLD-4 (24)	0.6571			
		SW08 (S11)	0.6610			
	MP01	BOLD-4 (24)	0.5833	24/ 27	26a	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT 24, defined as 'Northern Spearwood shrublands and woodlands'. This FCT forms part of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC. However, quadrat MP01 lacks the key characteristic Banksia tree species of this TEC, so is not representative of FCT 24. FCT 30a2 is described as *Callitris preissii* and/or *Melaleuca lanceolata* forest and woodlands. Neither *Callitris preissii* or *Melaleuca lanceolata* were recorded, and therefore, it is not representative of FCT 30a2. Floristic community type 26b 'Woodlands and mallees on limestone; and FCT 24 (the FCT that floristics most strongly indicate is represented) both co-occur with, or intergrade with the Honeymyrtle shrubland (DEE 2019a; DCCEEW 2023d). Quadrat DR07 contains species typical of the Honeymyrtle shrubland, occurs on limestone ridges, and has been diagnosed as the Commonwealth TEC using the relevant criteria, so is therefore inferred to be representative of FCT 26a.
		Bold05 (S11)	0.6000			
		CHIDPT-1 (24)	0.6232			
	MP04	BOLD-4 (24)	0.6000	24/ 30a2	26a	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT 24, defined as 'Northern Spearwood shrublands and woodlands'.
		MI04 (S11)	0.6000			
		TRIG-5 (24)	0.6053			
	MP13r	m4601 (S11)	0.5789	S11/ 30a2/ 24	26a	Due to the Degraded nature data was recorded utilising a relevé. Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT S11, defined as 'Northern *Acacia rostellifera* – *Melaleuca acerosa* (syn. *Melaleuca systena*) shrublands'. However, the dominant quadrat
		TR03 (S13)	0.6500			

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
MhTrS (cont.)		buck01 (24)	0.6522			species, *Melaleuca huegelii* does not occur in FCT S11, nor the next most similar, FCT S13 (Gibson *et al.* 1994). FCT 24 is the third most similar in species composition, defined as 'Northern Spearwood shrublands and woodlands'. This FCT contains most of the quadrat species (*Acacia cyclops, Banksia sessilis, Clematis linearifolia, Dianella revoluta* and more) as well as *Melaleuca huegelii,* however the quadrat did not record *Eucalyptus gomphocephala* and occurs on limestone outcropping rather than deeper soil typical of FCT 24. FCT 24 co-occurs with, or intergrades with the Honeymyrtle shrubland (DEE 2019a; DCCEEW 2023d). Relevé MP13r contains species typical of the Honeymyrtle shrubland, occurs on limestone ridges, and has been diagnosed as the Commonwealth TEC using the relevant criteria, so is therefore inferred to be representative of FCT 26a.
	MP14	bold22 (27)	0.6889	27/ 24/ 30a2	26a	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT 27, defined as 'Species poor mallees and shrublands on Limestone". However, this community is more common over 15 km north and south of the study area. FCT 24 has the next lowest dissimilarity value and some affinity in the dendrogram, defined as 'Northern Spearwood shrublands and woodlands', however the quadrat did not record *Eucalyptus gomphocephala* and occurs on limestone outcropping rather than deeper soil typical of FCT 24. . FCT 30a2 is described as *Callitris preissii* and/or *Melaleuca lanceolata* forest and woodlands. Neither *Callitris preissii* or *Melaleuca lanceolata* were recorded in the quadrat, and therefore, it is not representative of FCT 30a2. FCT 24 (the FCT that floristics most strongly indicate is represented) co-occurs with, or intergrades with the Honeymyrtle shrubland (DEE 2019a; DCCEEW 2023d). Quadrat MP14 contains species typical of the Honeymyrtle shrubland, occurs on limestone ridges, and has been diagnosed as the Commonwealth TEC using the relevant criteria, so is therefore inferred to be representative of FCT 26a.
		BOLD-4 (24)	0.6897			
		PEPGRV-1 (30a2)	0.6957			
	MP15	BU04 (29a)	0.6596	27/ 29a/ 30a2/	26a	Lowest dissimilarity to FCT 29a, defined as 'Coastal shrubland on shallow sand' containing typical species such as *Acanthocarpus preissii, Rhagodia baccata* and *Spyridium globulosum* (Gibson et al (1994). None of these typical species were recorded within quadrat MP15. The
		CHIDPT-1 (24)	0.6721			

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
MhTrS (cont.)		BOLD-4 (24)	0.6765	24		presence of dominant *Melaleuca huegelii* and *Templetonia retusa* aligns better with FCT 24 with the next lowest dissimilarity. FCT 24 is defined as 'Northern Spearwood shrublands and woodlands', its typical species (*Briza maxima* and *Desmocladus flexuosus*) and common species (*Austrostipa flavescens, Dianella revoluta* and *Lysiandra calycina*) were present within the quadrat (DEE 2019a; DCCEEW 2023d). However, due to the lack of characteristic Banksia tree species, quadrat MP15 would not be representative of this FCT. Nearest neighbour in the dendrogram is FCT 27, defined as 'Species poor mallees and shrublands on Limestone' and is considered a closely allied vegetation community to FCT 26a. However, FCT 27 is largely restricted to the Yalgorup area and is either shrubland or mallee heath, variously dominated by Eucalyptus decipiens, Eucalyptus foecunda, Melaleuca systena or Hakea prostrata (without Melaleuca huegelii (DCCEEW 2023d). Quadrat MP15 contains species typical of the Honeymyrtle shrubland, occurs on limestone ridges, and has been diagnosed as the Commonwealth TEC using the relevant criteria, so is therefore inferred to be representative of FCT 26a.
	MP16	CHIDPT-1 (24)	0.7193	24/ 30a2	26a	The resulting dissimilarity values are notably high, suggesting a poor fit with the Gibson *et al.*(1994) and Keighery *et al.* (2012) datasets. Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT 24, defined as 'Northern Spearwood shrublands and woodlands'. This FCT forms part of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC. However, quadrat MP16 lacks the key characteristic Banksia tree species of this TEC, so is not representative of FCT 24. FCT 30a2 is described as *Callitris preissii* and/or *Melaleuca lanceolata* forest and woodlands. Neither *Callitris preissii* nor *Melaleuca lanceolata* were recorded, and therefore, quadrat MP16 is not representative of FCT 30a2. Quadrat MP16 contains species typical of the Honeymyrtle shrubland, occurs on limestone ridges, and has been diagnosed as the Commonwealth TEC using the relevant criteria, so is therefore inferred to be representative of FCT 26a.
		PEPGRV-2 (30a2)	0.7200			
		cool 08 (24)	0.7288			
MrGtW	DR03	MTB-5 (17)	0.5385	S07/ 17/16	17	Lowest dissimilarity to and some affinity in the dendrogram with FCT 17, defined as '*Melaleuca rhaphiophylla – Gahnia trifida* seasonal wetlands'. The quadrat species are shared with FCT 17, including the presence of *Melaleuca rhaphiophylla* and *Gahnia trifida* (Gibson *et al.* 1994). FCT S07 is described as 'Northern woodlands to forest over tall sedgelands alongside permanent wetlands'. Due to the lack of *Eucalyptus rudis* it is not considered representative of FCT S07.
		Alfr02 (S07)	0.5455			
		bold21 (S07)	0.5714			

Vegetation Unit	Quadrat/ Relevé	Most Similar Gibson/ Keighery Quadrats (FCT)	Dissimilarity Value	Nearest on Dendrogram	Inferred FCT	Reasoning
MrGtW (cont.)	MP03	cool 04 (17)	0.4857	17	17	Lowest dissimilarity to FCT 17, defined as '*Melaleuca rhaphiophylla – Gahnia trifida* seasonal wetlands'. The quadrat species are shared with FCT 17, including the presence of *Melaleuca rhaphiophylla* and *Gahnia trifida* (Gibson *et al.* 1994). The resulting dendrogram indicates affinity to FCT 17.
		Possum2 (16)	0.5897			
		alfr02 (S07)	0.6129			
	MP07r	alfr02 (S07)	0.6154	S07/ 16/ 17	17	Lowest dissimilarity to and nearest neighbour in the dendrogram is FCT S07, defined as 'Northern woodlands to forests over tall sedgelands alongside permanent wetlands', likely due to the presence weeds (*Atriplex prostrata* and *Symphyotrichum subulatum*) shared by the quadrat and FCT S07. The next lowest dissimilarity is to FCT 17, defined as '*Melaleuca rhaphiophylla – Gahnia trifida* seasonal wetlands'. Characteristic species of FCT 17 , including *Melaleuca rhaphiophylla* and *Gahnia trifida,* occur within the quadrat (Gibson *et al.* 1994). The resulting dendrogram also indicates affinity to FCT 17.
		Possum2 (16)	0.7059			
		cool 01 (17)	0.7143			

5.2.4 Vegetation Condition

Based on a combination of FVC (2021) vegetation condition mapping, supplemented with results from FVC field observations in November 2023, vegetation condition mapping was carried out. The results of this determined that of the remnant vegetation within the study area (71.81 ha), majority is in 'Good' condition (44.1%), followed by 31.57% in 'Very Good' condition. Overall, the vegetation has been determined to range from 'Completely Degraded' to 'Excellent' condition.

Only 1.55% of remnant vegetation is considered to be 'Completely Degraded', as cleared areas such as parkland, tracks and infrastructure are excluded from this mapping. Areas of better-quality vegetation, ranging from 'Good' to 'Excellent', comprise 76.42% of remnant vegetation, and are mostly concentrated within the central corridor.

The study area also includes parkland, open water, revegetation areas, firebreaks, paths and clearings, which collectively occupy 35.82 ha (33.28%) of the total study area. The areas of the varying vegetation condition are summarised in **Table 15** and the spatial extent of this is presented in **Figure 21**.

Comparison of vegetation condition mapping from ELA (2018) and FVC (2021) to current mapping (**Figure 20**), show similar proportions, with 'Completely Degraded' and 'Very Good' condition vegetation decreasing and 'Good' condition vegetation increasing between 2018 and 2023 (**Figure 20**). No areas of 'Excellent' condition vegetation have previously been recorded.

Table 15 – Summary of Vegetation Condition in the Study Area

Vegetation Condition Rating		Area (ha)	% of Study Area	% of Bushland Area
Excellent		0.54	0.50	0.75
Very Good		22.67	21.06	31.57
Good		31.67	29.43	44.1
Degraded		15.82	14.7	22.03
Completely Degraded		1.11	1.03	1.55
Remaining areas	Other Uses (Includes cleared, firebreaks/tracks, other uses)	13.69	12.72	-
	Open Water	5.31	4.93	-
	Parkland	14.16	13.16	-
	Revegetation	**2.66**	**2.47**	**-**
TOTAL		**107.63**	**100**	**100**

^remaining area consist of firebreaks/tracks, open water, cleared, parkland and revegetation

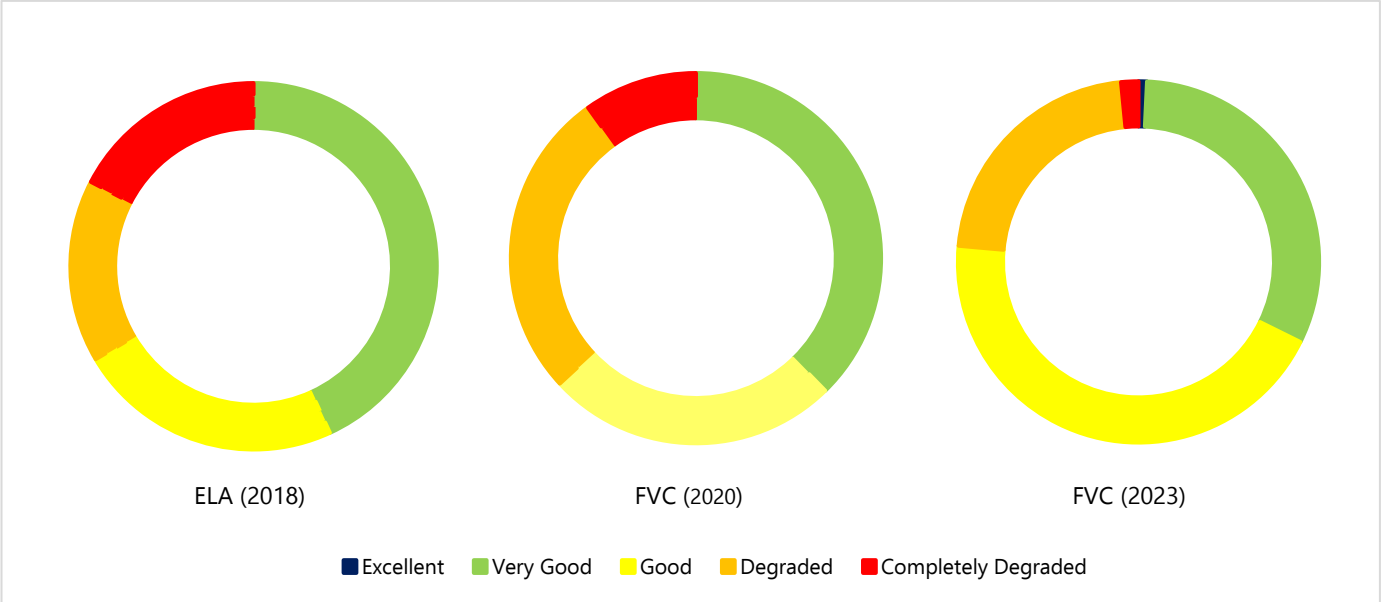

Figure 20 – Vegetation Condition Comparison

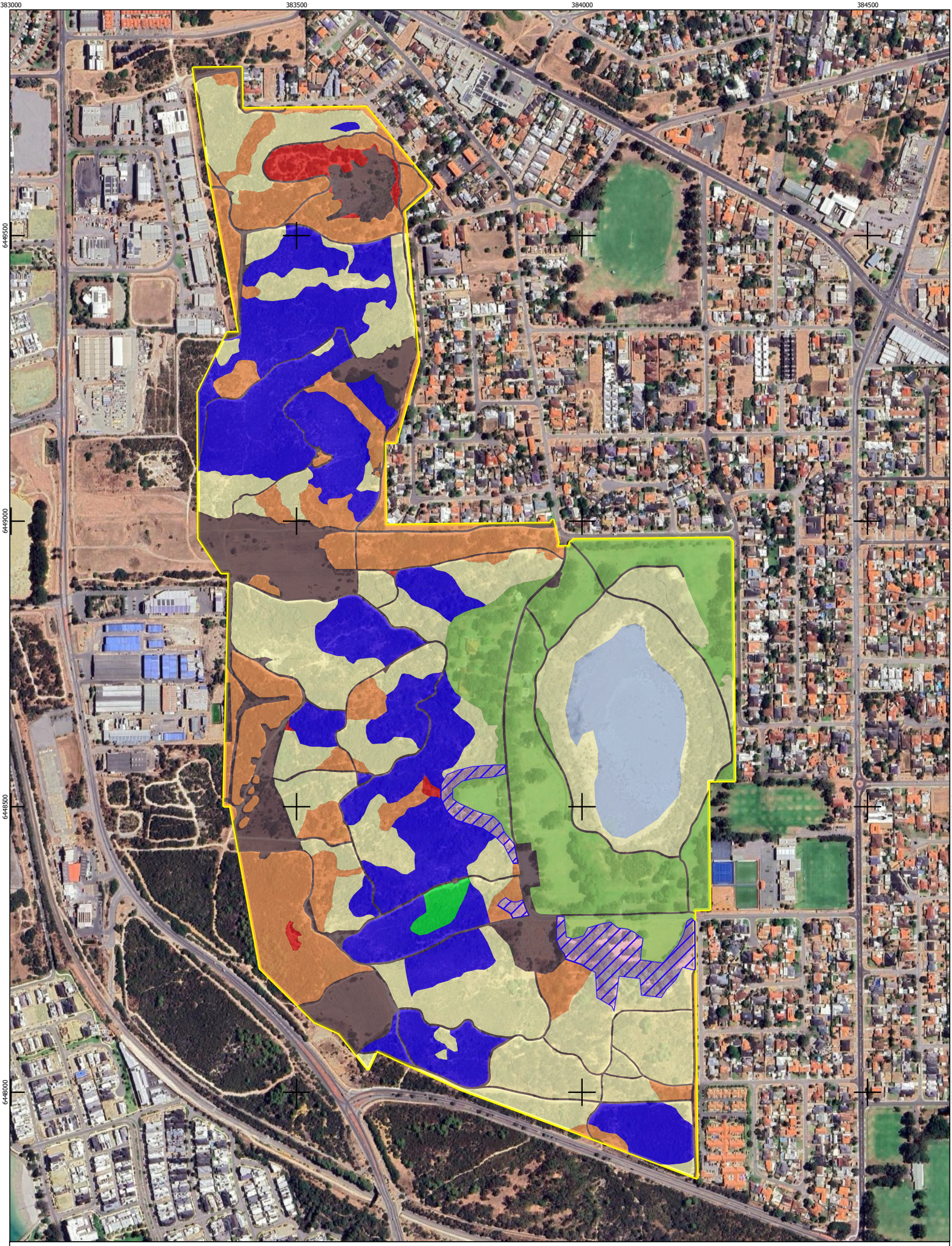

Figure 21 - Vegetation Condition

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FOCUSED VISION consulting

5.2.5 Threatened and Priority Ecological Communities

The desktop assessment identified nine TECs and/or PECs that are known to occur within the desktop study area (study area plus a 10 km buffer). Of these, known occurrences of the following three ecological communities and/or their buffer intersect the study area, and the presence of all three was confirmed during the previous FVC (2020) survey:

- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forest of the Swan Coastal Plain Ecological Community (EPBC Act: Critically Endangered; WA Conservation status: Priority 3)
- SCP 26a *Melaleuca huegelii – M. systena* shrublands of limestone ridges (FCT 26a) a State-listed Critically Endangered TEC
- SCP 24 Northern Spearwood shrublands and woodlands (FCT24) a State-listed Priority 3 PEC.

Additionally, since the previous survey, the *Honeymyrtle shrubland on limestone ridges of the SCP ecological community* (Honeymyrtle shrubland TEC) (EBPC Act: Critically Endangered) has been listed (after the database inquiry for the desktop assessment was lodged) as a TEC of Commonwealth significance. The previously recorded SCP 26a corresponds with this TEC (DCCEEW 2023d).

Each of these TECs and PECs and their presence and extent in the study area, based on relevant Conservation Advice and available information, are discussed in the following sections.

5.2.5.1 *Tuart Woodlands and Forests TEC*

The primary defining feature of the Tuart woodlands and forests TEC is the presence of *Eucalyptus gomphocephala* (Tuart) in the uppermost canopy (DEE 2019a). The ecological community intergrades and/or interacts with other ecological communities of the Swan Coastal Plain (DEE 2019a). The Tuart woodlands and forests TEC may be comprised of a number of different FCTs, which may include separately listed significant ecological communities, including FCTs S11 and SCP 24, that resulted from PATN™ analysis (DEE 2019a). However, Tuart trees must be present to be representative of the TEC, and Tuart trees are not necessarily represented within all representations of the respective FCTs.

The Conservation Advice (DEE 2019a) states that the Tuart woodlands and forests TEC is primarily found in sandy, well-drained soils, though it can also occur in protected swales, saline and freshwater wetlands, riverbanks, and limestone slopes.

Tuart Woodlands and Forests TEC Characterisation

Since the presence of Tuart trees in the uppermost canopy is the key defining feature of the Tuart woodlands and forests TEC), areas supporting Tuarts (*Eucalyptus gomphocephala*) were assessed using a checklist developed from the Conservation Advice (DEE 2019a). The checklist includes the key characteristics of the TEC, including botanical region, soil and landform types and required or typical species (**Table 16**). The analysis results concluded that where Tuart trees occur (EgSgW, Parkland, Revegetation and Other Uses) vegetation is characteristic of the Tuart woodlands and forests TEC. This applied to all areas supporting Tuart trees except one instance where only a single Tuart is present, on the western boundary of the study area. The key characters of the TEC require that there are at least two Tuart trees separated by no more than 60 m, which creates a patch (**Table 16**).

Table 16 – Tuart Woodlands and Forests TEC Characterisation

Key Character	
a)	Swan Coastal Plain or Jarrah Forest location
b)	Mainly in the Spearwood and Quindalup dune systems, as well as the Bassendean dunes and Pinjarra Plain, along riverbanks and in wetlands. Extends beneath the Darling and Whicher escarpments, on a plateau east of the Swan Coastal Plain.
c)	Contains a minimum of two *Eucalyptus gomphocephala* (Tuart) situated within 60 m of each tree's canopy
d)	Mainly as woodland, though may be a closed forest, open forest, woodland, open woodland, closed mallee forest, open mallee forest, mallee woodland and open mallee woodland
e)	The dominant canopy species is tuart: *Eucalyptus gomphocephala.* Although other tree species might present, they are not as abundant as tuart
f)	With (although can be without) other trees including *Agonis flexuosa, Banksia grandis, Banksia attenuata, Eucalyptus marginata* or less commonly *Corymbia calophylla*

Tuart Woodlands and Forests Extent

The possible extent of the Tuart woodlands and forests TEC within the study area was, in accordance with the Conservation Advice (DEE 2019a), determined to be all areas containing a continuous Tuart canopy (incorporating a 30 m buffer around each of the canopies). These areas of Tuart canopy, plus the 30 m buffer, as per the Conservation Advice (DEE 2019a) are presented in **Figure 22**.

Tuart Woodlands and Forests Patches

The Tuart woodlands and forests patches within the study area have been mapped in accordance with the methodologies and requirements described in the approved Conservation Advice (DEE 2019a). The key criteria for an area to be considered for inclusion in a patch are the presence of Tuarts in the upper canopy and no more than 60 m distance between the canopy of two trees (which allows for a 30 m buffer around each canopy). Even in the absence of understorey (i.e. in parkland), Tuart trees can form a patch characteristic of the TEC. The patch mapping resulted in three Tuart woodlands and forests TEC patches, as presented in **Figure 22**.

In the context of regional patches, there are no areas supporting Tuart trees adjacent to the study area that would extend the patches within the study area into the local region.

Tuart Woodlands and Forests TEC Condition

Within the study area, the condition of the vegetation characteristic of the Tuart woodlands and forests TEC ranges from 'Completely Degraded' to 'Very Good', in accordance with the Keighery (1994) condition scale. Most of the remnant vegetation supporting Tuart trees in the study area is in 'Degraded' and 'Good' condition, with areas considered 'Other Uses', 'Revegetation', 'Parkland' considered 'Completely Degraded'. The implication of this condition rating and meeting condition thresholds is discussed further below.

Tuart Woodlands and Forests TEC Patch and Condition Thresholds

The Conservation Advice (DEE 2019a) specifies condition thresholds for patches to be considered eligible as part of the nationally protected ecological community. The following criteria apply:

- Patches <0.5 ha – NOT part of the nationally protected ecological community
- Patches at least 0.5 ha to <5 ha – patches in this range are presumed to be part of the nationally protected ecological community unless they do not meet the minimum condition
- Patches ≥5 ha – that meet the key diagnostic characteristics are part of the nationally protected ecological community.

This analysis has determined that all three of the mapped patches of Tuart woodland are eligible for inclusion as part of the nationally protected ecological community, covering an area of 28.50 ha, of which 27.75 ha occurs within the study area (**Table 17**).

Table 17 –Analysis of Tuart Woodlands and Forests Patches Against Condition and Biotic Thresholds

Patch Number	Area (ha)	Relevant Conservation Advice Patch Size Range	FVC Conservative Average Condition	Corresponding Conservation Advice Condition	Relevant Biotic Thresholds of the Conservation Advice Met in that Patch (DEE 2019a)	Eligible as TEC?
1	4.77	≥2 ha to <5 ha	Degraded - Good	(Moderate - High)	Plays an important landscape role, has a habitat role and shows regeneration	Yes
2	1.11	≥0.5 ha to <2 ha	Good	(Moderate - High)	Plays an important landscape role, has a habitat role and shows regeneration	Yes
3	22.62	>5 ha	Degraded	(Moderate - High)	N/A (minimum patch size met)	Yes

Tuart Woodlands and Forests PEC

Areas of defined Tuart Woodlands and Forests TEC are eligible as the Priority 3 ecological community, provided that the vegetation is a naturally occurring assemblage, as defined by the BC Act. A total of 12.07 ha of areas eligible as the Tuart Woodlands TEC occur as a naturally occurring assemblages and hence 12.07 ha of the study area (11.21%) is considered representative of the Tuart Woodlands and Forests PEC (**Figure 22**).

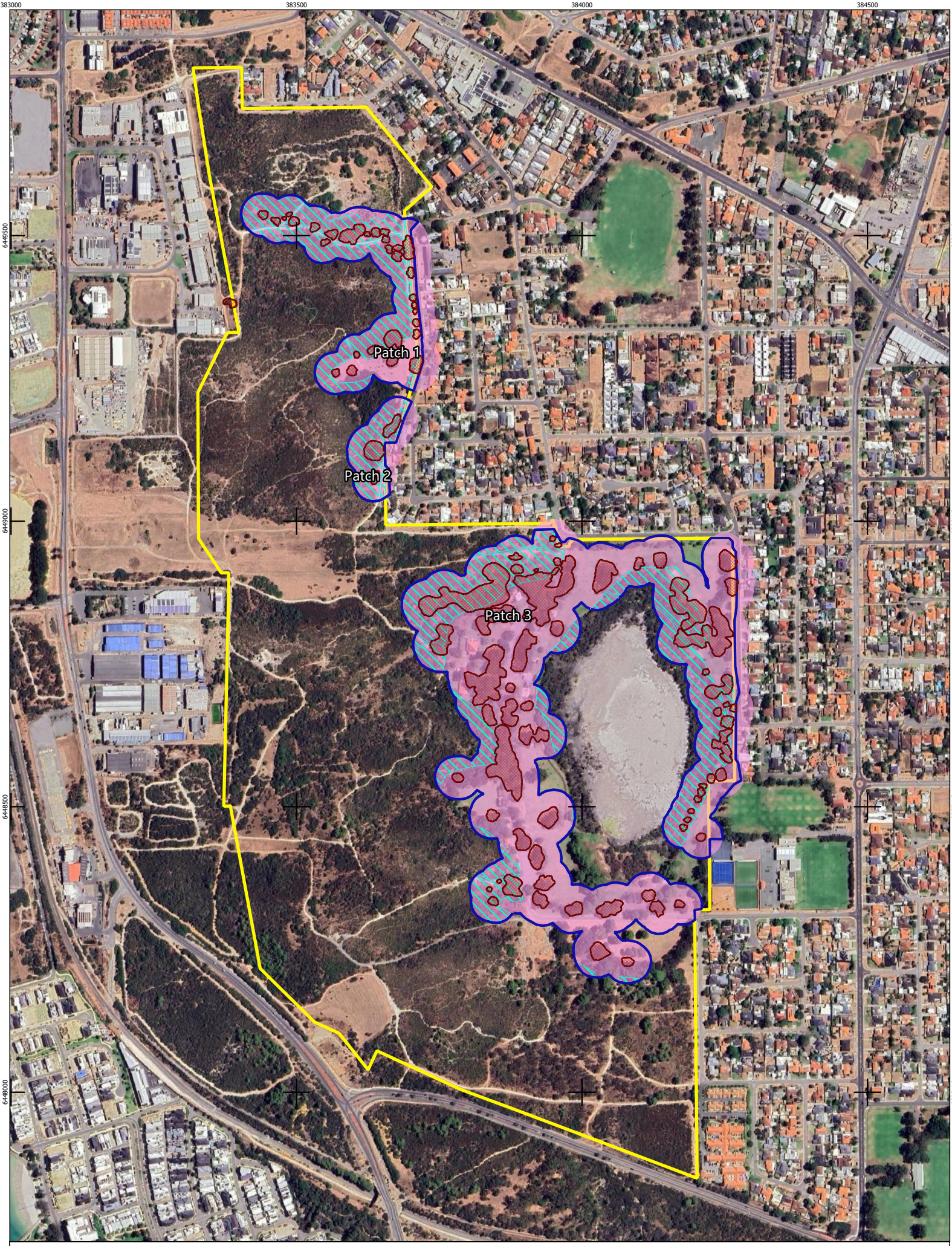

Figure 22 - Tuart Woodlands and Forests TEC Patches and PEC Extent

5.2.5.2 *Honeymyrtle shrubland on limestone ridges of the SCP TEC*

The Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion TEC (Honeymyrtle shrubland TEC) is listed in the Critically Endangered category of the Threatened Ecological Communities list under the EPBC Act (DCCEEW 2023d; e).

This ecological community is confined to the slopes and hilltops of limestone ridges of the Swan Coastal Plain (DCCEEW 2023d). It represents an assemblage of plants, animals, and other organisms found in warm temperate shrubland or heath habitats, predominantly dominated by species such as *Melaleuca huegelii, Melaleuca systena*, and/or *Banksia sessilis* commonly over by *Grevillea preissii*, *Spyridium globulosum*, *Acacia lasiocarpa*, and herby understory (DBCA 2023a; DCCEEW 2023d).

Honeymyrtle Shrubland TEC Characterisation, Extent and Patch Eligibility

In order to ascertain the equivalence of the defined vegetation units with the Honeymyrtle shrubland TEC, the sampled quadrats and relevés supporting *Melaleuca huegelii*, *Melalecua systena* and/or *Banksia sessilis* were assessed using a checklist developed from the Conservation Advice (DCCEEW 2023d). The checklist includes the key characteristics of the TEC, including botanical region, soil and landform types and required or typical species.

All quadrats within vegetation unit MhTrS meet the key diagnostic criteria, whilst quadrats/relevés within different vegetation units, did not (**Table 18**). The analysis results concluded that vegetation unit MhTrS exhibits characteristics typical of the Honeymyrtle shrubland TEC (DCCEEW 2023d).

Table 18 – Honeymyrtle Shrubland TEC Characterisation

Vegetation Unit		AcBsS		ArSgS					EdSgW		EgSg	MhTrS						
Quadrat/ Relevé		DR01	MP05r	DR02r	DR05	MP06	MP08	MP12	DR06	MP10	MP02	DR07	MP01	MP04	MP13r	MP14	MP15	MP16
Key Character (see Key)	a)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	b)	-	-	-	-	+	+	+	-	-	+	+	+	+	+	+	+	+
	c)	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
	d)	+	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+
	e)	-	-	-	+	-	-	-	+	-	-	+	+	+	-	-	+	+
Confirmed		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Key

a) Perth subregion (SWA02) of the Swan Coastal Plain IBRA7 Bioregion in Western Australia
b) Mainly on the ridge slopes and tops of limestone ridges and outcrops associated with Tamala Limestone
c) Mainly as shrubland, heath, or as thickets; and has less than 10% tree canopy cover
d) The dominant shrub layer species are: *Melaleuca huegelii, M. systena*, and/or *Banksia sessilis*. Commonly over *Acacia lasiocarpa, Grevillea preissii* and *Spyridium globulosum*
e) The ground layer is typically abundant with herbs, and may have a mossy ground cover

In accordance with the approved Conservation Advice, there is no minimum vegetation condition threshold for the Honeymyrtle shrubland TEC, and minimum patch size is 0.01 ha (DCCEEW 2023d). Therefore, also in accordance with the approved Conservation Advice (DCCEEW 2023d), the confirmed extent of the Honeymyrtle shrubland TEC within the study area was determined to be all areas meeting the key diagnostic criteria (**Table 18**). Where breaks of tracks and exposed areas of soils occur the patch extent was altered, separate patches are defined by breaks up to 30 m. A total of six patches, occur within the study area, ranging from 0.12 ha to 10.34 ha. In conclusion, all areas of the floristic community/vegetation unit MhTrS and representative of the Honeymyrtle shrubland TEC, are eligible for inclusion as the nationally protected TEC, covering an area of 23.25 ha (21.60%) in the study area (**Figure 23**).

5.2.5.3 *SCP26a Melaleuca huegelii – M. systena shrublands of limestone ridges TEC*

The *'Melaleuca huegelii – M. systena* shrublands of limestone ridges TEC (floristic community type 26a as originally described in (Gibson *et al.* 1994)*'* (SCP 26a) is considered to correspond to the Honeymyrtle shrublands TEC (DCCEEW 2023d; DBCA 2023c). This vegetation unit ranges from 'Completely Degraded' to 'Excellent' in the study area. Where vegetation was considered to be in 'Degraded' or poorer condition, including minor tracks and cleared areas (DCCEEW 2023d), it is not considered to be representative FCT 26a (since floristic analysis relies on vegetation being in approximately 'Good or better condition), and therefore, such degraded vegetation is not representative of the State-listed TEC. Areas considered representative of the SCP 26a TEC occupy 19.72 ha (18.32%) of the study area (**Figure 23**).

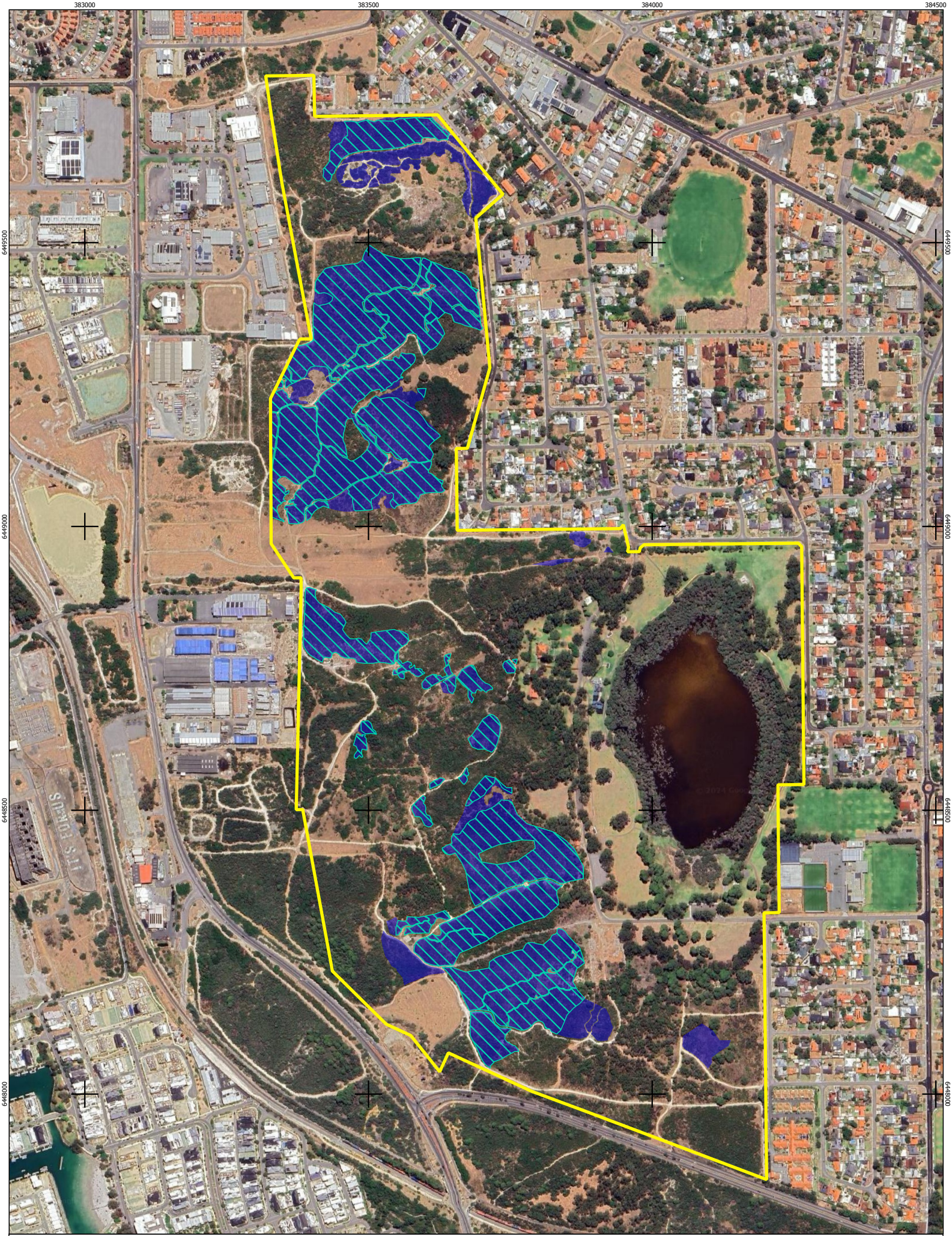

Figure 23 - Honeymyrtle Shrubland TEC and SCP 26a TEC Extent

5.2.5.4 *SCP24 Northern Spearwood Shrublands and Woodlands (FCT 24) PEC*

The Northern Spearwood shrublands and woodlands PEC (SCP 24) is defined as heaths with *Banksia attenuata* and *Banksia menziesii* with scattered *Eucalyptus gomphocephala* occurring on deeper soils occurring from Rockingham to Alkimos. This FCT is associated Tuart woodlands and forests TEC and the Banksia Woodlands TEC, providing key species are present. The heathlands in this group typically include *Banksia sessilis*, *Calothamnus quadrifidus* and *Schoenus grandiflorus* (DCCEEW 2016). Other species typical for this community are *Lepidosperma angustatum*, *Desmocladus flexuosus, Melaleuca systena, Xanthorrhoea preissii, Phyllanthus calycinus, Dianella revoluta, Conostylis aculeata* and *Lomandra maritima* (Gibson *et al.* 1994).

Floristic analysis against the Gibson *et al.* (1994) and Keighery *et al.* (2012) dataset indicates that vegetation unit EdSgW has the greatest affinity to FCT 24, supporting vegetation structure and composition similar to this FCT (**Table 14**). This vegetation unit ranges from 'Degraded' to 'Very Good'. Where vegetation was considered to be in 'Degraded' or poorer condition, it is not considered to be representative FCT 24, and therefore, not considered representative of the SCP 24 PEC. A total of 5.44 ha (5.05%) study area and is considered to represent the 'Northern Spearwood shrublands and woodlands' PEC (SCP 24) (**Figure 24**).

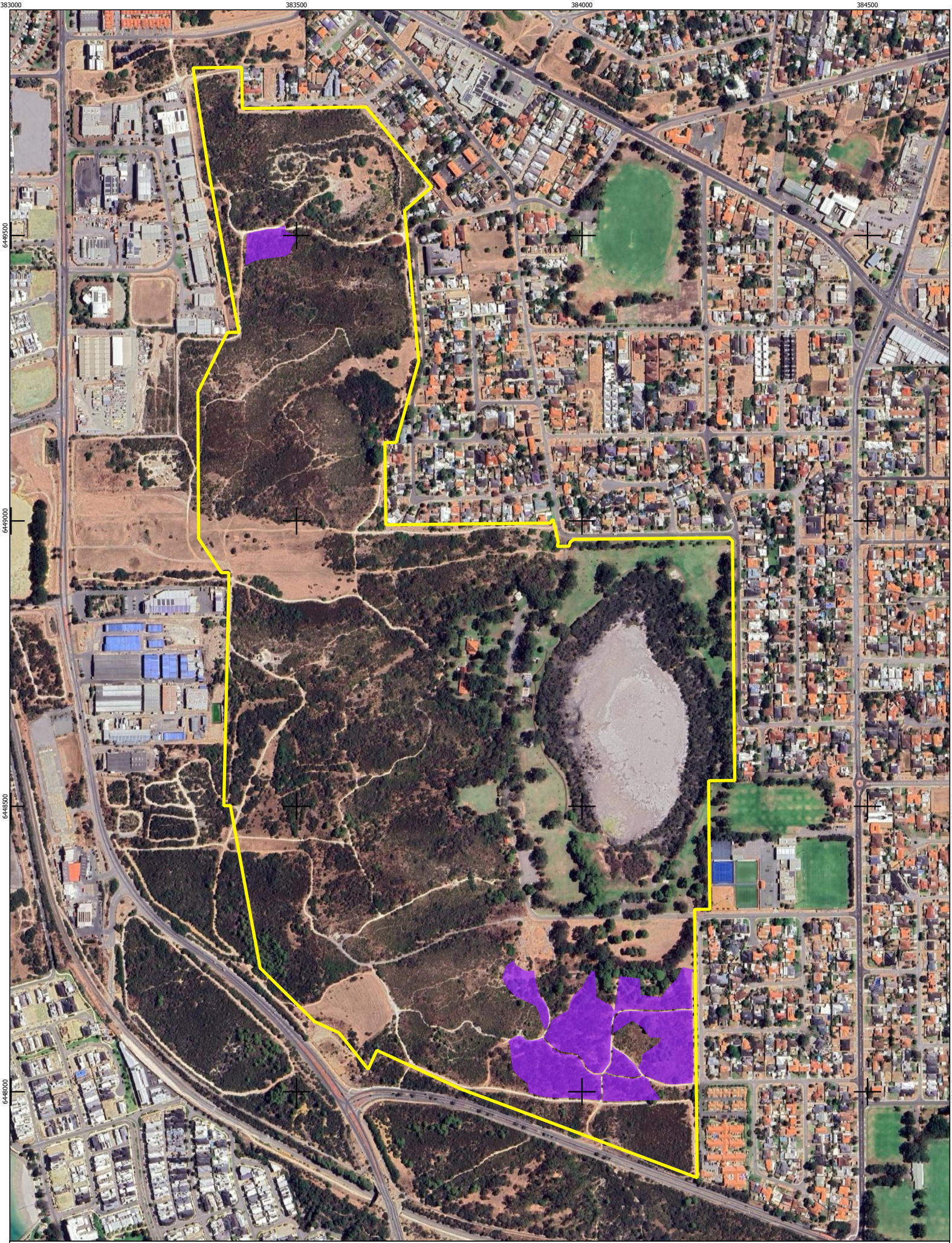

Figure 24 - SCP 24 PEC Extent

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6 DISCUSSION

6.1 FLORA

A total of 156 flora species, from 118 genera and 56 families were recorded during the field survey. The study area supports a high proportion (48.72%) of introduced weeds species, which can be attributed to the disturbed state of some parts of the study area and its close proximity to cleared, recreational areas, infrastructure such as roads, residential, commercial, and industrial properties, and other land uses that necessitated the removal of vegetation and habitat.

Reassessment of the likelihood of occurrence of Threatened and Priority flora post-field survey confirmed that no Threatened flora are deemed possible or likely to occur naturally in the study area. However, three Priority flora are considered likely to occur, and two were recorded within the study area. This determination was based on field observations, indicating the absence of suitable habitat within the study area. Vegetation within the study area was traversed on foot, where possible. Given the level of survey intensity, the habitats provided, and the condition of the study area, further targeted surveys to detect additional significant flora species are not considered to be necessary. However, further surveys would better ascertain the population numbers and extents of the Priority recorded, discussed further below.

The survey confirmed the presence of two Priority flora species, identified during the desktop assessment. A total of 61 individuals of the Priority 3 species, *Pimelea calcicola* (found within vegetation units ArSgS, AcBsS and MhTrS), and one individual of the Priority 4 species, *Dodonaea hackettiana* (found in vegetation unit MhTrS), were recorded within the study area during the 2020 and 2023 FVC field assessments. It is likely that further surveys would record additional *Pimelea calcicola* individuals within the survey area. The single *Dodonaea hackettiana* plant recorded is likely to have been planted, as it is a commonly planted species within the City and therefore no others may occur. However, this species is also known to be locally abundant in natural and planted populations.

None of the recorded flora were found to be occurring outside their known range, as determined by known distributions from WA Herbarium records. None of the recorded flora are undescribed (not formally described and published in a scientific journal) taxa. Nineteen taxa were not able to be identified to species level and one was not able to be identified to genus level. None of these 19 taxa are considered likely to represent Threatened or Priority flora.

Out of the 38 introduced species recorded within the study area, two DP plants are listed under the BAM Act and are also classed as WoNS (**Asparagus asparagoides*, commonly known as Bridal Creeper and, **Lantana camara* commonly called Common Lantana), Bridal Creeper was found across the majority of the study area, whereas Common Lantana was found in three isolated areas within the middle of the study area, plus one individual in the north. Bridal Creeper is a highly invasive weed which spreads along roadsides, town allotments and invades dry coastal vegetation and undisturbed bushland as its seeds are spread by birds (DPRID 2017). Common Lantana is a highly invasive weed spreading along rivers and near wetlands, usually spread by birds, all parts of the plant are considered poisonous and is toxic to livestock (DPRID 2017). Any proposed activities in the study area should ensure no degradation of the surrounding environment as a result of further proliferation of Bridal Creeper or other weed species.

6.2 VEGETATION

6.2.1 Vegetation Units

Six vegetation units (AcBsS, ArSgS, EdSgW, EgSgW, MhTrS and MrGtW) were identified across the study area based on data collected in the 2023 and 2020 FVC surveys from a total of 18 quadrats and six relevés. These units constitute 66.72% (71.81 ha) of the study area, with the remaining area comprising open water (4.93% or 5.31 ha) and modified land (28.35% or 30.51 ha).

Of the six vegetation units, one, MrGtW, is associated with water availability, only occurring in association with a conservation category wetland, Manning Lake. The evidence for this conclusion is the dominant presence of the riparian species, *Melaleuca rhaphiophylla* (White *et al.* 2021).

6.2.2 Vegetation Condition

The condition of the vegetation within the study area ranges from 'Excellent' to 'Completely Degraded', with the majority found to be in 'Good' and 'Very Good' condition.

A large proportion of weeds were recorded, a reflection of the disturbed nature of the study area. This is evident as the study area is within or in proximity to cleared or disturbed areas including roads, residential, commercial and industrial properties. In addition, within the study area, there are numerous cleared recreational areas and access paths throughout Manning Park Reserve and adjacent areas, which are a source of existing and ongoing degradation in the forms of weed invasion, erosion and further clearing through expansion of the unrationalised path and trail network.

Areas that have been subject to disturbance and historic clearing support vegetation of poorer quality, which is evident along tracks and areas that have been extensively modified. Areas of higher-quality vegetation were predominantly observed in the central part of the study area, primarily within the vegetation unit MhTrW, which mainly ranges from 'Excellent' to 'Good' condition.

6.2.3 Vegetation Representation

EPA's Position Statement No. 2 lists a series of objectives which relate to biodiversity (EPA 2000). One of them is to protect at least 30% of the original extent of vegetation complexes in unconstrained areas and 10% in constrained areas (i.e. urban regions). All documented (Beard 1990) remaining vegetation extents in the study area are above the minimum 10% threshold level and therefore meet the EPA objective of retention for the purposes of biodiversity conservation.

6.2.4 Threatened and Priority Ecological Communities

Just over half of the study area (54.78 ha, 50.90%) was considered to represent one or more of the three TECs and two PECs identified, with TECs covering a total of 49.50 ha (45.99%) and PECs covering a total of 17.34 ha (16.11%) of the study area (**Figure 25**).

Among the six vegetation units, two, EdEgW and MhTrS, are characteristic of the SCP24 PEC and SCP26a TEC, respectively, based on FCT analysis. Additionally, the Tuart Woodlands and Forests TEC and Honeymyrtle shrubland TEC were identified to occur based on approved conservation advice. (**Table 19**).

Vegetation unit, MhTrS, features a dominant shrub layer characteristic of the Commonwealth-listed, Critically Endangered, Honeymyrtle shrubland TEC. Evaluation of this vegetation unit against the key diagnostic criteria outlined in the Conservation Advice concluded that it meets the condition thresholds to be eligible for inclusion as the nationally protected TEC.

Vegetation unit, EgSgW (and other areas of isolated Tuart trees), contains a canopy characteristic of the Commonwealth-listed, Critically Endangered, Tuart Woodlands and Forests TEC. Assessment of this vegetation

unit against key diagnostic criteria as per the Conservation Advice (DEE 2016) determined that there are three patches occupying a total area of 27.75 ha in the study area that are eligible for inclusion as the nationally protected TEC.

Table 19 – Threatened and Priority Ecological Communities Recorded in the Study Area

Abbreviated Identifier	EPBC Cons. Status	WA Cons. Status	Representative Vegetation	Area (ha)	Area (%)	% of Bushland Area
Tuart Woodlands and Forests	Critically Endangered		EgSgW, Parkland, Revegetation, Other Uses	27.75	25.78	38.64
Honeymyrtle shrubland	Critically Endangered	-	MhTrS	23.25	21.60	32.38
SCP26a	-	Critically Endangered	MhTrS (in 'Good' or better condition)	19.72	18.32	27.46
			Sub-Total TECs	**49.50**	**45.99**	**68.93**
Tuart Woodlands and Forests	-	Priority 3	EgSgW (in 'Good' or better condition)	12.07	11.21	16.81
SCP24	-	Priority 3	EdSgW (in 'Good' or better condition)	5.44	5.05	7.58
			Sub-Total TOTAL PECs	**17.34**	**16.11**	**24.15**
			TOTAL ALL TECs and PECs*	**54.78**	**50.90**	**76.28**

^Extent of Tuart Woodland and Forest TEC overlap with other TECs and PECs

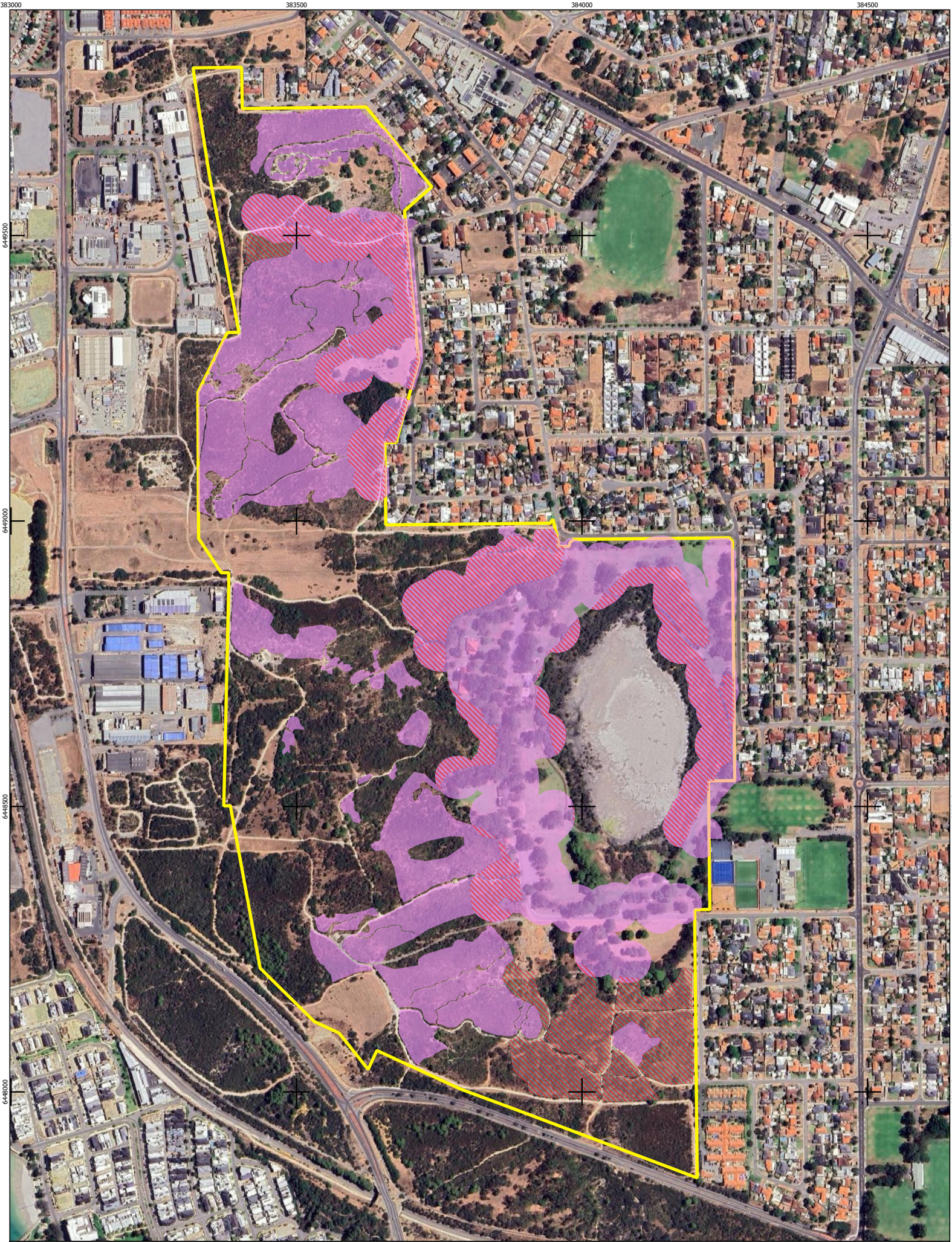

Figure 25 - Recorded Threatened and Priority Ecological Communities

6.3 VEGETATION OF SIGNIFICANCE

6.3.1 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 (DCCEEW 2023c).

6.3.1.1 *Threatened Flora*

No EPBC-listed Threatened flora were recorded in the field assessment; therefore, none of the recorded vegetation units are of significance due to this factor.

6.3.1.2 *Threatened Ecological Communities*

Two EPBC listed TECs were recorded within the study area, the Tuart Woodlands and Forests TEC and the Honeymyrtle shrublands TEC. Vegetation units EgSgW and MhTrS are associated with these TECs and therefore may be considered to be of national significance.

6.3.1.3 *Ramsar Wetlands*

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

6.3.2 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.

6.3.2.1 *Threatened Flora*

No State-listed Threatened flora were recorded within the study area, nor are any likely to occur, and therefore, none of the recorded vegetation units are of significance due to this factor.

6.3.2.2 *Threatened Ecological Communities*

One State listed TEC is considered to occur within the study area, SCP 26a. This TEC is considered to be represented by vegetation unit MhTrS which therefore may be of significance due to this factor.

6.3.2.3 *Conservation Estate*

No DBCA Conservation Reserves or Estates occur within the study area. Therefore, none of the defined vegetation units are significant due to this factor.

6.3.3 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
- their role in maintaining important ecological processes
- the presence of flora species exhibiting range extensions or undescribed species
- having a restricted regional distribution
- being represented by less than 10% of the pre-European extent.

6.3.3.1 *Priority Flora*

Two Priority flora species, *Pimelea calcicola* (P3) and *Dodonaea hackettiana* (P4), were recorded within the study area in vegetation units AcBsS, ArSgS and MhTrS, which therefore, may considered to be of regional significance.

6.3.3.2 *Priority Ecological Communities*

Two PECs were recorded within the study area, Tuart Woodlands and Forests PEC and FCT 24. Vegetation units EgSgW and EdSgW are considered representative of these PECs and therefore may be considered to be of regional significance.

6.3.3.3 *ESAs or Conservation Areas*

The study area intersects with the buffer of one ESA and supports a Bush Forever Site, *Site 247 – Manning Lake and Adjacent Bushland, Hamilton Hill/Spearwood*. Therefore, all recorded vegetation units, AcBsS, ArSgS, EdSgW, EgSgW, MhTrS and MrGtW may considered to be of regional significance.

6.3.3.4 *Conservation Category Wetlands*

One Conservation Category Wetland, Manning Lake, occurs within the study area intersecting with remnant vegetation units EgSgW and MrGtW. Therefore, these vegetation units may considered to be of regional significance.

6.3.3.5 *Role in Maintaining Important Ecological Processes*

One of the recorded vegetation units, MrGtW, is associated with Manning Lake, which would rely on this vegetation to maintain important ecological processes associated with the wetland's function. Therefore, vegetation units MrGtW may be considered to be of regional significance.

6.3.3.6 *Range Extending and Undescribed Flora*

Of the recorded flora, none are considered to be exhibiting an extension beyond their currently documented range of occurrence, in accordance with records of the WAH (WAH 1998-), nor are any undescribed flora, and therefore, none of the recorded vegetation units are of significance due to this factor .

6.3.3.7 *Restricted Regional Representation and Distribution*

The one vegetation association defined by Shepherd *et al.* (2002) and the two complexes defined by Heddle *et al.* (1980) that are supported by the study area are all well-represented and distributed regionally (**Section 3.4**), and therefore, none of the recorded vegetation units are of significance due to this factor.

6.3.3.8 *Extent Remaining*

The one vegetation association defined by Shepherd *et al.* (2002) and the two complexes defined by Heddle *et al.* (1980) that are supported by the study area are all currently represented by more than 10% of their pre-European extent (**Section 3.4**), and therefore, none of the recorded vegetation units are of significance due to this factor.

6.3.4 Locally Significant Vegetation

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

- the presence of small, isolated communities
- the local extent (proportion) and/or distribution.

6.3.4.1 *Small, Isolated Communities*

Although some occurrences of some of the mapped vegetation units occur as small, isolated occurrences, they are all also represented in larger extents, and therefore, none are considered to be of local significance due to this factor.

6.3.4.2 *Limited Extent and Distribution*

One of the recorded vegetation units, MrGtW, is considered to be limited in its local distribution, restricted to the fringes of Manning Lake, and therefore, may be considered to be of local significance.

6.3.5 Summary of Vegetation Significance

The significant vegetation units of the study area, along with the aspects determining their significance, are summarised in **Table 20**. The level of significance for each vegetation unit is broadly summarised in **Table 21**.

Table 20 –Summary of Level of Potential Significance

Scale	Significance Aspect	Vegetation Units
National Significance	Populations of Threatened (EPBC listed) species	-
	Presence of EPBC listed TECs	EgSgW, MhTrS
	Presence of Ramsar wetlands	-
State Significance	Presence of State-listed Threatened flora	-
	Presence of State-listed TECs	MhTrS
	Land within in the Conservation Estate	-
Regional Significance	Presence of Priority flora	AcBsS, ArSgS, MhTrS
	Presence of PECs	EdSgW, EgSgW
	Presence of ESAs or areas relevant to a conservation scheme	AcBsS, ArSgS, EdSgW, EgSgW, MhTrS, MrGtW
	Presence of conservation category wetlands	EgSgW, MrGtW
	Role in maintaining important ecological processed	MrGtW
	Presence of flora species exhibiting a range extension	-
	Presence of undescribed flora	-
	Having a restricted regional representation and distribution	-
	Represented by less than 10% of the pre-European extent	-
Local Significance	Small, isolated communities	-
	Having a limited local extent and distribution	MrGtW

Table 21 – Summary of the Potential Significance of Vegetation Units

Vegetation Unit	Overall Significance – Factor of Significance	Area (ha)	Survey Area (%)
AcBsS	Regional Significance - Presence of Priority flora Regional Significance - Presence of ESAs or areas relevant to a conservation scheme	11.71	10.88
ArSgS	Regional Significance - Presence of Priority flora Regional Significance - Presence of ESAs or areas relevant to a conservation scheme	17.01	15.80
EdSgW	Regional Significance - Presence of PECs Regional Significance - Presence of ESAs or areas relevant to a conservation scheme	6.18	5.74
EgSgW	National Significance - Presence of EPBC listed TECs Regional Significance - Presence of PECs Regional Significance - Presence of ESAs or areas relevant to a conservation scheme Regional Significance - Presence of conservation category wetlands	6.56	6.10
MhTrS	National Significance - Presence of EPBC listed TEC State Significance – Presence of State-Listed TEC Regional Significance - Presence of Priority flora Regional Significance - Presence of ESAs or areas relevant to a conservation scheme	25.08	23.30
MrGtW	Regional Significance - Presence of conservation category wetlands Regional Significance - Role in maintaining important ecological processes Local Significance – Having limited local extent or distribution	5.27	4.90

6.3.6 Areas of Significant Floristic Value

Further to the areas of vegetation of significance listed above, vegetation supporting Priority flora, representative of TECs or PECs, and in 'Very Good' or better condition are considered areas of significant floristic value. These combined areas are presented in **Figure 26**.

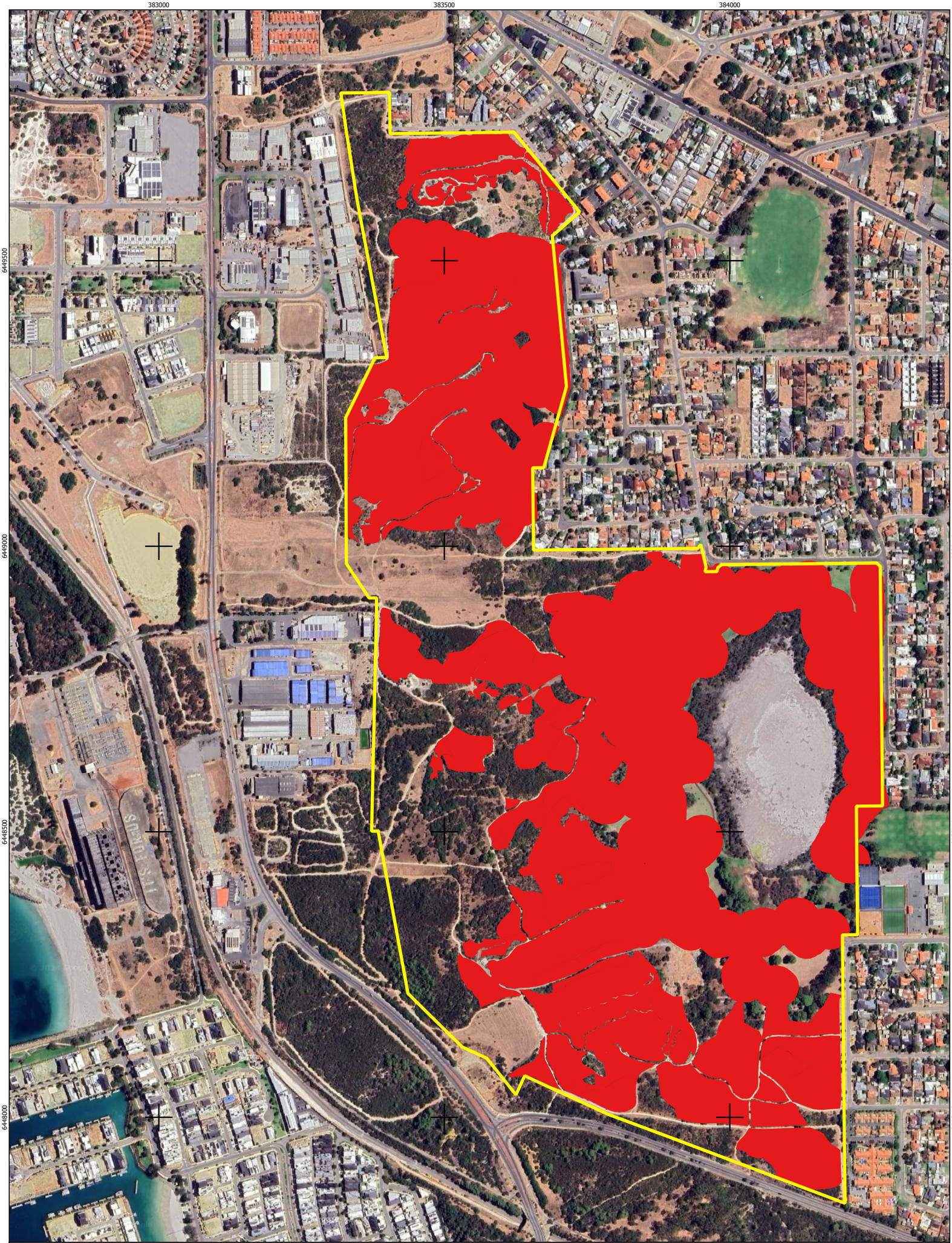

Figure 26 - Areas of Significant Floristic Values

7 CONCLUSIONS

The key findings, conclusions and recommendations arising from the flora and vegetation assessment within the study area are as follows:

- The timing of the field assessment (October - November) was considered optimal for the identification of flowering flora or annual and ephemeral species.
- No Threatened flora were recorded within the study area.
- Two Priority flora, *Pimelea calcicola* (Priority 3), and *Dodanoaea hackettiana* (Priority 4) were recorded within vegetation units ArSgS and MhTrS.
- Two of the recorded weed species, Bridal Creeper (**Asparagus asparagoides*) and Common Lantana (**Lantana camara*) are listed as a Declared Pest (DP) plant under the *Biosecurity and Agricultural Management* (BAM) Act (DPIRD 2017a) and as a WoNS (CISS 2021); however, as it is listed under the "Exempt' category, landholders are under no obligation to control infestations.
- None of the recorded flora species are exhibiting an extension beyond their currently documented range and no flora species were undescribed.
- A total of six intact vegetation communities AcBsS, ArSgS, EdSgW, EgSgW, MhTrS, and MrGtW were recorded and mapped for the study area.
- The vegetation condition within the study area was found to range from 'Completely Degraded' to 'Excellent', with the majority (29.43%) in 'Good' condition.
- The percentage of Bushland Area within the study area was 66.72% (71.81 ha)
- The desktop assessment identified three TECs and/or PECs and or their buffers that occur within the study area, but did not report that FCT *SCP 24 Northern Spearwood shrublands and woodlands* (a PEC) occurs within the study area.
- One vegetation unit, EgSgW, was found to meet key diagnostic criteria, and therefore be representative of the Commonwealth-Listed ecological community, Tuart woodlands and forests TEC. Three patches of Tuart woodlands and forests were confirmed to be part of the nationally protected ecological community, as they meet minimum condition and biotic thresholds.
- One vegetation unit, MhTrS, was found to meet diagnostic criteria, and therefore be representative of the Commonwealth-listed ecological community, Honeymyrtle shrubland TEC. Six patches of Honeymyrtle shrubland were mapped and all of these were confirmed to be part of the nationally protected ecological community as they meet the minimum condition threshold.
- One vegetation unit, MhTrS was considered representative of SCP 26a, which is a State-listed TEC.
- Portions of one vegetation unit, EdSgW that are in 'Good' or better condition are considered representative of the State-listed Priority 3 PEC, SCP 24 – Northern Spearwood Shrublands.
- Vegetation representing three TECs and two PECs was determined to occur across 53.94 ha (50.12%) of the study area, comprised of:
    - Tuart Woodlands and Forests TEC (Commonwealth-listed), covering 27.75 ha across vegetation unit EgSgW, and 'Parkland', 'Revegetation' and 'Other Uses' areas
    - Honeymyrtle Shrublands TEC (Commonwealth-listed), covering 23.25 ha across vegetation unit MhTrS
    - SCP 26a TEC (State-listed), covering 19.72 ha across 'Good' or better condition areas of vegetation unit MhTrS
    - Tuart Woodlands and Forest PEC (State-listed), covering 12.07 ha across areas eligible as the Tuart Woodlands and Forest TEC, associated with vegetation unit EgSgW where vegetation occurs as a native assemblage.

- SCP 24 PEC (State-listed), covering 5.44 ha across 'Good' or better condition areas of vegetation unit EdSgW.

- All areas of vegetation supporting Priority flora, representative of TECs or PECs, and in 'Very Good' or better condition are considered areas of significant floristic value.

The following recommendations are suggested in relation to the development or enhancement of recreational facilities in Manning Park Reserve:

- Where possible, avoid any clearing of native vegetation
- Avoid clearing any 'Areas of Significant Floristic Value'
- Develop an environmental management plan to manage the impacts of recreational use of the park.

8 LIST OF PARTICIPANTS

The personnel who contributed to the project are summarised in **Table 22**.

Table 22 – Project Team

Name	Qualification	Years of Relevant Experience	Role
Kellie Bauer–Simpson Principal Ecologist	B.Sc. Biological Science	25	Project manager, study planning, report technical and authorization review
Linda Hosking Administration		20	Editorial support
Dr. Margaret Collins Botanist/Taxonomist	Ph.D. Botany M.Sc. Biotechnology and Molecular Biology B.Sc. Organic Chemistry and Microbiology (Hons.)	26	Flora identifications
Will Bauer–Simpson Technician	Cert. IV (Health and Safety)	14	Field safety and logistics planning, GIS mapping, spatial analysis, spatial data management
Dr Kristen Bleby Senior Ecologist	BSc. (Hons) Natural Resource Management PhD (Ecology)	11	Report technical review
Taryn Brebner Botanist/Ecologist (FB62000156)	BSc. (Conservation Biology)	7	Field survey, report writing
Megan Gray Botanist/Ecologist (FB62000334)	BSc. (Environmental Biology)	4	Field survey, spatial data management, GIS mapping, technical support, technical review
Olga Nazarova Botanist/Ecologist	BSc (Botany and Genetics)	4	Flora identification, report writing, floristic analysis, data management
Vaida Seikyte GIS Technician	B.Sc. Geography	2	GIS mapping, spatial analysis, spatial data management
Sarah Beckwith Graduate Botanist/Ecologist (FB62000535)	BSc. (Conservation Biology)	1	Field survey, report support
Aishwarya Gujarathi Botanist/Ecologist (FB62000581)	BSc. (Botany) MSc. Environmental Science	2	Field survey, report support

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APPENDIX A - DBCA NATURE MAP SEARCH REPORT

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Grevillea thelemanniana*	Critically endangered
Plantae	DICOT	*Acacia lasiocarpa* var. bracteolata long peduncle variant (G.J. Keighery 5026)	Priority 1
Plantae	DICOT	*Hydrocotyle striata*	Priority 1
Plantae	DICOT	*Bossiaea modesta*	Priority 2
Plantae	DICOT	*Angianthus micropodioides*	Priority 3
Plantae	DICOT	*Beyeria cinerea* subsp. *cinerea*	Priority 3
Plantae	DICOT	*Dampiera triloba*	Priority 3
Plantae	DICOT	*Jacksonia gracillima*	Priority 3
Plantae	DICOT	*Pimelea calcicola*	Priority 3
Plantae	DICOT	*Stylidium maritimum*	Priority 3
Plantae	DICOT	*Stylidium paludicola*	Priority 3
Plantae	DICOT	*Styphelia filifolia*	Priority 3
Plantae	DICOT	*Calothamnus graniticus* subsp. *leptophyllus*	Priority 4
Plantae	DICOT	*Dodonaea hackettiana*	Priority 4
Plantae	DICOT	*Grevillea olivacea*	Priority 4
Plantae	DICOT	*Hydrocotyle lemnoides*	Priority 4
Plantae	DICOT	*Jacksonia sericea*	Priority 4
Plantae	DICOT	*Stylidium longitubum*	Priority 4
Plantae	DICOT	?*Astroloma pallidum*	-
Plantae	DICOT	?*Dampiera linearis*	-
Plantae	DICOT	?*Lactuca serriola*	-
Plantae	DICOT	?*Solanum nigrum*	-
Plantae	DICOT	?*Wahlenbergia capensis*	-
Plantae	DICOT	*Acacia applanata*	-
Plantae	DICOT	*Acacia cochlearis*	-
Plantae	DICOT	*Acacia cyclops*	-
Plantae	DICOT	*Acacia divergens*	-
Plantae	DICOT	*Acacia huegelii*	-
Plantae	DICOT	*Acacia iteaphylla*	-
Plantae	DICOT	*Acacia lasiocarpa*	-
Plantae	DICOT	*Acacia lasiocarpa* var. *lasiocarpa*	-
Plantae	DICOT	*Acacia longifolia*	-
Plantae	DICOT	*Acacia longifolia* subsp. *longifolia*	-
Plantae	DICOT	*Acacia microbotrya*	-
Plantae	DICOT	*Acacia pulchella*	-
Plantae	DICOT	*Acacia pulchella* var. *glaberrima*	-
Plantae	DICOT	*Acacia pulchella* var. *glaberrima* x *pulchella* var. *pulchella*	-
Plantae	DICOT	*Acacia pulchella* var. *pulchella*	-
Plantae	DICOT	*Acacia rostellifera*	-
Plantae	DICOT	*Acacia saligna*	-
Plantae	DICOT	*Acacia saligna* subsp. *saligna*	-
Plantae	DICOT	*Acacia* sp.	-
Plantae	DICOT	*Acacia stenoptera*	-
Plantae	DICOT	*Acacia truncata*	-
Plantae	DICOT	*Acacia willdenowiana*	-
Plantae	DICOT	*Acacia xanthina*	-
Plantae	DICOT	*Acrotriche cordata*	-
Plantae	DICOT	*Adenanthos cygnorum* subsp. *cygnorum*	-
Plantae	DICOT	*Adenanthos obovatus*	-
Plantae	DICOT	*Adriana quadripartita*	-
Plantae	DICOT	*Ageratina adenophora*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Agonis flexuosa*	-
Plantae	DICOT	*Agonis flexuosa* var. *flexuosa*	-
Plantae	DICOT	*Ailanthus altissima*	-
Plantae	DICOT	*Aizoon pubescens*	-
Plantae	DICOT	*Allocasuarina fraseriana*	-
Plantae	DICOT	*Allocasuarina humilis*	-
Plantae	DICOT	*Alternanthera denticulata*	-
Plantae	DICOT	*Alternanthera nodiflora*	-
Plantae	DICOT	*Alyogyne huegelii*	-
Plantae	DICOT	*Alyogyne huegelii* var. *huegelii*	-
Plantae	DICOT	*Alyxia buxifolia*	-
Plantae	DICOT	*Amaranthus albus*	-
Plantae	DICOT	*Amaranthus blitum*	-
Plantae	DICOT	*Amaranthus caudatus*	-
Plantae	DICOT	*Amaranthus lividus*	-
Plantae	DICOT	*Amaranthus powellii*	-
Plantae	DICOT	*Amaranthus* sp.	-
Plantae	DICOT	*Amaranthus viridis*	-
Plantae	DICOT	*Anagallis arvensis*	-
Plantae	DICOT	*Anchusa capensis*	-
Plantae	DICOT	*Anredera cordifolia*	-
Plantae	DICOT	*Anthotium junciforme*	-
Plantae	DICOT	*Aotus cordifolia*	-
Plantae	DICOT	*Aotus gracillima*	-
Plantae	DICOT	*Aotus procumbens*	-
Plantae	DICOT	*Apium annuum*	-
Plantae	DICOT	*Apium prostratum*	-
Plantae	DICOT	*Apium prostratum* subsp. *prostratum* var. *prostratum*	-
Plantae	DICOT	*Arctotheca calendula*	-
Plantae	DICOT	*Arctotheca calendula* x *populifolia*	-
Plantae	DICOT	*Arctotheca populifolia*	-
Plantae	DICOT	*Arenaria leptoclados*	-
Plantae	DICOT	*Argemone ochroleuca* subsp. *ochroleuca*	-
Plantae	DICOT	*Argyranthemum frutescens*	-
Plantae	DICOT	*Argyranthemum frutescens* subsp. *foeniculaceum*	-
Plantae	DICOT	*Asclepias curassavica*	-
Plantae	DICOT	*Astartea* aff. *fascicularis*	-
Plantae	DICOT	*Astartea scoparia*	-
Plantae	DICOT	*Asteridea pulverulenta*	-
Plantae	DICOT	*Astroloma microcalyx*	-
Plantae	DICOT	*Astroloma pallidum*	-
Plantae	DICOT	*Astroloma xerophyllum*	-
Plantae	DICOT	*Atriplex cinerea*	-
Plantae	DICOT	*Atriplex hypoleuca*	-
Plantae	DICOT	*Atriplex isatidea*	-
Plantae	DICOT	*Atriplex prostrata*	-
Plantae	DICOT	*Babingtonia camphorosmae*	-
Plantae	DICOT	*Bacopa monnieri*	-
Plantae	DICOT	*Banksia attenuata*	-
Plantae	DICOT	*Banksia dallanneyi* subsp. *dallanneyi* var. *dallanneyi*	-
Plantae	DICOT	*Banksia grandis*	-
Plantae	DICOT	*Banksia ilicifolia*	-
Plantae	DICOT	*Banksia littoralis*	-
Plantae	DICOT	*Banksia menziesii*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Banksia sessilis* var. *cygnorum*	-
Plantae	DICOT	*Bartsia trixago*	-
Plantae	DICOT	*Beaufortia elegans*	-
Plantae	DICOT	*Bellardia trixago*	-
Plantae	DICOT	*Bellardia viscosa*	-
Plantae	DICOT	*Beyeria viscosa*	-
Plantae	DICOT	*Bidens pilosa*	-
Plantae	DICOT	*Billardiera fraseri*	-
Plantae	DICOT	*Boronia alata*	-
Plantae	DICOT	*Boronia crenulata*	-
Plantae	DICOT	*Boronia crenulata* subsp. *viminea*	-
Plantae	DICOT	*Boronia dichotoma*	-
Plantae	DICOT	*Boronia fastigiata*	-
Plantae	DICOT	*Boronia ramosa*	-
Plantae	DICOT	*Bossiaea eriocarpa*	-
Plantae	DICOT	*Brachyloma preissii*	-
Plantae	DICOT	*Brachyscome bellidioides*	-
Plantae	DICOT	*Brachyscome iberidifolia*	-
Plantae	DICOT	*Brachyscome pusilla*	-
Plantae	DICOT	*Brassica tournefortii*	-
Plantae	DICOT	*Brassica* x *napus*	-
Plantae	DICOT	*Buglossoides arvensis*	-
Plantae	DICOT	*Cakile maritima*	-
Plantae	DICOT	*Calandrinia brevipedata*	-
Plantae	DICOT	*Calandrinia calyptrata*	-
Plantae	DICOT	*Calandrinia corrigioloides*	-
Plantae	DICOT	*Calandrinia liniflora*	-
Plantae	DICOT	*Calceolaria tripartita*	-
Plantae	DICOT	*Callitriche brutia* subsp. *brutia*	-
Plantae	DICOT	*Calothamnus lateralis*	-
Plantae	DICOT	*Calothamnus quadrifidus*	-
Plantae	DICOT	*Calothamnus quadrifidus* subsp. *angustifolius*	-
Plantae	DICOT	*Calothamnus quadrifidus* subsp. *quadrifidus*	-
Plantae	DICOT	*Calothamnus sanguineus*	-
Plantae	DICOT	*Calothamnus validus*	-
Plantae	DICOT	*Calytrix angulata*	-
Plantae	DICOT	*Calytrix flavescens*	-
Plantae	DICOT	*Calytrix flavescens* x *fraseri*	-
Plantae	DICOT	*Calytrix fraseri*	-
Plantae	DICOT	*Capsella bursa-pastoris*	-
Plantae	DICOT	*Cardamine occulta*	-
Plantae	DICOT	*Cardiospermum grandiflorum*	-
Plantae	DICOT	*Carduus pycnocephalus*	-
Plantae	DICOT	*Carpobrotus aequilaterus*	-
Plantae	DICOT	*Carpobrotus edulis*	-
Plantae	DICOT	*Carpobrotus* sp.	-
Plantae	DICOT	*Carthamus lanatus*	-
Plantae	DICOT	*Cassytha flava*	-
Plantae	DICOT	*Cassytha racemosa*	-
Plantae	DICOT	*Casuarina cunninghamiana*	-
Plantae	DICOT	*Casuarina equisetifolia*	-
Plantae	DICOT	*Casuarina glauca*	-
Plantae	DICOT	*Casuarina obesa*	-
Plantae	DICOT	*Centaurea calcitrapa*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Centaurea melitensis*	-
Plantae	DICOT	*Centaurium erythraea*	-
Plantae	DICOT	*Centaurium tenuiflorum*	-
Plantae	DICOT	*Centella asiatica*	-
Plantae	DICOT	*Centranthus macrosiphon*	-
Plantae	DICOT	*Cerastium glomeratum*	-
Plantae	DICOT	*Chamaecytisus palmensis*	-
Plantae	DICOT	*Chamelaucium uncinatum*	-
Plantae	DICOT	*Chenopodium album*	-
Plantae	DICOT	*Chenopodium glaucum*	-
Plantae	DICOT	*Chenopodium macrospermum*	-
Plantae	DICOT	*Chenopodium murale*	-
Plantae	DICOT	*Chondrilla juncea*	-
Plantae	DICOT	*Chorizema cordatum*	-
Plantae	DICOT	*Chrysanthemoides monilifera* subsp. *monilifera*	-
Plantae	DICOT	*Cinnamomum camphora*	-
Plantae	DICOT	*Cirsium arvense* var. *arvense*	-
Plantae	DICOT	*Cirsium vulgare*	-
Plantae	DICOT	*Clematis linearifolia*	-
Plantae	DICOT	*Clematis pubescens*	-
Plantae	DICOT	*Comesperma calymega*	-
Plantae	DICOT	*Comesperma ciliatum*	-
Plantae	DICOT	*Comesperma confertum*	-
Plantae	DICOT	*Comesperma flavum*	-
Plantae	DICOT	*Comesperma integerrimum*	-
Plantae	DICOT	*Comesperma virgatum*	-
Plantae	DICOT	*Conospermum triplinervium*	-
Plantae	DICOT	*Conostephium pendulum*	-
Plantae	DICOT	*Conostephium preissii*	-
Plantae	DICOT	*Convolvulus arvensis*	-
Plantae	DICOT	*Convolvulus sabatius* subsp. *mauritanicus*	-
Plantae	DICOT	*Conyza albida*	-
Plantae	DICOT	*Conyza bonariensis*	-
Plantae	DICOT	*Conyza canadensis*	-
Plantae	DICOT	*Conyza* sp.	-
Plantae	DICOT	*Conyza sumatrensis*	-
Plantae	DICOT	*Corrigiola litoralis*	-
Plantae	DICOT	*Corymbia calophylla*	-
Plantae	DICOT	*Cotoneaster pannosus*	-
Plantae	DICOT	*Cotula coronopifolia*	-
Plantae	DICOT	*Cotula cotuloides*	-
Plantae	DICOT	*Cotula turbinata*	-
Plantae	DICOT	*Crassula colorata*	-
Plantae	DICOT	*Crassula colorata* var. *colorata*	-
Plantae	DICOT	*Crassula exserta*	-
Plantae	DICOT	*Crassula glomerata*	-
Plantae	DICOT	*Crassula natans*	-
Plantae	DICOT	*Crassula pedicellosa*	-
Plantae	DICOT	*Crassula* sp.	-
Plantae	DICOT	*Crepis foetida*	-
Plantae	DICOT	*Cristonia biloba* subsp. *biloba*	-
Plantae	DICOT	*Croninia kingiana*	-
Plantae	DICOT	*Cryptandra mutila*	-
Plantae	DICOT	*Cuscuta epithymum*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Cymbalaria muralis* subsp. *muralis*	-
Plantae	DICOT	*Dampiera linearis*	-
Plantae	DICOT	*Dampiera pedunculata*	-
Plantae	DICOT	*Datura metel*	-
Plantae	DICOT	*Daucus glochidiatus*	-
Plantae	DICOT	*Daviesia decurrens* subsp. *decurrens*	-
Plantae	DICOT	*Daviesia divaricata*	-
Plantae	DICOT	*Daviesia divaricata* subsp. *divaricata*	-
Plantae	DICOT	*Daviesia nudiflora* subsp. *nudiflora*	-
Plantae	DICOT	*Daviesia physodes*	-
Plantae	DICOT	*Daviesia triflora*	-
Plantae	DICOT	*Diplolaena dampieri*	-
Plantae	DICOT	*Diplopeltis huegelii* subsp. *huegelii*	-
Plantae	DICOT	*Diplotaxis muralis*	-
Plantae	DICOT	*Diplotaxis tenuifolia*	-
Plantae	DICOT	*Dischisma arenarium*	-
Plantae	DICOT	*Dischisma capitatum*	-
Plantae	DICOT	*Dittrichia graveolens*	-
Plantae	DICOT	*Dodonaea aptera*	-
Plantae	DICOT	*Drosera drummondii*	-
Plantae	DICOT	*Drosera erythrorhiza*	-
Plantae	DICOT	*Drosera erythrorhiza* subsp. *erythrorhiza*	-
Plantae	DICOT	*Drosera gigantea*	-
Plantae	DICOT	*Drosera glanduligera*	-
Plantae	DICOT	*Drosera macrantha*	-
Plantae	DICOT	*Drosera menziesii*	-
Plantae	DICOT	*Drosera paleacea* subsp. *paleacea*	-
Plantae	DICOT	*Drosera pallida*	-
Plantae	DICOT	*Drosera porrecta*	-
Plantae	DICOT	*Drosera* sp.	-
Plantae	DICOT	*Drosera* sp. "climbing"	-
Plantae	DICOT	*Drosera* sp. indet.	-
Plantae	DICOT	*Drosera stolonifera*	-
Plantae	DICOT	*Drosera subhirtella*	-
Plantae	DICOT	*Drosera zonaria*	-
Plantae	DICOT	*Dryandra nivea*	-
Plantae	DICOT	*Dryandra sessilis*	-
Plantae	DICOT	*Dryandra sessilis* var. *sessilis*	-
Plantae	DICOT	*Dysphania ambrosioides*	-
Plantae	DICOT	*Dysphania multifida*	-
Plantae	DICOT	*Epilobium ciliatum*	-
Plantae	DICOT	*Epilobium hirtigerum*	-
Plantae	DICOT	*Eremaea asterocarpa*	-
Plantae	DICOT	*Eremaea asterocarpa* subsp. *asterocarpa*	-
Plantae	DICOT	*Eremaea pauciflora*	-
Plantae	DICOT	*Eremaea pauciflora* var. *pauciflora*	-
Plantae	DICOT	*Eremophila glabra*	-
Plantae	DICOT	*Eremophila glabra* subsp. *albicans*	-
Plantae	DICOT	*Erigeron karvinskianus*	-
Plantae	DICOT	*Eriostemon spicatus*	-
Plantae	DICOT	*Erodium botrys*	-
Plantae	DICOT	*Erodium cicutarium*	-
Plantae	DICOT	*Erodium moschatum*	-
Plantae	DICOT	*Eryngium pinnatifidum*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Eryngium pinnatifidum* subsp. *pinnatifidum*	-
Plantae	DICOT	*Eucalyptus botryoides*	-
Plantae	DICOT	*Eucalyptus camaldulensis* subsp. *camaldulensis*	-
Plantae	DICOT	*Eucalyptus camaldulensis* subsp. *obtusa*	-
Plantae	DICOT	*Eucalyptus decipiens*	-
Plantae	DICOT	*Eucalyptus erythrocorys*	-
Plantae	DICOT	*Eucalyptus foecunda*	-
Plantae	DICOT	*Eucalyptus gomphocephala*	-
Plantae	DICOT	*Eucalyptus marginata*	-
Plantae	DICOT	*Eucalyptus marginata* subsp. *marginata*	-
Plantae	DICOT	*Eucalyptus patens*	-
Plantae	DICOT	*Eucalyptus petrensis*	-
Plantae	DICOT	*Eucalyptus rudis*	-
Plantae	DICOT	*Eucalyptus rudis* subsp. *rudis*	-
Plantae	DICOT	*Eucalyptus todtiana*	-
Plantae	DICOT	*Eucalyptus utilis*	-
Plantae	DICOT	*Euchilopsis linearis*	-
Plantae	DICOT	*Euphorbia arborea*	-
Plantae	DICOT	*Euphorbia helioscopia*	-
Plantae	DICOT	*Euphorbia maculata*	-
Plantae	DICOT	*Euphorbia paralias*	-
Plantae	DICOT	*Euphorbia peplus*	-
Plantae	DICOT	*Euphorbia prostrata*	-
Plantae	DICOT	*Euphorbia terracina*	-
Plantae	DICOT	*Eutaxia virgata*	-
Plantae	DICOT	*Exocarpos sparteus*	-
Plantae	DICOT	*Ficus carica*	-
Plantae	DICOT	*Foeniculum vulgare*	-
Plantae	DICOT	*Frankenia pauciflora*	-
Plantae	DICOT	*Fumaria bastardii*	-
Plantae	DICOT	*Fumaria capreolata*	-
Plantae	DICOT	*Fumaria muralis* subsp. *muralis*	-
Plantae	DICOT	*Galinsoga parviflora*	-
Plantae	DICOT	*Galium aparine*	-
Plantae	DICOT	*Galium murale*	-
Plantae	DICOT	*Gastrolobium capitatum*	-
Plantae	DICOT	*Gastrolobium ebracteolatum*	-
Plantae	DICOT	*Gastrolobium linearifolium*	-
Plantae	DICOT	*Gastrolobium nervosum*	-
Plantae	DICOT	*Gazania linearis*	-
Plantae	DICOT	*Geranium molle*	-
Plantae	DICOT	*Glebionis coronaria*	-
Plantae	DICOT	*Gnaphalium* sp. indet.	-
Plantae	DICOT	*Gnephosis angianthoides*	-
Plantae	DICOT	*Gomphocarpus fruticosus*	-
Plantae	DICOT	*Gompholobium aristatum*	-
Plantae	DICOT	*Gompholobium confertum*	-
Plantae	DICOT	*Gompholobium tomentosum*	-
Plantae	DICOT	*Gonocarpus pithyoides*	-
Plantae	DICOT	*Goodenia pulchella* subsp. Coastal Plain A (M. Hislop 634)	-
Plantae	DICOT	*Goodenia scapigera*	-
Plantae	DICOT	*Goodenia* sp.	-
Plantae	DICOT	*Grammatotheca bergiana* var. *bergiana*	-
Plantae	DICOT	*Gratiola pubescens*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Grevillea crithmifolia*	-
Plantae	DICOT	*Grevillea preissii* subsp. *preissii*	-
Plantae	DICOT	*Grevillea thelemanniana* subsp. *preissii*	-
Plantae	DICOT	*Grevillea vestita*	-
Plantae	DICOT	*Grevillea vestita* subsp. *vestita*	-
Plantae	DICOT	*Gyrostemon ramulosus*	-
Plantae	DICOT	*Hakea amplexicaulis*	-
Plantae	DICOT	*Hakea myrtoides*	-
Plantae	DICOT	*Hakea prostrata*	-
Plantae	DICOT	*Hakea varia*	-
Plantae	DICOT	*Hardenbergia comptoniana*	-
Plantae	DICOT	*Helianthus annuus*	-
Plantae	DICOT	*Helianthus tuberosus*	-
Plantae	DICOT	*Heliophila pusilla*	-
Plantae	DICOT	*Hemiandra linearis*	-
Plantae	DICOT	*Hemiandra pungens*	-
Plantae	DICOT	*Hemiandra pungens* var. *glabra*	-
Plantae	DICOT	*Hemiandra* sp.	-
Plantae	DICOT	*Hemigenia incana*	-
Plantae	DICOT	*Hemigenia sericea*	-
Plantae	DICOT	*Hibbertia amplexicaulis*	-
Plantae	DICOT	*Hibbertia commutata*	-
Plantae	DICOT	*Hibbertia cuneiformis*	-
Plantae	DICOT	*Hibbertia huegelii*	-
Plantae	DICOT	*Hibbertia huegelii complex*	-
Plantae	DICOT	*Hibbertia hypericoides*	-
Plantae	DICOT	*Hibbertia hypericoides* subsp. *hypericoides*	-
Plantae	DICOT	*Hibbertia racemosa*	-
Plantae	DICOT	*Hibbertia spicata* subsp. *leptotheca*	-
Plantae	DICOT	*Hibbertia stellaris*	-
Plantae	DICOT	*Hibbertia striata*	-
Plantae	DICOT	*Hibbertia subvaginata*	-
Plantae	DICOT	*Hibiscus diversifolius* subsp. *diversifolius*	-
Plantae	DICOT	*Homalanthus novo-guineensis*	-
Plantae	DICOT	*Homalosciadium homalocarpum*	-
Plantae	DICOT	*Hornungia procumbens*	-
Plantae	DICOT	*Hovea pungens*	-
Plantae	DICOT	*Hovea trisperma*	-
Plantae	DICOT	*Hovea trisperma* var. *trisperma*	-
Plantae	DICOT	*Hyalosperma cotula*	-
Plantae	DICOT	*Hybanthus calycinus*	-
Plantae	DICOT	*Hydrocotyle hispidula*	-
Plantae	DICOT	*Hydrocotyle ranunculoides*	-
Plantae	DICOT	*Hydrocotyle scutellifera*	-
Plantae	DICOT	*Hypocalymma angustifolium*	-
Plantae	DICOT	*Hypocalymma angustifolium* subsp. Swan Coastal Plain (G.J. Keighery 16777)	-
Plantae	DICOT	*Hypocalymma robustum*	-
Plantae	DICOT	*Hypochaeris glabra*	-
Plantae	DICOT	*Hypochaeris radicata*	-
Plantae	DICOT	*Ipomoea cairica*	-
Plantae	DICOT	*Ipomoea indica*	-
Plantae	DICOT	*Isotropis cuneifolia*	-
Plantae	DICOT	*Isotropis cuneifolia* subsp. *cuneifolia*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Ixiolaena viscosa*	-
Plantae	DICOT	*Jacksonia furcellata*	-
Plantae	DICOT	*Jacksonia sternbergiana*	-
Plantae	DICOT	*Kennedia coccinea*	-
Plantae	DICOT	*Kennedia prostrata*	-
Plantae	DICOT	*Kunzea glabrescens*	-
Plantae	DICOT	*Lactuca saligna*	-
Plantae	DICOT	*Lactuca serriola*	-
Plantae	DICOT	*Lagenifera huegelii*	-
Plantae	DICOT	*Lagenophora huegelii*	-
Plantae	DICOT	*Lagunaria patersonia*	-
Plantae	DICOT	*Lantana camara*	-
Plantae	DICOT	*Lasiopetalum glabratum*	-
Plantae	DICOT	*Latrobea tenella*	-
Plantae	DICOT	*Lawrencia spicata*	-
Plantae	DICOT	*Lechenaultia expansa*	-
Plantae	DICOT	*Lechenaultia floribunda*	-
Plantae	DICOT	*Lechenaultia linarioides*	-
Plantae	DICOT	*Leonotis leonurus*	-
Plantae	DICOT	*Leontodon rhagadioloides*	-
Plantae	DICOT	*Leontodon saxatilis*	-
Plantae	DICOT	*Lepidium didymum*	-
Plantae	DICOT	*Lepidium rotundum*	-
Plantae	DICOT	*Leptomeria cunninghamii*	-
Plantae	DICOT	*Leptomeria empetriformis*	-
Plantae	DICOT	*Leptomeria pauciflora*	-
Plantae	DICOT	*Leptomeria preissiana*	-
Plantae	DICOT	*Leptospermum erubescens*	-
Plantae	DICOT	*Leptospermum laevigatum*	-
Plantae	DICOT	*Leucophyta brownii*	-
Plantae	DICOT	*Leucopogon conostephioides*	-
Plantae	DICOT	*Leucopogon oxycedrus*	-
Plantae	DICOT	*Leucopogon parviflorus*	-
Plantae	DICOT	*Leucopogon polymorphus*	-
Plantae	DICOT	*Leucopogon propinquus*	-
Plantae	DICOT	*Leucopogon racemulosus*	-
Plantae	DICOT	*Leucopogon tenuis*	-
Plantae	DICOT	*Levenhookia pusilla*	-
Plantae	DICOT	*Levenhookia pusilla/stipitata*	-
Plantae	DICOT	*Levenhookia stipitata*	-
Plantae	DICOT	*Limonium sinuatum*	-
Plantae	DICOT	*Linaria maroccana*	-
Plantae	DICOT	*Linum marginale*	-
Plantae	DICOT	*Liparophyllum violifolium*	-
Plantae	DICOT	*Lobelia alata*	-
Plantae	DICOT	*Lobelia anceps*	-
Plantae	DICOT	*Lobelia gibbosa*	-
Plantae	DICOT	*Lobelia tenuior*	-
Plantae	DICOT	*Lobularia maritima*	-
Plantae	DICOT	*Logania vaginalis*	-
Plantae	DICOT	*Lophostemon* sp.	-
Plantae	DICOT	*Lotus angustissimus*	-
Plantae	DICOT	*Lotus subbiflorus*	-
Plantae	DICOT	*Lotus uliginosus*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Lupinus angustifolius*	-
Plantae	DICOT	*Lupinus cosentinii*	-
Plantae	DICOT	*Lupinus luteus*	-
Plantae	DICOT	*Lycium ferocissimum*	-
Plantae	DICOT	*Lycopersicon esculentum*	-
Plantae	DICOT	*Lysimachia arvensis*	-
Plantae	DICOT	*Lysinema elegans*	-
Plantae	DICOT	*Lysinema pentapetalum*	-
Plantae	DICOT	*Macarthuria apetala*	-
Plantae	DICOT	*Macarthuria australis*	-
Plantae	DICOT	*Malva arborea*	-
Plantae	DICOT	*Malva parviflora*	-
Plantae	DICOT	*Malva pseudolavatera*	-
Plantae	DICOT	*Marrubium vulgare*	-
Plantae	DICOT	*Matthiola incana*	-
Plantae	DICOT	*Medicago littoralis*	-
Plantae	DICOT	*Medicago polymorpha*	-
Plantae	DICOT	*Medicago sativa*	-
Plantae	DICOT	*Meionectes brownii*	-
Plantae	DICOT	*Melaleuca acerosa*	-
Plantae	DICOT	*Melaleuca armillaris* subsp. *armillaris*	-
Plantae	DICOT	*Melaleuca cuticularis*	-
Plantae	DICOT	*Melaleuca huegelii*	-
Plantae	DICOT	*Melaleuca huegelii* subsp. *huegelii*	-
Plantae	DICOT	*Melaleuca incana* subsp. *incana*	-
Plantae	DICOT	*Melaleuca lanceolata*	-
Plantae	DICOT	*Melaleuca lateritia*	-
Plantae	DICOT	*Melaleuca lateritia* x *teretifolia*	-
Plantae	DICOT	*Melaleuca linariifolia*	-
Plantae	DICOT	*Melaleuca nervosa*	-
Plantae	DICOT	*Melaleuca pauciflora*	-
Plantae	DICOT	*Melaleuca preissiana*	-
Plantae	DICOT	*Melaleuca rhaphiophylla*	-
Plantae	DICOT	*Melaleuca seriata*	-
Plantae	DICOT	*Melaleuca systena*	-
Plantae	DICOT	*Melaleuca teretifolia*	-
Plantae	DICOT	*Melaleuca thymoides*	-
Plantae	DICOT	*Melaleuca viminea*	-
Plantae	DICOT	*Melaleuca viminea subsp. viminea*	-
Plantae	DICOT	*Melilotus indicus*	-
Plantae	DICOT	*Mentha spicata*	-
Plantae	DICOT	*Mesembryanthemum crystallinum*	-
Plantae	DICOT	*Millotia tenuifolia*	-
Plantae	DICOT	*Minuartia hybrida*	-
Plantae	DICOT	*Mirabilis jalapa*	-
Plantae	DICOT	*Monoculus monstrosus*	-
Plantae	DICOT	*Monopsis debilis* var. *depressa*	-
Plantae	DICOT	*Monotaxis grandiflora* var. *grandiflora*	-
Plantae	DICOT	*Monotaxis occidentalis*	-
Plantae	DICOT	*Muehlenbeckia adpressa*	-
Plantae	DICOT	*Myoporum insulare*	-
Plantae	DICOT	*Myriocephalus occidentalis*	-
Plantae	DICOT	*Myriophyllum crispatum*	-
Plantae	DICOT	*Myriophyllum salsugineum*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Myriophyllum tillaeoides*	-
Plantae	DICOT	*Nemcia capitata*	-
Plantae	DICOT	*Nemcia reticulata*	-
Plantae	DICOT	*Nicotiana glauca*	-
Plantae	DICOT	*Nitraria billardierei*	-
Plantae	DICOT	*Nuytsia floribunda*	-
Plantae	DICOT	*Oenothera drummondii*	-
Plantae	DICOT	*Oenothera drummondii* subsp. *drummondii*	-
Plantae	DICOT	*Oenothera glazioviana*	-
Plantae	DICOT	*Oenothera indecora* subsp. *bonariensis*	-
Plantae	DICOT	*Oenothera jamesii*	-
Plantae	DICOT	*Oenothera laciniata*	-
Plantae	DICOT	*Oenothera mollissima*	-
Plantae	DICOT	*Oenothera speciosa*	-
Plantae	DICOT	*Oenothera stricta*	-
Plantae	DICOT	*Oenothera stricta* subsp. *stricta*	-
Plantae	DICOT	*Olea europaea*	-
Plantae	DICOT	*Olearia axillaris*	-
Plantae	DICOT	*Olearia rudis*	-
Plantae	DICOT	*Olearia* sp. Kennedy Range (G. Byrne 66)	-
Plantae	DICOT	*Opercularia hispidula*	-
Plantae	DICOT	*Opercularia vaginata*	-
Plantae	DICOT	*Ornduffia albiflora*	-
Plantae	DICOT	*Ornithopus compressus*	-
Plantae	DICOT	*Orobanche minor*	-
Plantae	DICOT	*Osteospermum ecklonis*	-
Plantae	DICOT	*Oxalis corniculata*	-
Plantae	DICOT	*Oxalis debilis* var. *corymbosa*	-
Plantae	DICOT	*Oxalis pes-caprae*	-
Plantae	DICOT	*Parentucellia latifolia*	-
Plantae	DICOT	*Parentucellia viscosa*	-
Plantae	DICOT	*Parietaria debilis*	-
Plantae	DICOT	*Parietaria judaica*	-
Plantae	DICOT	*Parthenocissus quinquefolia*	-
Plantae	DICOT	*Pelargonium capitatum*	-
Plantae	DICOT	*Pelargonium havlasae*	-
Plantae	DICOT	*Pelargonium littorale*	-
Plantae	DICOT	*Pelargonium* x *domesticum*	-
Plantae	DICOT	*Pericalymma ellipticum*	-
Plantae	DICOT	*Pericalymma ellipticum* var. *ellipticum*	-
Plantae	DICOT	*Persicaria decipiens*	-
Plantae	DICOT	*Persicaria hydropiper*	-
Plantae	DICOT	*Persicaria maculosa*	-
Plantae	DICOT	*Persicaria* sp.	-
Plantae	DICOT	*Persoonia saccata*	-
Plantae	DICOT	*Petrophile axillaris*	-
Plantae	DICOT	*Petrophile linearis*	-
Plantae	DICOT	*Petrophile serruriae*	-
Plantae	DICOT	*Petrorhagia dubia*	-
Plantae	DICOT	*Petrorhagia velutina*	-
Plantae	DICOT	*Petunia* x *atkinsiana*	-
Plantae	DICOT	*Philotheca spicata*	-
Plantae	DICOT	*Phyllanthus calycinus*	-
Plantae	DICOT	*Phyllota gracilis*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Physalis philadelphica*	-
Plantae	DICOT	*Phytolacca octandra*	-
Plantae	DICOT	*Pimelea ferruginea*	-
Plantae	DICOT	*Pimelea imbricata* var. *piligera*	-
Plantae	DICOT	*Pimelea leucantha*	-
Plantae	DICOT	*Pimelea rosea* subsp. *rosea*	-
Plantae	DICOT	*Pimelea suaveolens* subsp. *suaveolens*	-
Plantae	DICOT	*Pimelea sulphurea*	-
Plantae	DICOT	*Pithocarpa cordata*	-
Plantae	DICOT	*Pithocarpa pulchella*	-
Plantae	DICOT	*Pithocarpa pulchella* var. *melanostigma* / *pulchella* var. *pulchella*	-
Plantae	DICOT	*Pithocarpa pulchella* var. *pulchella*	-
Plantae	DICOT	*Pittosporum phylliraeoides*	-
Plantae	DICOT	*Plantago coronopus* subsp. *commutata*	-
Plantae	DICOT	*Plantago major*	-
Plantae	DICOT	*Plantago* sp. indet.	-
Plantae	DICOT	*Platysace compressa*	-
Plantae	DICOT	*Platysace filiformis*	-
Plantae	DICOT	*Platytheca galioides*	-
Plantae	DICOT	*Podolepis gracilis*	-
Plantae	DICOT	*Podolepis nutans*	-
Plantae	DICOT	*Podotheca angustifolia*	-
Plantae	DICOT	*Podotheca chrysantha*	-
Plantae	DICOT	*Podotheca gnaphalioides*	-
Plantae	DICOT	*Podotheca* sp.	-
Plantae	DICOT	*Polycarpon tetraphyllum*	-
Plantae	DICOT	*Polygala myrtifolia*	-
Plantae	DICOT	*Polygonum aviculare*	-
Plantae	DICOT	*Poranthera drummondii*	-
Plantae	DICOT	*Poranthera microphylla*	-
Plantae	DICOT	*Poranthera microphylla/moorokatta*	-
Plantae	DICOT	*Pseudognaphalium luteoalbum*	-
Plantae	DICOT	*Pseudognaphalium luteo-album*	-
Plantae	DICOT	*Ptilotus drummondii*	-
Plantae	DICOT	*Ptilotus drummondii* var. *drummondii*	-
Plantae	DICOT	*Ptilotus eremita*	-
Plantae	DICOT	*Ptilotus manglesii*	-
Plantae	DICOT	*Ptilotus polystachyus*	-
Plantae	DICOT	*Ptilotus sericostachyus* subsp. *sericostachyus*	-
Plantae	DICOT	*Ptilotus stirlingii* subsp. *stirlingii*	-
Plantae	DICOT	*Pultenaea ochreata*	-
Plantae	DICOT	*Pultenaea reticulata*	-
Plantae	DICOT	*Quinetia urvillei*	-
Plantae	DICOT	*Ranunculus colonorum*	-
Plantae	DICOT	*Ranunculus sp.*	-
Plantae	DICOT	*Ranunculus trilobus*	-
Plantae	DICOT	*Raphanus raphanistrum*	-
Plantae	DICOT	*Rapistrum rugosum*	-
Plantae	DICOT	*Regelia ciliata*	-
Plantae	DICOT	*Regelia inops*	-
Plantae	DICOT	*Reseda luteola*	-
Plantae	DICOT	*Retama raetam*	-
Plantae	DICOT	*Rhagodia baccata*	-

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Plantae	DICOT	*Rhagodia baccata* subsp. *baccata*	-
Plantae	DICOT	*Rhagodia baccata* subsp. *dioica*	-
Plantae	DICOT	*Rhagodia radiata*	-
Plantae	DICOT	*Rhamnus alaternus*	-
Plantae	DICOT	*Rhodanthe corymbosa*	-
Plantae	DICOT	*Ricinocarpos undulatus*	-
Plantae	DICOT	*Ricinus communis*	-
Plantae	DICOT	*Roepera similis*	-
Plantae	DICOT	*Rorippa nasturtium-aquaticum*	-
Plantae	DICOT	*Rumex acetosella*	-
Plantae	DICOT	*Rumex crispus*	-
Plantae	DICOT	*Rumex pulcher*	-
Plantae	DICOT	*Rumex pulcher* subsp. *pulcher*	-
Plantae	DICOT	*Sagina apetala*	-
Plantae	DICOT	*Sagina maritima*	-
Plantae	DICOT	*Salicornia quinqueflora*	-
Plantae	DICOT	*Salicornia quinqueflora* subsp. *quinqueflora*	-
Plantae	DICOT	*Salvia verbenaca*	-
Plantae	DICOT	*Samolus junceus*	-
Plantae	DICOT	*Samolus repens*	-
Plantae	DICOT	*Samolus repens var. paucifolius*	-
Plantae	DICOT	*Samolus repens var. repens*	-
Plantae	DICOT	*Santalum acuminatum*	-
Plantae	DICOT	*Sarcocornia quinqueflora*	-
Plantae	DICOT	*Scabiosa atropurpurea*	-
Plantae	DICOT	*Scaevola anchusifolia*	-
Plantae	DICOT	*Scaevola canescens*	-
Plantae	DICOT	*Scaevola crassifolia*	-
Plantae	DICOT	*Scaevola nitida*	-
Plantae	DICOT	*Scaevola repens* var. *repens*	-
Plantae	DICOT	*Scaevola thesioides* subsp. *thesioides*	-
Plantae	DICOT	*Schinus terebinthifolia*	-
Plantae	DICOT	*Scholtzia involucrata*	-
Plantae	DICOT	*Senecio condylus*	-
Plantae	DICOT	*Senecio diaschides*	-
Plantae	DICOT	*Senecio glossanthus* x *lautus*	-
Plantae	DICOT	*Senecio lautus subsp. maritimus*	-
Plantae	DICOT	*Senecio multicaulis* subsp. *multicaulis*	-
Plantae	DICOT	*Senecio pinnatifolius*	-
Plantae	DICOT	*Senecio pinnatifolius* var. *latilobus*	-
Plantae	DICOT	*Senecio vulgaris*	-
Plantae	DICOT	*Silene armeria*	-
Plantae	DICOT	*Silene gallica*	-
Plantae	DICOT	*Silene gallica* var. *gallica*	-
Plantae	DICOT	*Silene nocturna*	-
Plantae	DICOT	*Siloxerus humifusus*	-
Plantae	DICOT	*Sisymbrium irio*	-
Plantae	DICOT	*Sisymbrium orientale*	-
Plantae	DICOT	*Solanum americanum*	-
Plantae	DICOT	*Solanum linnaeanum*	-
Plantae	DICOT	*Solanum lycopersicum*	-
Plantae	DICOT	*Solanum nigrum*	-
Plantae	DICOT	*Solanum oldfieldii*	-
Plantae	DICOT	*Solanum simile*	-

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Plantae	DICOT	*Solanum symonii*	-
Plantae	DICOT	*Solidago chilensis*	-
Plantae	DICOT	*Soliva sessilis*	-
Plantae	DICOT	*Sonchus asper*	-
Plantae	DICOT	*Sonchus hydrophilus*	-
Plantae	DICOT	*Sonchus oleraceus*	-
Plantae	DICOT	*Spergularia marina*	-
Plantae	DICOT	*Sphaerolobium linophyllum*	-
Plantae	DICOT	*Sphaerolobium medium*	-
Plantae	DICOT	*Sphaerolobium vimineum*	-
Plantae	DICOT	*Spyridium globulosum*	-
Plantae	DICOT	*Stachys arvensis*	-
Plantae	DICOT	*Stackhousia huegelii*	-
Plantae	DICOT	*Stackhousia* sp.	-
Plantae	DICOT	*Stellaria media*	-
Plantae	DICOT	*Stellaria pallida*	-
Plantae	DICOT	*Stenopetalum gracile*	-
Plantae	DICOT	*Stirlingia latifolia*	-
Plantae	DICOT	*Stylidium androsaceum*	-
Plantae	DICOT	*Stylidium araeophyllum*	-
Plantae	DICOT	*Stylidium araeophyllum/neurophyllum*	-
Plantae	DICOT	*Stylidium brunonianum*	-
Plantae	DICOT	*Stylidium bulbiferum*	-
Plantae	DICOT	*Stylidium guttatum*	-
Plantae	DICOT	*Stylidium neurophyllum*	-
Plantae	DICOT	*Stylidium piliferum*	-
Plantae	DICOT	*Stylidium preissii*	-
Plantae	DICOT	*Stylidium repens*	-
Plantae	DICOT	*Stylidium scariosum*	-
Plantae	DICOT	*Stylidium schoenoides*	-
Plantae	DICOT	*Stylidium* sp.	-
Plantae	DICOT	*Suaeda australis*	-
Plantae	DICOT	*Symphyotrichum squamatum*	-
Plantae	DICOT	*Synaphea acutiloba*	-
Plantae	DICOT	*Synaphea gracillima*	-
Plantae	DICOT	*Synaphea spinulosa*	-
Plantae	DICOT	*Synaphea spinulosa* subsp. *spinulosa*	-
Plantae	DICOT	*Taraxacum khatoonae*	-
Plantae	DICOT	*Taraxacum* sp.	-
Plantae	DICOT	*Tecticornia halocnemoides*	-
Plantae	DICOT	*Tecticornia indica* subsp. *bidens*	-
Plantae	DICOT	*Tecticornia pergranulata* subsp. *pergranulata*	-
Plantae	DICOT	*Templetonia retusa*	-
Plantae	DICOT	*Tersonia cyathiflora*	-
Plantae	DICOT	*Tetragonia decumbens*	-
Plantae	DICOT	*Tetragonia tetragonoides*	-
Plantae	DICOT	*Tetratheca hirsuta* subsp. *viminea*	-
Plantae	DICOT	*Thomasia cognata*	-
Plantae	DICOT	*Thomasia triphylla*	-
Plantae	DICOT	*Threlkeldia diffusa*	-
Plantae	DICOT	*Trachymene coerulea* subsp. *coerulea*	-
Plantae	DICOT	*Trachymene pilosa*	-
Plantae	DICOT	*Tribulus terrestris*	-
Plantae	DICOT	*Trifolium ?campestre*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	DICOT	*Trifolium ?campestre/dubium*	-
Plantae	DICOT	*Trifolium angustifolium*	-
Plantae	DICOT	*Trifolium angustifolium* var. *angustifolium*	-
Plantae	DICOT	*Trifolium arvense* var. *arvense*	-
Plantae	DICOT	*Trifolium campestre*	-
Plantae	DICOT	*Trifolium campestre var. campestre*	-
Plantae	DICOT	*Trifolium campestre/dubium*	-
Plantae	DICOT	*Trifolium cernuum*	-
Plantae	DICOT	*Trifolium dubium*	-
Plantae	DICOT	*Trifolium fragiferum* var. *fragiferum*	-
Plantae	DICOT	*Trifolium hirtum*	-
Plantae	DICOT	*Trifolium resupinatum* var. *resupinatum*	-
Plantae	DICOT	*Trifolium scabrum*	-
Plantae	DICOT	*Trifolium* sp.	-
Plantae	DICOT	*Trifolium* sp. indet.	-
Plantae	DICOT	*Trifolium suffocatum*	-
Plantae	DICOT	*Trifolium tomentosum*	-
Plantae	DICOT	*Trifolium tomentosum var. tomentosum*	-
Plantae	DICOT	*Tripterococcus* sp. (A.S. George 14234)	-
Plantae	DICOT	*Tropaeolum majus*	-
Plantae	DICOT	*Trymalium albicans*	-
Plantae	DICOT	*Trymalium ledifolium* var. *ledifolium*	-
Plantae	DICOT	*Urospermum picroides*	-
Plantae	DICOT	*Ursinia anthemoides*	-
Plantae	DICOT	*Ursinia anthemoides* subsp. *anthemoides*	-
Plantae	DICOT	*Urtica urens*	-
Plantae	DICOT	*Utricularia multifida*	-
Plantae	DICOT	*Vellereophyton dealbatum*	-
Plantae	DICOT	*Veronica arvensis*	-
Plantae	DICOT	*Verticordia drummondii*	-
Plantae	DICOT	*Vicia benghalensis*	-
Plantae	DICOT	*Vicia hirsuta*	-
Plantae	DICOT	*Vicia sativa*	-
Plantae	DICOT	*Vicia sativa* subsp. *nigra*	-
Plantae	DICOT	*Villarsia* sp. indet.	-
Plantae	DICOT	*Viminaria juncea*	-
Plantae	DICOT	*Wahlenbergia ?capensis*	-
Plantae	DICOT	*Wahlenbergia capensis*	-
Plantae	DICOT	*Wahlenbergia preissii*	-
Plantae	DICOT	*Wahlenbergia* sp.	-
Plantae	DICOT	*Waitzia citrina*	-
Plantae	DICOT	*Waitzia nitida*	-
Plantae	DICOT	*Waitzia suaveolens*	-
Plantae	DICOT	*Wilsonia backhousei*	-
Plantae	DICOT	*Wilsonia humilis*	-
Plantae	DICOT	*Xanthium spinosum*	-
Plantae	DICOT	*Xanthosia huegelii*	-
Plantae	DICOT	*Xanthosia* sp. indet.	-
Plantae	DICOT	*Xylomelum occidentale*	-
Plantae	FERN	*Ophioglossum gramineum*	-
Plantae	FERN	*Phylloglossum drummondii*	-
Plantae	FERN	*Pteridium esculentum* subsp. *esculentum*	-
Plantae	FERN	*Selaginella gracillima*	-
Plantae	FERN	*Callitris preissii*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	FERN	*Macrozamia fraseri*	-
Plantae	FERN	*Macrozamia riedlei*	-
Plantae	GYMNO	*Pinus halepensis*	-
Plantae	GYMNO	*Pinus radiata*	-
Plantae	GYMNO	?*Asparagus asparagoides*	-
Plantae	GYMNO	?*Austrostipa compressa*	-
Plantae	GYMNO	?*Chamaescilla corymbosa*	-
Plantae	MONOCOT	*Caladenia huegelii*	Critically endangered
Plantae	MONOCOT	*Drakaea elastica*	Critically endangered
Plantae	MONOCOT	*Thelymitra variegata*	Critically endangered
Plantae	MONOCOT	*Diuris drummondii*	Endangered
Plantae	MONOCOT	*Austrostipa mundula*	Priority 3
Plantae	MONOCOT	*Cyathochaeta teretifolia*	Priority 3
Plantae	MONOCOT	*Phlebocarya pilosissima* subsp. *pilosissima*	Priority 3
Plantae	MONOCOT	*Microtis quadrata*	Priority 4
Plantae	MONOCOT	?*Asparagus asparagoides*	-
Plantae	MONOCOT	?*Austrostipa compressa*	-
Plantae	MONOCOT	?*Chamaescilla corymbosa*	-
Plantae	MONOCOT	?*Ehrharta calycina*	-
Plantae	MONOCOT	?*Microlaena stipoides*	-
Plantae	MONOCOT	?*Phlebocarya ciliata*	-
Plantae	MONOCOT	?*Pterostylis sanguinea*	-
Plantae	MONOCOT	?*Romulea rosea*	-
Plantae	MONOCOT	?*Rytidosperma occidentalis*	-
Plantae	MONOCOT	?*Sowerbaea laxiflora*	-
Plantae	MONOCOT	*Acanthocarpus preissii*	-
Plantae	MONOCOT	*Agave americana*	-
Plantae	MONOCOT	*Aira caryophyllea*	-
Plantae	MONOCOT	*Aira caryophyllea/cupaniana group*	-
Plantae	MONOCOT	*Aira/Pentameris* sp.	-
Plantae	MONOCOT	*Allium triquetrum*	-
Plantae	MONOCOT	*Althenia preissii*	-
Plantae	MONOCOT	*Amphibolis antarctica*	-
Plantae	MONOCOT	*Amphibolis griffithii*	-
Plantae	MONOCOT	*Amphibolis* sp.	-
Plantae	MONOCOT	*Amphipogon laguroides*	-
Plantae	MONOCOT	*Amphipogon laguroides* subsp. *laguroides*	-
Plantae	MONOCOT	*Amphipogon turbinatus*	-
Plantae	MONOCOT	*Anigozanthos humilis*	-
Plantae	MONOCOT	*Anigozanthos humilis* subsp. *humilis*	-
Plantae	MONOCOT	*Anigozanthos humilis* x *manglesii*	-
Plantae	MONOCOT	*Anigozanthos manglesii*	-
Plantae	MONOCOT	*Anigozanthos manglesii* subsp. *manglesii*	-
Plantae	MONOCOT	*Anigozanthos* sp.	-
Plantae	MONOCOT	*Arnocrinum preissii*	-
Plantae	MONOCOT	*Asparagus aethiopicus*	-
Plantae	MONOCOT	*Asparagus asparagoides*	-
Plantae	MONOCOT	*Asparagus plumosus*	-
Plantae	MONOCOT	*Asphodelus fistulosus*	-
Plantae	MONOCOT	*Austrostipa* ?*compressa*	-
Plantae	MONOCOT	*Austrostipa compressa*	-
Plantae	MONOCOT	*Austrostipa flavescens*	-
Plantae	MONOCOT	*Austrostipa hemipogon*	-
Plantae	MONOCOT	*Austrostipa nitida*	-

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Plantae	MONOCOT	*Austrostipa semibarbata*	-
Plantae	MONOCOT	*Austrostipa* sp.	-
Plantae	MONOCOT	*Austrostipa* sp. Marchagee (B.R. Maslin 1407)	-
Plantae	MONOCOT	*Austrostipa variabilis*	-
Plantae	MONOCOT	*Avellinia michelii*	-
Plantae	MONOCOT	*Avena barbata*	-
Plantae	MONOCOT	*Avena fatua*	-
Plantae	MONOCOT	*Baumea articulata*	-
Plantae	MONOCOT	*Baumea juncea*	-
Plantae	MONOCOT	*Baumea laxa*	-
Plantae	MONOCOT	*Baumea preissii*	-
Plantae	MONOCOT	*Baumea vaginalis*	-
Plantae	MONOCOT	*Bolboschoenus caldwellii*	-
Plantae	MONOCOT	*Brachypodium distachyon*	-
Plantae	MONOCOT	*Briza maxima*	-
Plantae	MONOCOT	*Briza minor*	-
Plantae	MONOCOT	*Bromus arenarius*	-
Plantae	MONOCOT	*Bromus diandrus*	-
Plantae	MONOCOT	*Bromus hordeaceus*	-
Plantae	MONOCOT	*Bromus* sp.	-
Plantae	MONOCOT	*Burchardia bairdiae*	-
Plantae	MONOCOT	*Burchardia congesta*	-
Plantae	MONOCOT	*Burchardia umbellata*	-
Plantae	MONOCOT	*Caesia micrantha*	-
Plantae	MONOCOT	*Caesia occidentalis*	-
Plantae	MONOCOT	*Caladenia ? arenicola*	-
Plantae	MONOCOT	*Caladenia ? discoidea*	-
Plantae	MONOCOT	*Caladenia ? flava*	-
Plantae	MONOCOT	*Caladenia arenicola*	-
Plantae	MONOCOT	*Caladenia arenicola* x *huegelii*	-
Plantae	MONOCOT	*Caladenia discoidea*	-
Plantae	MONOCOT	*Caladenia flava*	-
Plantae	MONOCOT	*Caladenia flava* subsp. *flava*	-
Plantae	MONOCOT	*Caladenia footeana*	-
Plantae	MONOCOT	*Caladenia georgei*	-
Plantae	MONOCOT	*Caladenia latifolia*	-
Plantae	MONOCOT	*Caladenia longicauda* subsp. *calcigena*	-
Plantae	MONOCOT	*Caladenia marginata*	-
Plantae	MONOCOT	*Caladenia nana* subsp. *nana*	-
Plantae	MONOCOT	*Caladenia nobilis*	-
Plantae	MONOCOT	*Caladenia occidentalis*	-
Plantae	MONOCOT	*Caladenia paludosa*	-
Plantae	MONOCOT	*Caladenia* sp.	-
Plantae	MONOCOT	*Caladenia* sp. indet.	-
Plantae	MONOCOT	*Caladenia vulgata*	-
Plantae	MONOCOT	*Calectasia narragara*	-
Plantae	MONOCOT	*Cartonema philydroides*	-
Plantae	MONOCOT	*Catapodium rigida*	-
Plantae	MONOCOT	*Catapodium rigidum*	-
Plantae	MONOCOT	*Cenchrus americanus*	-
Plantae	MONOCOT	*Cenchrus clandestinus*	-
Plantae	MONOCOT	*Cenchrus echinatus*	-
Plantae	MONOCOT	*Cenchrus longisetus*	-
Plantae	MONOCOT	*Cenchrus purpureus*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	MONOCOT	*Cenchrus setaceus*	-
Plantae	MONOCOT	*Centrolepis drummondiana*	-
Plantae	MONOCOT	*Chaetanthus aristatus*	-
Plantae	MONOCOT	*Chamaescilla corymbosa*	-
Plantae	MONOCOT	*Chamaescilla corymbosa* var. *corymbosa*	-
Plantae	MONOCOT	*Chasmanthe floribunda*	-
Plantae	MONOCOT	*Chordifex sinuosus*	-
Plantae	MONOCOT	*Commelina benghalensis*	-
Plantae	MONOCOT	*Conostylis aculeata*	-
Plantae	MONOCOT	*Conostylis aculeata* subsp. *aculeata*	-
Plantae	MONOCOT	*Conostylis aculeata* subsp. *cygnorum*	-
Plantae	MONOCOT	*Conostylis aurea*	-
Plantae	MONOCOT	*Conostylis candicans*	-
Plantae	MONOCOT	*Conostylis candicans* subsp. *calcicola*	-
Plantae	MONOCOT	*Conostylis candicans* subsp. *candicans*	-
Plantae	MONOCOT	*Conostylis juncea*	-
Plantae	MONOCOT	*Conostylis serrulata*	-
Plantae	MONOCOT	*Conostylis setigera*	-
Plantae	MONOCOT	*Conostylis setigera* subsp. *setigera*	-
Plantae	MONOCOT	*Conostylis setosa*	-
Plantae	MONOCOT	*Conostylis sp.*	-
Plantae	MONOCOT	*Cortaderia selloana* subsp. *selloana*	-
Plantae	MONOCOT	*Corynotheca micrantha* var. *micrantha*	-
Plantae	MONOCOT	*Cryptostylis ovata*	-
Plantae	MONOCOT	*Cyanicula sericea*	-
Plantae	MONOCOT	*Cycnogeton huegelii*	-
Plantae	MONOCOT	*Cynodon dactylon*	-
Plantae	MONOCOT	*Cyperus congestus*	-
Plantae	MONOCOT	*Cyperus eragrostis*	-
Plantae	MONOCOT	*Cyperus gymnocaulos*	-
Plantae	MONOCOT	*Cyperus involucratus*	-
Plantae	MONOCOT	*Cyperus laevigatus*	-
Plantae	MONOCOT	*Cyperus polystachyos*	-
Plantae	MONOCOT	*Cyperus tenuiflorus*	-
Plantae	MONOCOT	*Cyrtostylis huegelii*	-
Plantae	MONOCOT	*Danthonia occidentalis*	-
Plantae	MONOCOT	*Dasypogon bromeliifolius*	-
Plantae	MONOCOT	*Desmocladus asper*	-
Plantae	MONOCOT	*Desmocladus fasciculatus*	-
Plantae	MONOCOT	*Desmocladus flexuosus*	-
Plantae	MONOCOT	*Deyeuxia quadriseta*	-
Plantae	MONOCOT	*Dianella revoluta*	-
Plantae	MONOCOT	*Dianella revoluta* var. *divaricata*	-
Plantae	MONOCOT	*Dichopogon capillipes*	-
Plantae	MONOCOT	*Dielsia stenostachya*	-
Plantae	MONOCOT	*Digitaria violascens*	-
Plantae	MONOCOT	*Disa bracteata*	-
Plantae	MONOCOT	*Diuris ?magnifica*	-
Plantae	MONOCOT	*Diuris corymbosa*	-
Plantae	MONOCOT	*Diuris corymbosa/magnifica*	-
Plantae	MONOCOT	*Diuris laxiflora*	-
Plantae	MONOCOT	*Diuris magnifica*	-
Plantae	MONOCOT	*Echinochloa crus-galli*	-
Plantae	MONOCOT	*Echinochloa crus-pavonis*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	MONOCOT	*Ehrharta brevifolia*	-
Plantae	MONOCOT	*Ehrharta calycina*	-
Plantae	MONOCOT	*Ehrharta longiflora*	-
Plantae	MONOCOT	*Ehrharta villosa*	-
Plantae	MONOCOT	*Eleusine indica*	-
Plantae	MONOCOT	*Elythranthera brunonis*	-
Plantae	MONOCOT	*Elythranthera emarginata*	-
Plantae	MONOCOT	*Elythranthera* sp. indet.	-
Plantae	MONOCOT	*Epiblema grandiflorum*	-
Plantae	MONOCOT	*Eragrostis curvula*	-
Plantae	MONOCOT	*Eriochilus dilatatus*	-
Plantae	MONOCOT	*Eriochilus dilatatus* subsp. *multiflorus*	-
Plantae	MONOCOT	*Eriochilus helonomos*	-
Plantae	MONOCOT	*Eriochilus scaber* subsp. *scaber*	-
Plantae	MONOCOT	*Ferraria crispa*	-
Plantae	MONOCOT	*Ficinia nodosa*	-
Plantae	MONOCOT	*Fimbristylis velata*	-
Plantae	MONOCOT	*Freesia* aff. *leichtlinii*	-
Plantae	MONOCOT	*Freesia alba* x *leichtlinii*	-
Plantae	MONOCOT	*Freesia* x sp.	-
Plantae	MONOCOT	*Furcraea selloa*	-
Plantae	MONOCOT	*Gahnia trifida*	-
Plantae	MONOCOT	*Gladiolus caryophyllaceus*	-
Plantae	MONOCOT	*Haemodorum paniculatum*	-
Plantae	MONOCOT	*Haemodorum sp.*	-
Plantae	MONOCOT	*Haemodorum spicatum*	-
Plantae	MONOCOT	*Halodule uninervis*	-
Plantae	MONOCOT	*Halophila ovalis*	-
Plantae	MONOCOT	*Hensmania turbinata*	-
Plantae	MONOCOT	*Holcus lanatus*	-
Plantae	MONOCOT	*Homeria flaccida*	-
Plantae	MONOCOT	*Hordeum leporinum*	-
Plantae	MONOCOT	*Hypolaena exsulca*	-
Plantae	MONOCOT	*Isolepis cernua*	-
Plantae	MONOCOT	*Isolepis cernua* var. *setiformis*	-
Plantae	MONOCOT	*Isolepis marginata*	-
Plantae	MONOCOT	*Isolepis nodosa*	-
Plantae	MONOCOT	*Isolepis producta*	-
Plantae	MONOCOT	*Isolepis prolifera*	-
Plantae	MONOCOT	*Isolepis* sp.	-
Plantae	MONOCOT	*Juncus acutus* subsp. *acutus*	-
Plantae	MONOCOT	*Juncus acutus* subsp. *acutus* x *kraussii* subsp. *australiensis*	-
Plantae	MONOCOT	*Juncus bufonius*	-
Plantae	MONOCOT	*Juncus kraussii* subsp. *australiensis*	-
Plantae	MONOCOT	*Juncus microcephalus*	-
Plantae	MONOCOT	*Juncus pallidus*	-
Plantae	MONOCOT	*Lachenalia aloides*	-
Plantae	MONOCOT	*Lachenalia reflexa*	-
Plantae	MONOCOT	*Lachnagrostis filiformis*	-
Plantae	MONOCOT	*Lagurus ovatus*	-
Plantae	MONOCOT	*Laxmannia ramosa* subsp. *ramosa*	-
Plantae	MONOCOT	*Laxmannia squarrosa*	-
Plantae	MONOCOT	*Lemna disperma*	-
Plantae	MONOCOT	*Lepidosperma angustatum*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	MONOCOT	*Lepidosperma gladiatum*	-
Plantae	MONOCOT	*Lepidosperma longitudinale*	-
Plantae	MONOCOT	*Lepidosperma oldhamii*	-
Plantae	MONOCOT	*Lepidosperma pubisquameum*	-
Plantae	MONOCOT	*Lepidosperma scabrum*	-
Plantae	MONOCOT	*Lepidosperma* sp.	-
Plantae	MONOCOT	*Lepidosperma* sp. (coastal terete varient) (BJK&NG 231)	-
Plantae	MONOCOT	*Lepidosperma* sp. Brixton Street broad inflorescence	-
Plantae	MONOCOT	*Lepidosperma* sp. Brixton Street narrow inflorescence	-
Plantae	MONOCOT	*Lepidosperma* sp. Darling Scarp	-
Plantae	MONOCOT	*Lepidosperma* sp. inland scabrum	-
Plantae	MONOCOT	*Lepidosperma* sp. Margaret River (B.J. Lepschi 1841)	-
Plantae	MONOCOT	*Lepidosperma squamatum*	-
Plantae	MONOCOT	*Lepidosperma squamatum* s.l.	-
Plantae	MONOCOT	*Leporella fimbriata*	-
Plantae	MONOCOT	*Leptocarpus coangustatus*	-
Plantae	MONOCOT	*Leptocarpus decipiens*	-
Plantae	MONOCOT	*Leptocarpus scariosus*	-
Plantae	MONOCOT	*Leptocarpus tephrinus*	-
Plantae	MONOCOT	*Leptoceras menziesii*	-
Plantae	MONOCOT	*Lepyrodia muirii*	-
Plantae	MONOCOT	*Lolium perenne*	-
Plantae	MONOCOT	*Lolium perenne* x *rigidum*	-
Plantae	MONOCOT	*Lolium rigidum*	-
Plantae	MONOCOT	*Lomandra* ?*caespitosa*	-
Plantae	MONOCOT	*Lomandra* ?*nigricans*	-
Plantae	MONOCOT	*Lomandra* ?*preissii*	-
Plantae	MONOCOT	*Lomandra* ?*suaveolens*	-
Plantae	MONOCOT	*Lomandra caespitosa*	-
Plantae	MONOCOT	*Lomandra hermaphrodita*	-
Plantae	MONOCOT	*Lomandra maritima*	-
Plantae	MONOCOT	*Lomandra micrantha* subsp. *micrantha*	-
Plantae	MONOCOT	*Lomandra nigricans*	-
Plantae	MONOCOT	*Lomandra preissii*	-
Plantae	MONOCOT	*Lomandra* sp.	-
Plantae	MONOCOT	*Lomandra suaveolens*	-
Plantae	MONOCOT	*Loxocarya flexuosa*	-
Plantae	MONOCOT	*Luzula meridionalis*	-
Plantae	MONOCOT	*Lyginia barbata*	-
Plantae	MONOCOT	*Lyginia barbata/imberbis*	-
Plantae	MONOCOT	*Lyginia imberbis*	-
Plantae	MONOCOT	*Lyginia* sp.	-
Plantae	MONOCOT	*Lyperanthus nigricans*	-
Plantae	MONOCOT	*Melinis repens*	-
Plantae	MONOCOT	*Mesomelaena pseudostygia*	-
Plantae	MONOCOT	*Microlaena stipoides*	-
Plantae	MONOCOT	*Microtis arenaria*	-
Plantae	MONOCOT	*Microtis brownii*	-
Plantae	MONOCOT	*Microtis cupularis*	-
Plantae	MONOCOT	*Microtis media*	-
Plantae	MONOCOT	*Microtis media* subsp. *media*	-
Plantae	MONOCOT	*Monadenia bracteata*	-
Plantae	MONOCOT	*Musa acuminata*	-
Plantae	MONOCOT	*Myrsiphyllum asparagoides*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	MONOCOT	*Narcissus papyraceus* x *tazetta*	-
Plantae	MONOCOT	*Neurachne alopecuroidea*	-
Plantae	MONOCOT	*Ornithogalum arabicum*	-
Plantae	MONOCOT	*Orthrosanthus laxus* var. *laxus*	-
Plantae	MONOCOT	*Ottelia ovalifolia*	-
Plantae	MONOCOT	*Pancratium maritimum*	-
Plantae	MONOCOT	*Panicum miliaceum*	-
Plantae	MONOCOT	*Parapholis incurva*	-
Plantae	MONOCOT	*Paspalum dilatatum*	-
Plantae	MONOCOT	*Paspalum distichum*	-
Plantae	MONOCOT	*Paspalum urvillei*	-
Plantae	MONOCOT	*Paspalum vaginatum*	-
Plantae	MONOCOT	*Patersonia occidentalis*	-
Plantae	MONOCOT	*Patersonia occidentalis* (swamp form)	-
Plantae	MONOCOT	*Patersonia occidentalis* var. *angustifolia*	-
Plantae	MONOCOT	*Patersonia occidentalis* var. *occidentalis*	-
Plantae	MONOCOT	*Pauridia occidentalis* var. *occidentalis*	-
Plantae	MONOCOT	*Pauridia occidentalis* var. *quadriloba*	-
Plantae	MONOCOT	*Phalaris arundinacea* var. *arundinacea*	-
Plantae	MONOCOT	*Pheladenia deformis*	-
Plantae	MONOCOT	*Phlebocarya ciliata*	-
Plantae	MONOCOT	*Phlebocarya filifolia*	-
Plantae	MONOCOT	*Phoenix canariensis*	-
Plantae	MONOCOT	*Poa annua*	-
Plantae	MONOCOT	*Poa drummondiana*	-
Plantae	MONOCOT	*Poa porphyroclados*	-
Plantae	MONOCOT	*Poa pratensis*	-
Plantae	MONOCOT	*Poa* sp. indet.	-
Plantae	MONOCOT	*Poaceae* sp.	-
Plantae	MONOCOT	*Polypogon monspeliensis*	-
Plantae	MONOCOT	*Posidonia coriacea*	-
Plantae	MONOCOT	*Posidonia sinuosa*	-
Plantae	MONOCOT	*Posidonia* sp.	-
Plantae	MONOCOT	*Prasophyllum drummondii*	-
Plantae	MONOCOT	*Prasophyllum drummondii* x *regium*	-
Plantae	MONOCOT	*Prasophyllum fimbria*	-
Plantae	MONOCOT	*Prasophyllum gibbosum*	-
Plantae	MONOCOT	*Prasophyllum macrostachyum*	-
Plantae	MONOCOT	*Prasophyllum plumiforme*	-
Plantae	MONOCOT	*Prasophyllum regium*	-
Plantae	MONOCOT	*Prasophyllum* sp. indet.	-
Plantae	MONOCOT	*Pterostylis* ?*sanguinea*	-
Plantae	MONOCOT	*Pterostylis* aff. *nana*	-
Plantae	MONOCOT	*Pterostylis* aff. *nana* ?short sepal	-
Plantae	MONOCOT	*Pterostylis aspera*	-
Plantae	MONOCOT	*Pterostylis atrosanguinea*	-
Plantae	MONOCOT	*Pterostylis ectypha*	-
Plantae	MONOCOT	*Pterostylis nana* "short sepal"	-
Plantae	MONOCOT	*Pterostylis recurva*	-
Plantae	MONOCOT	*Pterostylis sanguinea*	-
Plantae	MONOCOT	*Pterostylis* sp.	-
Plantae	MONOCOT	*Pterostylis* sp. crinkled leaf (G.J. Keighery 13426)	-
Plantae	MONOCOT	*Pterostylis vittata*	-
Plantae	MONOCOT	*Pyrorchis nigricans*	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	MONOCOT	*Romulea rosea*	-
Plantae	MONOCOT	*Romulea rosea* var. *australis*	-
Plantae	MONOCOT	*Romulea rosea* var. *communis*	-
Plantae	MONOCOT	*Rostraria cristata*	-
Plantae	MONOCOT	*Ruppia polycarpa*	-
Plantae	MONOCOT	*Ruppia* sp.	-
Plantae	MONOCOT	*Rytidosperma caespitosum*	-
Plantae	MONOCOT	*Rytidosperma occidentale*	-
Plantae	MONOCOT	*Schoenus* aff. *laevigatus*	-
Plantae	MONOCOT	*Schoenus brevisetis*	-
Plantae	MONOCOT	*Schoenus caespititius*	-
Plantae	MONOCOT	*Schoenus clandestinus*	-
Plantae	MONOCOT	*Schoenus curvifolius*	-
Plantae	MONOCOT	*Schoenus efoliatus*	-
Plantae	MONOCOT	*Schoenus grandiflorus*	-
Plantae	MONOCOT	*Schoenus lanatus*	-
Plantae	MONOCOT	*Schoenus rodwayanus*	-
Plantae	MONOCOT	*Schoenus subfascicularis*	-
Plantae	MONOCOT	*Secale cereale*	-
Plantae	MONOCOT	*Sisyrinchium rosulatum*	-
Plantae	MONOCOT	*Sorghum bicolor*	-
Plantae	MONOCOT	*Sorghum halepense*	-
Plantae	MONOCOT	*Sowerbaea laxiflora*	-
Plantae	MONOCOT	*Sparaxis pillansii*	-
Plantae	MONOCOT	*Spinifex hirsutus*	-
Plantae	MONOCOT	*Spinifex longifolius*	-
Plantae	MONOCOT	*Spinifex* x *alterniflorus*	-
Plantae	MONOCOT	*Sporobolus africanus*	-
Plantae	MONOCOT	*Sporobolus virginicus*	-
Plantae	MONOCOT	*Stenotaphrum secundatum*	-
Plantae	MONOCOT	*Stipa compressa*	-
Plantae	MONOCOT	*Stipa elegantissima*	-
Plantae	MONOCOT	*Stipa flavescens*	-
Plantae	MONOCOT	*Stipa* sp.	-
Plantae	MONOCOT	*Stipa* sp. indet.	-
Plantae	MONOCOT	*Stuckenia pectinata*	-
Plantae	MONOCOT	*Stypandra glauca*	-
Plantae	MONOCOT	*Syringodium isoetifolium*	-
Plantae	MONOCOT	*Tetraria octandra*	-
Plantae	MONOCOT	*Thalassodendron pachyrhizum*	-
Plantae	MONOCOT	*Thelymitra campanulata*	-
Plantae	MONOCOT	*Thelymitra flexuosa* x *vulgaris*	-
Plantae	MONOCOT	*Thelymitra graminea*	-
Plantae	MONOCOT	*Thelymitra mucida*	-
Plantae	MONOCOT	*Thelymitra tigrina*	-
Plantae	MONOCOT	*Thysanotus* ? *manglesianus/patersonii complex*	-
Plantae	MONOCOT	*Thysanotus* ? *thyrsoideus*	-
Plantae	MONOCOT	*Thysanotus arbuscula*	-
Plantae	MONOCOT	*Thysanotus arenarius*	-
Plantae	MONOCOT	*Thysanotus manglesianus*	-
Plantae	MONOCOT	*Thysanotus manglesianus/patersonii complex*	-
Plantae	MONOCOT	*Thysanotus multiflorus*	-
Plantae	MONOCOT	*Thysanotus patersonii*	-
Plantae	MONOCOT	*Thysanotus* sp.	-

KINGDOM	CLASS	TAXON	WA Cons Code
Plantae	MONOCOT	*Thysanotus* sp. indet.	-
Plantae	MONOCOT	*Thysanotus* sp. *manglesianus/patersonii group*	-
Plantae	MONOCOT	*Thysanotus sparteus*	-
Plantae	MONOCOT	*Thysanotus thyrsoideus*	-
Plantae	MONOCOT	*Thysanotus triandrus*	-
Plantae	MONOCOT	*Trachyandra divaricata*	-
Plantae	MONOCOT	*Tradescantia fluminensis*	-
Plantae	MONOCOT	*Tribonanthes violacea*	-
Plantae	MONOCOT	*Tricoryne elatior*	-
Plantae	MONOCOT	*Tricoryne tenella*	-
Plantae	MONOCOT	*Triglochin mucronata*	-
Plantae	MONOCOT	*Triglochin sp.*	-
Plantae	MONOCOT	*Triglochin striata*	-
Plantae	MONOCOT	*Typha domingensis*	-
Plantae	MONOCOT	*Typha orientalis*	-
Plantae	MONOCOT	*Urochilus sanguineus*	-
Plantae	MONOCOT	*Vulpia bromoides*	-
Plantae	MONOCOT	*Vulpia myuros*	-
Plantae	MONOCOT	*Vulpia myuros forma megalura*	-
Plantae	MONOCOT	*Vulpia myuros forma myuros*	-
Plantae	MONOCOT	*Vulpia* sp.	-
Plantae	MONOCOT	*Watsonia meriana*	-
Plantae	MONOCOT	*Watsonia meriana* var. *bulbillifera*	-
Plantae	MONOCOT	*Xanthorrhoea brunonis*	-

APPENDIX B - EPBC PROTECTED MATTERS SEARCH REPORT

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: 19-Oct-2023

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:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	59
Listed Migratory Species:	73

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 environment anywhere.

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 https://www.dcceew.gov.au/parks-heritage/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:	107
Commonwealth Heritage Places:	2
Listed Marine Species:	107
Whales and Other Cetaceans:	12
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:	18
Regional Forest Agreements:	None
Nationally Important Wetlands:	4
EPBC Act Referrals:	76
Key Ecological Features (Marine):	None
Biologically Important Areas:	12
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties			[Resource Information]
Name	State	Legal Status	Buffer Status
Australian Convict Sites (Fremantle Prison)	WA	Declared property	In buffer area only

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Historic			
Fremantle Prison (former)	WA	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Forrestdale and thomsons lakes	Within 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
Empodisma peatlands of southwestern Australia	Endangered	Community may occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to 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			
Anous tenuirostris melanops			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
FISH			
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
INSECT			
Hesperocolletes douglasi			
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely 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
Eubalaena australis			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In feature area
[Pseudocheirus occidentalis](#) Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
[Andersonia gracilis](#) Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
[Banksia mimica](#) Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only
[Caladenia huegelii](#) King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat known to occur within area	In feature area
[Conospermum undulatum](#) Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Diuris drummondii](#) Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Diuris micrantha](#) Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 buffer area only
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In buffer area only
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
SHARK			
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pristis pristis			
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Ardenna pacifica			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Diomedea amsterdamensis			
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Diomedea dabbenena](#) Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
[Hydroprogne caspia](#) Caspian Tern [808]		Breeding known to occur within area	In feature area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Onychoprion anaethetus](#) Bridled Tern [82845]		Breeding known to occur within area	In feature area
[Sterna dougallii](#) Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
[Sternula albifrons](#) Little Tern [82849]		Species or species habitat may occur within area	In feature area
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Caperea marginata			
Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus			
Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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 known to occur within area	In feature area
[Arenaria interpres](#) Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In buffer area only
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
[Calidris subminuta](#) Long-toed Stint [861]		Species or species habitat known to occur within area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Philomachus pugnax](#) Ruff (Reeve) [850]		Species or species habitat known to occur within area	In buffer area only
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
[Pluvialis squatarola](#) Grey Plover [865]		Roosting known to occur within area	In buffer area only
[Thalasseus bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
[Tringa brevipes](#) Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
[Tringa glareola](#) Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only
[Tringa totanus](#) Common Redshank, Redshank [835]		Roosting known to occur within area	In buffer area only
[Xenus cinereus](#) Terek Sandpiper [59300]		Roosting known to occur within area	In buffer area only

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
Defence		
Defence - ARTILLERY BARRACKS - FREMANTLE [50155]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - EAST FREMANTLE SMALL CRAFT BASE [50118]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50149]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50148]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50146]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50147]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50152]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50151]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50154]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50150]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50153]	WA	In buffer area only
Defence - PRESTON POINT TRAINING DEPOT [50174]	WA	In buffer area only
Defence - PRESTON POINT TRAINING DEPOT [50172]	WA	In buffer area only
Defence - PRESTON POINT TRAINING DEPOT [50173]	WA	In buffer area only
Unknown		
Commonwealth Land - [51115]	WA	In buffer area only
Commonwealth Land - [50779]	WA	In buffer area only
Commonwealth Land - [51438]	WA	In buffer area only
Commonwealth Land - [50755]	WA	In buffer area only
Commonwealth Land - [50754]	WA	In buffer area only
Commonwealth Land - [50756]	WA	In buffer area only
Commonwealth Land - [50751]	WA	In buffer area only
Commonwealth Land - [50750]	WA	In buffer area only
Commonwealth Land - [51148]	WA	In buffer area only
Commonwealth Land - [50671]	WA	In feature area
Commonwealth Land - [50647]	WA	In buffer area only
Commonwealth Land - [50670]	WA	In buffer area only
Commonwealth Land - [51150]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50677]	WA	In buffer area only
Commonwealth Land - [51151]	WA	In buffer area only
Commonwealth Land - [50676]	WA	In buffer area only
Commonwealth Land - [51494]	WA	In buffer area only
Commonwealth Land - [51149]	WA	In buffer area only
Commonwealth Land - [50672]	WA	In buffer area only
Commonwealth Land - [50673]	WA	In buffer area only
Commonwealth Land - [51116]	WA	In buffer area only
Commonwealth Land - [51153]	WA	In buffer area only
Commonwealth Land - [51498]	WA	In buffer area only
Commonwealth Land - [51152]	WA	In buffer area only
Commonwealth Land - [50729]	WA	In buffer area only
Commonwealth Land - [50725]	WA	In buffer area only
Commonwealth Land - [51147]	WA	In buffer area only
Commonwealth Land - [50664]	WA	In buffer area only
Commonwealth Land - [50665]	WA	In buffer area only
Commonwealth Land - [50721]	WA	In buffer area only
Commonwealth Land - [50669]	WA	In buffer area only
Commonwealth Land - [50722]	WA	In buffer area only
Commonwealth Land - [50785]	WA	In buffer area only
Commonwealth Land - [50745]	WA	In buffer area only
Commonwealth Land - [50742]	WA	In buffer area only
Commonwealth Land - [50741]	WA	In buffer area only
Commonwealth Land - [50749]	WA	In buffer area only
Commonwealth Land - [50743]	WA	In buffer area only
Commonwealth Land - [50740]	WA	In buffer area only
Commonwealth Land - [51146]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50788]	WA	In buffer area only
Commonwealth Land - [50789]	WA	In buffer area only
Commonwealth Land - [51143]	WA	In buffer area only
Commonwealth Land - [50782]	WA	In buffer area only
Commonwealth Land - [50781]	WA	In buffer area only
Commonwealth Land - [50786]	WA	In buffer area only
Commonwealth Land - [51122]	WA	In buffer area only
Commonwealth Land - [50787]	WA	In buffer area only
Commonwealth Land - [51421]	WA	In buffer area only
Commonwealth Land - [51125]	WA	In buffer area only
Commonwealth Land - [50666]	WA	In buffer area only
Commonwealth Land - [50663]	WA	In buffer area only
Commonwealth Land - [50517]	WA	In buffer area only
Commonwealth Land - [50516]	WA	In buffer area only
Commonwealth Land - [50762]	WA	In buffer area only
Commonwealth Land - [50763]	WA	In buffer area only
Commonwealth Land - [50690]	WA	In buffer area only
Commonwealth Land - [50734]	WA	In buffer area only
Commonwealth Land - [50733]	WA	In buffer area only
Commonwealth Land - [50683]	WA	In buffer area only
Commonwealth Land - [51981]	WA	In buffer area only
Commonwealth Land - [50686]	WA	In buffer area only
Commonwealth Land - [50687]	WA	In buffer area only
Commonwealth Land - [51128]	WA	In buffer area only
Commonwealth Land - [51126]	WA	In buffer area only
Commonwealth Land - [51900]	WA	In buffer area only
Commonwealth Land - [51901]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50685]	WA	In buffer area only
Commonwealth Land - [50684]	WA	In buffer area only
Commonwealth Land - [51895]	WA	In buffer area only
Commonwealth Land - [50730]	WA	In buffer area only
Commonwealth Land - [50731]	WA	In buffer area only
Commonwealth Land - [50732]	WA	In buffer area only
Commonwealth Land - [50790]	WA	In buffer area only
Commonwealth Land - [51899]	WA	In buffer area only
Commonwealth Land - [50795]	WA	In buffer area only
Commonwealth Land - [51894]	WA	In buffer area only
Commonwealth Land - [50735]	WA	In buffer area only
Commonwealth Land - [51413]	WA	In buffer area only
Commonwealth Land - [51415]	WA	In buffer area only
Commonwealth Land - [51412]	WA	In buffer area only
Commonwealth Land - [51417]	WA	In buffer area only
Commonwealth Land - [51414]	WA	In buffer area only
Commonwealth Land - [50736]	WA	In buffer area only
Commonwealth Land - [51416]	WA	In buffer area only
Commonwealth Land - [50688]	WA	In buffer area only
Commonwealth Land - [50710]	WA	In buffer area only
Commonwealth Land - [51144]	WA	In buffer area only
Commonwealth Land - [50707]	WA	In buffer area only
Commonwealth Land - [50784]	WA	In buffer area only
Commonwealth Land - [50780]	WA	In buffer area only
Commonwealth Land - [50708]	WA	In buffer area only
Commonwealth Land - [50761]	WA	In buffer area only

Commonwealth Heritage Places

[Resource Information]

Name	State	Status	Buffer Status
Historic			
Artillery Barracks	WA	Listed place	In buffer area only
Claremont Post Office	WA	Listed place	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 known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	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
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In buffer area only
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
[Calidris subminuta](#) Long-toed Stint [861]		Species or species habitat known to occur within area overfly marine area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
[Charadrius dubius](#) Little Ringed Plover [896]		Species or species habitat known to occur within area overfly marine area	In buffer area only
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area	In feature area
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area	In feature area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In feature area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In feature area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In feature area
Mammal			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In feature area
Reptile			
[Aipysurus pooleorum](#) Shark Bay Seasnake [66061]		Species or species habitat may occur within area	In buffer area only
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
[Disteira kingii](#) Spectacled Seasnake [1123]		Species or species habitat may occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
[Pelamis platurus](#) Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Alfred Cove	Nature Reserve	WA	In buffer area only
Canning River	Management Area	WA	In buffer area only
Carnac Island	Nature Reserve	WA	In buffer area only
Cottesloe Reef	Fish Habitat Protection Area	WA	In buffer area only
Harry Waring Marsupial Reserve	Nature Reserve	WA	In buffer area only
Keanes Point Reserve	5(1)(g) Reserve	WA	In buffer area only
Swan Estuary - Alfred Cove	Marine Park	WA	In buffer area only
Swan River	Management Area	WA	In buffer area only
Thomsons Lake	Nature Reserve	WA	In buffer area only
Unnamed WA39584	Conservation Park	WA	In buffer area only
Unnamed WA39752	Conservation Park	WA	In buffer area only
Unnamed WA42469	Nature Reserve	WA	In buffer area only
Unnamed WA44414	5(1)(g) Reserve	WA	In buffer area only
Unnamed WA48291	Conservation Park	WA	In buffer area only
Unnamed WA49220	Conservation Park	WA	In buffer area only
Unnamed WA49561	Conservation Park	WA	In buffer area only
Unnamed WA53313	Conservation Park	WA	In buffer area only
Unnamed WA53632	Conservation Park	WA	In buffer area only

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Booragoon Swamp	WA	In buffer area only
Gibbs Road Swamp System	WA	In buffer area only
Swan-Canning Estuary	WA	In buffer area only
Thomsons Lake	WA	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
119 Hammond Road Residential Development	2023/09541		Completed	In buffer area only
Beale Park Redevelopment	2022/09297		Assessment	In feature area
Cockburn Surf Park	2022/09267		Completed	In buffer area only
Fremantle District Police Complex Project	2022/09345		Completed	In buffer area only
Jandakot Airport Expansion, Commercial Development and Clearing of Vegetation	2009/4796		Referral Decision	In buffer area only
Jandakot Horse Agistment	2022/09280		Assessment	In buffer area only
Kwinana Alumina Refinery ? Future Residue Storage Area	2023/09454		Referral Decision	In buffer area only
Land clearing for limestone quarry	2023/09558		Referral Decision	In buffer area only
Residential Development, Wattleup Road, Hammond Park, WA	2021/8933		Post-Approval	In buffer area only
Controlled action				
Alcoa Bauxite Residue Storage Area Extension	2011/5878	Controlled Action	Further Information Request	In buffer area only
Construction of Fiona Stanley Hospital	2008/3970	Controlled Action	Post-Approval	In buffer area only
Development of Kwinana Quay port facility	2008/4387	Controlled Action	Completed	In buffer area only
Extension of Beeliar Drive between the junction of Mayor and Fawcett Roads an...	2003/1029	Controlled Action	Completed	In buffer area only
Hammond Park Secondary School development, WA	2016/7741	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Latitude 32-industrial development of various lots, Ashley and Sayer Roads, Hope Valley, WA	2016/7695	Controlled Action	Post-Approval	In buffer area only
Lots 13, 14 & 18 Barfield Rd & Lots 48-51 Rowley Rd, Hammond Park	2012/6524	Controlled Action	Post-Approval	In buffer area only
Roe Highway extension, Kwinana Freeway to Stock Road, WA	2009/5031	Controlled Action	Post-Approval	In buffer area only
Roe Hwy Extension	2003/972	Controlled Action	Post-Approval	In buffer area only
Shark Hazard Mitigation Drum Line Program, WA	2014/7174	Controlled Action	Completed	In buffer area only
Shenton Park Subdivision	2004/1479	Controlled Action	Completed	In buffer area only
Thornlie-Cockburn Link Project, WA	2018/8188	Controlled Action	Post-Approval	In buffer area only
Vegetation clearing (Cwlth land), Jandakot Airport, Cockburn, WA	2013/7032	Controlled Action	Post-Approval	In buffer area only
Warders Hotel, Block 1 Warders Cottages, Fremantle, WA	2018/8144	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
'Looping 10' gas transmission pipeline from Kwinana to Hopelands	2005/2212	Not Controlled Action	Completed	In buffer area only
Armadale Road Duplication - Tapper to Anstey Road	2017/7972	Not Controlled Action	Completed	In buffer area only
Armadale Road to North Lake Road Bridge development, Jandakot, WA	2018/8284	Not Controlled Action	Completed	In buffer area only
Bibra Lake Aboriginal Cultural Centre Development	2020/8642	Not Controlled Action	Completed	In buffer area only
Calleya Residential Development, Banjup, WA	2016/7708	Not Controlled Action	Completed	In buffer area only
Clearing and development of 220 and 234 Wattleup Rd, Wattleup, WA	2016/7738	Not Controlled Action	Completed	In buffer area only
Clearing of Native Vegetation, Hammond Park, WA	2011/6041	Not Controlled Action	Completed	In buffer area only
Construction and operation of an 8 turbine wind farm at Rous Head Harbour, Frema	2003/933	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Construction of Hammond Road Primary School, Hammond Park, WA	2012/6619	Not Controlled Action	Completed	In buffer area only
Development of Lots 100-101 Sayer Road, Hope Valley, WA	2019/8399	Not Controlled Action	Completed	In buffer area only
Disposal of residential properties, Fremantle, WA	2019/8593	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In buffer area only
Expansion of berthing facilities at Kwinana Bulk Terminal	2006/2509	Not Controlled Action	Completed	In buffer area only
Expansion of existing Ammonium Nitrate Production Facility	2005/1941	Not Controlled Action	Completed	In buffer area only
Frankland Parks Oval project, Hammond Park, WA	2018/8369	Not Controlled Action	Completed	In buffer area only
Fremantle Ports Inner Harbour Capital Dredging Proposal	2005/2477	Not Controlled Action	Completed	In feature area
Gas-fired Power Station	2005/2213	Not Controlled Action	Completed	In buffer area only
Hammond West Urban Development, Hammond Park, WA	2017/7917	Not Controlled Action	Completed	In buffer area only
High Street Upgrade, Fremantle, WA	2018/8315	Not Controlled Action	Completed	In buffer area only
Hope Valley-Wattleup Redevelopment Project	2020/8644	Not Controlled Action	Completed	In buffer area only
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
Industrial development 105 Sayer Road, Hope Valley, WA	2014/7261	Not Controlled Action	Completed	In buffer area only
Industrial Development Lot 64 Ashley Road, Hope Valley, WA	2014/7238	Not Controlled Action	Completed	In buffer area only
Jandakot Road Widening, Solomon Road to Berrigan Drive, Jandakot, WA	2020/8728	Not Controlled Action	Completed	In buffer area only
Kwinana Fwy southbound widening Roe Hwy to Armadale Rd and construction of farrington Rd off-ramp	2013/7062	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Kwinana Gas-Fired Power Station	2005/2101	Not Controlled Action	Completed	In buffer area only
Latitude 32 industrial development 6A, Cockburn, WA	2018/8193	Not Controlled Action	Completed	In buffer area only
Lot 170 Hope Valley Road, Hope Valley	2020/8830	Not Controlled Action	Completed	In buffer area only
Lots 12, 13 and 18 Hammond Road, Lot 80 Beeliar Drive and Lot 500 Hird Road	2012/6576	Not Controlled Action	Completed	In buffer area only
Murdoch University Sports Precinct, Melville, WA	2016/7823	Not Controlled Action	Completed	In buffer area only
Perth Seawater Desalination Project: Thomsons Lake to Kogolup Pipeline	2005/1971	Not Controlled Action	Completed	In buffer area only
Redevelopment of Purvis Street school site, Hamilton Hill, WA	2018/8255	Not Controlled Action	Completed	In buffer area only
Residential Development, Lot 12 Lyon Road, Aubin Grove, WA	2013/6852	Not Controlled Action	Completed	In buffer area only
Residential development, Lot 33 Barfield Road, Hammond Park, WA	2015/7548	Not Controlled Action	Completed	In buffer area only
Residential development, Lot 74 Wattleup Road, Hammond Park, WA	2018/8273	Not Controlled Action	Completed	In buffer area only
Residential development, Lots 124 and 125, Wattleup Road, Hammond Park, WA	2015/7519	Not Controlled Action	Completed	In buffer area only
Residential Development Lot 4225 North Lake Road, Kardinya, WA	2015/7505	Not Controlled Action	Completed	In buffer area only
Residential Development of Lots 76 and 107 Wattleup Road, Hamond Park	2020/8865	Not Controlled Action	Completed	In buffer area only
Residential development on part of Lot 2 Fanstone Avenue, Beeliar, WA	2016/7726	Not Controlled Action	Completed	In buffer area only
Roe Highway - Karel Avenue to Hope Road Bridge Project	2005/2061	Not Controlled Action	Completed	In buffer area only
South Metropolitan Crop Research Hub, Murdoch WA	2018/8201	Not Controlled Action	Completed	In buffer area only
Stages 2-5 of primary school and assoc facilities development, Hammond Park, WA	2015/7407	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Urban development, Lot 109 Wattleup Road, Hammond Park, WA	2015/7425	Not Controlled Action	Completed	In buffer area only
Urban development of Lot 107 Wattleup Road, Hammond Park, WA	2017/7890	Not Controlled Action	Completed	In buffer area only
Warders' Cottages Block 2 'W2'	2022/9148	Not Controlled Action	Completed	In buffer area only
Warders' Cottages W2 minor works, Fremantle, WA	2018/8185	Not Controlled Action	Completed	In buffer area only
Wentworth West residential development, Bartram Road, Success, WA	2014/7245	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
City of Cockburn Sporting Facilties	2005/2139	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Extension of Spearwood Ave, from Barrington Rd to Miguel Rd	2009/5140	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
South West Metropolitan Railway Project	2003/1175	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Rezoning of Crown Reserve 39181 to facilitate future residential development	2005/2096	Referral Decision	Completed	In buffer area only

Biologically Important Areas			
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna carneipes Flesh-footed Shearwater [82404]	Aggregation	Known to occur	In buffer area only
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
Eudyptula minor			
Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In feature area
Hydroprogne caspia			
Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In feature area
Larus pacificus			
Pacific Gull [811]	Foraging (in high numbers)	Former Range	In feature area
Onychoprion anaethetus			
Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In feature area
Puffinus assimilis tunneyi			
Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In feature area
Sterna dougallii			
Roseate Tern [817]	Foraging	Known to occur	In feature area
Sternula nereis			
Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In feature area
Seals			
Neophoca cinerea			
Australian Sea Lion [22]	Foraging (male)	Likely to occur	In feature area
Whales			
Balaenoptera musculus brevicauda			
Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
Megaptera novaeangliae			
Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only

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 INVENTORY

*denotes weed (introduced) flora species

Family	Species
Aizoaceae	**Carpobrotus edulis*
Anacardiaceae	**Schinus terebinthifolia*
Apiaceae	*Daucus glochidiatus*
Apiaceae	**Foeniculum vulgare*
Apocynaceae	**Asclepias tuberosa*
Arecaceae	**Pheonix dactylifera*
Arecaceae	**Washingtonia filifera*
Asparagaceae	*Acanthocarpus preissii*
Asparagaceae	**Agave* sp.
Asparagaceae	**Asparagus asparagoides*
Asparagaceae	*Dichopogon capillipes*
Asparagaceae	*Lomandra maritima*
Asparagaceae	*Thysanotus arenarius*
Asparagaceae	**Yucca* sp.
Asphodelaceae	**Asphodelus fistulosus*
Asphodelaceae	**Trachyandra divaricata*
Asteraceae	**Gazania* sp.
Asteraceae	**Hypochaeris glabra*
Asteraceae	**Lactuca serriola*
Asteraceae	*Olearia axillaris*
Asteraceae	**Reichardia tingitana*
Asteraceae	**Sonchus oleraceus*
Asteraceae	**Symphyotrichum squamatum*
Asteraceae	**Urospermum picroides*
Asteraceae	**Ursinia anthemoides*
Basellaceae	**Anredera cordifolia*
Brassicaceae	**Raphanus raphanistrum*
Caprifoliaceae	**Centranthus macrosiphon*
Caprifoliaceae	**Sixalix atropurpurea*
Caryophyllaceae	**Petrorhagia dubia*
Casuarinaceae	*Allocasuarina humilis*
Chenopodiaceae	**Atriplex prostrata*
Chenopodiaceae	**Chenopodium macrospermum*
Chenopodiaceae	*Rhagodia baccata*
Chenopodiaceae	*Rhagodia baccata* subsp. *dioica*
Cyperaceae	*Gahnia trifida*
Cyperaceae	*Lepidosperma oldhamii*
Cyperaceae	*Lepidosperma* sp.
Cyperaceae	*Lepidosperma squamatum*
Cyperaceae	*Machaerina juncea*
Cyperaceae	*Mesomelaena pseudostygia*
Cyperaceae	*Mesomelaena* sp.
Cyperaceae	*Morelotia octandra*
Dilleniaceae	*Hibbertia hypericoides*
Droseraceae	*Drosera* sp.
Ericaceae	*Conostephium pendulum*
Ericaceae	*Leucopogon ?australis*
Ericaceae	*Leucopogon parviflorus*
Ericaceae	*Leucopogon* sp.
Euphorbiaceae	**Euphorbia terracina*
Euphorbiaceae	**Ricinus communis*
Fabaceae	*Acacia cyclops*

Family	Species
Fabaceae	**Acacia iteaphylla*
Fabaceae	**Acacia longifolia*
Fabaceae	*Acacia pulchella*
Fabaceae	*Acacia rostellifera*
Fabaceae	*Acacia saligna*
Fabaceae	*Acacia truncata*
Fabaceae	*Bossiaea eriocarpa*
Fabaceae	Fabaceae sp.
Fabaceae	*Gompholobium tomentosum*
Fabaceae	*Hardenbergia comptoniana*
Fabaceae	**Lupinus cosentinii*
Fabaceae	**Lupinus* sp.
Fabaceae	**Retama raetam*
Fabaceae	*Templetonia retusa*
Fabaceae	**Trifolium campestre*
Fabaceae	**Trifolium* sp.
Fabaceae	**Vicia sativa*
Geraniaceae	**Pelargonium capitatum*
Goodeniaceae	*Lechenaultia linarioides*
Goodeniaceae	*Scaevola thesioides* subsp. *thesioides*
Haemodoraceae	*Conostylis candicans* subsp. *calcicola*
Hemerocallidaceae	*Dianella revoluta*
Hemerocallidaceae	*Tricoryne elatior*
Iridaceae	**Ferraria crispa*
Iridaceae	**Freesia alba x leichtlinii*
Iridaceae	**Gladiolus caryophyllaceus*
Iridaceae	**Romulea rosea*
Iridaceae	**Watsonia meriana*
Juncaceae	*Juncus kraussii*
Juncaceae	*Juncus pallidus*
Lamiaceae	**Lavandula* sp.
Lauraceae	*Cassytha racemosa*
Lauraceae	*Cassytha* sp.
Lycium	**Lycium ferocissimum*
Malvaceae	*Thomasia triphylla*
Moraceae	**Ficus carica*
Myrtaceae	*Calothamnus quadrifidus*
Myrtaceae	**Chamelaucium uncinatum*
Myrtaceae	*Eucalyptus decipiens*
Myrtaceae	*Eucalyptus gomphocephala*
Myrtaceae	*Eucalyptus rudis subsp. Rudis*
Myrtaceae	**Gaudium laevigatum*
Myrtaceae	*Melaleuca huegelii*
Myrtaceae	**Melaleuca nesophila*
Myrtaceae	*Melaleuca rhaphiophylla*
Myrtaceae	*Melaleuca* sp.
Myrtaceae	*Melaleuca systena*
Myrtaceae	*Melaleuca teretifolia*
Oleaceae	**Olea europaea*
Onagraceae	**Oenothera drummondii*
Orchidaceae	*Microtis media*
Oxalidaceae	**Oxalis pes-caprae*
Papaveraceae	**Fumaria capreolata*
Papaveraceae	**Fumaria* sp.
Phyllanthaceae	*Lysiandra calycina*
Pinaceae	**Pinus pinaster*

Family	Species
Plantaginaceae	**Bacopa monnieri*
Poaceae	*Amphipogon turbinatus*
Poaceae	**Arundo donax*
Poaceae	*Austrostipa elegantissima*
Poaceae	*Austrostipa flavescens*
Poaceae	*Austrostipa nitida*
Poaceae	*Austrostipa* sp.
Poaceae	**Avena barbata*
Poaceae	**Briza maxima*
Poaceae	**Bromus diandrus*
Poaceae	**Cenchrus clandestinus*
Poaceae	**Cenchrus* sp.
Poaceae	**Cenchrus setaceus*
Poaceae	**Cynodon dactylon*
Poaceae	**Ehrharta calycina*
Poaceae	**Ehrharta longiflora*
Poaceae	**Ehrharta villosa*
Poaceae	**Eragrostis curvula*
Poaceae	**Lagurus ovatus*
Poaceae	**Lolium perenne*
Poaceae	**Stenotaphrum secundatum*
Poaceae	**Vulpia myuros*
Polygalaceae	*Comesperma confertum*
Polygalaceae	*Comesperma integerrimum*
Polygalaceae	**Polygala myrtifolia*
Primulaceae	**Lysimachia arvensis*
Proteaceae	*Banksia dallanneyi*
Proteaceae	*Banksia sessilis*
Proteaceae	*Conospermum canaliculatum*
Proteaceae	*Grevillea preissii*
Ranunculaceae	*Clematis linearifolia*
Restionaceae	*Desmocladus flexuosus*
Rhamnaceae	*Spyridium globulosum*
Rhamnaceae	*Trymalium ledifolium*
Rhamnaceae	*Trymalium ledifolium* var. *ledifolium*
Rhamnaceae	*Trymalium odoratissimum*
Rhamnaceae	*Trymalium* sp.
Rubiaceae	*Opercularia hispidula*
Rubiaceae	*Opercularia vaginata*
Santalaceae	*Santalum acuminatum*
Sapindaceae	*Dodonaea hackettiana* (P4)
Scrophulariaceae	*Eremophila glabra*
Thymelaeaceae	*Pimelea calcicola* (P3)
Verbenaceae	**Lantana camara*
Violaceae	*Pigea ?calycina*
Xanthorrhoeaceae	*Xanthorrhoea preissii*

APPENDIX D - STRUCTURAL VEGETATION CLASSIFICATIONS (MUIR, 1977)

Life Form/Height Class	Canopy Cover			
	Dense 70-100%	**Mid-dense 30-70%**	**Sparse 10-30%**	**Very sparse 2-10%**
Trees >30m **Trees 15-30m** **Trees 5-15m** **Trees <5m**	Dense tall forest Dense forest Dense low forest A Dense low forest B	Tall forest Forest Low forest A Low forest B	Tall woodland Woodland Low woodland A Low woodland B	Open tall woodland Open woodland Open low woodland A Open low woodland B
Mallee Tree Form **Mallee Shrub form**	Dense tree mallee Dense shrub mallee	Tree mallee Shrub mallee	Open tree mallee Open shrub mallee	Very open tree mallee Very open shrub mallee
Shrubs >2m **Shrubs 1.5-2m** **Shrubs 1-1.5m** **Shrubs 0.5-1m** **Shrubs <0.5m**	Dense thicket Dense heath A Dense heath B Dense low heath C Dense low heath D	Thicket Heath A Heath B Low heath C Low heath D	Scrub Low scrub A Low scrub B Dwarf scrub C Dwarf scrub D	Open scrub Open low scrub A Open low scrub B Open dwarf scrub C Open dwarf scrub D
Mat plants **Hummock grass** **Bunch grass >0.5m** **Bunch grass <0.5m** **Herbaceous spp.**	Dense mat plants Dense hummock grass Dense tall grass Dense low grass Dense herbs	Mat plants Mid-dense hummock grass Tall grass Low grass Herbs	Open mat plants Hummock grass Open tall grass Open low grass Open herbs	Very open mat plants Open hummock grass Very open tall grass Very open low grass Very open herbs
Sedges >0.5m **Sedges <0.5m**	Dense tall sedges Dense low sedges	Tall sedges Low sedges	Open tall sedges Open low sedges	Very open tall sedges Very open low sedges
Ferns **Mosses, Liverwort**	Dense ferns Dense mosses	Ferns Mosses	Open ferns Open mosses	Very open ferns Very open mosses

APPENDIX E – FLORA SPECIES BY VEGETATION UNIT

*denotes weed (introduced) flora species

Family	Species	AcBsS	ArSgS	EdSgW	EgSgW	MhTr	MhTrS
Aizoaceae	**Carpobrotus edulis*		+				
Anacardiaceae	**Schinus terebinthifolia*	+	+	+	+	+	+
Apiaceae	*Daucus glochidiatus*						
Apiaceae	**Foeniculum vulgare*	+	+	+	+	+	+
Apocynaceae	**Asclepias tuberosa*	+					
Arecaceae	**Pheonix dactylifera*	+	+		+		
Arecaceae	**Washingtonia filifera*				+		
Asparagaceae	*Acanthocarpus preissii*		+				+
Asparagaceae	**Agave* sp.	+		+		+	+
Asparagaceae	**Asparagus asparagoides*	+	+	+	+	+	+
Asparagaceae	*Dichopogon capillipes*				+		
Asparagaceae	*Lomandra maritima*		+	+			+
Asparagaceae	*Thysanotus arenarius*		+				
Asparagaceae	**Yucca* sp.				+		
Asphodelaceae	**Asphodelus fistulosus*	+	+	+	+	+	+
Asphodelaceae	**Trachyandra divaricata*		+				
Asteraceae	**Gazania* sp.	+					+
Asteraceae	**Hypochaeris glabra*	+					+
Asteraceae	**Lactuca serriola*			+			
Asteraceae	*Olearia axillaris*		+				+
Asteraceae	**Reichardia tingitana*						+
Asteraceae	**Sonchus oleraceus*		+	+	+		+
Asteraceae	**Symphyotrichum squamatum*						
Asteraceae	**Urospermum picroides*	+	+	+	+		+
Asteraceae	**Ursinia anthemoides*		+	+			
Basellaceae	**Anredera cordifolia*						+
Brassicaceae	**Raphanus raphanistrum*	+	+	+		+	+
Caprifoliaceae	**Centranthus macrosiphon*		+				
Caprifoliaceae	**Sixalix atropurpurea*				+		+
Caryophyllaceae	**Petrorhagia dubia*	+	+	+			+
Casuarinaceae	*Allocasuarina humilis*		+				
Chenopodiaceae	**Atriplex prostrata*						
Chenopodiaceae	**Chenopodium macrospermum*						
Chenopodiaceae	*Rhagodia baccata*		+		+		
Chenopodiaceae	*Rhagodia baccata* subsp. *dioica*						
Cyperaceae	*Gahnia trifida*						+
Cyperaceae	*Lepidosperma oldhamii*		+	+			+
Cyperaceae	*Lepidosperma* sp.						
Cyperaceae	*Lepidosperma squamatum*		+	+			
Cyperaceae	*Machaerina juncea*						
Cyperaceae	*Mesomelaena pseudostygia*		+	+			
Cyperaceae	*Mesomelaena* sp.		+				
Cyperaceae	*Morelotia octandra*			+			
Dilleniaceae	*Hibbertia hypericoides*		+	+			+
Droseraceae	*Drosera* sp.						+
Ericaceae	*Conostephium pendulum*		+				
Ericaceae	*Leucopogon ?australis*				+		+
Ericaceae	*Leucopogon parviflorus*		+				+
Ericaceae	*Leucopogon* sp.						+
Euphorbiaceae	**Euphorbia terracina*	+	+	+	+	+	+
Euphorbiaceae	**Ricinus communis*	+			+		+
Fabaceae	*Acacia cyclops*	+					+

Family	Species	AcBsS	ArSgS	EdSgW	EgSgW	MhTr	MhTrS
Fabaceae	**Acacia iteaphylla*	+			+		+
Fabaceae	**Acacia longifolia*	+			+	+	+
Fabaceae	*Acacia pulchella*			+			
Fabaceae	*Acacia rostellifera*		+	+			+
Fabaceae	*Acacia saligna*						+
Fabaceae	*Acacia truncata*						+
Fabaceae	*Bossiaea eriocarpa*		+				
Fabaceae	Fabaceae sp.		+				
Fabaceae	*Gompholobium tomentosum*		+	+			+
Fabaceae	*Hardenbergia comptoniana*		+	+	+		+
Fabaceae	**Lupinus cosentinii*	+	+	+	+	+	+
Fabaceae	**Lupinus* sp.	+					
Fabaceae	**Retama raetam*	+		+	+		+
Fabaceae	*Templetonia retusa*		+		+		+
Fabaceae	**Trifolium campestre*		+	+			
Fabaceae	**Trifolium* sp.			+			
Fabaceae	**Vicia sativa*		+		+	+	+
Geraniaceae	**Pelargonium capitatum*	+	+	+	+	+	+
Goodeniaceae	*Lechenaultia linarioides*			+			
Goodeniaceae	*Scaevola thesioides* subsp. *thesioides*						+
Haemodoraceae	*Conostylis candicans* subsp. *calcicola*						+
Hemerocallidaceae	*Dianella revoluta*		+	+			+
Hemerocallidaceae	*Tricoryne elatior*		+	+			+
Iridaceae	**Ferraria crispa*		+		+		+
Iridaceae	**Freesia alba x leichtlinii*	+	+	+	+	+	+
Iridaceae	**Gladiolus caryophyllaceus*		+	+	+	+	+
Iridaceae	**Romulea rosea*			+	+		+
Iridaceae	**Watsonia meriana*	+	+	+	+	+	+
Juncaceae	*Juncus kraussii*						
Juncaceae	*Juncus pallidus*						
Lamiaceae	**Lavandula* sp.						+
Lauraceae	*Cassytha racemosa*		+				+
Lauraceae	*Cassytha* sp.		+				
Lycium	**Lycium ferocissimum*		+				+
Malvaceae	*Thomasia triphylla*						+
Moraceae	**Ficus carica*	+	+		+		+
Myrtaceae	*Calothamnus quadrifidus*			+			
Myrtaceae	**Chamelaucium uncinatum*			+	+		
Myrtaceae	*Eucalyptus decipiens*			+			
Myrtaceae	*Eucalyptus gomphocephala*				+		
Myrtaceae	*Eucalyptus rudis subsp. Rudis*						
Myrtaceae	**Gaudium laevigatum*	+	+	+	+	+	+
Myrtaceae	*Melaleuca huegelii*		+	+	+		+
Myrtaceae	**Melaleuca nesophila*				+		
Myrtaceae	*Melaleuca rhaphiophylla*						
Myrtaceae	*Melaleuca* sp.		+				
Myrtaceae	*Melaleuca systena*		+	+			+
Myrtaceae	*Melaleuca teretifolia*						
Oleaceae	**Olea europaea*	+	+	+	+	+	+
Onagraceae	**Oenothera drummondii*	+					
Orchidaceae	*Microtis media*			+			
Oxalidaceae	**Oxalis pes-caprae*				+		
Papaveraceae	**Fumaria capreolata*		+		+		
Papaveraceae	**Fumaria* sp.	+	+		+		+
Phyllanthaceae	*Lysiandra calycina*		+				+
Pinaceae	**Pinus pinaster*	+	+	+			+

Family	Species	AcBsS	ArSgS	EdSgW	EgSgW	MhTr	MhTrS
Plantaginaceae	**Bacopa monnieri*						
Poaceae	*Amphipogon turbinatus*			+			
Poaceae	**Arundo donax*	+					
Poaceae	*Austrostipa elegantissima*		+				
Poaceae	*Austrostipa flavescens*		+	+	+		+
Poaceae	*Austrostipa nitida*		+	+			
Poaceae	*Austrostipa* sp.				+		+
Poaceae	**Avena barbata*	+	+	+	+		+
Poaceae	**Briza maxima*		+	+			+
Poaceae	**Bromus diandrus*		+				+
Poaceae	**Cenchrus clandestinus*	+	+		+	+	+
Poaceae	**Cenchrus* sp.	+	+	+		+	+
Poaceae	**Cenchrus setaceus*	+	+				+
Poaceae	**Cynodon dactylon*	+	+		+		+
Poaceae	**Ehrharta calycina*	+	+	+	+	+	+
Poaceae	**Ehrharta longiflora*		+	+	+		+
Poaceae	**Ehrharta villosa*		+				
Poaceae	**Eragrostis curvula*					+	+
Poaceae	**Lagurus ovatus*		+		+		+
Poaceae	**Lolium perenne*		+				+
Poaceae	**Stenotaphrum secundatum*	+			+		
Poaceae	**Vulpia myuros*			+			
Polygalaceae	*Comesperma confertum*			+			
Polygalaceae	*Comesperma integerrimum*		+				
Polygalaceae	**Polygala myrtifolia*	+				+	
Primulaceae	**Lysimachia arvensis*		+	+			+
Proteaceae	*Banksia dallanneyi*		+	+			+
Proteaceae	*Banksia sessilis*	+	+		+		+
Proteaceae	*Conospermum canaliculatum*						+
Proteaceae	*Grevillea preissii*		+	+			+
Ranunculaceae	*Clematis linearifolia*		+	+	+		+
Restionaceae	*Desmocladus flexuosus*		+	+			+
Rhamnaceae	*Spyridium globulosum*	+	+	+	+		+
Rhamnaceae	*Trymalium ledifolium*						+
Rhamnaceae	*Trymalium ledifolium* var. *ledifolium*						+
Rhamnaceae	*Trymalium odoratissimum*						+
Rhamnaceae	*Trymalium* sp.						+
Rubiaceae	*Opercularia hispidula*		+				+
Rubiaceae	*Opercularia vaginata*		+				+
Santalaceae	*Santalum acuminatum*						+
Sapindaceae	*Dodonaea hackettiana* (P4)						+
Scrophulariaceae	*Eremophila glabra*		+				
Thymelaeaceae	*Pimelea calcicola* (P3)	+	+				+
Verbenaceae	**Lantana camara*	+	+				+
Violaceae	*Pigea ?calycina*						+
Xanthorrhoeaceae	*Xanthorrhoea preissii*		+	+	+		

APPENDIX F – VEGETATION QUADRAT DATA

Site DR01

Date	17/11/2020
Botanist	Daniel Roberts and Adrian Barrett
Quadrat Size	10 x 10 m
NW Corner Coordinates	384131mE 6447970mN
Vegetation Unit	**AcBsS** - *Acacia cyclops* and *Banksia sessilis* tall shrubland over **Euphorbia terracina* and **Pelargonium capitatum* isolated herbs and **Ehrharta calycina* isolated grasses
Slope	Flat
Landform	Upper Slope
Soil Colour	Brown Orange
Soil Type	Sand
Litter	35%
Bare Ground	10%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (cm)	% Cover
Banksia sessilis	2.5	75.0
*Ehrharta calycina	0.7	75.0
*Euphorbia terracina	0.5	5.0
Acacia cyclops		+
*Hypochaeris glabra		+
*Pelargonium capitatum		+
*Petrorhagia dubia		+
*Urospermum picroides		+

Site DR02r

Date	17/11/2020
Botanist	Daniel Roberts and Adrian Barrett
Quadrat Size	Relevè
NW Corner Coordinates	383451mE 6448398mN
Vegetation Unit	**ArSgS** - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Gentle
Landform	Mid Slope
Soil Colour	Brown Orange
Soil Type	Sand
Litter	65%
Bare Ground	15%
Fire Age	>10 Years
Vegetation Condition	Degraded
Disturbances/Impacts	weeds

Species	Height (m)	% Cover
Acacia rostellifera	4.0	5.0
**Gaudium laevigatum*	3.0	85.0
Banksia sessilis		+
**Ehrharta calycina*		+

Site DR03

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	384142 mE 6448772 mN
Vegetation Unit	**MrGtW** - *Melaleuca rhaphiophylla* woodland over *Gahnia trifida* and *Juncus kraussii* sedgeland over *Cynodon dactylon* grassland
Slope	Gentle
Landform	Wetland
Soil Colour	Dark brown black
Soil Type	Peat loam
Litter	20%
Bare Ground	2%
Fire Age	>10 Years
Vegetation Condition	Good-Very Good
Disturbances/Impacts	Litter, weeds

Species	Height (m)	% Cover
Melaleuca rhaphiophylla	6.0	20.0
Gahnia trifida	1.0	25.0
Juncus kraussii	1.0	2.0
**Cynodon dactylon*	0.2	1.0
**Chenopodium macrospermum*		+
Comesperma integerrimum		+
Lepidosperma sp.		+

Site DR04

Date	19/11/2020
Botanist	Daniel Roberts and Adrian Barrett
Quadrat Size	10 x 10 m
NW Corner Coordinates	383916mE 6448927mN
Vegetation Unit	**EgSgW** - *Eucalyptus decipiens* open woodland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Gentle
Landform	Mid Slope
Soil Colour	Brown
Soil Type	Sandy Loam
Litter	60%
Bare Ground	5%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Eucalyptus gomphocephala	30	50.0
Templetonia retusa	2.5	20.0
**Euphorbia terracina*	0.5	3.0
**Asparagus asparagoides*		+
**Asphodelus fistulosus*		+
Austrostipa sp.		+
**Avena barbata*		+
Clematis linearifolia		+
Dichopogon capillipes		+
**Ehrharta calycina*		+
Hardenbergia comptoniana		+
**Romulea rosea*		+
**Schinus terebinthifolia*		+
Xanthorrhoea preissii		+

Site DR05

Date	19/11/2020
Botanist	Daniel Roberts and Adrian Barrett
Quadrat Size	10 x 10 m
NW Corner Coordinates	383656mE 6448379mN
Vegetation Unit	**ArSgS** - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Gentle
Landform	Uppre Slope
Soil Colour	Brown
Soil Type	Sandy Loam
Litter	25%
Bare Ground	5%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Acacia rostellifera	2.7	20.0
Templetonia retusa	1.5	12.0
Xanthorrhoea preissii	1.5	8.0
Spyridium globulosum	1.5	5.0
Hibbertia hypericoides	0.7	35.0
Lomandra maritima	0.5	5.0
Desmocladus flexuosus	0.4	5.0
Acanthocarpus preissii		+
Allocasuarina humilis		+
**Asparagus asparagoides*		+
Austrostipa nitida		+
**Avena barbata*		+
Banksia dallanneyi		+
Bossiaea eriocarpa		+
**Briza maxima*		+
Cassytha sp.		+
Clematis linearifolia		+
Conostephium pendulum		+
Dianella revoluta		+
**Ehrharta calycina*		+
**Euphorbia terracina*		+
**Gladiolus caryophyllaceus*		+
Gompholobium tomentosum		+
Grevillea preissii		+
**Lagurus ovatus*		+
Lepidosperma squamatum		+
Lysimachia arvensis		+
Melaleuca systena		+
Mesomelaena pseudostygia		+
Mesomelaena sp.		+
Opercularia vaginata		+
**Petrorhagia dubia*		+
Phyllanthus calycinus		+
Pimelea calcicola (P3)		+
Thysanotus arenarius		+
Tricoryne elatior		+
**Trifolium campestre*		+
**Urospermum picroides*		+
**Ursinia anthemoides*		+

Site DR06

Date	19/11/2020
Botanist	Daniel Roberts and Adrian Barrett
Quadrat Size	10 x 10 m
NW Corner Coordinates	383929mE 6448062mN
Vegetation Unit	**EdSgW** - *Eucalyptus decipiens* low woodland over *Spyridium globulosum* and *Xanthorrhoea preissii* open shrubland over *Hibbertia hypericoides* and *Tricoryne elatior* low sparse shrubland over **Ehrharta calycina* sparse grassland over *Mesomelaena pseudostygia* sparse sedgeland
Slope	Flat
Landform	Valley Floor
Soil Colour	Light Brown
Soil Type	Sand
Litter	15%
Bare Ground	25%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Eucalyptus decipiens	8.0	30.0
Acacia rostellifera	7.0	10.0
Xanthorrhoea preissii	1.8	20.0
Spyridium globulosum	1.8	10.0
**Ehrharta calycina*	1.2	2.0
**Avena barbata*	1.0	3.0
Hibbertia hypericoides	0.6	13.0
**Briza maxima*	0.6	3.0
Mesomelaena pseudostygia	0.6	3.0
Tricoryne elatior	0.6	3.0
**Asparagus asparagoides*		+
Austrostipa nitida		+
Banksia dallanneyi		+
Calothamnus quadrifidus		+
Clematis linearifolia		+
Comesperma confertum		+
Desmocladus flexuosus		+
Dianella revoluta		+
**Euphorbia terracina*		+
Freesia alba x *leichtlinii*		+
**Gladiolus caryophyllaceus*		+
Hardenbergia comptoniana		+
Lepidosperma squamatum		+
Lysimachia arvensis		+
Melaleuca systena		+
Microtis media		+
**Pelargonium capitatum*		+
**Petrorhagia dubia*		+
**Romulea rosea*		+
Morelotia octandra		+
**Trifolium campestre*		+
**Urospermum picroides*		+
**Ursinia anthemoides*		+
**Vulpia myuros*		+

Site DR07

Date	17/11/2020
Botanist	Kellie Bauer-Simpson and Lisa Chappell
Quadrat Size	10 x 10 m
NW Corner Coordinates	383418mE 6449221mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Steep
Landform	Upper Slope
Soil Colour	Brown
Soil Type	Loam sand
Litter	25%
Bare Ground	5%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Weeds

Species	Height (cm)	% Cover
Banksia sessilis	1.8	30.0
Melaleuca huegelii	1.5	15.0
Templetonia retusa	1.2	6.0
Thomasia triphylla	1.2	4.0
**Lagurus ovatus*	0.5	4.0
**Ehrharta longiflora*	0.4	5.0
Acacia truncata		+
Acanthocarpus preissii		+
**Asparagus asparagoides*		+
Austrostipa sp.		+
Banksia dallanneyi		+
**Briza maxima*		+
Conospermum canaliculatum		+
Dianella revoluta		+
**Euphorbia terracina*		+
**Hypochaeris glabra*		+
Lysimachia arvensis		+
Melaleuca systena		+
Olearia axillaris		+
**Pelargonium capitatum*		+
Pimelea calcicola (P3)		+
**Romulea rosea*		+
**Sonchus oleraceus*		+
Tricoryne elatior		+
Trymalium ledifolium		+
Trymalium ledifolium var. *ledifolium*		+
Trymalium odoratissimum subsp. *odoratissimum*		+
Trymalium sp.		+

Site MP01

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383693 mE 6448720 mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Moderate
Landform	Ridge
Soil Colour	Light brown
Soil Type	Loam sand
Litter	55%
Bare Ground	22%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Melaleuca huegelii	1.5	2.0
Templetonia retusa	1.5	25.0
Melaleuca systena	1.5	1.0
Banksia dallanneyi	0.5	2.0
Lepidosperma oldhamii	0.5	10.0
Acacia saligna		+
Acanthocarpus preissii		+
**Asparagus asparagoides*		+
Banksia dallanneyi		+
Banksia sessilis		+
**Briza maxima*		+
Desmocladus flexuosus		+
Dianella revoluta		+
**Euphorbia terracina*		+
Gompholobium tomentosum		+
Hardenbergia comptoniana		+
**Lagurus ovatus*		+
**Lavandula* sp.		+
Lepidosperma oldhamii		+
Leucopogon sp.		+
Lomandra maritima		+
**Lysimachia arvensis*		+
Melaleuca systena		+
**Olea europaea*		+
Opercularia vaginata		+
**Petrorhagia dubia*		+
Pimelea calcicola (P3)		+
**Reichardia tingitana*		+
Spyridium globulosum		+
Trymalium ledifolium var. *ledifolium*		+
**Urospermum picroides*		+

Site MP02

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383659 mE 6449320 mN
Vegetation Unit	**EgSgW** - *Eucalyptus decipiens* open woodland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Moderate
Landform	Mid Slope
Soil Colour	Brown
Soil Type	Sandy loam
Litter	70%
Bare Ground	0.1%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Eucalyptus gomphocephala	10.0	3.0
**Gaudium laevigatum*	4.0	2.0
Spyridium globulosum	4.0	40.0
**Schinus terebinthifolia*	1.5	1.0
**Asparagus asparagoides*		+
Banksia sessilis		+
Clematis linearifolia		+
**Ehrharta longiflora*		+
**Euphorbia terracina*		+
Hardenbergia comptoniana		+
Leucopogon ? australis		+
Melaleuca huegelii		+
Rhagodia baccata		+
**Urospermum picroides*		+
**Watsonia* sp.		+

Site MP03

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	384149 mE 6448423 mN
Vegetation Unit	**MrGtW** - *Melaleuca rhaphiophylla* woodland over *Gahnia trifida* and *Juncus kraussii* sedgeland over *Cynodon dactylon* grassland
Slope	Moderate
Landform	Wetland
Soil Colour	Dark brown black
Soil Type	Peat loam
Litter	3%
Bare Ground	8%
Fire Age	5-10 Years
Vegetation Condition	Good-Very Good
Disturbances/Impacts	Weeds, litter

Species	Height (m)	% Cover
Melaleuca rhaphiophylla	6.0	5.0
Melaleuca teretifolia	1.5	2.0
Juncus pallidus	1.0	0.5
Machaerina juncea	1.0	1.0
**Cynodon dactylon*	0.5	85.0
Eucalyptus gomphocephala		+
Eucalyptus rudis subsp. *rudis*		+
Gahnia trifida		+
Rhagodia baccata		+
Rhagodia baccata subsp. *dioica*		+

Site MP04

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383506 mE 6449465 mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Gentle
Landform	Mid Slope
Soil Colour	Brown
Soil Type	Sandy loam
Litter	55%
Bare Ground	1%
Fire Age	>10 Years
Vegetation Condition	Poor-Good
Disturbances/Impacts	Weeds and litter

Species	Height (m)	% Cover
Banksia sessilis	2.5	5.0
Melaleuca huegelii	2.5	2.0
Spyridium globulosum	2.5	2.0
Grevillea preissii	1	1.0
Melaleuca systena	1	1.0
Desmocladus flexuosus	0.5	10
**Freesia alba* x *leichtlinii*	0.5	1.0
Tricoryne elatior	0.5	1.0
Acacia rostellifera		+
**Asparagus asparagoides*		+
Austrostipa flavescens		+
**Avena barbata*		+
**Briza maxima*		+
Clematis linearifolia		+
Conostylis candicans subsp. *calcicola*		+
Dianella revoluta		+
**Ehrharta calycina*		+
**Gaudium laevigatum*		+
Gompholobium tomentosum		+
Lepidosperma oldhamii		+
Lomandra maritima		+
Lysiandra calycina		+
**Pelargonium capitatum*		+
Pigea ? *calycina*		+
Santalum acuminatum		+
Scaevola thesioides subsp. *thesioides*		+
Spyridium globulosum		+
Templetonia retusa		+
**Urospermum picroides*		+

Site MP05r

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	Relevé
NW Corner Coordinates	383510 mE 6449028 mN
Vegetation Unit	**AcBsS** - *Acacia cyclops* and *Banksia sessilis* tall shrubland over **Euphorbia terracina* and **Pelargonium capitatum* isolated herbs and **Ehrharta calycina* isolated grasses
Slope	Gentle
Landform	Mid Slope
Soil Colour	Brown grey
Soil Type	Loam sand
Litter	55%
Bare Ground	0.1%
Fire Age	>10 Years
Vegetation Condition	Degraded
Disturbances/Impacts	Weeds, loss of structure

Species	Height (m)	% Cover
Acacia cyclops	3.0	1.0
Banksia sessilis	3.0	25.0
**Schinus terebinthifolia*	2.5	1.0
**Avena barbata*	0.5	25.0
**Ehrharta calycina*	0.5	30.0
**Euphorbia terracina*		+
**Lupinus* sp.		+
**Pelargonium capitatum*		+
**Schinus terebinthifolia*		+
Spyridium globulosum		+

Site MP06

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383520 mE 6448644 mN
Vegetation Unit	**ArSgS** - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Gentle
Landform	Mid Slope
Soil Colour	Light brown yellow
Soil Type	Loam sand
Litter	80%
Bare Ground	2%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Acacia rostellifera	4.0	4.0
Banksia sessilis	1.5	3.0
**Gaudium laevigatum*	1.5	2.0
**Ehrharta longiflora*	0.3	1.0
**Asparagus asparagoides*		+
Austrostipa flavescens		+
Clematis linearifolia		+
Dianella revoluta		+
**Euphorbia terracina*		+
Lepidosperma oldhamii		+
Leucopogon parviflorus		+
Melaleuca systena		+
**Pelargonium capitatum*		+
**Urospermum picroides*		+

Site MP07r

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	Relevé
NW Corner Coordinates	383922 mE 6448649 mN
Vegetation Unit	**MrGtW** - *Melaleuca rhaphiophylla* woodland over *Gahnia trifida* and *Juncus kraussii* sedgeland over *Cynodon dactylon* grassland
Slope	Gentle
Landform	Wetland
Soil Colour	Dark brown black
Soil Type	Peat loam
Litter	12%
Bare Ground	4%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	High water level (50% gc) weeds

Species	Height (m)	% Cover
Melaleuca rhaphiophylla	6.0	20.0
Gahnia trifida	1.0	1.0
Juncus kraussii	1.0	0.5
**Cynodon dactylon*	0.3	35.0
**Atriplex prostrata*		+
Daucus glochidiatus		+
**Symphyotrichum squamatum*		+

Site MP08

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383605 mE 6448752 mN
Vegetation Unit	**ArSgS** - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Moderate
Landform	Upper Slope
Soil Colour	Light brown yellow
Soil Type	Sand
Litter	45%
Bare Ground	10%
Fire Age	5-10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Acacia rostellifera	4	5.0
Banksia sessilis	1.5	3.0
Spyridium globulosum	1.5	3.0
Templetonia retusa	1.5	1.0
**Euphorbia terracina*	0.2	1.0
Clematis linearifolia	Climber	2.0
Acanthocarpus preissii		+
**Asparagus asparagoides*		+
**Bromus diandrus*		+
Dianella revoluta		+
**Ehrharta longiflora*		+
Eremophila glabra		+
**Euphorbia terracina*		+
Hardenbergia comptoniana		+
**Lagurus ovatus*		+
Leucopogon parviflorus		+
**Lolium perenne*		+
Lomandra maritima		+
Melaleuca huegelii		+
Melaleuca systena		+
Rhagodia baccata		+
**Schinus terebinthifolia*		+
**Sonchus oleraceus*		+
Templetonia retusa		+
Tricoryne elatior		+
**Urospermum picroides*		+

Site MP09r

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	Relevé
NW Corner Coordinates	383606 mE 6449205 mN
Vegetation Unit	**ArSgS** - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Moderate
Landform	Lower Slope
Soil Colour	Dark brown
Soil Type	Sandy loam
Litter	85%
Bare Ground	2%
Fire Age	>10 Years
Vegetation Condition	Degraded
Disturbances/Impacts	Weeds, loss of structure

Species	Height (m)	% Cover
Acacia rostellifera	4	60.0
Melaleuca sp.	2	1.0
**Ehrharta longiflora*	0.3	3.0
**Fumaria capreolata*	0.2	1.0
**Asparagus asparagoides*		+
**Euphorbia terracina*		+

Site MP10

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	384010 mE 6448094 mN
Vegetation Unit	**EdSgW** - *Eucalyptus decipiens* low woodland over *Spyridium globulosum* and *Xanthorrhoea preissii* open shrubland over *Hibbertia hypericoides* and *Tricoryne elatior* low sparse shrubland over **Ehrharta calycina* sparse grassland over *Mesomelaena pseudostygia* sparse sedgeland
Slope	Gentle
Landform	Lower Slope
Soil Colour	Light brown orange
Soil Type	Sand
Litter	62%
Bare Ground	18%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Eucalyptus decipiens	6.0	4.0
Xanthorrhoea preissii	1.5	3.0
**Ehrharta calycina*	1.0	5.0
Mesomelaena pseudostygia	1.0	2.0
Acacia pulchella		+
Amphipogon turbinatus		+
Austrostipa flavescens		+
Banksia dallanneyi		+
**Briza maxima*		+
Clematis linearifolia		+
Desmocladus flexuosus		+
Dianella revoluta		+
**Gladiolus caryophyllaceus*		+
Gompholobium tomentosum		+
Grevillea preissii		+
Hardenbergia comptoniana		+
Hibbertia hypericoides		+
Lechenaultia linarioides		+
Lepidosperma oldhamii		+
Lomandra maritima		+
Melaleuca huegelii		+
Melaleuca systena		+
**Pelargonium capitatum*		+
Spyridium globulosum		+
Tricoryne elatior		+
**Ursinia anthemoides*		+

Site MP11r

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	Relevé
NW Corner Coordinates	383926 mE 6448192 mN
Vegetation Unit	**EdSgW** - *Eucalyptus decipiens* low woodland over *Spyridium globulosum* and *Xanthorrhoea preissii* open shrubland over *Hibbertia hypericoides* and *Tricoryne elatior* low sparse shrubland over **Ehrharta calycina* sparse grassland over *Mesomelaena pseudostygia* sparse sedgeland
Slope	Moderate
Landform	Upper Slope
Soil Colour	Dark brown
Soil Type	Loam sand
Litter	65%
Bare Ground	15%
Fire Age	>10 Years
Vegetation Condition	Degraded
Disturbances/Impacts	Weeds, tracks nearby, loss of structure

Species	Height (m)	% Cover
Eucalyptus decipiens	5.0	25.0
**Schinus terebinthifolia*	2.0	25.0
Spyridium globulosum	1.5	1.0
**Ehrharta longiflora*	0.3	25.0
**Lactuca serriola*	0.3	1
**Avena barbata*		+
**Sonchus oleraceus*		+

Site MP12

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383779 mE 6448102 mN
Vegetation Unit	**ArSgS** - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Steep
Landform	Upper Slope
Soil Colour	Brown
Soil Type	Sandy loam
Litter	62%
Bare Ground	1%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Weeds, tracks nearby

Species	Height (m)	% Cover
Acacia rostellifera	2.5	2.0
Spyridium globulosum	1.5	2.0
Templetonia retusa	1.5	2.0
Olearia axillaris	1.0	1.0
Opercularia hispidula	0.3	2.0
Acanthocarpus preissii		+
Austrostipa elegantissima		+
**Avena barbata*		+
Cassytha racemosa		+
Comesperma integerrimum		+
Dianella revoluta		+
Fabaceae sp.		+
**Gaudium laevigatum*		+
**Lagurus ovatus*		+
Lepidosperma oldhamii		+
Leucopogon parviflorus		+
Melaleuca systena		+
Olearia axillaris		+
Opercularia hispidula		+
Templetonia retusa		+
**Urospermum picroides*		+

Site MP13r

Date	31/10/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	Relevé
NW Corner Coordinates	383385 mE 6449065 mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Steep
Landform	Upper Slope
Soil Colour	Brown grey
Soil Type	Sandy loam
Litter	20%
Bare Ground	0.1%
Fire Age	>10 Years
Vegetation Condition	Degraded
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Banksia sessilis	1.5	5.0
Melaleuca huegelii	1.5	25.0
Acacia cyclops		+
**Asparagus asparagoides*		+
Austrostipa flavescens		+
**Bromus diandrus*		+
Clematis linearifolia		+
Dianella revoluta		+
**Euphorbia terracina*		+
Hardenbergia comptoniana		+
**Lagurus ovatus*		+
Leucopogon ? australis		+
**Lolium perenne*		+
**Pelargonium capitatum*		+
**Sixalix atropurpurea*		+
**Vicia sativa*		+

Site MP14

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383556 mE 6449691 mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Moderate
Landform	Mid Slope
Soil Colour	Light brown
Soil Type	Loam sand
Litter	45%
Bare Ground	30%
Fire Age	5-10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
**Gaudium laevigatum*	4.0	0.5
Melaleuca huegelii	2.0	25.0
Spyridium globulosum	1.5	5.0
Templetonia retusa	1.3	20.0
**Freesia alba* x *leichtlinii*	0.2	1.0
Acacia truncata		+
Austrostipa flavescens		+
Banksia sessilis		+
Dianella revoluta		+
Grevillea preissii		+
**Lagurus ovatus*		+
Lepidosperma oldhamii		+
Melaleuca systena		+
**Petrorhagia dubia*		+
**Retama raetam*		+

Site MP15

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383761 mE 6448210 mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Moderate
Landform	Mid Slope
Soil Colour	Light brown
Soil Type	Sandy loam
Litter	30%
Bare Ground	1%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Tracks, weeds

Species	Height (m)	% Cover
Melaleuca huegelii	1.5	4.0
Templetonia retusa	1.5	15.0
Desmocladus flexuosus	0.2	3.0
Cassytha racemosa	Climber	2.0
Acacia truncata		+
**Asparagus asparagoides*		+
Austrostipa flavescens		+
**Avena barbata*		+
**Briza maxima*		+
Desmocladus flexuosus		+
Dianella revoluta		+
Gompholobium tomentosum		+
Grevillea preissii		+
Hibbertia hypericoides		+
Lepidosperma oldhamii		+
Lysiandra calycina		+
Olearia axillaris		+
Opercularia hispidula		+
Pimelea calcicola (P3)		+
Trymalium ledifolium var. *ledifolium*		+
**Urospermum picroides*		+

Site MP16

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383664 mE 6448548 mN
Vegetation Unit	**MhTrS** - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland
Slope	Steep
Landform	Upper Slope
Soil Colour	Light brown
Soil Type	Sandy loam
Litter	58%
Bare Ground	5%
Fire Age	>10 Years
Vegetation Condition	Very Good
Disturbances/Impacts	Weeds

Species	Height (m)	% Cover
Acacia rostellifera	3.0	2.0
**Gaudium laevigatum*	3.0	5.0
Melaleuca huegelii	1.5	2.0
Spyridium globulosum	1.5	2.0
Templetonia retusa	1.5	5.0
Lepidosperma oldhamii	0.3	5.0
**Asparagus asparagoides*		+
Austrostipa flavescens		+
**Avena barbata*		+
Banksia sessilis		+
Dianella revoluta		+
Drosera sp.		+
**Euphorbia terracina*		+
Gahnia trifida		+
**Lagurus ovatus*		+
Leucopogon parviflorus		+
Lysiandra calycina		+
Tricoryne elatior		+
**Urospermum picroides*		+

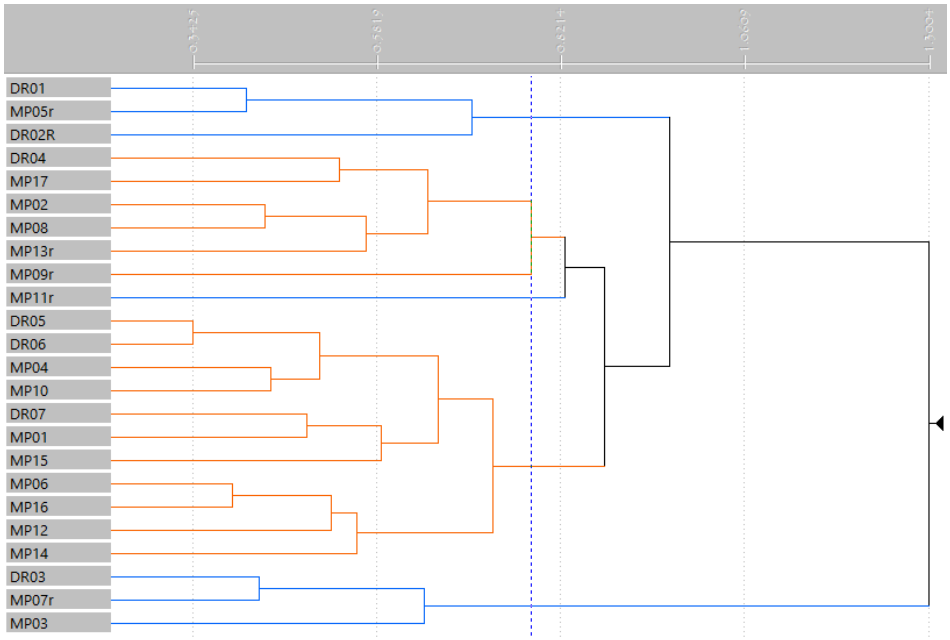
Site MP17

Date	01/11/2023
Botanist	Sarah Beckwith and Taryn Brebner
Quadrat Size	10 x 10 m
NW Corner Coordinates	383799 mE 6448871 mN
Vegetation Unit	**EgSgW** - *Eucalyptus decipiens* open woodland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over **Euphorbia terracina* isolated herbs
Slope	Moderate
Landform	Lower Slope
Soil Colour	Dark brown
Soil Type	Sandy loam
Litter	80%
Bare Ground	2%
Fire Age	>10 Years
Vegetation Condition	Good
Disturbances/Impacts	Weeds, some loss of structure

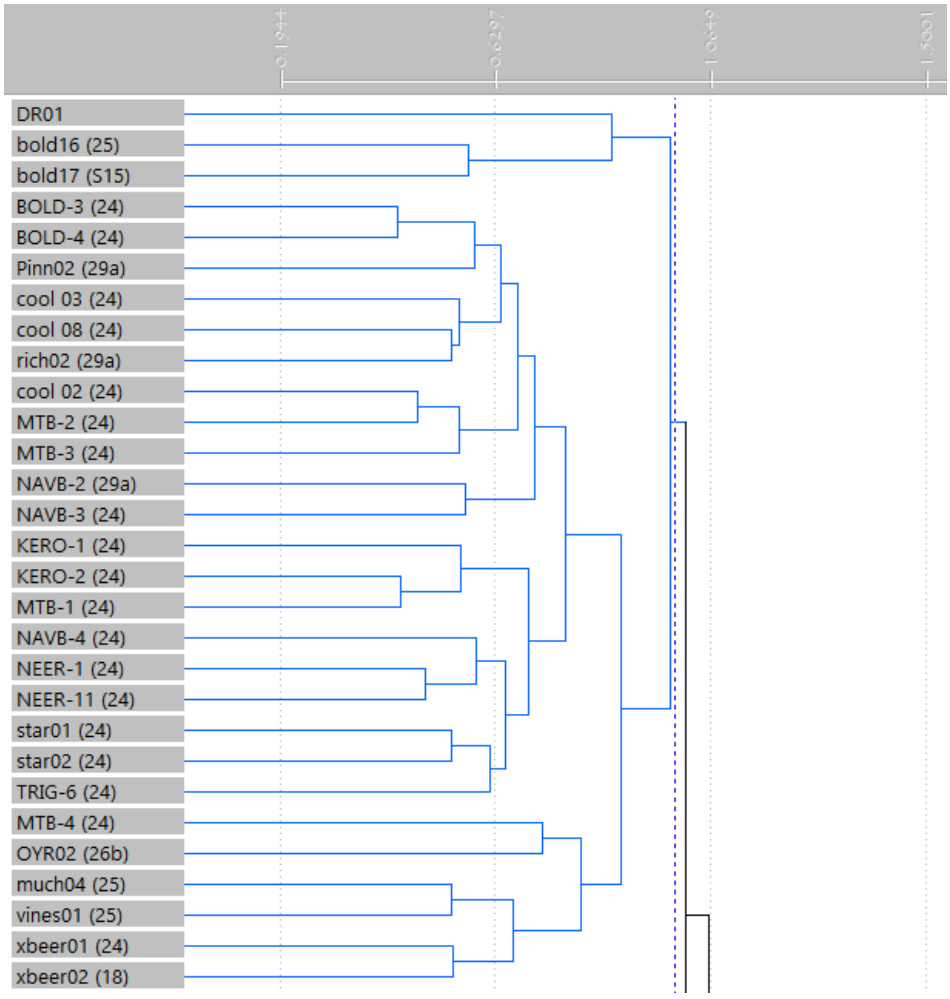
Species	Height (m)	% Cover
Eucalyptus gomphocephala	10.0	30.0
Spyridium globulosum	1.5	1.0
Templetonia retusa	1.5	0.5
**Asparagus asparagoides*	0.5	1.0
**Ehrharta longiflora*	0.5	2.0
**Euphorbia terracina*	0.5	0.5
**Fumaria capreolata*	0.5	1
Austrostipa flavescens		+
**Avena barbata*		+
**Cenchrus clandestinus*		+
Hardenbergia comptoniana		+
**Lagurus ovatus*		+
**Oxalis pes-caprae*		+
**Schinus terebinthifolia*		+
**Sixalix atropurpurea*		+
**Sonchus oleraceus*		+

APPENDIX G – FLORISTIC ANALYSIS DENDROGRAM

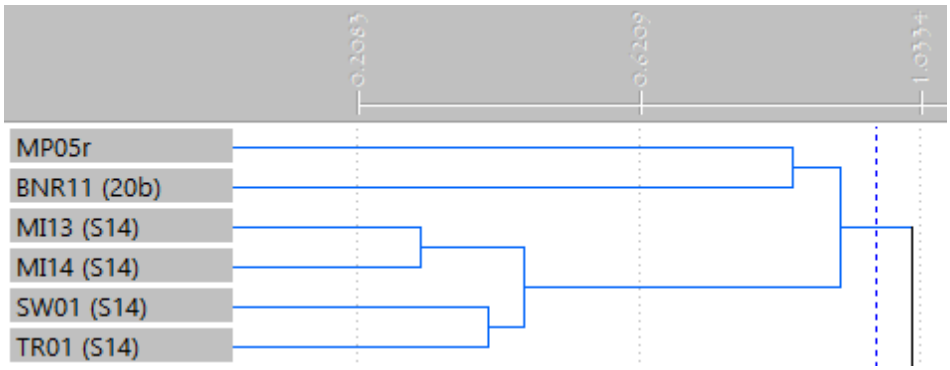
Dendrogram 1 – Batch Analysis Manning Park Quadrats



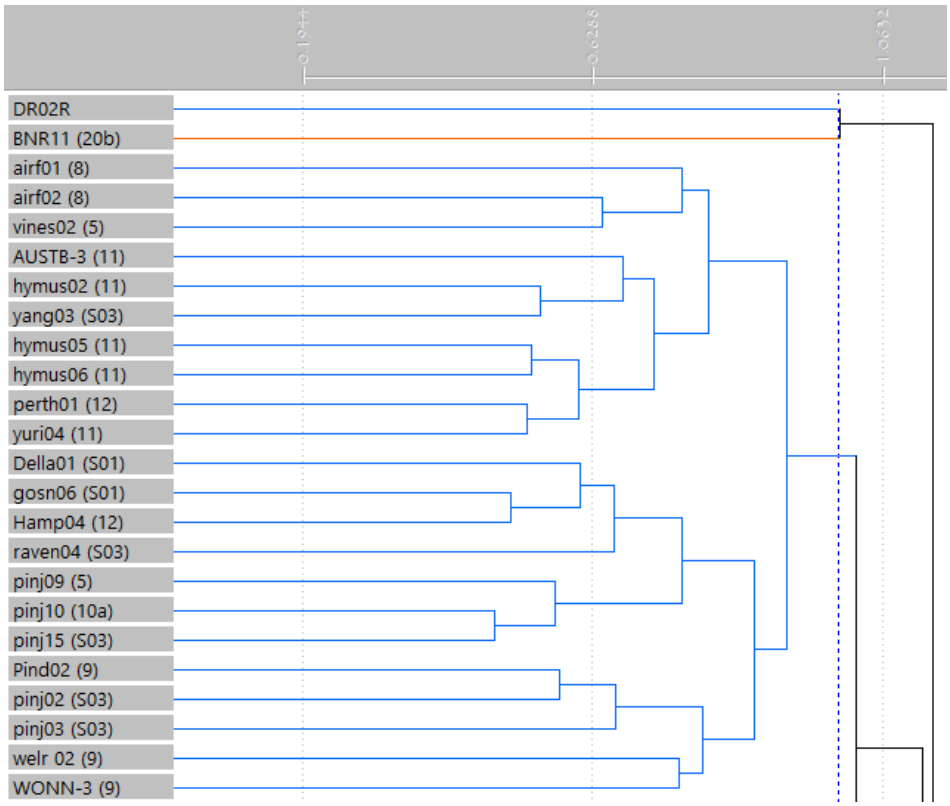
Dendrogram 2 – AcBs SSI DR01 (Excerpt)



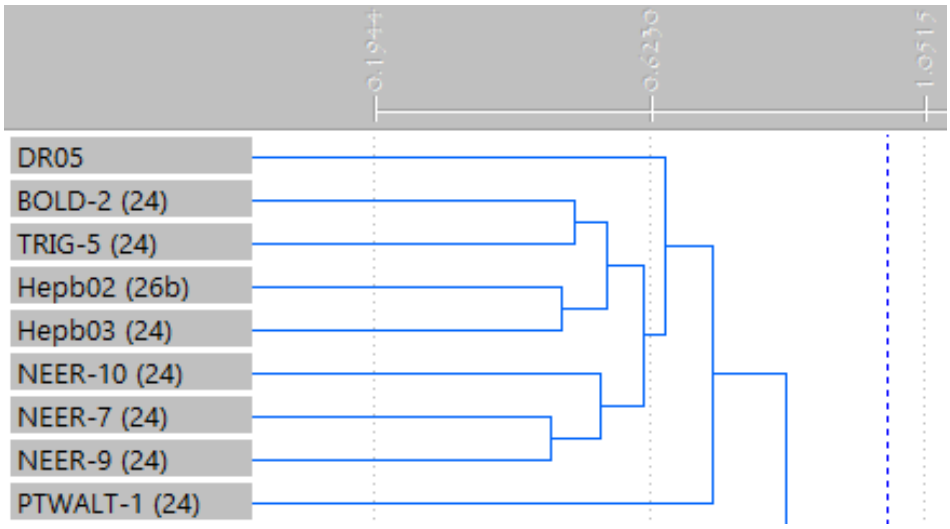
Dendrogram 3 – AcBs SSI MP05r (Excerpt)



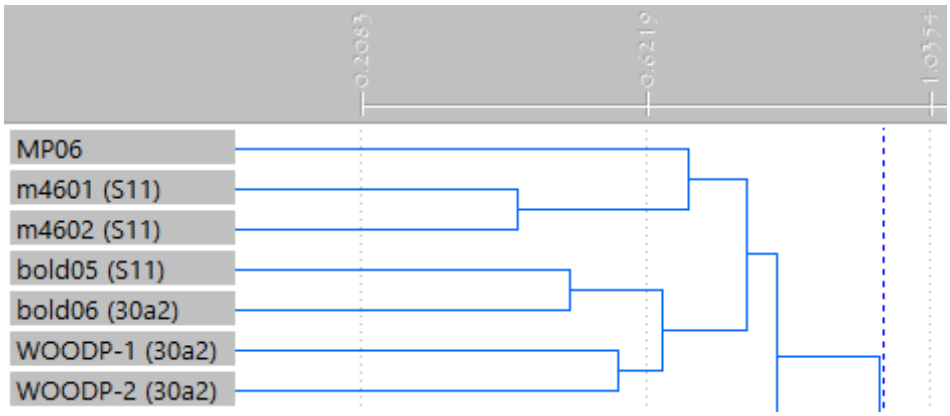
Dendrogram 4 – ArSg DR02R (Excerpt)



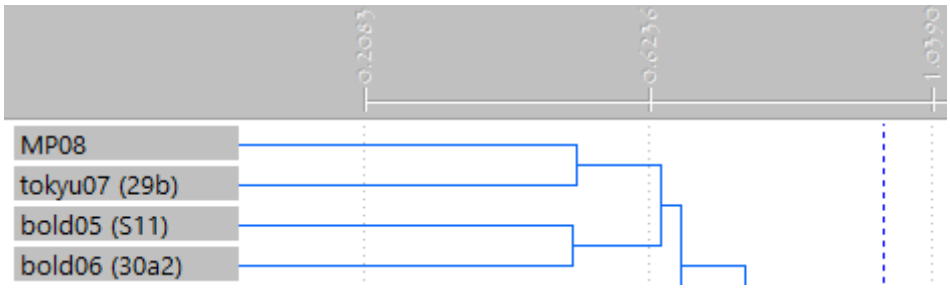
Dendrogram 5 – ArSg SSI DR05 (Excerpt)



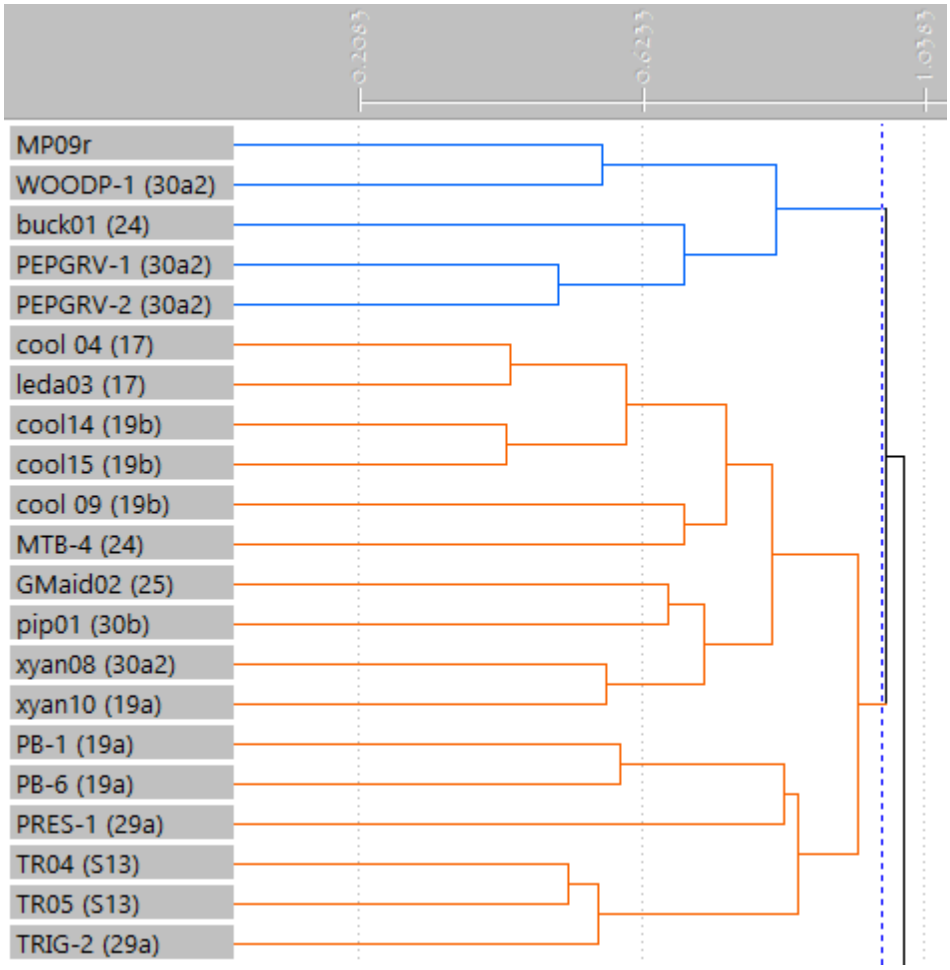
Dendrogram 6 – ArSg SSI MP06 (Excerpt)



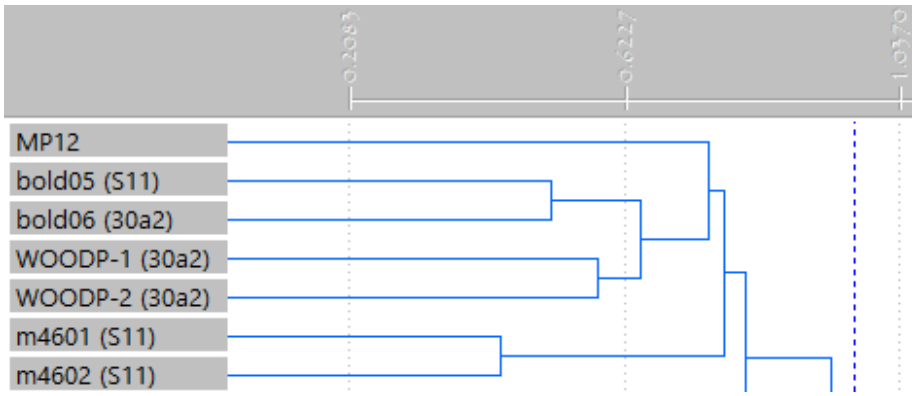
Dendrogram 7 – ArSg SSI MP08 (Excerpt)



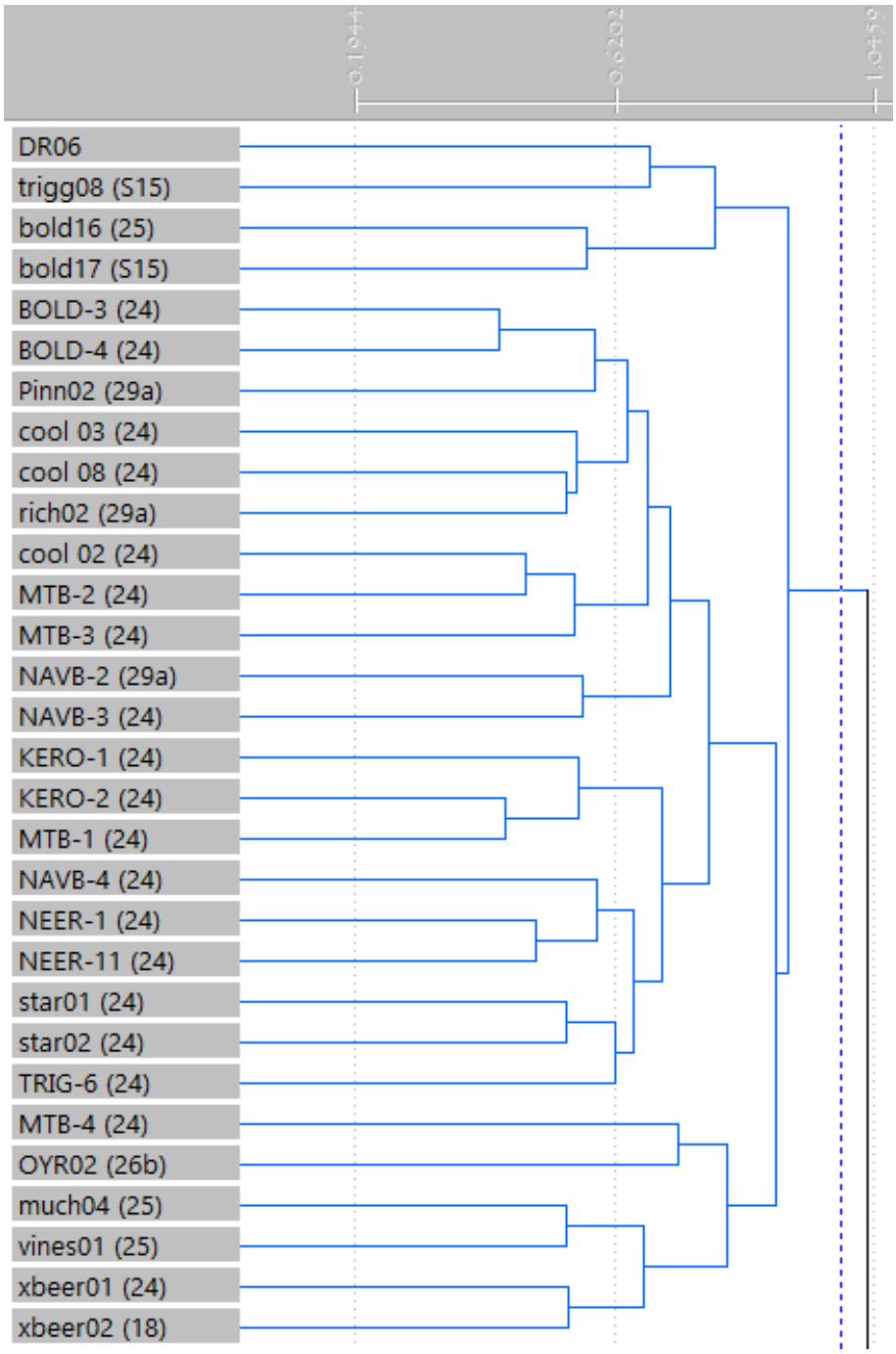
Dendrogram 8 – ArSg SSI MP09r (Excerpt)



Dendrogram 9– ArSg SSI MP12 (Excerpt)

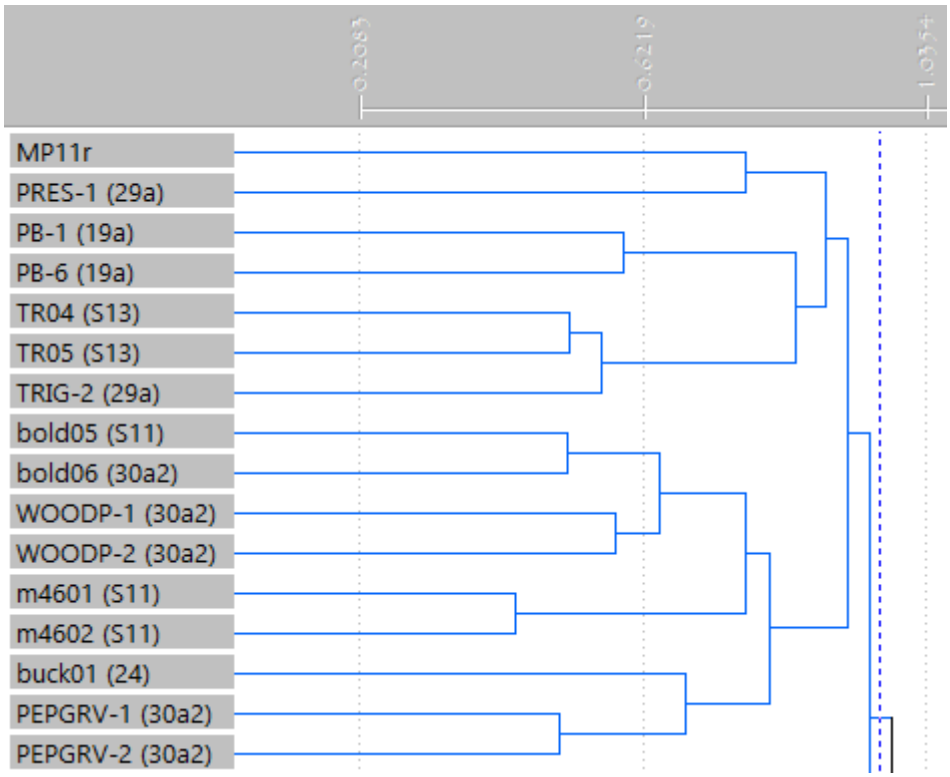


Dendrogram 10 – EdSg SSI DR06 (Excerpt)

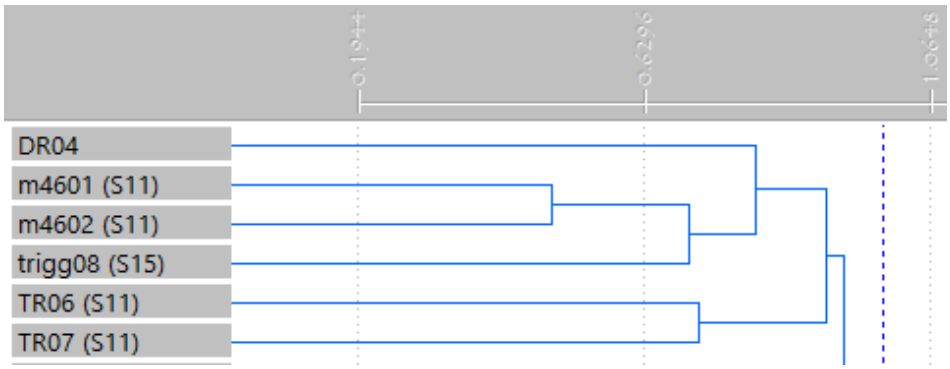


Dendrogram 11 – EdSg SSI MP10 (Excerpt)

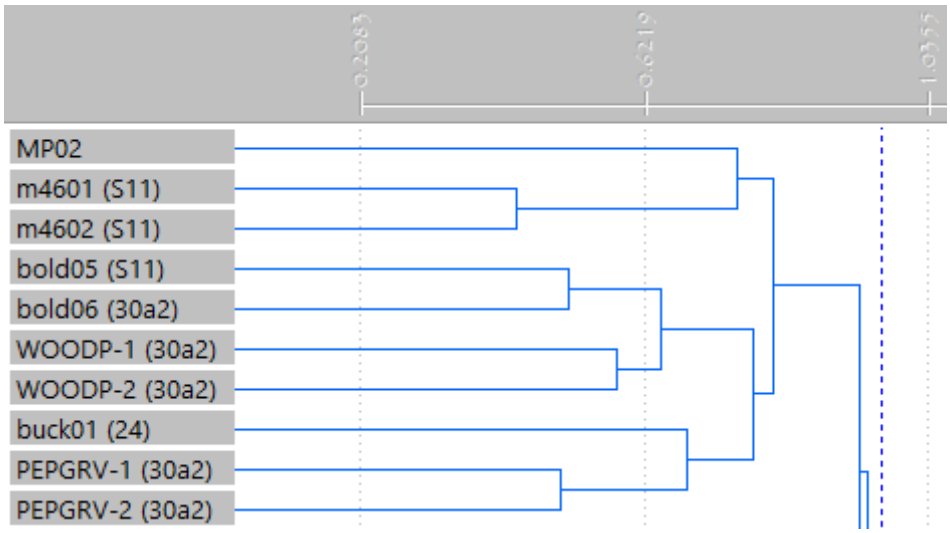
Dendrogram 12 – EdSg SSI MP11r (Excerpt)



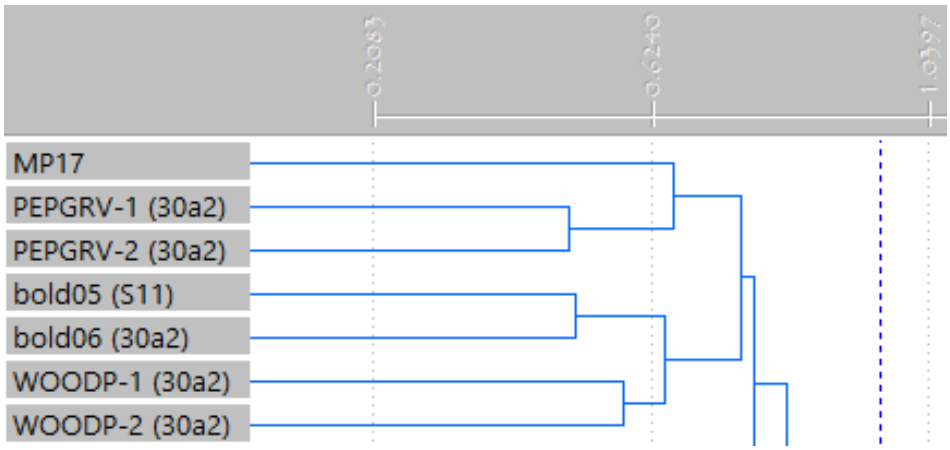
Dendrogram 13 – EgSg SSI DR04 (Excerpt)



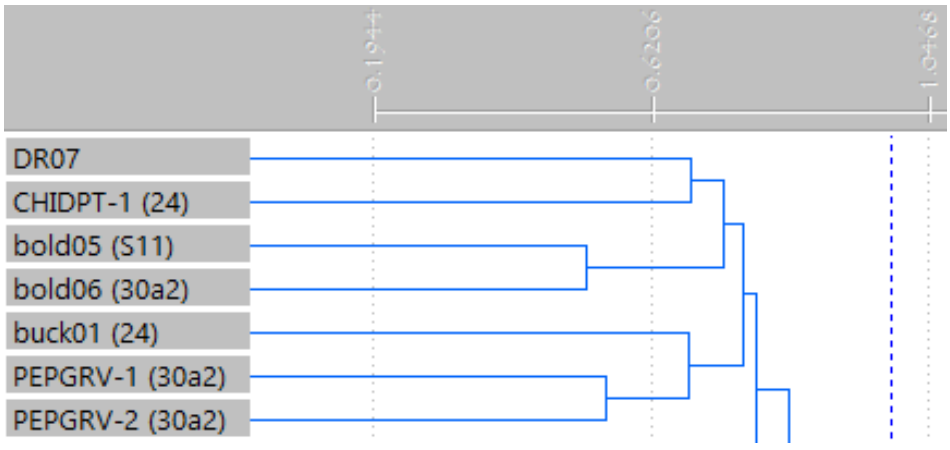
Dendrogram 14 – EgSg SSI MP02 (Excerpt)



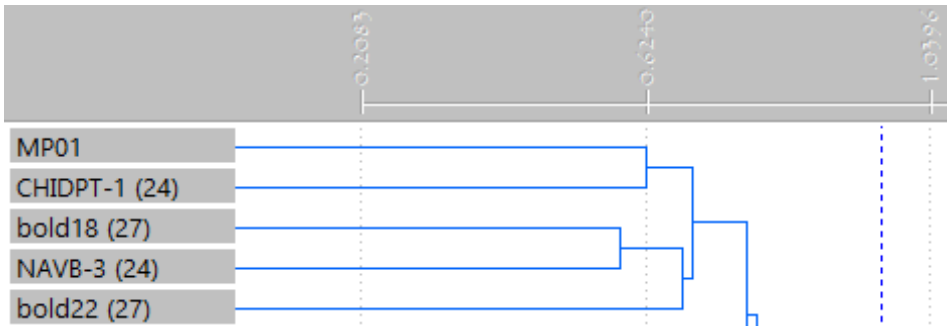
Dendrogram 15 – EgSg SSI MP17 (Excerpt)



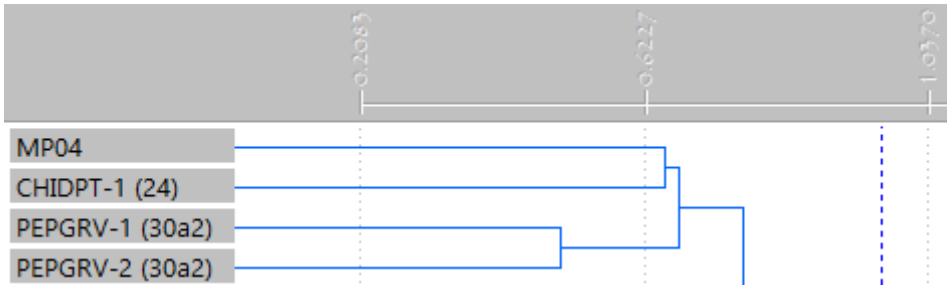
Dendrogram 16 – MhTr SSI DR07 (Excerpt)



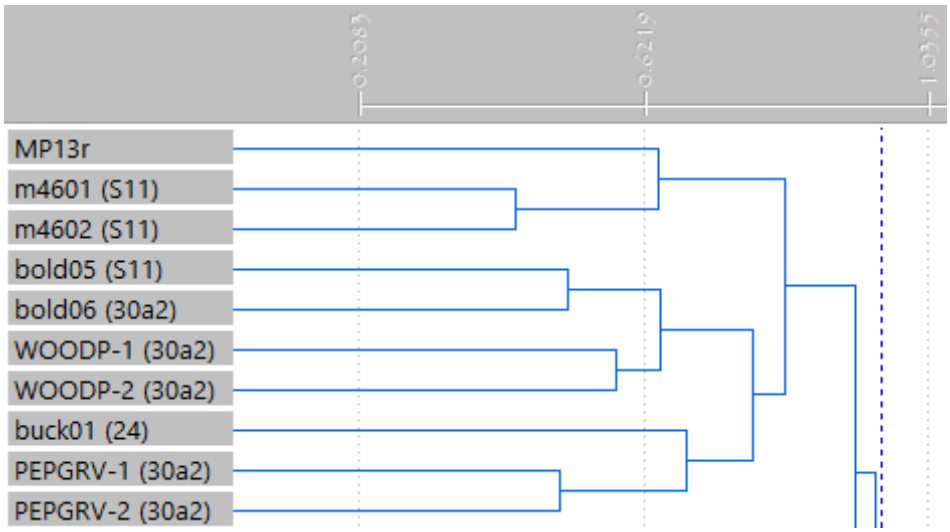
Dendrogram 17 – MhTr SSI MP01 (Excerpt)



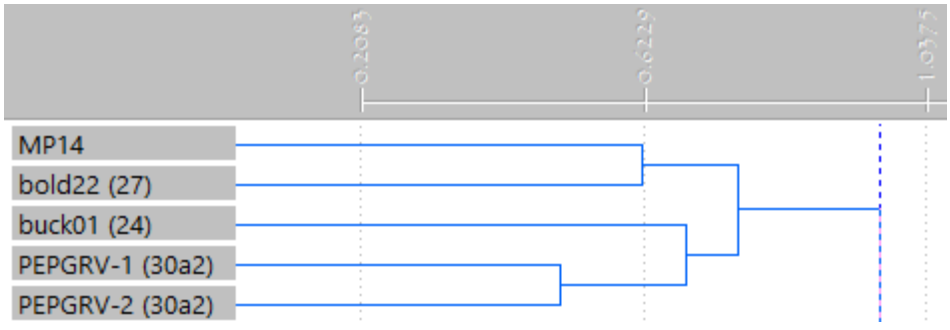
Dendrogram 18 – MhTr SSI MP04 (Excerpt)



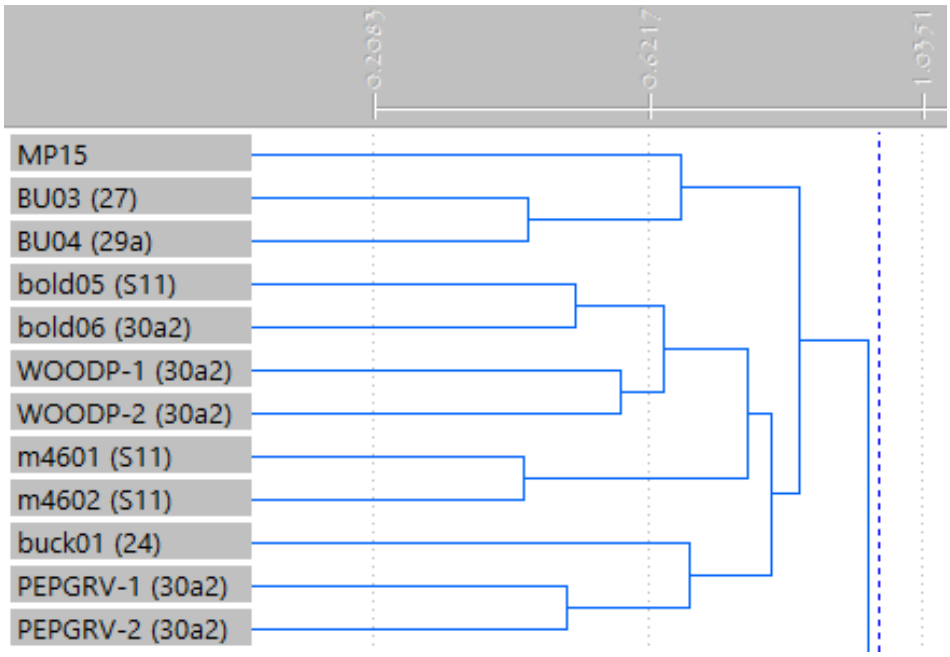
Dendrogram 19 – MhTr SSI MP13r (Excerpt)



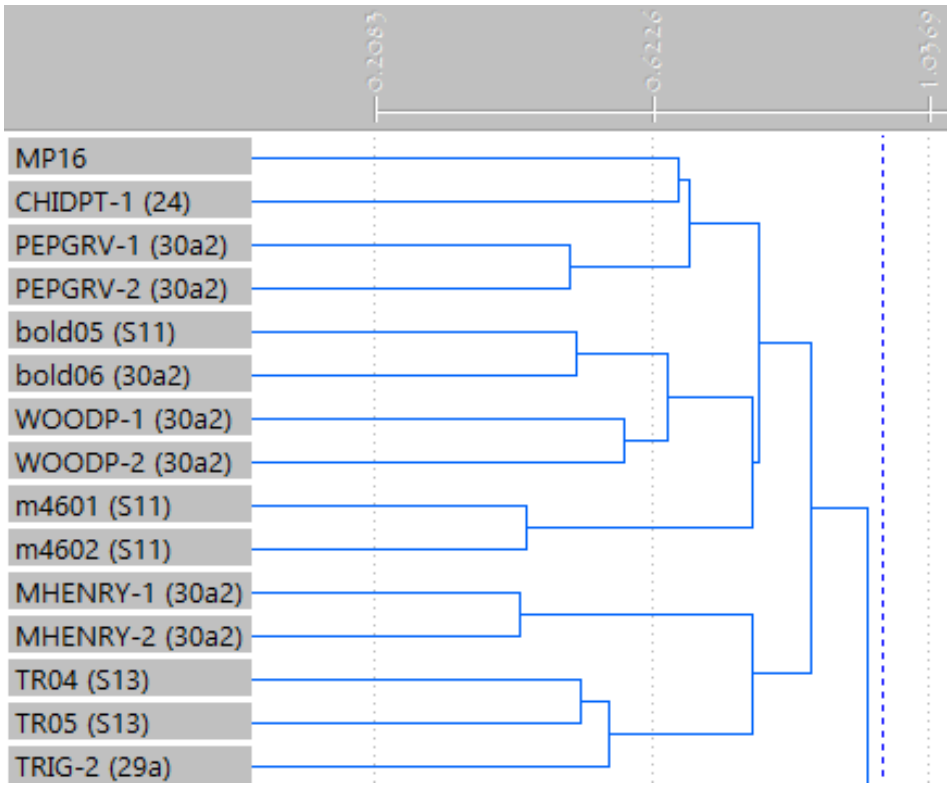
Dendrogram 20 – MhTr SSI MP14 (Excerpt)



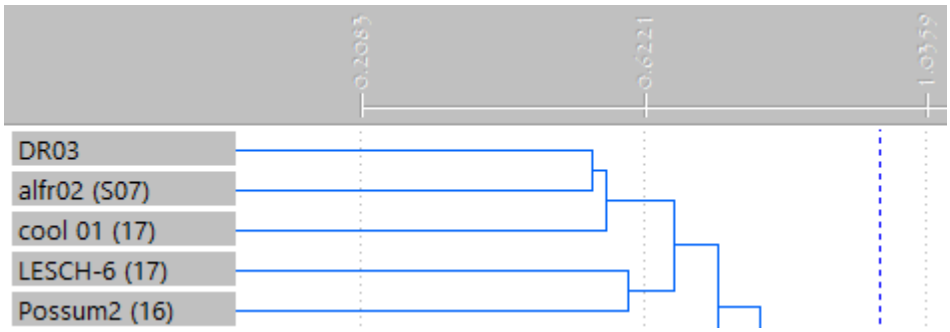
Dendrogram 21 – MhTr SSI MP15 (Excerpt)



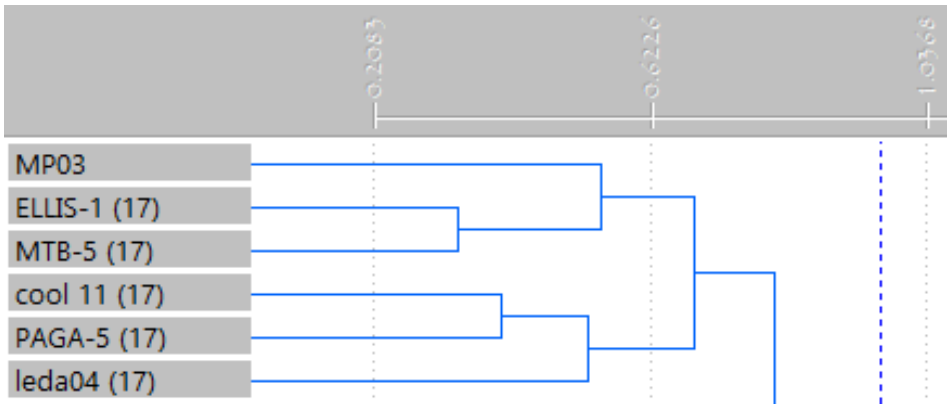
Dendrogram 22 – MhTr SSI MP16 (Excerpt)



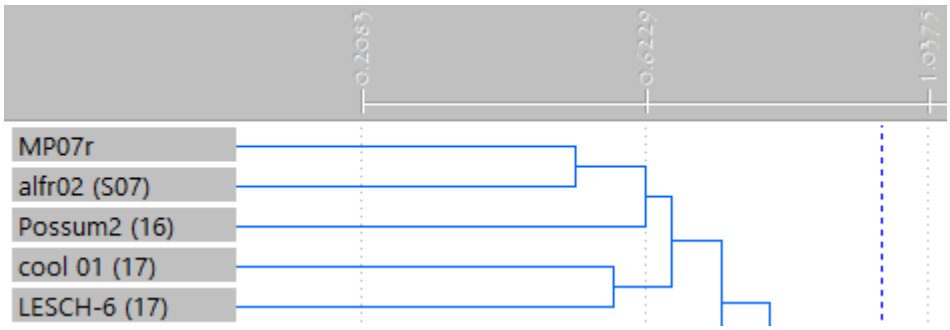
Dendrogram 23 – MtGt SSI DR03 (Excerpt)



Dendrogram 24 – MtGt SSI MP03 (Excerpt)



Dendrogram 25 – MtGt SSI MP07r (Excerpt)



APPENDIX H – NAIA FORMS

Natural Area Initial Desktop Assessment

Date of assessment 23/02/2024 Native Vegetation Unique ID No. _____

Name of area Manning Park Database Site No. _____

Other names used Part submission Area 336, part Bellier Regional Park

Location (address/street name incl. suburb, nearest street corner, Local Government)

Azelia Road, Spearwood/Hamilton Hill, City of Cockburn

Street Directory: Year, Page and Grid Ref. (Street Smart/ Gregorys/ UBD) _____

Prepare the following maps and label with the name of the area.

Map 1: Location of _____

Photocopy of street directory showing location of site

Map 2: Reference Sites/Plots and Linkage for _____

A GIS print-out of general area showing vegetation complexes, potential reference sites and plots, mapped wetlands and their management category, areas of any previously recorded Declared Rare Flora, Specially Protected Fauna, Priority Flora or Fauna or Threatened Ecological Communities plus location of Draft Regional and, if available, Local Ecological Linkages. If no Local Ecological Linkages have been determined for the Local Government area, use this map to mark potential local ecological linkages to other natural areas.

Map 3: Aerial photograph of _____

Date of photography _____ Scale _____

GIS print-out of aerial photography (with topography, if available) at a scale that ensures site covers most of an A4 page. Easy-to-use scales are 1:2000 (1 cm = 20 m), 1:3000 (1 cm = 30 m), 1:4000 (1 cm = 40 m) or 1:5000 (1 cm = 50 m). For large sites, spread over several A4 pages at one of these scales if necessary.

Area (ha) 107.63 Perimeter (m) 5606.67

Perimeter (m) to area (m^2) ratio 0.005 Priority for Further Investigation _____

Lot/Location/Reserve Number/s Bushforever Site number 247

Ownership (Local Government Reserve / Other Govt (Agency?) / Private) _____

Local Government Reserve

Land Manager City of Cockburn

Vesting Purpose Parks and Recreation

MRS Reservation or Zoning Parks and Recreation

TPS Reservation or Zoning Parks and Recreation

Protection Status (circle) none / conservation covenant / conservation zone / conservation vesting purpose / Bush Forever & Parks and Recreation in the MRS / protected CALM land

Current Status/Use of land Conservation

Long term plans?

Initial Desktop Assessment Name of area: Manning Park

Recognised International/ National? State? Regional Conservation Value yes/no

Specify:

Entered in the Interim List of the Register of the National Estate: Subject to protection under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, EPP Lake

Part of a Draft Regional Ecological yes/no

Linkage Specify (links which areas?): Recognised regional ecological linkage (Linkage 76), protected under State policy, North-South

Mapped Vegetation Complex/es Cottesloe complex-central and south yes/no

Mapped Soil Type/s (if mapping available) Spearwood system - Sand dunes and plains. Yellow deep sands, pale deep sands and yellow/ brown shallow sands CC/RE/MU yes/no

Mapped wetland/s: yes/no Environmental Protection Policy (EPP) Lake:

Wetland Management Category:

Is it a mapped floodplain area?

Potential Reference Sites and Plots (e.g. Bush Forever Sites; CALM Reserves, see Map 2). For Bush Forever Sites note floristic community type/s (FCTs) and whether FCTs actual or inferred.

Bush Forever site 247. Manning Lake and Adjacent Bushland, Hamilton Hill/Spearwood Inferred FCTs:

SCP 17 - *Melaleuca rhaphiophylla - Gahnia trifida* seasonal wetlands SCP24 - Northern Spearwood shrublands and woodlands

SCP26a - *Melaleuca huegleii - Melaleuca* systena shrulands on limestone ridges SCP16 - Highly saline seasonal wetlands

SCP 30a - The Rottnest Island Pine and Tea Tree TEC

SCP30c - Woodlands and Shrublands on Holcene Dunes

Existing biological information for area or for potential Reference Sites (reports/ surveys/ species lists)

NAIA assessment 2008

NAIA assessment 2018 (Ecological Australia)

NAIA assessment 2020 (Focused Vision Consulting

Conservation Management Plan yes/no Current or Review needed? Review needed

Title/Author/Year Beelier Regional Park Final Management Plan 2006

Part of a Local Ecological Linkage yes/no

(if these have not already been determined by Local Government mark potential linkages on Map 2)

Time since isolation from other natural areas (consult local community, historical aerial photography)

<5 years / (5 - 20 years) / >20 years

Initial Desktop Assessment Name of area: Manning Park

Does it contain any mapped Threatened Ecological Communities (see Map 2)? yes/no

Specify: Tuart woodlands and forests TEC, and Honeymyrtle on Limestone Ridges TEC

Does it contain any mapped Declared Rare Flora (see Map 2) or is it a known location for any Specially Protected Fauna or significant habitat for these fauna? yes/no

Specify: Habitat provided for Threatened Black-cockatoos

Does it contain any mapped Priority (see Map 2) or other significant **flora** (e.g. see Table 13, Bush Forever, Vol. 2, p. 51) or is it a known location for any Priority or other significant **fauna** (e.g. see Tables 14 and 15, Bush Forever, Vol. 2, pp. 59-63) or significant habitat for these fauna?

yes/no

Specify Records of Carnaby Black-cockatoo, Perth Slider, Lined Skink, Blue-billed duck within study area

Riparian streamline vegetation expected yes/no

Estuarine fringing vegetation expected yes/no

Coastal vegetation expected (foredunes or secondary dunes) yes/no

Fire History (consult with FESA/Volunteer Fire Brigades, local community, historical aerial photography)

Last fire approx 15years

Known to be of particular value to the local community for conservation yes/no

Active Friends/Environmental Group yes/no

Name of group and contact details Cockburn Wetlands Friends Group
Friends of Manning Park

Surrounding land uses with potential for community interest and possibly assistance with management

☒ educational facility yes/no

☒ residential development yes/no

☒ other (specify) yes/no

Indigenous or European Cultural or Historical Heritage Value yes/no

Notes Place No.533 Manning Estate, Hamilton Hill, Azelia Ley Homestead, Manning Park and Tuart Trees, Manning Lake

Natural Area Initial Field Assessment A

Date of assessment 23/02/2024 Native Vegetation Unique ID No. _____

Name of area Manning Park Reserve Database Site No. _____

Location (address/street name) Azelia Road, Spearwood/Hamilton Hill, City of Cockburn

Assessor	Taryn Brebner	*Skill Level 6b
Recorder	Taryn Brebner	Skill Level 6b
Recorder	Sarah Beckwith	Skill Level 6b
Recorder	Megan Gray	Skill Level 6b
Recorder	Olga Nazarova	Skill Level 6b

**Important Note: Skill level 4 or above is required by the assessor to complete this template (see Appendix 1).*

Photographs

Indicate film roll no. and photograph no., location and direction of each photo on Map 4 during the field assessment. e.g. R1/P4 **o** (Roll 1/Photo 4 looking **o**)

Photographer's Name _____

GPS used: (yes)/no GPS datum: GDA 2020 _____

Descriptor and Location No. (eg. BMX jump GPS 1)	Latitude (S) or Northing	Longitude (E) or Easting
Study Area central Point	383811	6448623

Prepare the following map during the field assessment and label with the name of the area.

Map 4 (transparent overlay on aerial photograph, Map 3): Uplands/Wetlands, Structural Plant Communities, Vegetation Condition, Spot Weed Occurrences, Areas of Disturbance and Management Infrastructure of _____

Uplands, Wetlands And Structural Plant Communities – Description And Mapping

On Map 4 divide the site into upland versus wetland areas and then into broad sections based on structural plant communities. Allocate a number to each community and describe each community using a representative sample point. Note the vegetation condition of each sample point as well as drawing a vegetation condition map for the whole site.

Describe each community using page 5 of these templates OR if preferred the templates of Keighery(1994) (see Appendix 3). If using the Keighery templates, describe each community on Recording Sheets 1 & 2 and list common native species present on Recording Sheet 3. Note that Appendix 3 contains minor modifications to the Keighery (1994) templates to include the additional information required on page 5.

Each structural plant community is described by noting the dominant species in each growth form layer of the community (see Appendix 2). Collect specimens for identification if necessary provided you have a licence from CALM and land owner permission. Carefully label all specimens. DO NOT collect species suspected of being DECLARED RARE FLORA instead take a good photo and accurately note location. Do not collect whole plants unless they are very small species and do not collect at all if only a few are present, take a good photo as an alternative

Initial Field Assessment A

Name of area Manning Park

Structural Plant Community No. 1 Indicate location of sample point described on Map

4. **Latitude and Longitude**

GPS used: (yes)/no GPS datum: 2020 E: 383693 N: 6448720

Landform and Soils

SLOPE: flat/ gentle/ (steep) ASPECT: N/ NE/ (E)/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: Light Brown Texture: sand/ (loamy sand)/ sandy loam/ loam/ clay/ gravel EXPOSED ROCK (type and % of surface):

SUB-SURFACE SOIL: Colour: _____ Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known):

DRAINAGE: (well)/ moderate/ poor WET: all year/ winter and spring only OR (n/a)

CURRENT WATER DEPTH: _____cm

LITTER (% cover & depth): 55 BARE GROUND (% cover) 22

Topographic Position Circle position of point described on a transect diagram of site below.

(**Upland**)/**or Wetland?** (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m			
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m			
Shrubs 1-2 m	*Melaleuca huegleii, Templetonia retusa, Melaleuca systena*	20-30%	1.5, 28%
Shrubs under 1 m	*Banksia dallanneyii,*	0-2%	0.5 2
Herbs			
Sedges/ Rushes	*Lepidosperma oldhamii*	10-30%	0.5, 10
Grasses			
Other (e.g. climbers)			

Common Native Species Note species observed.

Refer to Appendix G in COC22001 report

Icon Flora Species (Note if present)

Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)

Very Good

Description Of Structural Plant Community No. (see Appendix 2)

MhTrS - *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland.

Icon Community (tick if an icon community)

Community Type1

Initial Field Assessment A

Name of area Manning Park

Structural Plant Community No. 2 Indicate location of sample point described on Map

4. **Latitude and Longitude**

GPS used: yes/no GPS datum: 2020 E: 383659 N: 6449320

Landform and Soils

SLOPE: flat/ gentle/ steep ASPECT: N/ NE/ E/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: Brown Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel EXPOSED ROCK (type and % of surface):

SUB-SURFACE SOIL: Colour: Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known):

DRAINAGE: well/ moderate/ poor WET: all year/ winter and spring only OR n/a

CURRENT WATER DEPTH: cm

LITTER (% cover & depth): 70 BARE GROUND (% cover) 0.1

Topographic Position Circle position of point described on a transect diagram of site below.

Upland or Wetland? (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m	*Eucalyptus gomphocephala*	2-10%	10, 3%
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m	*Spyridium globulosum, *Gaudium laevigatum*	30-70%	4, 42%
Shrubs 1-2 m			
Shrubs under 1 m	**Schinus terebinthifolia*	0-2%	1.5, 1%
Herbs			
Sedges/ Rushes			
Grasses			
Other (e.g. climbers)			

Common Native Species Note species observed.

Refer to Appendix G in COC22001 report

Icon Flora Species (Note if present)

Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)

Good

Description Of Structural Plant Community No. (see Appendix 2)

EgSgW - *Eucalyptus decipiens* open woodland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over **Euphorbia terracina* isolated herbs.

Icon Community (tick if an icon community)

Community Type 2

Initial Field Assessment A

Name of area Manning Park

Structural Plant Community No. 3 Indicate location of sample point described on Map

4. **Latitude and Longitude**

GPS used: yes/no GPS datum: 7850 E: 384149 N: 6448423

Landform and Soils

SLOPE: flat/ gentle/ steep ASPECT: N/ NE/ E/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: Dark Brown Black Texture: sand/ loamy sand/ sandy loam/ loam/ clay/

gravel EXPOSED ROCK (type and % of surface):

SUB-SURFACE SOIL: Colour: Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known):

DRAINAGE: well/ moderate/ poor WET: all year/ winter and spring only OR n/a

CURRENT WATER DEPTH: cm

LITTER (% cover & depth): 3 BARE GROUND (% cover) 8

Topographic Position Circle position of point described on a transect diagram of site below.

Upland or Wetland? (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m			
Trees under 10 m	*Melaleuca rhaphiophylla*	2-10%	6, 5%
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m			
Shrubs 1-2 m			
Shrubs under 1 m			
Herbs			
Sedges/ Rushes	*Machaerina juncea* and *Juncus pallidus*	0-2%	1, 1.5%
Grasses	**Cynodon dactylon*	>70%	0.5, 85%
Other (e.g. climbers)			

Common Native Species Note species observed.

Refer to Appendix G in COC22001 report

Icon Flora Species (Note if present)

Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)

Good-Very Good

Description Of Structural Plant Community No. (see Appendix 2)

MtGtW - *Melaleuca rhaphiophylla* woodland over *Gahnia trifida* and *Juncus kraussii* sedgeland over **Cynodon dactylon* grassland

Icon Community (tick if an icon community)

Community Type 3

Initial Field Assessment A Name of area Manning Park

Structural Plant Community No. 4 Indicate location of sample point described on Map 4. **Latitude and Longitude**

GPS used: yes/no GPS datum: 2020 E: 383520 N: 6448644

Landform and Soils

SLOPE: flat/ gentle/ steep ASPECT: N/ NE/ E/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: Light Brown/yellow Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel EXPOSED ROCK (type and % of surface):

SUB-SURFACE SOIL: Colour: Light Brown/yellow Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known):

DRAINAGE: well/ moderate/ poor WET: all year/ winter and spring only OR n/a

CURRENT WATER DEPTH: cm

LITTER (% cover & depth): 80 BARE GROUND (% cover) 2

Topographic Position Circle position of point described on a transect diagram of site below.

Upland or Wetland? (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m			
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m	*Acacia rostellifera*	2-10%	4, 4%
Shrubs 1-2 m	*Banksia sessilis, *Gaudium laevigatum*	2-10%	1.5, 5%
Shrubs under 1 m			
Herbs			
Sedges/ Rushes			
Grasses	**Ehrharta longiflora*	0-2%	0.3, 1%
Other (e.g. climbers)			

Common Native Species Note species observed.

Refer to Appendix G in COC22001 report

Icon Flora Species (Note if present)

Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)

Good

Description Of Structural Plant Community No. (see Appendix 2)

ArSgS - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs

Icon Community (tick if an icon community)

Community Type 4

Initial Field Assessment A

Name of area Manning Park

Structural Plant Community No. 5 Indicate location of sample point described on Map

4. **Latitude and Longitude**

GPS used: yes/no GPS datum: 7850 E: 383605 N: 6448752

Landform and Soils

SLOPE: flat/ gentle/ steep ASPECT: N/ NE/ E/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: Light Brown/yellow Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel EXPOSED ROCK (type and % of surface):

SUB-SURFACE SOIL: Colour: Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known):

DRAINAGE: well/ moderate/ poor WET: all year/ winter and spring only OR n/a

CURRENT WATER DEPTH: cm

LITTER (% cover & depth): 45 BARE GROUND (% cover) 10

Topographic Position Circle position of point described on a transect diagram of site below.

Upland or Wetland? (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m			
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m	*Acacia rostellifera*	2-10%	4, 5%
Shrubs 1-2 m	*Banksia sessilis, Spyridium globulosum, Templetonia retusa*	2-10%	1.5, 7%
Shrubs under 1 m			
Herbs	**Euphorbia terracina, Clematis linearifolia*	2-10%	0.2, 3%
Sedges/ Rushes			
Grasses			
Other (e.g. climbers)			

Common Native Species Note species observed.

Refer to Appendix G in COC22001 report

Icon Flora Species (Note if present)

Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)

Good

Description Of Structural Plant Community No. (see Appendix 2)

ArSgS - *Acacia rostellifera* tall open shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Lomandra maritima* low sparse shrubland over **Euphorbia terracina* isolated herbs

Icon Community (tick if an icon community)

Community Type 5

Initial Field Assessment A Name of area Manning Park

Structural Plant Community No. 6 Indicate location of sample point described on Map
4. **Latitude and Longitude**
GPS used: yes/no GPS datum: 7850 E: 383510 N: 6449028

Landform and Soils
SLOPE: flat/ gentle/ steep ASPECT: N/ NE/ E/ SE/ S/ SW/ W/ NW OR n/a
SURFACE SOIL: Colour: Brown/grey Texture: sand/ loamy sand/ sandy loam/ loam/ clay/
gravel EXPOSED ROCK (type and % of surface):
SUB-SURFACE SOIL: Colour: Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel
UNDERLYING ROCK (type and depth if known):
DRAINAGE: well/ moderate/ poor WET: all year/ winter and spring only OR n/a
CURRENT WATER DEPTH: cm
LITTER (% cover & depth): 55 BARE GROUND (% cover) 0.1
Topographic Position Circle position of point described on a transect diagram of site below.

Upland or Wetland? (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m			
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m	*Acacia cyclops, Banksia sessilis, *Schinus terebinthifolia*	10-30%	2.5-3, 27%
Shrubs 1-2 m			
Shrubs under 1 m			
Herbs			
Sedges/ Rushes			
Grasses	*Avena barbata, *Ehrharta calycina*	30-70%	0.5, 55%
Other (e.g. climbers)			

Common Native Species Note species observed.

Refer to Appendix G in COC22001 report

Icon Flora Species (Note if present)

Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)
Degraded

Description Of Structural Plant Community No. (see Appendix 2)

AcBsS - *Acacia cyclops* and *Banksia sessilis* tall shrubland over **Euphorbia terracina* and **Pelargonium capitatum* isolated herbs and **Ehrharta calycina* isolated grasses

Icon Community (tick if an icon community)

Community Type 6

Initial Field Assessment A

Name of area: Manning Park

Weed Species Note species observed, especially the occurrence of species in better condition areas, even if they only occur in small numbers or in small patches at present. Note the distribution of each species across the site, e.g. throughout the site, spot occurrences or disturbed areas only (edges/tracks/cleared areas). Mark spot occurrences and easily mapped distributions on Map 4. If a species is widespread, note whether it is restricted to specific plant communities or wetland areas.

Weed Species	**Distribution** e.g. throughout the site, spot occurrences or disturbed areas only (edges/tracks/cleared areas)
**Acacia iteaphylla*	Spot occurrences
**Acacia longifolia*	Spot occurrences
**Agave* sp.	Spot occurrences
**Anredera cordifolia*	Spot occurrences
**Arundo donax*	Spot occurrences
**Asclepias tuberosa*	Spot occurrences
**Asparagus asparagoides*	Throughout site
**Asphodelus fistulosus*	Spot occurrences
**Atriplex prostrata*	Spot occurrences
**Avena barbata*	Spot occurrences
**Bacopa monnieri*	Spot occurrences
**Briza maxima*	Spot occurrences
**Bromus diandrus*	Spot occurrences
**Carpobrotus edulis*	Spot occurrences
**Cenchrus clandestinus*	Spot occurrences
**Cenchrus* sp.	Disturbed areas
**Cenchrus setaceus*	Spot occurrences
**Centranthus macrosiphon*	Spot occurrences
**Chamelaucium uncinatum*	Spot occurrences
**Chenopodium macrospermum*	Spot occurrences
**Cynodon dactylon*	Throughout site
**Ehrharta calycina*	Spot occurrences
**Ehrharta longiflora*	Spot occurrences
**Ehrharta villosa*	Spot occurrences
**Eragrostis curvula*	Spot occurrences
**Euphorbia terracina*	Throughout site
**Ferraria crispa*	Spot occurrences
**Ficus carica*	Spot occurrences
**Foeniculum vulgare*	Spot occurrences
**Freesia alba x leichtlinii*	Spot occurrences
**Fumaria capreolata*	Spot occurrences
**Fumaria* sp.	Spot occurrences
**Gaudium laevigatum*	Throughout site
**Gazania* sp.	Spot occurrences
**Gladiolus caryophyllaceus*	Spot occurrences
**Hypochaeris glabra*	Spot occurrences
**Lactuca serriola*	Spot occurrences

**Lagurus ovatus*	Spot occurrences
**Lantana camara*	Spot occurrences
**Lavandula* sp.	Spot occurrences
**Lolium perenne*	Spot occurrences
**Lupinus cosentinii*	Spot occurrences
**Lupinus* sp.	Spot occurrences
**Lycium ferocissimum*	Spot occurrences
**Lysimachia arvensis*	Spot occurrences
**Melaleuca nesophila*	Spot occurrences
**Oenothera drummondii*	Spot occurrences
**Olea europaea*	Spot occurrences
**Oxalis pes-caprae*	Spot occurrences
**Pelargonium capitatum*	Spot occurrences
**Petrorhagia dubia*	Spot occurrences
**Pheonix dactylifera*	Spot occurrences
**Pinus pinaster*	Spot occurrences
**Polygala myrtifolia*	Spot occurrences
**Raphanus raphanistrum*	Spot occurrences
**Reichardia tingitana*	Spot occurrences
**Retama raetam*	Spot occurrences
**Ricinus communis*	Spot occurrences
**Romulea rosea*	Spot occurrences
**Schinus terebinthifolia*	Spot occurrences
**Sixalix atropurpurea*	Spot occurrences
**Sonchus oleraceus*	Spot occurrences
**Stenotaphrum secundatum*	Spot occurrences
**Symphyotrichum squamatum*	Spot occurrences
**Trachyandra divaricata*	Spot occurrences
**Trifolium campestre*	Spot occurrences
**Trifolium* sp.	Spot occurrences
**Urospermum picroides*	Spot occurrences
**Ursinia anthemoides*	Spot occurrences
**Vicia sativa*	Spot occurrences
**Vulpia myuros*	Spot occurrences
**Washingtonia filifera*	Spot occurrences
**Watsonia meriana*	Spot occurrences
**Yucca* sp.	Spot occurrences
**Oxalis pes-caprae*	Spot occurrences
**Pelargonium capitatum*	Throughout site
**Petrorhagia dubia*	Spot occurrences
**Pheonix dactylifera*	Spot occurrences
**Pinus pinaster*	Spot occurrences
**Polygala myrtifolia*	Spot occurrences
**Raphanus raphanistrum*	Spot occurrences
**Reichardia tingitana*	Spot occurrences
**Retama raetam*	Spot occurrences
**Ricinus communis*	Spot occurrences

**Romulea rosea*	Spot occurrences
**Schinus terebinthifolia*	Spot occurrences
**Sixalix atropurpurea*	Spot occurrences
**Sonchus oleraceus*	Spot occurrences
**Stenotaphrum secundatum*	Spot occurrences
**Symphyotrichum squamatum*	Spot occurrences
**Trachyandra divaricata*	Spot occurrences
**Trifolium campestre*	Spot occurrences
**Trifolium* sp.	Spot occurrences
**Urospermum picroides*	Spot occurrences
**Ursinia anthemoides*	Spot occurrences
**Vicia sativa*	Spot occurrences
**Vulpia myuros*	Spot occurrences
**Washingtonia filifera*	Spot occurrences
**Watsonia meriana*	Spot occurrences
**Yucca* sp.	Spot occurrences
**Vulpia myuros*	Spot occurrences
**Washingtonia filifera*	Spot occurrences
**Watsonia meriana*	Spot occurrences

Feral Fauna Note species observed or evidence for presence of species (scats, tracks or traces).

	✓	**Comments**
Evidence of Foxes (burrows, wildlife kills)		
Evidence of Rabbits (burrows, dung piles, grazing)		
Evidence of Dogs (droppings, scratchings)		
Evidence of Cats (wildlife kills)		
European Honey Bees (hives in tree hollows)		
Evidence of Horses/ Cattle/ Sheep (foot prints, droppings)		
Evidence of Pigs (soil disturbance)		
Rainbow Lorikeets		
Other		

Initial Field Assessment A

Name of area: Manning Park

Native Fauna and Fungi. Note species observed or evidence of presence for fauna species. Indicate icon species.

Species	**Comments:** Observed directly, evidence of presence (scats, tracks and traces) or likely habitat?
	No fauna species of conservation significance directly observed

Native Fauna and Fungi Habitat

Habitat	✓	**Comments**
Areas of trees (with or without understory)	✓	Mature trees in remnant vegetation and in parkland areas providing important habitat for black cockatoos
Areas of dense understory vegetation		
Tree hollows in old mature trees		
Dead branches as perches for hunting/ look outs		
Dead vegetation for fungi/invertebrate habitat (leaf litter, branches/logs)		
Large fallen logs on the ground		
Granite or other natural rocky outcrops	✓	Limestone outcropping
Moss beds for fungi habitat		
Wetlands or waterways	✓	Infested with weedy grasses from neighboring parklands

Vegetation Health

Note dead or dying trees, shrubs, herbs and so on. Note the species concerned and the pattern of deaths/changes in the vegetation. *Phytophthora* Root Rot moves in fronts and along drainage lines therefore noting patterns helps to determine whether *Phytophthora* spp. are present. Appendix 5 defines and provides the website address for a list of common indicator species that are affected by *Phytophthora* spp. Do not automatically assume dead or dying plants means that *Phytophthora* is present.

	✓	**Comments**
Numerous tree stumps (not from logging)		
Dead or dying species		
Obvious reduction of tree canopies (e.g. staghorns)		
Heavy leaf/stem damage by insects (e.g. lerps, stem borers)		
Diseases/pests suspected		
Drought/lowering of groundwater table suspected		
Flooding/rise in groundwater table suspected		

Miscellaneous Disturbance Factors and Threatening Processes

Determine the range and extent of disturbance factors and threatening processes occurring at the site. If appropriate, mark on Map 4 and photograph as required. If site is large it may be beneficial to divide into sections and evaluate each separately.

Factor/Process	✓	Comments
Evidence of salinisation (e.g. scalding, seeps)		
Erosion (e.g. gullies, bank collapse)	✓	Erosion on and adjacent to tracks and quarries
Wetland eutrophication (e.g. algal blooms)		
Stormwater drains/sumps		
Service corridors (e.g. Water Corp, Telstra, Western Power, Alinta Gas)		
Mining/extraction	✓	Historic Limestone quarries
Evidence of past logging (e.g. selective removal of large trees)		
Previous clearing (may be partially cleared areas or evidence of previous clearing and regrowth over much of site)	✓	Recreation parkland areas cleared
Overgrazing (e.g. rabbits, stock, goats; over-population by kangaroos)		
Firewood collection (e.g. recent chainsaw/axe cuts, sawdust piles)		
Dope plants/ production equipment		
Soil movement (dumping or removal)		Historic limestone quarries
Rubbish dumping (note type, e.g. construction, garden waste, weed source?)	✓	General rubbish
Proliferation of tracks (fire breaks, walk trails)	✓	Walking and Cycling tracks, firebreaks
Off road vehicle use (4WD / trail bikes/ BMX/ mountain bikes)	✓	Mountain bike tracks
Cubby construction		
Vandalism (damage to plants)		
"Enrichment Planting" (revegetation with species not found in that local plant community, are these becoming weeds?)		
Impacts of High Fire Frequency and/or Intensity		
• Reduced range of tree ages		
• Fire scars high up (due to a hot burn)		
• Major trunk damage		
• Trees suckering from trunk and branches		
• Amount of leaf litter reduced		
• Large fallen logs nearly burnt away		
• Evidence of arson (burnt grass tree skirts, matches, cigarette lighters, exploded spray cans)		
Time since last fire (estimate)		<2 yrs/ < 5 yrs/ <10 yrs/ <20 yrs / >20 yrs (circle one)
Other disturbance factors or threatening processes		

Initial Field Assessment A

Name of area Manning Park

Vegetation Condition Map

For initial assessment, the overall vegetation condition of the site can be determined after familiarising yourself with the site. On Map 4, divide the site into broad sections based on condition, draw the boundaries of each section and record their condition. Using the map, estimate the % area each section occupies of the total site and note in the relevant boxes below using the Keighery (1994) condition scale(see Appendix 4). For example, 'Very Good: Section 1, 75% of site.' 'Degraded: Section 2, 25% of site.' For most sites there will be very degraded areas along tracks, for example, where rubbish has been dumped. If not extensive, these can be referred to by adding a statement such as 'areas of severe localised disturbance' in the comments.

Vegetation Condition Scales Indicate % area each section occupies of the total site (ensure adds up to 100%).

Keighery (1994)	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded
% area		0.75	31.57	44.1	22.03	1.55

Comments Areas of Open Water, Parkland, Revegetation and areas for Other Use (including cleared, firebreaks/tracks and other use) have been excluded from percentage area of vegetation condition.

Existing Management Infrastructure

Describe type in box below and mark location on Map 4, photograph if required.

	✓	Comments
Fencing	✓	Cyclone, Mesh
Fence condition	✓	Mostly in good condition, some holes been cut
Gates		
Paths	✓	Sand or limestone
Path condition	✓	Mostly good, some paths eroded
Path fencing		
Path fence condition		
Fire access tracks	✓	
Signs	✓	Reserve signs
Previous works	✓	Revegetation, weed control

Social Significance Values

	✓	Comments
Evidence of Community/ Passive recreation/ Education interest	✓	BBQ and picnic areas around lake. Lookout spots, Exercise on Manning Stairs
Landscape amenity (e.g. area screens/ buffers conflicting land uses)	✓	Lawn present in parkland areas
Scenic features (e.g. high point in landscape)	✓	Lookouts present
Indigenous/ European Heritage (Cultural or Historical)	✓	Limestone Quarry
Other		

Surrounding Land Uses (mark on Map 4)

	Comments
Surrounding Land Uses (note type/s and indicate likely impacts/benefits e.g. source of rubbish; weed seeds blowing into site; potential for community interest and perhaps volunteers to assist management)	Light industrial to the west Housing surrounding to the north, south and east

Recommendations for Management List potential management actions (for example, assessment for the presence of *Phytophthora* species by an accredited assessor; fencing; signage to identify as a conservation area; rubbish removal; detailed weed survey and mapping; fire response and management planning; detailed flora/fauna/fungi surveys).
Trail audit – map, name tracks, rehabilitate where possible
Weed control
Domestic ducks in wetland, public feeding them
Continue revegetation and consider opportunities to reintroduce *E. gomphocephala* in the vegetation community to restore Tuart woodlands and forests TEC
Other specific actions to promote the conservation, recovery and management of the occurrences of the Tuart woodlands and forests TEC include: o Avoiding further clearing, fragmentation or detrimental modification of any of the TEC vegetation o Protection of mature trees o Establishing and maintaining suitable buffers o Retaining vegetation connectivity between patches of the TEC other local vegetation o Rehabilitation o Prevention of impacts to native vegetation, native fauna, hydrology, or soil structure o Planning prescribed burning only when coupled with appropriate weed management o Protection from feral animals o Hygiene management o Community and stakeholder communication
Other specific actions to promote the conservation, recovery and management of the occurrences of the Honeymyrtle shrubland on Limestone ridges: o Avoiding further clearing, fragmentation or detrimental modification of any of the TEC vegetation o Establishing and maintaining suitable buffers o Retaining vegetation connectivity between patches of the TEC other local vegetation o Rehabilitation o Prevention of impacts to native vegetation, native fauna, hydrology, or soil structure o Planning prescribed burning only when coupled with appropriate weed management o Protection from feral animals o Hygiene management o Community and stakeholder communication o Formalise main tracks, rehab non-formal tracks

Initial Field Assessment A

Name of area: Manning Park

Confirmation of GIS Mapped Boundaries

Prepare the following map if recommending changes to native vegetation (A) or wetland (B) mapping and label with the name of the area.

Map 5: (overlay on aerial photo): Recommended GIS Boundary Changes for _____

When recommending changes, forward a completed copy of all 4 Initial Natural Area Assessment templates to the Perth Biodiversity Project, WALGA, 15 Altona St, West Perth 6005 for distribution to relevant custodian of database.

GIS dataset		Changes recommended (yes/no) Outline the rationale for each change against the relevant category (A, B or C). Prepare Map 5 if recommending changes to A or B only. Draw boundaries that correspond to your field assessment and assign accordingly to 'A' and/or 'B'.
A	**Mapped Native Vegetation** (DPI/Dept of Agriculture 2001)	Yes / No
	Rationale: _____	
B	**Mapped Wetland/s and Management Category** CC, RE or MU (DoE current update)	Yes / No / NA For changes to the mapping of wetlands on the Swan Coastal Plain complete and attach the current Department of the Environment guidelines for evaluating wetlands in this bioregion.
	Rationale: _____	
C	**Mapped Vegetation Complex/es** (Heddle, Loneragan and Havel 1980 or Mattiske & Havel 1998)	Yes / No More likely to be _____
	Rationale: (do not map)_____	

Natural Area Initial Field Assessment B –

Significant Species and Communities

General Information

Date of assessment 2 3 / 0 2 / 2 0 2 3 Native Vegetation Unique ID No. _____

Name of area Manning Park, Reserve Database Site No. _____

Location (address/street name) Azelia Road, Spearwood/Hamiliton Hill, City of Cockburn

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Assessor Taryn Brebner *Skill Level 6b

Recorder Taryn Brebner Skill Level 6b

Recorder Sarah Beckwith Skill Level 6b

Recorder Megan Gray Skill Level 6b

Recorder Olga Nazarova Skill Level 6b

**Important Note: Skill level 5 or above is required by the assessor to survey natural areas for significant species. Skill Level 6 is required to survey for threatened ecological communities (see Appendix 1).*

NO significant species or communities recorded through Field Assessment B If searches for significant flora, significant fauna and Threatened Ecological Communities by an appropriately skilled assessor have **NOT** recorded any significant species or communities on this site during this assessment, tick the box and continue no further.	✓

Partial Assessment ONLY In situations where significant species or communities have been recorded during Field Assessment A but a comprehensive Field Assessment B has **NOT** yet taken place, transfer the relevant information to these forms for databasing purposes and tick this box.	✓

Photographs

Indicate film roll no. and photograph no., location and direction of each photo on Map 4 during the field assessment. e.g. R1/P4 **o** (Roll 1/Photo 4 looking**o**)

Photographer's Name Olga Nazarova

Latitude And Longitude (for various locations noted during assessment, compulsory)

GPS used: yes/no GPS datum: GDA 2020

Descriptor and Location No. (eg. Species A GPS 1)	Reading/calculation (mark location number on Map 6) Latitude (S) or Northing	Longitude (E) or Easting
Pimelea calcicola	6448330	383760
Pimelea calcicola	6448309	383681
Pimelea calcicola	6448327	383709
Pimelea calcicola	6448321	383708
Pimelea calcicola	6448286	383667
Pimelea calcicola	6448115	383791
Pimelea calcicola	6449598	383424
Pimelea calcicola	6448116	383792
Pimelea calcicola	6448110	383771
Pimelea calcicola	6448110	383771
Pimelea calcicola	6448261	383610
Pimelea calcicola	6448240	383584
Pimelea calcicola	6448264	383584
Pimelea calcicola	6448313	383708
Pimelea calcicola	6448325	383707
Pimelea calcicola	6448320	383704
Pimelea calcicola	6449641	383443
Pimelea calcicola	6449639	383455
Pimelea calcicola	6448308	383669
Pimelea calcicola	6448313	383708
Pimelea calcicola	6448325	383707
Pimelea calcicola	6448313	383715
Dodonaea hackettiana	6449692	383514

Prepare the following map during the field assessment and label with the name of the area. Consult Map 4 prepared for Natural Area Initial Field Assessment A for the structural plant communities and vegetation condition mapping, update on Map 6 if necessary.

Map 6 (overlay on aerial photograph): Location of Threatened Ecological Communities, significant native flora or fauna or suitable habitat for these fauna of

Threatened Ecological Communities (TECs) (see Appendix 6)

List the Threatened Ecological Communities present or believed to be present on the site and the reasons why. For those TECs based on floristic community types, map the boundary of each TEC by cross referencing with the structural plant communities mapped during the Natural Area Initial Field Assessment A (Map 4). **During spring**, describe a standard 10 x 10 m quadrat and compile a species list for each structural plant community representing a TEC (see **page 15**, Threatened Ecological Communities – Description and Mapping).

Tuart woodlands and forests TEC (Critically Endangered) **EgOF**

Eucalyptus gomphocephala open forest over **Leptospermum laevigatum*, *Spyridium globulosum* and *Banksia sessilis* var. *sessilis* tall open scrub over **Ehrharta calycina* and **Briza maxima* very open grassland. Meets the following TEC characteristics
-Swan Coastal Plain bioregion -Soils and landform either Spearwood or Quindalup dune systems, occasionally occurring on Bassendean dunes and Pinjarra plains -Contains a minimum of two *Eucalyptus gomphocephala* (Tuart) situated within 60 m of each tree's canopies -Occurs as woodland but can occur as forest, open forest, open woodland and various mallee forms -Other tree species include: *Agonis flexuosa*, *Banksia grandis*, *Banksia attenuata*, *Eucalyptus marginata*, less commonly *Corymbia calophylla*, *Banksia menziesii*, *Banksia prionotes*. -Understorey is structurally variable. Common species include: *Hardenbergia comptoniana*, *Daucus glochidiatus* and *Trachymene pilosa* (although can be without)
Honeymyrtle shrubland on limestone ridges TEC (Critically Endangered) **MhTrS** *Melaleuca huegelii* and *Melaleuca systena* sparse shrubland over *Spyridium globulosum* and *Templetonia retusa* sparse shrubland over *Desmocladus flexuosus* and *Lepidosperma oldhamii* sparse sedgeland. Meets the following TEC characteristics
-Perth subregion (SWA02) of the Swan Coastal Plain Bioregion -Mainly on the ridge slopes and tops of limestone ridges and outcrops associated with Tamala limestone -Mainly as shrubland, heath, or as a thicket and has less than 10% tree canopy -Dominant shrub layer species are: *Melaleuca huegelii, Melaleuca systena*, and *Banksia sessilis* over *Acacia lasiocarpa*, *Grevillea preissii,* and *Spyridium globulosum*.

Significant Native Flora (see Appendix 6)

Note presence of Declared Rare, Priority or other significant flora. Note location of species on Map 6. Indicate which structural plant communities they occur in (refer to Map 4 of the Natural Area Initial Field Assessment A).

Species and Significance	Comments eg. Structural Plant Community, Population Size
Pimelea calcicola	DR05 (ArTOS)
Pimelea calcicola	DR07 (MhTrAtOH)
Dodonaea hackettiana	Recorded in the North of the study area
Pimelea calcicola	MP01 (MhTrS)
Pimelea calcicola	Mp15 (MhTrS)
Pimelea calcicola	Opportunistically (MhTrS)
Pimelea calcicola	Opportunistically ArGs
Pimelea calcicola	Opportunitically (AcBsS)

Significant Native Fauna (see Appendix 6)

Note presence or evidence for presence of Specially Protected, Priority or other significant fauna. Note location of species/evidence on Map 6. Indicate which structural plant communities they occur in or utilise.

Species and Significance	Comments: Observed Directly, Evidence of Presence or Likely Habitat?

Initial Field Assessment B

Name of area Manning Park

Photocopy this page and complete for **each** Structural Plant Community identified as a TEC OR if preferred use Recording Sheets 1 & 2 of Keighery (1994) (see Appendix 3) to describe each community. Note that Appendix 3 contains minor modifications to the Keighery (1994) templates to include the additional information required below.

Threatened Ecological Communities – Description and Mapping

For TECs based on floristic community types, description and mapping needs to be undertaken during spring to provide the definitive floristic information needed to confirm the presence of a TEC. On Map 6, draw the boundary of each Threatened Ecological Community present and label with the TEC to which it belongs. These boundaries should be based on the structural plant communities identified on Map 4 of the Natural Area Initial Field Assessment A template. Allocate a number to each structural plant community representing a TEC and describe each below using a permanently located and representative 10 x 10 m quadrat. Note the vegetation condition of each quadrat. Compile a list of the plant species present within each quadrat.

Structural Plant Community No. 1 Indicate location of sample point described on Map 6.

Latitude and Longitude

GPS used: (yes)/no GPS datum: 2020 E.: 383693 N.: 6448720

Landform and Soils

SLOPE: flat/ gentle/ (steep) ASPECT: N/ NE/ (E)/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: Light Brown Texture: sand/ (loamy sand)/ sandy loam/ loam/ clay/ gravel

EXPOSED ROCK (type and % of surface):

SUB-SURFACE SOIL: Colour: Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known):

DRAINAGE: (well)/ moderate/ poor WET: all year/ winter and spring only OR (n/a)

CURRENT WATER DEPTH: cm

LITTER (% cover & depth): 55 BARE GROUND (% cover) 22

Topographic Position Circle position of point described on a transect diagram of site below.

(**Upland or Wetland?** (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m			
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m			
Shrubs 1-2 m	*Melaleuca huegleii, Templetonia retusa, Melaleuca systena*	20-30%	1.5, 28%
Shrubs under 1 m	*Banksia dallanneyii,*	0-2%	0.5 2
Herbs			
Sedges/ Rushes	*Lepidosperma oldhamii*	10-30%	0.5, 10
Grasses			
Other (e.g. climbers)			

Initial Field Assessment B

Name of area Manning Park

Photocopy this page and complete for each Structural Plant Community identified as a TEC OR if preferred use Recording Sheet 3 of Keighery (1994) (see Appendix 3) to list species for each community. Note that Appendix 3 contains minor modifications to the Keighery (1994) templates to include the additional information required below.

Plant Species Note native and weed species observed within a standard 10 x 10 m quadrat.		
Trees / Mallees	**Herbs**	
	**Asparagus asparagoides*	
	Desmocladus flexuosus	
	Dianella revoluta	
	**Euphorbia terracina*	
	Hardenbergia comptoniana	
Shrubs	**Lysimachia arvensis*	
Melaleuca huegelii	*Opercularia vaginata*	
Templetonia retusa	**Petrorhagia dubia*	
Melaleuca systena	*Trymalium ledifolium* var. *ledifolium*	
Banksia dallanneyi	**Urospermum picroides*	
Acacia saligna		
Acanthocarpus preissii		
Banksia sessilis		
Gompholobium tomentosum		
**Lavandula* sp.		**Sedges / Rushes**
Leucopogon sp.		*Lepidosperma oldhamii*
**Olea europaea*		*Lomandra maritima*
Pimelea calcicola (P3)		
**Reichardia tingitana*		
Spyridium globulosum		
		Grasses
		**Briza maxima*
		**Lagurus ovatus*
Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)		
Description Of Structural Plant Community No. 2 (see Appendix 2)		MhTrS

Initial Field Assessment B

Name of area Manning Park

Photocopy this page and complete for **each** Structural Plant Community identified as a TEC OR if preferred use Recording Sheets 1 & 2 of Keighery (1994) (see Appendix 3) to describe each community. Note that Appendix 3 contains minor modifications to the Keighery (1994) templates to include the additional information required below.

Threatened Ecological Communities – Description and Mapping

For TECs based on floristic community types, description and mapping needs to be undertaken during spring to provide the definitive floristic information needed to confirm the presence of a TEC. On Map 6, draw the boundary of each Threatened Ecological Community present and label with the TEC to which it belongs. These boundaries should be based on the structural plant communities identified on Map 4 of the Natural Area Initial Field Assessment A template. Allocate a number to each structural plant community representing a TEC and describe each below using a permanently located and representative 10 x 10 m quadrat. Note the vegetation condition of each quadrat. Compile a list of the plant species present within each quadrat.

Structural Plant Community No. 2 Indicate location of sample point described on Map 6.

Latitude and Longitude

GPS used: yes/no GPS datum: 2020 E: 383659 N: 6449320

Landform and Soils

SLOPE: flat/ gentle/ steep ASPECT: N/ NE/ E/ SE/ S/ SW/ W/ NW OR n/a

SURFACE SOIL: Colour: _____ Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

EXPOSED ROCK (type and % of surface): _____

SUB-SURFACE SOIL: Colour: _____ Texture: sand/ loamy sand/ sandy loam/ loam/ clay/ gravel

UNDERLYING ROCK (type and depth if known): _____

DRAINAGE: well/ moderate/ poor WET: all year/ winter and spring only OR n/a

CURRENT WATER DEPTH: _____ cm

LITTER (% cover & depth): _____ BARE GROUND (% cover) _____

Topographic Position Circle position of point described on a transect diagram of site below.

Upland or Wetland? (circle one)

Growth Form Layer	**Dominant species** for each growth form layer list all dominant species, in their order of dominance, up to a maximum of 3*. (* if more than 3 species are obviously dominant record as many as appropriate to describe the layer)	**Crown Cover (Keighery 1994)** 2-10% / 10-30% / 30-70% / over 70%	**Height & Crown Cover (NVIS)** Record max. height of layer & % crown cover to nearest 5%
Trees over 30 m			
Trees 10–30 m	*Eucalyptus gomphocephala*	2-10%	10, 3%
Trees under 10 m			
Mallees over 8 m			
Mallees under 8 m			
Shrubs over 2 m	*Spyridium globulosum, *Gaudium laevigatum*	30-70%	4, 42%
Shrubs 1-2 m			
Shrubs under 1 m	**Schinus terebinthifolia*	0-2%	1.5, 1%
Herbs			
Sedges/ Rushes			
Grasses			
Other (e.g. climbers)			

Initial Field Assessment B

Name of area: Manning Park

Photocopy this page and complete for each Structural Plant Community identified as a TEC OR if preferred use Recording Sheet 3 of Keighery (1994) (see Appendix 3) to list species for each community. Note that Appendix 3 contains minor modifications to the Keighery (1994) templates to include the additional information required below.

Plant Species Note native and weed species observed within a standard 10 x 10 m quadrat.		
Trees / Mallees	**Herbs**	
Eucalyptus gomphocephala	**Asparagus asparagoides*	
	Clematis linearifolia	
	**Euphorbia terracina*	
	Hardenbergia comptoniana	
	**Urospermum picroides*	
Shrubs		
**Gaudium laevigatum*		
Spyridium globulosum		
**Schinus terebinthifolia*		
Banksia sessilis		
Leucopogon ?australis		
Melaleuca huegelii		
Rhagodia baccata		
		Sedges / Rushes
		**Watsonia* sp.
		Grasses
		**Ehrharta longiflora*
Vegetation Condition (Give reasoning and note scale used) (see Appendix 4)		
Description Of Structural Plant Community No. _____ (see Appendix 2) _____		

Natural Area Initial Assessment Summary

Database Site Number _____ Name of area Manning Park

ECOLOGICAL CRITERIA	
1. Representation	
1a. Regional Representation	
i) recognised International, National, State or Regional conservation value but not already protected Specify:	yes/no
ii) of an ecological community with only 1500 ha or 30% or less (whichever is the greater) remaining in IBRA subregion Specify: Honeymrtle shrubland on limestone ridges TEC (MhTr)	yes/no
iii) large (greater than 20 ha), viable natural areas in good or better condition of an ecological community with more than 30% remaining within the IBRA subregion	yes/no
iv) of an ecological community with only 1500 ha or 15% or less (whichever is the greater) protected for conservation in the Jarrah Forest IBRA subregion Specify:	yes/no
v) of an ecological community with only 400 ha or 10% or less (whichever is the greater) protected for conservation in the Bush Forever Study Area Specify:	yes/no
1b. Local Representation	
i) of an ecological community with 10% or less remaining of its pre-European extent within the Local Government Area Specify:	yes/no
ii) of an ecological community with 30% or less remaining of its pre-European extent within the Local Government Area Specify: Veg association 998, only has 18.92% remaining in cockburn	yes/no
iii) large (greater than 10 ha), viable natural areas in good or better condition of an ecological community with more than 30% remaining within the Local Government Area	yes/no
2. Diversity	
i) natural area in good or better condition that contains both upland and wetland structural plant communities	yes/no
3. Rarity	
i) of an ecological community with only 1500 ha or 10% or less (whichever is the greater) remaining in the IBRA subregion Specify: Honeymrtle shrubland on limestone ridges TEC (MhTr)	yes/no
ii) of an ecological community with only 400 ha or 10% or less (whichever is the greater) remaining in the Bush Forever Study Area Specify: Honeymrtle shrubland on limestone ridges TEC (MhTr)	yes/no
iii) contains a Threatened Ecological Community Specify: Tuart Woodland and Forests TEC and Honeymyrtle shrubland on Limestone ridges TEC	yes/no
iv) contains Declared Rare Flora, Specially Protected Fauna or significant habitat for these fauna Specify: Black Cocoatoo Habitat	yes/no
v) contains Priority or other significant flora or fauna or significant habitat for these fauna Specify: Pimelea cacicola and Dodanaea hackattiana	yes/no
4. Maintaining Ecological Processes or Natural Systems - Connectivity	
i) natural areas acting as stepping stones in a Regionally Significant Ecological Linkage	yes/no
ii) natural areas acting as stepping stones in a locally significant ecological linkage	yes/no
5. Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	
i) Conservation or Resource Enhancement category wetland plus buffer	yes/no
ii) EPP Wetland plus buffer	yes/no
iii) riparian vegetation plus buffer	yes/no
iv) floodplain area plus buffer	yes/no
v) estuarine fringing vegetation plus buffer	yes/no
vi) coastal vegetation on foredunes and secondary dunes	yes/no

Initial Assessment Summary

Name of area Manning Park

VIABILITY ESTIMATE			
Viability Factor	**Category**		**Score**
Size	Greater than 20 ha		5
	Greater than 10 ha less than 20 ha		4
	Greater than 4 ha less than 10 ha		3
	Greater than 1 ha less than 4 ha		2
	Less than 1 ha		1
Shape	Circle, square or squat rectangle		3.5
	Oval, rectangle or symmetrical triangle		3
	Irregular shape with few indentations		2.5
	Irregular shape with many indentations		2
	Long thin shape with large proportion of area greater than 50 m wide		1.5
	Long thin shape with large proportion of area less than 50 m wide		1
Perimeter to area ratio	Less than 0.01		4
	Greater than 0.01 less than 0.02		3
	Greater than 0.02 less than 0.04		2
	Greater than 0.04		1
Vegetation condition NB: based on Keighery (1994) condition scale	Pristine	10 x 0 % = 0	
	Excellent	8 x 0.75 % = 0.06	
	Very Good	6 x 31.57 % = 1.89	
	Good	4 x 44.1 % = 1.76	
	Degraded	2 x 22.03 % = 0.44	
	Completely Degraded	0 x 1.55 % = 0	
		Total calculated score =	4.15
Connectivity	**A.** Forms part of a Regional Ecological Linkage and is contiguous with a protected natural area greater than 4ha		5
	B. Not part of a Regional Ecological Linkage but contiguous with a protected natural area greater than 4ha		4.5
	C. Forms part of a Regional Ecological Linkage and is within 500 m of more than 4 protected natural areas having an area greater than 4 ha		4
	D. Not part of a Regional Ecological Linkage but within 500 m of more than 4 protected natural areas having an area greater than 4 ha		3.5
	E. Forms part of a Regional Ecological Linkage and is within 500 m of 3 or 4 protected natural areas having an area greater than 4 ha		3
	F. Not part of a Regional Ecological Linkage but within 500 m of 3 or 4 protected natural areas having an area greater than 4 ha		2.5
	G. Forms part of a Regional Ecological Linkage and is within 500 m of 2 protected natural areas having an area greater than 4 ha		2
	H. Not part of a Regional Ecological Linkage but within 500 m of 2 protected natural areas having an area greater than 4 ha		1.5
	I. Forms part of a Regional Ecological Linkage and is within 500 m of 1 protected natural area having an area greater than 4 ha		1
	J. Not part of a Regional Ecological Linkage but within 500 m of 1 protected natural area having an area greater than 4 ha		0.5
	K. Forms part of a Regional Ecological Linkage but is not within 500 m of any protected natural areas having an area greater than 4 ha		0.25
TOTAL SCORE (Viability Estimate)			20.65