APPENDIX 2:
ENVIRONMENTAL ASSESSMENT REPORT

East Wanneroo Environmental Assessment Report

Precinct 7

Hesperia

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	6 December 2023	Vongai Mugabe	Genelle Abolis	Genelle Abolis
2.0	11 December 2023	Vongai Mugabe	Genelle Abolis	Genelle Abolis

Basis of Report

This report has been prepared by SLR Consulting Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Hesperia (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

360 Environmental Pty Ltd (360 Environmental), a part of SLR Consulting (SLR) was commissioned by Hesperia to prepare an Environmental Assessment Report (EAR) to support the development of a Local Structure Plan (LSP) and lifting of Urban Deferment for Precinct 7, East Wanneroo. Precinct 7 is within the East Wanneroo District Structure Plan (DSP) and comprises 127 individually owned rural residential lots bound by Rousset Road, Pinjar Road, Caporn Street, Lakeview Street and Mariginiup Lake within the City of Wanneroo.

The LSP area is approximately 394.7 ha and located 37 km north of Perth's Central Business District. The LSP area is zoned 'Urban Deferred' under the Metropolitan Region Scheme (MRS) and zoned 'General Rural', 'Rural Resource' and 'Parks and Recreation' Reserve under the City of Wanneroo District Planning Scheme No. 2 (DPS 2).

The Environmental Assessment Report (EAR) provides an understanding of any environmental aspects associated with the proposed LSP including opportunities and constraints, management, protection and mitigation measures to minimize impacts on environmental values within the LSP area. The development of the proposed LSP has considered the environmental aspects of the LSP area and planned for its protection, including incorporating wetland buffers, Regional Ecological Linkages, conservation areas and Public Open Space (POS) areas to protect the existing vegetation and habitat values.

No Threatened flora species pursuant to the *Environmental Protection Biodiversity Conservation Act 1999* (EPBC Act) and/or gazetted as Threatened/Declared Rare Flora pursuant to the Biodiversity Conservation Act 2016 (BC Act) were recorded during the three (3) spring flora and vegetation surveys conducted in 2020, 2021 and 2022. Only one (1) DBCA listed Priority flora was identified and recorded, *Jacksonia sericea* (P4). Native vegetation will be retained by creating and retaining areas for Public Open Space (POS) and Regional Ecological Linkages wherever practicable.

The LSP area occurs within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo (360 Environmental, 2021). A total of 32.58ha of black cockatoo foraging habitat was recorded, of which 18.91 ha was Very High Quality, 12.50ha was High Quality, 0.65ha Medium Quality and 0.0.51ha was Low Quality.

Conservation and environmentally sensitive areas were identified within the proposed LSP for protection including Lake Mariginiup and seven conservation sites including two (2) Bush Forever sites. Consideration of Regional Ecological linkages have been incorporated within the proposed LSP wherever possible.

Two (2) Aboriginal heritage sites (ID: 3741 and 28616) are identified within the proposed LSP. An ethnographic and archaeological survey of the LSP area will be required by a suitably qualified consultant prior to development occurring. Consideration of the *Aboriginal Heritage Act 1972 (as amended)* and approval process associated with future development will be addressed separately to the LSP process.

Lake Mariginiup is mapped as having 'High to Moderate' risk of ASS within the first 3 m of natural soil surface. An ASS investigation for the LSP area is anticipated to determine the impact of the ASS to the project. If required, prior to ground disturbing activities an ASS Management Plan and Dewatering Management Plan will be developed to manage the ASS risk within the LSP and adjacent wetland area at the time of subdivision.

A recent bushfire event has occurred within the LSP area in November 2023. The design of the proposed LSP considered the previous environmental values and condition of the LSP area prior to the bushfire event.

Based on the results of this EAR, the environmental matters identified in this report are not significant and should not restrict development of the proposed LSP. Appropriate environmental management assessments and approvals will be sought prior to future subdivision and development of the land within Precinct 7.

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Acronyms and Abbreviations

AHD	Australian Height Datum
ASS	Acid Sulfate Soils
BC	Biodiversity Conservation
BMP	Bushfire Management Plan
BoM	Bureau of Meterology
CBD	Central Business District
CCW	Conservation Category Wetland
CoW	City of Wanneroo
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPLH	Department of Planning, Lands and Heritage
DSP	District Structure Plan
DWER	Department of Water and Environmental Regulation
DWMS	District Water Management Strategy
EAR	Environmental Assessment Report
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation
ESA	Environmentally Sensitive Area
IWMS	Integrated Water Management Strategy
PEC	Priority Ecological Communities
PDWSA	Public Drinking Water Source Area
POS	Public Open Space
PMST	Protected Matter Search Tool
LSP	Local Structure Plan
LWMS	Local Water Management Strategy
MNES	Matters of National Environmental Significance
MRS	Metropolitan Region Scheme
SLR	SLR Consulting
TEC	Threatened Ecological Communities
WAPC	Western Australian Planning Commission

1.0 Introduction

1.1 Background

360 Environmental Pty Ltd (360 Environmental), a part of SLR Consulting (SLR) has been commissioned by Hesperia to undertake an Environmental Assessment Report (EAR) to support the proposed Local Structure Plan (LSP) and lifting of Urban Deferment for Precinct 7 of the East Wanneroo District Structure Plan (DSP). The proposed LSP comprises 127 individually owned lots bound by Rousset Road, Pinjar Road, Caporn Street, Lakeview Street, Franklin Road, Wells Street, Edward Street and Mariginiup Lake within the City of Wanneroo (CoW) (the LSP area) (Figure 1).

The proposed LSP is approximately 394.7 ha in size and is located approximately 50 km north of Perth's Central Business District (CBD)and is situated within the City of Wanneroo. The proposed LSP is currently zoned General Rural,' 'Rural Resource 'and 'Parks and Recreation' Reserve under the City's District Planning Scheme No. 2 (DPS 2).

The planning and design of the proposed LSP and this EAR has been developed in reference to the following:

- East Wanneroo District Structure Plan
- Precinct 7 East Wanneroo Vegetation Survey and Black Cockatoo Assessment (360 Environmental)
- District Water Management Strategy (Urbaqua)
- East Wanneroo Integrated Water Management Strategy (IWMS)
- Bushfire Management Plan (Linfire Consultancy)
- Local Water Management Strategy (SLR Consulting).

Appendix B provides the proposed Local Structure Plan.

A recent bushfire event (dated 23 November 2023) has occurred within the LSP area resulting in anticipated loss of native vegetation and fauna habitats. Those previous environmental values of the LSP area are considered in this EAR.

1.2 Environmental Assessment Objectives

The EAR outlines the key environmental matters and management and protection measures associated with the proposed development of the land consistent with the proposed LSP and the lifting of the Urban Deferred zoning for Precinct 7 of the East Wanneroo District Structure Plan.

1.3 Scope

The scope includes a review of environmental information for the LSP area including government databases, search tools and online reports available for the site. The desktop environmental assessment included the following:

- NatureMap database search.
- Searches of the Federal Department of Climate Change, Energy, Environmental Water (DCCEEW) (formerly Department of Agriculture, Water and Environment's (DAWE) *Environment Protection and Biodiversity Conservation Act 1999* Protected Matters Search Tool.

- Review of publicly listed ecological information where available (previous reports and any relevant scientific literature).
- Review of applicable environmental legislation, policies and guidelines and their relevance to the LSP area.
- Topography, soil, and potential acid sulfate soils.
- Groundwater levels, groundwater protection areas, surface water and geomorphic wetlands.
- Review of regional vegetation association and complex mapping (Beard and Heddle).
- Fauna and habitats: Desktop and habitat assessment, DBCA NatureMap and DCCCEW MNES PMST databases for recorded species and their habitats within the vicinity of the LSP area and a likelihood assessment (based on mapped habitat) of these species potentially occurring on the LSP area.
- Heritage sites (Aboriginal and non-Aboriginal) that may be located within or nearby the LSP area. Search of the Department of Planning Lands and Heritage (DPLH) Aboriginal and State and Local Heritage databases.
- Identification of environmental constraints and opportunities associated with the LSP area.

Further assessments and surveys to address bushfire management, flora and vegetation, fauna, and urban water management applicable to the proposed LSP have been undertaken and have informed the design of the LSP area. The recommendations responding to the environmental matters and associated mitigation measures have been included within the EAR.

2.0 Key Environmental Legislation

2.1 Commonwealth Legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the central piece of environmental legislation, administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW). The Act protects Matters of National Environmental Significance (MNES) at a national level. Environmental Assessments under the EPBC Act are undertaken to enable environment and heritage protection and biodiversity conservation. An action should not be undertaken that has, will have or is likely to have a significant impact on any MNES, or other protected matters without a pre-action referral to the Australian Government's Minister for the Environment.

2.2 State Legislation

The *Environmental Protection Act 1986* (EP Act) is the key legislative tool for environmental protection in Western Australia. It is administered by EPA and the Minister for the Environment. Under Part IV of the EP Act, the EPA undertakes environmental impact assessment of development proposal and schemes. The environmental impact assessment process provides an orderly and systematic evaluation of a proposal and its potential impact on the environment. A critical component of the assessment is the consideration of ways in which a proposal, if implemented, could avoid, or reduce any potential impact on the environment.

Table 1 provides a summary of the key State legislation and regulations relevant to the LSP area.

Table 1: Key State Legislation and Regulations

Key Legislation	Responsible Government Agency	Aspect
Aboriginal Heritage Act 1972 (as amended)	Department of Aboriginal Affairs	Archaeological and ethnographic heritage
Biodiversity Conservation Act 2016	Department of Biodiversity Conservation and Attractions	Listing of and protection of native species, threatened species, ecological communities, fauna, critical habitat, and threatening processes
Biosecurity and Agriculture Management Act 2007	Department of Primary Industries and Regional Development	Weeds/pests/diseases
Bush Fires Act 1954	Department of Fires and Emergency Services	Bush fire control
Conservation and Land Management Act 1984	Department of Biodiversity Conservation and Attractions Department of Agriculture	Flora and fauna/habitat/weeds /pests/diseases
Conservation and Land Management Regulations 2002	Department of Biodiversity Conservation and Attractions Department of Agriculture	Flora and fauna/habitat/weeds /pests/diseases
Contaminated Sites Act 2003	Department of Water and Environmental Regulation	Management of contaminated soils and water
Environmental Protection Act 1986	Environmental Protection Authority Department of Water and Environmental Regulation	Part IV – Environmental Impact Assessment Part V – Works Approvals and Licences, Clearing Permits
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Department of Water and Environmental Regulation	Clearing of native vegetation
Heritage Act 2018		Provides for the identification and documentation of places of cultural heritage significance in Western Australia, and for the conservation, use, development, and adaption of such places.
Planning and Development Act 2005	Department of Planning, Lands and Heritage	Structure planning and subdivision approval
Rights in Water and Irrigation Act 1914	Department of Water and Environmental Regulation	Governs management of the use, service and health of water and watercourses (including beds and banks) Water licensing is required in all proclaimed areas and for all artesian groundwater wells throughout the state.

2.3 Relevant Standards, Guidelines and Policies

The proposed development of land and associated clearing is subject to compliance with applicable standards, guidelines and policies developed by the State's regulators to assist proponents in understanding the minimum requirements for environmental protection. Table 2 details the key standards, guidelines, and State Planning Policies relevant to clearing and development of the LSP area.

Table 2: Relevant Standards, Guidelines and Policies

Document	Description
EPA Policies and Guidance	
Statement of Environmental Principles, Factors and Objectives (EPA 2016a)	This statement communicates the EPA considers the object and principles of the EP Act, uses environmental factors and objectives to organise and systemise environmental impact assessment, taking a holistic view of the environment and considering significance of a proposal.
Environmental Factor Guideline – *Flora and Vegetation (EPA 2016b)*	Provides guidance to protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Environmental Factor Guideline – *Terrestrial Environmental Quality (EPA 2016c)*	Provides guidance with the objective to maintain the quality of land and soils so that environmental values are protected.
Environmental Factor Guideline – *Terrestrial Fauna (EPA 2016d)*	Provides guidance with the objective to protect terrestrial fauna so that biological diversity and ecological integrity at maintained.
Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016e)*	Provides technical guidance to ensure adequate flora and vegetation data of an appropriate standard are obtained and used in environmental impact assessment.
Technical Guidance – *Terrestrial Fauna Surveys (EPA 2016f)*	Provides technical on the direction and information on general standards and protocols for terrestrial fauna surveys for environmental impact assessment.
Environmental Factor Guideline: *Coastal Processes (EPA, 2016g)*	The EPA's environmental objectives for the factor Coastal Processes is to maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.
Guidance Statement No. 33: *Environmental Guidance for Planning and Development (EPA 2008)*	Provides information and advice to assist land use planning and development processes to protect, conserve and enhance the environment.
State Planning Policy 2.9 – Water Resources *(Department of Planning, Lands and Heritage, 2021).*	The policy is directly related to the overarching sector policy SPP 2 Environment and Natural Resources policy and provides clarification and additional guidance to planning decision-makers for consideration of water resources in land use planning strategy. The objective is to protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values and assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving the quality and quantity of water resources.

Document	Description
WA Environmental Offsets Policy (EPA 2011)	Seeks to protect and conserve environmental and biodiversity values for present and future generations. The policy ensures that economic and social development may occur while supporting long term environmental and conservation values.
Department of Water and Environmental Regulation (DWER) Guidelines	
Operational Policy 4.3: Identifying and establishing waterways foreshore areas. Department of Water and Environmental regulation, 2012	This policy describes the process for identifying and managing foreshore areas. It aims to ensure that foreshore areas will maintain or improve the environmental, social and economic values of waterways and adjoining land.
Assessment and Management of Contaminated Sites Guideline (DER 2014)	Provides guidance on the assessment and management of contaminated sites in Western Australian within legislative framework of the Contaminated Sites Act 2003 and the Contaminated Sites Regulations 2006.

3.0 Planning

3.1 Perth and Peel @3.5 million Sub Regional Planning Framework

The Perth and Peel @3.5 million suite of strategic land use planning documents aim to accommodate 3.5 million people by the year 2050. The Western Australian Planning Commission (WAPC) has identified the LSP area as an 'Urban Expansion Area' in the Metropolitan Perth and Peel Sub-regional Planning Framework (WAPC 2018).

3.2 Metropolitan Region Scheme

The LSP area is zoned 'Urban Deferred' under the Metropolitan Region Scheme (MRS).

The Western Australian Planning Commission (WAPC) initiated the MRS amendment 1308/41 to rezone 2099.80ha in East Wanneroo from 'Rural' to 'Urban Deferred'. **The MRS amendment was referred to the EPA for their review and the EPA subsequently advised that no formal assessment of East Wanneroo locality would be required.**

3.3 City of Wanneroo District Planning Scheme No. 2

The LSP area is currently zoned 'General Rural', 'Rural Resource' and 'Parks and Recreation' Reserve under the City of Wanneroo District l Planning Scheme No. 2 (DPS 2).

3.4 East Wanneroo District Structure Plan

The East Wanneroo District Structure Plan (DSP) was developed to guide the future development of the East Wanneroo area. As part of the development of the DSP, areas of environmental significance were identified and considered. Precinct 7 of the DSP comprises the following attributes:

- Suburban neighborhood residential
- Public Open Space (POS) centered around vegetation retention, rehabilitation, heritage, and hydrology land requirements of DSP significance)
- Public Open Space links (encompass vegetation and fauna habitat links)

- Lake Marginiup Wetland (encompass wetland significance, protection and environmental qualities).

The key environmental objectives of the DSP relating to Precinct 7 include:

- Protection of Bush Forever areas, Conservation Category Wetlands (CCW) and buffers
- Protection of high value Carnaby's Black Cockatoo habitat and vegetation with 10-30% remaining in Perth and Peel regions
- Protection of Threatened Ecological Communities (TEC) and flora populations
- Protection of the Aboriginal heritage significance, namely Lake Mariginiup and associated tree scar
- Protection of Berriman House (est. 1914) for European heritage significance
- Transition/interface with regional open space areas and associated ecological linkages.

The above key considerations have been assessed and considered and have influenced the design and outcomes of the proposed LSP.

3.5 Local Structure Plan

A LSP has been developed for Precinct 7 (Appendix B). The proposed LSP is centred around the development of a low-density residential community, focusing on existing amenity opportunities associated with Lake Mariginiup and natural environmental values within the LSP area. The proposed LSP identifies the use of land as detailed in Table 3.

Table 3: Precinct 7 Land Use Allocations

Proposed Land use	Area Covered (ha)
MRS P&R Reserve	149.30
Public Purposes- Primary School	8.51
Public Purposes -High School	9.07
Public Purposes -Water Corporation	2.14
MRS Other Regional Road Reserve	6.03
Non-Creditable open areas 1:1 drainage (H1)	2.46
Non-Creditable open areas: Wetland core (H2)	0.19
TOTAL	**177.7**

The proposed LSP identifies native vegetation and black cockatoo foraging habitat and breeding trees that will be protected and retained during and following the development of the LSP area (Appendix B).

3.5.1 Implementation of LSP

The design of the proposed LSP has been focused on the preservation and rehabilitation of the existing natural environment, including:

- Approximately 9.36ha of existing vegetation will be retained through POS, road reserves and within lots, wherever possible.
- Lake Mariginiup CCW and associated 50 m buffer have been protected within POS.

- Bush Forever Sites (No. 147 and 469) will be protected within POS. The LSP proposes hard edges to POS and Bush Forever interface with proposed residential development to ensure protection (Figure 10).
- Retention of remnant vegetation, black cockatoo foraging habitat and breeding trees (including hollows) have been incorporated within POS, road verges, wetland buffers and within lots (where possible) within the proposed LSP.
- Incorporation of Regional Ecological Linkages through the LSP area, with roads intersecting the linkages have been kept to a minimum, wherever possible. This will assist and support fauna movement across the LSP area.
- POS areas capture a variety of fauna habitats such as wetland areas, transition zones from low lying to uplands and Banksia woodlands.
- Retention of 89 Caporn Street for Berriman House for significance of European heritage.
- Consent under the *Aboriginal Heritage Act 1972* (as amended) would be required prior to any disturbance or potential development of Lake Mariginiup (ID 3741).
- Wetland and Aboriginal heritage sensitivity zones will be retained within POS.

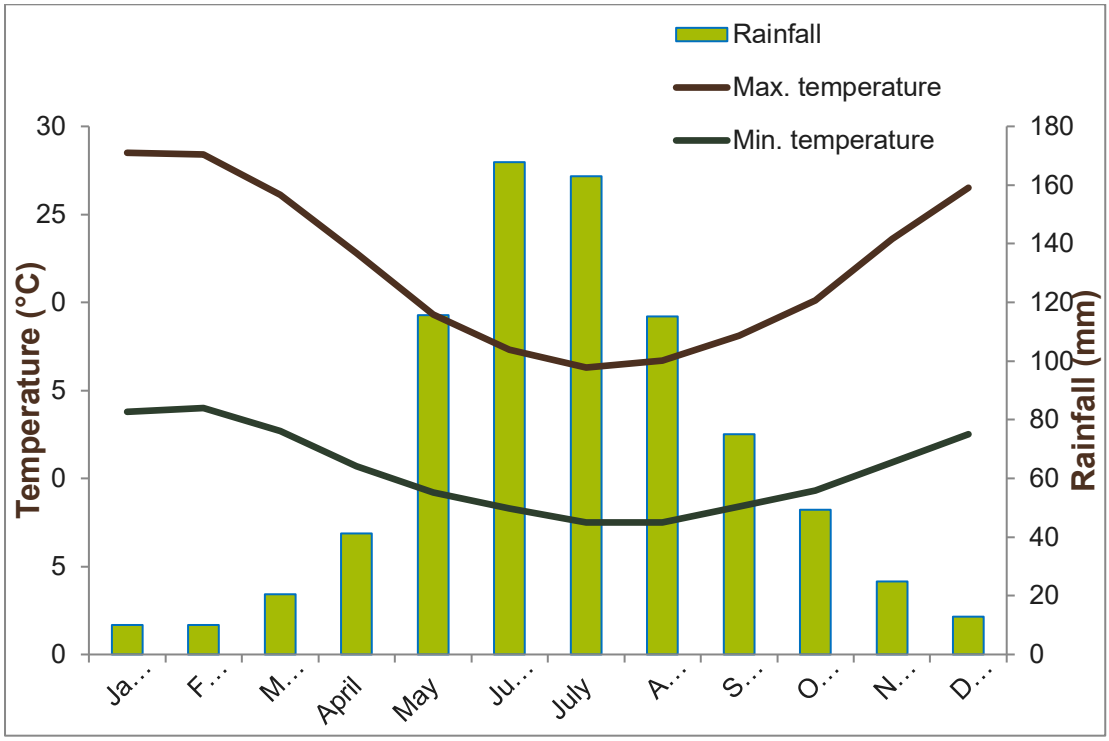
4.0 Environmental Features

4.1 Climate

The LSP area is within a warm Mediterranean climate with warm summers and cool winters.

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Pearce RAAF weather station (Station 9053), located approximately 20km east of the LSP area. The closest long-term BoM weather station with rainfall statistics is Wanneroo (Station 9105), located approximately 0.7 km south of the LSP area.

The long-term mean minimum temperature for Pearce RAAF weather station ranges from 8.2℃ (August) to 17.6℃ (February) from 1940 to 2020 and the long-term mean maximum temperature ranges from 17.9℃ (July) to 33.5℃ (Bureau of Meteorology, 2021). The long-term average rainfall of the area is 652.1 mm.



Graph 1: Long term and Monthly Total Rainfall, Maximum and Minimum temperatures for Pearce RAAF (Station 9053) and Wanneroo (Station 9105) (Bureau of Meteorology, 2023).

4.2 Land Uses

4.2.1 Current Land Use

The LSP area is currently used for market gardens, rural lifestyle properties, equestrian activities, and other rural purposes.

4.2.2 Historical Land Uses

A historical aerial photograph assessment identifies that the LSP area has predominantly been used for broad acre grazing and associated rural activities. Land uses have subsequently changed for the creation of land parcels for market gardening, lifestyle opportunities, equestrian activities, and other rural activities. These historical land uses have resulted in fragmentation of native vegetation and other environmental values within the LSP area.

4.2.3 Surrounding Land Uses

The LSP area is surrounded by the following land uses:

- Residential development e.g. Banksia Grove to the northwest (6km from LSP area)
- Residential development e.g., Tapping to the west (5km from LSP area)
- Residential development e.g. Sinagra to the south (2.7km from LSP area)
- Residential development and agricultural uses to the east
- Mix of rural land uses including market gardens, rural lifestyle properties, equestrian activities and broad acre grazing to the northeast.

4.3 Topography

The topography of the area ranges between 48 m AHD and 61 m AHD across the LSP area. The highest areas are in the south-western areas of the LSP area and low-lying areas are located close to wetlands (Landgate, 2023).

4.4 Regional Geology and Soils

4.4.1 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, and has been captured at scales ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012 (Figure 2). The LSP area occurs within two land systems:

- Bassendean System 212Bs - Swan Coastal Plain from Busselton to Jurien. Sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths.
- Spearwood System 211Sp- Sand dunes and plains. Yellow deep sands, pale deep sands, and yellow/brown shallow sands.

The LSP area occurs within four soil landscape subsystems:

- Spearwood permanent lakes and swamps Phase 211Sp_Wp- Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. *Melaleuca* spp. and *E. rudis* at water's edge. Reeds and sedges in shallow water.
- Karrakatta Sand Yellow Phase 211spKy- Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. Banksia spp. woodland with scattered emergent *E. gomphocephala* and *E. marginata* and a dense shrub layer.
- Spearwood seasonal swamps Phase 211Sp_Ws- Depressions with free water in winter. Humus podzols and peat. Dense *M. preissiana*; *M. rhaphiophylla* and *E. rudis* around the edges with reeds and sedges in the centre.
- Bassendean seasonal swamps Phase 212Bs_Ws - Depressions with free water in winter. Humus podzols and peat. Dense *M. preissiana*; *M. rhaphiophylla* and *E. rudis* around the edges with reeds and sedges in the centre.

4.4.2 Acid Sulphate Soils

The Department of Water and Environmental Regulation (DWER) has identified Lake Marginiup as having 'High to Moderate' risk of ASS within the first 3 m of natural soil surface (Figure 3). As this area of the LSP area will not be developed, minimal risk of disturbance is likely to be incurred. The remainder of the LSP area is not identified within the ASS risk mapping area as being at risk (DWER 2023).

4.5 Hydrogeology

4.5.1 Groundwater

The LSP area is not located within a Public Drinking Water Source Area (PDWSA) (DWER, 2023). The nearest PDWSA to the LSP area is a P1 which is approximately 900m southeast of the LSP area. The PDWSA, P1 area is under the Gnangara Underground Water Pollution Control Area. A P2 PDWSA connects with the P1 area extending to the eastern side of the LSP area.

The depth of water from ground level to water table ranges between 2 to 8 mbgl. Areas close to the wetland boundary are at the depth of 2m and the depth increases away from the wetland (DWER, 2023c).

4.5.2 Surface Water

There are no streams, creeks, or major drains within the LSP area. Mariginiup Lake is the only surface water feature mapped within the LSP area (DWER,2023).

4.5.3 Wetlands

A wetland is defined in Schedule 5 of the *Environmental Protection Act 1986* as 'an area of seasonally, intermittently, or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary (Hill *et al.* 1996).

Desktop mapping has identified one Conservation Category Wetland (CCW) (UFI 7953) within the LSP area (DBCA 2023) (Table 4) (Figure 4).

Table 4: Geomorphic Wetlands within the LSP area

UFI Number	Name	Conservation Category
7953	Mariginiup Lake	Conservation

The LSP area is not listed under the Directory of Important Wetlands or classified as a Ramsar site (DBCA, 2023).

4.6 Flora and Vegetation

4.6.1 Interim Biogeographic Regionalization of Australia (IBRA)

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The LSP area occurs within the Swan Coastal Plain (SWA) bioregion and the Perth (SWA02) subregion (DCCEEW, 2022).

The Swan Coastal Plain bioregion is a low lying coastal plain, mainly covered with woodlands (Mitchell, Williams, and Desmond, 2002). It is dominated by Banksia or Tuart on sandy soils, *Casuarina obesaon* outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah woodland. The outwash plains, once dominated by *Casuarinaobesa-marri* woodlands and *Melaleuca* shrublands, are extensive only in the south.

The Perth subregion is composed of colluvial and aeolian sands, alluvial river flats, coastal limestone (Mitchell, Williams, and Desmond, 2002). The subregion is represented by heath and/or Tuart woodlands on limestone, Banksia, and Jarrah-Banksia woodlands on quaternary marine dunes of various ages, Marri on colluvial and alluvial.

4.6.2 Broad Vegetation Associations

Mapping of the vegetation of the Perth region of Western Australia was completed on a broad scale (1:250,000) by Beard (1980). These vegetation units were then re-assessed by Shepherd *et al.* (2001) to account for clearing in the intensive land use zone, dividing some larger vegetation units into smaller ones.

There are four broad vegetation types identified within proposed LSP. These vegetation associations are described below and their representation at a local, regional, and state level are illustrated in Table 5:

- Spearwood 6: a woodland of Jarrah, Marri, and Wandoo *Eucalyptus marginata*, *Corymbia calophylla*, E. wandoo
- Spearwood 126: a freshwater lake
- Bassendean 37: wattle, *Casuarina* and tea tree, *Acacia-Allocasuarina-Melaleuca* alliance
- Bassendean 949: a low woodland or open low woodland of other acacia, banksia, peppermint, cypress pine, *casuarina*, York gum *Acacia* spp., Banksia spp., *Agonisflexuosa*, *Callitris* spp., *Allocasuarin*a spp., *Eucalyptus loxophleba*.

Table 5: Broad Vegetation Types within the State, Regional and Local Representation (Government of Western Australia, 2019)**.**

System and Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Proportion of Current Extent in DBCA Managed Lands (%)
Representation across Western Australia				
Spearwood 6	56,343.01	13,362.25	23.72	39.83
Spearwood 126	23,503.39	9,570.88	40.72	38.53
Bassendean 37	39,296.52	24,727.17	62.92	20.92
Bassendean 949	218,193.94	123,104.02	56.42	55.86
Representation across the Swan Coastal Plain Bioregion				
Spearwood 6	56,343.01	13,362.25	23.72	39.83
Spearwood 126	3,420.06	807.46	23.61	37.23
Bassendean 37	15,617.85	5,404.74	34.61	40.96
Bassendean 949	209,983.26	120,287.93	57.28	56.40
Representation across the Perth Subregion				
Spearwood 6	56,343.01	13,362.25	23.72	39.83
Spearwood 126	3,420.06	807.46	23.61	37.23
Bassendean 37	14,018.45	4,784.19	34.13	44.87
Bassendean 949	184,475.82	104,128.96	56.45	58.99

System and Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Proportion of Current Extent in DBCA Managed Lands (%)
Representation across the City of Wanneroo				
Spearwood 6	12,662.10	2,777.67	21.94	50.65
Spearwood 126	704.48	255.28	36.24	55.35
Bassendean 37	568.92	270.83	47.60	20.19
Bassendean 949	37,138.40	17,196.34	46.30	70.10

Within constrained areas on the Swan Coastal Plain, *Guidance Statement No. 33: Environmental Guidance for Planning and Development* identifies a threshold for retention of 10% of the pre-existing extent of native vegetation (EPA 2008). The Bassendean 37, Bassendean 949 and Spearwood 126 vegetation extents are above the expected threshold. The Spearwood 6 vegetation is slightly below the expected threshold remaining for the State. Therefore, the proposed LSP has been designed to retain as much existing native vegetation wherever possible.

4.6.3 Vegetation Types

A total of 50 vegetation types were mapped within the LSP area (360 Environmental,2021) (Figure 5). These are further described in Table 6. Several vegetation types have been determined to have affiliation with Floristic Community Type (FCT) SCP 28 – Spearwood *Banksia attenuata* or *Banksia attenuata- Eucalyptus* woodlands. Vegetation type BaBm, which, has been determined to have affiliation with FCT SCP 21a – Central Banksia *attenuat*a and *Eucalyptus marginata* woodlands.

However, both these FCTs have been identified as being a sub-community of the Commonwealth protected Banksia Woodlands of the Swan Coastal Plain TEC. The vegetation was identified to be analogous with FCT SCP 21a and 28 however do not meet the criteria for protection due to size of each remnant community and their condition.

Eucalyptus gomphocephala (Tuart) was recorded within the LSP area. The species itself is not listed under the EPBC Act, however, it can potentially be considered, in association with (form part of) Tuart (*Eucalyptus gomphocephala)* Woodlands and Forests of the Swan Coastal Plain ecological community which is listed under the EPBC Act.

Based on the sparse distribution of Tuarts in the proposed LSP (often isolated single trees) and condition of the vegetation in which they are located (in some cases they are amongst household gardens and turf), none of the Tuarts within the LSP area are considered part of the TEC Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community.

Table 6 provides the vegetation types occurring within the LSP area.

Table 6: Vegetation Types Occurring within the LSP Area

Vegetation Unit		Total Area (ha)
Code	Description	
Ac*Oe	Low isolated trees of *Allocasuarina fraseriana* and *Banksia attenuata* over tall open shrubland of *Adenanthos cygnorum, Jacksonia furcellata* and **Olea europaea* over low isolated clumps of sedges of *Gahnia trifida* and *Lyginia barbata*	1.27
AfEm	Low open woodland of *Allocasuarina fraseriana, Eucalyptus marginata, Banksia attenuata* and *Banksia menziesii* over tall sparse shrubland of *Jacksonia sternbergiana* over mid open shrubland of *Xanthorrhoea preissii, Hibbertia hypericoides* and *Corynotheca micrantha*	4.42
BaBm	Low woodland of *Banksia attenuata, Banksia menziesii* and *Melaleuca preissiana* over low isolated clumps of shrubs of *Philotheca spicata, Hypocalymma robustum* and *Eremaea pauciflora* over low isolated clumps of forbs of *Desmocladus flexuosus*, *Lepidosperma squamatum* and *Lyginia barbata*	1.01
BaEm	Low open woodland of *Banksia attenuata, Eucalyptus marginata, Banksia menziesii* and *Banksia ilicifolia* over tall isolated clumps of shrubs of *Jacksonia furcellata, Jacksonia sternbergiana* and *Macrozamia riedlei* over low open shrubland of *Hibbertia hypericoides* over low forbland of **Ursinia anthemoides*	0.46
BaBi	Low woodland of *Banksia attenuata, Banksia menziesii* and *Banksia ilicifolia* over low isolated clumps of *Acacia huegelii, Eremaea pauciflora* and *Hibbertia hypericoides* over mid closed grassland of **Ehrharta calycina*	0.60
EmJs	Low open woodland *of Eucalyptus marginata* over tall open shrubland of *Jacksonia sternbergiana* over low isolated clumps of shrubs of *Hibbertia hypericoides* and *Corynotheca micrantha* over tall open grassland of **Ehrharta calycina*	5.26
ErAs	Mid open forest of *Eucalyptus rudis* over mid isolated clumps of shrubs *of Hibbertia cuneiformis* and *Astartea scoparia* over low open grassland of **Ehrharta longiflora, *Hordeum leporinum* and **Bromus diandrus*	0.89
ErMp	Mid isolated clumps of trees of *Eucalyptus rudis* and *Melaleuca preissiana* over Mid isolated clumps of shrubs of *Jacksonia furcellata* and *Macrozamia riedlei* over low sparse forbland of **Ursinia anthemoides, *Carpobrotus edulis* and **Hypochaeris glabra*	0.33
KgJs	Low open woodland of *Banksia attenuata* over tall shrubland of *Kunzea glabrescens, Jacksonia sternbergiana* and *Adenanthos cygnorum* over low open sedgeland of *Gahnia trifida, Mesomelaena pseudostygia* and *Dianella revoluta*	0.47
AcJf	Tall, isolated clumps of shrubs of *Adenanthos cygnorum* and *Jacksonia furcellata* over low isolated clumps of *Scholtzia involucrata* and *Corynotheca micrantha* over mid grassland of **Ehrharta calycina*	2.19

Vegetation Unit		Total Area (ha)
Code	Description	
Afl	*Agonis flexuosa*	0.01
Af	*Allocasuarina fraseriana*	0.23
*Al	*Acacia longifolia*	0.01
Ar	*Acacia rostellifera*	0.02
As	*Acacia saligna*	0.02
AsMac	*Acacia saligna* and *Macrozamia riedlei*	0.03
Ba	*Banksia attenuate*	0.15
BaJf	*Banksia attenuata* and *Jacksonia furcellata*	0.22
Bh	*Banksia hookeriana*	0.64
Bi	*Banksia ilicifolia*	0.01
Bg	*Banksia grandis*	0.001
Bm	*Banksia menziesii*	0.05
Cc	*Corymbia calophylla*	0.51
CcAs	Mid open forest of *Corymbia calophylla* over tall isolated shrubs of *Jacksonia sternbergiana, Hibbertia cuneiformis* and *Macrozamia riedlei* over low grassland of **Cenchrus clandestinus, *Ehrharta calycina* and **Eragrostis curvula*	0.72
CcEmAfBspp	Isolated trees of *Corymbia calophylla*, *Eucalyptus marginata*, *Allocasuarina fraseriana*, and *Banksia* species.	0.52
*Ec	**Ehrharta calycina*	0.40
Eg	*Eucalyptus gomphocephala*	2.12
*Egl	**Eucalyptus globulus* and *Eucalyptus cinerea*	1.52
Em	*Eucalyptus marginata*	3.19
EmBi	Isolated trees of *Eucalyptus marginata, Banksia ilicifolia, Banksia attenuata* and *Allocasuarina fraseriana* with *Macrozamia riedlei* and *Jacksonia sternbergiana* over lawn	0.17
EmCc	Isolated trees of *Eucalyptus marginata* and *Corymbia calophylla*	0.25
Er	*Eucalyptus rudis*	1.21
ErBa	*Eucalyptus rudis* and *Banksia attenuate*	0.09
Et	*Eucalyptus todtiana*	0.18
EtBm	Isolated trees of *Eucalyptus todtiana, Banksia menziesii and Banksia ilicifolia*	0.04
G	Garden	12.19
Jf	*Jacksonia furcellata* over weeds	2.07
JfCu	*Jacksonia furcellata* and *Chamelaucium uncinatum*	0.15
Js	Stand of *Jacksonia sternbergiana*	0.08

Vegetation Unit		Total Area (ha)
Code	Description	
JsBi	Tall shrubland of Jacksonia sternbergiana with scattered Banksia ilicifolia	0.57
JsJfNe	Mid Woodland of Non-endemic trees over tall open shrubland of *Jacksonia sternbergiana* and *Jacksonia furcellata*	0.58
Kg	Stand of *Kunzea glabrescens*	0.19
*Ll	*Leptospermum laevigatum*	0.21
*Ma	**Morus alba*	0.01
Mac	Individual *Macrozamia riedlei*	0.04
MacJf	Scattered *Macrozamia riedlei* and *Jacksonia furcellata*	0.42
Mp	*Melaleuca preissiana*	0.08
Ne	Non-endemic trees	10.08
*Oe	**Olea europaea*	0.20
*P	**Pinus* sp.	0.44

4.6.4 Vegetation Condition

Vegetation condition within the LSP area has been mapped or identified as Very Good to Completely Degraded. The majority of the existing native vegetation has historically been cleared previously by individual landowners for market gardens, domestic gardens, and infrastructure associated with residential development (Figure 6). Future residential development will protect the remaining native vegetation in POS areas, Regional Ecological Linkages, wetland buffers, road verges and within lots (where possible). Current vegetation condition within the LSP area is detailed in Table 7.

Table 7: Vegetation Condition

Vegetation Condition	Extent within the Survey Area (ha)*	Percentage of Vegetation Condition (%)
Very Good	1.50	1.11
Good	0.76	0.56
Good to Degraded	2.82	2.11
Degraded	9.54	7.10
Degraded to Completely Degraded	1.50	1.11
Completely Degraded	117.67	88.01
Total Area of Vegetation Condition	**133.79**	**100**

4.6.5 Threatened and Priority Ecological Communities

Two of the FCTs identified as occurring in the LSP area, FCT SCP 28 - Spearwood *Banksia attenuata* or *Banksia attenuate. Eucalyptus* woodlands and FCT SCP 21a – Central *Banksia attenuata* and *Eucalyptus marginata* woodlands are not listed as TECs by the State. Banksia woodlands of the Swan Coastal Plain are listed as a Priority 3 by the State.

4.6.6 Flora

The desktop assessment identified sixty-nine (69) conservation significant species occurring within 65 km radius of the LSP area (Appendix C). A likelihood of occurrence assessment was undertaken pre-survey determined three (3) species as having a high likelihood of occurrence, six (6) species as having a medium likelihood of occurrence, 58 species as having a low likelihood of occurrence (Appendix C).

The detailed flora and vegetation survey recorded the floristic composition and vegetation types from seven quadrats, five relevés and additional mapping notes. The survey recorded a total of 174 taxa from 127 genera across 54 families. The most dominant families were Myrtaceae (19 species), Fabaceae (21 species) and Poaceae (14 species) and the most dominant genera were *Acacia* and *Eucalyptus* (six species each) (Appendix C).

One flora species was not able to be identified to species level that may potentially occur within the fragmented remnant native vegetation areas which warrants further consideration:

Caladenia sp.

The *Caladenia sp*. could not be identified to species levels as it was only at leaf stage and not in flower. These specimens were recorded in three specific locations of the survey area (360 Environmental, 2021).

The two spring surveys completed to date (2021 and 2023) did not confirm the presence of *Caladenia huegelii* within the LSP area. To comprehensively address the presence of this flora species, a targeted survey for *Caladenia huegelii* was undertaken in early spring (during the species known flowering period i.e., August to October) in 2022 and the species was not identified within these specific locations (Appendix D).

4.6.7 Flora of Conservation Significance

No Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and/or gazetted as Threatened/Declared Rare Flora pursuant to the *Biodiversity and Conservation Ac*t 2016 were recorded during the survey (Appendix C).

Caladenia sp. was recorded in three locations of the LSP area (as depicted in Figure 9 of Appendix C).

As per Section 4.4.4.6, Caladenia sp. was recorded in three specific locations of the survey area (refer to Figure 9 of Appendix C). *Caladenia huegelii* have been previously recorded in numerous locations between 6 to 15km of the LSP area (DBCA, 2020) (refer to Figure 7 of Appendix C).

The majority of the LSP area has been historically cleared and used for rural land uses such as market gardens, equestrian or other rural activities. The areas of remnant native vegetation within the LSP area are highly fragmented, with some of this vegetation being in a Degraded condition. The targeted survey for *Caladenia huegelii* undertaken in early spring (during the species known flowering period i.e. August to October) in 2022 has not identified any of these species within the specific locations (Appendix D).

One (1) Priority species as listed by DBCA, *Jacksonia sericea* (P4), was recorded within the LSP area. The species was recorded in four quadrats across the LSP area (360 Environmental,2021). These species will be protected/retained within proposed POS or within lots (where practicable).

4.6.8 Introduced Flora

Forty-six (46) introduced species were recorded during the survey (360 Environmental, 2021). The survey covered 400 ha, not 341.25ha which covers the LSP area. Survey results identified four species **Asparagus asparagoides, Echium plantagineum, Moraea flaccida* and **Opuntia stricta* are listed as Declared Pests Under the BAM Act (Department of Primary Industries and Regional Development, 2021). * *Asparagus asparagoides* and * *Opuntia stricta* are listed as Weeds of National Significance (WoNS) by the Department of Agriculture Water and the Environment (2021). Introduced flora identified within the survey is identified in Table 8.

Table 8: Introduced Flora Species within the LSP area.

Species	Common Name	Status under BAM Act	WoNS
**Acacia iteaphylla*	Flinders Ranges Wattle	Permitted – s11	No
**Acacia longifolia*	Sallow Wattle	Permitted – s11	No
**Aira caryophyllea*	Silvery Hairgrass	Permitted – s11	No
**Arctotheca calendula*	Cape Weed	Permitted – s11	No
**Asparagus asparagoides*	Bridal Creeper	Declared Pest – s22(2)	Yes
**Avena barbata*	Bearded Oat	Permitted – s11	No
**Briza maxima*	Blowfly Grass	Permitted – s11	No
**Bromus diandrus*	Great Brome	Permitted – s11	No
**Carpobrotus edulis*	Hottentot Fig	Permitted – s11	No
**Cenchrus clandestinus*	Kikuyu Grass	Permitted – s11	No
**Cynodon dactylon*	Couch	Permitted – s11	No
**Disa bracteate*	N/A	Permitted – s11	No
**Echium plantagineum*	Paterson's Curse	Declared Pest – s22(2)	No
**Ehrharta calycina*	Perennial Veldt Grass	Permitted – s11	No
**Ehrharta longiflora*	Annual Veldt Grass	Permitted – s11	No
**Eragrostis curvula*	African Lovegrass	Permitted – s11	No
**Eucalyptus globulus* (Planted)	Tasmanian Blue Gum	Permitted – s11	No
**Euphorbia peplus*	Petty Spurge	Permitted – s11	No
**Euphorbia terracina*	Geraldton Carnation Weed	Permitted – s11	No
**Ficus carica* (Planted)	Common Fig	Permitted – s11	No
**Fumaria capreolata*	Whiteflower Fumitory	Permitted – s11	No
**Gladiolus caryophyllaceus*	Wild Gladiolus	Permitted – s11	No
**Hordeum leporinum*	Barley Grass	Permitted – s11	No
**Hypochaeris glabra*	Smooth Cats-ear	Permitted – s11	No
**Lagurus ovatus*	Hare's Tail Grass	Permitted – s11	No
**Leptospermum laevigatum*	Coast Teatree	Permitted – s11	No
**Lupinus cosentinii*	Sand Plain Lupin	Permitted – s11	No
**Lysimachia arvensis*	Pimpernel	Permitted – s11	No

Species	Common Name	Status under BAM Act	WoNS
**Melia azedarach* (Planted)	White Cedar	Permitted – s11	No
**Moraea flaccida*	One-leaf Cape Tulip	Declared Pest – s22(2)	No
**Morus alba* (Planted)	Common Mulberry	Permitted – s11	No
**Oenothera stricta*	Common Evening Primrose	Permitted – s11	No
**Olea europaea* (Planted)	Olive	Permitted – s11	No
**Opuntia stricta*	Common Prickly Pear	Declared Pest – s22(2)	Yes
**Ornithopus sativus*	French Serradella	Permitted – s11	No
**Orobanche minor*	Lesser Broomrape	Permitted – s11	No
**Oxalis pes-caprae*	Soursob	Permitted – s11	No
**Pelargonium capitatum*	Rose Pelargonium	Permitted – s11	No
**Pinus* sp. (Planted)	Pine	Permitted – s11	No
**Ricinus communis*	Castor Oil Plant	Permitted – s11	No
**Romulea rosea*	Guildford Grass	Permitted – s11	No
**Schinus terebinthifolia*	South American Pepper	Permitted – s11	No
**Silene gallica*	French Catchfly	Permitted – s11	No
**Sonchus oleraceus*	Common Sowthistle	Permitted – s11	No
**Ursinia anthemoides*	Ursinia	Permitted – s11	No
**Urtica urens*	Small Nettle	Permitted – s11	No

The LSP area consists of 127 individual privately owned properties in an urban setting, with a portion of the vegetation comprising of gardens, market gardens, non-endemic species and planted native species (Table 9). These species are not considered to be weed species, however, are not endemic to the Wanneroo area and are introduced flora species.

Table 9: Planted Flora Species within the LSP area.

Species	Common name
Agonis flexuosa	Peppermint
Banksia hookeriana	Hooker's Banksia
Callistemon sp.	Bottlebrush
Chamelaucium uncinatum	Geraldton Wax
Citrus limon	Lemon
Eucalyptus cinerea	Argyle Apple
Ficus macrophylla	Moreton-bay Fig
Liquidambar styraciflua	Sweet Gum
Melia azedarach	White Cedar

4.6.9 Weeds

Weeds are listed under the Commonwealth as Weeds of National Significance (WONS) and under the Biosecurity and Agriculture Management Act 2007 (BAM Act) as 'Declared' species. Three species (*Asparagus asparagoides*, *Moraea flaccida*, and *Opuntia stricta*) are listed as Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2018). *Asparagus asparagoides* and *Opuntia stricta*, are also listed as WoNS (Department of Energy and Environment, 2018). Table 8 identifies the introduced Flora species in the LSP area.

4.7 Fauna

4.7.1 Desktop Assessment

DBCA NatureMap and Department of Climate Change, Energy, the Environment and Water, (DCCEEW), Protected Matter Search Tool (PMST) database searches were conducted, and 24 conservation significant species were identified as potentially occurring within a 10 km radius of the LSP area (Appendix E). As there is no marine environment within LSP area, marine species have been excluded from the results.

Table 10: PMST Database Fauna Search Results

Scientific Name	Common Name	Conservation Status	
		EPBC Act	BC Act
Birds			
Anous tenuirostris melanops	Australian Lesser Noddy	VU	EN
Ardenna carneipes	Flesh-footed Shearwater, Fleshy-footed Shearwater	MI	MI
Ardenna grisea	Sooty Shearwater	MI	MI
Botaurus poiciloptilus	Australasian Bittern	EN	EN
Calidris acuminata	Sharp-tailed Sandpiper	MI	MI
Calidris canutus	Red Knot, Knot	EN, MI	EN, MI
Calidris ferruginea	Curlew Sandpiper	CR, MI	CR, MI
Calidris melanotos	Pectoral Sandpiper	MI	MI
Calidris ruficollis	Red-necked Stint	MI	MI
Calidris subminuta	Long-toed Stint	MI	MI
Calyptorhynchus banksii naso	Forest Red tailed Black Cockatoo	VU	VU
Charadrius leschenaultia	Greater Sand Plover, Large Sand Plover	VU, MI	VU, MI
Hydroprogne caspia	Caspian Tern	MI	MI
Leipoa ocellata	Malleefowl	VU	VU
Limosa lapponica	Bar-tailed Godwit	MI	MI
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit,	CR	CR
Motacilla cinerea	Grey Wagtail	MI	MI

Scientific Name	Common Name	Conservation Status	
		EPBC Act	BC Act
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	CR, MI	CR, MI
Pachyptila turtur subantarctica	Fairy Prion (southern)	VU	-
Pandion haliaetus	Osprey	MI	MI
Rostratula australis	Australian Painted Snipe	EN	EN
Sternula nereis nereis	Australian Fairy Tern	VU	VU
Zanda latirostris listed as Calyptorhynchus latirostris	Carnaby's Black Cockatoo	EN	EN
Fish			
Galaxiella nigrostriata	Blackstriped Dwarf Galaxias	EN	EN
Insects			
Hesperocolletes douglasi	Douglas' Broad-headed Bee	CR	CR
Mammals			
Bettongia penicillata ogilbyi	Woylie	EN	CR
Dasyurus geoffroii	Chuditch, Western Quoll	VU	VU
Macroderma gigas	Ghost Bat	VU	VU
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR

4.7.2 Black Cockatoo Habitat Assessment

The Black Cockatoo Habitat Assessment identified 494 potential breeding trees with a diameter at breast height (DBH) of greater than 500 mm across the LSP area (Appendix C). The breeding trees comprised:

- 171 Jarrah (Eucalyptus marginata)
- 22 Marri (Corymbia calophylla)
- 70 Tuart (Eucalyptus gomphocephala)
- 24 Flooded Gum (Eucalyptus rudis)
- 6 Coastal Blackbutt (Eucalyptus todtiana)
- 45 dead trees (stags)
- 156 introduced eucalypts.

A total of 70 breeding trees were identified to contain hollows that are potentially suitable for black cockatoo breeding including one tree with a DBH of less than 500mm. Twelve potentially suitable black cockatoo breeding trees are currently occupied by bees within the survey area. A further seventeen (17) trees contain hollows that were unsuitable for black cockatoo breeding. No evidence of black cockatoo breeding such as chew marks around hollow entrances was observed (Figure 7).

The proposed LSP has protected 342 trees that are potentially suitable for black cockatoo breeding trees and 57 hollows. This equates to 69% protection of breeding trees and 40% protection of hollows.

A total of 32.58ha of black cockatoo foraging habitat was recorded, of which 18.9ha was of Very High Quality, 12.50ha was of High Quality,0.65ha of Medium Quality, 0.51ha was of Low Quality (Figure 8). Carnaby's Black Cockatoo foraging evidence in the form of chewed Marri nuts was also recorded. A pair of Carnaby's Black Cockatoos were observed within the LSP area.

The proposed LSP has protected black cockatoo foraging habitat as follows:

- 4.59ha of Very High-Quality foraging habitat (equates to 14% of total)
- 2.14ha of High-Quality foraging habitat (equates to 6.57% of total)
- 0.05ha of Medium-Quality foraging habitat (equates to 0.15 % of the total)
- 0.10ha of Low-Quality foraging habitat (equates to 0.3% of total).

Black cockatoo foraging habitat, breeding trees and hollows have been retained within POS areas, road reserves or within lots (wherever practicable).

4.8 Reserves and Conservation Areas

4.8.1 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The LSP area partially overlaps with a mapped ESA, which includes Lake Mariginiup and Little Mariginiup Lake. The ESA mapping is likely to reflect associated buffers (Figure 9) (Department of Water and Environmental Regulation, 2023).

4.8.2 Conservation Areas

The LSP area overlaps a Bush Forever Site (Site No. 147). Other areas of conservation located close to the LSP area are described below:

- Caporn Park, a Bush Forever Site (Site No. 469) located on the southwestern boundary of the site.
- A portion of Edgar Griffiths Park, a Bush Forever Site (Site No. 470) located 300 m south of the site.
- Jandabup Nature Reserve (Reserve No.7349), a Bush Forever Site (Site No. 324) located 350m east of the Survey Area and is vested under the Conservation Commission of Western Australia. The north-western portion of the Bush Forever Site is located on the boundary of the site.
- Ashley Park, a Bush Forever Site (Site No. 164) located 800 m west of the LSP area.
- Three (3) Regional Ecological Linkages (IDs 12, 16 and 24) (Figure 10).

4.9 Heritage

4.9.1 Aboriginal Heritage

The Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System identified the site has one registered site (ID 3741) which is Lake Mariginiup, a mythological, hunting place type of site.

On the northwestern edge of the wetland is an unregistered site (ID 28616), Lake Mariginiup Scarred Tree. Northeast of the LSP area is site (ID 22160) which is unregistered, the site is an artefact type of site (AHIS,2021) (Figure 11).

The site is under the Whadjuk People Indigenous Land Use Agreement (WI2017/015).

4.9.2 European Heritage

One European heritage site, Berriman House (Place Number 09514) is located within the LSP area at 89 Caporn Street Mariginiup. Berriman House is a single-storey limestone house with iron roof tall brick chimney, timber framed doors and windows. It is significant as it represents the early successful farming venture on the shores of Lake Mariginiup (State Heritage Office, 2023).

Northwest of the LSP area, approximately 3.5 km is Charles Aubrey Gibbs house (17921). The LSP area has historic and social significance as an example of a house constructed of concrete blocks in the immediate post World War II period characterized by shortages of building materials (State Heritage Office, 2023).

4.10 Contaminated Sites

A search of DWER's Contaminated Sites Database has identified there are no registered contaminated sites within 2 km of the LSP area. The nearest registered contaminated site is located approximately 4.5 km northwest of the LSP area (ID 78266) (DWER 2023d). However, given the current and previous land use of the sites additional contaminated sites investigations will be undertaken later in the planning process.

4.11 Bushfire Risk

The State Planning Policy 3.7 Planning in Bushfire Prone Areas applies to the proposed LSP as the site is identified within a 'Bushfire Prone Area' (Figure 12).

The SPP identifies that to reduce vulnerability to bushfire, the identification of bushfire risks should be considered in decision making at all stages of the planning and development process. A Bushfire Management Plan (BMP) has been prepared for the proposed LSP (Appendix F).

5.0 Environmental Constraints and Management

5.1 Key Environmental Matters, Factors and Objectives

The potential impacts that may result from implementation of the proposed development and the LSP area's key environmental features are discussed in this section. Management measures based on key legislation, guidelines, and policies are also outlined with the intent to mitigate the potential impacts.

The principles, factors, and objectives used by the EPA in assessing projects have been used in considering the environmental impact posed by the development and how these will be managed. The relevant factors and objectives of this proposal are outlined in Table 11 below and are addressed within this section.

Table 11: EPA Environmental Factors and Objectives

Theme	Factor	Objectives
Land	Flora and Vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
	Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
	Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.
	Subterranean Fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.
	Terrestrial Environmental Quality	To maintain the quality of land and soils so that environmental values are protected.
	Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
People	Social Surroundings	To protect social surroundings from significant harm.
Water	Hydrological Process	To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.
	Inland Waters Environmental Quality	To maintain the quality of groundwater and surface water so that environmental values are protected.

5.2 Flora and Vegetation

5.2.1 Background

The desktop assessment and outcomes from the Flora and Vegetation Survey completed by 360 Environmental (2020, 2021 and 2022) determined that no Threatened Flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the surveys (Appendix C and Appendix D).

One (1) DBCA listed Priority flora was recorded, *Jacksonia sericea* (P4). The presence of these species is unlikely to form a statutory constraint for the proposed development and should be dealt with by DWER and DBCA on a case-by-case basis at the subdivision stage.

Four (4) species (*Asparagus asparagoides*, *Echium plantagineum, Moraea flaccida,* and Opuntia *stricta*) are listed as Declared Pests under the BAM Act. Two of these, Asparagus *asparagoides* and Opuntia stricta, are listed as WoNS. The Biosecurity and Agriculture Management Act 2017 provides management, control, and prevention of the spread of declared pest within Western Australia.

Vegetation condition within the LSP area ranged from Very Good to Completely Degraded due to the historical uses within the LSP area, such as market gardens. A total of 50 vegetation types were mapped within the LSP area. Two floristic community types, FCT SCP 21A and 28 were identified as being a sub community of the Commonwealth Banksia Woodlands of the Swan Coastal Plain TEC, however, the vegetation representing these FCTs do not meet the criteria for protection, as identified during the site investigation.

5.2.2 Management Measures

The proponent will retain native vegetation in POS areas, regional ecological linkages, wetland buffers and road verges and lots (where possible). Amenity planting in streetscapes and POS will be undertaken using local native plant species where possible. The proposed LSP has considered the retention and protection of native vegetation and flora species. Future management of native vegetation and flora species will be addressed at subdivision stage.

A Vegetation Management Plan will be prepared prior to development works to reduce the risk of the introduction or distribution of pathogens or weed species to the retained vegetation within the LSP area.

The recent bushfire event that occurred within the LSP area is anticipated to have impacted on native vegetation. Anticipated impacts resultant from the bushfire may require further investigation during the LSP approval process.

5.3 Fauna

5.3.1 Background

The LSP area is located within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo (360 Environmental, 2021). A total of 32.58ha of black cockatoo foraging habitat was recorded, of which 18.91ha was of Very High Quality, 12.51ha was of High Quality,0.65ha of Medium Quality and 0.51ha was of Low Quality. Carnaby's Black Cockatoo foraging evidence in the form of chewed Marri nuts was also recorded. A pair of Carnaby's Black Cockatoo were observed and evidence of foraging in the form of chewed Marri nuts was record ed within the LSP area. Desktop assessment identified 24 conservation significant species protected under the State and Federal Government environmental regulations potentially occurring within the LSP area.

5.3.2 Management Measures

Appropriate environmental management measures are currently being established to ensure flora and fauna habitat disturbance is minimized during future development works associated with the proposed LSP. Public Open Spaces and Regional Ecological Linkages will used to secure a variety of fauna habitats such as wetland areas, transition zones from sensitive areas to development areas. A Fauna Management Plan will be prepared during construction to manage the impact of the development on fauna potentially occurring on site.

The proponent will retain significant trees within the POS, road reservations, Regional Ecological Linkages and within lots (where possible). The Black Cockatoo Habitat Assessment identified the health, foraging habitat, and potential black cockatoo trees within areas proposed to be retained.

Four hundred and ninety-four trees were identified as having a DBH greater than 500 mm and 107 black cockatoo hollows have been mapped with the LSP overlaid (Figure 7). The LSP incorporates the foraging habitats, and potential breeding trees (including hollows) into the overall design particularly within the Public Open Space, Regional Ecological Linkages, wetland buffers, road verges and within lots (where possible).

EPBC Referrals will be necessary to address the management of black cockatoo foraging habitat and breeding and roosting trees applicable to the proposed LSP. These referrals will be undertaken separate to the LSP approvals.

The recent bushfire event that occurred within the LSP area is anticipated to have impacted on fauna and fauna habitats. Anticipated impacts resultant from the bushfire may require further investigation during the LSP approval process.

5.4 Aboriginal Heritage

Two (2) Aboriginal Heritage sites were identified within the LSP area including Lake Mariginiup (ID:3741) and Lake Mariginiup Scarred Tree (ID: 28616).

5.4.1 Management Measures

Consent under *Aboriginal Heritage Act 1972 (as amended)* would be required prior to any disturbance to this site for the protection of the sites. Approval for works within the registered and lodged Aboriginal heritage sites may be conditional upon a heritage survey and liaison with the DPLH may be required prior to clearing or development works. If any potential remains, scatter or suspended artefacts are discovered, all works will be required to cease immediately and reported to the DPLH in accordance with the *Aboriginal Heritage Act 1972 (as amended).*

Consent documentation will be prepared and lodged to address the significance and presence of Aboriginal Heritage applicable to the proposed LSP. This application would be undertaken separately to the LSP approvals.

5.5 Surface Water and Wetlands

5.5.1 Background

Wetlands are the only water surface features identified within the LSP area. Lake Mariginiup (ID: 7953) Conservation Category Wetland covers a large portion of the northern side of the LSP area. On the south-eastern side of the LSP area is Lake Jandabup which is divided into two wetland categories. Wetland ID: 7957 is a Multiple Use Wetland and ID 15006 is Conservation Category Wetland (Figure 4).

5.5.2 Management Measures

An Integrated Water Management Strategy (IWMS) has been developed for the East Wanneroo District Structure Plan (RPS, 2019). The IWMS identifies that Lake Mariginiup, and Lake Jandabup are among the largest wetlands within the draft East Wanneroo District Structure Plan and are selected as significant wetlands for management in the Gnangara Mound Water Resources Environmental Review and Management Program.

To manage or mitigate the impacts on the wetlands within the LSP area, a Wetland and Wetland Buffer Management Plan (WWBMP) and/or associated Foreshore Management Plan or Strategy will be required to support the proposed LSP. The WWBMP and/or Foreshore Management Plan or Strategy will be confirmed with the regulatory authorities and form a condition of approval of the LSP.

5.5.2.1 District Water Management Strategy

A District Water Management Strategy (DWMS) was developed in 2021 for the East Wanneroo District Structure Plan. The DWMS describes how the matters of surface and groundwater management associated with the proposed development will be managed. The key water-related risk as a result of development within the East Wanneroo DSP area is associated with predicted inconsistent groundwater level rise. Rises in groundwater results

in risks to the environment from increased lake and groundwater levels causing excessive depths and durations of inundation and/or waterlogging of wetlands and vegetation, as well as risks to future development. The water management strategies identified in the DWMS include the following:

- *Protection of important environmental assets and water resources:* The key water resources requiring protection in the East Wanneroo DSP area are public drinking water source areas, important wetlands, and other important environmental assets. Other important environmental assets include water dependent species and ecosystems such as vegetation in good or better condition, threatened and priority ecological communities and threatened flora and fauna.
- *Management of surface water and groundwater at precinct scale:* The nature of the groundwater system in the East Wanneroo DSP is such that changes in hydrology in one precinct of the DSP area have the potential to impact significantly on groundwater levels in another precinct as well as the health of the important wetlands in the area. It is necessary to undertake further work to design and test the district groundwater management system to ensure impacts of groundwater level changes will not impact on wetlands and/or the proposed development.
- *Management of surface water and groundwater at district scale:* Groundwater and surface water management are integrated and delivered at both the district and precinct scale. Guidance for strategies at the precinct scale, delivered through local structure plans and local water management strategies include baseline assessments, small vent and groundwater management, local arterial drainage systems and local groundwater management systems.
- *Fit-for-purpose water supply and wastewater servicing:* Local Structure Plans should outline the strategy for the provision of drinking water, wastewater, and irrigation of Public Open Space.

The DWMS is the overarching district level water management strategy for the East Wanneroo District Structure Plan. The proposed LSP is consistent with the intent of the DWMS and will address water management strategies applicable at the local level associated with the proposed design of the LSP.

5.5.2.2 Local Water Management Strategy

A Local Water Management Strategy (LWMS) has been prepared to demonstrate how the LSP will address water management as identified in the DWMS (360 Environmental, 2021). Detailed surface water modelling has been undertaken to support the LSP and presented in the LWMS. The modelling considers the risks associated with surface water and groundwater interaction both now and in the future.

The LWMS has been prepared to detail how all forms of water including groundwater, stormwater and potable water will be managed on-site in accordance with the Better Urban Water Management Guidelines (WAPC, 2008a)

The proposed LSP will influence the total water cycle predominantly due to an increase in impervious areas and through limited cut to fill strategy for the LSP area. The LWMS provides strategies and plans for total water cycle management across the LSP area in accordance with the principles of Water Sensitive Urban Design (WSUD). It also provides a summary of local and regional environmental data that inform management strategies for stormwater, groundwater, protection of receiving environments and water conservation. A strategy for implementing the total water cycle management during construction and post development is also provided.

In summary, the LWMS details the following:

- The LSP area does not contain any rivers, creeks or other significant waterways and is characterised by highly conductive sandy soils which results in water predominantly infiltrating and evaporating.
- Surface water is generally confined to the wetlands, such as Lake Mariginiup located in the sites central part.
- Groundwater is situated between 2.3 m below ground level (bgl) near Lake Jandabup (Sept 2019) and 6.3 m bgl on the western edge of Lake Mariginiup (May 2020).
- Based on the DWMS, the controlled groundwater level for the wider EWDSP area including the LSP area is the Average Annual Maximum Groundwater Level (AAMGL). The AAMGL at the LSP area ranges from 45 m AHD to the east to approximately 38.6 m AHD on the west.
- Groundwater flows from east to the west towards Lake Mariginiup and from Lake Mariginiup to the southwest outside of the LSP area.
- Groundwater quality monitoring of the LSP area recorded the following:
    - pH was acidic during all monitoring occasions at all wells and below the adopted ANZECC trigger value
    - Salinity varied from fresh to brackish and exceeded the trigger value at two locations
    - NO2 was consistent across all locations and events
    - No3 was generally consistent
    - TN was elevated at all locations
- Groundwater at the LSP area is used for a variety of horticultural and agricultural purposes and approximately 1,356.63ML of water are extracted annually from the Perth-Superficial Swan Aquifer within the LSP area. Groundwater will be available to source for POS areas.
- Lake Mariginiup and Lake Jandabup have water level criteria set in Ministerial Statement No. 819. At Lake Mariginiup, water levels should not fall between 42.1 AHD (spring maximum peak) and 41.5 m AHD at a rate of more than two in size years, with the absolute minimum criteria being 41.5 m AHD. However, groundwater and lake levels have declined such that Lake Mariginiup is now dry for more than six months a year. Lake Jandabup's water levels should not fall between 44.7 m AHD (preferred spring minimum peak) and 44.2 m AHD (absolute spring minimum peak) - 44.3 m AHD (absolute summer minimum) at a rate of more than two in six years.
- The water conservation strategies to meet the conservation design criteria for small areas of landscaping and open space include:
    - The use of waterwise landscaping and efficient irrigation design will be utilized in both areas of POS and front landscaping packages controlled by the developer to limit the amount of water required outside of the building envelopes.
    - The LSP area contains mature vegetation which will be retained where possible to reduce the need to establish newly planted vegetation which requires higher rates of irrigation to become established.
    - Groundwater will be used as the water source for irrigation to reduce potable water consumption. The existing groundwater licences will be transferred to the respective developers from the existing landowners for this use.

  - The use of water efficient fixtures and fittings within areas of landscaping and, where possible, individual homes will be mandated.
  - Subsoil water is a source able be used fit for a purpose and its use should be further investigated in detail at the UWMP stage in line with district level subsoil drainage investigations.
- Groundwater modelling was undertaken by RPS (2021) to identify the risk posed by groundwater level rise. The objectives of the groundwater monitoring was to:
  - Estimate post-development groundwater level changes across the LSP area, including at the key environmental locations of Lake Jandabup and Lake Mariginiup. This would be used to estimate areas of the site that would require subsoil drainage.
  - Estimate subsoil drainage volumes that require management. This would inform the design of the groundwater management system.
- The groundwater modelling indicated that no subsoil drainage is required across the development area, except for a portion to the east of Lake Mariginiup. The model also suggests a small area to the east of the proposed transit corridor may require subsoil drainage.
- A conservative subsoil drainage plan would require the following:
  - For areas where the CGL is within 3 m of the ground surface (post-development surface where available), subsoil drainage was assumed to be at the CGL
  - For areas where groundwater is expected to rise to within 3 m of the ground surface, but the CGL is more than 3 m below ground level, subsoil drainage was assumed to be at a maximum practicable depth of 3 m below ground level (post-development ground surface where available).
- Further investigation into the requirement for subsoil drainage has determined that subsoil drainage is unlikely to be required. In the event it is required, the LSP has allocated an area for management of the subsoil discharge.
- The need for subsoil drainage will be further informed by a district scale groundwater management strategy currently being prepared and will be reported in the UWMP if available.
- A Conceptual Stormwater Management Strategy has been developed to demonstrate that the LSP area can effectively manage stormwater generated during the small, minor, and major rainfall events complying with stormwater quantity design criteria.
- Drainage requirements have been calculated based on a hydraulic conductivity of 5m/day. This is in accordance with the design permeability values recommended in the geotechnical report (Douglas Partners, 2021).
- The post development site earth worked levels have been developed to reduce the cut to fill requirements for the LSP area to help maintain predevelopment catchments and retain vegetation across the LSP area.
- In accordance with the DWMS (Urbaqua, 2021), wetlands within the LSP area will be used for the retention of minor (20%) and major (1%) event flood storage where feasible.

- The LSP area will utilise various water sensitive urban design strategies within the development to achieve the design criteria. The WSUD strategies that will be utilised for stormwater management throughout the LSP area, to remove gross pollutants, sediments, and nutrients from runoff prior to infiltration or discharge to the wetland include:
  - Soakwells
  - Bio retention areas
  - Erosion control structures.
- The stormwater systems that utilise Lake Mariginiup for flood storage will need to be designed to maintain pre-development surface water flow rates, runoff volumes, water levels and shallow groundwater recharge rates for receiving water bodies during frequent rainfall events (up to and including one exceedance per year).

The implementation of the LWMS will require the following information which is currently being investigated at the district scale:

- Development of a Wetland Management Plan for Lake Mariginiup and Lake Jandabup
- Planning and design of the district groundwater management strategy.

An Urban Water Management Plan will be required to support the subdivision of the site.

5.5.2.3 Wetland and Wetland Buffer Management Plan and/or Foreshore Management Plan or Strategy

To manage or mitigate the impacts of the project in the wetlands, a Wetland and Wetland Buffer Management Plan (WWBMP) is recommended to consider the location of Lake Mariginiup to the proposed development. The plan will include the implementation of buffers, species management and will be prepared as a condition of the LSP approval.

Wetland buffers involves separating a wetland from the adjacent land use(s) that might threaten its desired values and ensuring wetland activities do not have undue impact on the land use(s), through either spatial separation or the use of physical barriers (WAPC,2005).

As detailed in the IWMF, Local Structure Plans should demonstrate and define the values, functions and attributes of the wetland to be protected, the characteristic of the surrounding land uses, and the threats associated with the land use. A 50m buffer is typically required from a Conservation Category Wetland is required and this buffer is depicted in the LSP.

Confirmation from the regulatory authorities for management of the wetland, wetland buffers and associated foreshore areas is required to identify which management plan(s) will apply to the LSP.

5.6 Acid Sulfate Soils

5.6.1 Background

Lake Mariginiup which covers part of the LSP area has high to moderate risk of ASS occurring within 3 m of the natural soil surface. Development is not proposed to occur within the area identified as ASS.

5.6.2 Management Measures

In accordance with Department of Environment Regulation (2015) an ASS investigation may be warranted subject to the following being undertaken at the LSP area:

- Earthworks that will disturb more than 100 m^3 of soil
- Dewatering or soil draining activity.

To manage the risk of exposure to the ASS, Public Open Space (POS) areas can be designed in the areas which are of high risk. A ASS self-assessment will be required to be completed as part of the LSP. The result of the assessment will determine the development of an ASS Management Plan and Dewatering Management Plan to manage the ASS risk associated with the development. Although only medium risk, a POS link has been created around the periphery of the ASS mapped to further protect and reduce impact.

5.7 Existing Land Uses

5.7.1 Background

The LSP area is currently used for market gardens, rural lifestyle properties, equestrian activities, and other rural purposes. The intended land uses for the proposed LSP include residential, commercial, educational and areas for Public Open Space and recreation.

5.7.2 Management Measures

Appropriate land use planning and management measures will be implemented to ensure environmental impacts associated with the intended land uses such as residential, commercial and educational uses and POS have less environmental impact than those existing land uses which have resulted in the high fragmentation of native vegetation and other environmental values of the LSP area. These management measures are addressed within the LSP and supporting documentation and/or future approvals.

5.8 Bushfire Risk

5.8.1 Background

State Planning Policy 3.7 - Planning in Bushfire Prone Areas applies to the LSP area. The intent of this policy is to implement effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure.

5.8.2 Management Measures

A Bushfire Management Plan has been prepared by Linfire (2023) to support the development of the East Wanneroo LSP. The BMP provides management strategies to the identified bushfire matters raised within the LSP. Some of the key strategies include (Linfire, 2023):

- Creating sufficient separation from classified vegetation outside and within the project area in accordance with AS 3959, and by ensuring all other land within the project area (i.e., outside areas of proposed conservation, revegetation, drainage etc), is either non vegetated or any landscaping complies with the Asset Protection Zone (APZ) standards of the Guideline.
- Ensure vehicular access to and from the proposed development complies with the technical specifications of Guidelines.
- Ensure a secure bushfire fighting water supply by extending the existing town main and street hydrant connections to the development, or if required, use of static tanks.

- Ensure a Bushfire Emergency Evacuation Plan accompanies the BMP for any future planning applications for vulnerable land uses.
- Ensure a Bushfire Risk Management Plan accompanies the BMP for any future planning applications for high-risk land uses.

Given the above strategies, the BMP concludes that bushfire hazards within and adjacent to project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. The strategies need to be factored into proposed development as early as possible at all stages of the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets (Linfire 2023).

6.0 Review of Proposal against EPA Factors and Objectives

Table 12 provides an overview of relevant environmental factors on LSP area and consideration of proposal against the EPA objectives in relation to the LSP.

Table 12: Review of Proposal against EPA Factors and Objectives

Environmental Factor	Objective	Consideration of Proposal
Land		
Flora and Vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	A Flora and Vegetation Survey conducted 360 Environmental on the proposed site of development identifies that the site has no Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey. Fifty (50) vegetation types were described and mapped within the LSP area. Of these 50 vegetation types, only 12 are considered to have any vegetation community structure. Several vegetation types have been determined to have affiliation with Floristic Community Type (FCT) SCP 28 – Spearwood *Banksia attenuata* or *Banksia attenuata-Eucalyptus* woodlands. Vegetation type BaBm, which, has been determined to have affiliation with FCT SCP 21a – Central *Banksia attenuata* and *Eucalyptus marginata* woodlands. As stated in Section 4.4.4.3 both these FCTs have been identified as being a sub-community of the Commonwealth Banksia Woodlands of the Swan Coastal Plain TEC, however, the vegetation representing these FCTs do not meet the criteria for protection, this is based on the size of each remnant and their condition. The development of the site will not impact the EPA objective to protect flora and vegetation so that diversity and ecological integrity are maintained. A targeted flora survey for Caladenia huegelii was undertaken in early spring (during the species known flowering period i.e. August to October) of 2022. This survey did not confirm the presence of the Caladenia sp. in the three specific locations of the LSP area.

Environmental Factor	Objective	Consideration of Proposal
Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.	The topography of the area ranges between 48 m AHD and 61 m AHD across the LSP area. The highest areas are within the LSP area boundaries and low-lying areas are located close to wetlands. There are no significant or any listed landforms within the area or 10 km around LSP area. The objective to maintain a variety and integrity of distinctive physical landforms so that environmental values are protected will not be impacted by development in this LSP area.
Terrestrial Environmental Quality	To maintain the quality of land and soils so that environmental values are protected.	The LSP area occurs within two land systems: • Bassendean System 212Bs - Swan Coastal Plain from Busselton to Jurien. Sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths. • Spearwood System 211Sp- Sand dunes and plains. Yellow deep sands, pale deep sands, and yellow/brown shallow sands. The LSP area occurs within the Swan Coastal Plain (SWA) bioregion and the Perth (SWA02) subregion. The LSP area occurs within the Swan Coastal Plain (SWA) bioregion and the Perth (SWA02) subregion. The Swan Coastal Plain bioregion is a low lying coastal plain, mainly covered with woodlands (Mitchell, Williams, and Desmond, 2002). It is dominated by Banksia or Tuart on sandy soils, Casuarina obesaon outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah woodland. The outwash plains, once dominated by *Casuarinaobesa*-marri woodlands and *Melaleuca* shrublands, are extensive only in the south. The subregion is represented by heath and/or Tuart woodlands on limestone, Banksia, and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, Marri on colluvial and alluvial. The clearing of land on the already degraded areas will not impact on the terrestrial environmental quality of the region. The proposed development will not impact the objective to maintain the quality of land and soils so that environmental values are protected.

Environmental Factor	Objective	Consideration of Proposal
Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	A desktop database search of terrestrial fauna on DBCA, PMST and Naturemap identified that the LSP area contains 66 threatened and priority species under the State and Federal protection. A Black Cockatoo Habitat Assessment of the LSP area identifies that the area is within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo.A total of 32.58ha of black cockatoo foraging habitat was recorded, of which 18.91ha was of Very High Quality, 12.51ha was of High Quality,0.65ha of Medium Quality and 0.51ha was of Low Quality. A pair of Carnaby's Black Cockatoo were observed and evidence of foraging in the form of chewed Marri nuts was recorded within the LSP area. Although no evidence of black cockatoo breeding such as chew marks around hollow entrances was observed, the LSP area may be a habitat to some black cockatoos. The development of the area is likely to impact the diversity of black cockatoos within the LSP area or surrounds. The proposed LSP has incorporated the foraging habitat and breeding trees (including hollows) into Public Open Space, Regional Ecological Linkages, wetland buffers, road verges and within lots (where possible) to enable the protection of the black cockatoo species.
Inland Waters	To maintain the quality of groundwater and surface water so that environmental values are protected.	The LSP area is not within any RIWI Act, surface water areas and irrigation districts (DWER, 2023). Lake Mariginiup is a part of the LSP area; no other surface water features were identified within the LSP area. The LSP area is not located within a Public Drinking Water Source Area (PDWSA) (DWER, 2023c). The nearest PDWSA to the LSP area is a Protection Area -P1 which is approximately 900m southeast. The PDWSA, P1 area is under the Gnangara Underground Water Pollution Control Area. Within the same distance in the same direction is a Protection Area -P2 PDWSA which joins a P1 expanding to the east. The LSP area contains one geomorphic wetland (DWER, 2023). The wetland within the LSP area and their purpose are: • UFI 7953 Mariginiup Lake- Conservation Category. The proposed management plans for surface water and wetlands within the LSP area such as the establishment of a wetland buffer, removal of market gardens and drain management implementation will have a net environmental benefit to the area.

Environmental Factor	Objective	Consideration of Proposal
People		
Social Surroundings	To protect social surroundings from significant harm.	The area encompasses one registered Aboriginal Heritage site (ID 3741) which is Lake Mariginiup, a mythological, hunting place type of site. Within the same boundary with registered site is an unregistered site (ID 28616), Lake Mariginiup Scarred Tree. Northeast of the LSP area is site (ID 22160) which is unregistered, the site is an artefact type of site. The nearest European heritage is Berriman House, site (Place number 09514) is located at 89 Caporn Street Mariginiup. It is significant as it represents the early successful farming venture on the shores of Lake Mariginiup. The existing land uses of the LSP area includerural pursuits including equestrian activities, market gardens and other rural activities. Intended land uses for the LSP area such as residential, commercial and educational uses and POS will have lesser impact than previous land uses which has resulted highly in fragmentation of native vegetation and impact on other environmental values. The development of the LSP area may impact the objective to protect social surroundings from significant harm unless appropriate measures are implemented to minimise the harm to European and Aboriginal heritage sites and existing land uses. Appropriate land use planning and management measures to be implemented to minimise impact on intended land uses. Consent applications under the *Aboriginal Heritage Act 1972 (as amended)* should be considered separate to the LSP process.

7.0 Summary

In summary, the following conclusions on environmental aspects applicable to Precinct 7 of the proposed LSP include:

- **Environmentally Sensitive Areas**: The LSP area partially overlaps with a mapped ESA, which includes Lake Mariginiup and Little Mariginiup Lake. The proposed development is unlikely to impact the ESA's, management measures which include avoiding clearing within the area and any activities close to the area that may cause degradation to the ESAs.
- **Conservation Areas**: Several conservation sites were identified within the LSP area and areas surrounding the LSP area, these include five (5) Bush Forever sites and Regional Ecological Linkages. The development of the LSP area has considered measures to protect these conservation areas and not impact or reduce the quality of these environments.
- **Hydrology and Wetlands**: The LSP area contains one geomorphic Conservation Category Wetland (CCW). A Wetland and Wetland Buffer Management Plan (WWBMP) and associated Foreshore Management Plan (FMP) will be required to protect the CCW area. A Local Water Management Strategy (LWMS) has been prepared to demonstrate management strategies associated with the LSP. Sufficient groundwater will be available to source to POS areas. Stormwater management is achievable subject to meeting specific design criteria. The LWMS identifies that a Wetland Management Plan will be necessary for Lake Mariginiup and an Urban Water Management Plan for the subdivision of the LSP area.
- **Acid Sulfate Soils**: Lake Mariginiup, which covers the northern part of the LSP area is mapped within high to moderate risk of ASS occurring within 3m of the natural soil surface. To manage the risk of exposure to the ASS, an ASS self-assessment can be completed for the LSP area once detailed engineering design has been undertaken. Should the self-assessment identify the potential for ASS disturbance from the proposed works, then an ASS investigation will be undertaken in accordance with the DER's 'Identification and Investigation of ASS' guideline. The ASS investigation will determine whether ASS will require management during soil disturbance.
- **Heritage Sites**: The site contains one registered Aboriginal Heritage site (ID 3741) which is Lake Mariginiup, a mythological, hunting place type of site. On the edge of the wetland is an unregistered site (ID 28616), Lake Mariginiup Scarred Tree which is within the boundary of the site. Approval for works within the registered and lodged Aboriginal Heritage sites may be conditional upon a heritage survey and liaison with the DPLH may be required prior to clearing or development works. Consent under the *Aboriginal Heritage Act 1972 (as amended)* may be required, separate to the LSP process.
- **European Site**: The LSP area contains one European Heritage site. Berriman House shall be preserved and protected for its significance. Consideration for this site should have regard in the LSP.
- **Flora and Vegetation:** The Flora and Vegetation surveys identified no Threatened Flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded within the LSP area. The vegetation condition within the LSP area ranged from 'Very Good' to 'Completely Degraded'. Majority of the vegetation condition of remnant native vegetation within the LSP area is 'Completely Degraded'. A Vegetation Management Plan will be prepared at the time of subdivision and development to address fencing and signage requirements for protection of remnant native vegetation and flora

species during the construction phase of the development. Vegetation will be managed through the protection and retention of remnant vegetation and flora species within the POS, wetland buffers, regional ecological linkages, road verges and/or lots (wherever practicable). A targeted flora survey was undertaken in spring to confirm the presence/absence of the Caladenia sp. in specific locations, specifically within fragmented remnant native vegetation areas and no species were identified.

- **Fauna**: A Nature map and PMST database search results identifies there are potentially 24 conservation significant fauna species are within the LSP area. The LSP area is within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo (360 Environmental, 2021). No evidence of black cockatoo breeding was found in the area during black cockatoo survey. A pair of Carnaby's Black Cockatoo were observed and evidence of foraging in the form of chewed Marri nuts was recorded within the LSP area. A total of 32.58ha of black cockatoo foraging habitat was recorded, of which 18.91ha was of Very High Quality, 12.51ha was of High Quality,0.65ha of Medium Quality and 0.51ha was of Low Quality. Carnaby's Black Cockatoo foraging evidence in the form of chewed Marri nuts was also recorded. The establishment of POS areas will maintain the existing vegetation connected as habitat for fauna. In addition, retaining black cockatoo foraging habitat and breeding trees within POS, wetland buffers, Regional Ecological Linkages, road verges and within lots, where possible. A Fauna Management Plan will be prepared to manage the risk to habitats and fauna during construction reduce the risk of the introduction or distribution of pathogens or weed species to the retained vegetation and fauna habitats within the LSP area. EPBC referrals will be necessary to address the loss of black cockatoo foraging habitat and potential breeding trees (and hollows) associated with the proposed LSP. These EPBC referrals will be undertaken separate to the LSP approvals.
- **Bush Fire Risk:** The LSP area is mapped within a Bush fire Prone Area. *State Planning Policy - 3.7 Planning in Bushfire Prone* areas applies to the LSP area. A Bushfire Management Plan has been prepared to identify strategies to address bushfire risk and the consideration of bushfire protection criteria support to the LSP. The BMP will be supporting other management plans for the development of the LSP. Further investigation of the anticipated impacts on environmental values resultant from the recent bushfire event may be required to be considered during the LSP approval process.

8.0 Conclusion

The key environmental matters identified in the EAR do not pose a significant constraint to the draft LSP. Avoidance of important environmental assets during the LSP phase has resulted in a development having limited environmental impact.

Where the environment could possibly be impacted, environmental management measures, additional investigations, surveys, or assessments (including additional approvals) are proposed to avoid or mitigate these impacts. Those matters not addressed through the LSP process will be addressed in detail in the subdivision and development phases accordingly.

9.0 Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data, and analyses ('client's information') provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive, or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness, and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive, and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions, and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

10.0 References

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11.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

Appendix A Figures

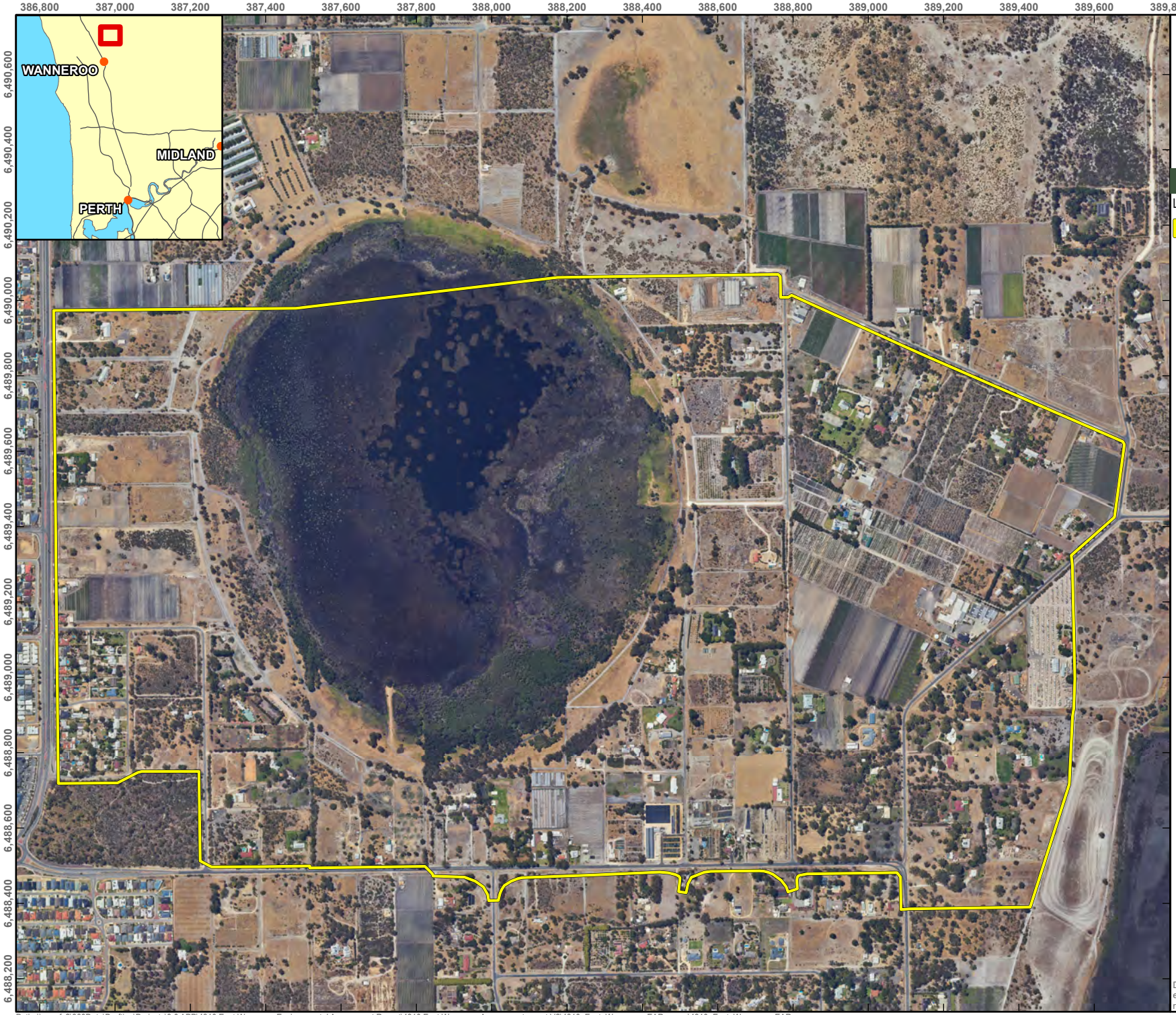
East Wanneroo Environmental Assessment Report

Precinct 7

Hesperia

SLR Project No.: 675.V64310.00000

11 December 2023



Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Site Location

FIGURE 1

LEGEND

Study Area (398.72 ha)

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:13,500 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
Drawn by:	JH
Reviewed by:	GA

SLR

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Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Soil Landscapes and Land Systems

FIGURE 2

LEGEND

Study Area (398.72 ha)

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:20,000 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
Drawn by:	JH
Reviewed by:	GA

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Soils Subsystem Central

- 211Sp__Kg: Low hilly to gently undulating terrain. Iron podzols. Banksia spp woodland with E. todtiana and depauperate E. marginata; dense shrub layer. (Karrakatta Sand Grey Phase)
- 211Sp__Ky: Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. Banksia spp. woodland with scattered emergent E. gomphocephala and E. marginata and a dense shrub layer. (Karrakatta Sand Yellow Phase)
- 211Sp__Sp: Irregular banks of karst depressions. Some limestone outcrop. Shallow brown sands. Banksia spp. woodland with emergent E. gomphocephala and E. marginata; dense shrub layer. (Spearwood Sand Phase)
- 211Sp__Wp: Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. Melaleuca spp. and E. rudis at waters edge. Reeds and sedges in shallow water. (Spearwood permanent lakes and swamps Phase)
- 211Sp__Ws: Depressions with free water in winter. Humus podzols and peat. Dense M. preissiana; M. rhaphiophylla and E. rudis around the edges with reeds and sedges in the centre. (Spearwood seasonal swamps Phase)
- 212Bs__G: Flat or gently undulating landscape. Iron-humus podzols and some diatomite deposits. Banksia spp. Low open woodland with scattered emergent Eucalyptus calophylla and Melaleuca pressiana dense shrub layer. (Bassendean, Gavin Phase)
- 212Bs__J: Poorly drained depressions. Humus podzols. Scattered M. preissiana, E. rudis and Banksia ilicifolia with a dense shrub layer. (Bassendean, Joel Phase)
- 212Bs__Ja: Jandakot low dunes. Slopes <10% and generally more than 5m relief. Grey sand over pale yellow sands generally underlain by humic and iron podsols; Banksia spp. low open woodland with a dense shrub layer. (Bassendean, Jandakot Phase)
- 212Bs__Wp: Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. Melaleuca spp. and E. rudis at waters edge. Reeds and sedges in shallow water. (Bassendean permanent lakes and swamps Phase)
- 212Bs__Ws: Depressions with free water in winter. Humus podzols and peat. Dense M. preissiana; M. rhaphiophylla and E. rudis around the edges with reeds and sedges in the centre. (Bassendean seasonal swamps Phase)

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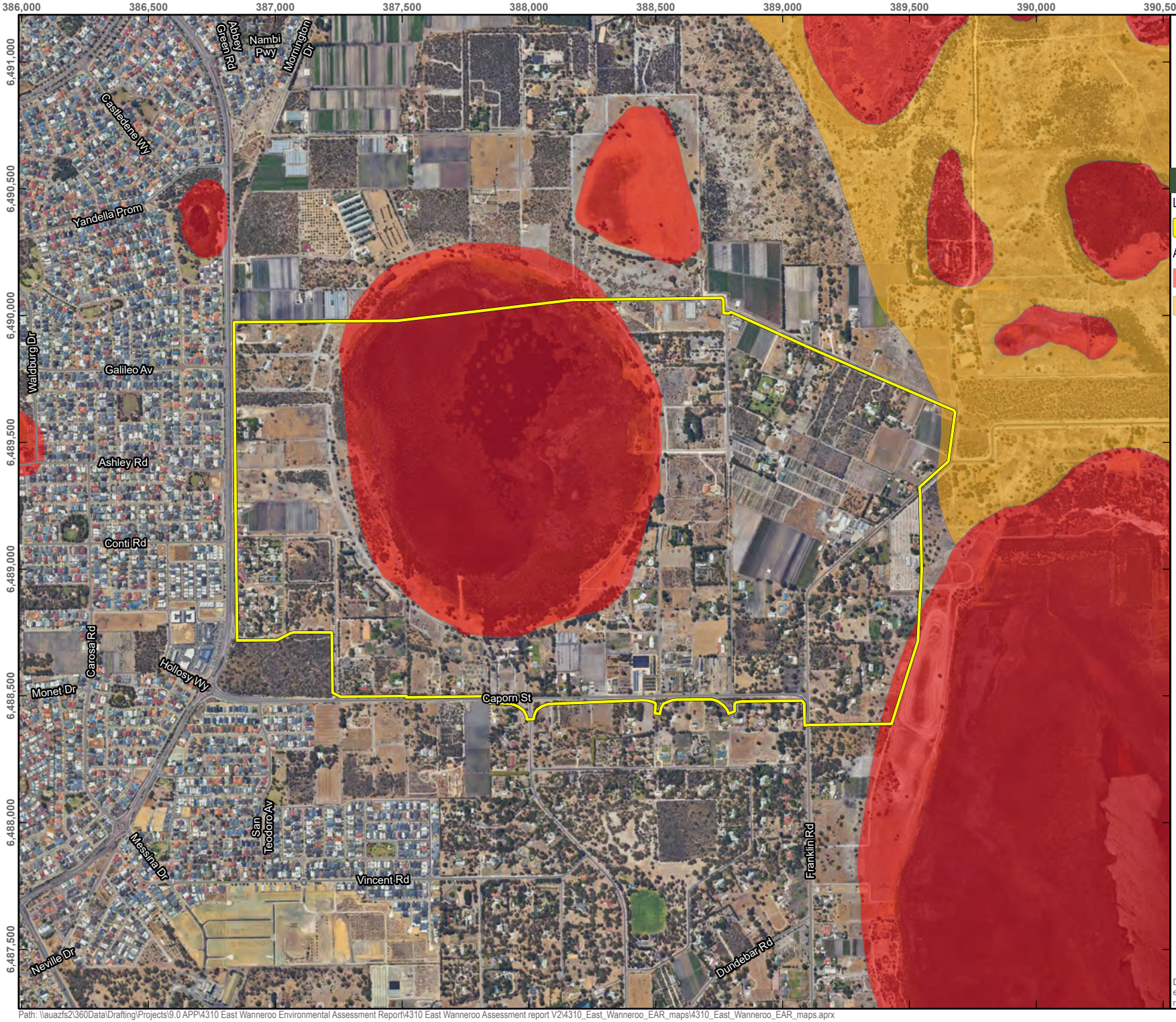


Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Acid Sulphate Soils

FIGURE 3

LEGEND

- Study Area (398.72 ha)

Acid Sulphate Soils

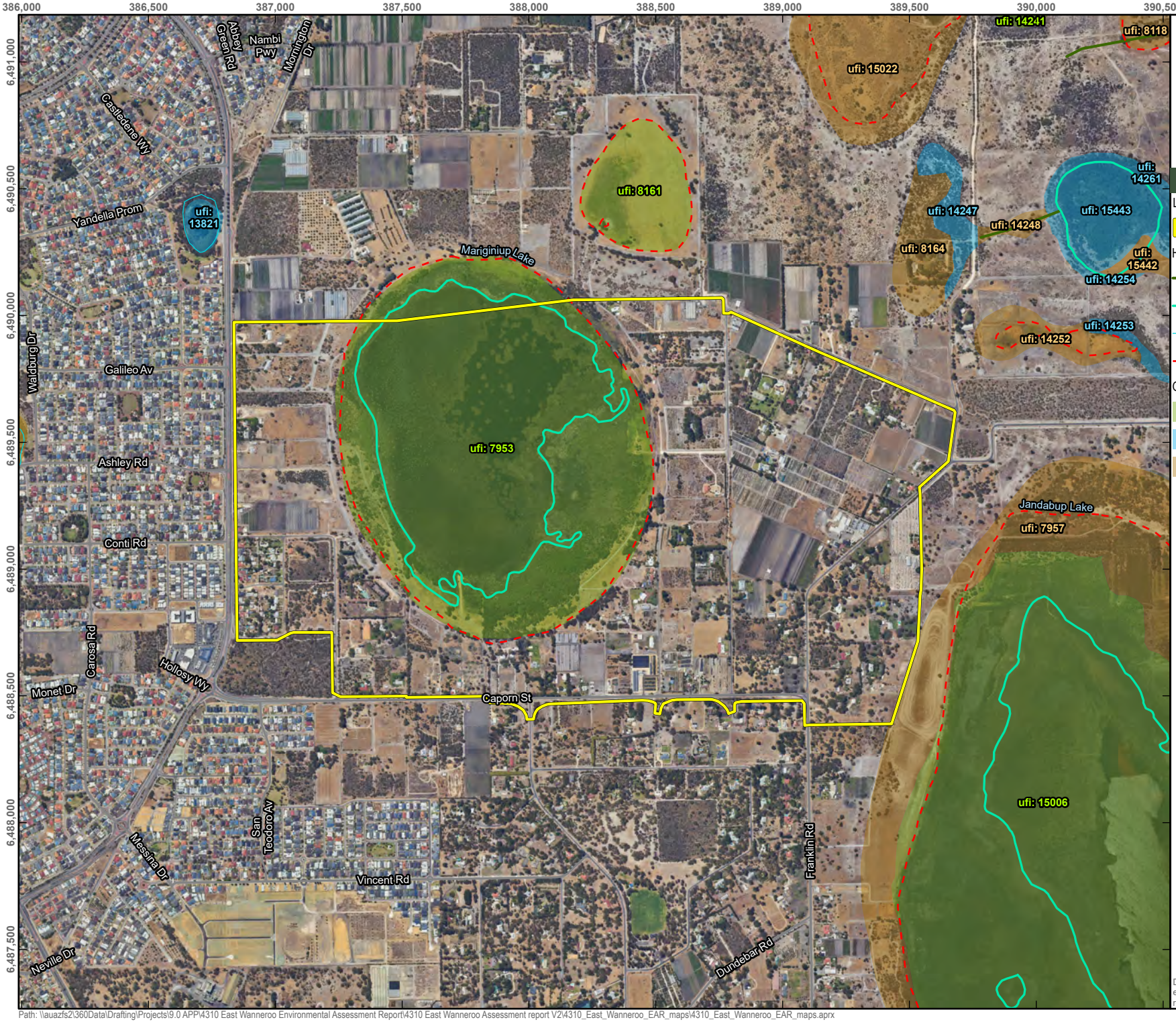
- High to moderate risk
- Moderate to low risk

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:20,000 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
Drawn by:	JH
Reviewed by:	GA

SLR



Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Hydrology and Wetlands

FIGURE 4

LEGEND

- Study Area (398.72 ha)

Hydrography

- Drain - major
- Lake
- Swamp
- Area Subject to Inundation

Geomorphic Wetlands

- Conservation Category
- Resource Enhancement Category
- Multiple Use Category

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:20,000 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
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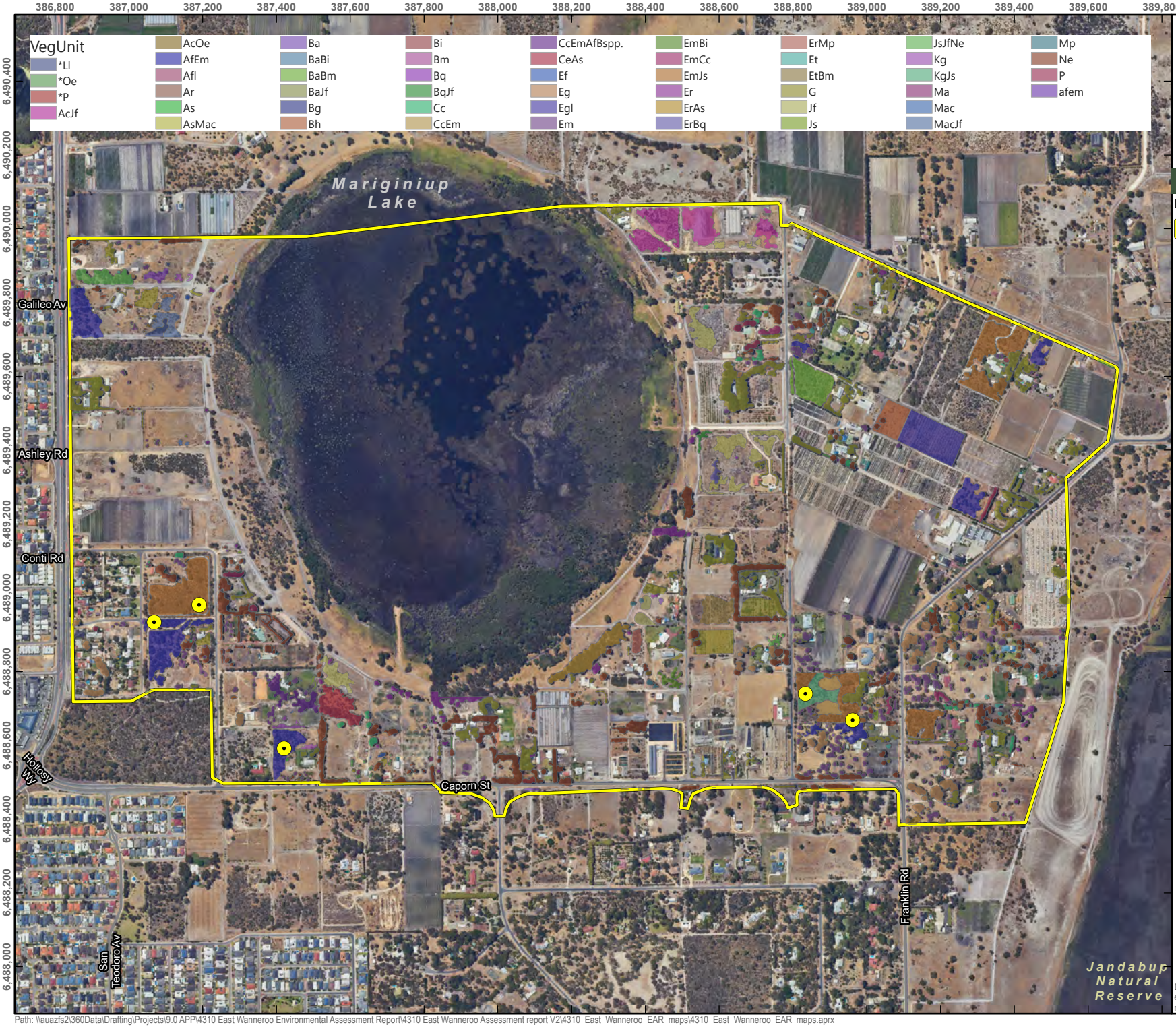

Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Vegetation Types

FIGURE 5

LEGEND

- Study Area (398.72 ha)
- *Jacksonia sericea* (P4)

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:13,812 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
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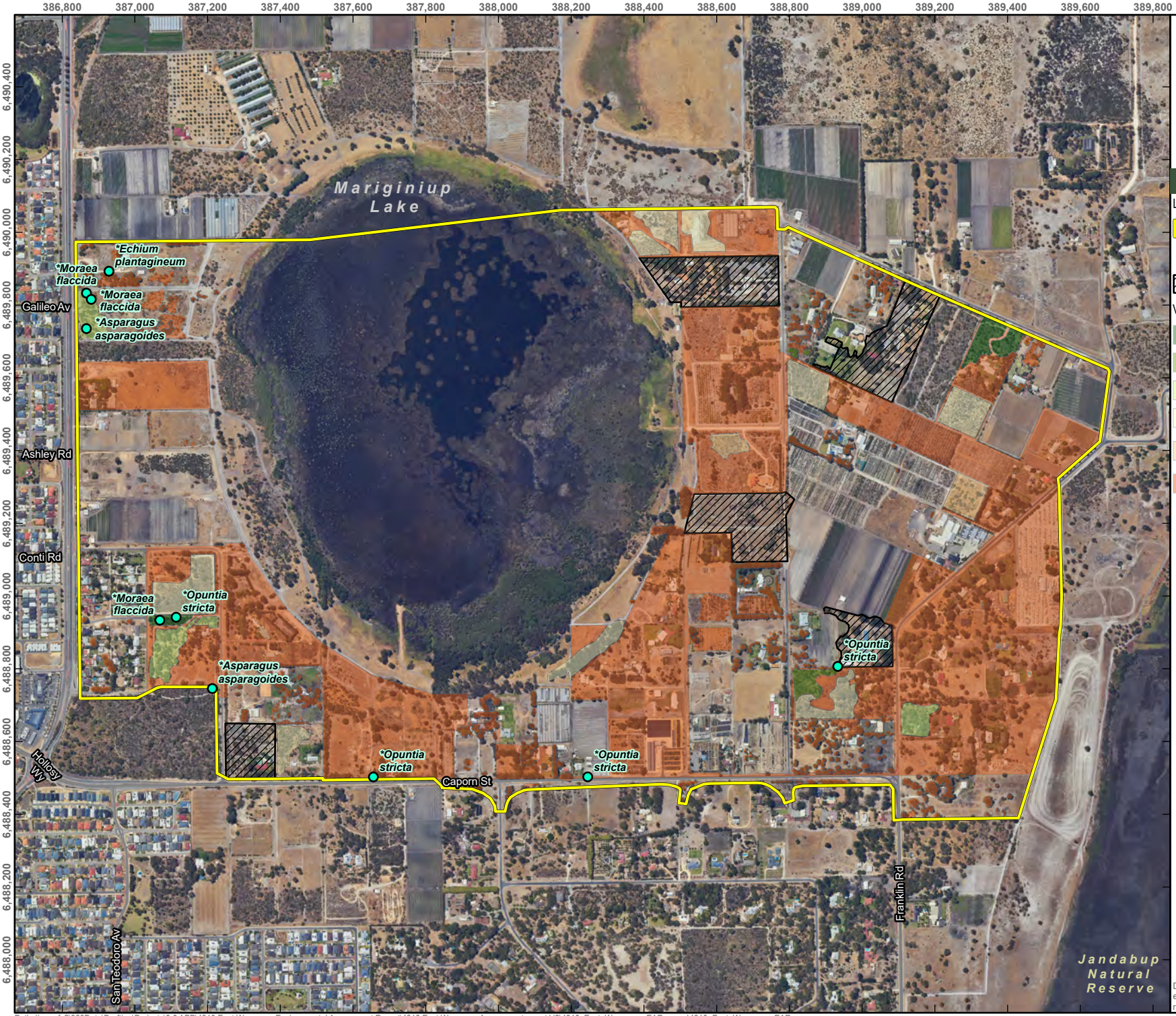

Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Vegetation Condition

FIGURE 6

LEGEND

- Study Area (398.72 ha)
- Declared Weeds
- Not Assessed

VegCond

- Very Good
- Good
- Good - Degraded
- Degraded
- Degraded- Completely Degraded
- Completely Degraded

Service Layer Credits: Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:14,000 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
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Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Potential Black Cockatoo Breeding Trees

FIGURE 7

LEGEND

- Study Area (398.72 ha)

Potential Black Cockatoo Breeding Trees Species

- Coastal blackbutt (Eucalyptus todtiana)
- Flooded gum (Eucalyptus rudis)
- Introduced Eucalypt
- Jarrah (Eucalyptus marginata)
- Marri (Corymbia calophylla)
- Non Endemic
- Stag
- Tuart (Eucalyptus gomphocephala)
- Potentially Suitable Breeding Hollow >120mm

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:13,812 at A4
Project Number:	4310
Date Drawn:	01-Dec-2023
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Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Black Cockatoo Habitat

FIGURE 8

LEGEND

- Study Area (398.72 ha)
- Carnaby's Black Cockatoo call heard
- Carnaby's Black Cockatoo foraging evidence
- Carnaby's Black Cockatoo sighting

Foraging Habitat

- Very high quality
- High quality
- Medium quality
- Low quality

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:13,812 at A4
Project Number:	4310
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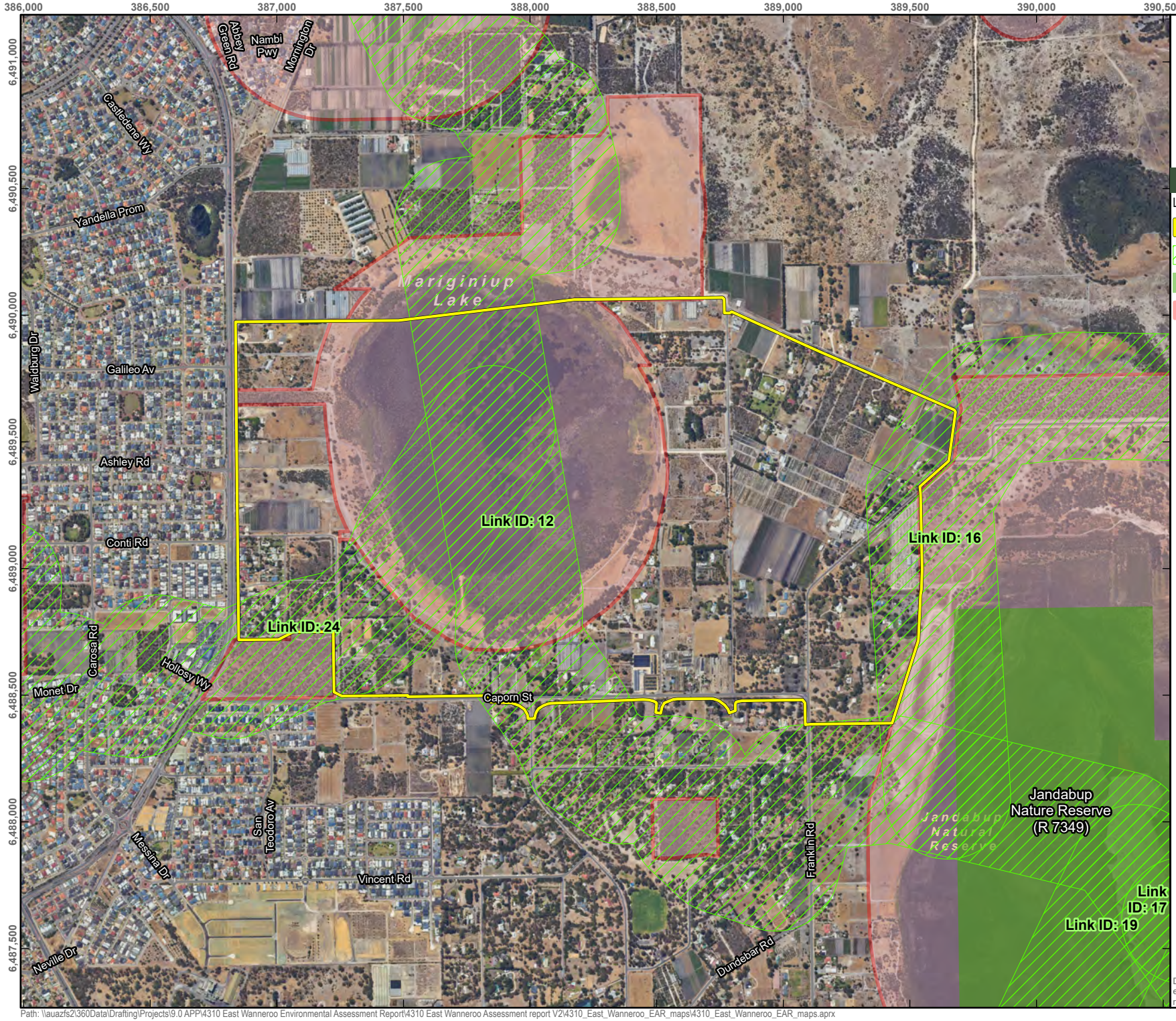

Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Conservation and Environmentally Sensitive Areas

FIGURE 9

LEGEND

- Study Area (398.72 ha)
- Regional Ecological Linkage
- DBCA Managed Land
- Environmentally Sensitive Areas

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
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Project Number:	4310
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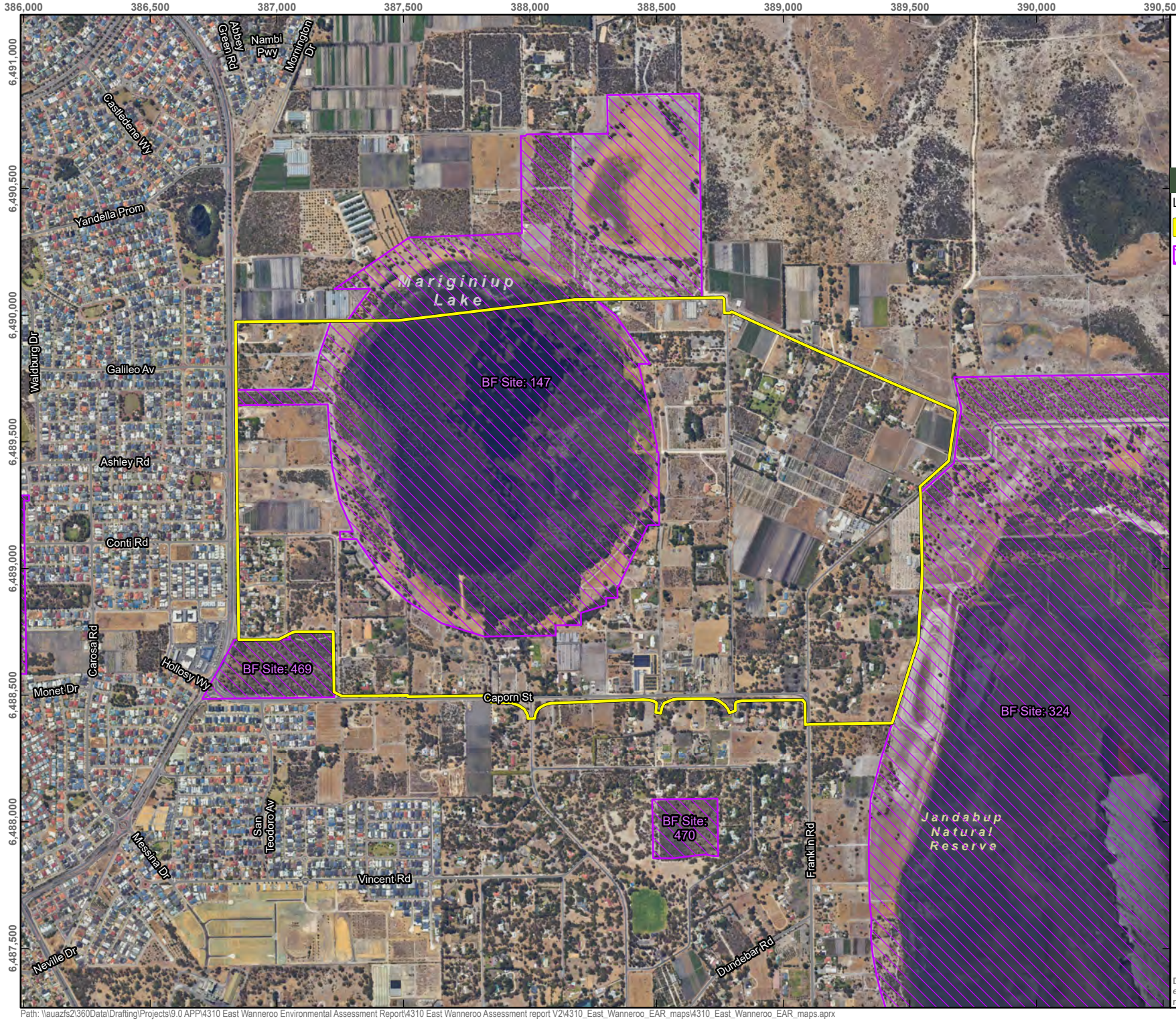

Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Bush Forever Sites

FIGURE 10

LEGEND

- Study Area (398.72 ha)
- Bush Forever Sites

Service Layer Credits:
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0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:20,000 at A4
Project Number:	4310
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Precinct 7, East Wanneroo

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Heritage

FIGURE 11

LEGEND

- Study Area (398.72 ha)
- European Heritage Place

Aboriginal Heritage

- Registered Sites
- Lodged Sites

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:20,000 at A4
Project Number:	4310
Date Drawn:	05-Dec-2023
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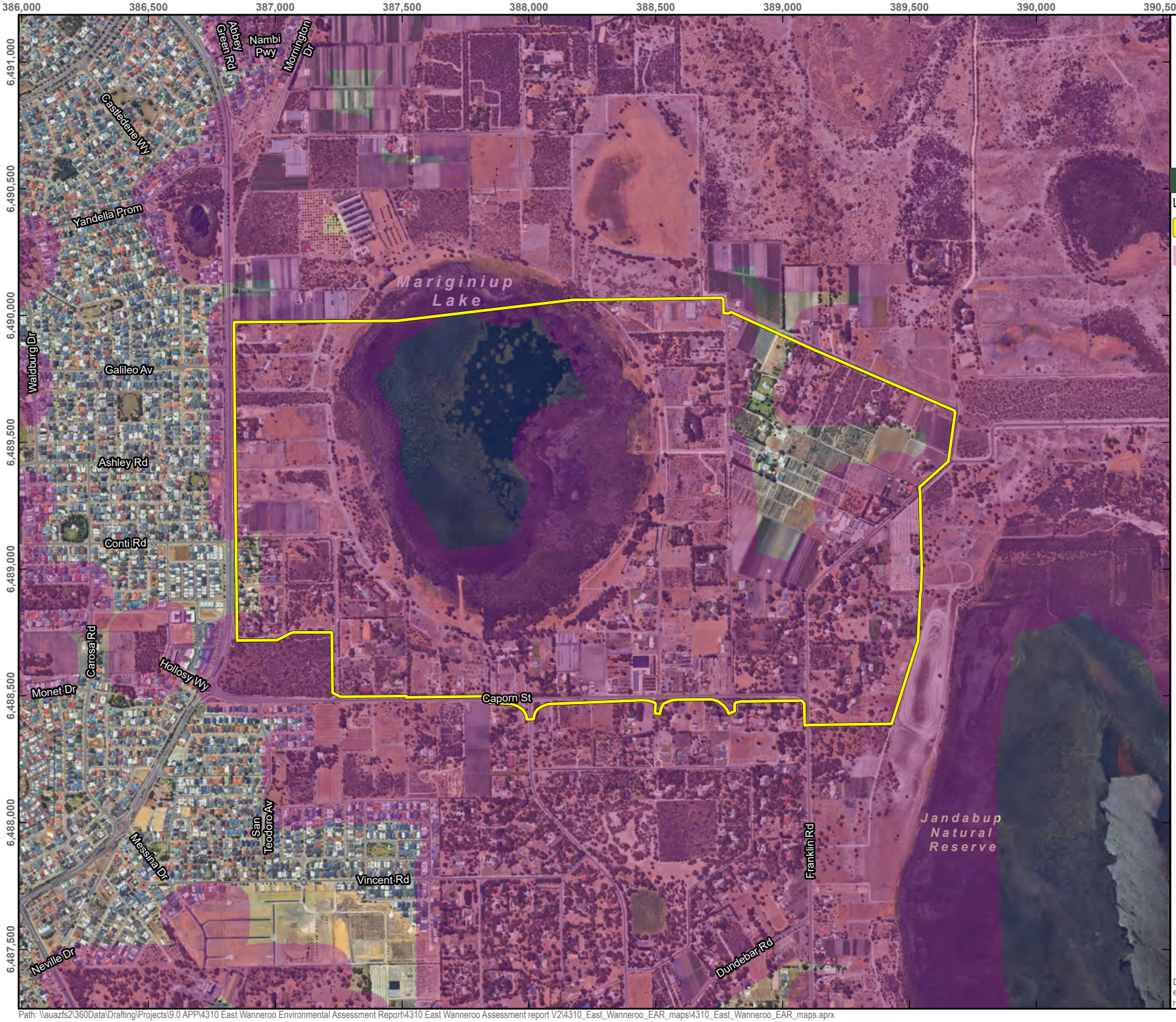

Hesperia
Precinct 7, East Wanneroo

Environmental Assessment Report, Precinct 7 East Wanneroo

Bushfire Prone Areas

FIGURE 12

LEGEND

- Study Area (398.72 ha)
- Bushfire Prone Areas

Service Layer Credits:
Landgate / SLIP,SLIP

0 100 200 Metres

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:20,000 at A4
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Appendix B East Wanneroo Local Structure Plan

East Wanneroo Environmental Assessment Report

Precinct 7

Hesperia

SLR Project No.: 675.V64310.00000

11 December 2023

LEGEND

STRUCTURE PLAN AREA

MRS RESERVES

PARKS AND RECREATION

LOCAL SCHEME

RESIDENTIAL R30-R60*

RESIDENTIAL R40-R80

PUBLIC OPEN SPACE

PUBLIC PURPOSES - HIGH SCHOOL

PUBLIC PURPOSES - PRIMARY SCHOOL

PUBLIC PURPOSES - WATER CORPORATION

PUBLIC PURPOSES

SPECIAL USE 1 (LOCAL CENTRE)

MOVEMENT NETWORK

INTEGRATOR A (35m)

NEIGHBOURHOOD CONNECTOR A (25m)

NEIGHBOURHOOD CONNECTOR B (20m)

ACCESS STREET A (24m)

ACCESS STREET B (17.9m)

ACCESS STREET C (15m**)

INDICATIVE EXTERNAL ROADS

ROUNDABOUT INTERSECTION***

LEFT-IN/LEFT-OUT INTERSECTION***

OTHER

CHARACTER AREA*

CONSERVATION AREA

150m ODOUR BUFFER TO WWPS

WETLAND CORE

50m WETLAND BUFFER

RAPID TRANSIT ROUTE

GREEN STREET*

NOTES:

*REFER TO STRUCTURE PLAN REPORT FOR DETAIL.

**MAY BE REDUCED TO 13m ADJACENT TO PUBLIC OPEN SPACE (EXCLUDING AREAS IDENTIFIED FOR CONSERVATION PURPOSES), OR 10m WHERE USED AS A CONTROLLED ACCESS PLACE.

***ALL OTHER INTERSECTIONS TO BE PRIORITY CONTROLLED.

POS 1 0.8933ha

P&R RESERVE 1.7354ha

POS 2 6.8736ha

POS 3 0.7928ha

POS 4 0.5883ha

P&R RESERVE 147.5671ha

WWPS 1.9859ha

PS 4.2551ha

SU1

POS 5 4.0002ha

HS 9.0712 ha

POS 6 3.1638ha

POS 22 0.2000ha

POS 21 0.8762ha

CHARACTER AREA

POS 20 1.7445ha

POS 18 0.3660ha

GROUNDWATER PUMPING STATION 0.0500ha

WWPS PUMPING STATION 0.1059ha

POS 19 0.0350ha

PS 4.2589ha

POS 7 1.0755ha

POS 8 0.8652ha

POS 9 1.3709ha

POS 10 1.1526ha

POS 11 0.3175ha

POS 12 0.8111ha

POS 13 0.5324ha

POS 14 0.1576ha

POS 15 0.3093ha

POS 16 1.1492ha

POS 17 5.5257ha

TRANSPORT CORRIDOR 6.0298 ha

JANDABUP LAKE

NORTH

0 50 100 150 200 250m

SCALE 1:10,000 (A3)

PLAN 1: STRUCTURE PLAN MAP

EAST WANNEROO: PRECINCT 7

MARIGINIUP

CITY OF WANNEROO

BURGESS DESIGN GROUP
TOWN PLANNING + URBAN DESIGN
PO Box 8779, Perth Business Centre 6849
www.burgessdesigngroup.com.au
P (08) 9328 6411
F (08) 9328 4062

Plan No: HES MAR 03-05f-02 Client: HESPERIA
Date: 21.11.23 Planner: JB/AC

Appendix C East Wanneroo Vegetation Survey and Black Cockatoo Assessment 2021

East Wanneroo Environmental Assessment Report

Precinct 7

Hesperia

SLR Project No.: 675.V64310.00000

11 December 2023

360 environmental

East Wanneroo Vegetation Survey and Black Cockatoo Assessment

Prepared for

Hesperia

December 2021

people planet professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
4660AA_Rev0	Internal Draft	N. Whittington L. Geidans B. Duncan	E. Webb S. Walker	L. Ioannidis	-	22/12/2021
4660AA_Rev1	Client Draft	N. Whittington L. Geidans B. Duncan	E. Webb S. Walker	N. Chambers	1x electronic copies	23/12/2021

Disclaimer

Executive Summary

Hesperia commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a spring biological (vegetation and black cockatoo) assessment for the East Wanneroo Project, approximately 2.4 km north of Wanneroo, in the Swan Coastal Plain bioregion (herein referred to as the Survey Area). An initial detailed flora and vegetation survey was undertaken in October 2020 with a black cockatoo habitat assessment undertaken in January 2021. An additional flora, vegetation and black cockatoo survey was required to capture those properties that were not surveyed during the initial survey as well as several additional lots that have been added to the project. The data from both surveys have been combined into this report.

Flora and Vegetation

The desktop assessment identified 69 conservation significant species occurring within 65 km radius of the Survey Area. A likelihood of occurrence assessment was undertaken pre-survey and determined three species as having a high likelihood of occurrence, six species as having a medium likelihood of occurrence, 58 species as having a low likelihood of occurrence.

The detailed flora and vegetation survey recorded the floristic composition and vegetation types from eight quadrats, 11 relevés and additional mapping notes. The survey recorded a total of 174 taxa from 127 genera across 54 families.

No Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation Act (EPBC) 1999* and/or gazetted as Threatened pursuant to the *Biodiversity and Conservation (BC) Ac*t 2016 were recorded during the survey.

One Priority flora, *Jacksonia sericea* (P4), was recorded within the Survey Area.

The presence of priority species is unlikely to be a statutory constraint for the Survey Area and is dealt with by the Department of Water and Environmental Regulation and Department of Biodiversity, Conservation and Attractions on a case by case basis.

A total of 50 vegetation types were mapped in the Survey Area.

Vegetation types EmJs, BaEm, AfEm, KgJs and Ac*0e, which are represented by sites EWR01, EWR02, EWR03, EWQ01, EWQ03, EWQ04, EWQ05, EWQ06 and EWQ07, have been determined to have an affiliation with Floristic Community Type (FCT) SCP 28 – Spearwood *Banksia attenuata* or *Banksia attenuata* - *Eucalyptus woodlands*. Vegetation type BaBm, which, is represented by site EWQ02, has been determined to have an affiliation with FCT SCP 21a – Central *Banksia attenuata* and *Eucalyptus marginata* woodlands. Both these FCTs have been identified as being a sub-community of the Commonwealth *Banksia* Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC). The vegetation which was found to be analogous with FCT SCP 21a and 28 do not meet the criteria for protection. This is based on the size of each remnant and their current condition.

Eucalyptus gomphocephala (Tuart) was recorded throughout the Survey Area, and although this species is not list as being conservation significant under the EPBC Act, it can however form part

of the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC. Based on the wide distribution of *E. gomphocephala* in the Survey Area (often isolated single trees) and the condition of the vegetation they occurred in (in some cases they are amongst gardens and grass), none are considered part of the TEC.

Vegetation condition within the Survey Area ranged from Very Good to Completely Degraded. The majority of the Survey Area was in Completely Degraded condition.

Forty-two introduced species were recorded during the survey. Two species, **Asparagus asparagoides* and **Opuntia stricta* are listed as Weeds of National Significance by the Department of Agriculture Water and the Environment (2021b) and as Declared Pests by the Department of Primary Industries and Regional Development. An additional species, **Moraea flaccida* is listed as a Declared Pest.

Black Cockatoos

The Survey Area occurs within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo.

The black cockatoo assessment identified 494 potential breeding trees with a diameter at breast height of greater than 500 mm comprising of:

- 171 Jarrah (*Eucalyptus marginata*)
- 22 Marri (*Corymbia calophylla*)
- 70 Tuart (*Eucalyptus gomphocephala*)
- 24 Flooded Gum (*Eucalyptus rudis*)
- Six Coastal Blackbutt (*Eucalyptus todtiana*)
- 45 dead trees (stags)
- 156 introduced eucalypts.

A total of 70 trees were found to contain hollows that are potentially suitable for black cockatoo breeding (including one tree with a diameter at breast height of less than 500 mm), however none displayed evidence of black cockatoo breeding such as chew marks around hollow entrances.

A total of 36.83 ha of black cockatoo foraging habitat was recorded, of which 20.03 ha was very high quality, 15.57 ha was high quality, 0.69 ha was medium quality and 0.53 ha was low quality. Carnaby's Black Cockatoos were observed at six locations within the Survey Area and evidence of foraging in the form of chewed Marri nuts was recorded within the Survey Area.

Abbreviations

Abbreviations used through the report are described below in Table 1.

Table 1: Abbreviations

Abbreviation	Description
360 Environmental	360 Environmental Pty Ltd
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
°C	Degree Celsius
CR	Critically Endangered
DAWE	Department of Agriculture, Water, and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DoE	Department of Environment
DP	Declared Pest
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection Biodiversity and Conservation Act 1999
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
m	Metres
mm	Millimetres
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
Study Area	The database search area (varied according to each parameter)

Abbreviation	Description
Survey Area	The East Wanneroo Survey Area is 397.0 ha, and comprises private land, Bush Forever Sites, Nature reserves, roads and cleared tracks
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
TPFRF	Threatened and Priority Flora Report Forms
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance

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1 Introduction

Hesperia commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a spring biological (vegetation and black cockatoo) assessment for the East Wanneroo Project in East Wanneroo, Western Australia. A detailed flora and vegetation survey and Black Cockatoo habitat assessment was completed within the defined area, approximately 2.4 km north of Wanneroo, in the Swan Coastal Plain bioregion (herein referred to as the Survey Area). An initial flora and vegetation survey was undertaken in October 2020 with the black cockatoo survey undertaken in January 2021. An additional flora, vegetation and black cockatoo survey was required to capture those properties that were not surveyed during the initial survey as well as several additional lots that have been added to the project. The data from both surveys have been combined into this report.

The Survey Area comprised private land, Bush Forever Sites, Nature reserves, roads and cleared tracks, covering approximately 397.0 hectares (ha) (Figure 1). Due to access restrictions, the entirety of the Survey Area was not able to be surveyed. There are also areas that have already been proposed as Public Open Space (POS), these were not required to be surveyed. This report only assesses the properties 360 Environmental was able to gain access to, as well as vegetation that could be confidently observed from fence lines.

1.1 Objectives and Scope

The purpose of the survey is to delineate key flora and fauna values within the Survey Area and identify potential environmental sensitivities that may impact the Project.

The scope of works includes:

- A desktop assessment using DBCA database searches
- A spring (in season) detailed flora and vegetation survey of properties that could not be accessed in the 2020 survey as well as an additional 17 Lots
- A black cockatoo habitat assessment
- A technical biological report
- And GIS geospatial data in the IBSA format.

2 Background

2.1 Protection of Flora, Vegetation and Fauna

Western Australian flora and fauna is protected formally and informally by legislative and non-legislative measures:

Legislative measures:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *WA Biodiversity Conservation Act 2016* (BC Act)
- *WA Environmental Protection Act 1986* (EP Act)
- *WA Biosecurity and Agriculture Management Act 2007* (BAM Act).

Non-legislative measures:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora and ecological communities
- Weeds of National Significance (WoNS)
- Recognition of locally significant populations by DBCA.

These protection mechanisms are supported by guidance documents published by the Environmental Protection Authority (EPA) and Department of Agriculture, Water and the Environment (DAWE; formerly Department of Environment, and Department of Sustainability, Environment, Water, Population and Communities):

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016)
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (Department of Parks and Wildlife, 2013)
- Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment, 2013)
- Survey Guidelines for Australia's Threatened Birds Under the Environment Protection And Biodiversity Conservation Act 1999 (Department of the Environment Water Heritage and the Arts, 2010)
- EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (Department of Sustainability Environment Water Population and Communities, 2012)
- 'Banksia Woodlands of the Swan Coastal Plain' Guidelines (Department of the Environment and Energy, 2019)
- Approved Conservation Advice for the Tuart Woodlands and Forests of the Swan Coastal Plain Ecological Community (Department of Environment and Energy, 2019).

2.2 Existing Environment

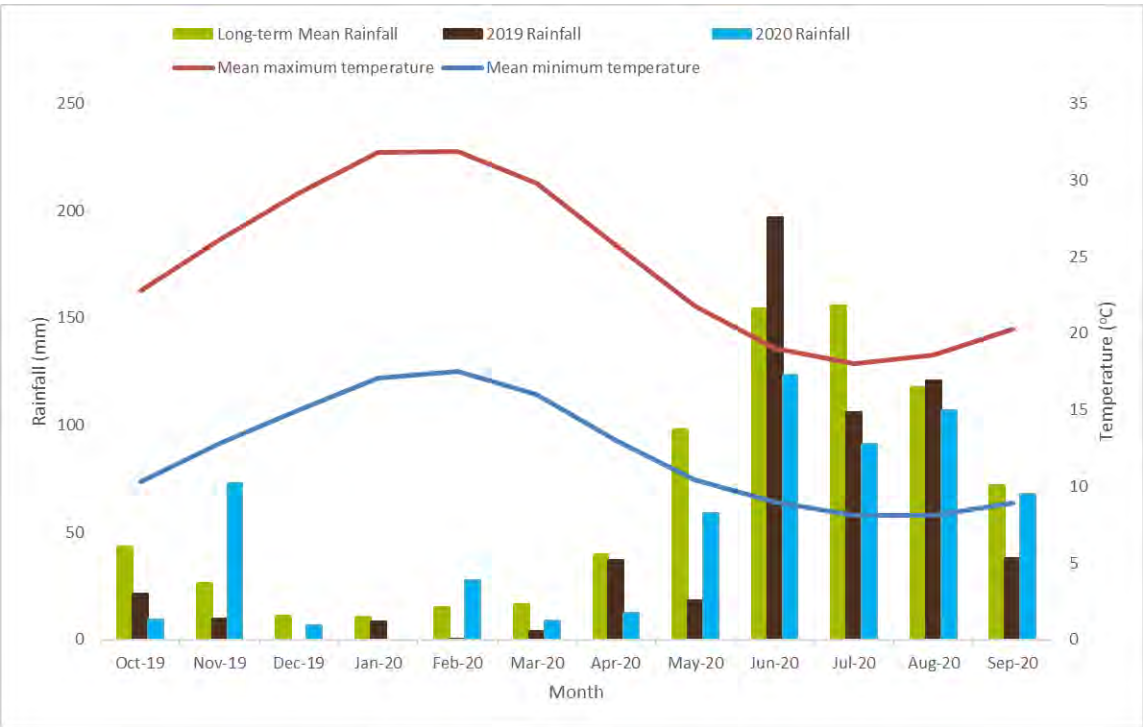
2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a climate and weather dataset is Perth Airport weather station (Station 9021), located approximately 26 km south of the Survey Area. The closest long-term BoM weather station with rainfall statistics is Wanneroo (Station 9105), located approximately 0.7 km south of the Survey Area.

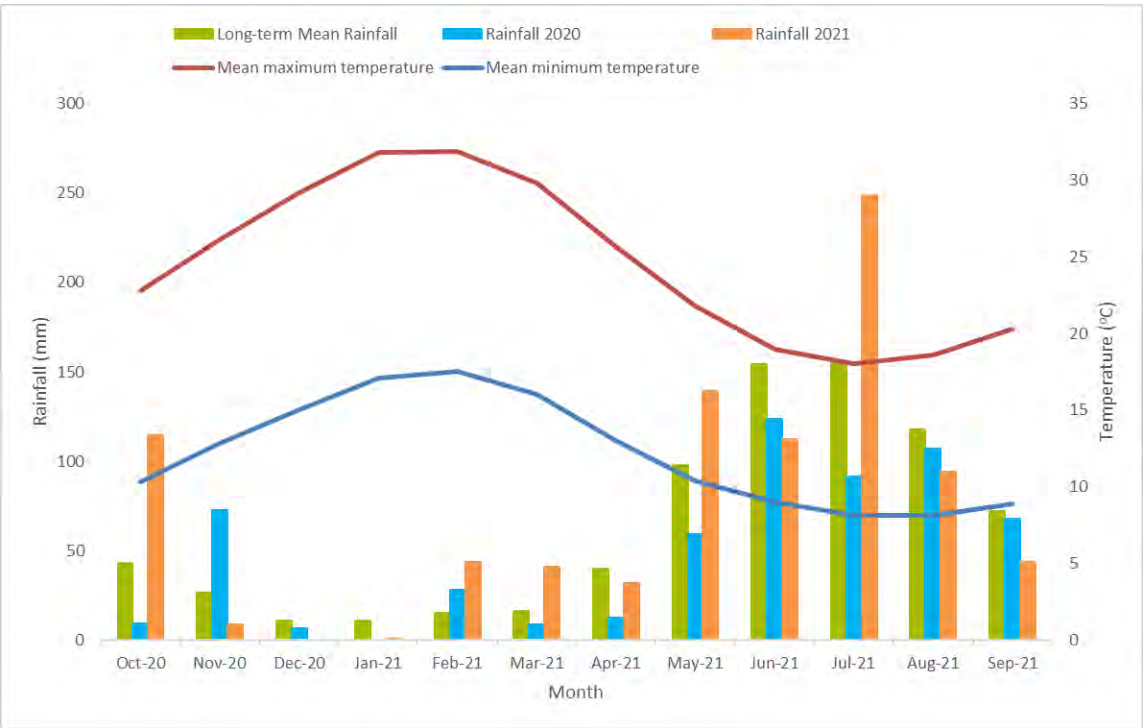
The long-term mean minimum temperature for Perth Airport weather station ranges from 8.1˚C (July and August) to 17.5˚C (February) (1944 to 2021) and the long-term mean maximum temperature ranges from 18.6˚C (August) to 31.9˚C (February) (Bureau of Meteorology, 2021) (Graph 1, Graph 2).

In the three months prior to the 2020 survey (July 2020 to September 2020), 266.3 mm of rainfall was recorded, which is 79.3 mm below the long-term average of 345.6 mm for the same time period (Bureau of Meteorology, 2021).

In the three months prior to the 2021 survey (July 2021 to September 2021), 386.4 mm of rainfall was recorded, which is 40.8 mm above the long-term average of 345.6 mm for the same time period (Bureau of Meteorology, 2021).



Graph 1: Long-term and Monthly Total Rainfall, Maximum and Minimum temperatures for Perth Airport (Station 9105) and Wanneroo (Station 9105) for 12 months prior to the 2020 survey (Bureau of Meteorology, 2021)



Graph 2: Long-term and Monthly Total Rainfall, Maximum and Minimum temperatures for Perth Airport (Station 9105) and Wanneroo (Station 9105) for 12 months prior to the 2021 survey (Bureau of Meteorology, 2021)

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Swan Coastal Plain (SWA) bioregion and the Perth (SWA02) subregion.

The Swan Coastal Plain bioregion is a low lying coastal plain, mainly covered with woodlands (Mitchell, Williams, & Desmond, 2002). It is dominated by Banksia or Tuart on sandy soils, *Casuarina obesa* on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah woodland. The outwash plains, once dominated by *Casuarina obesa*-marri woodlands and *Melaleuca* shrublands, are extensive only in the south.

The Perth subregion is composed of colluvial and aeolian sands, alluvial river flats, coastal limestone (Mitchell et al., 2002). The subregion is represented by heath and/or Tuart woodlands on limestone, Banksia and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, over colluvial and alluvial soils including a complex series of seasonal wetlands.

2.2.3 Soil Landscapes and Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, and has been captured at scales ranging

from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012). The Survey Area occurs within two land systems in Bassendean and Spearwood (Table 2).

Table 2: Land Systems within the Survey Area

Land System		Description (Department of Agriculture and Food WA, 2012)
Name	Code	
Bassendean System	212Bs	Swan Coastal Plain from Busselton to Jurien. Sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths.
Spearwood System	211Sp	Sand dunes and plains. Yellow deep sands, pale deep sands and yellow/brown shallow sands.

The Survey Area occurs across seven sub systems shown in Figure 2 and detailed in Table 3.

Table 3: Land Sub Systems across the Survey area

Sub System Code	Description
211Sp__Kg	Low hilly to gently undulating terrain. Iron podzols. *Banksia* spp. woodland with *Eucalyptus todtiana* and depauperate *E. marginata*; dense shrub layer.
211Sp__Ky	Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. *Banksia* spp. woodland with scattered emergent *Eucalyptus gomphocephala* and *E. marginata* and a dense shrub layer.
211Sp__Sp	Irregular banks of karst depressions. Some limestone outcrop. Shallow brown sands. *Banksia* spp. woodland with emergent *Eucalyptus gomphocephala* and *E. marginata*; dense shrub layer.
211Sp__Wp	Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. *Melaleuca* spp. and *Eucalyptus rudis* at waters edge. Reeds and sedges in shallow water.
211Sp__Ws	Depressions with free water in winter. Humus podzols and peat. Dense *Melaleuca preissiana*; *M. rhaphiophylla* and *Eucalyptus rudis* around the edges with reeds and sedges in the centre.
212Bs__G	Flat or gently undulating landscape. Iron-humus podzol sand some diatomite deposits. *Banksia* spp. Low open woodland with scattered emergent *Corymbia calophylla* and *Melaleuca preissiana* dense shrub layer.
212Bs__J	Poorly drained depressions. Humus podzols. Scattered *Melaleuca preissiana*, *Eucalyptus rudis* and *Banksia ilicifolia* with a dense shrub layer.
212Bs__Ja	Jandakot low dunes. Slopes <10% and generally more than 5m relief. Grey sand over pale yellow sands generally underlain by humic and iron podsols; *Banksia* spp. low open woodland with a dense shrub layer.
212Bs__Wp	Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. Melaleuca spp. and E. rudis at waters edge. Reeds and sedges in shallow water.
212Bs__Ws	Depressions with free water in winter. Humus podzols and peat. Dense *M. preissiana*; *M. rhaphiophylla* and *E. rudis* around the edges with reeds and sedges in the centre.

2.2.4 Hydrology and Wetlands

The Geomorphic Wetlands dataset is identified and utilised by the EPA, Department of Water and Environment Regulations (DWER) and the Department of Lands and Heritage (DPLH) as a basis for planning and decision making. The Survey Area contains three geomorphic wetlands (Department of Water and Environmental Regulation, 2016) (Table 4, Figure 3) as well an additional four in close proximity (Table 5).

Table 4: Geomorphic Wetlands Within the Survey Area

UFI Number	Name	Conservation Category
7953	Mariginiup Lake	Conservation
7957	Jandabup Lake	Multiple use
15006	Jandabup Lake	Conservation

Table 5: Geomorphic Wetlands in Close Proximity to the Survey

UFI Number	Conservation Category	Distance to the Survey Area
8161	Conservation (Little Mariginiup Lake)	200 m north
8164	Multiple use	300 m north
14252	Multiple use	210 m north
14247	Resource Enhancement	420 m north

2.2.5 Broad Vegetation Types

Mapping of pre-European broad vegetation within Western Australia was completed on a broad scale (1:1,000,000) by Beard (1976). These vegetation types were later re-assessed by Shepherd, Beeston, & Hopkins (2002) with some larger vegetation units divided into smaller units. Together, this pre-European database contains a total of 819 vegetation associations within Western Australia.

Four broad vegetation types are mapped over the Survey Area (Figure 4). These vegetation associations are described below and their representation at a local, regional and state level is shown in Table 6.

- **Spearwood 6:** a woodland of Jarrah, Marri and Wandoo *Eucalyptus marginata*, *Corymbia calophylla*, *E. wandoo*
- **Spearwood 126:** a freshwater lake
- **Bassendean 37:** wattle, *Casuarina* and teatree, *Acacia-Allocasuarina-Melaleuca* alliance
- **Bassendean 949:** a low woodland or open low woodland of other acacia, banksia, peppermint, cypress pine, casuarina, York gum *Acacia* spp., *Banksia* spp., *Agonis flexuosa*, *Callitris* spp., *Allocasuarina* spp., *Eucalyptus loxophleba*.

Table 6: Broad Vegetation Types within the State, Regional and Local Representation (Government of Western Australia, 2019)

System and Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Proportion of Current Extent in DBCA Managed Lands (%)
Representation across Western Australia				
Spearwood 6	56,343.01	13,362.25	23.72	39.83
Spearwood 126	23,503.39	9,570.88	40.72	38.53
Bassendean 37	39,296.52	24,727.17	62.92	20.92
Bassendean 949	218,193.94	123,104.02	56.42	55.86
Representation across the Swan Coastal Plain Bioregion				
Spearwood 6	56,343.01	13,362.25	23.72	39.83
Spearwood 126	3,420.06	807.46	23.61	37.23
Bassendean 37	15,617.85	5,404.74	34.61	40.96
Bassendean 949	209,983.26	120,287.93	57.28	56.40
Representation across the Perth Subregion				
Spearwood 6	56,343.01	13,362.25	23.72	39.83
Spearwood 126	3,420.06	807.46	23.61	37.23
Bassendean 37	14,018.45	4,784.19	34.13	44.87
Bassendean 949	184,475.82	104,128.96	56.45	58.99
Representation across the City of Wanneroo				
Spearwood 6	12,662.10	2,777.67	21.94	50.65
Spearwood 126	704.48	255.28	36.24	55.35
Bassendean 37	568.92	270.83	47.60	20.19
Bassendean 949	37,138.40	17,196.34	46.30	70.10

2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands. The Survey Area overlaps with a mapped ESA, which are Mariginiup Lake, Little Mariginiup Lake and surrounding areas. The ESA mapping is likely to reflect associated buffers (Figure 5) (Department of Water and Environmental Regulation, 2018).

2.2.7 Conservation Areas

The Survey Area overlaps a Bush Forever Site (Site No. 147) and an EPA Redbook recommended Conservation Reserve (Area No. M8). Other near areas of conservation to the Survey Area are described below and shown in Figure 5.

- Caporn Park, a Bush Forever Site (Site No. 469) located on the southwestern boundary of the Survey Area.
- A portion of Edgar Griffiths Park, a Bush Forever Site (Site No. 470) located 300 m south of the Survey Area.
- Jandabup Nature Reserve (Reserve No. 7349), a Bush Forever Site (Site No. 324) located 350 m east of the Survey Area and is vested under The Conservation Commission of Western Australia. The north-western portion of the Bush Forever Site is located on the boundary of the Survey Area.
- Ashley Park, a Bush Forever Site (Site No. 164) located 800 m west of the Survey Area.

Three Regional Ecological Linkages (IDs 12, 16 and 24).

3 Methods

3.1 Requirements for Flora and Fauna Surveys

This survey has been carried out as per the EPA requirements for environmental surveying and reporting of flora and fauna surveys in Western Australia as described in Section 2.1.

3.2 Desktop Assessment

3.2.1 Literature Review

Background information on the Survey Area and surrounds, at a scale meaningful to the Survey Area, was compiled prior to the field survey (see Section 2.2). Historical vegetation mapping (Beard, 1976; Shepherd et al., 2002), land systems mapping (Department of Agriculture and Food WA 2012), and the IBRA classification system (Mitchell, Williams & Desmond 2002) were consulted to provide broad contextual knowledge of vegetation units likely to be encountered within the Survey Area (Appendix A).

The literature review also considered the following three publicly available biological reports undertaken in the vicinity of the Survey Area:

- Conservation Area Management Plan Mather Reserve (53163) and Lot 24 Mary Street (City of Wanneroo, 2020), Mather Reserve: 6.5 km north west, Lot 24 Mary Street: 6 km south
- Lot 1665 Wanneroo Road, Sinagra - Environmental Assessment Report (Strategen Environmental, 2019), 1.5 km south west
- Various Lots Caporn Street, Wanneroo - Environmental Assessment Report, (360 Environmental Pty Ltd, 2017), adjacent to southern boundary.

3.2.2 Database Searches

Database searches were undertaken to compile a list of potential flora and fauna and identify potential conservation significant flora, fauna, and ecological communities within or surrounding the Survey Areas (Table 7). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (Department of Agriculture Water and the Environment, 2020).

The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 7: Database Searches of the Survey Area

Database Name	Date Received	Search Target	Search Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2021a)	5 October 2020	TECs and PECs	10 km buffer around the Survey Area
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions, 2020c)	14 September 2020	Threatened and Priority Flora	20 km buffer around the Survey Area
Western Australian Herbarium flora database search (Department of Biodiversity Conservation and Attractions, 2021c)	14 September 2020		20 km buffer around the Survey Area
DBCA Threatened and Priority Fauna database search (Department of Biodiversity Conservation and Attractions, 2021b)	5 November 2020	Threatened and Priority Fauna	8 km buffer around the Survey Area
NatureMap (Department of Biodiversity Conservation and Attractions, 2020a)	3 September 2020	Threatened and Priority flora and fauna, and inventory of potential flora and fauna	5 km buffer around the Survey Area
Protected Matters Search Tool (Department of Agriculture Water and the Environment, 2021a)	3 September 2020	Commonwealth listed Threatened flora and fauna and TECs	5 km buffer around the Survey Area

3.2.3 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were assessed to determine a likelihood of occurrence both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 8. Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence are discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria are not discussed unless a justification for this classification is required.

For fauna, species listed as Marine under the EPBC Act were not included as conservation significant as the Marine listing only applies within Commonwealth marine areas.

Table 8: Likelihood of Occurrence Criteria

Rank	Criteria
Previously Recorded	The species has been previously recorded in the Survey Area
High (Likely to occur)	• There are existing records of the species near the Survey Area (within 5 km) • The species is strongly linked to a specific habitat, which is present in the Survey Area; or • The species has more general habitat preferences, and suitable habitat is present.
Medium (May occur)	• There are existing records of the species between 5-10 km, however: ○ The species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area; or ○ The species has more general habitat preferences, but only some suitable habitat is present. • There is suitable habitat in the Survey Area, but the species is recorded infrequently in the locality.
Low (Unlikely to occur)	• The species is linked to a specific habitat, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality.

3.3 Flora and Vegetation

3.3.1 Field Survey

A detailed flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington (Flora Licence FB62000177, TFL 70-1920) and Graduate Ecologist Bridget Duncan (Flora Licence FB62000272) on 13, 19, 21 and 26 October 2020. A second flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington (Flora Licence FB62000177, TFL 70-1920) and Ecologist Grant Buller (Flora Licence FB62000321) on 12 – 14 October 2021.

The field surveys included an assessment of eight quadrats and eleven relevés, mapping notes, vegetation condition notes, opportunistic flora collections, observations, and a targeted search for conservation significant flora. The survey effort and quadrat locations are shown in (Figure 6).

Due to the restricted access to numerous properties, mapping notes were visually assessed from fence lines to determined major vegetation types and structure. Properties that did not have access and were not surveyed have been indicated on the figures with cross-hatching (Figure 6).

Quadrats of 10 x 10 m (100 m^2) were installed in each representative vegetation type. Each quadrat was accurately measured using measuring tapes, and the northwest corner was demarcated with an aluminium fence dropper.

At each quadrat, the following was recorded using a Fulcrum mobile data collection device:

- Site code – a unique identifier allocated to each quadrat.
- Date and recorder – a record of the date of quadrat sample and a list of the personnel involved in sampling the quadrat.
- Location – GPS coordinates (MGA94) recorded at the north west corner of the quadrat.
- Dimensions – the size and shape of the quadrat.
- Landform and soil description – a description of the quadrat habitat.
- Additional site descriptors – location information that might be useful in vegetation classification including, slope, aspect, litter cover, bare ground cover and fire history.
- Inventory of vascular flora including the approximate height and percentage foliar cover for each taxon recorded.
- Vegetation description – a description of the vegetation according to the National Vegetation Information System (NVIS), Level 5. According to this level, vegetation is classified to 'association', where the dominant growth form, height, cover and species (three species) for the three traditional strata (upper, mid and ground) are described.
- Vegetation condition – assessed according to the South West vegetation condition scale (Environmental Protection Authority, 2016).
- Photographs – a photograph from the north west corner looking toward the south east corner was taken.

3.3.2 Flora of Conservation Significance

Prior to the surveys, conservation significant flora with the likelihood or potential to occur within the Survey Area was compiled (see Section 3.2.3). Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey.

The Survey Area was traversed on foot and suitable habitats targeted. Where Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby. Specimens of any potential conservation significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.3.3 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected systematically for later identification using resources of the WAH. Taxonomy was completed by Narelle Whittington and experienced taxonomist Frank Obbens at the WAH.

The finalised species list was checked against FloraBase (Western Australian Herbarium, 2020) to determine the species' conservation status and known distribution. Introduced species were compared against the BAM Act Declared Plants list the WoNS list to determine their status (Department of Agriculture Water and the Environment, 2021b; Department of Primary Industries and Regional Development, 2021).

3.3.4 Statistical Analyses

Quadrats were classified on the basis of similarity in species composition using Primer-E version 6.1.5. Species presence/absence quadrat data was pre-treated, transformed and then analysed using Bray-Curtis similarity tests.

A Bray-Curtis similarity analysis was undertaken on the floristic composition of the quadrats recorded during the survey with weed and native flora quadrat data compiled between 1990 - 1996 for the Southern Swan Coastal Plain (SCP) (Keighery, Keighery, Longman, & Clarke, 2012). The (Keighery et al., 2012) data set combines a total of 1098 sites from numerous studies on the SCP.

The SCP dataset provides publicly available standardised regional vegetation dataset. Attempts were made to correlate the vegetation in the Survey Area with the FCTs as presented in the SCP dataset as an aid in determining the conservation significance of the vegetation.

Species accumulation curves were plotted using Primer-E version 6.1.5. to determine the adequacy of the survey. The treatments comprised Sobs (Mao Tao), to reflect the number of species observed (based on a given total of species recorded), and richness estimators Chao 1, Chao 2, Jacknife 1, Bootstrap and Michaelis-Menton to predict the total number of flora taxa that could potentially be recorded. Species accumulation curves for this survey were calculated using data collected from the flora sites within the Survey Area. All flora taxa, both annual and perennial, within each flora site were used in generating the species accumulation curve.

3.4 Black Cockatoos

3.4.1 Field Survey

The black cockatoo assessment was undertaken by Ecologist Lukas Geidans on 12 and 14 January 2021 and 12 - 14 October 2021. The survey involved driving between accessible properties of the Survey Area and traversing them on foot to determine the presence of breeding, foraging and roosting habitat. The survey was conducted in accordance with the EPBC Act referral guidelines for three threatened black cockatoo species (Department of Sustainability Environment Water Population and Communities, 2012) and with due regard for the revised draft referral guideline for three threatened black cockatoo species (Department of the Environment and Energy, 2017).

3.4.2 Breeding Habitat

Any vegetation meeting the following criteria for potential black cockatoo breeding habitat were recorded using the Fulcrum mobile data-collection application:

- Tree species with the potential to form suitable hollows, particularly endemic eucalypt species (e.g. Jarrah, Marri, Tuart, Wandoo and Salmon Gum)
- Diameter at breast height (DBH) of greater than 500 mm (greater than 300 mm for Wandoo and Salmon Gum) regardless of the presence or absence of hollows (DBH is measured approximately 1.3 metres from the ground)

- Any trees containing hollows (observed from the ground), which were then categorised as:
  - Hollows that are unsuitable for black cockatoo breeding e.g. hollows with an estimated opening diameter of obviously less than 100 mm, downwards-facing hollows
  - Hollows that are potentially suitable for black cockatoo breeding e.g. upwards or sideways-facing hollows with an estimated opening diameter of greater than 100 mm (Saunders, Mawson, & Dawson, 2014).

Trees with swellings or forking/branching at breast height were measured just above or below breast height to gain a more accurate measurement of diameter. In instances where trees had multiple stems, only the largest stem was measured.

3.4.3 Foraging Habitat

Foraging habitat was assessed on the presence of tree and shrub species known to be important dietary items for black cockatoos, such as Marri and *Banksia* species, as outlined in the referral and revised draft referral guidelines. It also included looking for:

- Evidence of feeding (chewed cones, seed and nut material)
- Opportunistic observations of black cockatoos foraging or using the Survey Area.

Foraging habitat was mapped and classified as low, medium, high or very high quality using criteria adapted from the Foraging Habitat Scoring Tool in the Draft Revised EPBC Referral Guidelines (Department of the Environment and Energy, 2017).

3.4.4 Roosting Habitat

Areas suitable for black cockatoo roosting were identified and recorded. If observed, evidence of roosting such as scat at the base of the trees was recorded. Absence of roosting evidence does not rule out the possibility of black cockatoo roosting, as dusk/dawn surveys were not undertaken.

4 Limitations

Limitations and constraints of the flora, vegetation and black cockatoo survey are detailed in Table 9.

Table 9: Limitations and Constraints Associated with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Availability of Data	Not a limitation	All data required to complete the scope of works including regional and local contextual information was available
Access and Survey Intensity	Moderate limitation	The Survey Area was comprised of many individual private properties, some of which access was not permitted. This resulted in vegetation and trees not being accurately surveyed and targeted searches not undertaken on these properties. Where possible the vegetation and trees on these properties were assessed from the boundary. Access for the black cockatoo survey was a limitation. A number of properties were not granted access and so could not be assessed.
Experience	Not a limitation	The flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington and Ecologists Bridget Duncan and Grant Buller. Narelle has 20 years' experience conducting surveys of similar scope throughout Western Australia and is a specialist in the south west region. Grant and Bridget provided assistance in the field as well as data collation and reporting. Identification of flora collections was completed by Narelle Whittington and experienced taxonomist Frank Obbens at the WAH. Relevant WAH specialists were consulted for difficult specimens, and any specimens with novel characteristics were submitted to the WAH for formal identification. The black cockatoo assessment was undertaken by Lukas Geidans who has one year of experience conducting surveys of similar scope.
Timing, weather, season	Partial Limitation	The recommended primary survey period for the region as per the EPA Technical Guidance is Spring (September – November) in which this survey was undertaken. In the three months prior to the survey (June 2020 to August 2020), 322.1 mm of rainfall was recorded, which is 47.3 mm below the long-term average of 369.4 mm for the same time period (Bureau of Meteorology, 2020). In the three months prior to the second survey (July 2021 to September 2021), 386.4 mm of rainfall was recorded, which is 40.8 mm above the long-term average (Bureau of Meteorology, 2021). Conservation significant flora species identified by the likelihood of occurrence assessment with a high or medium likelihood of occurrence that are annual, ephemeral, or short-lived perennial species could occur within the Survey Area but have been indetectable at the time of the survey.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
		The timing of the survey was not a limitation for black cockatoo habitat assessment.
Life forms sampled	Partial limitation	The Survey Area was traversed by vehicle and on foot and representative sites were sampled in all remnant vegetation types where access allowed. All flora species encountered within the Survey Area were recorded. Of the 53 flora taxa collected, 7 (4.0 %) were unable to be identified to species level due to the absence of required identification features such as fruits and flowers. The black cockatoo assessment focussed on habitat assessments and opportunistic fauna records, therefore there were no constraints relating to fauna recorded associated with the survey.
Completeness	Moderate limitation	Several of the properties in the Survey Area could not be accessed and therefore could not be surveyed. The survey was considered complete for a detailed flora and vegetation survey for the properties that were accessed. Completeness of the black cockatoo survey was a minor limitation, given the restricted access to certain properties within the Survey Area.

5 Results

5.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix A.

5.2 Flora and Vegetation

5.2.1 Desktop Assessment

The desktop assessment identified 69 conservation significant species occurring within 65 km radius of the Survey Area (Figure 7, Appendix B). This included:

- Sixteen Threatened species
- Seven Priority 1 species
- Ten Priority 2 species
- Twenty-four Priority 3 species
- Twelve Priority 4 species.

The desktop assessment identified eight PECs and three TECs listed by the State occurring within 10 km of the Survey Area, six of these are listed as TECs under the EPBC Act (Department of Biodiversity Conservation and Attractions, 2020b); (Department of Agriculture Water and the Environment, 2020) (Figure 8):

- SCP20a – *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994)) (Endangered (DBCA), Endangered (EPBC)) – 1.6 km north and 8.9 km south of the Survey Area.
- SCP26a – *Melaleuca huegelii - Melaleuca systena* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994)) (Endangered (DBCA), Not listed (EPBC)) – 7.3 km northwest of the Survey Area.
- SCP30a – *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. (1994)) (Vulnerable (DBCA), Not listed (EPBC)) – 7.0 km southwest of the Survey Area.
- Banksia WL SCP – Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 (DBCA), Endangered (EPBC)) – overlapping the western portion of the Survey Area.
- SCP22 – *Banksia ilicifolia* woodlands (Priority 3 (DBCA), Endangered (EPBC)) – 4.3 km north of the Survey Area.
- SCP29a – Coastal shrublands on shallow sands (Priority 3 (DBCA), Not listed (EPBC)) – 7.5 km west of the Survey Area.
- SCP21c – Low lying Banksia attenuata woodlands or shrublands (Priority 3 (DBCA), Endangered (EPBC)) – 6.9 km northeast of the Survey Area.

- SCP24 – Northern Spearwood shrublands and woodlands (Priority 3 (DBCA), Not listed (EPBC)) – 3.3 km west of the Survey Area.
- SCP25 – Southern *Eucalyptus gomphocephala* - *Agonis flexuosa* woodlands (Priority 3 (DBCA), Not listed (EPBC)) – 2.5 km west of the Survey Area.
- SCP23b – Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands (Priority 3 (DBCA), Endangered (EPBC)) – 3.6 km east of the Survey Area and 6.9 km northeast of the Survey Area.
- Tuart woodlands – Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (Priority 3 (DBCA), Critically Endangered (EPBC)) – 0.3 km south and 2.5 km west of the Survey Area.

5.2.2 Likelihood of Occurrence

The conservation significant species identified in the desktop assessment were reviewed for their likelihood of occurrence within the Survey Area based on the criteria outlined in Table 8. This was done prior to the field work being undertaken and again following the completion of the field work. Prior to the field survey, of the 69 species identified in the desktop assessment, no species had previously been recorded within the Survey Area, three species were considered to have a high likelihood of occurrence, six species were considered to have a medium likelihood and 58 were considered to have a low likelihood of occurrence. Two species were non-vascular and therefore were not assessed.

The post field survey likelihood assessment considered the habitat types observed, vegetation condition and survey effort, which, resulted in one species considered to have a high likelihood of occurrence and the remaining considered to have a low likelihood of occurrence. Two species were not assessed. One species identified from the database searches were found within the Survey Area. The likelihood assessment is displayed in Appendix C.

5.2.3 Flora

The survey recorded a total of 174 taxa from 127 genera across 54 families. The most dominant families were Fabaceae (21 taxa), Myrtaceae (19 taxa) and Poaceae (14 taxa). The most dominant genera were *Acacia* (eight taxa) and *Eucalyptus* (six taxa). A full species inventory is detailed in Appendix D.

Seven taxa (4.0%) were unable to be identified confidently to species level. This was mainly due to the specimens being sterile with no flowering material or fruit present at the time of the survey.

All of these have been assigned a confirmed genus. Six of the seven species are not considered to be analogous to any conservation significant species identified by the database searches. However, *Caladenia* sp. had dead flowers and was unable to be identified, and therefore could represent a conservation significant *Caladenia* species.

5.2.4 Flora of Conservation Significance

The targeted flora survey focused on areas of suitable habitat for taxa with a medium or high likelihood of occurrence within the Survey Area (Appendix C).

No Threatened flora taxa pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey. One Threatened taxon, *Caladenia huegelii*, is still considered to have a medium likelihood of occurring within the Survey Area.

One Priority taxon as listed by DBCA, *Jacksonia sericea* (P4), was recorded within the Survey Area. The taxon was recorded in six flora sites (EWQ3, EWQ7, EWR1, EWR2, HESQ01 and HESR02) across the Survey Area as well as opportunistically.

5.2.5 Introduced Flora

A total of 46 introduced taxa were recorded within the Survey Area, representing 26.4% of the total taxa recorded (Table 10). Four species (**Asparagus asparagoides, *Echium plantagineum*, *Moraea flaccida,* and *Opuntia stricta*) are listed as Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2021). **Asparagus asparagoides* and **Opuntia stricta*, are also listed as WoNS (Department of Agriculture Water and the Environment, 2021b).

As the Survey Area consists of private properties in an urban setting, a portion of the vegetation in the Survey Area consisted of gardens and planted native species (Table 11). These species are not considered to be weed species, however, are not endemic to the Wanneroo area and are planted.

Table 10: Introduced Flora Species within the Survey Area

Species	Common Name	Status under BAM Act	WoNS
**Acacia iteaphylla*	Flinders Ranges Wattle	Permitted – s11	No
**Acacia longifolia*	Sallow Wattle	Permitted – s11	No
**Aira caryophyllea*	Silvery Hairgrass	Permitted – s11	No
**Arctotheca calendula*	Cape Weed	Permitted – s11	No
**Asparagus asparagoides*	Bridal Creeper	Declared Pest – s22(2)	Yes
**Avena barbata*	Bearded Oat	Permitted – s11	No
**Briza maxima*	Blowfly Grass	Permitted – s11	No
**Bromus diandrus*	Great Brome	Permitted – s11	No
**Carpobrotus edulis*	Hottentot Fig	Permitted – s11	No
**Cenchrus clandestinus*	Kikuyu Grass	Permitted – s11	No
**Cynodon dactylon*	Couch	Permitted – s11	No
**Disa bracteata*	N/A	Permitted – s11	No
**Echium plantagineum*	Paterson's Curse	Declared Pest – s22(2)	No
**Ehrharta calycina*	Perennial Veldt Grass	Permitted – s11	No

Species	Common Name	Status under BAM Act	WoNS
**Ehrharta longiflora*	Annual Veldt Grass	Permitted – s11	No
**Eragrostis curvula*	African Lovegrass	Permitted – s11	No
**Eucalyptus globulus* (Planted)	Tasmanian Blue Gum	Permitted – s11	No
**Euphorbia peplus*	Petty Spurge	Permitted – s11	No
**Euphorbia terracina*	Geraldton Carnation Weed	Permitted – s11	No
**Ficus carica* (Planted)	Common Fig	Permitted – s11	No
**Fumaria capreolata*	Whiteflower Fumitory	Permitted – s11	No
**Gladiolus caryophyllaceus*	Wild Gladiolus	Permitted – s11	No
**Hordeum leporinum*	Barley Grass	Permitted – s11	No
**Hypochaeris glabra*	Smooth Cats-ear	Permitted – s11	No
**Lagurus ovatus*	Hare's Tail Grass	Permitted – s11	No
**Leptospermum laevigatum*	Coast Teatree	Permitted – s11	No
**Lupinus cosentinii*	Sand Plain Lupin	Permitted – s11	No
**Lysimachia arvensis*	Pimpernel	Permitted – s11	No
**Melia azedarach* (Planted)	White Cedar	Permitted – s11	No
**Moraea flaccida*	One-leaf Cape Tulip	Declared Pest – s22(2)	No
**Morus alba* (Planted)	Common Mulberry	Permitted – s11	No
**Oenothera stricta*	Common Evening Primrose	Permitted – s11	No
**Olea europaea* (Planted)	Olive	Permitted – s11	No
**Opuntia stricta*	Common Prickly Pear	Declared Pest – s22(2)	Yes
**Ornithopus sativus*	French Serradella	Permitted – s11	No
**Orobanche minor*	Lesser Broomrape	Permitted – s11	No
**Oxalis pes-caprae*	Soursob	Permitted – s11	No
**Pelargonium capitatum*	Rose Pelargonium	Permitted – s11	No
**Pinus* sp. (Planted)	Pine	Permitted – s11	No
**Ricinus communis*	Castor Oil Plant	Permitted – s11	No
**Romulea rosea*	Guildford Grass	Permitted – s11	No
**Schinus terebinthifolia*	South American Pepper	Permitted – s11	No
**Silene gallica*	French Catchfly	Permitted – s11	No
**Sonchus oleraceus*	Common Sowthistle	Permitted – s11	No
**Ursinia anthemoides*	Ursinia	Permitted – s11	No
**Urtica urens*	Small Nettle	Permitted – s11	No

Table 11: Planted Flora Species within the Survey Area

Species	Common name
Agonis flexuosa	Peppermint
Banksia hookeriana	Hooker's Banksia
Callistemon sp.	Bottlebrush
Chamelaucium uncinatum	Geraldton Wax
Citrus limon	Lemon
Eucalyptus cinerea	Argyle Apple
Ficus macrophylla	Moreton-bay Fig
Liquidambar styraciflua	Sweet Gum

5.2.6 Vegetation Types

A total of 50 vegetation types were mapped within the Survey Area (Table 12, Figure 9). Detailed site sheets for each quadrat and relevé are provided in Appendix E. Of these 50 vegetation types, only 12 are considered to have any vegetation community structure. The remaining 38 vegetation types consisted of single plants or species at a location with no native associated species.

Table 12: Vegetation Types Occurring within the Survey Area

Vegetation Unit		Sites	Total Area (ha)
Code	Description		
Ac*Oe	Low isolated trees of *Allocasuarina fraseriana* and *Banksia attenuata* over tall open shrubland of *Adenanthos cygnorum, Jacksonia furcellata* and **Olea europaea* over low isolated clumps of sedges of *Gahnia trifida* and *Lyginia barbata*	EWR03	1.27
AfEm	Low open woodland of *Allocasuarina fraseriana, Eucalyptus marginata, Banksia attenuata* and *Banksia menziesii* over tall sparse shrubland of *Jacksonia sternbergiana* over mid open shrubland of *Xanthorrhoea preissii, Hibbertia hypericoides* and *Corynotheca micrantha*	EWQ07, HESQ01 HESR02	4.42
BaBm	Low woodland of *Banksia attenuata, Banksia menziesii* and *Melaleuca preissiana* over low isolated clumps of shrubs of *Philotheca spicata, Hypocalymma robustum* and *Eremaea pauciflora* over low isolated clumps of forbs of *Desmocladus flexuosus*, *Lepidosperma squamatum* and *Lyginia barbata*	EWQ02	1.01
BaEm	Low open woodland of *Banksia attenuata, Eucalyptus marginata, Banksia menziesii* and *Banksia ilicifolia* over tall isolated clumps of shrubs of *Jacksonia furcellata, Jacksonia sternbergiana* and *Macrozamia riedlei* over	EWQ06	0.46

Vegetation Unit		Sites	Total Area (ha)
Code	Description		
	low open shrubland of *Hibbertia hypericoides* over low forbland of **Ursinia anthemoides*		
BaBi	Low woodland of *Banksia attenuata, Banksia menziesii* and *Banksia ilicifolia* over low isolated clumps of *Acacia huegelii, Eremaea pauciflora* and *Hibbertia hypericoides* over mid closed grassland of **Ehrharta calycina*	HESR06	0.60
EmJs	Low open woodland *of Eucalyptus marginata* over tall open shrubland of *Jacksonia sternbergiana* over low isolated clumps of shrubs of *Hibbertia hypericoides* and *Corynotheca micrantha* over tall open grassland of **Ehrharta calycina*	EWQ01 EWQ03 EWQ04 EWQ05 EWR02	5.26
ErAs	Mid open forest of *Eucalyptus rudis* over mid isolated clumps of shrubs *of Hibbertia cuneiformis* and *Astartea scoparia* over low open grassland of **Ehrharta longiflora, *Hordeum leporinum* and **Bromus diandrus*	EWR05	0.89
ErMp	Mid isolated clumps of trees of *Eucalyptus rudis* and *Melaleuca preissiana* over Mid isolated clumps of shrubs of *Jacksonia furcellata* and *Macrozamia riedlei* over low sparse forbland of **Ursinia anthemoides, *Carpobrotus edulis* and **Hypochaeris glabra*	EWR04	0.33
KgJs	Low open woodland of *Banksia attenuata* over tall shrubland of *Kunzea glabrescens, Jacksonia sternbergiana* and *Adenanthos cygnorum* over low open sedgeland of *Gahnia trifida, Mesomelaena pseudostygia* and *Dianella revoluta*	EWR01	0.47
AcJf	Tall, isolated clumps of shrubs of *Adenanthos cygnorum* and *Jacksonia furcellata* over low isolated clumps of *Scholtzia involucrata* and *Corynotheca micrantha* over mid grassland of **Ehrharta calycina*	MN	2.19
Afl	*Agonis flexuosa*	MN	0.01
Af	*Allocasuarina fraseriana*	MN	0.23
*Al	*Acacia longifolia*	MN	0.01
Ar	*Acacia rostellifera*	MN	0.02
As	*Acacia saligna*	MN	0.02
AsMac	*Acacia saligna* and *Macrozamia riedlei*	MN	0.03
Ba	*Banksia attenuata*	MN	0.15
BaJf	*Banksia attenuata* and *Jacksonia furcellata*	MN	0.22
Bh	*Banksia hookeriana*	MN	0.64

Vegetation Unit		Sites	Total Area (ha)
Code	Description		
Bi	*Banksia ilicifolia*	MN	0.01
Bg	*Banksia grandis*	MN	0.001
Bm	*Banksia menziesii*	MN	0.05
Cc	*Corymbia calophylla*	MN	0.51
CcAs	Mid open forest of *Corymbia calophylla* over tall isolated shrubs of *Jacksonia sternbergiana, Hibbertia cuneiformis* and *Macrozamia riedlei* over low grassland of **Cenchrus clandestinus, *Ehrharta calycina* and **Eragrostis curvula*	MN	0.72
CcEmAfBspp	Isolated trees of *Corymbia calophylla*, *Eucalyptus marginata*, *Allocasuarina fraseriana*, and *Banksia* species.	MN	0.52
*Ec	**Ehrharta calycina*	MN	0.40
Eg	*Eucalyptus gomphocephala*	MN	2.12
*Egl	**Eucalyptus globulus* and *Eucalyptus cinerea*	MN	1.52
Em	*Eucalyptus marginata*	MN	3.19
EmBi	Isolated trees of *Eucalyptus marginata, Banksia ilicifolia, Banksia attenuata* and *Allocasuarina fraseriana* with *Macrozamia riedlei* and *Jacksonia sternbergiana* over lawn	MN	0.17
EmCc	Isolated trees of *Eucalyptus marginata* and *Corymbia calophylla*	MN	0.25
Er	*Eucalyptus rudis*	MN	1.21
ErBa	*Eucalyptus rudis* and *Banksia attenuata*	MN	0.09
Et	*Eucalyptus todtiana*	MN	0.18
EtBm	Isolated trees of *Eucalyptus todtiana, Banksia menziesii and Banksia ilicifolia*	MN	0.04
G	Garden	MN	12.19
Jf	*Jacksonia furcellata* over weeds	MN	2.07
JfCu	*Jacksonia furcellata* and *Chamelaucium uncinatum*	MN	0.15
Js	Stand of *Jacksonia sternbergiana*	MN	0.08
JsBi	Tall shrubland of Jacksonia sternbergiana with scattered Banksia ilicifolia	MN	0.57

Vegetation Unit		Sites	Total Area (ha)
Code	Description		
JsJfNe	Mid Woodland of Non-endemic trees over tall open shrubland of *Jacksonia sternbergiana* and *Jacksonia furcellata*	MN	0.58
Kg	Stand of *Kunzea glabrescens*	MN	0.19
*Ll	*Leptospermum laevigatum*	MN	0.21
*Ma	**Morus alba*	MN	0.01
Mac	Individual *Macrozamia riedlei*	MN	0.04
MacJf	Scattered *Macrozamia riedlei* and *Jacksonia furcellata*	MN	0.42
Mp	*Melaleuca preissiana*	MN	0.08
Ne	Non-endemic trees	MN	10.08
*Oe	**Olea europaea*	MN	0.20
*P	**Pinus* sp.	MN	0.44

MN: Mapping note

5.2.7 Vegetation Condition

Vegetation condition within the Survey Area ranged from Very Good to Completely Degraded. Given that the Survey Area is developed, including market gardens, the majority of the Survey Area was in a Completely Degraded condition. The urban setting means that the majority of the native vegetation has been cleared for the purposes of housing, market gardens, domestic gardens and infrastructure. This implies that the remaining remnant vegetation is subject to ongoing degradation from disturbances such as litter, illegal dumping, weeds, repeated fires, heavy grazing, and trampling by livestock. Vegetation condition within the Survey Area is summarised in Table 13 and illustrated in Figure 10.

Table 13: Vegetation Condition within the Survey Area

Vegetation Condition	Extent within the Survey Area (ha)*
Very Good	1.52
Good	1.15
Good to Degraded	2.82
Degraded	10.55
Degraded to Completely Degraded	1.50
Completely Degraded	124.15

*Rounded to the nearest decimal place.

5.2.8 Floristic Community Types Analysis

The FCT analysis (nearest neighbour method) of the quadrat data identified 10 SCP floristic community types, that were statistically similar to the vegetation recorded during the surveys. The following similarities in vegetation types were determined:

- FCT SCP 4 – *Melaleuca preissiana* damplands
- FCT SCP S07 – Northern woodlands to forests over tall sedgelands alongside permanent wetlands
- FCT SCP 14 – Deeper wetlands on sandy soils
- FCT SCP S17 – *Eucalyptus rudis*/*Agonis linearifolia* wetlands in Bassendean Dunes
- FCT SCP 21a – Central *Banksia attenuata* and *Eucalyptus marginata* woodlands
- FCT SCP 23a – Central *Banksia attenuata* – *Banksia menziesii* woodlands
- FCT SCP 24 – Northern Spearwood shrublands and woodlands
- FCT SCP 25 – Southern *Eucalyptus gomphocephala* – *Agonis flexuosa* woodlands
- FCT SCP 28 – Spearwood *Banksia attenuata* or *Banksia attenuata- Eucalyptus* woodlands
- FCT SCP 30a2 – *Callitris preissii* and/or *Melaleuca lanceolata* forests and woodlands.

The FCT analysis using quadrat data is presented in Table 14, where the validation included the statistical results and other key information like the presence of indicator species, soil types and landform position. Table 15 illustrates the FCT analysis using relevé data as supporting evidence. Using relevé data isn't typically used in the FCT statistical analyses; however it was considered valuable on this occasion due to the mosaic structure of the Survey Area.

Table 14: Floristic Community Type Analysis of Quadrats

Quadrat	Nearest Neighbour Analysis			Notes	FCT Comparison
	Similarity %	Site	FCT		
EWQ01 (EmJs)	45.87	Light02	23a	Even though the quadrat was found to be more similar to 23a which has a dominant canopy of *Banksia*, the quadrat had no *Banksia* present and was dominated by *Eucalyptus marginata*	28 - Spearwood *Banksia attenuata* or *Banksia attenuata- Eucalyptus* woodlands
	45.71	hurst03	23a		
	44.89	Jand07	23a		
EWQ02 (BaBm)	45.54	WIRR-2	23a	21a was considered more likely given the dominance of *Eucalyptus marginata* and the occurrence of 21a in nearby bushland	*21a – Central Banksia attenuata and Eucalyptus marginata woodlands*
	45.33	TAM-1	21a		
	44.73	THOM-2	24		

Quadrat	Nearest Neighbour Analysis			Notes	FCT Comparison
	Similarity %	Site	FCT		
EWQ03 (EmJs)	39.08	TRIG-3	28	In the field these quadrats were grouped as being the same vegetation type. The different FCT results are most likely due to the few different understorey species within each of the quadrats. Given the dominance of *Eucalyptus marginata* and the occurrence of 28 in nearby bushland, allocating this FCT was deemed appropriate	28 - Spearwood *Banksia attenuata* or *Banksia attenuata- Eucalyptus* woodlands
	38.35	KING-2	28		
	35.95	gnan03	23a		
EWQ04 (EmJs)	33.33	TRIG-3	28		
	32.72	bold13	24		
	31.25	NEER-11	24		
EWQ05 (EmJs)	38.23	NEER-11	24		
	37.50	Bold16	25		
	35.29	WARI-2	28		
EWQ06 (BaEm)	49.41	SHENT-1	28		
	47.61	TRIG-3	28		
	47.19	YAN-3	28		
EWQ07 (AfEm)	48.88	KING-2	28		
	45.71	Yela01	28		
	44.18	THOM-2	24		

Table 15: Floristic Community Type Analysis of Relevés

Relevés	Nearest Neighbour Analysis			Notes	FCT Comparison
	Similarity %	Site	FCT		
EWR01 (KgJs)	32.55	TRIG - 3	28	In the field these quadrats were grouped as being the same vegetation type. The different FCT results are most likely due to the few different understorey species within each of the quadrats. Given the dominance of *Eucalyptus marginata* and the occurrence of 28 in nearby bushland, allocating this FCT was deemed appropriate	28 - Spearwood *Banksia attenuata* or *Banksia attenuata- Eucalyptus* woodlands
	32.25	TRIG - 4	28		
	31.57	BOLD -2	24		
EWR02 (EmJs)	45.33	THOM -2	24		
	43.03	KING -2	28		
	40.54	TAM -1	21a		
EWR03 (Ac*Oe)	42.5	KING -2	28		
	39.53	Perth08	23a		
	39.08	WAND -1	23a		

Relevés	Nearest Neighbour Analysis			Notes	FCT Comparison
	Similarity %	Site	FCT		
EWR04 (ErMp)	29.26	Yuri05	S17	Being within Bassendean unit and only having a few native species to base an FCT on, S17 appeared to be the most appropriate	S17 – *Eucalyptus rudis/Agonis linearifolia* wetlands in Bassendean Dunes
	28.57	Yan -21	14		
	28.57	ELE07	4		
EWR05 (ErAs)	27.27	WOODP -1	30a2	With limited native species to base the FCT on the analysis was based on location and near by occurrences	S07 – Northern woodlands to forests over tall sedgelands alongside permanent wetlands
	20.68	Bold06	30a2		
	20.68	TAM -1	S07		

5.2.9 Threatened and Priority Ecological Communities

FCT SCP S17 – *Eucalyptus rudis/Agonis linearifolia* wetlands in Bassendean Dunes and S07 – Northern woodlands to forests over tall sedgelands alongside permanent wetlands are not listed as conservation significant by the State or under the EPBC Act.

Two of the FCTs identified as occurring in the Survey Area from the statistical analysis, FCT SCP 28 - Spearwood *Banksia attenuata* or *Banksia attenuata- Eucalyptus* woodlands and FCT SCP 21a – Central *Banksia attenuata* and *Eucalyptus marginata* woodlands are not listed as TECs by the State, however, are listed as sub-communities under the EPBC Act listed TEC, *Banksia woodlands of the Swan Coastal Plain*, therefore, have the potential to be listed and protected under the EPBC Act (Department of the Environment and Energy, 2019).

Banksia woodlands of the Swan Coastal Plain are also listed as a Priority 3 ecological by the State.

It should also be noted that *Eucalyptus gomphocephala* (Tuart) was recorded within the Survey Area. The species itself is not listed under the EPBC Act, however, it can potentially be considered, in association with (form part of) Tuart (*Eucalyptus gomphocephala*) Woodlands and forests of the Swan Coastal Plain ecological community which is listed under the EPBC Act. Tuart (*Eucalyptus gomphocephala*) Woodlands and forests of the Swan Coastal Plain ecological community is listed as Priority 3 by the State.

5.2.10 Regional Representation

Vegetation mapping units described in the Survey Area were correlated with the Beard (1976) and Shepherd et al. (2002) broad vegetation types by examining similarities in vegetation descriptions (Table 16). Differences exist with the terminology used in the descriptions as they

are based on different methods of categorising and characterising vegetation types, and the different spatial scale of the analysis (i.e. region vs. local scale).

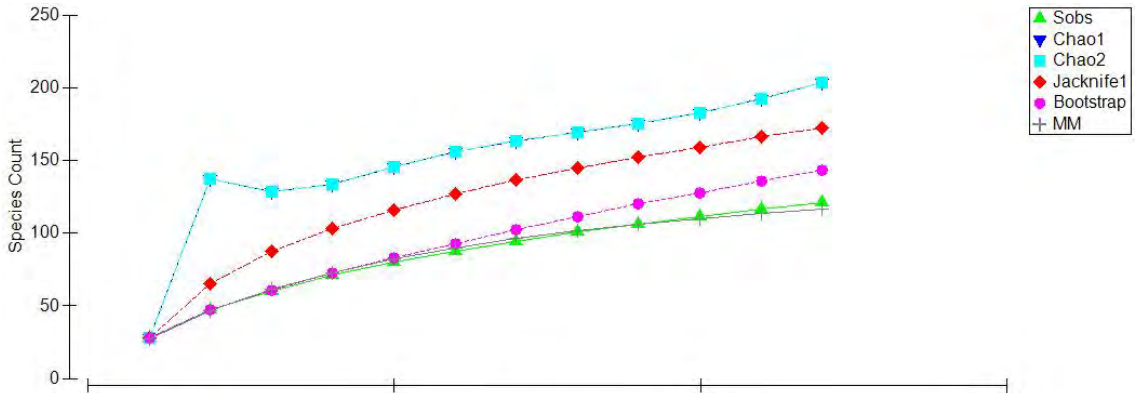
Table 16: Representation of Broad Vegetation Types and Corresponding Vegetation Associations

Vegetation Type and Description	Corresponding Vegetation Association	Vegetation Type Extent in Survey Area (ha)
Spearwood 6	AfEm BaBm BaEm EmJs KgJs	9.08
Spearwood 126	ErAs	0.89
Bassendean 37	-	
Bassendean 949	ErMp BaBi	0.33

5.2.11 Survey Adequacy

Eight quadrats and 11 relevés were sampled across the Survey Area. Due to the fragmentation, level of disturbance and size of the vegetation remnants, this was considered adequate.

The species accumulation curve for the Survey Area produced a smooth Sobs curve steadily increasing however didn't reach asymptote (Graph 3).



Graph 3: Species Accumulation Curve

Estimated species richness for the Survey Area ranged from 117 to 204, with an observed value of 121 taxa. Richness estimators indicated that the survey was approximately 59% (Chao 1, Chao 2) to 103% (Michaelis-Menton) adequate in recording the full complement of vascular flora taxa within the Survey Area (Table 17). The data used to produce the species accumulation curve was

conservative because opportunistic species (which are not associated with a quadrat) were not included.

Table 17: Species Richness Indicators

Treatment	Expected Species Richness	Percentage Adequate
Chao 1	204	59%
Chao 2	204	59%
Jacknife 1	172	70%
Bootstrap	143	85%
Michaelis-Menton	117	103%
Sobs	121	100%

5.3 Black Cockatoos

5.3.1 Desktop Assessment

The Survey Area occurs within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo (Department of Sustainability Environment Water Population and Communities, 2012; Department of the Environment and Energy, 2017).

The DBCA black cockatoo database search identified 11 confirmed breeding sites within eight km of the Survey Area, all at the Edith Cowan University (ECU) Joondalup campus. The database search also identified 32 roosting sites within eight km of the Survey Area, one of which occurs within the Survey Area. Figure 11 shows the results of the DBCA black cockatoo database search.

5.3.2 Breeding Habitat

A total of 494 potential breeding trees with a DBH of greater than 500 mm were recorded within the Survey Area (Figure 12; Appendix F), comprising:

- 171 Jarrah (*Eucalyptus marginata*)
- 22 Marri (*Corymbia calophylla*)
- 70 Tuart (*Eucalyptus gomphocephala*)
- 24 Flooded Gum (*Eucalyptus rudis*)
- Six Coastal Blackbutt (*Eucalyptus todtiana*)
- 45 dead trees (stags)
- 156 introduced eucalypts.

A total of 70 trees were found to contain hollows that are potentially suitable for black cockatoo breeding (including one tree with a DBH of less than 500 mm), of which 12 trees are currently

occupied by bees. A further seventeen trees contain hollows that were unsuitable for black cockatoo breeding.

No evidence of black cockatoo breeding, including chew marks around hollow entrances, was observed.

5.3.3 Foraging Habitat

A total of 36.83 ha of black cockatoo foraging habitat was recorded within the Survey Area (Figure 13). The results of the Foraging Habitat Scoring Tool are summarised below in Table 18 and the full results are shown in Appendix G.

Table 18: Foraging Habitat Summary

Foraging Habitat	Area (ha)
Very high quality	20.03
High quality	15.57
Medium quality	0.69
Low quality	0.53

Evidence of Carnaby's Black Cockatoo foraging was recorded at one location within the Survey Area in the form of chewed Marri nuts. Carnaby's Black Cockatoos were also sighted at six locations within Survey Area. These sightings were widespread within the Survey Area and often occurred near foraging habitat, suggesting that foraging is likely to be widespread within the Survey Area (Figure 13; Appendix H).

5.3.4 Roosting Habitat

A total of 12.47 ha of potential roosting habitat was recorded within the Survey Area, comprising vegetation types that contain tall trees suitable for roosting (Table 19).

As stated in Section 4.3.1, the desktop assessment identified a recorded roosting site within the Survey Area. The location of the recorded roosting site was inspected during the field survey, however there were no suitable roosting trees present at the location.

Table 19: Vegetation Types Considered to be Black Cockatoo Roosting Habitat

Vegetation Unit		Total Area (ha)
Code	Description	
Ne	Non-endemic trees	10.09
Em	*Eucalyptus marginata*	3.19
Eg	*Eucalyptus gomphocephala*	2.12
*Egl	**Eucalyptus globulus* and *Eucalyptus cinerea*	1.52

Vegetation Unit		Total Area (ha)
Code	**Description**	
ErAs	Mid open forest of *Eucalyptus rudis* over mid isolated clumps of shrubs *of Hibbertia cuneiformis* and *Astartea scoparia* over low open grassland of **Ehrharta longiflora, *Hordeum leporinum* and **Bromus diandrus*	0.89
CcAs	Mid open forest of *Corymbia calophylla* over tall isolated shrubs of *Jacksonia sternbergiana, Hibbertia cuneiformis* and *Macrozamia riedlei* over low grassland of **Cenchrus clandestinus, *Ehrharta calycina* and **Eragrostis curvula*	0.72
Er	*Eucalyptus rudis*	1.23
CcEmAfBspp.	Isolated trees of Corymbia calophylla, Eucalyptus marginata, Allocasuarina fraseriana, and Banksia species.	0.52
Cc	*Corymbia calophylla*	0.51
*P	**Pinus* sp.	0.89
ErMp	Mid isolated clumps of trees of *Eucalyptus rudis* and *Melaleuca preissiana* over Mid isolated clumps of shrubs of *Jacksonia furcellata* and *Macrozamia riedlei* over low sparse forbland of **Ursinia anthemoides, *Carpobrotus edulis* and **Hypochaeris glabra*	0.33
EmCc	Isolated trees of *Eucalyptus marginata* and *Corymbia calophylla*	0.29
EmBi	Isolated trees of *Eucalyptus marginata, Banksia ilicifolia, Banksia attenuata* and *Allocasuarina fraseriana* with *Macrozamia riedlei* and *Jacksonia sternbergiana* over lawn	0.18
ErBa	*Eucalyptus rudis* and *Banksia attenuata*	0.09
Total		**12.47**

6 Discussion

6.1 Flora and Vegetation

6.1.1 Survey Adequacy

The flora and vegetation survey effort was in accordance with the scope of works, EPA technical guidelines (2016) and deemed appropriate for a detailed flora and vegetation survey on the Swan Coastal Plain. Eight quadrats and 11 relevés were sampled within the Survey Area. Due to the fragmentation, level of disturbance and size of the vegetation remnants, this was considered adequate. The inventory of vascular flora, and records of conservation significant flora and weed species was compiled using site data and opportunistic observations made while traversing between sites and during systematic targeted searching.

When a species accumulation curve approaches an asymptote, it indicates sampling effort has been sufficient to adequately collect the species comprising the floral assemblage at the locations sampled. The value at which the curve asymptotes can also be used as an approximate measure of the total size of the species complement at that location. The species accumulation curve and the richness estimators approached asymptote but did not plateau, indicating additional survey could record additional vascular flora taxa.

6.1.2 Flora

The suite of flora taxa recorded during the survey is considered below average for the subregion for the timing of the survey undertaken (spring). This can be attributed to the degraded condition of the Survey Area, weed infestations, historical and current land use. Approximately 275.5 ha of the Survey Area was not accessed and extrapolating from the fence line and aerial photography was undertaken where possible.

6.1.3 Flora of Conservation Significance

Conservation significant flora species identified in the desktop assessment with a medium and high likelihood of occurrence were targeted during the survey.

The database searches identified 16 Threatened species as having potential to occur in the Survey Area. No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened pursuant to the BC Act were recorded during the survey. One Threatened species, *Caladenia huegelii*, is still considered to have a medium likelihood of occurring within the Survey Area. This is attributed to it being an annual (orchid) species, which may not emerge every year and the survey was not undertaken during early September when its more likely to be present.

The database searches identified 53 Priority flora species as potentially occurring in the vicinity of the Survey Area, of these, one species was found during the field survey in *Jacksonia sericea*.

***Jacksonia sericea* (P4)** is a low spreading shrub, to 0.6 m high. The species has orange flowers, usually December or January to February. It favours calcareous and sandy soils. The WAH has 58

specimens lodged, with records spanning between Wanneroo and Rockingham on the Swan Coastal Plain (Western Australian Herbarium, 2020).

During the survey, *J. sericea* was recorded at six flora sites and during targeted flora searches with a total of 13 plants recorded.

Plate 1: *Jacksonia sericea* (P4) – (Source: 360 Environmental, 2020)

6.1.4 Introduced Flora

Forty-six introduced species were recorded within the Survey Area. Four of these are listed as Declared Pests under the BAM Act, with two of these also listed as WoNS.

**Moraea flaccida* (One-leaf Cape Tulip) is listed as a Declared Pest. A total of 43 individuals were recorded during the survey at three locations. The species is a cormous, perennial herb that can grow to 75 cm high. It has yellow and orange/yellow flowers between September and November. The species can be found in numerous habitats including white sand, grey sandy loam over limestone, laterite clay and gravel. It has been known to inhabit seasonally wet sites, creeklines, hilltops, pasture and disturbed land.

Plate 2: **Moraea flaccida* – (Source: 360 Environmental, 2020 and Department of Primary Industries and Regional Development, 2020)

**Asparagus asparagoides* (Bridal Creeper) is listed as a Declared Pest and a WoNS. A total of three individuals were recorded at two locations. Bridal creeper is a rhizomatous and tuberous perennial climber which can grow between 1 to 5 m high. The species has white flowers between August and September and can grow in sand, loam, clay and granite.

Plate 3: **Asparagus asparagoides* – (Source: 360 Environmental, 2020)

**Opuntia stricta* (Common Prickly Pear) is listed as a Declared Pest and a WoNS, 29 individuals were found at four locations. Is a spreading to erect shrub/cactus that can grow to 2 m high. It has yellow flowers and generally favours sandy soils.

Plate 4: **Opuntia stricta* – (Source: 360 Environmental, 2020)

**Echium plantagineum* (Paterson's Curse) is listed as a Declared Pest. A total of 3 individuals were recorded during the survey at a single location. The species is an erect annual or biennial, herb that grows between 0.1-0.6(-1) m high. It has blue/blue-purple/pink/white flowers in mainly September to December or January. The species is a widespread weed in warm temperate regions, found mostly in areas dominated by winter rainfall. It is adapted to a wide range of soils.

Plate 5: **Echium plantagineum* – (Source: 360 Environmental, 2021)

The areas encompassing these species must be managed in such a way that alleviates the impact, reduces the number or distribution, or prevents or contains the spread of the Declared Pest in this area. Any person conducting an activity on the land should be made aware that measures are required to be taken to control the Declared Pest.

6.1.5 Vegetation

Fifty vegetation types were described and mapped within the Survey Area:

Vegetation types EmJs, BaEm, AfEm, KgJs, Ac*0e and BaBi which are represented by sites EWR01, EWR02, EWR03, EWQ01, EWQ03, EWQ04, EWQ05, EWQ06, EWQ07, HESQ01, HESR02 and HESR06 have been determined to have affiliation with FCT SCP 28 – Spearwood *Banksia attenuata* or *Banksia attenuata - Eucalyptus woodlands*. Vegetation type BaBm, which, is represented by site EWQ02, has been determined to have affiliation with FCT SCP 21a – *Central Banksia attenuata* and *Eucalyptus marginata* woodlands. As stated in section 4.2.9 both these FCTs have been identified as being a sub-community of the Commonwealth Banksia Woodlands of the Swan Coastal Plain TEC.

For vegetation to be considered as the Endangered TEC under the EPBC Act and warrant full national protection, the community has to meet key diagnostic characteristics. Regarding the presence of the TEC, the approved conservation advice for the thresholds state that for vegetation in Excellent condition, the minimum patch size should be 0.5 ha, while vegetation in Very Good condition should be a minimum of one hectare, and vegetation in Good condition should be a minimum of two hectares. If a vegetation patch is considered Degraded or worse, it is not considered favourable for national protection. The TEC generally has a dominant Banksia component, which includes at least one of four key species, *Banksia attenuata, B. menziesii*, *B. prionotes* and/or *B. ilicifolia*.

Based on this information, and the survey results, the vegetation which was found to be analogous with FCT SCP 21a and SCP 28 do not meet the criteria for protection. This is based on

the size of each remnant and their condition. One patch, which was of suitable size and condition was the vegetation type EWQ01, as it was approximately 1.12 ha and assessed as being in Very Good condition. The quadrat, however, did not contain any *Banksia* tree species and they only occurred sporadically, which does not meet the 5% minimum *Banksia* canopy that is required for it to be considered for protection.

Under the State legislation, FCT SCP 21a and SCP 28 are not listed as conservation significant and based on the above information would also not be considered to form part of the Priority 3 Ecological Community Banksia dominated woodlands of the Swan Coastal Plain IBRA region.

The Threatened Species Scientific Committee provided an advice report in 2018 which recommended that "Tuart woodlands and forests of the Swan Coastal plain be listed as Critically Endangered under the EPBC Act". On 4 July 2019 the Minister accepted the committee's advice and adopted the document as the approved conservation advice and amended the list of TECs under section 184 of the EPBC Act to include the Tuart (*Eucalyptus gomphocephala*) woodlands and forest of the Swan Coastal Plain ecological community in the Critically Endangered category.

The conservation advice provides information to help identify areas of the ecological community that are considered a MNES. This includes assessing the vegetation within the Survey Area against diagnostic characteristics such as location, soils, canopy species, vegetation structure and understorey composition. Based on the scattered distribution of the tuarts in the Survey Area (often isolated single trees) and the condition of the vegetation they occur in (in some cases they are amongst gardens and grass), none of the Tuarts within the Survey Area are considered part of the TEC Tuart (*Eucalyptus gomphocephala*) woodlands and forest of the Swan Coastal Plain.

6.1.6 Regional Representation

The EPA recognises vegetation complexes as having <10-30% remaining may be considered regionally significant.

The Spearwood 6 complex has 23.72% remaining within the Swan Coastal Plain Bioregion, Spearwood 126 complex has 23.61% remaining and Bassendean 949 has 57.28% remaining which is above the retention rate set by both the EPA (Environmental Protection Authority, 2006) and the Commonwealth of Australia (Department of the Environment and Heritage, 2001) for protecting Australia's biological diversity.

6.2 Black Cockatoos

The Survey Area was found to contain 492 trees that meet the criteria for potential black cockatoo breeding habitat, and approximately 14% of these trees bear hollows that are currently suitable for black cockatoo breeding. The field survey was undertaken within the recommended period, during breeding season for the Carnaby's Black Cockatoos (Forest Red-tailed Black Cockatoos can breed at any time of year and the survey was outside the distribution of Baudin's Black Cockatoo) (Department of Sustainability Environment Water Population and Communities, 2012; Department of the Environment and Energy, 2017). The lack of observed

black cockatoo breeding and roosting evidence does not rule out the possibility of breeding within the Survey Area, as dawn and dusk surveys for breeding and roosting activity were beyond the scope of this assessment.

The foraging habitat that occurs within the Survey Area consists primarily of Marri, Tuart, Jarrah, *Banksia* spp. and *Allocasuarina* spp. While much of the foraging habitat is very high quality, it is sparse and patchy.

The desktop assessment identified a previously recorded black cockatoo roosting site within the Survey Area, however the location of the recorded roosting site was inspected during the field survey and no suitable roosting trees were present at the location. The record is therefore either subject to positional error or has since been cleared and is no longer present.

7 Conclusion

Flora and Vegetation

In summary, the following conclusions on the existing flora and vegetation are made:

- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.
- One DBCA listed Priority flora was recorded; *Jacksonia sericea* (P4). The presence of these species is unlikely to form a statutory constraint for the Survey Area and is dealt with by DWER and DBCA on a case by case basis.
- Forty-two introduced species were recorded during the survey. Three species (**Asparagus asparagoides, *Moraea flaccida,* and *Opuntia stricta*) are listed as Declared Pests under the BAM Act. Two of these, **Asparagus asparagoides* and **Opuntia stricta*, are listed as WoNS.
- Thirty-eight vegetation types were mapped within the Survey Area.
- Vegetation condition within the Survey Area ranged from Very Good to Completely Degraded.
- FCT SCP 21a and 28 have been identified as being a sub-community of the Commonwealth *Banksia* Woodlands of the Swan Coastal Plain TEC, however, the vegetation representing these FCTs do not meet the criteria for protection, based on the size of each remnant and their condition.

Black Cockatoo

- The Survey Area occurs within the modelled breeding distributions of the Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo and outside the modelled distribution of the Baudin's Black Cockatoo
- A total of 494 potential breeding trees with a DBH of greater than 500 mm were recorded, and 70 trees contain hollows that are potentially suitable for black cockatoo breeding
- No evidence of black cockatoo breeding such as chew marks around hollow entrances was observed
- A total of 36.83 ha of black cockatoo foraging habitat was recorded, of which 20.03 ha was very high quality, 15.57 ha was high quality, 0.69 ha was medium quality and 0.53 ha was low quality
- Carnaby's Black Cockatoos were observed at six locations within the Survey Area and evidence of foraging in the form of chewed Marri nuts was recorded within the Survey Area.

8 Report Disclaimer

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data and analyses ("client's information") provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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Figures

Legend

- Indicative Survey Area Boundary
- Cadastral Lines
- Not Assessed

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 2021
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2021 (© Western Australian Land Information Authority 2021)

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LOCALITY MAP

PROJECT ID	DATE
4660	07/12/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

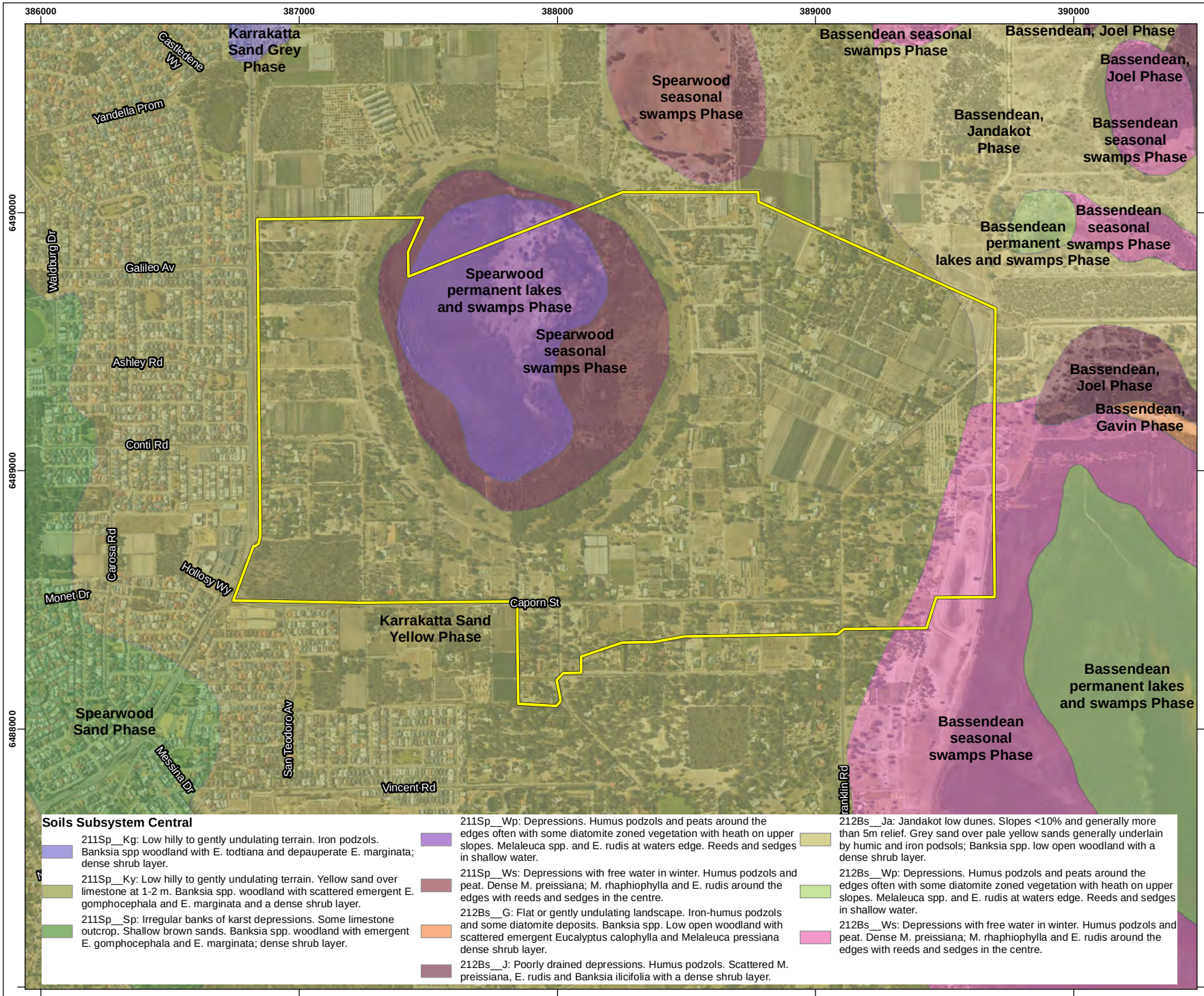
CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	0

Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 1
Survey Area Location

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F01 Survey Area Location.mxd



Soils Subsystem Central

211Sp__Kg: Low hilly to gently undulating terrain. Iron podzols. Banksia spp woodland with E. todtiana and depauperate E. marginata; dense shrub layer.

211Sp__Ky: Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. Banksia spp. woodland with scattered emergent E. gomphocephala and E. marginata and a dense shrub layer.

211Sp__Sp: Irregular banks of karst depressions. Some limestone outcrop. Shallow brown sands. Banksia spp. woodland with emergent E. gomphocephala and E. marginata; dense shrub layer.

211Sp__Wp: Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. Melaleuca spp. and E. rudis at waters edge. Reeds and sedges in shallow water.

211Sp__Ws: Depressions with free water in winter. Humus podzols and peat. Dense M. preissiana; M. rhaphiophylla and E. rudis around the edges with reeds and sedges in the centre.

212Bs__G: Flat or gently undulating landscape. Iron-humus podzols and some diatomite deposits. Banksia spp. Low open woodland with scattered emergent Eucalyptus calophylla and Melaleuca pressiana dense shrub layer.

212Bs__J: Poorly drained depressions. Humus podzols. Scattered M. preissiana, E. rudis and Banksia ilicifolia with a dense shrub layer.

212Bs__Ja: Jandakot low dunes. Slopes <10% and generally more than 5m relief. Grey sand over pale yellow sands generally underlain by humic and iron podsols; Banksia spp. low open woodland with a dense shrub layer.

212Bs__Wp: Depressions. Humus podzols and peats around the edges often with some diatomite zoned vegetation with heath on upper slopes. Melaleuca spp. and E. rudis at waters edge. Reeds and sedges in shallow water.

212Bs__Ws: Depressions with free water in winter. Humus podzols and peat. Dense M. preissiana; M. rhaphiophylla and E. rudis around the edges with reeds and sedges in the centre.

Legend

Indicative Survey Area

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
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LOCALITY MAP

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HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

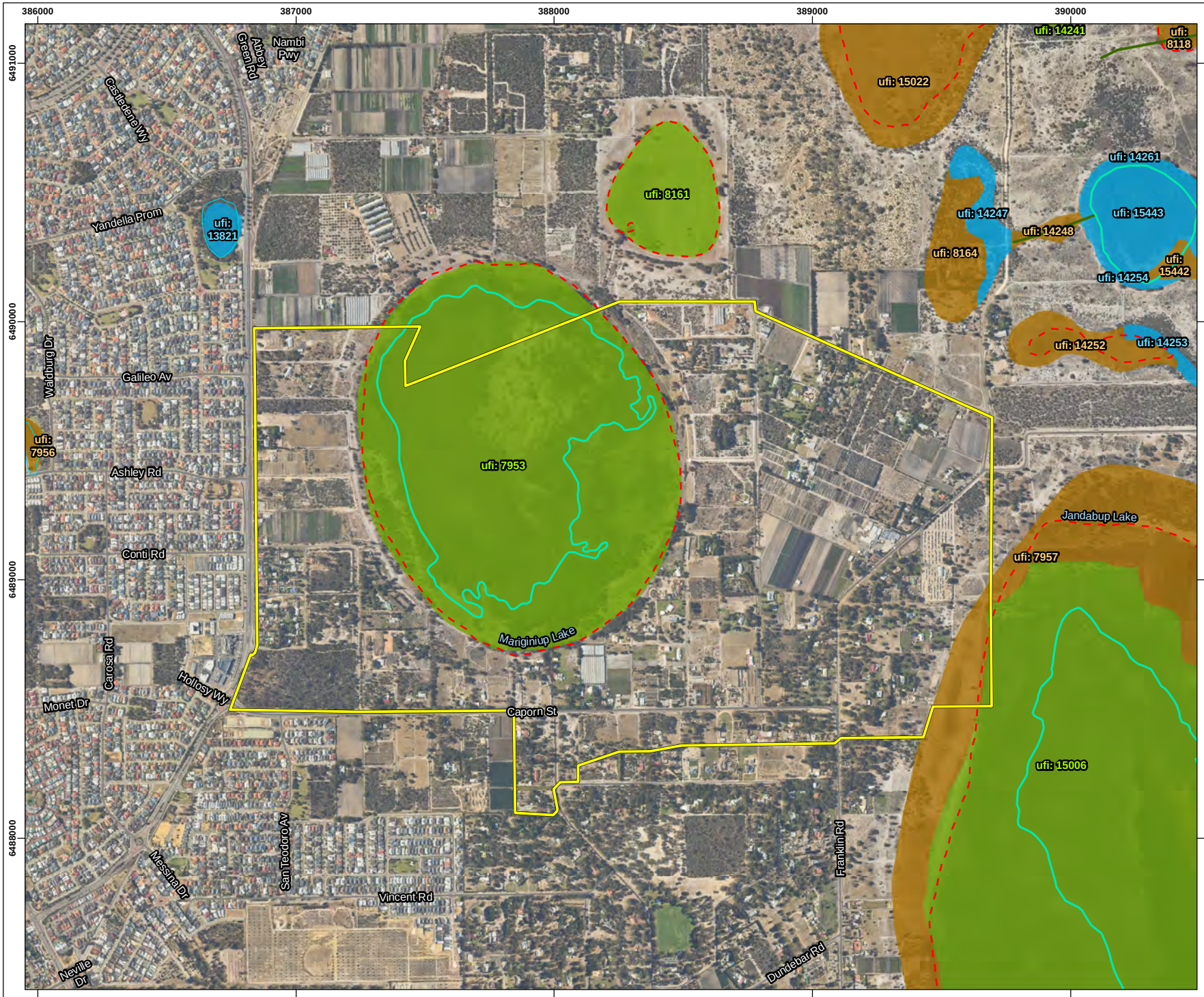
CREATED	CHECKED	APPROVED	REVISION
CL	NW	NW	0

Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 2
Soil Landscapes and Systems

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F02 Soil Landscapes and Systems.mxd



Legend

Hydrography

- Drain - major
- Lake
- Swamp
- Area Subject to Inundation

Geomorphic Wetlands

- Conservation Category
- Resource Enhancement Category
- Multiple Use Category

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 2021
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2021
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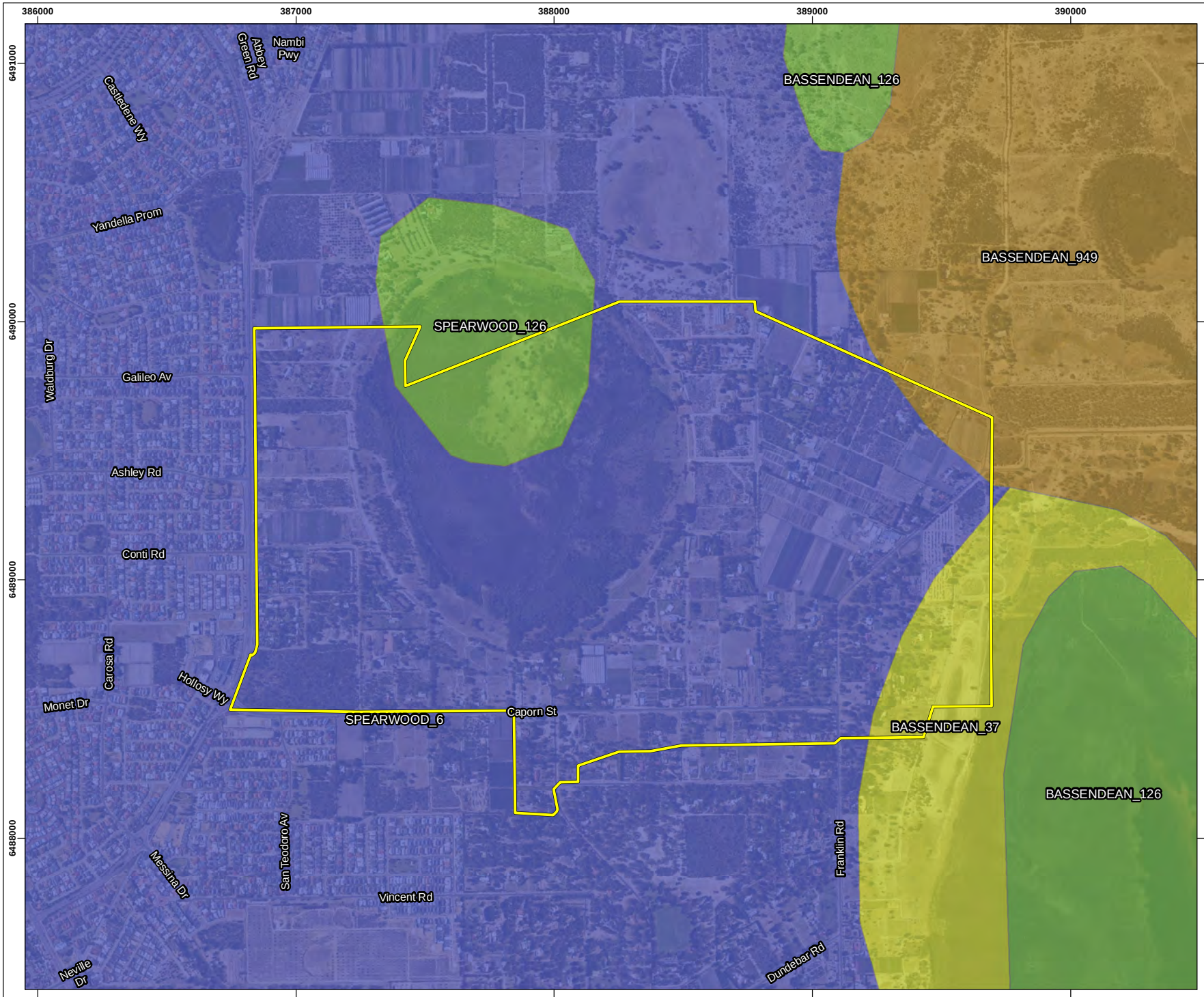
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 3
Hydrology and Wetlands

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F03 Hydrology and Wetlands.mxd



Legend

Indicative Survey Area Boundary

Vegetation Complex

- Freshwater lake
- Low woodland or open low woodland
- Thicket
- Woodland southwest

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 2021
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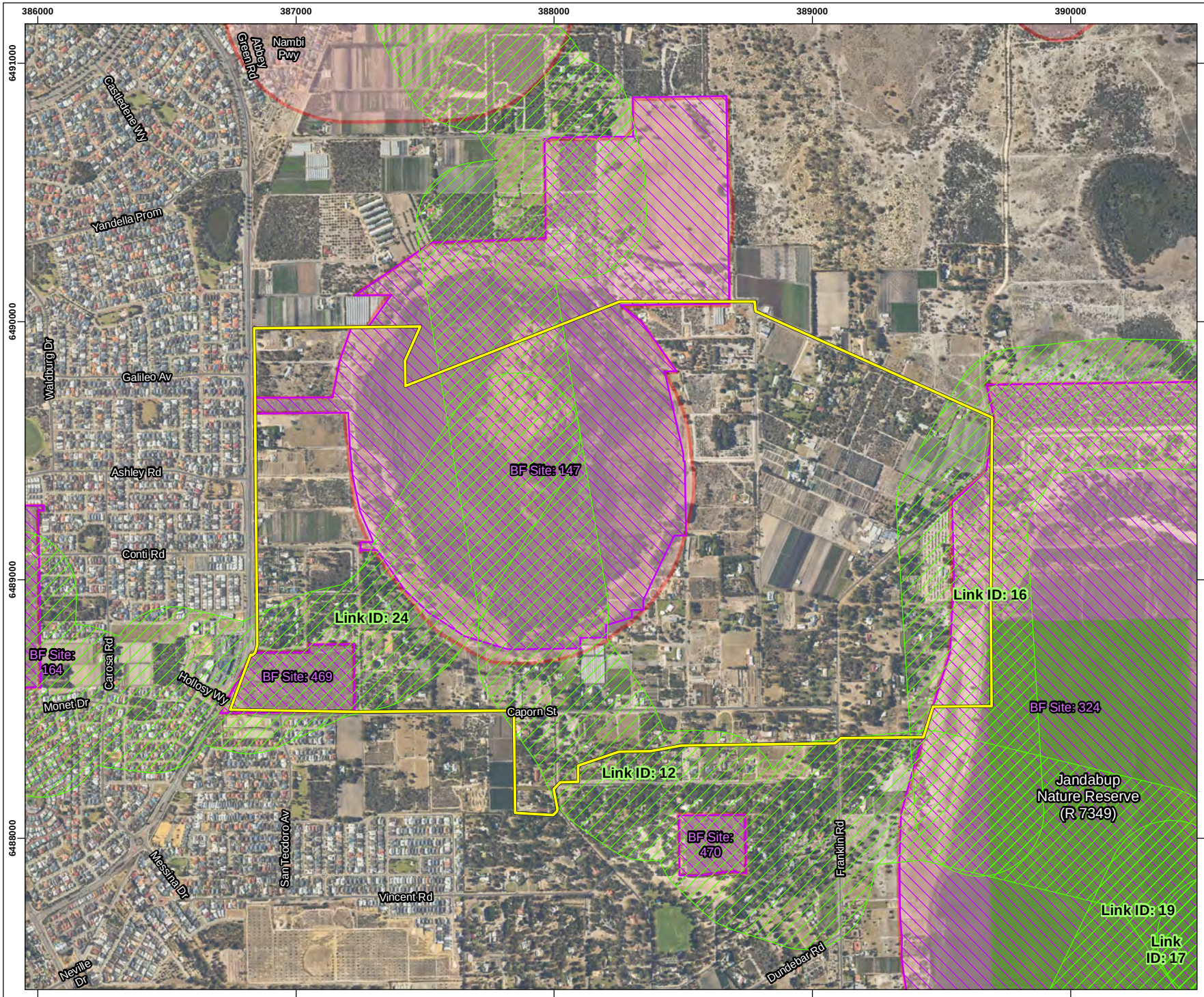
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 4
Broad Vegetation Types

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F04 Broad Vegetation Types.mxd



Legend

- Indicative Survey Area Boundary
- Regional Ecological Linkage
- Bush Forever Sites
- DBCA Managed Land
- Environmentally Sensitive Areas

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 20121
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2021
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LOCALITY MAP

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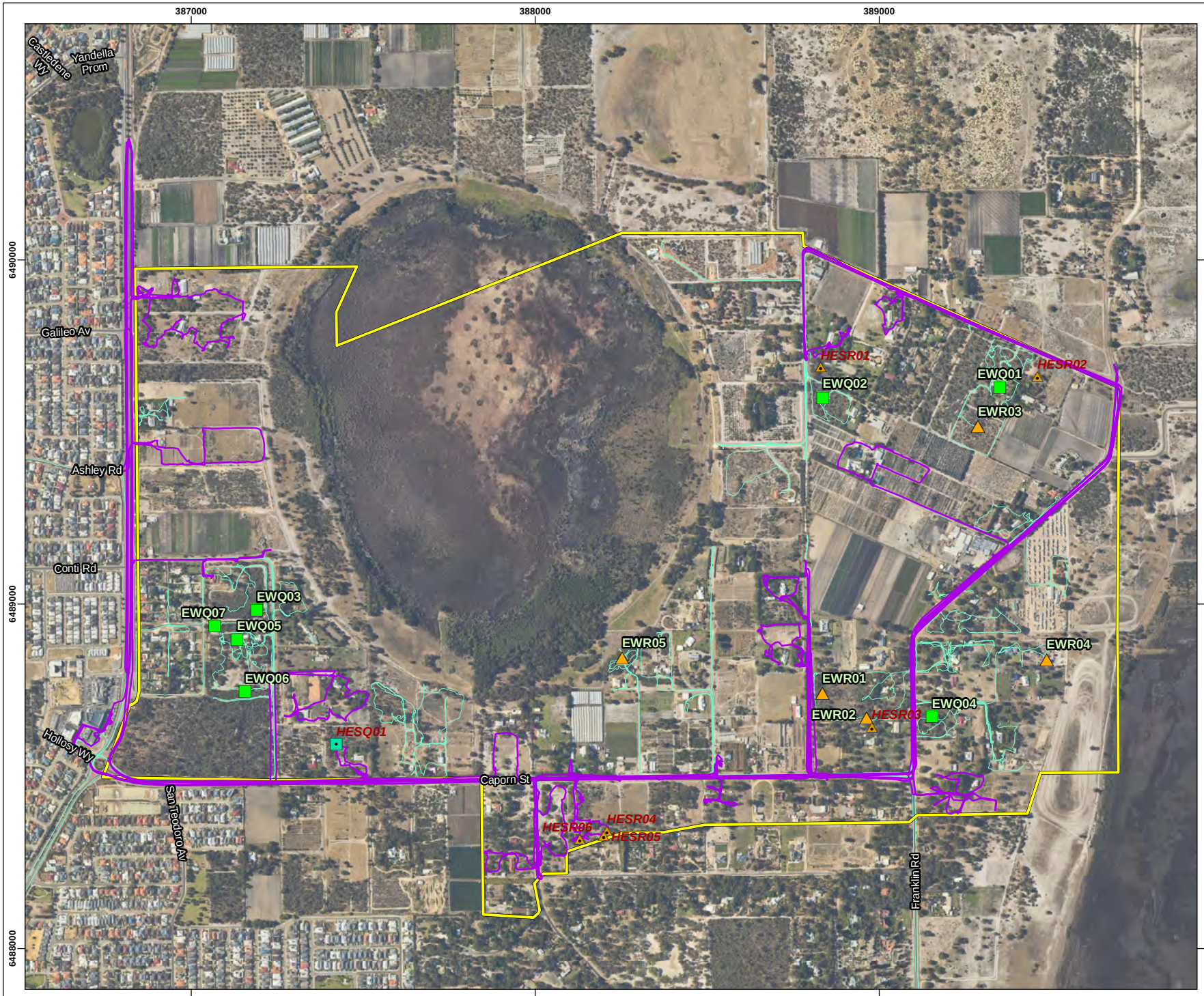
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 5
Conservation and Environmentally Sensitive Areas

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F05 Conservation and Environmentally Sensitive Areas.mxd



Legend

- Indicative Survey Area
- GPS Tracks 2020
- GPS Tracks 2021
- Quadrat 2020
- Releve 2020
- Quadrat 2021
- Releve 2021

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
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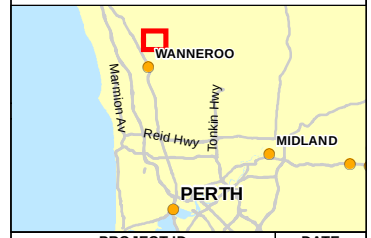

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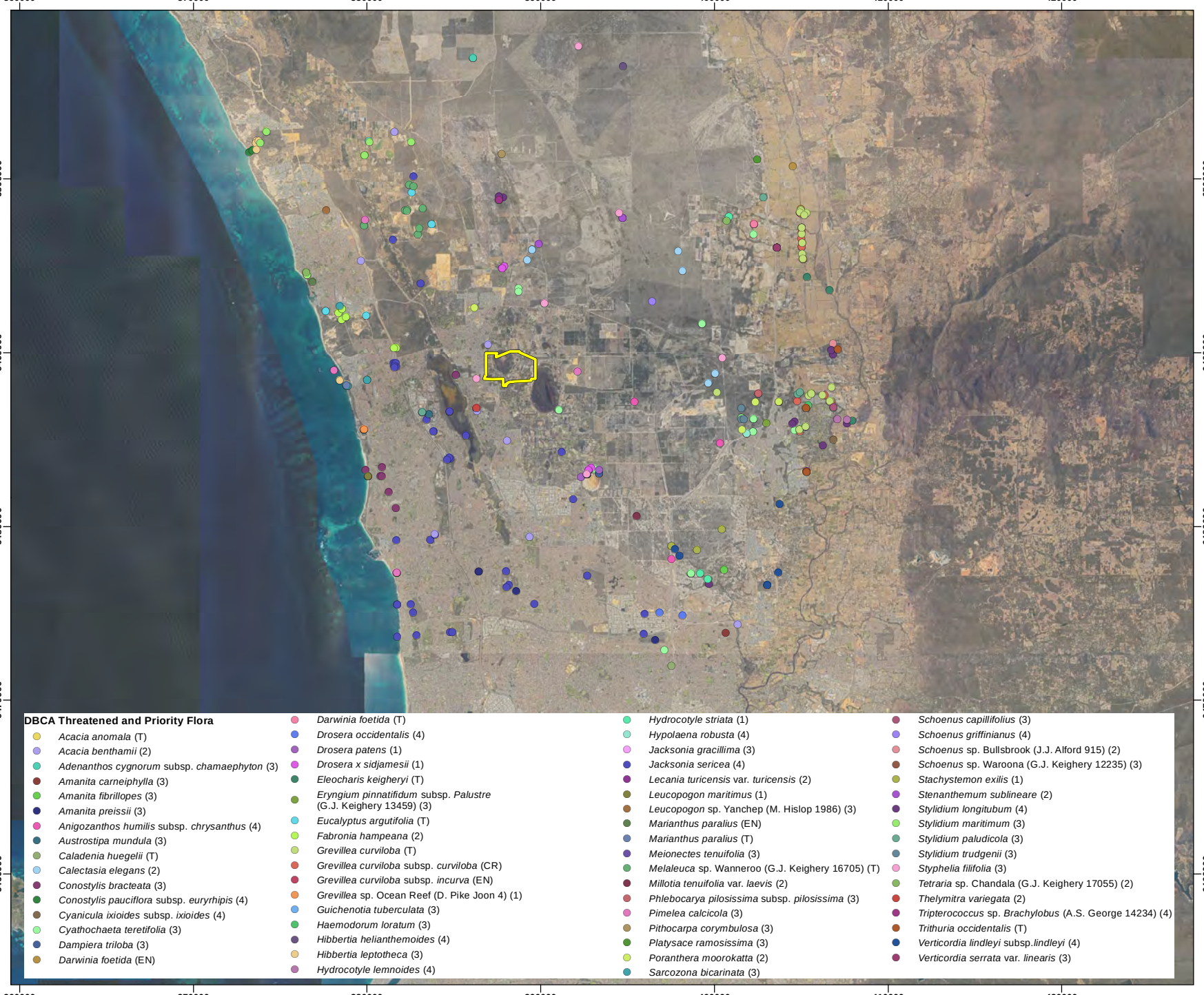
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 6
Survey Effort

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F06 Survey Effort.mxd



Legend

Indicative Survey

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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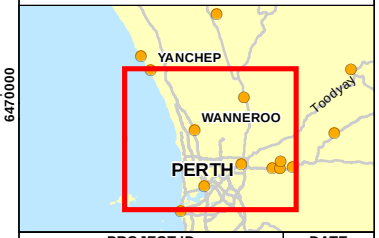

DBCA Threatened and Priority Flora

- *Acacia anomala* (T)
- *Acacia benthamii* (2)
- *Adenanthos cygnorum* subsp. *chamaephyton* (3)
- *Amanita carneiphylla* (3)
- *Amanita fibrillopes* (3)
- *Amanita preissii* (3)
- *Anigozanthos humilis* subsp. *chrysanthus* (4)
- *Austrostipa mundula* (3)
- *Caladenia huegelii* (T)
- *Calectasia elegans* (2)
- *Conostylis bracteata* (3)
- *Conostylis pauciflora* subsp. *euryrhipis* (4)
- *Cyanicula ixioides* subsp. *ixioides* (4)
- *Cyathochaeta teretifolia* (3)
- *Dampiera triloba* (3)
- *Darwinia foetida* (EN)
- *Darwinia foetida* (T)
- *Drosera occidentalis* (4)
- *Drosera patens* (1)
- *Drosera x sidjamesii* (1)
- *Eleocharis keigheryi* (T)
- *Eryngium pinnatifidum* subsp. *Palustre* (G.J. Keighery 13459) (3)
- *Eucalyptus argutifolia* (T)
- *Fabronia hampeana* (2)
- *Grevillea curviloba* (T)
- *Grevillea curviloba* subsp. *curviloba* (CR)
- *Grevillea curviloba* subsp. *incurva* (EN)
- *Grevillea* sp. Ocean Reef (D. Pike Joon 4) (1)
- *Guichenotia tuberculata* (3)
- *Haemodorum loratum* (3)
- *Hibbertia helianthemoides* (4)
- *Hibbertia leptotheca* (3)
- *Hydrocotyle lemnoides* (4)
- *Hydrocotyle striata* (1)
- *Hypolaena robusta* (4)
- *Jacksonia gracillima* (3)
- *Jacksonia sericea* (4)
- *Lecania turicensis* var. *turicensis* (2)
- *Leucopogon maritimus* (1)
- *Leucopogon* sp. Yanchep (M. Hislop 1986) (3)
- *Marianthus paralius* (EN)
- *Marianthus paralius* (T)
- *Meionectes tenuifolia* (3)
- *Melaleuca* sp. Wanneroo (G.J. Keighery 16705) (T)
- *Millotia tenuifolia* var. *laevis* (2)
- *Phlebocarya pilosissima* subsp. *pilosissima* (3)
- *Pimelea calcicola* (3)
- *Pithocarpa corymbulosa* (3)
- *Platysace ramosissima* (3)
- *Poranthera moorokatta* (2)
- *Sarcozona bicarinata* (3)
- *Schoenus capillifolius* (3)
- *Schoenus griffinianus* (4)
- *Schoenus* sp. Bullsbrook (J.J. Alford 915) (2)
- *Schoenus* sp. Waroona (G.J. Keighery 12235) (3)
- *Stachystemon exilis* (1)
- *Stenanthemum sublineare* (2)
- *Stylidium longitubum* (4)
- *Stylidium maritimum* (3)
- *Stylidium paludicola* (3)
- *Stylidium trudgenii* (3)
- *Styphelia filifolia* (3)
- *Tetraria* sp. Chandala (G.J. Keighery 17055) (2)
- *Thelymitra variegata* (2)
- *Tripterococcus* sp. *Brachylobus* (A.S. George 14234) (4)
- *Trithuria occidentalis* (T)
- *Verticordia lindleyi* subsp.*lindleyi* (4)
- *Verticordia serrata* var. *linearis* (3)

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GDA 1994 MGA Zone 50

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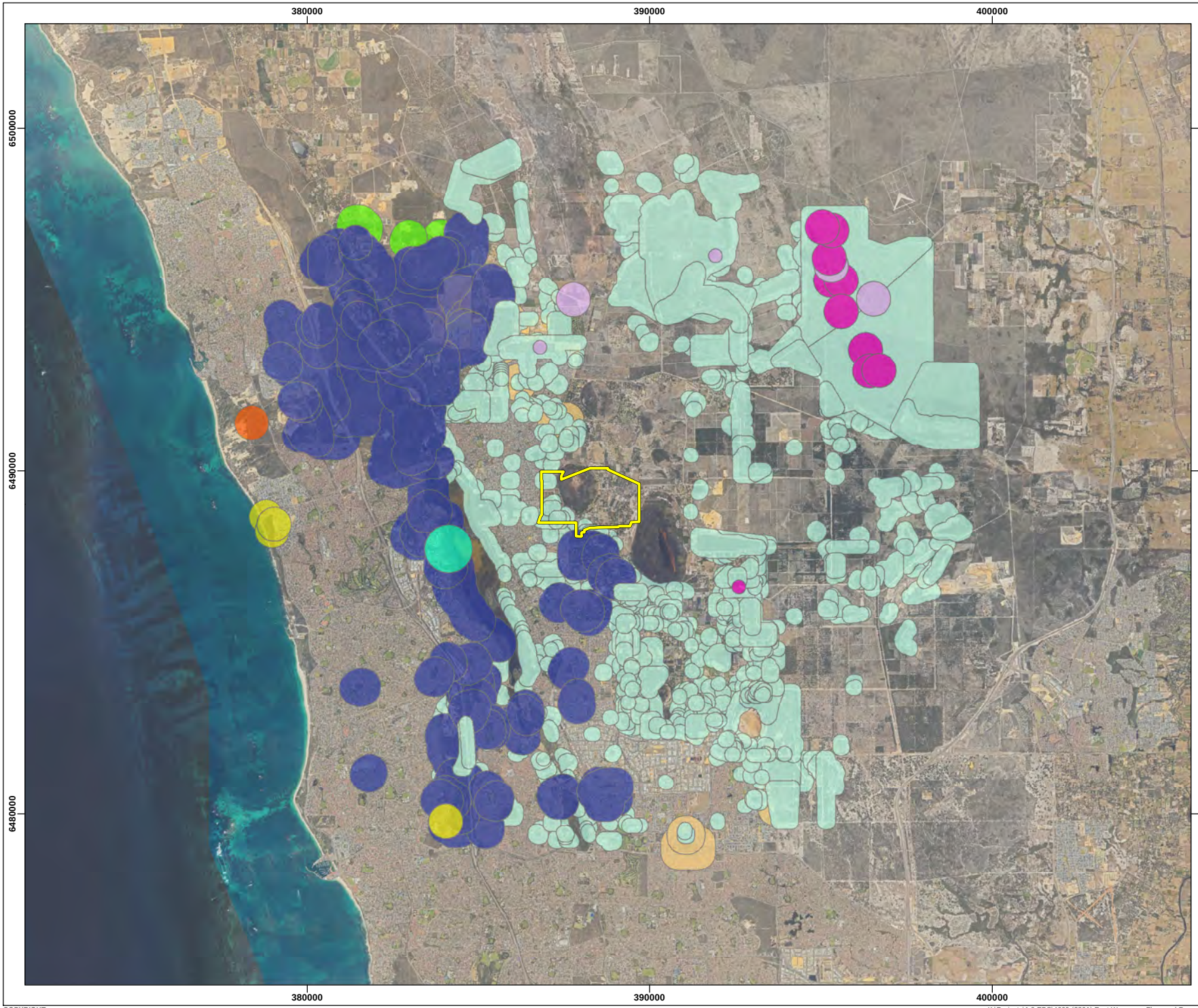
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 7
DBCA Threatened and Priority Flora Locations

 K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F07 DBCA Threatened and Priority Flora Locations.mxd



Legend

Indicative Survey Area Boundary

DBCA Threatened and Priority Ecological Communities

- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region
- Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))
- Banksia ilicifolia woodlands
- Callitris preissii (or Melaleuca lanceolata) forests and woodlands, Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. (1994))
- Coastal shrublands on shallow sands
- Low lying Banksia attenuata woodlands or shrublands
- Melaleuca huegelii - Melaleuca systena shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994))
- Northern Spearwood shrublands and woodlands
- Southern Eucalyptus gomphocephala-Agonis flexuosa woodlands
- Swan Coastal Plain Banksia attenuata - Banksia menziesii woodlands
- Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain

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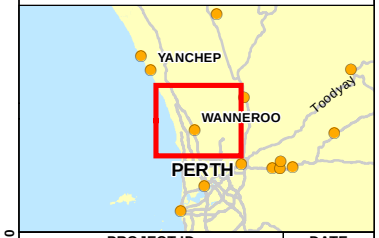

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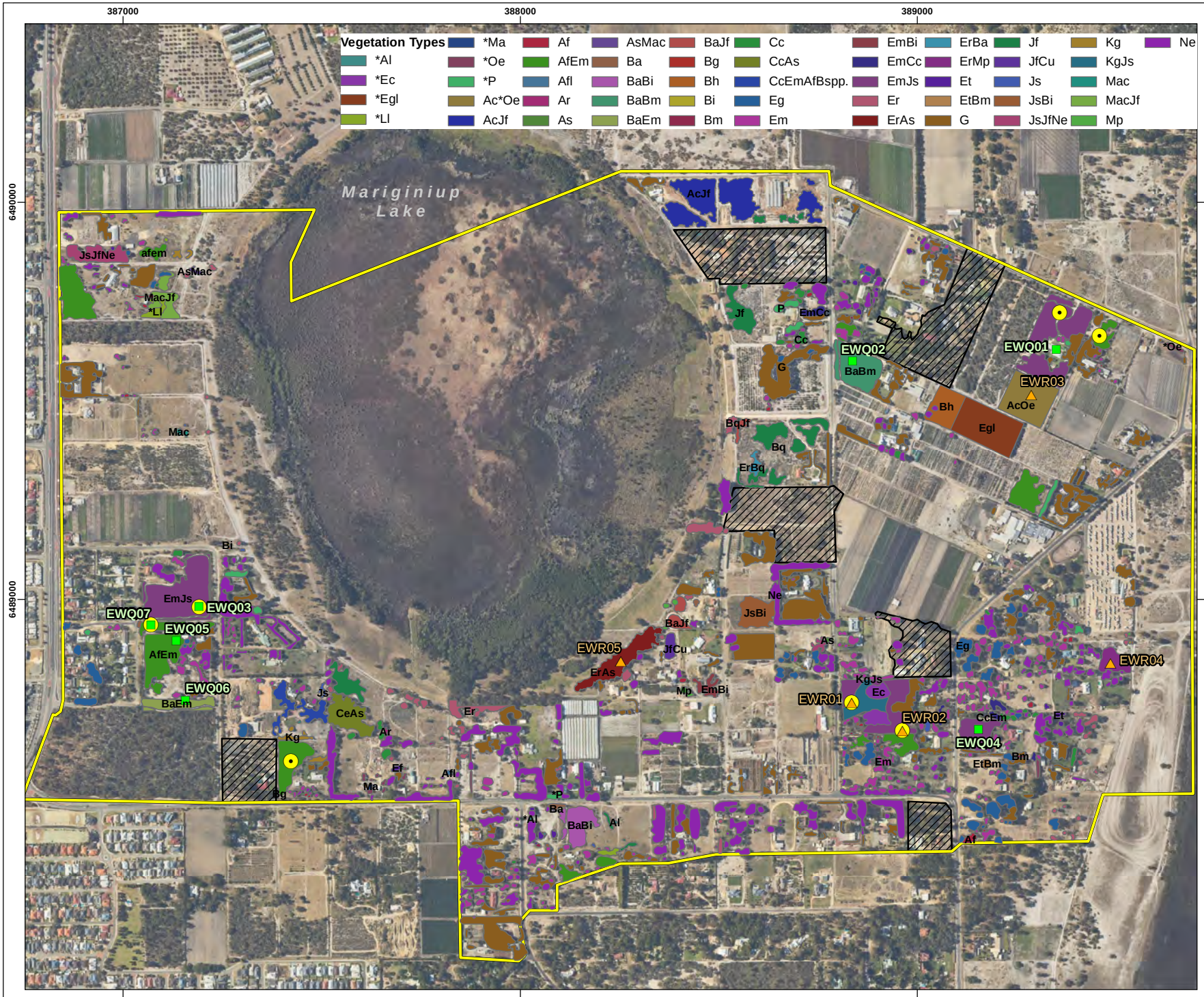
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 8
DBCA Threatened and Priority Ecological Communities



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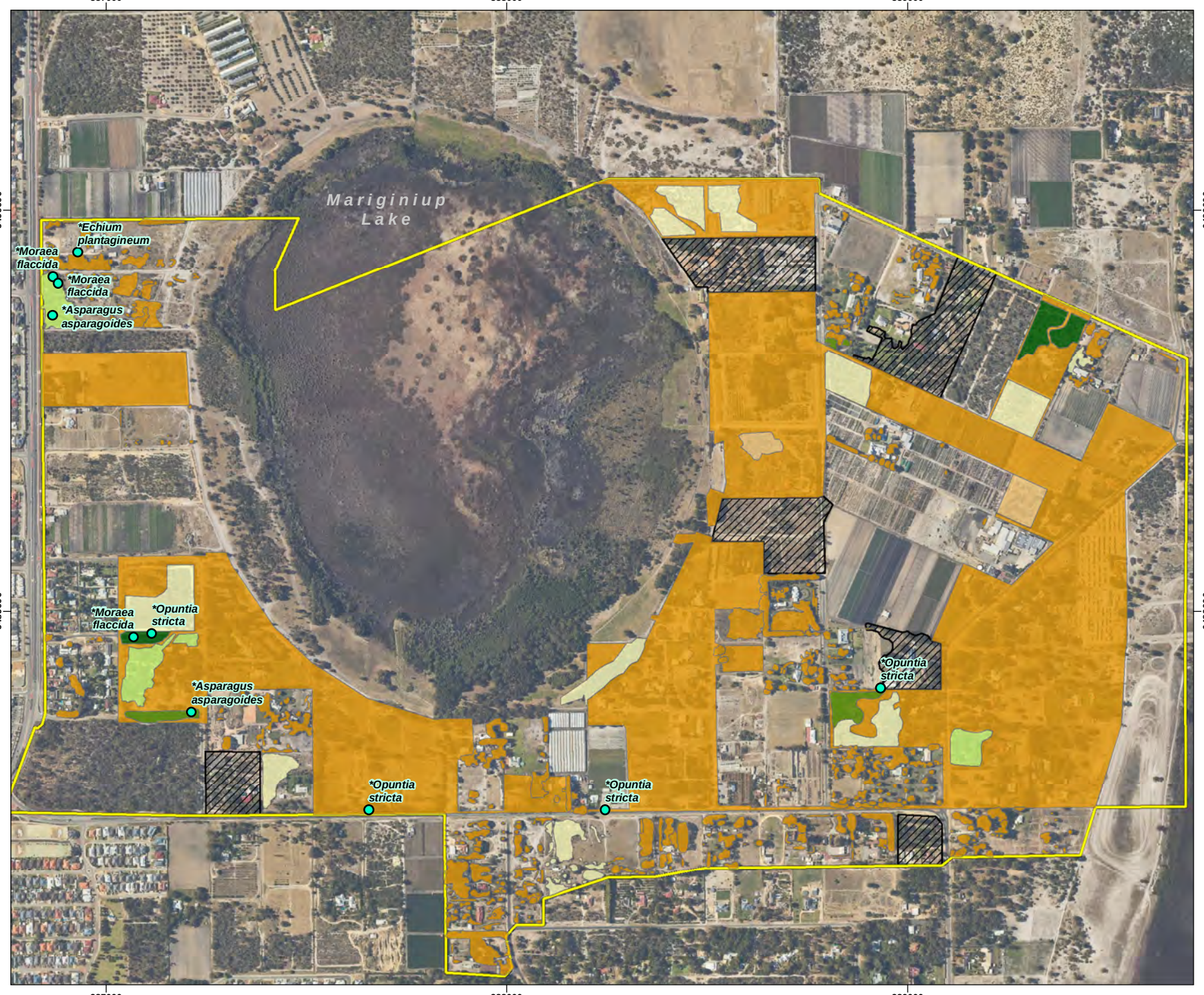
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 9
Vegetation Types Within the Survey Area

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F09 Vegetation Types within the Survey Area.mxd



Legend

- Indicative Survey
- Declared Weeds

Vegetation Condition

- Very Good
- Good
- Good - Degraded
- Degraded
- Degraded- Completely Degraded
- Completely Degraded
- Not Assessed

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREA
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- OTHER DATA SOURCED LANDGATE 2021
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2021
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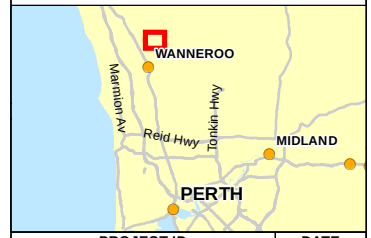

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GDA 1994 MGA Zone 50

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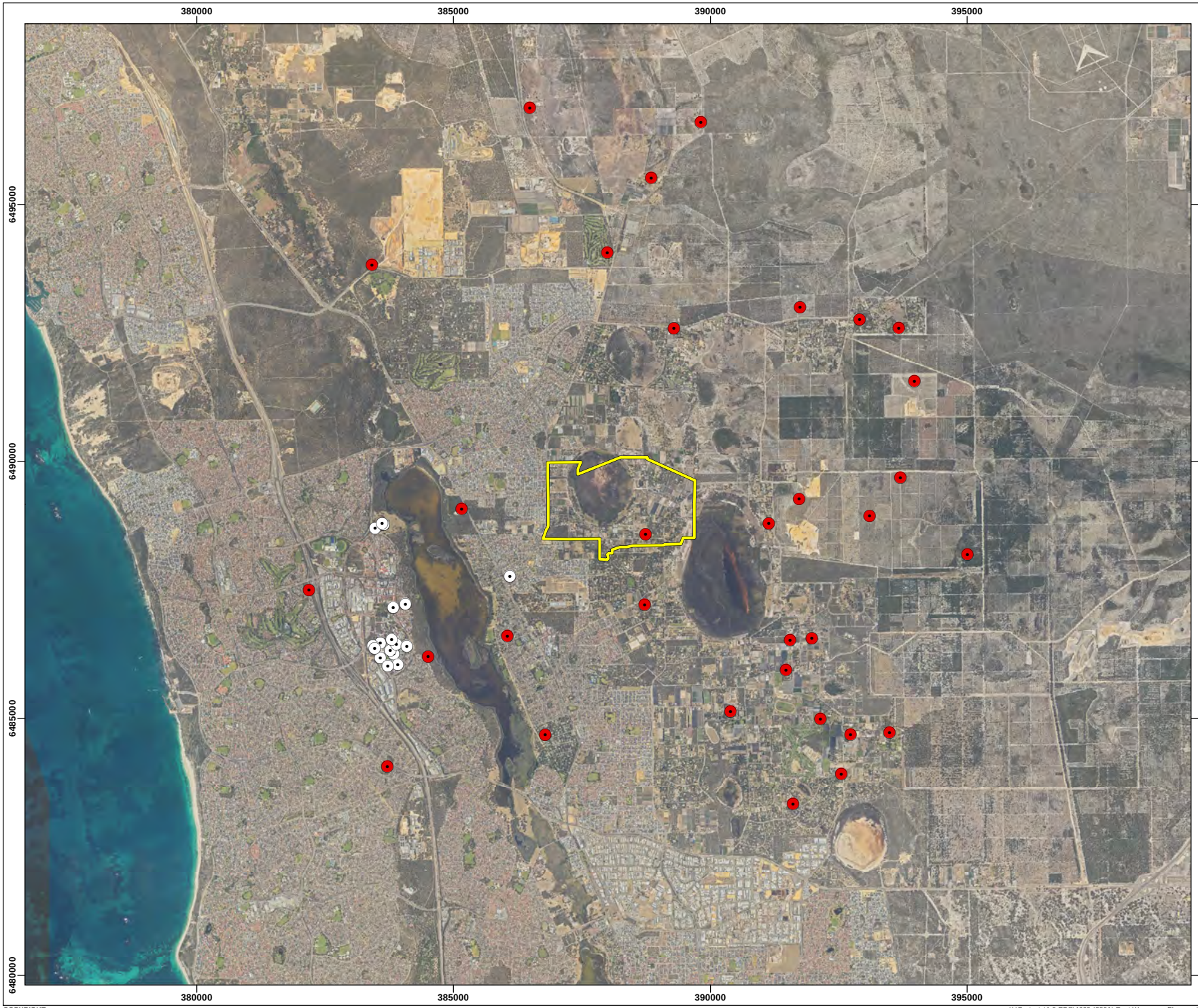
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 10
Vegetation Condition Within the Survey Area

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F10 Vegetation Condition within the Survey Area.mxd



Legend

- Indicative Survey Area
- DBCA Black Cockatoo Breeding Sites Results
- DBCA Black Cockatoo Roosting Sites Results

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 2021
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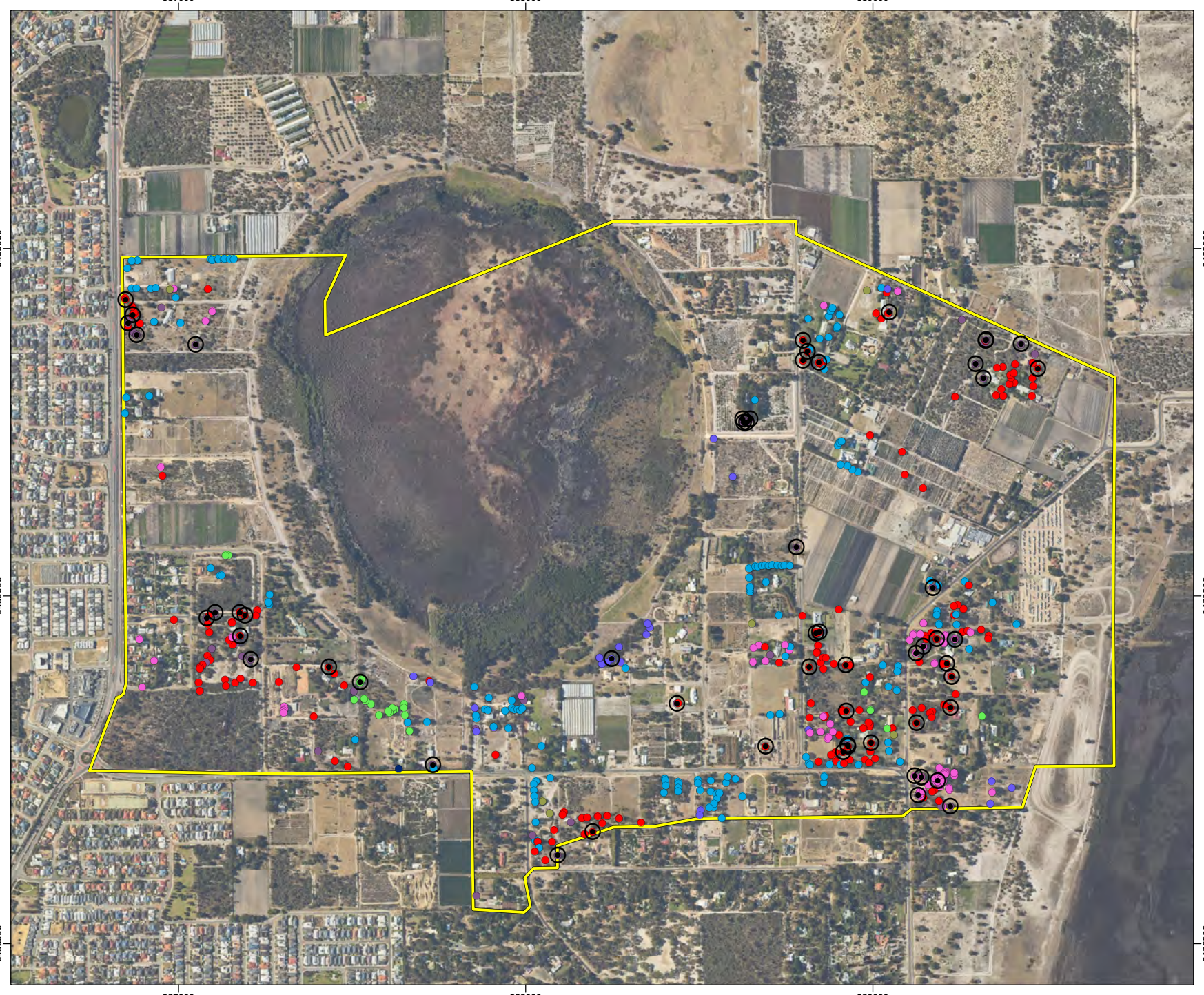
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 11
DBCA Black Cockatoo Database Search Results

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F11 DBCA Black Cockatoo Database Search Results.mxd



Legend

- Indicative Survey

Potential Black Cockatoo Breeding Trees Species

- Coastal blackbutt (Eucalyptus todtiana)
- Flooded gum (Eucalyptus rudis)
- Introduced Eucalypt
- Jarrah (Eucalyptus marginata)
- Marri (Corymbia calophylla)
- Non Endemic
- Stag
- Tuart (Eucalyptus gomphocephala)
- Potentially Suitable Breeding Hollow >120mm

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2021
- OTHER DATA SOURCED LANDGATE 2021
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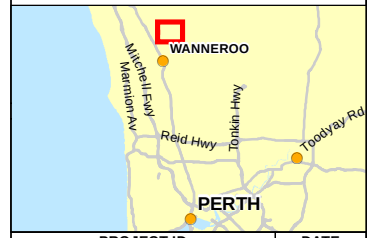

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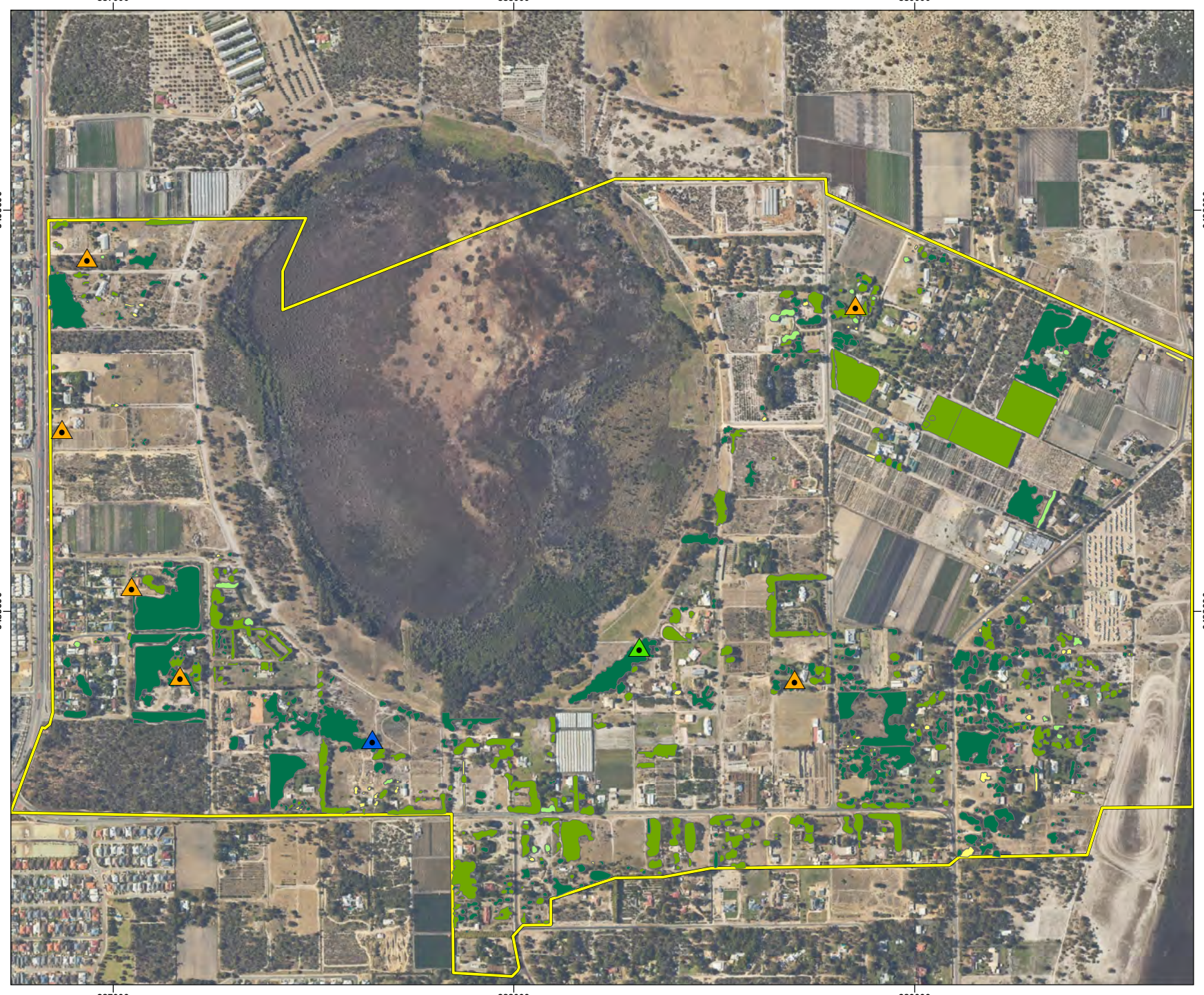
Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 12
Potential Black Cockatoo Breeding Trees

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F12 Potential Black Cockatoo Breeding Trees.mxd



Legend

- Indicative Survey Area
- Carnaby's Black Cockatoo call heard
- Carnaby's Black Cockatoo foraging evidence
- Carnaby's Black Cockatoo sighting

Foraging Habitat(Updated 2021)

- Very high quality
- High quality
- Medium quality
- Low quality

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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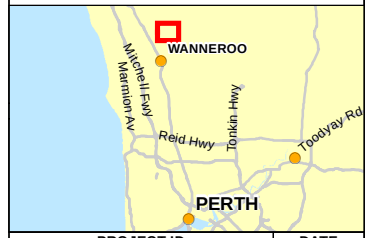
LOCALITY MAP



PROJECT ID	DATE
4660	22/12/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
CL	LG	NW	0

Land Group WA
Wells, Honey and Rousset Street Precinct, East Wanneroo

Flora, Vegetation and Black Cockatoo Assessment, Precinct 7 East Wanneroo

Figure 13
Black Cockatoo Foraging Habitat

K:\Projects\1.0 EBS\4660 (3861) East Wanneroo Flora and Fauna Survey\4660 F13 Black Cockatoo Foraging Habitat.mxd

Appendices

Appendix A
Literature Review

Appendix A: Literature Review

Report	Survey Area	Survey Type	Survey Timing	TEC / PEC Present	Total Taxa Recorded	Conservation Significant Species	Declared Pest or WoNS Recorded
Conservation Area Management Plan Mather Reserve (53163) and Lot 24 Mary Street (City of Wanneroo, 2020)	• Mather Reserve: 50 ha • Lot 24 Mary Street: 4 ha	• Mather Reserve: Ground truthing • Lot 24 Mary Street: Detailed Flora and Vegetation Survey	• Mather Reserve: August 2021 • Lot 24 Mary Street: September 2016	One TEC: • *Banksia attenuata* woodlands over species-rich dense shrubland (floristic community type 20a)	• Mather Reserve: N/A • Lot 24 Mary Street: 149 taxa	• *Acacia benthamii* (P2) • *Stylidium maritimum* (P3)	None
Lot 1665 Wanneroo Road, Sinagra - Environmental Assessment Report (Strategen Environmental, 2019)	40 ha	Environmental Assessment Report	September and November 2016	None	73 taxa	None	One Declared Pest and WoNS: **Opuntia stricta*
Various Lots Caporn Street, Wanneroo - Environmental Assessment Report (360 Environmental Pty Ltd, 2020)	27 ha	Detailed Flora and Vegetation Survey	November 2010 April 2019	One TEC identified during Desktop Assessment: • *Banksia* woodlands of the Swan Coastal Plain (Endangered)	36 taxa	• *Jacksonia sericea* (P4)	None

Appendix B
Database Searches

Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	PopNumber	SubPopCode	PopStatus	Location	District	Vesting	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes
Acacia benthamii	2		1			Lake edge, W of Lake Goollelal. Near Gavin Way and Astley Pl	SWAN COASTAL	PRI	15/09/1975 0:00		0			0			N			
Acacia benthamii	2		4			At intersection of Hester Ave & Railway Line. Adjacent to Neerabup National Park. 4 sub.populations present in this area	SWAN COASTAL	MRD	05/06/2000 0:00	ESTMT	71			71			N			VegClas: Open B.menziessii woodland over shrubland
Adenanthos cygnorum subsp. chamaephyton	3		16			8 km E of Muchea, along Muchea East Rd (?). Gnagarra-Moore River State Forest (No F 65)	SWAN COASTAL	LGA	13/11/1981 0:00	UNKNOWN	0			10			N			
Caladenia huegelii	T	CR	22			On Neaves Rd, 6.65km E of Pinjar Rd, on N side of road, on crest of sand hill, ca 2-3m from edge of road cutting	SWAN COASTAL	LGA	14/10/2004 0:00		0			0			N			Xanthorrhoea preissii, Patersonia sp., Hibbertia sp., Stirlingia latifolia
Caladenia huegelii	T	CR	25			SE cnr of Lot 1452 Maralla Rd, Bullsbrook. ca 1.3km W from Sawpit/Maralla Rd T-jnc. N side of road	SWAN COASTAL	PRI	15/10/1997 0:00	ESTMT	0			0			N			Xanthorrhoea preissii, Patersonia sp., Hibbertia sp., Stirlingia latifolia
Caladenia huegelii	T	CR	32		U	## Orginal discovery was not definitely identified as C. huegelii ## NE corner of Nature Reserve 46875 along Maralla Road, The Vines	SWAN COASTAL	CC	29/09/2004 0:00		0			0			N			Sonchus. Banksia Woodland. Hibberia, grass trees
Caladenia huegelii	T	CR	34		U	*Species identification not confirmed* N of Chardonnay Dr and Vines Ave junction, The Vines. East of Chardonnay Park	SWAN COASTAL	PRI	29/09/2004 0:00	ACT_IND	0			0			N			Cape tulip. Banksia, allocasuarina, Xanthorrhoea, Patersonia, Hibbertia, Stirlingia, Caladenia longicauda
Caladenia huegelii	T	CR	35		U	## Original population never properly identified## Nature Reserve 46875 south of Maralla Road and north of Barbera Lane, The Vines. Habitat appears unsuitable	SWAN COASTAL	CC	29/09/2004 0:00	ACT_IND	0			0			N			Xanthorrhoea preisii, Patersonia, Hibbertia, Stirlingia latifolia. Habitat degraded & unsuitable
Caladenia huegelii	T	CR	52		U	**Species correct ID not confirmed**Freehold land, lot 100, located at Lightning Swamp, Malaga. West of Reid Hwy and Tonkin Hwy junction, north of Matthews Cl	SWAN COASTAL	LGA	18/10/2004 0:00		0			0			N			Pockets of Banksia Woodland
Caladenia huegelii	T	CR	71			Lot 99, Whiteman Park (WAPC). Near the Archery Centre carpark, 26m north of lightpole at NW corner of carpark	SWAN COASTAL	SPC	04/10/2005 0:00	ACT_IND	1			1			N	HEALTHY		Vegetation changes character, with more Banksia illicifolia etc to the north of this area
Caladenia huegelii	T	CR	81			Lot 80 Maralla Road. Ellenbrook, Perth, WA. Bushland behind Rodsand Circuit, Ellenbrook (~40m)	SWAN COASTAL	PRI	24/09/2014 0:00	ESTMT	1			0	PLANTS		Y	HEALTHY	VRY_GOOD	
Caladenia huegelii	T	CR	85			Lot 9508 Ellenbrook. Population is ca. 1km west of Sawpit Rd then ca. 2.5km south along the west edge of the clearing for the Perth to Darwin Highway, then ca. 825 m due west	SWAN COASTAL	SPC	04/10/2017 0:00	ACT_IND	1			0	PLANTS	0.1	Y	HEALTHY	EXCELENT	Low Woodland of Banksia menziesii, B. attenuata, Eucalyptus todtiana, Nuytsia floribunda over occasional Adenanthos cygnorum over Low Shrubland of Hibbertia hypericoides, H. subvaginata, Stirlingia latifolia, Daviesia triflora, Philotheca spicata, Calytr
Calectasia elegans	2		1	A		Lot 205 Perry Rd, ca 300 m E of Perry Road in Chitty Road bushland (Bush Forever Site No. 398), Pinjar (City of Wanneroo)	SWAN COASTAL	SPC	07/09/2006 0:00	ACT_IND	9			9			Y			Andersonia heterophylla, Austrodanthonia occidentalis, Austrostipa compressa, Beaufortia sp.
Calectasia elegans	2		1	B		State Forest No 65, south of Population No 1A on Lot 205 Perry Rd; ca 270m east along Gallager Road then turn south for 170m	SWAN COASTAL	CC	20/10/2006 0:00	ACT_IND	2			2			Y			Open banksia, low woodland, dwarf scrubland
Conostylis bracteata	3		1	A		Vacant block, 47 Karalundie Way, Mullaloo, ca.1km inland. Shire of Joondalup	SWAN COASTAL	LGA	29/03/1986 0:00		0			0			N			DomSp:Xanthorrhoea sp.
Conostylis bracteata	3		1	B	X	PRI Lot.[18 previously 1506]. Kallaroo, 25km NNW of Perth; 50m SSW of Juno Cresent of the verge of Dampier Ave. Rendered Extinct by housing developement on August 17th. Shire of Joondalup	SWAN COASTAL	PRI	16/08/1986 0:00		0			0			N			
Conostylis bracteata	3		1	C		Un-named Reserve (ID: 28819), Mullaloo, ca.1km inland, recreation reserve W of intersection of Waltham and Gunidia Streets. Shire of Joondalup. GIS coords	SWAN COASTAL	LGA	16/08/1986 0:00		0			0			N			DomSp: Banksia attenuata, Melaleuca acerosa
Conostylis bracteata	3		4			UCL land. Remnant Banksia woodland (Block 9471), ca.2km S of Burns Beach Rd, E side of Lake Joondalup, Yellagonga Regional Park (all around Lake Joondalup). GIS coords	SWAN COASTAL	NON	06/11/1997 0:00		0			0			N			DomSp: Acacia spp., Ehrharta calycina
Cyathochaeta teretifolia	3		1			Crown Reserve (49300). Sawpit Gully Conservation Area. 2 km S of the junction of Sawpit Rd and Maralla Rd, Bullsbrook, Swan	SWAN COASTAL	CC	03/11/1995 0:00		0			0			N			Galium, Daucus, Trachymene
Cyathochaeta teretifolia	3		3			Shire Reserve (27279). E of Lake Gnagara, N edge, in System 6 Update quadrant gnan02 (System 6 Area M8, Bushforever Site 193), Wanneroo	SWAN COASTAL	LGA	27/10/1994 0:00		0			0			N			
Cyathochaeta teretifolia	3		5			Private Property. Whiteman Park, Lot 99, ca. 1km E of Beechboro Rd, Swan	SWAN COASTAL	PRI	03/08/1995 0:00		0			0			N			VegClass:Low Open Forest
Cyathochaeta teretifolia	3		10			Road Verge. Old West Rd, Bullsbrook. Swan	SWAN COASTAL	LGA	13/11/2007 0:00	ACT_IND	1			1			N			Open forest over tall open scrub over sedgeland. Meeboldina sp. Ground wet all year. 90% litter coverage
Cyathochaeta teretifolia	3		13			Reserve (49300). Cardinal Drive Bushland (Bush Forever Site 23) ca 200m N Bordeaux, Swan	SWAN COASTAL	CC	03/11/1995 0:00		0			0			N			
Cyathochaeta teretifolia	3		14			Shire Reserve (42592). NW cnr of Della and ?Marshall(Benara - more likely)Rd's, Beechboro, Della Reserve. Plants in wettest area of sumpland	SWAN COASTAL	LGA	08/12/1995 0:00		0			0			N			
Cyathochaeta teretifolia	3		20			Private Property. Lot 47 Lexia Ave. Site ML36M, N of Gnangara Rd, SW side Ellenbrook, Swan	SWAN COASTAL	PRI	06/09/1999 0:00		0			0			N			
Cyathochaeta teretifolia	3		21			Private Property. Lot 47 Lexia Ave. Site ML29, N of Gnangara Rd, NE section Ellenbrook, Swan	SWAN COASTAL	PRI	21/08/1999 0:00		0			0			N			DomSp:Astartea aff. fascicularis, Lepidosperma longitudinale, Baumea rubiginosa, Acacia saligna
Cyathochaeta teretifolia	3		23			Private Property. Lot 47 Lexia Ave. Site ML44A, N of Gnangara Rd, SE side, Ellenbrook, Swan	SWAN COASTAL	PRI	28/09/1999 0:00		0			0			N			
Cyathochaeta teretifolia	3		24			Gnangara-Moore River State Forest. Gnangara Mound, Wanneroo	SWAN COASTAL	CC	02/12/2002 0:00		0			0			N			
Darwinia foetida	T	EN	4			PP, Lot 200 Bingham Road. SW corner of property, Bullsbrook	SWAN COASTAL	PRI	09/03/2007 0:00	ESTMT	25			25			N			Palusplain multiple use wetland
Darwinia foetida	T	EN	5	B		Rail reserve, Muchea South Rd, Bullsbrook. ca. 2.1km north of Rutland Rd intersection turn right onto track crossing the rail line. ca. 500m north to end of upgraded firebreak then ca. 65m north on the east side of the rail line	SWAN COASTAL	RAI	03/09/2015 0:00	ACT_IND	18			0	PLANTS	100	Y	HEALTHY	GOOD	Tall Open Shrubland of Acacia saligna,Jacksonia furcellata, occ. Nuytsia floribunda & Banksia attenuata over Shrubland of Melaleuca seriata, Acacia pulchella, Xanthorrhoea preissii, Regelia ciliata, Pericalymma ellipticum over Low Shrubland of Calothamn
Darwinia foetida	T	EN	6	A		Road Res. ca. 100m north of Rutland Rd, Bullsbrook along unmade Almeria Pde road reserve, on the east side of the rail line	SWAN COASTAL	LGA	22/10/2015 0:00	ACT_IND	10	1		0	PLANTS	600	Y	HEALTHY	DEGRADED	Tall Shrubland of Acacia saligna, Jacksonia sternbergiana (both species have 50% senescence) over Open Shrubland of Xanthorrhoea preissii, Regelia ciliata over Open Sedgland of Desmocladus virgatus and Lyginia barbata and Grassland of *Agrostis curvula a
Darwinia foetida	T	EN	6	B		Rail reserve, Muchea South Rd, Bullsbrook. ca. 140m north of Rutland Rd along unmade Almeria Pde, on the east side of the rail line	SWAN COASTAL	RAI	22/10/2015 0:00	ACT_IND	2			0	PLANTS	70	Y	HEALTHY	GOOD	Tall Shrubland of Acacia saligna, Jacksonia sternbergiana (both species have 50% senescence) over Open Shrubland of Xanthorrhoea preissii, Regelia ciliata over Open Sedgland of Desmocladus virgatus and Lyginia barbata and Grassland of *Agrostis curvula a
Drosera occidentalis	4		2			Private Property. 13 m S of Marshall Rd at 1.5 km W of Beechboro Rd, Malaga. 50 W of the track running N-S, between the power lines and the first row of high voltage lines	SWAN COASTAL	PRI	06/01/1986 0:00	ESTMT	100			100			N			
Drosera occidentalis	4		3			Private Property. SW corner of Marshall and Beechboro Rds, Malaga. 250 m S of Marshall Rd and 10 W of Beechboro Rd	SWAN COASTAL	PRI	06/01/1986 0:00		0			0			N			
Eleocharis keigheryi	T	VU	7			RAAF Base Pearce, located on W side of Gt Northern Hwy, Bullsbrook. Pop located on SW side of airforce base in an open claypan	SWAN COASTAL	COM	17/09/2007 0:00	ESTMT	0			0			Y			Open tall sedges
Eucalyptus argutifolia	T	VU	7	A		Gnangara-Moore River State Forest 65 (Lot 3050). Drive 450m N on Hopkins Rd from Wesco Rd, then 350m W off Hopkins Rd into Mining Lease 70/141 (sublease 6). Located in a small remnant in the quarry	SWAN COASTAL	CC	06/12/2013 0:00	ACT_CLMP	2	0	0	0	CLUMPS	11	Y	HEALTHY	EXCELENT	QUARRY Despite being surrounded by a limestone mine this elevated and isolated remnant of vegetation on the top of the ridge is in very good to excellent condition
Eucalyptus argutifolia	T	VU	7	B		Gnangara-Moore River State Forest 65 (Lot 3050). On a N-S ridge 270-320m N of Wesco Rd and 180m-215m W of Hopkins Rd within mining Lease Mining lease 70/141 (sublease 6)	SWAN COASTAL	CC	06/12/2013 0:00	ACT_CLMP	41	3	0	0	CLUMPS	446	Y	HEALTHY		Heath of Banksia sessilis var. cygnorum, Acacia lasiocarpa, Melaleuca huegelii, Melaleuca systena, Xanthorrhoea preissii, Acacia ?stenoptera, Hemiandra pungens, Trymalium ledifolium var. ledifolium with occasional Hakea prostrata, Cassytha ?racemosa, Tem
Eucalyptus argutifolia	T	VU	10			Lot 12738, Quarry Reserve 45084. Ca 1.25km S of junction of Wesco Rd and Hopkins Rd, SSE of quarries	SWAN COASTAL	WAT	05/04/2012 0:00	ACT_CLMP	21			0	CLUMPS	290	N	MODERATE	VRY_GOOD	Disturbance by rabbits has impacted the condition of the habitat
Eucalyptus argutifolia	T	VU	13			Crown Reserve R43902 (Lot 12422 - Beaumarks Park), Beaumarks Ct, Mindarie. S boundary at Long Beach Prom and Savona Gr intersection. Plants located in SE corner	SWAN COASTAL	LGA	18/09/2013 0:00	ACT_IND	8			0	PLANTS	38	N	HEALTHY	GOOD	HABITAT CONDITION: Good-degraded
Eucalyptus argutifolia	T	VU	14	A		Lot 501, Wattle Avenue. Located 25m N of the N edge of limestone Quarry. Approx 3.6km NE of Gibbs Rd and Wattle Ave intersection	SWAN COASTAL	NON	13/12/2013 0:00	ACT_IND	32	0	0	0	PLANTS	339	N	MODERATE	EXCELENT	
Eucalyptus argutifolia	T	VU	14	B		Lot 501, Wattle Avenue. Located 170 m N of the N edge of limestone Quarry. Approx 3.5km NE of Gibbs Rd and Wattle Ave intersection	SWAN COASTAL	NON	13/12/2013 0:00	ACT_IND	6			0	PLANTS	10	N	HEALTHY	EXCELENT	
Eucalyptus argutifolia	T	VU	15			Crown Reserve R46305 (Lot 13983) Talara Circuit, Mindarie. Located in reserve bounded by Anchorage Drive to the N and Talara Circuit. Plants located in the central portion of the vegetated section of the reserve	SWAN COASTAL	LGA	05/11/2013 0:00	ACT_IND	20			0	PLANTS	143	N	HEALTHY	GOOD	Shrub Malle of Eucalyptus argutifolia over Shrubland Melaleuca huegelii, Melaleuca systena, Acacia rostellifera, Spyridium globulosum, Hakea trifurcata, over Hardenbergia comptoniana, Opercularia vaginata, Leucopogon parviflorus, Dianella revoluta, Comes
Eucalyptus argutifolia	T	VU	17			Lot 7. Approximately 800m S of Wesco Road and 1.2km W of Hopkins Road. 80m W of sub-population 17a, plant occur on a steep limestone slope N of quarry, immediately N of old track running in an E-W direction	SWAN COASTAL	PRI	03/08/2006 0:00	ACT_IND	1			0			N	MODERATE		
Fabronia hampeana	2		2			Private Property. Lot 9022. Between Neerabup NP and suburb of Kinross. Wanneroo	SWAN COASTAL	PRI	14/09/1994 0:00		0			0			N			Banksia, Macrozamia, Hibbertia, Xanthorrhoea, Dyandra, grasses, weeds
Fabronia hampeana	2		4	A		Private Property, Lot 9505. W side of Marmion Ave, Bushforever site 322. S of the proposed Tamala Park Development. [Ca. 900m S of junction of Marmion Ave & Neerabup Rd, then ca. 150m W]	SWAN COASTAL	PRI	12/01/2009 0:00		0			0			N			Dom sp: Xanthorrhoea preissii, Mesomelaena pseudostygia, Banksia sessilis, Spyridium globulosum
Fabronia hampeana	2		4	B		Private Property, Lot 9504. Part of the proposed Tamala Park Development (western cell). W side of Marmion Ave. [Ca. 500m S of junction of Marmion Ave & Neerabup Rd, then ca. 160m W]	SWAN COASTAL	PRI	12/01/2009 0:00		0			0			N			Dom sp: Macrozamia sp. & Banksia sp. Woodland
Fabronia hampeana	2		4	C		Private Property, Lot 9504 (1700 Marmion Ave, Clarkson). Part of the proposed Tamala Park Development (central cell). E side of Marmion Ave. 34km N of Perth CBD. [Ca. 200m S of junction of Marmion Ave & Neerabup Rd, then ca. 50m E]	SWAN COASTAL	PRI	12/01/2009 0:00		0			0			N			Banksia low open woodland. Dom sp: Acacia cyclops, Hibbertai hypericoides, Desmocladus flexuosus
Fabronia hampeana	2		4	D		Private Property, Lot 9504. Part of the proposed Tamala Park Development (central cell). E side of Marmion Ave. [Ca. 600-800m S of junction of Marmion Ave & Neerabup Rd, then ca. 80-370m E]	SWAN COASTAL	PRI	12/01/2009 0:00		0			0			N			Dom sp: Desmocladus flexuosus, Xanthorrhoea preissii, Hibbertia hypericoides & Banksia nivea
Grevillea curviloba subsp. curviloba	T	CR	1	A		Railway Reserve. East and west side of the railway line at the intersection of Rutland Rd and Railway Pde. North and south of Rutland Rd on the west side of the railway line, and south of Rutland Rd on both sides [Previously 1A and 1B]	SWAN COASTAL	RAI	06/11/2013 0:00	ACT_IND	0			289	PLANTS		N		GOOD	
Grevillea curviloba subsp. curviloba	T	CR	1	C		Un-made Road Reserve. Uncleared road reserve, east of the railway line at the intersection of Rutland Road and Railway Pde (Muchea South Rd), Bullsbrook	SWAN COASTAL	LGA	30/08/2011 0:00	ACT_CLMP	17	0		0	CLUMPS	600			GOOD	Sand over clay. Weeds: Ehrharta calycina, Hypochaeris glabra, Watsonia, Eragrostis curvula, Asparagus asparagoides
Grevillea curviloba subsp. curviloba	T	CR	1	D		[Shire Road Reserve on Muchea South Road, approximately 65m south from the intersection of Rutland Road and Muchea South Road. Adjacent to Railway Reserve, on eastern side of road]	SWAN COASTAL	LGA	06/11/2013 0:00		0			52			N		GOOD	
Grevillea curviloba subsp. curviloba	T	CR	2			Reserve 49300 â€œBordeaux Laneâ€ Nature Reserve, The Vines. From the SE corner of the Reserve the plants are 197m north along the track/drainage line of and 59-160m west into the bush. Bush Forever site 23	SWAN COASTAL	CC	12/01/2017 0:00		0			0			N		GOOD	The western side of the Reserve was burnt in 1989 and eastern side was burnt in 1973
Grevillea curviloba subsp. curviloba	T	CR	3			Unnamed (`Maralla Rd` NR) R 46875, 500m south of Maralla Road on the north-south track 220m East of Sawpit Road	SWAN COASTAL	CC	26/05/2015 0:00		0			0			N		DEGRADED	The vegetation and current regen appear to have been burnt more recently than 2013, and therefore it is likely that there was another burn post 2013. Very few native plants regenerating at this time. One adult Acacia saligna present plus a number of A
Grevillea curviloba subsp. curviloba	T	CR	4	A		Unnamed (`Maralla Rd NR`) R 46875. 18-60m S of Maralla Road, and 940-1030m E of Sawpit Rd just E of creekline	SWAN COASTAL	CC	21/09/2011 0:00	ACT_CLMP	16			0	CLUMPS	230	Y	MODERATE	DEGRADED	Localised patches of Schoenus were present but most of the area was degraded and predominantly weeds (Arctotheca calendula, Moraea flaccida, Poacea spp.)
Grevillea curviloba subsp. curviloba	T	CR	4	B		Maralla Road Nature Reserve (CR46875), Ellenbrook. Plants occur 100-230m NW of the Dunnett Road Bridge, in two distinct groups, one either side of Sawpit Gully, approximately 100m apart	SWAN COASTAL	CC	26/10/2016 0:00	ACT_CLMP	29	3		0	CLUMPS		Y	MODERATE	DEGRADED	Habitat 1 (main group of plants) - Occasional Corymbia calophylla over Open Shrubland of Grevillea curviloba subsp. curviloba over Closed Grassland of *Ehrharta longiflora, *Bromus diandrus, *E.calycina and *Briza maxima Habitat 2 (Clump of 4 plants)

Taxon	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies	Veg_Stru_A	Veg_domA1	Veg_Stru_B	Veg_domB1	Veg_Stru_C	Veg_domC1	Veg_Stru_D	Veg_domD1
Acacia benthamii																	
Acacia benthamii	MOIST	FLAT	LIMESTN		SAND	YELLOW			Calothamnus quadrifidus,Acacia humilis,Acacia pulchella,Hibbertia hypericoides	Unknown Veg Class	Calothamnus quadrifidus	Unknown Veg Class	Acacia humilis	Unknown Veg Class	Acacia pulchella	Unknown Veg Class	Hibbertia hypericoides
Adenanthos cygnorum subsp. chamaephyton			LATERITE		LOAM_SND												
Caladenia huegelii	DRY	RI_DUNE			SAND	GREY			Banksia attenuata,Banksia menziesii,Banksia ilicifolia,Allocasuarina fraseriana	woodland 10-30m, 20-50%	Banksia attenuata	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia ilicifolia	Unknown Veg Class	Allocasuarina fraseriana
Caladenia huegelii	DRY	FLAT			SAND	GREY			Banksia attenuata,Banksia menziesii,Banksia ilicifolia,Allocasuarina fraseriana	open woodland 10-30m, 0.25-20%	Banksia attenuata	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia ilicifolia	Unknown Veg Class	Allocasuarina fraseriana
Caladenia huegelii		SLOPE			SAND	GREY			Eucalyptus rudis,Melaleuca preissiana,Watsonia bulbosa,Solanum nigrum	woodland 10-30m, 20-50%	Eucalyptus rudis	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Watsonia bulbosa	Unknown Veg Class	Solanum nigrum
Caladenia huegelii		OD_DRGLN			LOAM_SND	GREY	PERMINUN		Eucalyptus calophylla,Acacia saligna,Conostephium minus,Xanthorrhoea preissii	woodland 10-30m, 20-50%	Eucalyptus calophylla	tall heathland >2m, 50-80%	Acacia saligna	low heathland <0.5m, 50-80%	Conostephium minus	Unknown Veg Class	Xanthorrhoea preissii
Caladenia huegelii	DRY	FLAT			SAND	GREY			Banksia attenuata,Banksia menzesii,banksia ilicifolia,Allocasuarina fraseriana	woodland 10-30m, 20-50%	Banksia attenuata	Unknown Veg Class	Banksia menzesii	Unknown Veg Class	banksia ilicifolia	Unknown Veg Class	Allocasuarina fraseriana
Caladenia huegelii		SLOPE			SAND	GREY											
Caladenia huegelii	DRY								Eucalyptus ? todtiana, Xanthorrhoea preissii, Conostephium, Hibbertia spp., Anigozanthus humilis, Patersonia occidentalis, Eremaea pauciflora, Caladenia flava, Caladenia arenicola. Few sedges inc. Mesomelaena psuedostygia. Some stinking roger (Osteosperm								
Caladenia huegelii	DRY	FLAT		GRVL_10	SAND	WHITE	WLL_DRND			tree mallee	Eucalyptus todtiana	woodland 10-30m, 20-50%	Banksia attenuata	shrubland 1-2m, 50-80%	Verticordia nitens		
Caladenia huegelii	DRY	SL_UP_GE			SAND	GREY	WLL_DRND	ESE	Occasional Petrophile linearis, Hensmania turbinata, Hibbertia huegelii, *Gladiolus caryophyllaceus								
Calectasia elegans		SLOPE	QUARTZ		SAND	GREY			Banksia menziesii,Banksia attenuata,Regelia inops,Alexgeorgea nitens	woodland 10-30m, 20-50%	Banksia menziesii	open shrubland 1-2m, 20-50%	Banksia attenuata	Unknown Veg Class	Regelia inops	Unknown Veg Class	Alexgeorgea nitens
Calectasia elegans		SLOPE	QUARTZ		SAND	GREY			Banksia menziesii,Banksia attenuata,Regelia inops,Alexgeorgea nitens	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Regelia inops	Unknown Veg Class	Alexgeorgea nitens
Conostylis bracteata		RI_DUNE							Acacia saligna,Eucalyptus gomphocephala,Banksia attenuata	Unknown Veg Class	Acacia saligna	Unknown Veg Class	Eucalyptus gomphocephala	Unknown Veg Class	Banksia attenuata		
Conostylis bracteata		RI_DUNE						E	Acanthocarpus preissii,Acacia lasiocarpa	Unknown Veg Class	Acanthocarpus preissii	Unknown Veg Class	Acacia lasiocarpa				
Conostylis bracteata		RI_DUNE	LATERITE						Dryandra sessilis,Acacia saligna,Acacia xanthina,Xanthorrhoea preissii	Unknown Veg Class	Dryandra sessilis	Unknown Veg Class	Acacia saligna	Unknown Veg Class	Acacia xanthina	Unknown Veg Class	Xanthorrhoea preissii
Conostylis bracteata		CD_LKBED			SAND	GREY			Banksia attenuata,Banksia menziesii,Burchardia congesta,Hibbertia hypericoides	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Burchardia congesta	Unknown Veg Class	Hibbertia hypericoides
Cyathochaeta teretifolia		SLOPE			LOAM	BROWN		N	Eucalyptus calophylla,Melaleuca huegelii,Xanthorrhoea,Hibbertia hypericoides	open forest 10-30m, 50-80%	Eucalyptus calophylla	tall heathland >2m, 50-80%	Melaleuca huegelii	heathland 1-2m, 50-80%	Xanthorrhoea	low open shrubland <0.5m, 20-50%	Hibbertia hypericoides
Cyathochaeta teretifolia																	
Cyathochaeta teretifolia		OD_CREEK					SEASINUN		Melaleuca preissiana,Astartea fascicularis,Agonis linearifolia,Viminaria juncea	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Agonis linearifolia	Unknown Veg Class	Viminaria juncea	Unknown Veg Class	Astartea fascicularis
Cyathochaeta teretifolia		FLAT			LOAM	BROWN	PERMINUN		Melaleuca preissiana,Astartea scoparia,Lepidosperma effusum	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Lepidosperma effusum	Unknown Veg Class	Astartea scoparia		
Cyathochaeta teretifolia		FL_PALU	LIMESTN		CLA_LOAM	RED_BRWN	SEASINUN	N	Eucalyptus calophylla	Unknown Veg Class	Eucalyptus calophylla						
Cyathochaeta teretifolia		CD_SMPLD			CLAY_SND	BLACK			Hakea varia,Melaleuca teretifolia	Unknown Veg Class	Hakea varia	Unknown Veg Class	Melaleuca teretifolia				
Cyathochaeta teretifolia		FLAT							Melaleuca preissiana,Banksia littoralis,Pericalymma ellipticum var. ellipticum	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Pericalymma ellipticum var. ellipticum	Unknown Veg Class	Banksia littoralis		
Cyathochaeta teretifolia	MOIST	CD_SMPLD							Melaleuca preissiana,Banksia littoralis,Melaleuca teretifolia,Melaleuca lateralis	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Melaleuca teretifolia	Unknown Veg Class	Melaleuca lateralis	Unknown Veg Class	Banksia littoralis
Cyathochaeta teretifolia		SLOPE							Corymbia calophylla,Agonis linearifolia,Xanthorrhoea preissii,Zantedeschia aethiopica	Unknown Veg Class	Corymbia calophylla	Unknown Veg Class	Xanthorrhoea preissii	Unknown Veg Class	Zantedeschia aethiopica	Unknown Veg Class	Agonis linearifolia
Cyathochaeta teretifolia									Melaleuca preissiana,Astartea fascicularis,Hypocalymma angustifolium,Banksia littoralis	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Hypocalymma angustifolium	Unknown Veg Class	Banksia littoralis	Unknown Veg Class	Astartea fascicularis
Darwinia foetida					SAND	GRY_BLCK			Corymbia calophylla,Melaleuca rhaphiophylla,Hypocalymma angustifolium	Unknown Veg Class	Corymbia calophylla	Unknown Veg Class	Melaleuca rhaphiophylla	Unknown Veg Class	Hypocalymma angustifolium		
Darwinia foetida	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND										
Darwinia foetida	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND		Other weed species along the road reserve are detailed in Population 5A Report Form								
Darwinia foetida	MOIST	FL_PLAIN			SND_LOAM	BROWN	WLL_DRND										
Drosera occidentalis																	
Drosera occidentalis																	
Eleocharis keigheryi	DRY	FLAT			CLA_LOAM	BROWN			Cotula coronopifolia	Unknown Veg Class	Cotula coronopifolia						
Eucalyptus argutifolia	DRY	OUTCROP	LIMESTN	GRVL_30	SAND	BROWN			Occasional E.argutifolia over closed heath of Melaleuca huegelii, Melaleuca systena, Banksia sessilis var. cygnorum, Acacia lasiocarpa, Hemiandra pungens, Acacia alata var. tetrantha with Lomandra maritima and Cassytha sp.								
Eucalyptus argutifolia	MOIST	SLOPE	LIMESTN		SAND	BROWN		ESE									
Eucalyptus argutifolia	DRY	SLOPE	LIMESTN		SAND	BROWN	WLL_DRND	E	Eucalyptus argutifolia, E. petrensis, E. foecunda, Melaleuca huegelii, Banksia sessilis, Xanthorrhoea preissii, Acacia lasiocarpa, Grevillea preissii subsp. preissii, Hibbertia hypericoides, Conostylis candicans, Desmocladus asper								
Eucalyptus argutifolia	MOIST	SL_MI_GE	LIMESTN		SAND	GREY	WLL_DRND			tree mallee	Eucalyptus argutifolia	tall shrubland >2m, 50-80%	Acacia rostellifera	grassland 0.5-1m, 50-80%	Clematis linearifolia	grassland 0.5-1m, 50-80%	Oxalis pes-caprae
Eucalyptus argutifolia	MOIST	SL_UP_ST	LIMESTN	GRVL_10	SAND	BROWN		NE	Hakea trifurcata, Xanthorrhoea preissii, Calothamnus quadrifidus, Hibbertia racemosa, Leucopogon parviflorus, Lepidosperma calcicola	mallee shrub	Eucalyptus argillacea	tall open shrubland >2m, 20-50%	Melaleuca systena	low shrubland 0.5-1m, 50-80%	Acacia alata var. tetrantha	open sedgeland 0.5-1m, 20-50%	Desmocladus flexuosus
Eucalyptus argutifolia	MOIST	RIDGE	LIMESTN		SAND	BROWN			Leucopogon parviflorus, Lepidosperma calcicola	mallee shrub	Eucalyptus argutifolia	tall open shrubland >2m, 20-50%	Melaleuca systena	tall open shrubland >2m, 20-50%	Hakea trifurcata	low shrubland 0.5-1m, 50-80%	Acacia alata var. tetrantha
Eucalyptus argutifolia	MOIST	SL_UP_GE	LIMESTN		SAND	WHITE				mallee shrub	Eucalyptus argutifolia	shrubland 1-2m, 50-80%	Melaleuca huegelii				
Eucalyptus argutifolia	MOIST	RIDGE	LIMESTN		SAND	BROWN			Eucalyptus sp., Desmocladus sp., Melaleuca systena								
Fabronia hampeana									Macrozamia riedlei	Unknown Veg Class	Macrozamia riedlei						
Fabronia hampeana					SAND				Macrozamia riedlei,Banksia attenuata,Hibbertia hypericoides,Hakea trifurcata	Unknown Veg Class	Macrozamia riedlei	Unknown Veg Class	Hibbertia hypericoides	Unknown Veg Class	Hakea trifurcata	Unknown Veg Class	Banksia attenuata
Fabronia hampeana					SAND	YELLOW			Hakea trifurcata,Xanthorrhoea preissii,Hakea trifurcata	Unknown Veg Class	Hakea trifurcata	Unknown Veg Class	Hakea trifurcata	Unknown Veg Class	Xanthorrhoea preissii		
Fabronia hampeana			LIMESTN		SAND	YELLOW			Eucalyptus decipiens,Macrozamia riedlei,Acacia rostellifera,Hypocalymma angustifolium	Unknown Veg Class	Eucalyptus decipiens	Unknown Veg Class	Acacia rostellifera	Unknown Veg Class	Hypocalymma angustifolium	Unknown Veg Class	Macrozamia riedlei
Fabronia hampeana									Acacia rostellifera,Acacia saligna,Mesomelaena pseudostygia,Macrozamia riedlei	Unknown Veg Class	Acacia rostellifera	Unknown Veg Class	Mesomelaena pseudostygia	Unknown Veg Class	Macrozamia riedlei	Unknown Veg Class	Acacia saligna
Grevillea curviloba subsp. curviloba	DRY	OD_DRGLN			SAND												
Grevillea curviloba subsp. curviloba	MOIST	OD_DRGLN		GRVL_10	SND_LOAM	GREY	SEASINUN		Herbland: Acanthocarpus preissii, Thysanotus ?manglesianus, Burchardia bairdiae, Drosera glanduligera, Dianella revoluta, Drosera stolonifera, banksia dallanneyi, Lepidisperma squamatum, Stirlingia latifolia, Tricoryne elatior, Conostylis festucacea, Bau	tall open shrubland >2m, 20-50%	Hakea varia	tall open shrubland >2m, 20-50%	Xanthorrhoea preissii	open heathland 1-2m, 20-50%	Regelia ciliata		
Grevillea curviloba subsp. curviloba	DRY	OD_DRGLN			SAND												
Grevillea curviloba subsp. curviloba	MOIST	FLAT		GRVL_10	SND_LOAM				Melaleuca huegelii, Banksia littoralis, Xanthorrhoea preissii, Podotheca gnaphalioides, *Ursinia anthemoides, *Hypochaeris ?glabra, *Sonchus oleraceus *Raphanus raphanistrum, occasional Stirlingia latifolia, *Aira caryophyllea								
Grevillea curviloba subsp. curviloba	DRY	FLAT	NONE	GRVL_10	SND_LOAM	GREY											
Grevillea curviloba subsp. curviloba	DRY	FLAT			SAND	WHITE			Occasional Banksia menziesii, Xanthorrhoea preissii, Acacia saligna, Schoenus subfascicularis, Cyonotheca micrantha, Podotheca gnaphalioides	shrubland 1-2m, 50-80%	Grevillea curviloba subsp. curviloba	closed sedgeland 0.5-1m, >80%	Schoenus subfascicularis				
Grevillea curviloba subsp. curviloba		OD_DRGLN			SAND	GREY			*Arctotheca calendula, *Hypochaeris glabra, Acacia saligna, Caladenia latifolia, Leucopogon parviflorus, Corynotheca micrantha, Sowerbaea laxiflora, *Pelargonium capitatum, *Lupinus consentinii								

Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	PopNumber	SubPopCode	PopStatus	Location	District	Vesting	CountDate	Method	MatCount	JuvCount	SeedlCount	LiveTotal	CountType	AreaOccupy	InFlower	PopConditi	HabConditi	HabNotes	SoilCondit	Landform	RockType	Gravel	SoilType	SoilColor	Drainage	Aspect	AssSpecies	Veg_Stru_A	Veg_domA1	Veg_Stru_B	Veg_domB1	Veg_Stru_C	Veg_domC1	Veg_Stru_D	Veg_domD1
Grevillea curviloba subsp. curviloba	T	CR	4	C		Private Property. Lot 9007 on Plan 407385. 85m northwest of Dunnett Road Bridge, new subdivision on northern side of Maralla Road Nature Reserve, Ellenbrook. Access to this population is off Maralla and Dunnett Roads	SWAN COASTAL	PRI	28/12/2016 0:00		0			1	PLANTS		N	HEALTHY	DEGRADED	Drainage line. Clearing for development adjacent. Otherwise degraded	MOIST	FLAT			SAND	GREY	WLL_DRND										
Grevillea curviloba subsp. curviloba	T	CR	5	A		Railway Reserve. Railway Parade, Bullsbrook, eastern verge. 2 fenced areas, approx 70m south of West Road. Population extends along railway reserve for 100m from intersection southwards	SWAN COASTAL	RAI	02/12/2015 0:00	ACT_IND	135			0	PLANTS		N	HEALTHY	DEGRADED	Degraded grassland (Eragrostis curvula, Cynodon dactylon, Avena barbata)	DRY	FLAT			SND_LOAM	GREY	WLL_DRND		Isolated individuals of Nuytsia floribunda and Jacksonia sternbergiana								
Grevillea curviloba subsp. curviloba	T	CR	5	B		Railway reserve along Railway Parade, E verge. 200m N of intersection with West Road, Bullsbrook	SWAN COASTAL	RAI	02/12/2015 0:00	ACT_IND	198			0	PLANTS		N	HEALTHY	DEGRADED	Degraded grassland, Eragrostis curvula, with patches of Watsonia meriana	DRY	FLAT			SND_LOAM	GREY	SEASINUN		Isolated individuals of Acacia saligna, Nuytsia fluribunda, Xanthorrhoea preissii and Jacksonia sternbergiana								
Grevillea curviloba subsp. curviloba	T	CR	5	C		Railway Parade, E verge. Opposite Strachan Road, west side of the railway line, Bullsbrook	SWAN COASTAL	LGA	03/09/2004 0:00	ACT_IND	2		5	7			Y			Acacia sp., weeds-grasses	DRY	FLAT			LOAM	BROWN											
Grevillea curviloba subsp. curviloba	T	CR	5	D		Railway reserve along Railway Parade, E verge. Opposite Strachan Road, west side of the railway line, Bullsbrook	SWAN COASTAL	RAI	02/12/2015 0:00	ACT_IND	0			0			N		DEGRADED	Degraded grassland - Eragrostis curvula, Cenchrus clandestinus	DRY	FLAT		GRVL_10	SND_LOAM	GREY	WLL_DRND										
Grevillea curviloba subsp. curviloba	T	CR	5	E		Railway Reserve, between Railway Parade and Almeria Parade, Bullsbrook. Plants occur on the Eastern side of the line between 230-340m south of the West Road railway crossing	SWAN COASTAL	RAI	30/08/2012 0:00	ESTMT	44			0	CLUMPS	1800	Y	HEALTHY	DEGRADED	Tall open scrub (Acacia saligna, Jacksonia sp.), over open heath (Grevillea curviloba ssp curviloba with occasional Xanothorrea preissii). Weeds: Eragrostis curvula, Watsonia sp, various Poa spp On top of drain embankment - Locally modified environment		FLAT		GRVL_10	SAND	GREY	WLL_DRND										
Grevillea curviloba subsp. curviloba	T	CR	5	F		Railway Reserve, between Railway Parade and Almeria Parade, Bullsbrook. Plants occur 400m south of the Strachen Rd Railway crossing, W of the railway and 700-850m S of the crossing on the E of the railway	SWAN COASTAL	RAI	03/12/2015 0:00	ACT_IND	165			0	PLANTS		N	HEALTHY	DEGRADED	Degraded grassland (Eragrostis curvula, Ehrharta calycina, Cenchrus clandestinus)	DRY	FLAT		GRVL_10	SND_LOAM	GREY	WLL_DRND			tall shrubland >2m, 50-80%	Acacia saligna						
Grevillea curviloba subsp. curviloba	T	CR	5	G		Shire Road Verge. Almeria Pde westerv verge, Bullsbrook. Plants occur 700-850m S of the Strachen Road Railway crossing on the drain embankment, opposite House 1138. [85m south from the intersection of Dean Head St and Almeria Pde]	SWAN COASTAL	LGA	01/08/2012 0:00	ESTMT	10			0	CLUMPS	20	Y	HEALTHY	DEGRADED	Tall open scrub (Acacia saligna) with occasional Banksia littoralis, Hakea varia, Banksia sessilis over open heath (Grevilliea curviloba subsp. curviloba, with occasional Xanothorrhoea preissii). Occasional Sterlingia latifolia and Dianella revoluta. W		FLAT		GRVL_10	SND_LOAM	BROWN											
Grevillea curviloba subsp. curviloba	T	CR	10	A		Maralla Nature Reserve (CR 46875), The Vines. Plants occur in riparian zone SE end of NR. City of Swan	SWAN COASTAL	CC	16/01/2018 0:00		0	1		0		1	N	MODERATE	GOOD	Habitat description has changed to reflect the vegetation at the current plant locations. The historic population extent was greater and therefore the vegetation description reflected the broader area	MOIST				SAND	BROWN			Low open forest of Eucalyptus rudis over tall open scrub of Acacia saligna over very open shrubland of Xanthorrhoea ?brunonis, Phyllanthus calycinus, Hardenbergia comptoniana and open low sedgeland of Lepidosperma longitudinale, Ficinia nodosa with na								
Grevillea curviloba subsp. curviloba	T	CR	10	B		PP Lot 9007 Jansellling Ave, The Vines. Shire managed park at the E end of Jansellling Ave, S of Maralla NR. City of Swan	SWAN COASTAL	PRI	16/01/2018 0:00		0			0			N		COM_DEGR	Garden landscaping and lawn are now covering half the site where the plants occurred. There is an overstorey of Eucalyptus rudis and Corymbia calophylla over thick regrowth of tall Acacia saligna over Pteridium esculentum with occasional Xanthorrhoea p	MOIST	FL_PLAIN			SAND	BROWN											
Grevillea curviloba subsp. incurva	T	EN	17			Nature Reserve (46875), Lot 12842. 1.1km east of Sawpit Road on Maralla Road, and 50m south. North of The Vines development. Just NE of the creekline in the riparian vegetation	SWAN COASTAL	CC	17/08/2012 0:00	ACT_CLMP	1			0	CLUMPS	6	Y		GOOD			FLAT							Weeds, Poa spp	open woodland 10-30m, 0.25-20%	Melaleuca rhaphiophylla	open woodland 10-30m, 0.25-20%	Grevillea curviloba subsp. incurva	closed sedgeland 0.5-1m, >80%	Schoenus subfascicularis		
Grevillea curviloba subsp. incurva	T	EN	19	A		Almeria Parade unmade road reserve, Bullsbrook. ~20m south of Neaves Rd on the eastern side of the rail line. Access is via a boundary track that runs south from Rutland Rd	SWAN COASTAL	LGA	22/10/2015 0:00	ESTMT	0			10	PLANTS	150	Y	POOR	DEGRADED	Occasional Acacia saligna over Shrubland of Grevillea curviloba subsp. incurva and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by *Agrostis curvula and *Ehrharta calycina		FLAT			LOAM_SND	GREY	WLL_DRND		Corynotheca micrantha, *Avena sp., *Briza spp., *Lolium sp., *Cenchrus clandestinus, Burchardia congesta, Jacksonia furcellata, Stirlingia latifolia, *Zantedeschia aethiopica								
Grevillea curviloba subsp. incurva	T	EN	19	B		Rail reserve, ~20m south of Neaves Rd on the eastern side of the rail line. Access is via a boundary track that runs south from Rutland Rd	SWAN COASTAL	RAI	22/10/2015 0:00	ESTMT	0			15	PLANTS	350	Y	POOR	DEGRADED	Occasional Acacia saligna over Shrubland of Grevillea curviloba subsp. incurva and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by *Agrostis curvula and *Ehrharta calycina		FLAT			LOAM_SND	GREY	WLL_DRND		Corynotheca micrantha, *Avena sp., *Briza spp., *Lolium sp., *Cenchrus clandestinus, Burchardia congesta, Jacksonia furcellata, Stirlingia latifolia, *Zantedeschia aethiopica								
Haemodorum loratum	3		2			20 km ESE of Muchea, Upper Swan	SWAN COASTAL	UNKNOWN	13/11/1981 0:00		0			0			N			Wandoo woodland			LATERITE		LOAM				Eucalypts wandoo	woodland 10-30m, 20-50%	Eucalypts wandoo						
Hibbertia helianthemoides	4		3			Gnangara-Moore River State Forest (65). Gnangara Mound, Chittering	SWAN COASTAL	CC	02/12/2002 0:00		0			0			N			Low woodland. Lechenaultia floribunda, Bibbertia subvaginata, Beaufortia elegans, Patersonia occidentalis									Banksia menziesii,Banksia attenuata,Eucalyptus todtiana,Melaleuca seriata	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Eucalyptus todtiana	Unknown Veg Class	Melaleuca seriata
Hibbertia leptotheca	3		4	A		Crown Reserve 47831. Burns Beach. From 300 to 900 m S of the Caravan Park (Burns Beach Rd). Sea cliff	SWAN COASTAL	LGA	21/09/1990 0:00		0			0			Y					SL_CLIFF	LIMESTN		SAND	GREY			Melaleuca cardiophylla	low closed heathland <0.5m, >80%	Melaleuca cardiophylla						
Hibbertia leptotheca	3		4	B		Crown Reserve 45122. Burns Beach. From 600 to 900 m S of the Caravan Park (Burns Beach Rd). From 0 to 300 m E of the W boundary of Swan Location M1722	SWAN COASTAL	LGA	21/09/1990 0:00		0			0			N					SL_CLIFF	LIMESTN		SAND	GREY			Melaleuca cardiophylla	low closed heathland <0.5m, >80%	Melaleuca cardiophylla						
Hibbertia leptotheca	3		9	A		Lot 102. Large limestone outcrop - Alkinios	SWAN COASTAL	PRI	14/10/2004 0:00	ESTMT	50			50			Y				DRY	OUTCROP	LIMESTN		SAND	GREY			Acacia truncata,Grevillea preissii,Loxocarya flexuosa,Melaleuca systena	Unknown Veg Class	Acacia truncata	Unknown Veg Class	Grevillea preissii	Unknown Veg Class	Loxocarya flexuosa	Unknown Veg Class	Melaleuca systena
Hibbertia leptotheca	3		9	B		Alkinios - Eglinton proposed housing development	SWAN COASTAL	PRI	14/10/2005 0:00	UNKNOWN	100			100			Y				DRY	OUTCROP	LIMESTN			WHITE			Melaleuca cardiophylla,Melaleuca huegelii,Diplopeltis huegelii,Grevillea preissii	Unknown Veg Class	Melaleuca cardiophylla	Unknown Veg Class	Melaleuca huegelii	Unknown Veg Class	Diplopeltis huegelii	Unknown Veg Class	Grevillea preissii
Hydrocotyle lemnoides	4		1			Ellen Brook N.Res. Fresh water pools in S part of res.	SWAN COASTAL	CC	02/11/1990 0:00	ESTMT	4000			4000			Y			Pools of water		OD_SWAMP			CLAY	BROWN	PERMINUN		Melaleuca lateritia,Viminaria juncea	heathland 1-2m, 50-80%	Melaleuca lateritia	Unknown Veg Class	Viminaria juncea				
Jacksonia sericea	4		1			Lake Joondalup, Edgewater	SWAN COASTAL	LGA	15/11/1979 0:00		0			0			N																				
Jacksonia sericea	4		2			Star Swamp Reserve. Between Marmion Ave, Beach Rd, North Beach Rd and Hope St	SWAN COASTAL	LGA	15/06/1979 0:00		0			0			N																				
Jacksonia sericea	4		4	A		[PP Lot 805, previously 7898] W side of Joondalup Dr. 200 - 400 m S of Hodges Dr, Joondalup	SWAN COASTAL	PRI	27/12/1989 0:00		0			0			N				DRY	RI_DUNE	LIMESTN		SAND	YELLOW			Dryandra sessilis,Eucalyptus gomphocephala,Jacksonia furcellata,Eucalyptus marginata	open woodland 10-30m, 0.25-20%	Dryandra sessilis	Unknown Veg Class	Eucalyptus gomphocephala	Unknown Veg Class	Jacksonia furcellata	tall heathland >2m, 50-80%	Eucalyptus marginata
Jacksonia sericea	4		4	B		Between Joondalup Dr and Honeybush Dr, at 1.1 - 1.4 km S of Hodges Dr, Joondalup	SWAN COASTAL	NON	27/12/1989 0:00		0			0			N				DRY	RI_DUNE	LIMESTN		SAND	YELLOW			Dryandra sessilis,Eucalyptus gomphocephala,Jacksonia furcellata,Eucalyptus marginata	open woodland 10-30m, 0.25-20%	Dryandra sessilis	Unknown Veg Class	Eucalyptus gomphocephala	Unknown Veg Class	Jacksonia furcellata	tall heathland >2m, 50-80%	Eucalyptus marginata
Jacksonia sericea	4		4	C		[PP Lot 807, previously 7899] Between Joondalup Dr and Honeybush Dr, at 1.1 - 1.4 km S of Hodges Dr, Joondalup	SWAN COASTAL	PRI	27/12/1989 0:00		0			0			N				DRY	RI_DUNE	LIMESTN		SAND	YELLOW			Dryandra sessilis,Eucalyptus gomphocephala,Jacksonia furcellata,Eucalyptus marginata	open woodland 10-30m, 0.25-20%	Dryandra sessilis	Unknown Veg Class	Eucalyptus gomphocephala	Unknown Veg Class	Jacksonia furcellata	tall heathland >2m, 50-80%	Eucalyptus marginata
Jacksonia sericea	4		5	A		[Crown Reserve 43705], 500 m S of Burns Beach Rd at 3 km W of Wanneroo Rd. W side of the proposed route for the Northern Suburbs Railway	SWAN COASTAL	RAI	27/12/1989 0:00		0			0			N																				
Jacksonia sericea	4		5	B		700 - 900 m S of Burns Beach Rd at 3 km W of Wanneroo Rd. Between the proposed routes of the Mitchell Freeway and the Northern Suburbs Railway	SWAN COASTAL	MRD	27/12/1989 0:00		0			0			N																				
Jacksonia sericea	4		5	C		700 m S of Burns Beach Rd at 3 km W of Wanneroo Rd. E side of the proposed route for the Mitchell Freeway	SWAN COASTAL	MRD	27/12/1989 0:00		0			0			N																				
Jacksonia sericea	4		5	D		1 km S of Burns Beach Rd at 3 km W of Wanneroo Rd. E side of the proposed route for the Mitchell Freeway	SWAN COASTAL	MRD	27/12/1989 0:00		0			0			N																				
Jacksonia sericea	4		5	E		[Crown reserve 43705] 850 m S of Burns Beach Rd at 3 km W of Wanneroo Rd. W side of the proposed route for the Northern Suburbs Railway	SWAN COASTAL	RAI	27/12/1989 0:00		0			0			N																				
Jacksonia sericea	4		5	F		[Private Property lot 251] 1 km S of Burns Beach Rd at 3 km W of Wanneroo Rd. 200 m W of the proposed route for the Northern Suburbs Railway	SWAN COASTAL	PRI	27/12/1989 0:00		0			0			N																				
Jacksonia sericea	4		7	A		Hepburn Heights, Padbury. N of Hepburn Ave, E of O'leary Rd, and S of the Reservoir. Bushland Preservation Reserve	SWAN COASTAL	LGA	07/11/1990 0:00	ESTMT	750			750			N						LIMESTN			BROWN			Banksia attenuata,Xanthorrhoea,Macrozamia sp.,Acacia pulchella	low open woodland <10m, 0.25-20%	Banksia attenuata	Unknown Veg Class	Xanthorrhoea	Unknown Veg Class	Macrozamia sp.	low closed heathland 0.5-1m, >80%	Acacia pulchella
Jacksonia sericea	4		7	B		Hepburn Heights, Padbury. N of Hepburn Ave and E of the Reservoir. Bushland Preservation Reserve	SWAN COASTAL	LGA	07/11/1990 0:00	ESTMT	250			250			N						LIMESTN			BROWN			Banksia attenuata,Xanthorrhoea,Macrozamia sp.,Acacia pulchella	low open woodland <10m, 0.25-20%	Banksia attenuata	Unknown Veg Class	Xanthorrhoea	Unknown Veg Class	Macrozamia sp.	low closed heathland 0.5-1m, >80%	Acacia pulchella
Jacksonia sericea	4		9	A		N verge of Ocean Reef Rd and on both sides of Joondalup Dr, from the intersection with Wedgewood Dr southwood	SWAN COASTAL	LGA	26/03/1990 0:00	ESTMT	280			280			N					SLOPE	LIMESTN			BROWN			Banksia menziessii,Banksia attenuata,Acacia saligna	low open woodland <10m, 0.25-20%	Banksia menziessii	Unknown Veg Class	Banksia attenuata	closed forbland 0.5-1m, >80%		low closed heathland <0.5m, >80%	Acacia saligna
Jacksonia sericea	4		9	B		NW corner of Ocean Reef Rd and Joondalup Dr, Woodvale	SWAN COASTAL	PRI	15/05/1990 0:00	ESTMT	7200			7200			N					SLOPE	LIMESTN		SAND	BROWN			Banksia attenuata,Banksia menziessii,Gompholobium aristatum,Acacia saligna	low open woodland <10m, 0.25-20%	Banksia attenuata	Unknown Veg Class	Banksia menziessii	Unknown Veg Class	Gompholobium aristatum	low closed heathland 0.5-1m, >80%	Acacia saligna
Jacksonia sericea	4		10			Crown Reserve 50441. Warwick Woodland. Between Wanneroo, Beach, Erindale and Warwick roads	SWAN COASTAL	LGA	17/10/1990 0:00	ESTMT	1000			1000			Y			Eucalyptus low woodland over Banksia attenuata low woodland A	DRY				SAND	BROWN			Eucalyptus marginata,Banksia attenuata,Xanthorrhoea preissii,Stirlingia latifolia	Unknown Veg Class	Xanthorrhoea preissii	Unknown Veg Class	Stirlingia latifolia	open woodland 10-30m, 0.25-20%	Eucalyptus marginata	woodland 10-30m, 20-50%	Banksia attenuata
Jacksonia sericea	4		12	A		Sandover Park, E of Dwyer Crt	SWAN COASTAL	LGA	04/04/1990 0:00	ESTMT	100			100			N					SLOPE			SAND	BROWN			Banksia attenuata,Xanthorrhoea sp.,Macrozamia sp.,Allocasuarina sp.	tall heathland >2m, 50-80%	Banksia attenuata	Unknown Veg Class	Xanthorrhoea sp.	Unknown Veg Class	Macrozamia sp.	Unknown Veg Class	Allocasuarina sp.
Jacksonia sericea	4		12	B		Karrinyup Country Club	SWAN COASTAL	PRI	04/04/1990 0:00		0			0			N					SLOPE			SAND	BROWN											
Marianthus paralius	T	EN	2			Iluka Coastal Reserve 47831, Joondalup. Plants are located at approx. 575m and 870m south of Ocean Parade along the pedestrian path. Plants occur approx. 20m and 5m west of the dual-use path respectively	SWAN COASTAL	LGA	26/10/2006 0:00	ACT_IND	9			0	PLANTS		Y	HEALTHY	EXCELENT	Coastal limstone heath	DRY	SL_CLIFF	LIMESTN		SAND	WHITE			Melaleuca cardiophylla, Thomasia triphylla, Templetonia retusa, Spyridium globulosum, Olearis axillaris, Acanthocarpus preissii, Scaevola crassifolia	heathland 1-2m, 50-80%							
Marianthus paralius	T	EN	3			'Kinsale Park', Crown Reserve R42931. Pop located approx 30m west from the end of Duncannon Rise	SWAN COASTAL	LGA	12/06/2013 0:00	ESTMT	4	0	0	0	CLUMPS	5		HEALTHY			MOIST	RIDGE	LIMESTN	GRVL_30	SAND	GREY	WLL_DRND			shrubland 1-2m, 50-80%	Acacia xanthina	shrubland 1-2m, 50-80%	Melaleuca cardiophylla				
Meionectes tenuifolia	3		4			Sawpit Conservation Area, Sawpit and Maralla Rd, Bullbrook. Lot 3 Lexia Ave	SWAN COASTAL	PRI	03/11/1995 0:00		0			0			N			Hyalosperma humifusus, Hyalosperma cotula, Lepidosperma longitudinale		FLAT	LIMESTN		CLAY	BROWN			Melaleuca rhaphiophylla,Acacia saligna,Aira,Siloxerus humifusus	tall heathland >2m, 50-80%	Melaleuca rhaphiophylla	low sparse tussck grsslnd <0.5m, 0.25-20%	Acacia saligna	forbland 0.5-1m, 50-80%	Aira	low sparse sedgeland <0.5m, 0.25-20%	Siloxerus humifusus
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	1			One Tree Hill in the centre of CR 25253 (Quarry). 250m West of Wanneroo Road	SWAN COASTAL	LGA	08/07/2014 0:00	PART_CNT	50			0	PLANTS	5364		HEALTHY	EXCELENT	Almost on the top of the ridge, slightly SW - W aspect	MOIST	RIDGE	LIMESTN		FSA_LOAM		WLL_DRND	SW	Closed tall scrub of Melaleuca systena, M. Sp Wanneroo, M. sp Wanneroo x systena, M. huegelii, over Low shrubland of Calothamnus quadrifidus, Banksia sessilis var cygnorum, Leucopogon parviflorus, Xanthorrhoea preissii, Templetonia retusa over low open s								
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	2			Lot 8 Wattle Ave, Nowergup. Mid and upper slopes of the limestone ridge	SWAN COASTAL	PRI	07/04/2008 0:00	ESTMT	100			0	PLANTS	4022	Y		EXCELENT			OU_SLOPE	LIMESTN		SAND	BLACK			Melaleuca cardiophylla, M. sp., M. systena tall closed shrubland								
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	3	A		Lot 7 (136)Wesco Rd, Nowergup. SE quater of the NW section of this lot(630m S of Wesco Rd)	SWAN COASTAL	PRI	10/05/2017 0:00	ESTMT	15	1		0	PLANTS	100	N	HEALTHY	EXCELENT	Most of the plants occurred in: Tall open scrub of Melaleuca huegelii, Melaleuca sp Wanneroo with occasional Eucalyptus petrensis and Melaleuca systena, over open low heath of Acacia alata var. tetrantha, Thomasia triphylla over open sedgeland/herbland	DRY	OU_SLOPE	LIMESTN		SAND	GREY	WLL_DRND		Banksia sessilis, Xanthorrhoea preissii, Conostylis pauciflora subsp. euryrhipis (P4), Conostylis candicans, WEEDS: Sonchus oleraceus, Urospermum picroides, Asparagus asparagoides								
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	3	B		CR 27590 in the W quater of the Reserve on the S end of the mine pit edge. 380mS of the Northextent of the Reserve and 1km W of Hopkins Rd	SWAN COASTAL	RDL	27/11/2013 0:00	ACT_IND	1			0	PLANTS	4	N		EXCELENT	NOTE - Fire information was taken from Corporate Mapping Data. Not confirmed in the field			LIMESTN														
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	3	C		CR 27590 in the E quater of the Reserve on the E edge of the mine. 180m S of the N extent of the Reserve and 325m W of Hopkins Rd	SWAN COASTAL	RDL	30/09/2009 0:00	ACT_IND	41			0		2047	N		EXCELENT				LIMESTN														
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	4	A		SF 65, adjacent to the bondary of 135 Wesco Rd, 910m N of Wesco 670m W of Hopkins Rd. 30-160m NW of the current mine pit	SWAN COASTAL	CC	26/11/2013 0:00	PART_CNT	46			0	PLANTS	18794	N		EXCELENT	NOTE - Fire information was taken from Corporate Mapping Data. Not confirmed in the field			LIMESTN														
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN	4	B		SF 65 670m NE of the Hopkins and Wesco intersection on the 'island' of vegetation in the middle of the mine pit	SWAN COASTAL	CC	06/12/2013 0:00	ESTMT	20			0	PLANTS	475	Y		EXCELENT		DRY	RIDGE	LIMESTN		SAND		WLL_DRND		Occ Eucalyptys argutifolia (pop7a) over Closed heath of Melaleuca huegelii, Melaleuca systena and Melaleuca sp Wanneroo, Banksia sessilis var. cygnorum, Acacia lasiocarpa, Hemiandra pungens, Acacia alata var. tetrantha with Lomandra maritima and Cassyth								
Sarcozona bicarinata	3		1	A		Coastal Reserve 47831 [previously 20561]. 500 metres south at end of Burns Beach Rd [intersection with Ocean Pde]	SWAN COASTAL	LGA	04/08/1992 0:00		0			0			N			White sand over yellow sand					SAND	WHITE			Banksia menziesii	forbland 0.5-1m, 50-80%	Banksia menziesii						
Sarcozona bicarinata	3		1	B		[Crown Reserve 45122]. 500 metres south at end of Burns Beach Rd [intersection with Ocean Pde]. (On Locn M1722)	SWAN COASTAL	LGA	04/08/1992 0:00	ESTMT	0			25			Y			White sand over yellow sand					SAND	WHITE			Banksia menziesii	forbland 0.5-1m, 50-80%	Banksia menziesii						
Stylidium longitubum	4		1			W side of Railway Parade. 0.5km N of Apple Rd, Upper Swan	SWAN COASTAL	AGR	12/11/1989 0:00		0			0			Y								SND_CLAY					forbland 0.5-1m, 50-80%							
Stylidium longitubum	4		2			Twin Swamp Wildlife Sanctuary Ellen Brook	SWAN COASTAL	CC	28/12/1971 0:00		0			0			N				MOIST	OD_SWAMP								forbland 0.5-1m, 50-80%							
Stylidium longitubum	4		4			West of Vines golf course. Ellenbrook area	SWAN COASTAL	UNKNOWN	30/10/1992 0:00		0			0			N													forbland 0.5-1m, 50-80%							
Stylidium longitubum	4		16			SPC Lot.1974. SE end off Perry Rd, Lake Pinjar Bushland (Sys.6 Area M8, Bush Forever 382). Lake Pinjar, in Sys.6 Update quadrat pinj03	SWAN COASTAL	SPC	10/11/1994 0:00		0			0			N					FL_PALU			CLA_LOAM	BROWN	SEASINUN		Calothamnus lateralis,Perischelia glomulifera	Unknown Veg Class	Calothamnus lateralis	Unknown Veg Class	Perischelia glomulifera				
Stylidium longitubum	4		21			SPC Lot 99, Whiteman Park	SWAN COASTAL	SPC	08/12/2005 0:00		0			0			N			DomSp: Deyeuxia quadriseta, Drosera gigantea subsp. gigantea		OD_SWAMP							Melaleuca rhaphiophylla,Villarsia albiflora,Melaleuca preissiana,Meeboldina scariosa	Unknown Veg Class	Melaleuca rhaphiophylla	Unknown Veg Class	Villarsia albiflora	Unknown Veg Class	Melaleuca preissiana	Unknown Veg Class	Meeboldina scariosa
Stylidium maritimum	3		13			WA Development Corp. Lot.102. Small dune, Alkinios. Close to edge of recent large firebreak presumably installed for fire	SWAN COASTAL	PRI	09/10/2004 0:00	ESTMT	100			100			Y			more illegible DomSp on RFRF	DRY	CREST	LIMESTN		SAND	GREY			Melaleuca cardiophylla,Melaleuca huegelii,Dryandra sessilis,Calothamnus quadrifidus	Unknown Veg Class	Melaleuca cardiophylla	Unknown Veg Class	Melaleuca huegelii	Unknown Veg Class	Calothamnus quadrifidus	Unknown Veg Class	Dryandra sessilis
Tripterococcus sp. Brachylobus (A.S. George 14234)	4		17			Private Property - WAPC Owned. SE end off Perry Rd, Lake Pinjar Bushland (System 6 Area M8, Bush Forever 382), Lake Pinjar, in System 6 Update quadrat pinj01	SWAN COASTAL	PRI	10/11/1994 0:00		0			0			N			VegClass:Open Herbs		FL_PALU			CLA_LOAM	BLACK	SEASINUN		Lepyrodia muirii,Baumea articulata,Baumea vaginalis	Unknown Veg Class	Lepyrodia muirii	Unknown Veg Class	Baumea vaginalis	Unknown Veg Class	Baumea articulata		

WA Herbarium Database Search

Taxon	Cons Code	Plant Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Acacia anomala	T	Grass-like, 0.5 m high. Multiple stems of grass-like shrub.	Hillside. Laterite.	Jarrah/Marri forest over scrub.			Jenkin's Road, Bullsbrook,	//
Acacia benthamii	2	Slender erect open shrub 70 cm high x 50 cm wide. In bud.	Slope above creek. Grey sand.	Degraded Tuart open woodland over Banksia low woodland.	scattered shrubs.		Bennett Brook, just S of Tonkin Highway	08/07/2007
Acacia benthamii	2	Spindly shrub, 1 m high x 0.5 m wide.	Consolidated sand dune (Quindalup - Spearwood Dunes boundary). Light brown sand, leaf litter over Tamala Limestone. Area burnt > 5 years ago.	Woodland of Banksia menziesii, B. attenuata, Eucalyptus marginata, Allocasuarina fraseri (FCT 28). Associated species: Hibbertia hypericoides, Jacksonia sternbergiana, Opercularia vaginata, Orthrosanthus laxus var. laxus, Ricinocarpus glaucus, Schoenus c	2 plants only.		Hepburn Heights Bushland Padbury, N boundary	09/09/2013
Acacia benthamii	2						E [of] Wanneroo	23/09/1965
Acacia benthamii	2						East Wanneroo	23/09/1965
Acacia benthamii	2		Flat, sand.	Areas of degraded - modified remnant jarrah woodland and weed dominated areas.			Kingsway Sporting Complex, Hepburn Avenue, Madeley, City of Wanneroo	22/11/2005
Acacia benthamii	2						Wanneroo	/09/1975
Acacia benthamii	2		Sand.				Woodville (Almost surely Woodvale in W.A.: R.S. Cowan).	/09/1901
Acacia benthamii	2	Shrub, 1.3 m high.	Flat. Yellow brown sand.	Low open forest of Allocasuarina fraseriana, Banksia attenuata and B. menziesii over tall open shrubland of Xanthorrhoea preissii over low open heath of Hibbertia hypericoides and Acacia humilis over very open grassland/sedgeland of Mesomelaena pseudosty			Mineral lease M70/341 and M70/345 within Bush Forever Site 290, Nowergup, City of Wanneroo	12/10/2009
Adenanthos cygnorum subsp. chamaephyton	3	Prostrate mat like shrub.	Lateritic sandy loam. Roadside.			Abundance: Common, ca 10 plants.	8 km E of Muchea	13/11/1981
Amanita carneiphylla	3	Pileus up to 165 mm diameter, white, hemispheric when young applanate when mature, non-strate appendiculate margin, slightly viscid, no odour, context white, unchanging. Universal veil on the pileus: white, adnate, initially covering the whole pileus the	On Karrakatta sand. Emerging from deep sand.	Degraded Banksias woodland. Species of plants nearby: Jacksonia furcellata.	3 collected.	Microscopic character details housed with specimen. Gill piece taken for sequencing 27.1.13. - E. Davison.	Caversham	15/06/2002
Amanita fibrilopes	3		In sand, with litter.	In degraded bushland, nearby Melaleuca preissiana.			Whiteman Park	18/06/2006
Amanita preissii	3	Cap: 32 -59 mm, convex to planar, largest specimens have shallow central depressions. Surface dry, white to ochre/cinnamon with irregular flat scraps of universal veil over it, these are densest at the centres of the caps, but there are none on the large		Mixed introduced plants and grasses interspersed with gum trees.			In park area bounded by Beach Road, Wanneroo Road, Glenfinnan Court and Inveraray Crescent in Hamersley	30/05/2010
Amanita preissii	3	The cap was 71 mm in diameter and planar in shape. It was white in colour with pale cinnamon scurf to thin patches of universal veil over it. The cap margin was smooth and slightly appendiculate. The gills were succeeding to free, closely spaced with at	Growing in sandy soil.		single fruiting body.		Lightning Swamp	08/07/2007
Amanita preissii	3	1. strong characteristic cauliflower odour; 2. pileus occasionally with light ochraceous-buff colour but dominantly white, white throughout certainly when young, light ochre-buff discolouration also occurring in context of stipe and bulb in age; context	Jarrah / Banksia woodland. Eucalyptus marginata, Banksia sp.			A diagnostic description provided by E.M. Davison is housed with this specimen.	Warwick Urban Bushland (Open Space), Warwick	01/07/2001
Amanita preissii	3	1. Conspicuous napiform bulb with marginate edge; 2. lamellar edges conspicuously white-fimbriate; 3. fruitbody white throughout except bulb with few ochracous or pale salmon stains; 4. spores elliptic, amyloid. Mode of Life: unknown Odour: strong caulif	Deeply in ground.	Jarrah / Banksia woodland. Eucalyptus calophylla, E. marginata, Banksia sp.	solitary.	A diagnostic description provided by E.M. Davison is housed with this specimen.	Warwick Urban Bushland (Open Space), Warwick	01/07/2001
Anigozanthos humilis subsp. chrysanthus	4	In flower.	Crest - upper slope with grey sand.	Associated species: Pinus pinaster, Eucalyptus todtiana, Adenanthos cygnorum, Nuytsia floribunda, Alexgeorgea nitens, Hibbertia subvaginata, Scholtzia involucrata.		Condition of population: healthy. Potential threats: mining.	Gnangara pine plantation	16/09/2005
Anigozanthos humilis subsp. chrysanthus	4	Perennial herb, 0.3 m high x 0.2 m wide. Flowers yellow.	Slope with white to grey sand. Underlying geology: Bassendean Dune System.	Eucalyptus todtiana isolated mid mallee trees over Banksia attenuata, Banksia menziesii and Nuytsia floribunda sparse low woodland over Verticordia nitens, Beaufortia elegans. Jacksonia floribunda.	2 plants.		W of St Patrick Road, Ellenbrook	24/09/2014
Anigozanthos humilis subsp. chrysanthus	4	Perennial herb, 0.3 m high x 0.2 m wide. Flowers yellow.	Slope with white / grey / yellow sand. Underlying geology: Bassendean Dune System.	Banksia attenuata and Banksia menziesii low woodland to sparse low woodland over Calytrix fraseri (Ellenbrook form), Verticordia nitens and Beaufortia elegans sparse mid shrubland over Alexgeorgea nitens and Desmocladus flexuosus sparse low rushland.	2 plants.		W of Beechboro Road North, S of Baal Street, Cullacabardee	24/09/2014
Austrostipa mundula	3			Tuart woodland.			Yanchep Road,	/08/1963
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Shrubs to 1.6 m, the branches somewhat layered. Petals white. hypanthium reddish.	Sand over limestone.	Tuart woodland.	frequent.		Star Swamp Bushland Reserve, on track E of Mary St, Marmion	27/12/2009
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Erect shrub 1 m high x 1 m wide.	Limestone outcrop/ridge. Yellow sand. Sand derived from Tamala Limestone - Spearwood Dune System. Limetone. Burnt 5+ years.	Heath thickets in good condition. Banksia sessilis var. cygnorum, Spyridium globulosum, Acacia rostellidera, Calothamnus quadrifidus, Melaleuca systena, Hibbertia hypericoides, Lechenaultia linarioides, Conostylis candicans subsp. candicans, Pelargonium	widespread on limestone, 100+ plants.		Edgewater Quarry, bound by Joondalup Drive, Treetop Avenue and Regatta Drive, City of Joondalup	17/09/2012
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Erect shrub ca 2 m high. Petals white, pink-tinged underneath, with a deep pink band across the base; sepals pink; centre green or yellow.	Growing in sand with outcropping limestone on the upper W slopes of a limestone hill.			Abundance: Only 2 plants.	State Housing area S of Wittington Avenue and W of Cromford Way, Carine	27/06/1982
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Open shrub 1 m high. Flowers white.	Soil - sand (dry).				Trichet Road, Wanneroo	09/12/1981
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1		Yellow sand over limestone sea cliffs.				North Beach	/12/1957
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Tall compact-straggly shrub, 2 m high. Flowers white.	Grey sand. Hill side.	Banksia woodland.			Trischett Road, SW of Jandabup Lake, Wanneroo	21/12/1981
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1			Banksia woodland with scattered jarrah and tuart, tuart woodland, paperbark woodland over ephemeral wetland, various shrublands.			N of Mary Street, Star Swamp Bushland Reserve, North Beach,	05/03/1986
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Shrub 1.8-2 m high, flowers white.	Limestone.				Neerabup Park	21/10/1970
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1			Banksia woodland with scattered jarrah and tuart, tuart woodland, paperbark woodland over eohemeral wetland. various shrublands.		B7.	Star Swamp Bushland Reserve, North Beach,	10/02/1986
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1						Lot 5, Peasholm Street, Scarborough	//1982
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1			Banksia woodland with scattered jarrah and tuart, tuart woodland, paperbark woodland over ephemeral wetland, various shrublands.	common in northern part of the reserve, especially in more open Tuart woodland.		Star Swamp Bushland Reserve, North Beach,	/01/1986
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1						Wanneroo	/11/1901
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Upright shrub to 2 m. White flowers.	Flat, sandy soil. Limestone.	Vegetation dominated by Banskia sessilis and Baeckea sp.	extensive population, 2307 plants recorded.		Neerabup, to S of Water Corporation's treatment plant	26/09/2017
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Upright shrub to 2.5 m. White flowers.	Moderate east-facing slope. Yellow grey sand.		120+ plants.		City of Wanneroo. Ca. 300 m W of Wanneroo Road, ca. 2.5 km N of the intersection with Romeo Road	09/11/2017
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	1	Upright shrub to 2 m. White flowers.	Flat, sandy soil.	Banksia woodland.	7 plants.		Nanika Park, along Nanika Crescent, Neerabup	28/09/2017
Caladenia huegelii	T						Gnangara,	19/09/1945
Caladenia huegelii	T	Orchid 0.6 m high x 0.1 m wide.	Plain. Organic litter, grey sand over sand.	Low Forest A. Banksia menziesii, B. attenuata.	occasional.		Lightning Swamp, Malaga	04/09/2000
Calectasia elegans	2	Herbaceous perennial shrub ca 40 cm x 50 cm in height with multiples stems and stilted roots. Flowers blue and fading to white.	On gentle slope above dampland, deep grey quartz sand. Last fire ca 20-30 years ago.	Banksia menziesii - Banksia attenuata - Banksia woodland (30-50% cover < 6m in height) over Regelia inops (2-10% cover <1.2 m in height) mixed low shrubs (10-30% cover <0.5 m in height) rushes, sedges, perennial monocots (10-30%) and herbs-grasses (2-10	only two plants found.		ca 300 m E of Perry Road in Chitty Road bushland (Bush Forever Site No. 398), Pinjar (City of Wanneroo)	08/11/2005
Calectasia elegans	2	Small compact shrub to 30 cm high and 30 cm wide. mature fruit present.	Flat to gentle slope. Grey sand.	With Banksia attenuata, Banksia menziesii, Stirlingia latifolia.			Ca 300 m E of Perry Road within Chitty Road Nature Reserve. Pinjar, City of Wanneroo	11/12/2008
Calectasia elegans	2	Erect perennial subshrub to c. 45 cm high. Typical purple flower with red anthers; still roots present; plants in full flower.	Flat plain with deep grey sand. Long unburnt area.	Low Banksia woodland with moderately dense vegetation. Associated species: Banksia spp., Stirlingia latifolia, Melaleuca spp., Eremaea spp., Hibbertia spp., Leucopogon spp.	several populations in this vicinity of 2 or 3 plants.		Melaleuca State Forest, ca 380 m W of powerline track, ca 2.7 km S from the intersection of Neaves and Gallagher Roads	16/09/2008
Calectasia elegans	2	Erect perennial subshrub to c. 45 cm high. Typical purple flower with red anthers; still roots present; plants in full flower.	Flat plain with deep grey sand. Long unburnt area.	Low Banksia woodland with moderately dense vegetation. Associated species: Banksia spp., Stirlingia latifolia, Melaleuca spp., Eremaea spp., Hibbertia spp., Leucopogon spp.	several populations in this vicinity of 2 or 3 plants.		Melaleuca State Forest, ca 170 m W of powerline track, ca 800 m S from the intersection of Neaves and Gallagher Roads	16/09/2008
Calectasia elegans	2	Small shrub.	Grey sand.	Associated species: Adenanthos cygnorum subsp. cygnorum, Jacksonia floribunda to 2.5 m, 20% cover, Beaufortia elegans to 1.7 m, 15% cover, Eremaea pauciflora subsp. pauciflora, Leucopogon conostephioides, Nuytsia floribunda to 0.9 m, 10% cover.	uncommon.		Gnangara - Moore River State Forest, Melaleuca Block, 10 m W of Walton Road, 190 m N from intersection of corner of Warbrook and Walton Road, 10.3 km SW from Bullsbrook, GSS site PC1C	11/09/2008
Calectasia elegans	2	Small shrub.	Grey sand.	Associated species: Banksia attenuata, Nuytsia floribunda to 5 m, 10% cover, Jacksonia floribunda, Adenanthos cygnorum subsp. cygnorum to 1.6 m, 5% cover, Verticordia nitens to 1.5 m, 2% cover.	uncommon.		Gnangara - Moore River State Forest, Melaleuca Block, 130 m E of St Patrick Road, 25 m S from intersection of corner of Warbook Road and St Patrick Road, 11 km SW of Bullsbrook, GSS site PC4A	11/09/2008
Conostylis bracteata	3	Loosely tufted herb, leaves in flattened fascicles, margins with white appressed to spreading plumose hairs.	Swale in undulating consolidated dunes, some outcropping limestone.	In coastal scrub of Dryandra sessilis, Acacia saligna, A. xanthina, Xanthorrhoea preissii, Banksia attenuata, Melaleuca acerosa.			Mullaloo, c. 1 km inland, recreation reserve W of intersection of Waltham and Gunida Streets	16/08/1986
Conostylis bracteata	3	Proliferous herb, leaves with hirsute, not spinescent margins.	On steep slope of consolidated sand dune.	Overlooking Blackboy Reserve, Acacia saligna scrub over dense low heath to 1m, on fringes of remnant tuart (Eucalyptus gomphocephala) woodland. Associated species include Xanthorrhoea and Banksia attenuata.			Vacant block, 47 Karalundie Way, Mullaloo, c. 1 km inland	29/03/1986
Conostylis bracteata	3	Perennial herb, flowers yellow.	Plain near lake. Grey sand.	Jarrah with Banksia attenuata, B. menziesii, Burchardia congesta, Hibbertia hypericoides. Acacia spp.. Ehrharta calycina.	occasional.		Remnant Banksia woodland (Block 9471), ca 2 km S of Burns Beach Road, E side of Lake Joondalup. Yellagonga Regional Park.	06/11/1997
Conostylis bracteata	3		Top of sand dune.				Mullaloo	19/11/1962
Conostylis bracteata	3	Loosely tufted herb to 80 cm diameter; leaf margins with white plumose appressed hairs <1 mm long; perianth 10-12 mm long, pale yellowish green outside, golden yellow inside tube, lobes cream inside, becoming golden yellow at base and near apex, conspicu	E slopes of a consolidated sand dune.	Low heath of Acanthocarpus preissii, Acacia lasiocarpa.		Rendered extinct by housing development on August 17.	Kallaroo, 25 km NNW of Perth; 50 m SSW of Juno Crescent on the verge of Dampier Avenue	16/08/1986
Conostylis bracteata	3	Tufted herb to 20 cm tall. Flowers yellow. Plants flowering at the time of collection. Leaves arranged into flattened, broadly fan-like clusters. The leaf margins elabrescent.	Grey sand, on mid-slope.	Acacia rostellifera and Melaleuca systena mid shrubland. Lomandra maritima low open herbs.	1 mature plant.	Project: 3536.	2 Quinns Road, Mindarie, within Bush Forever No 397	04/11/2015
Conostylis pauciflora subsp. euryrhipis	4	Tufted perennial.	Sand, secondary dunes.	Scaevola crassifolia, Lomandra maritima, Rhagodia baccata, Hardenbergia comptoniana, Threlkeldia diffusa, Hemiandra pungens, Acanthocarpus preissii.			Alkimos	01/03/2007
Conostylis pauciflora subsp. euryrhipis	4	Herb.	Dunes.	Acacia cochlearis and Melaleuca systena low open shrubland.			Alkimos, Perth	20/10/2016
Cyanicula ixioides subsp. ixioides	4						Upper Swan	/09/1913
Cyathochaeta teretifolia	3	Perennial herb up to 2 m tall, clumped.	On grey sandy clay on seasonally wet slope beside permanent lake.	In Melaleuca preissiana and Eucalyptus rudis Open Low Woodland A over Aotus gracillima and Astartea aff. fascicularis Heath A over Herbs, Very Open Tall Sedges and Open Low Sedges.			Site 02, Gnangara	//
Cyathochaeta teretifolia	3		Sandy loam.	Melaleuca preissania to 7.0 m, 10% cover, over Xanthorrhoea preissii, Banksia ilicifolia to 5.0 m, 20% cover, over Pultenaea reticulata, Astartea scoparia to 1.8 m, 10% cover, over Hypocalymma angustifolium to 0.7 m, 10% cover, over Mixed to 0.2 m, 10% co			Gnangara-Moore River State Forest, Melaleuca Block, 130 m W of a point 320 m N of intersection of Quicke Road and St Patrick Road, Bullsbrook, 13.8 km ENE of Wanneroo, GSS site 19B	26/10/2008
Cyathochaeta teretifolia	3	Rhizomatous sedge, clumped 1.5 m high.	Seasonal creek line.	Low open forest of Melaleuca preissiana. Growing with Astartea fascicularis, Axonis linearifolia. Viminaria juncea.	common locally.	(DPU 003)	Whiteman Park	03/08/1995
Cyathochaeta teretifolia	3	Perennial herb up to 2 m tall, clumped.	On grey sandy clay on seasonally wet slope beside permanent lake.	In Melaleuca preissiana and Eucalyptus rudis Open Low Woodland A over Aotus gracillima and Astartea aff. fascicularis Heath A over Herbs, Very Open Tall Sedges and Open Low Sedges.			Site 02, Gnangara	//
Cyathochaeta teretifolia	3	Tall grass like plant 1 m high.	In peat swamp.				8.38 km N along Galacher Road off Neeves Road	07/02/1980
Cyathochaeta teretifolia	3	Perennial herb up to 2 m tall, clumped.	On grey sandy clay on seasonally wet slope beside permanent lake.	In Melaleuca preissiana and Eucalyptus rudis Open Low Woodland A over Aotus gracillima and Astartea aff. fascicularis Heath A over Herbs, Very Open Tall Sedges and Open Low Sedges.			Site 02, Gnangara	//
Cyathochaeta teretifolia	3	Sedge, 0.6-1.6 m.	Lower part of floor of dampland complex.	Melaleuca preissiana, Banksia littoralis low open woodland over Melaleuca teretifolia high open shrubland over Melaleuca lateralis, Astartea aff. fascicularis shrubland to heath over Lepidosperma longitudinale, Baumea rubiginosa dense sedgeland. Dominant			Site ML29, N of Gnangara Road, NE section of Lot 47 Lexia Avenue, locality of Ellenbrook	21/08/1999
Cyathochaeta teretifolia	3	Tufted perennial herb to 1.5 m.	Edge of seasonal wetland, gentle slope, north aspect, dark brown loam over red sand with limestone, well drained.	Associated species: Eucalyptus calophylla.			Cardinal Drive Bushland (Bush Forever Site 23) approx. 200 m N Bordeaux Road (adjacent to System 6 Update quadrat vines01) Ellenbrook Bushland	03/11/1995
Cyathochaeta teretifolia	3	Sedge.	Site description: gently sloping to flat area.	Melaleuca preissiana, Banksia littoralis, low woodland to low open forest (patchy) over Pericalymma ellipticum var. ellipticum heath to closed heath over sedges.			Site ML36M ,N of Gnangara Road, SW side of Lot 47 Lexia Avenue, locality of Ellenbrook	06/09/1999
Cyathochaeta teretifolia	3	Tufted perennial herb, flowers straw colour.	Damp margin of lake, flat ground, grey sand with clay, poor drainage, wet during winter/spring.	Open Low Woodland A. Associated species: Melaleuca preissiana, Eucalyptus rudis.			E of Lake Gnangara in System 6 Update quadrat gnan02 (System 6 Area M8, Bush Forever Site 193)	27/10/1994
Cyathochaeta teretifolia	3	Sedge.	Site description: a thin strip at a change in slope where there has probably been seepage. Soil: has a deep humus layer.	Corymbia calophylla over Agonis linearifolia high open shrubland over Xanthorrhoea preissii open shrubland. Zantedeschia aethiopica (young) established here.			Site ML44A, N of Gnangara Road, SE side of Lot 47 Lexia Avenue, locality of Ellenbrook	28/09/1999
Cyathochaeta teretifolia	3	Grass like or sedge.		Low forest, Melaleuca preissiana, Astartea fascicularis, Hypocalymma aneustifolium. Banksia littoralis.			Gnangara Mound	02/12/2002
Dampiera triloba	3		Loamy sand.	Melaleuca priessiana, Corymbia calophylla to 9.0 m, 5% cover, over Astartea scoparia to 2.1 m, 25% cover, over Hypocalymma angustifolia to 1.0 m, 40% cover, over Patersonia occidentalis, Hypochaeris glabra, Trachymene pilosa to 0.7 m, 10% cover, Lepidosp			Crown Reserve 8399, Lake Gnangara Park, 30 m W towards lake from track, 900 m N of a point in the recreation area 630 m N of intersection of Gnangara Road and Alexander Drive Gnangara, 7.5 km SE of Wanneroo, GSS site GN1	24/09/2009
Dampiera triloba	3						Gnangara	/10/1945
Dampiera triloba	3	Erect perennial.	Loamy sand.	Melaleuca preissiana, Corymbia calophylla to 9 m, 5% cover, astartea scoparia to 2.1 m, 25% cover, Hypocalymma angustifolia to 1 m, 40% cover, Patersonia occidentalis, Hypochaeris glabra, Trachymene pilosa to 0.7 m, 10% cover, Lepidosperma striatum to 1.			Crown Reserve 8399, Lake Gnangara Park, 30 m W towards lake from track, 900 m N of a point in the recreation area, 630 m N of intersection of Gnangara Road and Alexander Drive, Gnangara, 7.5 km SE of Wanneroo, GSS site GN1	28/09/2008

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Darwinia foetida	T	Low, spreading shrubs to 0.6m x 1m, the leaves somewhat glaucous. Inflorescences inclined to nodding; bracts glaucous green tinged pinkish.	Moist flat; dark grey sand.	Melaleuca raphiophylla, Hypocalymma angustifolia, Acacia pulchella shrubland beneath marri, with invasion by blackberry, brazilian peppertrees, weedy grasses.	frequent - hundreds of plants.		Private property in corner of Neaves Road and Bingham Road, Bullsbrook	24/10/2010
Darwinia foetida	T	Low spreading shrub, 0.3 m x 0.3 m and 0.2 m high. Crowded angular leaves to 5 mm long, green. Terminal inflorescences, many flowered 'head', pale pink within pale green bracts.			frequent in a 70 m linear area.	Some very large sprawling plants in this population. Love and Veldt grasses are invading entire area.	C. 100 m N of Rutland Road, Bullsbrook, along unmade Almeria Parade Road Reserve, on the E side of the rail line	22/10/2015
Darwinia foetida	T	Perennial, prostrate compact shrub 0.5 m high x 0.5 m wide.	Palusplain Multiple Use Wetland. Grey black soil. Burnt Spring 2006.	Corymbia calophylla, Melaleuca rhaphiophylla, Hypocalymma angustifolium.	21-50 plants (25 alive, 22 dead)	Percentage of population in fruit 30%.	SW corner of Lot 200, Neaves Road, Bullsbrook	09/03/2007
Drosera occidentalis	4		Clayey sand soils.				Rutland road and Great Northern Highway junction, Bullsbrook	22/10/1987
Drosera patens	1						Lake Gnangarra	31/01/1992
Drosera patens	1						Pinjar Road, Wanneroo	19/11/1991
Drosera patens	1	Fibrous rooted perennial herb with a solitary, compact leafy rosette, 1.8-2.5 cm diam.	On the margin of swamps, lakes and winter wet depression in sandy soils.				NW shore of Lake Gnangarra	17/01/1998
Drosera x sidjamesii	1		Grows on the northern margins of lake.				Lake Gnangarra, Wanneroo	05/02/1985
Drosera x sidjamesii	1						Pinjar Road, Wanneroo	04/12/1984
Drosera x sidjamesii	1						Shores of Lake Gnangarra [Gnangara]	17/01/1998
Drosera x sidjamesii	1						Pinjar Road, Wanneroo	04/12/1984
Drosera x sidjamesii	1						Shores of Lake Gnangarra, N of Perth	17/01/1998
Drosera x sidjamesii	1	A natural hybrid, firbous rooted perennial herb.	On margins of swamps, lakes and winter wet depressions in sandy soil.				Northern shores of Lake Gnangarra	31/03/1992
Eleocharis keigheryi	T	Erect annually renewed sedge; flowers green.	Sumpland (claypan); clay grey/brown.	Sedges.	abundant in deepest area of claypan, in mown area of airfield.		SW side of Pearce Airforce Base (System 6 Area M15, Bush Forever Site 294) opposite in town area to E of the boundary road	20/09/1994
Eleocharis keigheryi	T	Tufted perennial herb, flowers inconspicuous.	Clay soil, under 6 inches water, dries in summer.		common.		Ellen Brook Tortoise Reserve, 21 miles N of Perth,	19/10/1978
Eleocharis keigheryi	T	Clumping grasslike sedge, green with yellow hairs. Height 20 - 30 cm.	Claypan with brown clay. Found in open water ponds.	Chorizandra enodis. Trees and shrubs 1-2 m.			Ellen Brook Nature Reserve, upper swan	12/10/2007
Eleocharis keigheryi	T	Clumping grass-like sedge to about 40 cm high. Green flowers with yellow hairs.	Seasonally inundated clay pan with brown clay.	Cotula coronopifolia, Triglochin sp., sedges and weed spp.	abundant in deepest section of claypan.		RAAF Pearce Aerodrome, Bullsbrook, population located on SW side of the airforce base in an open clay pan	17/09/2007
Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)	3	Erect annually renewed herb; flowers green/white/purple.	Dampland; grey sand.	Melaleuca shrubland.	locally common.		Wetland area to the N of quadrat Vines 01, W Vines residential area. Shire of Swan (Bush Forever Site 23)	03/11/1995
Eucalyptus argutifolia	T	Mallee to 2.5 m. Flowers white.	Slight slope/ridge. Grey/white sand over limestone.	With Acacia cyclops, Hakea prostrata, Lomandra maritima, rhagodia baccata, Spyridium globulosum.			Within Beaumarks Park, Mindarie. Approch population from Beaumarks Court as park is fenced at the back. Population faces Long Beach Promenade	08/01/2009
Eucalyptus argutifolia	T	Mallee to 2.5 m. Flowers white.	Slight slope/ridge. Grey/white sand over limestone.	With Acacia cyclops, Hakea prostrata, Lomandra maritima, rhagodia baccata, Spyridium globulosum.			Within Beaumarks Park, Mindarie. Approch population from Beaumarks Court as park is fenced at the back. Population faces Long Beach Promenade	08/01/2009
Eucalyptus argutifolia	T		ESE aspect. Lower ridgetop slope. Sheet sand/brown boulder. Completely open to treeless site.	Melaleuca huegelii, Xanthorrhoea preissii, Dryandra sessilis/nivea, Hakea trifurcata, Hibbertia hypericoides, Native wisteria.			Ridge State Forest, 260 metres along Hopkins Road, from junction of Wesco Road [Near Lake Pinjar].	06/08/1990
Eucalyptus argutifolia	T	Mallee to 3 m.	Dune slope, grey sand over limestone.	Mallee, Eucalyptus petrensis over heath.	rare in area.		Mindarie South, 30 km N of Perth	22/04/1991
Eucalyptus argutifolia	T	Mallee to 2 m high.	At the base of a limestone ridge. Grey sand.		ca. 6 plants.		City of Wanneroo. Ca. 600 m S of Carabooda Road and ca. 300 m NE of Water Corporation's Carabooda tank	07/11/2017
Eucalyptus argutifolia	T		Slight gully situation nestles between two limestone ridges. Sand/boulder/brown/ yellow/dry/limestone.	Completely open and treeless with dense scrubland. Dryandra's nivea/ sessilus, Hakea trifurcata, Melaleuca huegelii, Blackboys (Xanthorrhoea preissii), Templetonia retusa.	32 clumps.		Quarry Reserve 5204, 250 m from junction of Myrtle road and 380 m at 195 deg.	15/11/1991
Eucalyptus argutifolia	T		Slight gully situation nestled between two limestone ridges. Limestone/boulder/ sand/brown/yellow/dry.	Completely open & treeless with dense scrubland. Dryandra's nivea/ sessilus, Hakea trifurcata, Melaleuca huegelii, Blackboys (Xanthorrhoea preissii), Templetonia retusa.	32 clumps, undisturbed.		Quarry Reserve 5204, 250 m from the junction of Myrtle road and 380 m at 195 deg. to rare mallees	15/11/1991
Fabronia hampeana	2		Private property in depression between limestone outcrops with yellow sand. Potential threat by urban development. Last burnt summer 2001.	Banksia low open woodland with occasional Eucalyptus decipiens, Macrozamia riedlei, Acacia rostellifera and Hypocalymma angustifolium.		Condition of population: Healthy.	Lot 17 Marmion Avenue, Clarkson (along W boundary of the site), 34 km N of Perth CBD	12/01/2009
Fabronia hampeana	2	Fertile moss.	On trunk of Macrozamia.	Emergent large Banksia over Macrozamia, Hibbertia, Xanthorrhoea, grasses, weeds and thick Dryandra regrowth.			Between Neerabup National Park and developing suburb of Kinross, 28 km NNW of Perth	14/09/1994
Grevillea curviloba	T	Spreading shrub to 1 m.	Edge of seasonal wetland, gentle slope, N aspect. Dark brown loam over red sand with limestone, well drained.	Associated species: Eucalyptus calophylla.			Cardinal Drive Bushland (Bush Forever Site 23). c. 200 m N Bordeaux Road (adjacent to System 6 Update quadrat vines 01) Ellenbrook Bushland	03/11/1995
Grevillea curviloba	T		Grey sand.	Monoculture of Grevillea curviloba subsp. curviloba.			Lot 29 Maralla Road, North Ellenbrook	16/09/2019
Grevillea curviloba	T	Spreading shrub with prostrate vegetative growth and flowering/fruiting growth to 2 m. Bright green trifurcate foliage.	Low lying area of sandplain. Grey peaty sand over clay.	Cleared vegetation with weeds, grasses, Hakea sp., Melaleuca sp., Acacia sp.			Corner of Rutland and Railway Roads, S of Muchea townsite, on road and rail reserve W side	16/12/1998
Grevillea curviloba	T						Bullsbrook, Swan River	14/08/1900
Grevillea curviloba	T	Prostrate and erect shrub to 2 m. Flowers white.	Flats. Grey sand.	Banksia sp., Melaleuca sp,. weeds.			Occurs at the intersection of Brand Highway and Rutland Road, Muchea within the rail reserve. Plants occur on the NW and SE corners	06/01/2009
Grevillea curviloba	T	Shrub 1.5 - 1.8 m with white flowers and pinnate leaves.	In sand.				Bullsbrook	05/10/1972
Grevillea curviloba	T	Woody shrub to 3 m high. Erect branches. Mid pale green leaves, cream flowers.	Flat, near shallow seasonal creekline. Grey sand.	Shrubland/Sedgeland. Characteristic species: Hakea varia.			Ellenbrook,	15/02/2000
Grevillea curviloba	T	Prostrate to erect shrub 1 - 2 m high. White flowers.	Drainage line with grey sand over clay.	Tall open shrubland of Hakea varia, over open heath of Regelia ciliata, over herbland and weeds.	abundant.		NE corner of intersection of Rutland Road and Railway Parade, Bullsbrook	30/08/2012
Grevillea curviloba	T	Very large shrub over 2 m. White flowers.	Flat with dark brown loam.	Occasional Xanthorrhoea preissii and weeds including Watsonia, Couch grass, love grass, veldt grass.	occasional - 1 adult and 3 juveniles in area.		In railway reserve, 360 m S of Strachen Road, E of Railway Parade and W of railway line, Bullsbrook	21/09/2011
Grevillea curviloba	T	Perennial shrub, to 4 m high, to 10 m wide.	Riparian zone and within cleared paddock on low plain. Moist brown sand.	Eucalyptus rudis low forest over open scrub over very open low sedges. Corymbia calophylla, Melaleuca rhaphiophylla, Jacksonia furcellata, Xanthorrhoea preissii, Hakea prostrata, Hibbertia hypericoides, Lepidosperma longitudinale.	7 clumps, clonal.	Degraded habitat. New population.	Lot 9500 Maralla Road, The Vines. Plants occur in the riparian zone at the SE end of the property, c. 100 m N of Muirfield Way	30/06/2009
Grevillea curviloba	T	Erect shrub, 1.5 m tall with white cream flowers.	Drainage line, slope. Moist soil.	Associated species: Corymbia calophylla, Eucalyptus rudis, Xanthorrhoea preissii and Acacia saligna.	3 plants.	Vegetation condition: good.	Western bank of the Sawpit Gully Creek, Sawpit Gully Ellenbrook, c. 500 m N of the intersection of Roxburghe Drive and Tolladine Vista	16/09/2013
Grevillea curviloba	T	Open, erect shrub 3+ m high x 2+ m wide. Old mature plants, appeared heavily grazed. No lower branches. No pods.	Winter wet creek line. Moist, grey sand.	Open Scrub (very old). Associated species: Acacia saligna, Melaleuca rhaphiophylla, sedges, Xanthorrhoea preissii, Banksia menziesii.	common locally.		Maralla Road, Muchea, 7 km W from intersection with Railway Parade, S side of road,	09/09/1998
Grevillea curviloba	T	Prostrate vegetative branches and erect leafy flowering branches; up to 2.5 m high.	In semi-disturbed area. Deep sand, with a high water-table.	With Regelia ciliata, Conospermum triplinervium.		Abundance: frequent.	Near Muchea.	10/06/1976
Grevillea curviloba	T	Spreading shrub to 1.6 m with pinnatifid leaves, in early flower bud stage. Juvenile growth prostrate with broader leaf lobes than the mature upright leaves.	Flat, grey sand to sandy-loam, highly disturbed bushland corridor on rail and unmade road reserve.	Open Tall Shrubland of Acacia saligna over Open Shrubland of Xanthorrhoea preissii and Acacia ? cochlearis over African love grass, perennial Veldt grass and Cyathochaeta avenacea. Occasional Thysanotus ? patersonii and Hakea prostrata.	c. 120 plants in sometimes dense local patches, over a 230 m leneth.	Canker evident on many shrubs.	Rail reserve, E side, c. 210 m N of West Road rail crossing, Bullsbrook	06/09/2016
Grevillea curviloba	T	Perennial shrub, to 4 m high, to 10 m wide.	Riparian zone and within cleared paddock on low plain. Moist brown sand.	Eucalyptus rudis low forest over open scrub over very open low sedges. Corymbia calophylla, Melaleuca rhaphiophylla, Jacksonia furcellata, Xanthorrhoea preissii, Hakea prostrata, Hibbertia hypericoides, Lepidosperma longitudinale.	12 clumps, likely to be clonal.	Degraded habitat. New population.	Maralla Nature Reserve, The Vines (CR46874). Plants occur in riparian zone at the SE end of the reserve	30/06/2009
Grevillea curviloba	T	Perennial shrub, to 4 m high, to 10 m wide.	Riparian zone and within cleared paddock on low plain. Moist brown sand.	Eucalyptus rudis low forest over open scrub over very open low sedges. Corymbia calophylla, Melaleuca rhaphiophylla, Jacksonia furcellata, Xanthorrhoea preissii, Hakea prostrata, Hibbertia hypericoides, Lepidosperma longitudinale.	12 clumps, likely to be clonal.	Degraded habitat. New population.	Maralla Nature Reserve, The Vines (CR46874). Plants occur in riparian zone at the SE end of the reserve	30/06/2009
Grevillea curviloba	T	Upright shrub, to 2 m high. Variable width. White flowers.	Lower slope. Near to creekline. Flat. Grey loamy sand.	Occasional Acacia saligna over Shrubland of Grevillea curviloba and Xanthorrhoea preissii over Closed Grassland of mixed weed species dominated by Agrostis curvula and Ehrharta calycina. Associated species: Corynotheca micrantha, Burchardia congesta, Jac	ca 25 shrubs in one localised area.	Plants are in poor condition. Insects are having a secondary impact on the population which is stressed from weed competition and drying climate.	Ca 20 m S of Neaves Road along Railway Road, on the E side of the rail reserve, Bullsbrook	22/10/2015
Grevillea curviloba	T	Large shrub to 2 m with white flowers.	Near drainage line.	Occasional Banksia menziesii; over shrubland of Grevillea curviloba subsp. curviloba, Xanthorrhoea preissii, Acacia saligna; over closed sedgeland of Schoenus subfascicularis; over weeds.	occasional.	Leaves similar to G. vestita in this population, but leaf lobes sparsely tomentose with white hairs, not villous with rust coloured hairs as in G. vestita. Floral bracts deciduous, not persistent as in G. vestita.	Unnamed nature reserve (Maralla Road Nature Reserve) R 46875, 60 m S of Maralla Road, 1000 m E of Sawpit Road	21/09/2011
Grevillea curviloba	T	Shrub with white flowers.	Well drained flat ground, degraded habitat. Grey sand.	Tall open scrub of Acacia saligna and Jacksonia sp.; over open heath of Grevillea curviloba subsp. curviloba with occasional Xanthorrhoea preissii; over weeds of Eragrostis curvula. Watsona sp. and Poa sp.			Between Railway Parade and Almeria parade, E of the railway line, c. 230 m S of West Road railway crossing, Bullsbrook	30/08/2012
Grevillea curviloba	T	Shrub to 2 m. White flowers starting to emerge.	In riparian vegetation.	Open woodland of Melaleuca rhaphiophylla and M. preissiana; over Grevillea curviloba subsp. incurva and Macrozamia riedlei; over closed sedgeland of Schoenus subfascicularis (riparian zone) and weeds.	occasional - 1 plant only.		Maralla Road Nature Reserve (R46875), c. 75 m S of Maralla Road, c. 1 km E of Sawpit Road	17/08/2012
Grevillea curviloba	T	Shrub over 2 m high, in bud. Some plants prostrate.	Dark brown loam sand.	Tall open scrub of Acacia saligna with occasional Banksia littoralis, B. sessilis, Hakea varia; over open heath of Stirlingia latifolia, Dianella revoluta and weeds of Eragrostis curvula, Oxalis sp. Babiana sp., Asparagoides.	locally frequent.		Between Almeria Parade and the railway line, c. 700 m S of Strachen Road railway crossing, Bullsbrook	17/08/2012
Grevillea curviloba	T	Perennial shrub to 1.5 m in height, with white/cream flowers. Leaves divided with margins recurved.	Road verge, c. 1 m from edge.	Amongst planted non-endemics, including Leptospermum laevigatum and Eucalyptus spp. dominated by planted Eucalypts.	uncommon.	Individuals were flowering with immature fruits. Individuals were located on southern side of Cardinal Drive, c. 200 m from intersection with Vines Avenue. An additional two plants located at the intersection.	Cardinal Drive, The Vines, ca. 200 m W from intersection with Vines Avenue	14/09/2017
Grevillea sp. Ocean Reef (D. Pike Joon 4)	1	Erect, spreading shrub. To 1.5 m x 3 m.	Sand dune. Dry brown / grey sand.	Coastal sand scrub with Acacia, Banksia sessilis, Spiridium globulosum, Clematis, Calothamnus, Pelargonium, Dianella, Hardenbergia.	40 - 60 plants (D. Pike November 2008).		Ocean Reef Road, Ocean Reef	15/08/2012
Grevillea sp. Ocean Reef (D. Pike Joon 4)	1	Erect, spreading shrub - clonal. To 1.5 m x 3 m.	Sand dune / gully. Dry brown / grey sand.	Coastal sand scrub with Acacia, Banksia sessilis, Spiridium globulosum, Clematis, Calothamnus, Pelargonium, Dianella, Hardenbergia.	40 - 60 plants (D. Pike November 2008).	Does not appear to set fruit (D. Pike's observation).	Ocean Reef Road, Ocean Reef: between the boat harbour and Ocean Reef Road	06/09/2012
Grevillea sp. Ocean Reef (D. Pike Joon 4)	1	Dense, spreading shrub to 2 m high x 3 m wide. Plants in late flower.	Quindalup dunes. Dry, bare, light yellow-brown sand.	Tall shrubland. With Acacia rostellifera, Dryandra sessilis, Spyridium globulosum.	One apparently clonal population of 40-60 plants.		Ocean Reef, suburb of Perth	/11/2008
Grevillea sp. Ocean Reef (D. Pike Joon 4)	1	Compact perennial shrub 150 cm high x 200-300 cm wide.	Broad dune swails. Grey shallow sand. Numerous limestone boulders.	Acacia rostilifera, Conostylis sp., Tetraria octandra, Spyridium globulosum, Acanthocarpos preissii, Desmocladus flexuosus, Phyllanthus calycinus, Dianella revoluta, Lepidosperma sp., Banksia sessilis, Clematis sp., Hardenbergia comptoniana, Rhagodia bac	26-50 plants plus additional 6-10 juveniles within 40 m radius.		Bush Forever Site 325, bounded by Boat Harbour Quay and Ocean Reef Road in Ocean Reef	16/10/2013
Guichenotia tuberculata	3						Near Bullsbrook, between New Norcia and Perth	/09/1902
Haemodorum loratum	3	Bulbous herb. Inflorescence to 2 m, flowers green/brown, scented.	Lateritic loam.	Wandoo woodland.			20 km ESE Muchea.	13/11/1981
Hibbertia leptotheca	3	Low shrub.	Dunes.	Xanthorrhoea preissii mid open shrubland over Melaleuca systena low open shrubland.	5 plants.		Alkimos, Perth	20/10/2016
Hibbertia leptotheca	3		Outcrop, slope. Dry, red-brown-white, limestone.	Mixed low scrub. Melaleuca cardiophylla, Mel. huegelii, Diplopeltis huegelii, Grevillea preissii. Trvmalium ledifolium.	> 100 plants.		Alkimos - Eglinton proposed housing development	16/10/2005
Hibbertia leptotheca	3	Domed green shrub, to 30 cm x 40 cm. Flowers yellow, reflexed over sepals when in flower. In full flower.	Sea cliff. Grey-black sand over limestone.	Low Melaleuca cardiophylla closed heath.		Abundance: common.	Burns Beach; 26 km N of Perth	21/09/1990
Hydrocotyle lemnoides	4						Ellen Brook Nature Reserve	22/08/1989
Hydrocotyle lemnoides	4						21 mile peg Reserve Great Northern Highway [10 km S of Bullsbrook East]	/09/1963
Hydrocotyle striata	1	75 mm high x 300 mm wide.	Winter wet creekline. Light leaf litter on dark brown sandy humic loam. Fire history: < 5 years.	Eucalyptus rudis, Melaleuca rhaphiophylla, Banksia littoralis creekline. Associated with Lepidosperma longitudinale, Pteridium esculentum, Astartea fascicularis, Muehlenbeckia polybotrya.	Not frequent. Small patches in bare areas.		Whiteman Park, S of Whiteman Drive West	01/12/2012
Hydrocotyle striata	1	Spreading annual. Height: 5-10 cm.	Seasonally inundated depression within a Mound Spring. Moist, undulating slightly. Black peaty sand. Fire history: Autumn 1995.	Low Open forest of Melaleuca preissiana over Pteridium esculentum. With Cyathochaeta teretifolia (P3), Hibbertia perfoliata.	dense cover in localised ca 40 m x 30 m area. (Site not surveyed closely, plants maybe more widespread on Lot).	Collection made for identification as it had not been seen prior to removal of extremely dense cover of Blackberry initiated in 2012. Site is a Mound Spring of the Swan Coastal Plain threatened Ecological Community.	Lot 800, Pine Road, Bullsbrook. Land is vested within the Dept of Planning and Infrastructure and is adjoining Conservation Estate known as Neaves Road Nature Reserve	16/11/2016
Hydrocotyle striata	1	Prostrate annual herb, 6-30 cm in diameter. Leaves with shallow palmate lobing, glabrous, fleshy, up to 13 mm long by 16 mm wide. Stems fine, glabrous, occasionally rooting at the nodes. Flowers in tight orbicular umbels, petals cream, involucral bracts	Winter wet creekline on sandy soil.	Riparian woodland dominated by Melaleuca rhaphiophylla and Eucalyptus rudis. Associated with Astartea fascicularis, Boronia subsessilis, Lepidosperma longitudinale, Xanthorrhoea sp., Gahnia decomposita. Plants growing with other herbs such as Corybas rec	locally frequent in sheltered positions.		Whiteman Park, 300 m N of Whiteman Drive West	06/11/2016
Hypolaena robusta	4	Female. Rush, 40-65 cm.	Upper part of the crest of a quite tall dune. Soil: light greyish-brown sand with a pale grey surface in places and a thin litter layer elsewhere.	Banksia attenuata, Banksia menziesii low woodland over scattered Adenanthos cygnorum ssp. cygnorum over Conospermum stoechadis, Jacksonia densiflora open shrubland over Eremaea pauciflora ssp. pauciflora, Stirlingia latifolia, Astroloma xerophyllum. Scho			Site ML35, N of Gnangara Road, S side of Lot 47 Lexia Avenue, locality of Ellenbrook	01/09/1999
Hypolaena robusta	4	Male. Rush, 40-65 cm.	Upper part of the crest of a quite tall dune. Soil: light greyish-brown sand with a pale grey surface in places and a thin litter layer elsewhere.	Banksia attenuata, Banksia menziesii low woodland over scattered Adenanthos cygnorum ssp. cygnorum over Conospermum stoechadis, Jacksonia densiflora open shrubland over Eremaea pauciflora ssp. pauciflora, Stirlingia latifolia, Astroloma xerophyllum, Scho			Site ML35, N of Gnangara Road, S side of Lot 47 Lexia Avenue, locality of Ellenbrook	01/09/1999
Jacksonia gracillima	3	Perennial tufted herb with narrow leaves 10-40 cm long, with rose pink flowers.	Grey sand, on mid-slope with exposed limestone. Fire > 5 years.	Low open forest of Eucalyptus rudis and Melaleuca preissiana. Banksia attenuata shrubs. Tall shrubland of Gastrolobium ebracteolatum and Kunzea glabrescens. Sedgeland of Baumea preisii subsp. laxa.	1 mature plant.	Project: 3516.	The Roe Highway Extension area, ca 14 km S of Perth	09/10/2015
Jacksonia sericea	4	Spreading shrub to 0.5 m high. Stems and branchlets ridged. Inflorescence silky hairv. In bud and occasional flower.	Sandy flat, gradual slope.	Eucalyptus marginata open woodland over Banksia attenuata, B. menziesii low woodland A.		Abundance: abundandant on disturbed road verges. occasional else- where.	Warwick woodland - along Wanneroo, Beach, Erindale and Warwick roads	17/10/1990
Jacksonia sericea	4	Prostrate shrub, 50 cm x 1.5 m diam. Flowers orange-yellow; eye yellow.	Hilltop, sand over limestone.	Banksia low woodland.		Abundance: common.	Ocean Reef Road, Wanneroo, 30 km N Perth	20/01/1988
Jacksonia sericea	4	Prostrate shrub 0.1 m high, 1 m wide; sterile.	Side of Spearwood Dune, grey sand over deep yellow sand.	Banksia attenuata and B. menziesii woodland.	scattered.		Bushplan Site 463, ca 1 km W of Gnangara Road in bushland W of Sydney Road	15/06/1999
Jacksonia sericea	4			Banksia woodland with scattered jarrah and tuart, tuart woodland, paperbark woodland over ephemeral wetland, various shrublands.			Star Swamp Bushland Reserve, North Beach,	/09/1985
Jacksonia sericea	4	Multistem, prostrate shrub, 30 cm x 1.5 m daim. Flowers orange-yellow.	Flat, grey sand over sand.	Banksia woodland.		Abundance: common.	Trigg Dune Reserve No. 27471, Trigg; 20 km N Perth	02/12/1987

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Jacksonia sericea	4	Low spreading shrub to .3 m high. Brown pods.	In yellowish/brown sand on low ground.	In open woodland over low heath and disturbed areas, with Banksia attenuata, B. menziesii, Gomphlobium aristatum, Xanthorrhoea sp., Eucalyptus gomphocephalum.			NW corner of Ocean Reef road and Joondalup Drive, Woodvale	15/05/1990
Jacksonia sericea	4	Low spreading shrub 0.5 m high.	Highly disturbed.	Highly disturbed Tuart/Jarrah forest.			Lake Joondalup (Edgewater)	/11/1979
Jacksonia sericea	4	Flowers summer/autumn.		Banksia woodland with scattered jarrah and tuart, tuart woodland, paperbark woodland over ephemeral wetland, various shrublands.		Unburnt F2/3.	Star Swamp Bushland Reserve, North Beach,	17/07/1987
Jacksonia sericea	4		Slope/flat. Dry grey sand over limestone.	Eucalyptus marginata, Banksia attenuata, B. menziesii Woodland. Associated species: Banksia attenuata, B. grandis, Allocasuarina fraseriana, Dryandra sessilis, Calothamnus sp.		Condition of population: healthy.	Lot 21, Flynn Drive, Neerabup, Shire of Wanneroo	/07/2001
Jacksonia sericea	4			Banksia woodland with scattered tuart, jarrah and marri overstorey, tuart woodland, heath and paperbark wetland.		[Plot] B7.	Star Swamp Bushland Reserve, North Beach	23/05/1985
Jacksonia sericea	4	Shrub 30-60 cm high x 1 m wide. Perennial, prostrate, dense spreading. Flowers orange.	Hillside. Dry sand. Old soil disturbance.	Tuart, Banksia, Allocasuarina woodland.	over 50 plants, quite widespread.		Periwinkle Park, Periwinkle Road, Mullaloo	14/10/2002
Jacksonia sericea	4	Prostrate shrub to 0.1 m by 0.8 m. Flowers orange.	Sandridge; grey/white sand over limestone.	Low Scrub B.	scattered.		North Williamson Way in bushland in the Charles Riley Reserve, City of Stirling	11/10/1995
Jacksonia sericea	4	Low shrub.					Small remnant of Wanneroo road near Lake Neerabup	24/04/2001
Jacksonia sericea	4	Spreading shrub 0.4 m high x 1 m wide.	Gentle slope. Organic litter. Grey Bassendean sand.	Open Low Woodland A. Acacia saligna, Banksia menziesii.	occasional.		Fauna Rehabilitation Centre, E of Camboon Road and N of Reid Highway, Malaga	06/12/2000
Jacksonia sericea	4		Slope. Grey sand.	Disturbed area dominated by Adenanthos cygnorum, Jacksonia furcellata and Melaleuca preissiana. Associated species: Ehrharta calycina, Verticordia ? densiflora, Lyginia imberbis, Acacia stenoptera, Hypolaena exsulca, Thysanotus multiflorus.		Healthy population.	Near substation, W of Bullfinch Drive	02/11/2004
Jacksonia sericea	4		Well drained site on gentle slope with E aspect. Cream sand with pale yellow subsurface sand.	Banksia attenuata, B. menziesii, Allocasuarina fraseriana Low Woodland to Low Open Woodland with scattered emergent Eucalyptus marginata over species rich Shrubland over mixed Sedgeland, Herbland and Grassland.			Section KOON H in Koondoola Regional Bushland, Koondoola, bordered by Marangaroo Drive, Alexander Drive, Beach Road and Koondoola Avenue. Section is bordered on W by Koondoola Avenue and on SE by Water Corp Water Tower Boundary.	09/01/1999
Jacksonia sericea	4	Shrub perennial.	Flat, residential.	Parkland.		Potential threats from weeds, disease and recreational activities.	Heritage Park	10/11/2005
Jacksonia sericea	4			In open Banksia woodland of Banksia menziesii, B. grandis with Eucalyptus calophylla and Acacia saligna.			In centre of Shepherds Bush Reserve in Kingsley Park	24/10/1994
Jacksonia sericea	4	Spreading shrub 0.3 m wide with orange flowers.	Residential plain with grey sand.	Low trees and low shrubland with Eucalyptus marginata, Banksia attenuata, Adenanthos cygnorum, Xanthorrhoea preissii, Calytrix fraseri, Mesomelaena pseudostygia, Laxmannia squarrosa, Waitzia suaveolens, Corynotheca micrantha, Alexgeorgea nitens, Conosper	2 - 5.	Alien species: Gladiolus caryophyllaceus, Ehrharta calycina, Briza maxima, Pentaschistis airoides, Pelagonium capitatum, Ursinia anthemoides. Infestation area: 1 - 10 m2.	Directly N of Gnangara Road, Landsdale (approximately 17 km N of Perth)	12/11/2008
Jacksonia sericea	4	50 cm.	Slope. Recently burnt.	Woodland. With Eucalyptus marginata, Allocasuarina fraseriana, Banksia menziesii, Banksia attenuata, Ehrharta calycinus, Hibbertia hypericoides.	6-20 plants.		End of Carmignani Road in Gnangara	22/10/2007
Jacksonia sericea	4	Shrub 0.25 m high x 1.1 m wide. Spreading from centre, dense. Orange pea shaped flowers, yellow throat with red ring on standard petal. Grey hairy stems, no leaves. Pale green yellow narrow sepals.	Sand dune, flat inter-dune plain. Dry, ca 95% organic litter cover. Light grey sand.	Woodland, Eucalyptus marginata, Banksia attenuata, B. menziesii.	frequent.		Warwick Senior High School, Erindale Road,	14/11/1998
Jacksonia sericea	4	Shrub, 0.5 m high.	Gentle slope, slight ridge. Yellow brown loamy sand.	Tall open shrubland of Acacia rostellifera to 3 m over closed tall scrub of Banksia sessilis to 2.4 m over open shrubland of Xanthorrhoea preissii, Melaleuca systena and Hakea trifurcata to 2 m over low shrubland of Jacksonia sericea and Hibbertia hyperi	> 700 plants.		S of main track on ridge, mineral lease M70/013, Hopkins Road, Nowergup, City of Wanneroo	11/11/2010
Lecania turicensis var. turicensis	2		Coastal rocks, limestone.				Burns Beach, N of Perth	28/08/1988
Leucopogon maritimus	1					Field No. 166.	Burns - Mullaloo	27/06/1966
Leucopogon sp. Yanchep (M. Hislop 1986)	3	Low twiggy woody shrub, 15-20 cm, flowers white, sweet honey scent.	Low hill, grey sand over limestone.	Limestone heath.	scattered in area.		Neerabup [Lake] National Park; 35 km N of Perth	30/05/1990
Marianthus paralius	T		Well drained dry white sand. Limestone ridge. Fire history: long ago.	Melaleuca cardiophylla, Scaevola crassifolia, Olearia axillaris, Rhagodia baccata Closed Low Heath.		Condition of plants: moderate.	Dual use path & north of Silver Sands Drive, Joondalup	29/12/2010
Marianthus paralius	T	Prostrate shrub with red flowers.	Limestone cliff with dry, brown sand. Exposed limestone outcropping.	Dense Heath B. Coastal heath vegetation including Spyridium sp., Thomasia sp., Melaleuca sp., Scaevola sp., Acanthocarpus sp.	9 plants recorded.		Iluka foreshore reserve, Iluka R47831, plants are located approx 575 m and 870 m S of Ocean Parade along the pedestrian path	26/10/2006
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Slender erect open shrub, 2-3 m high x 1 m wide. In fruit, not in flower.	Limestone hill. Skeletal white loam over limestone.	Banksia sessilis / Melaleuca tall shrubland.	locally common.	Co-occurring with Melaleuca systena which is in full flower.	Wattle Avenue West, Wanneroo - Nowergup	28/08/2004
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Erect to spreading shrub to 1.5 m with yellow flowers.	Limestone ridge remnant within a mine pit.	Remnant.	occasional.		SF 65 670 m NE of the Hopkins and Wesco intersection on the 'island' of vegetation in the middle of the mine pit	06/12/2013
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Erect shrub 1 - 2.5 m x 2 m.	On fine sand to sandy loam soils with 30-70% outcropping limestone.	Closed tall scrub of Melaleuca systena, M. sp. Wanneroo, M. sp. Wanneroo x systena and M. huegelii, over low shrubland of Calothamnus quadrifidus, Banksia sessilis var. cygnorum, Leucopogon parviflorus and Templetonia retusa.	locally common.	Co-occurs with Melaleuca systena and M. systena x M. sp. Wanneroo. Population 1.	One Tree Hill (CR 25253), Nowergup	07/08/2014
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Slender erect single 2-3 m high and 1-2 m wide. Flowers pale yellow; in full flower.	Rugged limestone ridge. Mossy black sand.	Melaleuca cardiophylla, M. sp., M. systena tall closed shrubland.	dominant locally.		Wanneroo Shire Reserve, Wattle Avenue, Neerabup	23/12/2004
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Erect shrub 1-2.5 m x 2 m. Flowers yellow.	On well drained grey sand with 30-70% outcropping limestone.	Tall open scrub of Melaleuca huegelii, M. sp. Wanneroo with occasional Eucalyptus petrensis and Melaleuca systena, over open low heath of Acacia alata var. tetrantha, Thomasia triphylla over open sedgeland/herbland.	locally common.		SE corner of Lot 7 Wesco Road, Nowergup	28/11/2014
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Shrub to 2 m tall. Yellow flowers.	NE face of limestone hill. Soil: shallow yellow/brown sand.	Dense shrubland to 2 m. Associated species: Calothamnus sp., Hakea trifurcata, Grevillea preissii and Banksia sessilis.	>100.		W of Hopkins Road, NE of Wesco Road	17/01/2019
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Tall shrub to 2 m tall. Yellow flowers.	Hilltop and upper slopes. Soil: shallow brown sand.	Shrubland. Associated species: Thomasia sp., sedges, Hakea trifurcata, Grevillea preissii, Melaleuca systena, Banksia sessilis.	>1000.		Lot 7, S of Wesco Road. N of mine area	17/01/2019
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	Shrub, 2.5 m high. Flowers yellow.	Limestone ridge. Brown loamy sand.	Tall open scrub of Melaleuca huegelii and M. sp. Wanneroo (G.J. Keighery 16705) over open shrubland to 1.5 m of Melaleuca systena, Xanthorrhoea preissii and Acacia lasiocarpa over low open shrubland to 0.4 m of Grevillea preissii and Banksia nivea over v	40 plants.		Mineral lease M70/138, S of Wesco Road, Nowergup, City of Wanneroo	01/10/2009
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T		Hill slope. Yellow/brown sand.	Melaleuca shrubland. Associated species: Acacia alata var. tetrantha, Banksia sessilis, Melaleuca huegelii and M. systena.	1000+.		Lot 7 (north) Wesco Road, Nowergup	10/05/2017
Millotia tenuifolia var. laevis	2	Annual herb, 0.05 m high x 0.01 m wide. Flowers yellow.	Upper slope with grey sand. Underlying geology: Bassendean Dune System.	Banksia attenuata and Banksia menziesii low woodland over Eucalyptus todtiana sparse mid mallee woodland over Adenanthos cygnorum subsp. cygnorum sparse tall shrubland over Eremaea pauciflora var. pauciflora sparse mid shrubland over Hibbertia hypericoid			S of Maralla Road, Ellenbrook	24/09/2014
Millotia tenuifolia var. laevis	2	Small upright herb to 3.5 cm, white-yellow flowers and furry leaves and stems.	Gently inclined low dune, grey sand.	Low woodland of Banksia attenuata and B. menziesii over mid open shrubland of Allocasuarina humilis over low open shrubland of Hibbertia hypericoides.	uncommon.	Recorded in a quadrat.	Whiteman Park, ca. 2.4 km SE of the intersection between Alexander Drive and Gnangara Road	16/10/2018
Phlebocarya pilosissima subsp. pilosissima	3	Herb 15 cm.	Gentle slope to S at edge of a seasonal dampland. Light greyish brown sand with a pale grey (whitish) surface, a thin litter layer over parts (>half).	Banksia attenuata, Banksia ilicifolia low open woodland to low woodland over Regelia ciliata open scrub to closed scrub over Hypocalymma angustifolium open shrubland to open heath over scattered herbs and sedge of Dasypogon bromeliifolius and Hypolaena e		From site ML 18, Specimen ML18-12.	N of Gnangara Road, NE corner of Lot 46 Maralla Road, locality of Ellenbrook	20/08/1999
Phlebocarya pilosissima subsp. pilosissima	3	Herb, 15 cm.	Gentle slope to S at edge of a seasonal dampland. Light greyish brown sand with a pale grey (whitish) surface, a thin litter layer over parts (>half).	Banksia attenuata, Banksia ilicifolia low open woodland to low woodland over Regelia ciliata open scrub to closed scrub over Hypocalymma angustifolium open shrubland to open heath over scattered herbs and sedge of Dasypogon bromeliifolius and Hypolaena e		From site ML 18, Specimen ML18-13.	N of Gnangara Road, NE corner of Lot 46 Maralla Road, locality of Ellenbrook	20/08/1999
Pimelea calcicola	3	Shrub-like herb up to 18 inches high. Flowers pale mauve.		Heathland.			N of Wanneroo	16/10/1962
Pimelea calcicola	3	Shrub to 2.5 ft. Flowers light pink-white.	Sand-limestone.				Burns Beach Road (Quarry)	27/09/1968
Pimelea calcicola	3	Slender erect shrub, to 60 cm. Flowers deep pink to very pale pink. In full flower.	Low hill. Shallow grey sand over massive limestone.	Dryandra sessilis closed heath.		Abundance: Common in area.	Hepburn Heights; Wanneroo, 25 km N of Perth	07/11/1990
Pimelea calcicola	3	Shrub, erect 3 ft. Reddish pink flowers.					24 mile peg on Yanchep road, just S of lime quarries [ca 15 km S of Yanchep]	04/11/1964
Pimelea calcicola	3	Erect rounded, bushy shrub up to 1.5 m high. Flowers greenish at base and pale pink above, the anthers orange at first, becoming dark pink/purple.	On the summit of a limestone hill with yellow sand and exposed limestone.	Weedy, disturbed open woodland. Dominant species: Dryandra sessilis, a shrub up to 3 m high.			Cromford Way, S of Wittington Avenue, Carine (suburb of Perth)	10/10/1983
Pimelea calcicola	3	Erect rounded, bushy shrub up to 1.5 m high. Flowers greenish at base and pale pink above, the anthers orange at first, becoming dark pink/purple.	On the summit of a limestone hill with yellow sand and exposed limestone.	Weedy, disturbed open woodland. Dominant species: Dryandra sessilis, a shrub up to 3 m high.			Cromford Way, S of Wittington Avenue, Carine (suburb of Perth)	10/10/1983
Pimelea calcicola	3	Erect rounded, bushy shrub up to 1.5 m high. Flowers greenish at base and pale pink above, the anthers orange at first, becoming dark pink/purple.	On the summit of a limestone hill with yellow sand and exposed limestone.	Weedy, disturbed open woodland. Dominant species: Dryandra sessilis, a shrub up to 3 m high.			Cromford Way, S of Wittington Avenue, Carine (suburb of Perth)	10/10/1983
Pimelea calcicola	3	Rounded bushy shrub up to 1.5 m high. Flowers pale pink, the anthers becoming dark pink-purple.	On summit of limestone hill.	Weedy disturbed open shrubland dominated by Dryandra sessilis.			Cromford Way, Carine	30/09/1982
Pithocarpa corymbulosa	3					Field No. Y 64.	3 miles N of Pinjar Forestry Headquarters, Wanneroo	06/06/1963
Platysace ramosissima	3	Flowers cream.					32 mile peg, Great Northern Highway [ca 29 km SSW of Bindoon]	//
Poranthera moorokatta	2	Erect annual herb, 1 cm.	Flat to very slight depression on a broad flat dampland floor. Soil: surface light grey to grey, set clay with some coarse sand, thick white sand cover in some places. Belwo surface light grey-grey clay with some sand. Some litter in patches around shrub	Dominants: Melaleuca preissiana 4-13 +m 1-5% (varies); Calothamnus lateralis, Pericalymma ellipticum var. ellipticum 0.5-1 m >15%; Astartea aff. fascicularis 1-1.4 m <5%. Associated species: The more abundant species for this site were Phyllangium parado		Specimen ML48-8.	Site ML48, N of Gnangara Road, W part of Lot 47 Lexia Avenue, Locality of Ellenbrook	22/10/1999
Poranthera moorokatta	2	Annual herb, 0.05 m high x 0.05 m wide.	Dampland with brown / white peat / sand. Underlying geology: Bassendean Dune System.	Melaleuca preissiana mid woodland over Banksia littoralis sparse low woodland over Xanthorrhoea preissii and Taxandria linearifolia open tall shrubland over Hypocalymma angustifolium sparse low shrubland.	1 plant.		N of Fewson Turn, Ellenbrook	17/09/2014
Poranthera moorokatta	2	Annual herb, 0.05 m high x 0.05 m wide.	Slope with brown / white sand. Underlying geology: Bassendean Dune System.	Eucalyptus todtiana isolated mid mallee trees over Banksia attenuata, Banksia menziesii and Nuytsia floribunda sparse low woodland over Eremaea pauciflora var. pauciflora sparse mid shrubland over Hibbertia hypericoides, Hibbertia subvaginata and Scholtz	1 plant.		NW of Fewson Turn, Ellenbrook	19/09/2014
Poranthera moorokatta	2	Small herb, 1 cm high.	Crest of low dune with yellow sand (ant mounds). Greater than 10 years since a fire.	Banksia attenuata, Banksia menziesii, Allocasuarina fraseriana low woodland over Xanthorrhoea preissii open shrubland over Hibbertia hypericoides, Calothamnus sanguineus, Calytrix flavescens low shrubland over Mesomelaena pseudostygia scattered sedges.			Corner of Joseph Banks Boulevard and Woolly Drive, Banksia Grove, 33 km N of Perth CBD	25/10/2012
Poranthera moorokatta	2	Small erect annual herb to 2 cm, white flowers.	Very gently inclined plain, grey sand.	Low woodland of Banksia attenuata and B. menziesii over mid open shrubland of Xanthorrhoea preissii over low open shrubland of Eremaea pauciflora.	uncommon.	Recorded in a quadrat.	Whiteman Park near Cullacabardee, ca. 40 m S of Baal Street, ca. 155 m WSW of the intersection between Baal Street and Beechboro Road North	30/10/2018
Sarcozona bicarinata	3		Private property; limestone outcrops with dry white sand. Potential threat by urban development. Last burnt summer 2001.	Open Banksia sessilis heathland. Banksia sessilis, Opercularia vaginata, Scaevola crassifolia and Desmocladus flexuosus.	5 mature plants over 5 m squared.	Condition of population: Healthy.	Lot 17, Marmion Avenue Clarkson (NW corner of site near Marmion Avenue and Neerabup Road intersection) 34 km N of Perth CBD	12/01/2009
Sarcozona bicarinata	3	Herbaceous succulent 8 cm high and spreading to generally less than 30 cm across the ground. Leaves dull grey, green in colour; seeds brown and rough all over.	Grey sand over rocky limestone outcrops. Exposed sunny areas.	Edge of Dryandra sessilis (Parrot Bush) heathlands and cleared area for housing.		No evidence of recent fire but few plants (3 only) found on edge of bushland where the area has been cleared for housing development.	Iluka-Beaumaris Estate near Sales Office, 100 m N of Miami Beach Promenade, Location B (refer to map attached)	02/03/1997
Sarcozona bicarinata	3	Herbaceous succulent 8 cm high and spreading to generally less than 30 cm across the ground. Leaves dull grey, green in colour; seeds brown and rough all over.	Grey sand over rocky limestone outcrops. Exposed sunny areas. Fire approximately 12 months prior to collection. The fire most probably stimulates seed germination and opens up the very dense Dryandra heath providing a sunny environment for this species t	Dryandra sessilis (Parrot Bush) heathlands.		Abundance: this species is common throughout the fire burnt area but did not occur outside where the Dryandra sessilis formed closed dense heath nor did it occur in adjacent unburnt Banksia bushland.	Iluka-Beaumaris Estate (near Burns Beach), track off Burns Beach Road, Location A (refer to map attached)	02/03/1997
Schoenus capillifolius	3	Annual herb, in fruit.	Clay pan dry - some mud in deeper sections with live plants.				J. Martyn Reserve, 13 km N Midland	14/11/1980
Schoenus capillifolius	3	Aquatic herb. Growing submerged or on edges.	Winter wet claypan.	With Glossostigma sp., Hydatella sp. and Trithuria sp. surrounded by regenerating heath B of Melaleuca lateritica.		Abundance: several hundred plants.	Ellen Brook Nature Reserve, Upper Swan	02/11/1990
Schoenus griffinianus	4	Perennial sedge.	Soil: White sand. Topography/drainage: Well drained gentle SW facing slope. Geomorphology: Bassendean sands over guildford formation.	Vegetation: Banksia attenuata Open Low Woodland A over mixed Low Heath C over mixed Open Dwarf Scrub D over Lyginia barbata Very Open Low Sedges.			Melaleuca Park conservation area, N Cooper Rd, 12 km NE of Wanneroo (plot mela-8).	19/10/1993
Schoenus sp. Bullsbrook (J.J. Alford 915)	2	Delicate herb 15 cm high, flowers brown and green.	Low lyingflat, grey peaty sand over ? clay.	Herbs and low shrubs.	common.		Twin Swamps Nature Reserve, 8 km S of Bullsbrook	31/10/1986
Schoenus sp. Waroona (G.J. Keighery 12235)	3	Annual 2-5 cm, flowers green.	Winter wet flats, dark brown loam clay over clay.	Burnt low heath.	common.		J & B Martyn Reserve, 13 km N of Midland	31/10/1988
Stachystemon exilis	1	Upright shrub to 1 m by 0.3 m, buds and flowers.	Dry Flat, grey sand some humus, over humus and sand, well drained.	Open Scrub, Associated species: Adenanthos cygnorum.			Whiteman Park (Bush Forever Site 304, System 6 Area M13) in System 6 Update quadrat white07	19/10/1994
Stachystemon exilis	1		On grey sand, seasonally damp.	Marri Open Low Woodland A over Melaleuca sp. B and Hypocalymma angustifolium Dwarf Scrub C over Mixed Herbs.			Whiteman Park. Site White 05 (DEP System 6 Update)	19/10/1994
Stachystemon exilis	1	Slender small shrub, small white-yellow flowers and bright green narrowly lanceolate leaves with slightly recurved margins.	Very gently inclined plain, grey sand.	Low woodland of Banksia attenuata and B. menziesii over mid open shrubland of Xanthorrhoea preissii over low open shrubland of Eremaea pauciflora.	uncommon.		Whiteman Park near Cullacabardee, ca. 40 m S of Baal Street, ca. 155 m WSW of the intersection between Baal Street and Beechboro Road North	30/10/2018
Stenanthemum sublineare	2	Low erect shrub, 8 cm high x 4 cm wide. Flowers spent, few fruits evident.	Sand plain. Littered white sand.	Low Forest B (Muir 1977) with Banksia attenuata, Xanthorrhoea preissii, Calytrix flavescens, Patersonia occidentalis.	apparently quite common in relatively small area.		Melaleuca Park, W of Bullsbrook, ca 3 km N of Neaves Road along walk trail,	21/12/1997
Stenanthemum sublineare	2		Low rise on an undulating plain. Dry, grey sand. Unburnt for 20 + years.	Open Banksia attenuata/Banksia menziesii low woodland, over heath (Beaufortia elegans, Eremaea pauciflora subsp. pauciflora, Regelia inops) Caltyrix flavescens, Scholtzia involucrata, Bossiaea eriocarpa, Gompholobium tomentosum, Petrophile linearis, over	one plant.		Proposed Nerrabup Infiltration site, SE of Lake Pinjar, E of Wanneroo Golf Club, adjacent to Bush Forever site 398	17/11/2005
Stenanthemum sublineare	2	Low erect shrub, 10 cm high x 4 cm wide. Flowers greenish.	Sand plain. Littered white sand.	Low Forest B (Muir 1977) with Banksia attenuata, Xanthorrhoea preissii, Calytrix flavescens, Patersonia occidentalis.		Abundance: apparently quite common in relatively small area.	Melaleuca Park, W of Bullsbrook, ca 3 km N of Neaves Road along walk trail	27/10/1997
Stylidium longitubum	4	Annual herb, flowers pink, throat yellow.	Winter wet claypan.	Melaleuca lateritia shrubland; burnt.	abundant.		J. & R. Martyn Reserve, 13 km N Midland	03/10/1988

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Stylidium longitubum	4	Erect leafless herb with red succulent stems and pink flowers.	Recently dried muddy depression in swamp.				Twin Swamps Wildlife Sanctuary (Reserve No. A 27621) Ellen Brook - Bullsbrook area	28/12/1971
Stylidium longitubum	4	Flowers pink.	Seasonal Wetland, flat ground. Dark brown clay loam some peat, over ?clay. Poor drainage, wet during winter/spring.	Open Low Scrub A. Associated species: Astartea fascicularis.			SE end off Perry Road, Lake Pinjar Bushland (System 6 Area M8, Bush Forever 382). Lake Pinjar, in System 6 Update quadrat pinj 02	10/11/1994
Stylidium longitubum	4	Annual herb. Flowers pink, and laterally paired.	Grows in clayey sand, in small winter-wet depressions.	Under and around shrubs.			In a paddock on the W side of Railway Parade, 0.5 km N of Apple Road, Upper Swan	12/11/1989
Stylidium longitubum	4						Ellenbrook area, west of Vines golf course	30/10/1992
Stylidium maritimum	3	Flowers pink-mauve, throat white, outer petal surface white to pale pink, upper winged throat appendages pink, lower throat appendages white-red tipped, leaves 3 per papery sheath.	On limestone outcrops in crater-like depressions filled with black sandy soil.	Area surrounded by low coastal heath and open Banksia menziesii woodland.			Just N of the tavern on Wanneroo Road, Carabooda,	22/10/1995
Stylidium maritimum	3	Sedge-like herb to 0.4 m high. In fruit.	Limestone ridge with outcropping. Sandy soil.	Melaleuca huegelii and Melaleuca systena TEC.	ca. 35 plants.		City of Wanneroo. Ca. 700 m S of Carabooda Road and 200 m NE of Water Corporation's Carabooda tank	07/11/2017
Stylidium maritimum	3		Grey sand-loam, slope, ridge, limestone, private property.	Closed Tall Scrub of Melaleuca huegelii, Dryandra sessilis with occasional Spyridium globulosum.		Healthy population, in flower. Potential threat from clearing and weeds.	Lot 8 Butler Street, Butler, City of Wanneroo, Swan Coastal Plain	16/10/2007
Stylidium maritimum	3	Perennial tufted herb with narrow leaves 10-40 cm long, with rose pink flowers.	Grey sand, on mid-slope with exposed limestone.		1 mature plant.	Project: 3536.	2 Quinns Road, Mindarie, within Bush Forever No 397	04/11/2015
Stylidium maritimum	3	Herb.	Dune swale.	Banksia sessilis low open shrubland.	10 plants.		Alkimos, Perth	20/10/2016
Stylidium maritimum	3	Herb, 0.8 m high.	Limestone ridge. Brown loamy sand over limestone.	Tall shrubland of Melaleuca systena over open shrubland of Melaleuca huegelii and Acacia lasiocarpa over very open herbland of Desmocladus flexuosus. Associated species: Grevillea preissii.	15 plants.		Mineral lease M70/339, Nowergup, City of Wanneroo	02/10/2009
Stylidium paludicola	3		Sandy flats near winter-wet damplands.	Low woodland of marri and Banksia grandis over Baumea juncea sedgeland and mixed open heath adjacent to Melaleuca preissiana and Banksia littorea woodland.			Edith Cowan University campus, Joondalup, Perth	//2007
Stylidium paludicola	3	Herb to 1 m tall.	Peat based mound spring. Permanently wet site with water oozing from entire surface. Dips and mounds occur in peat layer.	With forest - woodland of Melaleuca preissiana over dense shrubland of Cyclosorrus interruptus, Pteridium esculentum, Agonis linearifolia, Astartea fascicularis, Isolepis prolifera, Lobelia alata, Burchardia sp.	occasional.		ca 950 m W of western end of Gaston Road in Bullsbrook	26/11/2007
Stylidium paludicola	3	Reed-like perennial herb 35-80 cm high, numerous scapes per plant; corolla lobes laterally-paired, bright pink, darker pink in bud; labellum pale pink with a pink terminal appendage; throat white, yellow to inside, glandular; anthers greenish-red fading	Winter-wet flat; brown sandy-clay.	Open Melaleuca preissiana woodland with dense Myrtaceous shrubs.	localised patch		Maralla Rd, E of Sawpit Road, Maralla Nature Reserve, N of Perth	31/10/2006
Stylidium paludicola	3	Multi-stemmed erect plant with pink flowers, white throat. Height to 90 cm.	Flat with moist grey sand.	With Acacia sp., Melaleuca preissiana and Leptospermum sp.	ca 50 plants.		Maralla Nature Reserve, Maralla Road, The Vines, 200 m E of Sawpit Road then 100 m S of gate	14/11/2005
Stylidium trudgenii	3	Perennial herb, 4-5 cm	Dampland - wetland. Peat, soggy.	Melaleuca preissiana (1.8) 5-7 m 1-2%; Astartea aff. fascicularis 1-1.8 m +/- 30% (more out of 10 x 10 m; to > 70%); Pericalymma ellipticum var. ellipticum 0.7 m < 5%; Meeboldina scariosa (ML49-1)0.5-1 m < 5%. Associated species: Stylidium mimeticum. Iso		From site ML49, Specimen ML49-11.	N of Gnangara Road, SW section of Lot 46 Maralla Road, locality of Ellenbrook	22/10/1999
Stylidium trudgenii	3	Perennial herb.	Floor of a dampland/wetland complex. Seasonally inundated? (probably for short period at most this year). Soil: dark grey (pale surface) sandy (little) peat.	Scattered Melaleuca preissiana, Banksia littoralis (shrubs), over Astartea aff. fascicularis heath. Associated species: Drosera pulchella, Drosera aff. pygmaea, Villarsia albiflora, Epilbema grandiflorum var. grandiflorum, Comesperma virgatum, patches of		Stylidium sp.Ellenbrook (M.Trudgen 49-11) in a localised patch about 5 m across of about 21 clumps.	Site ML50A, N of Gnangara Road, W part of Lot 47 Lexia Avenue, locality of Ellenbrook	01/12/1999
Stylidium trudgenii	3	Caespitose perennial herb. Flowers cerise laterally paired.	In black peaty soil on a winter wet swamp margin.			Specimens grown on in cultivation until anthesis then pressed for vouchers.	5 km N of Ellen Brook Estate	23/10/2000
Stypheliа filifolia	3		On brown sand on midslopes.	Woodland of Banksia attenuata, B. menziesii, B. ilicifolia over Heath dominated by Allocasuarina humilis.			Near Pinjar Powerstation	11/09/2007
Stypheliа filifolia	3						Melaleuca Park	11/06/1978
Stypheliа filifolia	3	Erect shrub to 50 cm.	Sandy soil.				8.38 km N along Galagher Road, Wanneroo	07/02/1980
Stypheliа filifolia	3	Erect shrub 60 cm high x 40 cm wide. Flowers white, strictly pendulous. Leaves patent. Plants single stemmed at ground level.	Coastal plain (Bassendean Sands). Dry, littered grey sand.	Banksia woodland with a few marri. Corymbia calophylla, Banksia attenuata, Regelia inops, Xanthorrhoea preissii.	very occasional (4-6).	Relatively low lying area.	Melaleuca Park, ca 4 km S of Wandoo Road on coastal plain track,	10/06/2001
Stypheliа filifolia	3	Erect, well branched shrub to ca 50 cm high. White flowers. Mostly in bud.	Flat, slope. Dry, white sand.	Banksia ilicifolia, B. menziesii, Nuytsia floribunda, Melaleuca - paper bark trees and sandplain shrubs including Scholtzia involucrata.	10+ scattered plants.		Warbrook Road, Bullsbrook, ca 200 m S from Wise Road then 100 m W	25/02/2006
Stypheliа filifolia	3	Erect shrub 0.4m.	Soil: Brown sand. Topography/drainage: Well drained flat. Geomorphology: Lagoonal deposits - bassendean dunes.	Vegetation: Eucalyptus calophylla, E. marginata Woodland over Xanthorrhoea preissii Heath B over Conostephium pendulum Dwarf Scrub D over Phlebocarya ciliata Open Herbs.			On Wandoo Rd S of Muchea - Eneabba powerline 11 km S Gingin airfield (adj. to plot pline-3)	21/10/1993
Tetraria sp. Chandala (G.J. Keighery 17055)	2	Sedge c. 50 cm tall with very narrow leaves and culms. Inflorescence loose and branched, with dark brown florets.	Grey brown peaty soil in a swamp.	Low open forest of Eucalyptus rudis and Melaleuca preissiana. Tall open shrubland of Astartea fascicularis and Kunzea glabrescens. Pteridium esculentum mid ferns. Sedgeland of Lepidosperma.	100 mature plants.	Project: 3516.	The Roe Highway Extension area, ca 14 km S of Perth	08/10/2015
Tetraria sp. Chandala (G.J. Keighery 17055)	2	Rhizomatous herb 1.6 m high, 1 m wide; flowers brown; fruits brown.	Mound spring, black peat over clay & humic sand.	Assoc. vegn.: Melaleuca rhaphiophylla forest over sedges.		Abundance: very common.	Property on W side of Neaves Road, Wanneroo	04/02/1997
Thelymitra variegata	2	Petals purple, spotted. Sepals orange, purplish in the centre, with reddish- purple spots. Column purple with orange wines.	On limestone hills towards the coast.			'Leopard Orchid'	Wanneroo	/09/1919
Tripterococcus sp. Brachylobus (A.S. George 14234)	4	Flowers yellow.	Seasonal Wetland, flat ground, black fine peaty clay loam sand, poor drainage, wet during winter/spring.	Open Herbs. Associated species: Lepyrodia muirii, Baumea articulata, Baumea vaginalis.			SE end off Perry Road, Lake Pinjar Bushland (System 6 Area M8, Bush Forever 382), Lake Pinjar, in System 6 Update quadrat pinj01	10/11/1994
Trithuria occidentalis	T	Annual herb, leaves red, flowers red, anthers purple-red.	In water, muddy open.		common.		J.R. & B. Martyn Reserve, Ellen Brook, 13 km N Midland	27/10/1982
Trithuria occidentalis	T	Reddish annual herb.	Slightly submerged clay pan, open.			Abundance: common	Warbrook Siding, Upper Swan	18/10/1978
Trithuria occidentalis	T	Small annual, reddish colour.	Drying pools, muddy claypan.	Melaleuca laterite scrub.	common.		J.R. and B. Martyn Reserve, Ellen Brook, 13 km N Midland	27/10/1982
Verticordia lindleyi subsp. lindleyi	4						RAAF Caversham Base	18/12/1998
Verticordia lindleyi subsp. lindleyi	4	Erect shrub 0.5 m high.	Winter wet depression. Damp, grey-brown clay-sand-humus.	Dense shrubs (tall) over sedges. Melaleuca rhaphiophylla, Hypocalymma angustifolium, Juncus pallidus, sedges.	occasional.		Saunders Street (W end), Aboriginal Community, Henley Brook	10/12/1996
Verticordia lindleyi subsp. lindleyi	4						RAAF Caversham Base	18/12/1998
Verticordia lindleyi subsp. lindleyi	4	Shrub 25 - 35 cm high.		Shrubland with some emergent Marri, Banksia and Nuytsia. Associated vegetation: Dasypogon bromelifolius, Melaleuca serriata, Stylidium repens, Hibbertia subvaginata.			Whiteman Park	09/02/2006
Verticordia lindleyi subsp. lindleyi	4	Shrub 30 - 40 cm high.	Flat.	Shrubland with few emergent Marri, Banksia and Nuytsia. Associated vegetation: Verticordia nitens, Patersonia occidentalis, Dasypogon bromelifolius, Calytrix fraseri, Hibbertia subvaginata.			Whiteman Park	09/02/2006
Verticordia lindleyi subsp. lindleyi	4		Topography: plain, low lying. Slope: flat. Soil texture: sand. Soil colour: brown to white. Surface layer: leaf litter. Rock type: limestone. Leaf litter coverage: 10-30% cover; ,3 cm depth; distribution mainly under shrubs. Wood litter: soarse. Fire his	Sparse Melaleuca preissiana over moderately dense Kunzea micrantha and Verticordia plumosa. Total vegetation cover: 95%. Trees <5 m, 2-10%: Melaleuca preissiana, Acacia saligna. Shrubs >2 m, 0-2%: Kunzea micrantha. Shrubs 1-2 m, 30-70%: Kunzea micrantha,			Site 11, RAAF Caversham Base	21/12/1998
Verticordia serrata var. linearis	3	80 cm high x 15 cm wide. Flowers golden yellow.	White sand and gravel on road verge.	Growing in association with Adenanthos cygnorum.		This specimen was collected for painting.	N of Bullsbrook	22/10/1987

TEC / PEC Database Search Results

COM_ID	COM_NAME	STATE_CATG	COMM_CATG
SCP20a	Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))	Endangered	Endangered
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered
SCP22	Banksia ilicifolia woodlands	Priority 3	Endangered
SCP30a	Callitris preissii (or Melaleuca lanceolata) forests and woodlands, Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. (1994))	Vulnerable	
SCP29a	Coastal shrublands on shallow sands	Priority 3	
SCP21c	Low lying Banksia attenuata woodlands or shrublands	Priority 3	Endangered
SCP26a	Melaleuca huegelii - Melaleuca systena shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994))	Endangered	
SCP24	Northern Spearwood shrublands and woodlands	Priority 3	
SCP25	Southern Eucalyptus gomphocephala-Agonis flexuosa woodlands	Priority 3	
SCP23b	Swan Coastal Plain Banksia attenuata - Banksia menziesii woodlands	Priority 3	Endangered
Tuart woodlands	Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain	Priority 3	Critically Endangered

Black Cockatoo Breeding Data Database Search

WT_ID	HOL_TYPE	TREE_CAT	YRFIRSTBR	YRLASTBR	SCE_ID_FLD	SCE_ID_VAL
1318.000000	artificial	confirmed	2016.000000	2019.000000	hollow code	JOOECUAH001
1319.000000	artificial	confirmed	2016.000000	2019.000000	hollow code	JOOECUAH002
1320.000000	artificial	confirmed	2016.000000	2019.000000	hollow code	JOOECUAH003
1321.000000	artificial	confirmed	2016.000000	2019.000000	hollow code	JOOECUAH004
1322.000000	artificial	confirmed	2017.000000	2019.000000	hollow code	JOOECUAH005
1323.000000	artificial	confirmed	2016.000000	2019.000000	hollow code	JOOECUAH006
1324.000000	artificial	potential	0.000000	0.000000	hollow code	JOOECUAH007
1325.000000	artificial	confirmed	2016.000000	2019.000000	hollow code	JOOECUAH008
1326.000000	artificial	confirmed	2016.000000	2018.000000	hollow code	JOOECUAH009
1327.000000	natural	confirmed	2016.000000	2019.000000	hollow code	JOOECUH001
1328.000000	natural	potential	0.000000	0.000000	hollow code	JOOECUH002
1329.000000	artificial	confirmed	2018.000000	2019.000000	hollow code	JOOJOOAH001
1330.000000	artificial	confirmed	2019.000000	2019.000000	hollow code	JOOJOOAH002
1337.000000	artificial	potential	0.000000	0.000000	hollow code	JOOJOOAH009
1338.000000	artificial	potential	0.000000	0.000000	hollow code	JOOJOOAH010
1339.000000	artificial	potential	0.000000	0.000000	hollow code	JOOJOOAH011
2853.000000	natural	potential	0.000000	0.000000	hollow code	WANWANH001

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 03/09/2020

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 49' 22" E,31° 43' 30" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	382	561
Priority 1	1	2
Priority 2	3	7
Priority 3	4	9
Priority 4	1	1
TOTAL	**391**	**580**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Priority 1					
1.	34161	*Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)*		P1	
Priority 2					
2.	3237	*Acacia benthamii*		P2	
3.	42022	*Poranthera moorokatta*		P2	
4.	1717	*Thelymitra variegata (Queen of Sheba)*		P2	
Priority 3					
5.	1425	*Conostylis bracteata*		P3	
6.	16245	*Cyathochaeta teretifolia*		P3	
7.	5237	*Pimelea calcicola*		P3	
8.	48297	*Styphelia filifolia*		P3	
Priority 4					
9.	4027	*Jacksonia sericea (Waldjumi)*		P4	
Non-conservation taxon					
10.	15466	*Acacia applanata*			
11.	3374	*Acacia huegelii*			
12.	17861	*Acacia longifolia*	Y		
13.	3502	*Acacia pulchella (Prickly Moses)*			
14.	15481	*Acacia pulchella var. glaberrima*			
15.	3525	*Acacia rostellifera (Summer-scented Wattle)*			
16.	30032	*Acacia saligna subsp. saligna*			
17.	3541	*Acacia sessilis*			
18.	3602	*Acacia willdenowiana (Grass Wattle)*			
19.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
20.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
21.	48513	*Aizoon pubescens*	Y		
22.	1056	*Alexgeorgea nitens*			
23.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
24.	2652	*Alternanthera nodiflora (Common Joyweed)*			
25.	2653	*Alternanthera pungens (Khaki Weed)*	Y		
26.	6565	*Alyxia buxifolia (Dysentery Bush)*			
27.	25840	*Amaranthus blitum*	Y		
28.	20184	*Amphipogon laguroides subsp. laguroides*			
29.	200	*Amphipogon turbinatus*			
30.	6311	*Andersonia heterophylla*			
31.	8595	*Apium graveolens (Wild Celery)*	Y		
32.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
33.	1264	*Arnocrinum preissii*			
34.	20283	*Astartea scoparia (Common Astartea)*			
35.	6323	*Astroloma ciliatum (Candle Cranberry)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
36.	6334	*Astroloma pallidum (Kick Bush)*			
37.	6339	*Astroloma xerophyllum*			
38.	16346	*Bacopa monnieri*	Y		
39.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
40.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
41.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
42.	1834	*Banksia menziesii (Firewood Banksia)*			
43.	1842	*Banksia prionotes (Acorn Banksia)*			
44.	32077	*Banksia sessilis var. cygnorum*			
45.	32315	*Barbula calycina*			
46.	741	*Baumea articulata (Jointed Rush)*			
47.	743	*Baumea juncea (Bare Twigrush)*			
48.	744	*Baumea laxa*			
49.	745	*Baumea preissii*			
50.	5382	*Beaufortia elegans (Elegant Beaufortia)*			
51.	25788	*Billardiera fraseri (Elegant Pronaya)*			
52.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
53.	17665	*Boronia purdieana subsp. purdieana*			
54.	11381	*Boronia ramosa subsp. anethifolia*			
55.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
56.	7867	*Brachyscome bellidioides*			
57.	7878	*Brachyscome iberidifolia*			
58.	11187	*Brassica barrelieri subsp. oxyrrhina (Smooth-stem Turnip)*	Y		
59.	2993	*Brassica fruticulosa (Twiggy Turnip)*	Y		
60.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
61.	244	*Briza maxima (Blowfly Grass)*	Y		
62.	32331	*Bryum lanatum*			
63.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
64.	1276	*Caesia micrantha (Pale Grass Lily)*			
65.	15330	*Caladenia arenicola*			
66.	1592	*Caladenia flava (Cowslip Orchid)*			
67.	15348	*Caladenia flava subsp. flava*			
68.	15360	*Caladenia longicauda subsp. borealis*			
69.	15361	*Caladenia longicauda subsp. calcigena*			
70.	15377	*Caladenia reptans subsp. reptans*			
71.	19309	*Calectasia narragara*			
72.	10861	*Callistachys lanceolata (Wonnich)*			
73.	5415	*Calothamnus lateralis*			
74.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
75.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
76.	5439	*Calytrix angulata (Yellow Starflower)*			
77.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
78.	5476	*Calytrix sapphirina*			
79.	32338	*Campylopus introflexus*	Y		
80.	3005	*Cardamine hirsuta (Common Bittercress)*	Y		
81.	49010	*Cardamine occulta*	Y		
82.	753	*Carex appressa (Tall Sedge)*			
83.	754	*Carex divisa (Divided Sedge)*	Y		
84.	755	*Carex fascicularis (Tassel Sedge)*			
85.	43241	*Carex thecata*			
86.	1162	*Cartonema philydroides*			
87.	2951	*Cassytha flava (Dodder Laurel)*			
88.	18314	*Casuarina cunninghamiana subsp. cunninghamiana*	Y		
89.	13685	*Catapodium rigidum (Rigid Fescue)*	Y		
90.	6214	*Centella asiatica*			
91.	1125	*Centrolepis drummondiana*			
92.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
93.	32462	*Ceratodon purpureus subsp. convolutus*			
94.	18156	*Chamaecytisus palmensis (Tagasaste)*	Y		
95.	1513	*Chasmanthe floribunda (African Cornflag)*	Y		
96.	2490	*Chenopodium glaucum (Glaucous Goosefoot)*	Y		
97.	2491	*Chenopodium macrospermum*	Y		
98.	17833	*Chordifex microcodon*			
99.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
100.	15607	*Conospermum acerosum subsp. acerosum*			
101.	15511	*Conospermum boreale*			
102.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
103.	1876	*Conospermum incurvum (Plume Smokebush)*			
104.	1885	*Conospermum triplinervium (Tree Smokebush)*			
105.	6348	*Conostephium pendulum (Pearl Flower)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
106.	6349	*Conostephium preissii*			
107.	1418	*Conostylis aculeata (Prickly Conostylis)*			
108.	11552	*Conostylis aculeata subsp. bromelioides*			
109.	1423	*Conostylis aurea (Golden Conostylis)*			
110.	1427	*Conostylis candicans (Grey Cottonhead)*			
111.	1436	*Conostylis juncea*			
112.	11597	*Conostylis setigera subsp. setigera*			
113.	11870	*Conostylis teretifolia subsp. teretifolia*			
114.	48259	*Cortaderia selloana subsp. selloana*	Y		
115.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
116.	3140	*Crassula glomerata*	Y		
117.	3146	*Crassula thunbergiana*	Y		
118.	11021	*Cuscuta planiflora*	Y		
119.	15114	*Cyanicula gemmata*			
120.	18318	*Cyperus involucratus*	Y		
121.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
122.	10916	*Cyrtostylis huegelii*			
123.	7454	*Dampiera linearis (Common Dampiera)*			
124.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
125.	18560	*Daviesia divaricata subsp. divaricata*			
126.	16585	*Daviesia nudiflora subsp. nudiflora*			
127.	3832	*Daviesia physodes*			
128.	3845	*Daviesia triflora*			
129.	1259	*Dianella revoluta (Blueberry Lily)*			
130.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
131.	4453	*Diplolaena angustifolia (Yanchep Rose)*			
132.	7054	*Dischisma arenarium*	Y		
133.	11049	*Diuris corymbosa*			
134.	1635	*Diuris longifolia (Common Donkey Orchid)*			
135.	12939	*Diuris magnifica*			
136.	48751	*Drosera drummondii*			
137.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
138.	3106	*Drosera macrantha (Bridal Rainbow)*			
139.	3116	*Drosera omissa (Bright Sundew)*			
140.	3118	*Drosera pallida (Pale Rainbow)*			
141.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
142.	32351	*Eccremidium pulchellum*			
143.	11485	*Ehrharta brevifolia var. cuspidata*	Y		
144.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
145.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
146.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
147.	6132	*Epilobium ciliatum*	Y		
148.	6133	*Epilobium hirtigerum (Hairy Willow Herb)*			
149.	14289	*Epilobium tetragonum subsp. tetragonum*	Y		
150.	376	*Eragrostis curvula (African Lovegrass)*	Y		
151.	14104	*Eremaea pauciflora var. pauciflora*			
152.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
153.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
154.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
155.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
156.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
157.	3872	*Euchilopsis linearis (Swamp Pea)*			
158.	4638	*Euphorbia peplus (Petty Spurge)*	Y		
159.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
160.	32369	*Fissidens tenellus*			
161.	7976	*Galinsoga parviflora (Potato Weed)*	Y		
162.	20475	*Gastrolobium capitatum*			
163.	20483	*Gastrolobium linearifolium*			
164.	16311	*Gazania linearis*	Y		
165.	32380	*Gemmabryum pachythecum*			
166.	32381	*Gemmabryum preissianum*			
167.	4341	*Geranium solanderi (Native Geranium)*			
168.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
169.	11051	*Gomphocarpus physocarpus*	Y		
170.	11083	*Gompholobium scabrum*			
171.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
172.	6161	*Gonocarpus pithyoides*			
173.	15839	*Grevillea preissii subsp. preissii*			
174.	12824	*Grevillea vestita subsp. vestita*			
175.	5011	*Guichenotia ledifolia*			

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176.	1468	*Haemodorum laxum*			
177.	1475	*Haemodorum spicatum (Mardja)*			
178.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
179.	8084	*Helminthotheca echioides (Ox-tongue, Prickly Ox-tongue)*	Y		
180.	439	*Hemarthria uncinata (Matgrass)*			
181.	6836	*Hemiandra incana*			
182.	6839	*Hemiandra pungens (Snakebush)*			
183.	1293	*Hensmania turbinata*			
184.	5112	*Hibbertia aurea*			
185.	5134	*Hibbertia huegelii*			
186.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
187.	45534	*Hibbertia hypericoides subsp. hypericoides*			
188.	5154	*Hibbertia perfoliata*			
189.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
190.	43280	*Hibbertia sericosepala*			
191.	5173	*Hibbertia subvaginata*			
192.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
193.	6222	*Homalosciadium homalocarpum*			
194.	449	*Hordeum leporinum (Barley Grass)*	Y		
195.	3968	*Hovea trisperma (Common Hovea)*			
196.	5216	*Hybanthus calycinus (Wild Violet)*			
197.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
198.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
199.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
200.	6620	*Ipomoea cairica (Coast Morning Glory)*	Y		
201.	910	*Isolepis cernua (Nodding Club-rush)*			
202.	20200	*Isolepis cernua var. setiformis*			
203.	917	*Isolepis marginata (Coarse Club-rush)*			
204.	919	*Isolepis oldfieldiana*			
205.	921	*Isolepis producta*			
206.	4010	*Jacksonia floribunda (Holly Pea)*			
207.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
208.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
209.	1188	*Juncus pallidus (Pale Rush)*			
210.	4044	*Kennedia prostrata (Scarlet Runner)*			
211.	15498	*Kunzea glabrescens (Spearwood)*			
212.	20019	*Lachnagrostis filiformis*			
213.	8096	*Lactuca serriola (Prickly Lettuce)*	Y		
214.	18585	*Lagenophora huegelii*			
215.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
216.	4052	*Latrobea tenella*			
217.	1307	*Laxmannia ramosa (Branching Lily)*			
218.	11911	*Laxmannia ramosa subsp. ramosa*			
219.	1309	*Laxmannia squarrosa*			
220.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
221.	6880	*Leonotis leonurus (Lion's Ear)*	Y		
222.	925	*Lepidosperma angustatum*			
223.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
224.	944	*Lepidosperma scabrum*			
225.	1653	*Leporella fimbriata (Hare Orchid)*			
226.	15418	*Leptoceras menziesii*			
227.	2344	*Leptomeria empetriformis*			
228.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
229.	19821	*Lessertia frutescens*	Y		
230.	6360	*Leucopogon australis (Spiked Beard-heath)*			
231.	6374	*Leucopogon conostephioides*			
232.	6405	*Leucopogon insularis*			
233.	6425	*Leucopogon oxycedrus*			
234.	6434	*Leucopogon polymorphus*			
235.	6436	*Leucopogon propinquus*			
236.	40803	*Leucopogon squarrosus subsp. squarrosus*			
237.	6489	*Limonium sinuatum (Perennial Sea Lavender)*	Y		
238.	4364	*Linum usitatissimum (Flax)*	Y		
239.	36160	*Liparophyllum capitatum*			
240.	7408	*Lobelia tenuior (Slender Lobelia)*			
241.	36860	*Lobelia tenuior subsp. dictyosperma*			Y
242.	475	*Lolium multiflorum (Italian Ryegrass)*	Y		
243.	1228	*Lomandra hermaphrodita*			
244.	1232	*Lomandra micrantha (Small-flower Mat-rush)*			
245.	1234	*Lomandra nigricans*			

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246.	1239	*Lomandra preissii*			
247.	1246	*Lomandra suaveolens*			
248.	1097	*Lyginia barbata*			
249.	34736	*Lysinema pentapetalum*			
250.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
251.	2838	*Macarthuria apetala*			
252.	4079	*Medicago polymorpha (Burr Medic)*	Y		
253.	34676	*Meionectes brownii (Swamp Raspwort)*			
254.	13271	*Melaleuca huegelii subsp. huegelii*			
255.	5952	*Melaleuca preissiana (Moonah)*			
256.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
257.	5964	*Melaleuca seriata*			
258.	18598	*Melaleuca systena*			
259.	5983	*Melaleuca trichophylla*			
260.	4516	*Melia azedarach (White Cedar)*			
261.	953	*Mesomelaena graciliceps*			
262.	955	*Mesomelaena pseudostygia*			
263.	485	*Microlaena stipoides (Weeping Grass)*			
264.	15419	*Microtis media subsp. media*			
265.	8105	*Millotia myosotidifolia*			
266.	8106	*Millotia tenuifolia (Soft Millotia)*			
267.	4100	*Mirbelia spinosa*			
268.	29418	*Monoculus monstrosus*	Y		
269.	2415	*Muehlenbeckia polybotrya*			
270.	7289	*Myoporum caprarioides (Slender Myoporum)*			
271.	6199	*Myriophyllum tillaeoides*			
272.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
273.	16390	*Oenothera drummondii subsp. drummondii*	Y		
274.	32716	*Olearia lehmanniana*			
275.	8149	*Olearia rudis (Rough Daisybush)*			
276.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
277.	532	*Paspalum urvillei (Vasey Grass)*	Y		
278.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
279.	30472	*Patersonia occidentalis var. occidentalis*			
280.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
281.	16477	*Pericalymma ellipticum var. ellipticum*			
282.	13911	*Persicaria decipiens*			
283.	16984	*Persicaria lapathifolia*	Y		
284.	2273	*Persoonia saccata (Snottygobble)*			
285.	20368	*Petrophile axillaris*			
286.	48781	*Petrophile brevifolia subsp. brevifolia*			
287.	2299	*Petrophile linearis (Pixie Mops)*			
288.	18529	*Philotheca spicata (Pepper and Salt)*			
289.	1478	*Phlebocarya ciliata*			
290.	6734	*Phyla nodiflora var. nodiflora*	Y		
291.	4675	*Phyllanthus calycinus (False Boronia)*			
292.	17794	*Phyllanthus tenellus*	Y		
293.	2793	*Phytolacca octandra (Red Ink Plant)*	Y		
294.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
295.	5244	*Pimelea floribunda*			
296.	5254	*Pimelea leucantha*			
297.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
298.	18352	*Pithocarpa pulchella var. melanostigma*			
299.	18353	*Pithocarpa pulchella var. pulchella*			
300.	7299	*Plantago debilis*			
301.	7304	*Plantago major (Greater Plantain)*	Y		
302.	571	*Poa annua (Winter Grass)*	Y		
303.	8175	*Podolepis gracilis (Slender Podolepis)*			
304.	8179	*Podolepis nutans (Nodding Podolepis)*			
305.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
306.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
307.	4689	*Poranthera ericoides (Heath Poranthera)*			
308.	4691	*Poranthera microphylla (Small Poranthera)*			
309.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
310.		*Pterostylis aff. nana*			
311.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
312.	15856	*Ptilotus sericostachyus subsp. sericostachyus*			
313.	4181	*Pultenaea reticulata*			
314.	8195	*Quinetia urvillei*			
315.	32480	*Racopilum cuspidigerum var. convolutaceum*			

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316.	3061	*Raphanus raphanistrum (Wild Radish)*	Y		
317.	6014	*Regelia inops*			
318.	18547	*Rhadinothamnus anceps*			
319.	19942	*Ricinocarpos undulatus*			
320.	44608	*Rosulabryum billarderii*			
321.	2429	*Rumex acetosella (Sorrel)*	Y		
322.	40426	*Rytidosperma occidentale*			
323.	7368	*Scabiosa atropurpurea (Purple Pincushion)*	Y		
324.	13181	*Scaevola repens var. angustifolia*			
325.	13152	*Scaevola thesioides subsp. thesioides*			
326.	48834	*Schinus terebinthifolia*	Y		
327.	48356	*Schoenoplectus tabernaemontani*			
328.	984	*Schoenus curvifolius*			
329.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
330.	1018	*Schoenus subfascicularis*			
331.	15972	*Silene gallica var. gallica*	Y		
332.	2910	*Silene nocturna (Mediterranean Catchfly)*	Y		
333.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
334.	48866	*Solanum nitidibaccatum*	Y		
335.	7037	*Solanum symonii*			
336.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
337.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
338.	4713	*Stachystemon axillaris (Leafy Stachystemon)*			
339.	9069	*Stackhousia huegelii*			
340.	15066	*Stenanthemum notiale subsp. chamelum*			
341.	19403	*Stenopetalum gracile*			
342.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
343.	25831	*Stylidium araeophyllum (Stilt Walker)*			
344.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
345.	7696	*Stylidium calcaratum (Book Triggerplant)*			
346.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
347.	7710	*Stylidium cygnorum*			
348.	11808	*Stylidium diuroides subsp. diuroides*			
349.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
350.	25829	*Stylidium neurophyllum (Coastal Plain Triggerplant)*			
351.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
352.	7785	*Stylidium repens (Matted Triggerplant)*			
353.	7798	*Stylidium schoenoides (Cow Kicks)*			
354.	32437	*Syntrichia antarctica*			
355.	32438	*Syntrichia pagorum*			
356.	4256	*Templetonia retusa (Cockies Tongues)*			
357.	2791	*Tersonia cyathiflora (Button Creeper)*			
358.	2824	*Tetragonia tetragonoides (New Zealand Spinach)*			
359.	20649	*Tetrapanax papyrifer*	Y		Y
360.	1036	*Tetraria octandra*			
361.	1318	*Thysanotus arbuscula*			
362.	1343	*Thysanotus patersonii*			
363.	1351	*Thysanotus sparteus*			
364.	6280	*Trachymene pilosa (Native Parsnip)*			
365.	32450	*Trichostomum eckelianum*			
366.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
367.	14738	*Trifolium resupinatum var. resupinatum*	Y		
368.	11665	*Trymalium ledifolium var. ledifolium*			
369.	8255	*Ursinia anthemoides (Ursinia)*	Y		
370.	7125	*Utricularia australis*			
371.	7131	*Utricularia dichotoma (Fairy Aprons)*			
372.	12493	*Utricularia gibba*			
373.	7158	*Utricularia volubilis (Twining Bladderwort)*			
374.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
375.	46275	*Verbesina encelioides var. encelioides (Crownbeard, Wild Sunflower, Goldweed, South African Daisy)*	Y		
376.	6077	*Verticordia drummondii (Drummond's Featherflower)*			
377.	6101	*Verticordia nitens (Morrison Featherflower, Kodjeningara)*			
378.	6103	*Verticordia ovalifolia*			
379.	11474	*Vicia sativa subsp. nigra*	Y		
380.	11137	*Vulpia fasciculata*	Y		
381.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
382.	7388	*Wahlenbergia multicaulis*			
383.	7389	*Wahlenbergia preissii*			
384.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			

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385.	17910	*Washingtonia filifera*	Y		
386.	1401	*Wurmbea pygmaea*			
387.	8286	*Xanthium occidentale (Noogoora Burr)*	Y		
388.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
389.	6289	*Xanthosia huegelii*			
390.	2331	*Xylomelum occidentale (Woody Pear, Djandin)*			
391.	36218	*Zygodon menziesii*			

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

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

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

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Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 49' 22" E,31° 43' 30" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	252	16158
Other specially protected fauna	2	14
Priority 3	4	12
Priority 4	5	138
Protected under international agreement	15	167
Rare or likely to become extinct	7	289
TOTAL	**285**	**16778**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24345	*Botaurus poiciloptilus (Australasian Bittern)*		T	
2.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
3.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
4.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
5.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
6.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
7.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		T	
Protected under international agreement					
8.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
9.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
10.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
11.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
12.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
13.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
14.	24690	*Macronectes giganteus (Southern Giant Petrel)*		IA	
15.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
16.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
17.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
18.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
19.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
20.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
21.	24809	*Tringa stagnatilis (Marsh Sandpiper, little greenshank)*		IA	
22.	41351	*Xenus cinereus (Terek Sandpiper)*		IA	
Other specially protected fauna					
23.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
24.	24475	*Falco peregrinus subsp. macropus (Australian Peregrine Falcon)*		S	
Priority 3					
25.	33977	*Hylaeus globuliferus (woolybush bee)*		P3	
26.	48935	*Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)*		P3	
27.	33982	*Leioproctus contrarius (a short-tongued bee)*		P3	
28.	25249	*Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)*		P3	
Priority 4					
29.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
30.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
31.	47975	*Ixobrychus dubius (Australian Little Bittern)*		P4	
32.	24328	*Oxyura australis (Blue-billed Duck)*		P4	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
33.	33992	*Synemon gratiosa (Graceful Sunmoth)*		P4	

Non-conservation taxon

34.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
35.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
36.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
37.	24262	*Acanthiza inornata (Western Thornbill)*			
38.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
39.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
40.	24281	*Accipiter cirrocephalus subsp. cirrocephalus (Collared Sparrowhawk)*			
41.	25536	*Accipiter fasciatus (Brown Goshawk)*			
42.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
43.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
44.		*Aname mainae*			
45.		*Aname tepperi*			
46.	24310	*Anas castanea (Chestnut Teal)*			
47.	24312	*Anas gracilis (Grey Teal)*			
48.	24313	*Anas platyrhynchos (Mallard)*			
49.		*Anas platyrhynchos subsp. domesticus*			
50.	24315	*Anas rhynchotis (Australasian Shoveler)*			
51.	24316	*Anas superciliosa (Pacific Black Duck)*			
52.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
53.		*Anser anser*			
54.	24561	*Anthochaera carunculata (Red Wattlebird)*			
55.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
56.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
57.	24285	*Aquila audax (Wedge-tailed Eagle)*			
58.		*Araneus senicaudatus*			
59.	25558	*Ardea ibis (Cattle Egret)*			
60.	25559	*Ardea intermedia (Intermediate Egret)*			
61.	41324	*Ardea modesta (great egret, white egret)*			
62.	24340	*Ardea novaehollandiae (White-faced Heron)*			
63.	24341	*Ardea pacifica (White-necked Heron)*			
64.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
65.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
66.		*Austracantha minax*			
67.		*Australomimetus ovidi*			
68.	24318	*Aythya australis (Hardhead)*			
69.		*Barnardius zonarius*			
70.	24319	*Biziura lobata (Musk Duck)*			
71.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
72.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
73.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
74.	25715	*Cacatua roseicapilla (Galah)*			
75.	25716	*Cacatua sanguinea (Little Corella)*			
76.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
77.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
78.	24427	*Cacomantis flabelliformis subsp. flabelliformis (Fan-tailed Cuckoo)*			
79.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
80.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
81.		*Carassius auratus*			
82.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
83.		*Cercophonius sulcatus*			
84.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
85.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
86.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
87.	24980	*Christinus marmoratus (Marbled Gecko)*			
88.		*Chroicocephalus novaehollandiae*			
89.	24432	*Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)*			
90.	24288	*Circus approximans (Swamp Harrier)*			
91.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
92.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
93.	24613	*Colluricincla harmonica subsp. rufiventris (Grey Shrike-thrush)*			
94.	24399	*Columba livia (Domestic Pigeon)*	Y		
95.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
96.		*Cormocephalus aurantiipes*			
97.	24416	*Corvus bennetti (Little Crow)*			
98.	25592	*Corvus coronoides (Australian Raven)*			
99.	24671	*Coturnix pectoralis (Stubble Quail)*			
100.	25701	*Coturnix ypsilophora (Brown Quail)*			
101.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
102.	25595	*Cracticus tibicen (Australian Magpie)*			
103.	25596	*Cracticus torquatus (Grey Butcherbird)*			
104.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
105.	25400	*Crinia insignifera (Squelching Froglet)*			
106.	30893	*Cryptoblepharus buchananii*			
107.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
108.	25039	*Ctenotus fallens*			
109.	25040	*Ctenotus gemmula (Jewelled South-west Ctenotus (Swan Coastal Plain subpop P3), skink)*			
110.	25047	*Ctenotus impar*			
111.	25087	*Cyclodomorphus celatus (Western Slender Blue-tongue)*			
112.	24322	*Cygnus atratus (Black Swan)*			
113.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
114.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
115.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
116.	24999	*Delma grayii*			
117.	25296	*Demansia psammophis subsp. reticulata (Yellow-faced Whipsnake)*			
118.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
119.		*Dingosa serrata*			
120.	24929	*Diplodactylus granariensis subsp. granariensis*			
121.	24939	*Diplodactylus polyophthalmus*			
122.	25251	*Echiopsis curta (Bardick)*			
123.	25100	*Egernia napoleonis*			
124.		*Egretta garzetta*			
125.		*Egretta novaehollandiae*			
126.		*Elanus axillaris*			
127.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
128.	25250	*Elapognathus coronatus (Crowned Snake)*			
129.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
130.		*Eodelena convexa*			
131.		*Eolophus roseicapillus*			
132.	24567	*Epthianura albifrons (White-fronted Chat)*			
133.		*Eriophora biapicata*			
134.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
135.		*Ethmostigmus rubripes*			
136.	25621	*Falco berigora (Brown Falcon)*			
137.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
138.	24472	*Falco cenchroides subsp. cenchroides (Australian Kestrel, Nankeen Kestrel)*			
139.	25623	*Falco longipennis (Australian Hobby)*			
140.	24616	*Falcunculus frontatus subsp. leucogaster (Western Shrike-tit, Crested Shrike-tit)*			
141.	24041	*Felis catus (Cat)*	Y		
142.	25727	*Fulica atra (Eurasian Coot)*			
143.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			
144.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
145.	24763	*Gallinula tenebrosa subsp. tenebrosa (Dusky Moorhen)*			
146.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
147.		*Gambusia affinis*			
148.	25530	*Gerygone fusca (Western Gerygone)*			
149.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
150.	24443	*Grallina cyanoleuca (Magpie-lark)*			
151.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
152.	24295	*Haliastur sphenurus (Whistling Kite)*			
153.	25410	*Heleioporus eyrei (Moaning Frog)*			
154.	25119	*Hemiergis quadrilineata*			
155.		*Henicops dentatus*			
156.	47965	*Hieraaetus morphnoides (Little Eagle)*			
157.	25734	*Himantopus himantopus (Black-winged Stilt)*			
158.	24491	*Hirundo neoxena (Welcome Swallow)*			
159.		*Hogna crispipes*			
160.		*Idiommata blackwalli*			
161.		*Isometroides vescus*			
162.		*Isopeda leishmanni*			
163.		*Lampona cylindrata*			
164.	25637	*Larus novaehollandiae (Silver Gull)*			
165.	25638	*Larus pacificus (Pacific Gull)*			
166.		*Latrodectus hasseltii*			
167.	25133	*Lerista elegans*			
168.	25148	*Lerista lineopunctulata*			
169.	25165	*Lerista praepedita*			
170.	25005	*Lialis burtonis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
171.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
172.	25661	*Lichmera indistincta (Brown Honeyeater)*			
173.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
174.	42461	*Limosa haemastica (Hudsonian Godwit)*	Y		
175.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
176.	25388	*Litoria moorei (Motorbike Frog)*			
177.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
178.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
179.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
180.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
181.	25654	*Malurus splendens (Splendid Fairy-wren)*			
182.	24583	*Manorina flavigula (Yellow-throated Miner)*			
183.		*Maratus pavonis*			
184.	25758	*Megalurus gramineus (Little Grassbird)*			
185.	25184	*Menetia greyii*			
186.	24598	*Merops ornatus (Rainbow Bee-eater)*			
187.		*Microcarbo melanoleucos*			
188.	25693	*Microeca fascinans (Jacky Winter)*			
189.		*Missulena granulosa*			
190.	25191	*Morethia lineoocellata*			
191.	25192	*Morethia obscura*			
192.	24223	*Mus musculus (House Mouse)*	Y		
193.	25420	*Myobatrachus gouldii (Turtle Frog)*			
194.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
195.	24738	*Neophema elegans (Elegant Parrot)*			
196.		*Nephila edulis*			
197.	25252	*Notechis scutatus (Tiger Snake)*			
198.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
199.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
200.	24742	*Nymphicus hollandicus (Cockatiel)*			
201.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
202.		*Oecobius navus*			
203.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
204.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
205.	24624	*Pachycephala rufiventris subsp. rufiventris (Rufous Whistler)*			
206.	24693	*Pachyptila desolata (Antarctic Prion)*			
207.	25253	*Parasuta gouldii*			
208.	25255	*Parasuta nigriceps*			
209.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
210.	25682	*Pardalotus striatus (Striated Pardalote)*			
211.	25687	*Passer domesticus (House Sparrow)*	Y		
212.	24641	*Passer domesticus subsp. domesticus (House Sparrow)*	Y		Y
213.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
214.	48060	*Petrochelidon ariel (Fairy Martin)*			
215.	48061	*Petrochelidon nigricans (Tree Martin)*			
216.	48066	*Petroica boodang (Scarlet Robin)*			
217.	24659	*Petroica goodenovii (Red-capped Robin)*			
218.	25697	*Phalacrocorax carbo (Great Cormorant)*			
219.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
220.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
221.	25699	*Phalacrocorax varius (Pied Cormorant)*			
222.	24409	*Phaps chalcoptera (Common Bronzewing)*			
223.		*Pholcus phalangioides*			
224.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
225.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
226.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
227.	24842	*Platalea regia (Royal Spoonbill)*			
228.		*Platycephalus endrachtensis*			
229.		*Platycephalus sp.*			
230.	25720	*Platycercus icterotis (Western Rosella)*			
231.	24747	*Platycercus spurius (Red-capped Parrot)*			
232.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
233.	25703	*Podargus strigoides (Tawny Frogmouth)*			
234.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
235.	25704	*Podiceps cristatus (Great Crested Grebe)*			
236.	24680	*Podiceps cristatus subsp. australis (Great Crested Grebe)*			
237.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
238.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
239.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
240.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
241.	24769	*Porzana fluminea (Australian Spotted Crake)*			
242.	25732	*Porzana pusilla (Baillon's Crake)*			
243.	24771	*Porzana tabuensis (Spotless Crake)*			
244.		*Pseudogobius olorum*			
245.	25511	*Pseudonaja affinis (Dugite)*			
246.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
247.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
248.		*Purpureicephalus spurius*			
249.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
250.	24245	*Rattus rattus (Black Rat)*	Y		
251.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
252.	48096	*Rhipidura albiscapa (Grey Fantail)*			
253.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
254.	24454	*Rhipidura leucophrys subsp. leucophrys (Willie Wagtail)*			
255.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
256.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
257.	30948	*Smicrornis brevirostris (Weebill)*			
258.	24329	*Stictonetta naevosa (Freckled Duck)*			
259.	25597	*Strepera versicolor (Grey Currawong)*			
260.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
261.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
262.	24942	*Strophurus spinigerus subsp. spinigerus*			
263.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
264.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
265.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
266.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
267.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
268.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
269.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
270.	25519	*Tiliqua rugosa*			
271.	25207	*Tiliqua rugosa subsp. rugosa*			
272.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
273.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
274.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
275.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
276.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
277.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
278.	24983	*Underwoodisaurus milii (Barking Gecko)*			
279.		*Urodacus novaehollandiae*			
280.	25577	*Vanellus miles (Masked Lapwing)*			
281.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
282.	25526	*Varanus tristis (Racehorse Monitor)*			
283.		*Venator immansueta*			
284.		*Venatrix pullastra*			
285.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

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

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

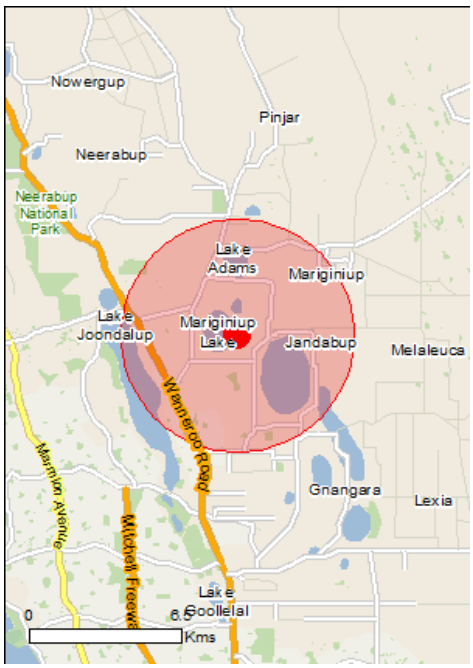
EPBC Act Protected Matters Report

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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 03/09/20 13:52:26



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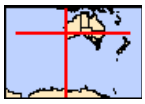

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	22
Listed Migratory Species:	13

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 http://www.environment.gov.au/heritage

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

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.

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Fish		
Galaxiella nigrostriata Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Insects		
Hesperocolletes douglasi Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Anigozanthos viridis subsp. terraspectans Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat may occur within area
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [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.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Jandabup	WA
Lake Joondalup	WA
Unnamed WA21176	WA
Unnamed WA43290	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species

Name	Status	Type of Presence
		habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Joondalup Lake	WA

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-31.72493 115.82287

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
Likelihood Assessment

Appendix/Table C: Assessment of the Likelihood of Occurrence of DRF and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Andersonia gracilis	T	EN		X		33.2	Sep - Nov	Currently known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils.[1]	No	Low	Low
Anigozanthos viridis subsp. *terraspectans*	T	VU		X		65.4	Aug - Sep	Occurs in winter-wet depressions where it grows on grey sandy clay loam, or grey sand, in low post-fire regenerating heath.[1]	No	Low	Low
Caladenia huegelii	T	EN		X	X	7	Sep - Oct	Grows in well-drained, deep sandy soils in low mixed woodlands.[1]	Yes	Medium	Medium
Diuris micrantha	T	VU		X		52.7	Sep - Oct	Found on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps.[2]	No	Low	Low
Diuris purdiei	T	EN		X		33.6	Sep - Oct	Typically found on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath.[1]	No	Low	Low
Drakaea elastica	T	EN		X		40	Oct - Nov	White, grey sand, low-lying situations adjoining winter-wet swamps.[1]	No	Low	Low
Drakaea micrantha	T	VU		X		40.1	Sep - Oct	Usually found on cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed.[1]	Yes	Low	Low
Eleocharis keigheryi	T	VU		X	X	17.6	Aug - Nov	Grows in small clumps in a substrate of clay or sandy loam. This species is emergent in freshwater creeks, and transient waterbodies such as drainage lines and claypans in water to approximately 15 cm deep.[1]	No	Low	Low
Eucalyptus argutifolia	T	VU		X	X	9	Mar - Apr	Occurs on slopes or gullies near the coast and, to a lesser extent, close to the summits of limestone ridges. Soils at these sites are shallow, well drained and grey with outcrops of limestone.[1]	No	Low	Low
Thelymitra dedmaniarum	T	EN		X		24.4	Nov - Dec or Jan	Granite.[2]	No	Low	Low
Darwinia foetida	T	CR			X	16	Oct - Nov	Occurs in grey-white sand on swampy, seasonally wet sites. Plants are found alongside sump land, that is, land acting as a pit or well where water collects.[1]	No	Low	Low
Marianthus paralius	T	EN			X	5.9	Sep - Nov	White sand over limestone, low coastal cliffs.[2]	No	Low	Low
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	T	EN			X	9.3	Nov - Dec	Yellow/Brown/ Grey/ Black sand. Limestone outcropping.[2]	No	Low	Low
Acacia anomala	T	VU			X	16.6	Aug - Sep	The species grows over laterite in shallow sand, loam, clay or gravel that is brown, yellow or grey. It grows on ridges, slopes and low plains.[1]	No	Low	Low
Grevillea curviloba	T	EN			X	11.8	Aug - Oct	Grey sand, sandy loam. Winter-wet heath.	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix/Table C: Assessment of the Likelihood of Occurrence of DRF and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Trithuria occidentalis	T	EN			X	17	Oct-Nov	Low-lying depression. Grey-brown clay.[2]	No	Low	Low
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1		X		X	3.3	Jun or Nov - Dec	Yellow, grey sand over limestone, outcrops, ridges.[2]	No	Low	Low
Drosera patens	P1				X	5.6	Dec or Feb	Sandy soils, margins of winter-wet depressions, swamps, lakes.[2]	No	Low	Low
Drosera x sidjamesii	P1				X	5.6	Nov - Mar	Peaty sand, along lake margins, close to winder high water line.[2]	No	Low	Low
Grevillea sp. Ocean Reef (D. Pike Joon 4)	P1				X	9.4	Nov	Brown, grey sand, sand dunes.[2]	No	Low	Low
Hydrocotyle striata	P1				X	15.1	Oct	Clay. Springs.[2]	No	Low	Low
Leucopogon maritimus	P1				X	10.6	May - Aug	Yellow, white sand over limestone, coastal dunes.[2]	No	Low	Low
Stachystemon exilis	P1				X	15.2	Oct - Nov	Low-lying coastal plain. Dry white sand, grey sand	Yes	Low	Low
Acacia benthamii	P2		X		X	1.9	Aug - Sep	Sand. Typically on limestone breakaways.[2]	No	Low	Low
Poranthera moorokatta	P2		X		X	4.1	Sep - Nov	Grey sand, yellow sand, clay, thick white sand.[2]	Yes	High	Low
Thelymitra variegata	P2		X		X	3.3	Jun - Sep	Sandy clay, sand, laterite.[2]	No	Low	Low
Calectasia elegans	P2				X	6.1	Sep - Nov	Grey sand, pale yellow sand, flat plains or gentle slopes.[2]	Yes	Medium	Low
Fabronia hampeana	P2				X	6.9	-	On Macrozamia ssp. trunks, Dry pale grey sand, between limestone outcrops with yellow sand.	Non- vascular species, not searched for		
Lecania turicensis var. *turicensis*	P2				X	10.4	-	Coastal rocks, limestone, Burns beach Yanchep Beach	Non- vascular species, not searched for		
Millotia tenuifolia var. *laevis*	P2				X	11.2	Sep - Oct	Granite or laterite soils.[2]	No	Low	Low
Schoenus sp. Bullsbrook (J.J. Alford 915)	P2				X	18.4	Oct - Nov	Grey peaty sand. Low-lying flats.[2]	No	Low	Low
Stenanthemum sublineare	P2				X	7.1	Oct - Dec	Littered white sand, coastal plain.[2]	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix/Table C: Assessment of the Likelihood of Occurrence of DRF and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Tetraria sp. Chandala (G.J. Keighery 17055)	P2				X	13.1	Feb or Jul or Sep or Oct	Black peaty sand, along edges of swamp.[2]	No	Low	Low
Conostylis bracteata	P3		X		X	3.4	Aug - Sep	Sand, limestone, consolidated sand dunes.[2]	No	Low	Low
Cyathochaeta teretifolia	P3		X		X	3.7	Dec	Grey sand, sandy clay, swamps, creek edges.[2]	No	Low	Low
Pimelea calcicola	P3		X		X	3.3	Sep - Nov	Sand, coastal limestone ridges.[2]	No	Low	Low
Styphelia filifolia	P3		X		X	2.3	Mar - May	Yellow sand, brown sand, grey sand, flat sandplains, lower slopes.[2]	Yes	High	Low
Adenanthos cygnorum subsp. *chamaephyton*	P3				X	17.8	Jul or Sep - Dec or Jan	Grey sand, lateritic gravel.[2]	Yes	Low	Low
Haemodorum loratum	P3				X	17	Nov	Grey or yellow sand, gravel.[2]	Yes	Low	Low
Hibbertia leptotheca	P3				X	9.7	Aug - Oct	Light brown/yellow to white sand, grey humic sand, Tamala limestone, sand dune, limsetone outcrop. [2]	No	Low	Low
Meionectes tenuifolia	P3				X	17.2	Sep - Dec	Seasonally wet inundated areas. Grey sand.[2]	No	Low	Low
Sarcozona bicarinata	P3				X	8.5	Aug	White sand.[2]	No	Low	Low
Stylidium maritimum	P3				X	13	Sep - Nov	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.[2]	No	Low	Low
Austrostipa mundula	P3				X	5.7	Sep - Oct	Upper slope of dune. Pale grey sand over limestone.[2]	No	Low	Low
Dampiera triloba	P3				X	7.5	Aug - Dec	Dark brown/black peaty soils, dark grey soils, hillsides, coastal plains.[2]	No	Low	Low
Eryngium pinnatifidum subsp. Palustre (G.J. Keighery 13459)	P3				X	14.9	Sep - Nov	Seasonally wet inundated areas. Grey-brown clay.[2]	No	Low	Low
Guichenotia tuberculata	P3				X	16.6	Aug - Oct	Sand clay over laterite, sand.[2]	No	Low	Low
Jacksonia gracillima	P3				X	13	Oct - Nov	Coastal plains, dry grey sand, near seasonal wetlands and winter-wet areas.[2]	Yes	Medium	Low
Leucopogon sp. Yanchep (M. Hislop 1986)	P3				X	14.1	Apr - Jun, Sep	Light grey-yellow sand, brown loam, limestone, laterite, granite. Coastal plain, breakaways, valley slopes, low hills.[2]	Yes	Medium	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix/Table C: Assessment of the Likelihood of Occurrence of DRF and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Phlebocarya pilosissima subsp. pilosissima	P3				X	14.2	Aug - Oct	White or grey sand, lateritic gravel.[2]	Yes	Medium	Low
Pithocarpa corymbulosa	P3				X	12.2	Jan - Apr	Gravelly or sandy loam. Amongst granite outcrops.[2]	No	Low	Low
Platysace ramosissima	P3				X	18.3	Oct - Nov	Sandy soils.[2]	Yes	Low	Low
Schoenus capillifolius	P3				X	17.9	Oct - Nov	Brown mud. Claypans.[2]	No	Low	Low
Schoenus sp. Waroona (G.J. Keighery 12235)	P3				X	17.9	Oct - Nov	Clay or sandy clay. Winter-wet flats.[2]	No	Low	Low
Stylidium paludicola	P3				X	5.9	Oct - Dec	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.[2]	No	Low	Low
Stylidium trudgenii	P3				X	13.3	Oct, Nov	Grey sand, dark grey to black sandy peat. Winter-wet swamps, depressions.[2]	No	Low	Low
Verticordia serrata var. *linearis*	P3				X	16.6	Sep - Oct	White sand, gravel. Open woodland.[2]	No	Low	Low
Jacksonia sericea	P4		X		X	4.6	Dec or Jan - Feb	Calcareous and sandy soils.[2]	Yes	High	Recorded
Drosera occidentalis	P4				X	16.6	Oct - Dec or Jan	Peaty sand around the margins of swamps, winter wet depressions and watersheds in open areas.[2]	No	Low	Low
Hibbertia helianthemoides	P4				X	18.3	Jul or Sep - Oct	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes	No	Low	Low
Hydrocotyle lemnoides	P4				X	16.6	Aug - Oct	Swamps.[2]	No	Low	Low
Stylidium longitubum	P4				X	9.7	Oct - Dec	Sandy clay, clay. Seasonal wetlands.[2]	No	Low	Low
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4				X	9.6	Feb	Winter wet flats, peaty sand over clay.[2]	No	Low	Low
Anigozanthos humilis subsp. *chrysanthus*	P4				X	7.2	Jul - Oct	Grey or yellow sand.[2]	Yes	Medium	Low
Conostylis pauciflora subsp. *euryrhipis*	P4				X	19.5	Aug - Oct	White, grey or yellow sand. Consolidated dunes.[2]	Yes	Low	Low
Cyanicula ixioides subsp. *ixioides*	P4				X	18.9	Aug - Oct	Laterite, gravel.[2]	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix/Table C: Assessment of the Likelihood of Occurrence of DRF and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Hypolaena robusta	P4				X	13.9	Sep - Oct	White sand. Sandplains.[2]	No	Low	Low
Schoenus griffinianus	P4				X	8.8	Sep - Oct	White sand.[2]	No	Low	Low
Verticordia lindleyi subsp. *lindleyi*	P4				X	14	May or Nov - Dec or Jan	Sand, sandy clay. Winter-wet depressions.[2]	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix D
Vascular Flora Inventory

Appendix D: Vascular Flora Inventory

Family	Species
Aizoaceae	**Carpobrotus edulis*
Altingiaceae	*Liquidambar styraciflua* (planted)
Amaranthaceae	*Ptilotus drummondii* var. *drummondii*
	Ptilotus manglesii
	Ptilotus polystachyus
Anacardiaceae	**Schinus terebinthifolia*
Anarthriaceae	*Lyginia barbata*
Araliaceae	*Trachymene pilosa*
Asparagaceae	**Asparagus asparagoides*
	Laxmannia squarrosa
	Lomandra caespitosa
	Lomandra hermaphrodita
	Lomandra preissii
	Sowerbaea laxiflora
	Thysanotus patersonii
	Thysanotus sparteus
Asteraceae	**Arctotheca calendula*
	**Hypochaeris glabra*
	**Sonchus oleraceus*
	**Ursinia anthemoides*
	Podotheca gnaphalioides
	Waitzia suaveolens
Cactaceae	**Opuntia stricta*
Casuarinaceae	*Allocasuarina fraseriana*
Colchicaceae	*Burchardia congesta*
Crassulaceae	*Crassula colorata*
Cyperaceae	*Gahnia trifida*
	Lepidosperma leptostachyum
	Lepidosperma squamatum
	Mesomelaena pseudostygia
	Tetraria octandra
Dasypogonaceae	*Calectasia narragara*
Dilleniaceae	*Hibbertia cuneiformis*
	Hibbertia hypericoides
	Hibbertia racemosa
Droseraceae	*Drosera* sp. "climbing"
Ericaceae	*Conostephium pendulum*
	Leucopogon polymorphus
	Styphelia propinqua
Euphorbiaceae	**Euphorbia peplus*
	**Euphorbia terracina*
	**Ricinus communis*
Fabaceae	**Acacia iteaphylla*
	**Acacia longifolia*
	**Lupinus cosentinii*
	**Ornithopus sativus*
	Acacia pulchella
	Acacia rostellifera
	Acacia saligna

Appendix D: Vascular Flora Inventory

Family	Species
Fabaceae	*Acacia willdenowiana*
	Bossiaea eriocarpa
	Daviesia triflora
	Gastrolobium capitatum
	Gompholobium tomentosum
	Hardenbergia comptoniana
	Isotropis cuneifolia
	Jacksonia furcellata
	Jacksonia sericea (P4)
	Jacksonia sternbergiana
	Kennedia prostrata
Geraniaceae	**Pelargonium capitatum*
Goodeniaceae	*Dampiera linearis*
	Scaevola repens
Haemodoraceae	*Anigozanthos humilis*
	Anigozanthos manglesii
	Conostylis aculeata
	Conostylis aculeata subsp. *cygnorum*
	Conostylis juncea
	Haemodorum laxum
	Haemodorum spicatum
Hemerocallidaceae	*Caesia micrantha*
	Corynotheca micrantha
	Dianella revoluta
	Tricoryne elatior
Iridaceae	**Gladiolus caryophyllaceus*
	**Moraea flaccida*
	**Romulea rosea*
	Patersonia occidentalis
Lamiaceae	*Hemiandra pungens*
Loganiaceae	*Phyllangium paradoxum*
Macarthuriaceae	*Macarthuria australis*
Meliaceae	*Melia azedarach* (planted)
Montiaceae	*Calandrinia* sp.
	Calandrinia corrigioloides
Moraceae	**Ficus carica* (planted)
	**Morus alba* (planted)
	Ficus macrophylla (planted)
Myrtaceae	**Eucalyptus globulus* (planted)
	**Leptospermum laevigatum*
	Agonis flexuosa (planted)
	Astartea scoparia
	Callistemon sp. (planted)
	Chamelaucium uncinatum (planted)
	Corymbia calophylla
	Eremaea pauciflora
	Eucalyptus cinerea (planted)
	Eucalyptus gomphocephala
	Eucalyptus marginata

Appendix D: Vascular Flora Inventory

Family	Species
Myrtaceae	*Eucalyptus rudis*
	Eucalyptus todtiana
	Hypocalymma angustifolium
	Hypocalymma robustum
	Kunzea glabrescens
	Melaleuca preissiana
	Melaleuca seriata
	Scholtzia involucrata
Oleaceae	**Olea europaea* (planted)
Orchidaceae	**Disa bracteata*
	Caladenia flava
	Caladenia sp.
	Microtis media subsp. *media*
	Pterostylis sp.
	Pterostylis vittata
	Pyrorchis nigricans
Orobanchaceae	**Orobanche minor*
Oxalidaceae	**Oxalis pes-caprae*
Papaveraceae	**Fumaria capreolata*
Phyllanthaceae	*Phyllanthus calycinus*
	Poranthera microphylla
Pinaceae	**Pinus* sp. (planted)
Pittosporaceae	*Billardiera heterophylla*
Poaceae	**Aira caryophyllea*
	**Avena barbata*
	**Briza maxima*
	**Bromus diandrus*
	**Cenchrus clandestinus*
	**Cynodon dactylon*
	**Ehrharta calycina*
	**Ehrharta longiflora*
	**Eragrostis curvula*
	**Hordeum leporinum*
	**Lagurus ovatus*
	Amphipogon turbinatus
	Austrostipa compressa
Primulaceae	**Lysimachia arvensis*
Proteaceae	*Adenanthos cygnorum*
	Banksia attenuata
	Banksia hookeriana (planted)
	Banksia ilicifolia
	Banksia menziesii
	Banksia prionotes
	Conospermum triplinervium
	Persoonia saccata
	Petrophile linearis
	Stirlingia latifolia
Restionaceae	*Alexgeorgea nitens*
	Desmocladus flexuosus

Appendix D: Vascular Flora Inventory

Family	Species
Rubiaceae	*Opercularia vaginata*
Rutaceae	*Citrus limon* (planted)
	Philotheca spicata
Stylidiaceae	*Stylidium androsaceum*
Stylidiaceae	*Stylidium neurophyllum*
	Stylidium schoenoides
Urticaceae	**Urtica urens*
Violaceae	*Hybanthus calycinus*
Xanthorrhoeaceae	*Xanthorrhoea preissii*
Zamiaceae	*Macrozamia riedlei*

Appendix E
Flora Site Sheets

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ1
Location MGA 50 389350 **mE** 6489629 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Quadrat

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey, Yellow at depth

Vegetation: *Eucalyptus marginata low open woodland over Jacksonia sternbergiana and Xanthorrhoea preissii tall open shrubland over Hibbertia hypericoides, Philotheca spicata and Tricoryne elatior low isolated clumps of shrubs*
Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia willdenowiana	30	0.5	
**Aira caryophyllea*	10	0.5	
Amphipogon turbinatus	20	1.5	
Anigozanthos manglesii	70	0.5	
Austrostipa compressa	20	0.5	
Bossiaea eriocarpa	30	0.5	
**Briza maxima*	15	3	
Burchardia congesta	60	0.5	
Caladenia sp.	30	0.5	
Calandrinia sp.	3	0.5	
Calandrinia corrigioloides	10	0.5	
Calectasia narragara	25	0.5	
Conostephium pendulum	35	0.5	
Conostylis aculeata subsp. cygnorum	15	1	
Crassula colorata	3	0.5	
Desmocladus flexuosus	15	5	
Eucalyptus marginata	550	6	
**Gladiolus caryophyllaceus*	110	0.5	
Gompholobium tomentosum	40	0.5	
Hardenbergia comptoniana	70	0.5	
Hibbertia hypericoides	45	5	
Hypocalymma robustum	45	1	
**Hypochaeris glabra*	1	0.5	
Jacksonia sternbergiana	300	7	
Laxmannia squarrosa	15	1	
Lepidosperma leptostachyum	30	0.5	
Leucopogon polymorphus	35	0.5	
Lomandra hermaphrodita	25	3	
Mesomelaena pseudostygia	50	1.5	
Opercularia vaginata	10	0.5	
Patersonia occidentalis	60	1	
Philotheca spicata	40	1	
Phyllangium paradoxum	5	0.5	
Podotheca gnaphalioides	30	0.5	
Stylidium androsaceum	10	0.5	
Stylidium neurophyllum	25	0.5	
Tetraria octandra	15	1	
Trachymene pilosa	5	0.5	
Tricoryne elatior	40	1	
**Ursinia anthemoides*	30	2	
Waitzia suaveolens	10	3	
Xanthorrhoea preissii	180	30	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ2
Location MGA 50 388837 **mE** 6489600 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Quadrat

Landform: Mid slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White

Vegetation: *Banksia attenuata, Banksia menziesii and Melaleuca preissiana low woodland over Philotheca spicata, Hypocalymma robustum and Eremaea pauciflora low isolated clumps of shrubs over Desmocladus flexuosus, Lepidosperma squamatum and Lyginia barbata low isolated clumps of herbs*

Condition: Degraded **Disturbance Type:** Weeds, Litter, Historical Clearing
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia pulchella	50	0.5	
Amphipogon turbinatus	35	1	
Anigozanthos humilis	25	0.5	
Banksia attenuata	700	15	
Banksia menziesii	600	4	
**Briza maxima*	25	4	
Burchardia congesta	45	0.5	
Caesia micrantha	100	0.5	
Conostylis aculeata subsp. cygnorum	40	1	
Dampiera linearis	25	0.5	
Desmocladus flexuosus	20	4	
Dianella revoluta	45	2	
**Ehrharta calycina*	120	10	
Eremaea pauciflora	120	1	
**Gladiolus caryophyllaceus*	130	1	
Haemodorum spicatum	120	0.5	
Hypocalymma robustum	45	1.5	
**Hypochaeris glabra*	2	0.5	
Lepidosperma squamatum	45	3	
Lyginia barbata	45	3	
Macrozamia riedlei	120	1	
Melaleuca preissiana	250	1	
Melaleuca seriata	60	2	
Patersonia occidentalis	50	0.5	
Petrophile linearis	40	0.5	
Philotheca spicata	60	2	
Sowerbaea laxiflora	50	0.5	
Stylidium schoenoides	50	0.5	
Trachymene pilosa	7	0.5	
**Ursinia anthemoides*	25	0.5	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ3
Location MGA 50 387191 **mE** 6488982 **mN**

Described by: NW, BD
Date: 19/10/2020
Type: Quadrat

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata and Banksia attenuata mid open woodland over Jacksonia sternbergiana tall open shrubland over *Ehrharta calycina mid tussock grassland*

Condition: Degraded **Disturbance Type:** Weeds, Litter, Dumping (Car bodies)
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Banksia attenuata	650	3	
Caladenia flava	20	0.5	
Conostylis aculeata subsp. cygnorum	35	0.5	
Corynotheca micrantha	40	2	
Dianella revoluta	40	0.5	
**Ehrharta calycina*	100	30	
Eucalyptus marginata	1100	8	
Gahnia trifida	80	2	
**Gladiolus caryophyllaceus*	80	0.5	
Gompholobium tomentosum	30	0.5	
Haemodorum laxum	70	0.5	
Hibbertia hypericoides	45	4	
Hybanthus calycinus	30	1	
**Hypochaeris glabra*	30	4	
Jacksonia sericea	10	1	P4
Jacksonia sternbergiana	400	15	
Lomandra caespitosa	50	1	
Macrozamia riedlei	220	1.5	
**Pelargonium capitatum*	45	0.5	
**Romulea rosea*	30	3	
Scaevola repens	6	0.5	
Trachymene pilosa	8	0.5	
Tricoryne elatior	30	1	
**Ursinia anthemoides*	40	8	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ4
Location MGA 50 389154 **mE** 6488673 **mN**

Described by: NW, BD
Date: 21/10/2020
Type: Quadrat

Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown,Grey

Vegetation: *Eucalyptus marginata and Banksia menziesii low woodland over Jacksonia sternbergiana tall shrubland over Gahnia trifida, Dianella revoluta and Alexgeorgea nitens low sparse sedgeland*

Condition: Degraded **Disturbance Type:** Weeds, Litter
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia iteaphylla*	250	1.5	
Alexgeorgea nitens	15	10	
**Briza maxima*	30	2	
Corynotheca micrantha	35	6	
Desmocladus flexuosus	5	1	
Dianella revoluta	60	1	
Drosera sp. "climbing"	50	0.5	
**Ehrharta calycina*	150	10	
Eucalyptus marginata	600	25	
Gahnia trifida	60	2.5	
**Gladiolus caryophyllaceus*	70	0.5	
Haemodorum laxum	100	0.5	
Hardenbergia comptoniana	230	1	
Hibbertia cuneiformis	200	1	
Hibbertia hypericoides	30	1.5	
Hibbertia racemosa	40	2	
**Hypochaeris glabra*	1	0.5	
Jacksonia sternbergiana	300	35	
**Leptospermum laevigatum*	200	1	
**Lysimachia arvensis*	10	0.5	
**Pelargonium capitatum*	30	0.5	
Pterostylis sp.	50	0.5	
Ptilotus polystachyus	70	0.5	
**Ursinia anthemoides*	30	10	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ5
Location MGA 50 387134 **mE** 6488896 **mN**

Described by: NW, BD
Date: 21/10/2020
Type: Quadrat

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown

Vegetation: *Eucalyptus marginata and Allocasuarina fraseriana mid open forest over Jacksonia sternbergiana tall open shrubland over *Ehrharta calycina and *Ehrharta longiflora mid open tussock grassland*

Condition: Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina fraseriana	800	4	
**Briza maxima*	10	1	
**Carpobrotus edulis*	10	15	
Conostylis aculeata subsp. cygnorum	35	0.5	
Conostylis juncea	20	0.5	
Corynotheca micrantha	35	2	
Desmocladus flexuosus	7	0.5	
**Disa bracteata*	15	0.5	
**Ehrharta calycina*	100	20	
**Ehrharta longiflora*	40	2	
Eucalyptus marginata	1200	40	
**Gladiolus caryophyllaceus*	90	0.5	
Haemodorum laxum	100	0.5	
Hardenbergia comptoniana	40	0.5	
Hypocalymma robustum	70	0.5	
**Hypochaeris glabra*	30	1	
Jacksonia sternbergiana	500	20	
Macrozamia riedlei	20	0.5	
Mesomelaena pseudostygia	30	0.5	
Microtis media subsp. media	30	0.5	
**Ornithopus sativus*	5	0.5	
Patersonia occidentalis	40	0.5	
**Romulea rosea*	15	1	
Sowerbaea laxiflora	50	0.5	
Stirlingia latifolia	70	0.5	
**Ursinia anthemoides*	10	0.5	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ6
Location MGA 50 387157 **mE** 6488746 **mN**

Described by: NW, BD
Date: 26/10/2020
Type: Quadrat

Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Banksia attenuata, Eucalyptus marginata and Banksia menziesii low open woodland over Jacksonia furcellata, Jacksonia sternbergiana and Macrozamia riedlei tall isolated clumps of shrubs over Hibbertia hypericoides low open shrubland over *Ursinia anthemoides low herbland*
Condition: Good **Disturbance Type:** Weeds, Litter
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia pulchella	45	1	
Alexgeorgea nitens	7	0.5	
Banksia attenuata	900	8	
Banksia ilicifolia	700	2	
Banksia menziesii	600	4	
**Briza maxima*	25	6	
Burchardia congesta	45	0.5	
Caladenia sp.	40	0.5	
Conostylis aculeata subsp. cygnorum	35	0.5	
Daviesia triflora	50	1	
Desmocladus flexuosus	10	1	
Dianella revoluta	45	3	
Eucalyptus marginata	800	5	
**Gladiolus caryophyllaceus*	100	2	
Gompholobium tomentosum	45	0.5	
Haemodorum spicatum	80	0.5	
Hardenbergia comptoniana	40	0.5	
Hemiandra pungens	15	1	
Hibbertia hypericoides	50	20	
Hypocalymma robustum	45	0.5	
**Hypochaeris glabra*	1	0.5	
Isotropis cuneifolia	15	0.5	
Jacksonia furcellata	250	2	
Jacksonia sternbergiana	250	4	
Lepidosperma squamatum	45	0.5	
Lomandra caespitosa	25	0.5	
Lomandra hermaphrodita	25	0.5	
Macrozamia riedlei	180	1	
Mesomelaena pseudostygia	45	1	
Opercularia vaginata	30	0.5	
Patersonia occidentalis	40	0.5	
**Pelargonium capitatum*	50	1	
Persoonia saccata	45	1	
Ptilotus manglesii	10	0.5	
Pyrorchis nigricans	2	0.5	
**Romulea rosea*	25	3	
Scaevola repens	10	1.5	
**Sonchus oleraceus*	50	0.5	
Styphelia propinqua	35	0.5	
Thysanotus patersonii	60	0.5	
Thysanotus sparteus	40	0.5	
Trachymene pilosa	7	0.5	
**Ursinia anthemoides*	25	30	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ7
Location MGA 50 387070 **mE** 6488935 **mN**

Described by: NW, BD
Date: 26/10/2020
Type: Quadrat

Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Allocasuarina fraseriana, Eucalyptus marginata and Banksia attenuata low open woodland over Jacksonia sternbergiana tall sparse shrubland over Xanthorrhoea preissii, Hibbertia hypericoides and Corynotheca micrantha mid open shrubland*
Condition: Very Good **Disturbance Type:** Weeds, Litter, Fire evidence
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alexgeorgea nitens	7	0.5	
Allocasuarina fraseriana	700	7	
Amphipogon turbinatus	25	0.5	
Banksia attenuata	650	3	
Banksia menziesii	130	1	
Billardiera heterophylla	40	0.5	
Bossiaea eriocarpa	35	0.5	
**Briza maxima*	30	8	
Burchardia congesta	50	0.5	
Conostylis aculeata subsp. cygnorum	30	0.5	
Corynotheca micrantha	40	1.5	
Dampiera linearis	25	0.5	
Daviesia triflora	70	1	
Desmocladus flexuosus	7	0.5	
**Ehrharta calycina*	100	1	
Eucalyptus marginata	700	3	
Gahnia trifida	55	2	
Gastrolobium capitatum	110	1.5	
**Gladiolus caryophyllaceus*	100	0.5	
Gompholobium tomentosum	40	0.5	
Hardenbergia comptoniana	40	0.5	
Hibbertia hypericoides	55	15	
Hypocalymma robustum	55	1.5	
Jacksonia sericea	40	1.5	P4
Jacksonia sternbergiana	300	6	
Lepidosperma squamatum	50	2	
Lomandra hermaphrodita	25	0.5	
Lomandra preissii	40	0.5	
Macrozamia riedlei	15	0.5	
Mesomelaena pseudostygia	50	4	
Microtis media subsp. media	35	0.5	
**Moraea flaccida*	45	0.5	
Philotheca spicata	70	1	
Poranthera microphylla	3	0.5	
Pterostylis sp.	25	0.5	
**Sonchus oleraceus*	40	1	
Stirlingia latifolia	70	1	
Thysanotus patersonii	50	0.5	
Tricoryne elatior	40	0.5	
**Ursinia anthemoides*	25	20	
Xanthorrhoea preissii	120	6	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR1
Location MGA 50 388835 **mE** 6488741 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown

Vegetation: *Banksia attenuata low open woodland over Kunzea glabrescens, Jacksonia sternbergiana and Adenanthos cygnorum tall shrubland over Gahnia trifida, Mesomelaena pseudostygia and Dianella revoluta low open sedgeland*
Condition: Good **Disturbance Type:** Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Adenanthos cygnorum	300	5	
Banksia attenuata	700	8	
Bossiaea eriocarpa	40	0.5	
**Briza maxima*	50	10	
Conospermum triplinervium	350	2	
Conostylis aculeata subsp. cygnorum	35	2	
Corynotheca micrantha	40	1	
Dianella revoluta	60	1	
**Ehrharta calycina*	70	15	
Gahnia trifida	55	20	
Gastrolobium capitatum	70	2	
Gompholobium tomentosum	40	1	
Hybanthus calycinus	20	1	
Jacksonia sericea	20	3	P4
Jacksonia sternbergiana	400	5	
Kunzea glabrescens	600	35	
Mesomelaena pseudostygia	45	4	
**Pelargonium capitatum*	50	6	
Phyllanthus calycinus	45	1	
Pterostylis vittata	35	0.5	
Scaevola repens	7	1	
Tricoryne elatior	45	2	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR2
Location MGA 50 388963 **mE** 6488670 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown

Vegetation: *Eucalyptus marginata, Corymbia calophylla and Banksia attenuata mid isolated clumps of trees over Jacksonia sternbergiana, Adenanthos cygnorum and Macrozamia riedlei tall open shrubland over Hibbertia hypericoides, Jacksonia sericea and Philotheca spicata low isolated clumps of shrubs*
Condition: Degraded **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Adenanthos cygnorum	250	5	
Allocasuarina fraseriana	800	1	
Anigozanthos manglesii	80	0.5	
Banksia attenuata	700	2	
Banksia menziesii	250	1	
**Briza maxima*	25	10	
Burchardia congesta	50	0.5	
Caladenia sp.	40	0.5	
**Carpobrotus edulis*	15	3	
Conostylis aculeata subsp. cygnorum	35	0.5	
Corymbia calophylla	1500	3	
Desmocladus flexuosus	15	5	
Dianella revoluta	70	0.5	
**Ehrharta calycina*	100	30	
Eucalyptus marginata	1000	30	
Gahnia trifida	60	0.5	
**Gladiolus caryophyllaceus*	110	1	
Gompholobium tomentosum	80	0.5	
Hardenbergia comptoniana	50	0.5	
Hibbertia hypericoides	50	3	
Hypocalymma robustum	45	0.5	
**Hypochaeris glabra*	1	1	
Jacksonia sericea	4	2	P4
Jacksonia sternbergiana	300	15	
Macrozamia riedlei	200	1	
Microtis media subsp. media	50	0.5	
**Pelargonium capitatum*	60	4	
Philotheca spicata	60	1	
Tricoryne elatior	40	0.5	
**Ursinia anthemoides*	30	7	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR3
Location MGA 50 389288 **mE** 6489516 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Releve

Landform: Mid slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Allocasuarina fraseriana and Banksia attenuata low isolated trees over Adenanthos cygnorum, Jacksonia furcellata and *Olea europaea tall open shrubland over Gahnia trifida and Lyginia barbata low isolated clumps of sedges*
Condition: Degraded **Disturbance Type:** Weeds, Historical Clearing
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia willdenowiana	5	0.5	
Adenanthos cygnorum	400	20	
Allocasuarina fraseriana	350	1	
Anigozanthos manglesii	50	0.5	
Banksia attenuata	400	1	
**Briza maxima*	25	0.5	
Chamelaucium uncinatum	150	0.5	
Conostylis aculeata subsp. cygnorum	40	0.5	
Dampiera linearis	25	0.5	
Daviesia triflora	45	0.5	
Desmocladus flexuosus	15	0.5	
Gahnia trifida	70	4	
Gompholobium tomentosum	40	0.5	
Hibbertia hypericoides	50	2	
Hybanthus calycinus	25	0.5	
Hypocalymma robustum	30	0.5	
**Hypochaeris glabra*	1	1	
Jacksonia furcellata	450	15	
Jacksonia sternbergiana	200	3	
Kunzea glabrescens	300	2	
Laxmannia squarrosa	20	0.5	
Lomandra hermaphrodita	30	0.5	
Lyginia barbata	60	2	
Mesomelaena pseudostygia	45	0.5	
**Olea europaea*	400	10	Planted
**Pelargonium capitatum*	45	1	
Scaevola repens	7	0.5	
Tricoryne elatior	45	1	
**Ursinia anthemoides*	30	20	
Waitzia suaveolens	2	1	
Xanthorrhoea preissii	100	1	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR4
Location MGA 50 389487 **mE** 6488839 **mN**

Described by: NW, BD
Date: 21/10/2020
Type: Releve

Landform: Wetland
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus rudis and Melaleuca preissiana mid isolated clumps of trees over Jacksonia furcellata and Macrozamia riedlei mid isolated clumps of shrubs over *Ursinia anthemoides, *Carpobrotus edulis and *Hypochaeris glabra low sparse herbland*
Condition: Completely Degraded **Disturbance Type:** Heavy grazing, Weeds, Horse tracks/scats
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Arctotheca calendula*	10	1	
**Carpobrotus edulis*	10	5	
Corynotheca micrantha	40	3	
**Ehrharta calycina*	100	3	
Eucalyptus rudis	1200	5	
**Hypochaeris glabra*	1	2	
Jacksonia furcellata	220	2	
Macrozamia riedlei	150	2	
Melaleuca preissiana	600	5	
**Ursinia anthemoides*	30	6	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR5
Location MGA 50 388253 **mE** 6488845 **mN**

Described by: NW, BD
Date: 19/10/2020
Type: Releve

Landform: Wetland
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown

Vegetation: *Eucalyptus rudis mid open forest over Hibbertia cuneiformis and Astartea scoparia mid isolated clumps of shrubs over *Ehrharta longiflora, *Hordeum leporinum and *Bromus diandrus low open grassland*

Condition: Degraded
Fire Age: >10 years
Disturbance Type: Heavy grazing, Weeds, Horse tracks/scats

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia longifolia*	250	3	
Astartea scoparia	130	1	
**Bromus diandrus*	20	5	
**Ehrharta longiflora*	50	10	
Eucalyptus rudis	1500	60	
**Euphorbia peplus*	20	10	
**Fumaria capreolata*	30	7	
Hibbertia cuneiformis	170	5	
**Hordeum leporinum*	20	10	
**Urtica urens*	45	0.5	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESQ01
Location MGA 50 387422 **mE** 6488593 **mN**

Described by: NW, GB
Date: 12/10/2021
Type: Quadrat

Landform: Mid slope
Slope: Northeast
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata and Banksia attenuata low woodland over Kunzea glabrescens, Acacia saligna and Macrozamia riedlei tall open shrubland over Gompholobium tomentosum, Hibbertia hypericoides and Jacksonia sericea low sparse shrubland over *Ehrharta calycina mid tussock grassland over Desmocladus flexuosus, Alexgeorgea nitens and Lepidosperma leptostachyum low open sedgeland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia saligna	300	2	
Alexgeorgea nitens	15	2	
Banksia attenuata	500	6	
Bossiaea eriocarpa	20	0.5	
**Briza maxima*	30	0.5	
Burchardia congesta	50	0.1	
Conostylis aculeata subsp. cygnorum	40	0.5	
Desmocladus flexuosus	15	10	
Dianella revoluta	40	0.5	
Drosera sp. "climbing"	80	0.1	
**Ehrharta calycina*	100	65	
Eucalyptus marginata	800	10	
**Gladiolus caryophyllaceus*	70	0.1	
Gompholobium tomentosum	45	1	
Hardenbergia comptoniana	100	0.5	
Hibbertia hypericoides	35	1	
Hovea trisperma	30	0.1	
**Hypochaeris glabra*	1	0.1	
Jacksonia sericea	40	1	P4
Jacksonia sternbergiana	75	1	
Kunzea glabrescens	200	10	
Lepidosperma leptostachyum	80	1	
Levenhookia pusilla	3	0.1	
**Lysimachia arvensis*	10	0.1	
Macrozamia riedlei	200	1.5	
Mesomelaena pseudostygia	45	1	
Morelotia octandra	80	4	
Patersonia occidentalis	40	0.1	
Ptilotus manglesii	10	0.5	
Pyrorchis nigricans	3	0.1	
**Romulea rosea*	25	0.1	
Scaevola repens	10	0.5	
**Silene gallica*	35	0.1	
**Sonchus oleraceus*	25	0.1	
Stylidium brunonianum	40	0.1	
Stylidium calcaratum	8	0.1	
Thysanotus manglesianus	50	0.1	
Wahlenbergia capensis	25	0.1	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR01
Location MGA 50 388830 **mE** 6489688 **mN**

Described by: NW, GB
Date: 12/10/2021
Type: Releve

Landform: Mid slope
Slope: South
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata and Allocasuarina fraseriana mid woodland over Banksia menziesii low open woodland over Jacksonia furcellata tall sparse shrubland over Gompholobium tomentosum, Petrophile linearis and Hibbertia hypericoides low open shrubland over *Ehrharta calycina low open tussock grassland over Phlebocarya ciliata, Dianella revoluta and Dampiera linearis low sparse herbland*

Condition: Good
Fire Age: > 15 years
Disturbance Type: Historical Clearing, Vehicle tracks, Weeds

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina fraseriana	1200	8	
Banksia menziesii	650	5	
Dampiera linearis	25	1	
Desmocladus flexuosus	15	4	
Dianella revoluta	60	2	
**Ehrharta calycina*	80	15	
Eucalyptus marginata	1400	15	
Gompholobium tomentosum	50	15	
Hibbertia hypericoides	45	2	
Jacksonia furcellata	250	5	
Petrophile linearis	45	4	
Philotheca spicata	55	1	
Phlebocarya ciliata	45	4	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR02
Location MGA 50 389459 **mE** 6489663 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Plain
Slope: N/A
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata mid open woodland over Banksia attenuata, Banksia menziesii and Eucalyptus todtiana low woodland over Jacksonia furcellata, Macrozamia riedlei and Jacksonia sternbergiana mid sparse shrubland over Petrophile linearis low sparse shrubland over *Ehrharta calycina tall closed tussock grassland over *Avena barbata, *Briza maxima and *Cynodon dactylon low open tussock grassland over *Carpobrotus edulis, *Oenothera stricta and *Oxalis pes-caprae low sparse herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Infrastructure, Weeds,Irrigation Pipes
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia applanata	25	0.1	
**Acacia longifolia*	200	1	
Allocasuarina fraseriana	400	3	
**Avena barbata*	45	10	
Banksia attenuata	1000	10	
Banksia menziesii	500	10	
**Briza maxima*	30	8	
Burchardia congesta	30	0.1	
**Carpobrotus edulis*	15	2	
**Cynodon dactylon*	20	3	
Drosera erythrorhiza	1	0.1	
**Ehrharta calycina*	160	90	
Eucalyptus marginata	1500	10	
Eucalyptus todtiana	600	10	
**Euphorbia terracina*	60	1	
**Gladiolus caryophyllaceus*	20	0.1	
Gompholobium tomentosum	55	3	
Hibbertia hypericoides	50	2	
Hypocalymma angustifolium	45	0.5	
Jacksonia furcellata	200	2	
Jacksonia sericea	15	0.5	P4
Jacksonia sternbergiana	200	1	
Lomandra hermaphrodita	35	0.1	
**Lupinus cosentinii*	30	1	
Macrozamia riedlei	200	2	
Mesomelaena pseudostygia	45	0.5	
**Oenothera stricta*	15	2	
**Oxalis pes-caprae*	25	2	
**Pelargonium capitatum*	50	4	
Petrophile linearis	40	1	
Philotheca spicata	50	0.5	
Scaevola repens	5	0.1	
**Sonchus oleraceus*	40	0.5	
Sowerbaea laxiflora	25	0.1	
Thysanotus dichotomus	50	0.5	
**Ursinia anthemoides*	25	1	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR03
Location MGA 50 388978 **mE** 6488644 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Mid slope
Slope: East
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata mid open woodland over Allocasuarina fraseriana, Banksia attenuata and Banksia menziesii low open woodland over Xanthorrhoea preissii mid sparse shrubland over Hibbertia hypericoides and Petrophile macrostachya low sparse shrubland over Mesomelaena pseudostygia low sparse sedgeland over Anigozanthos manglesii and Sowerbaea laxiflora mid sparse herbland*

Condition: Completely Degraded **Disturbance Type:** Historical Clearing, Weeds, Lawn
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina fraseriana	1000	6	
Anigozanthos manglesii	80	1	
Banksia attenuata	500	3	
Banksia menziesii	400	1	
Conostylis aculeata subsp. cygnorum	35	0.1	
Eucalyptus marginata	1100	5	
Hibbertia hypericoides	45	1	
Mesomelaena pseudostygia	45	1	
Petrophile macrostachya	90	0.5	
Sowerbaea laxiflora	50	0.5	
Xanthorrhoea preissii	200	2	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR04
Location MGA 50 388209 **mE** 6488341 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Plain
Slope: N/A
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata mid woodland over Banksia attenuata, Alocasuarina fraseriana and Banksia menziesii low woodland over *Leptospermum laevigatum and *Acacia iteaphylla tall sparse shrubland over Hibbertia hypericoides low sparse shrubland over *Ehrharta calycina and *Briza maxima low to mid closed tussock grassland over Desmocladus flexuosus and Mesomelaena pseudostygia low sparse sedgeland over *Pelargonium capitatum and *Ursinia anthemoides mid sparse herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Litter, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia iteaphylla*	400	3	
Allocasuarina fraseriana	800	5	
Banksia attenuata	600	8	
Banksia menziesii	200	6	
**Briza maxima*	30	3	
Burchardia congesta	40	0.1	
Desmocladus flexuosus	15	3	
**Ehrharta calycina*	90	80	
Eucalyptus marginata	1500	20	
Hibbertia hypericoides	45	2	
**Leptospermum laevigatum*	300	6	
Mesomelaena pseudostygia	40	0.5	
**Pelargonium capitatum*	60	4	
Sowerbaea laxiflora	40	0.1	
**Ursinia anthemoides*	30	3	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR05
Location MGA 50 388199 **mE** 6488327 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Open woodland
Slope: North
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Banksia attenuata, Eucalyptus marginata and Banksia menziesii low open forest over *Acacia longifolia and Hibbertia cuneiformis tall open shrubland over Hibbertia hypericoides and Stirlingia latifolia low sparse shrubland over *Briza maxima, *Ehrharta calycina and *Ehrharta longiflora low to mid tussock grassland over *Ursinia anthemoides and *Pelargonium capitatum low open herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Infrastructure, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia longifolia*	300	10	
Banksia attenuata	500	20	
Banksia menziesii	350	3	
**Briza maxima*	25	20	
**Ehrharta calycina*	60	20	
**Ehrharta longiflora*	20	5	
Eucalyptus marginata	400	10	
Hibbertia cuneiformis	200	2	
Hibbertia hypericoides	40	2	
**Pelargonium capitatum*	40	4	
Stirlingia latifolia	70	1	
**Ursinia anthemoides*	20	10	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR06
Location MGA 50 388130 **mE** 6488317 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Open woodland
Slope: North
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Banksia attenuata, Banksia menziesii and Banksia ilicifolia low open forest over Jacksonia furcellata and Macrozamia riedlei tall open shrubland over Hibbertia hypericoides, Acacia huegelii and Hypocalymma robustum low sparse shrubland over *Ehrharta calycina mid closed tussock grassland over Alexgeorgea nitens low sparse sedgeland over Trachymene pilosa, *Ursinia anthemoides and Burchardia congesta low open herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia huegelii	40	1	
Alexgeorgea nitens	10	6	
Austrostipa sp.	20	0.1	
Banksia attenuata	350	15	
Banksia ilicifolia	300	1	
Banksia menziesii	350	15	
Bossiaea eriocarpa	40	1	
Burchardia congesta	30	2	
Caladenia flava	5	0.1	
Conostylis aculeata subsp. cygnorum	30	0.5	
Dampiera linearis	25	0.5	
Dianella revoluta	40	0.5	
**Ehrharta calycina*	70	80	
Eremaea pauciflora	40	0.5	
**Gladiolus caryophyllaceus*	70	1	
Haemodorum laxum	50	0.5	
Hibbertia hypericoides	40	2	
Hypocalymma robustum	40	1	
Jacksonia furcellata	300	2	
Lyginia barbata	40	2	
Macrozamia riedlei	200	1	
Scholtzia involucrata	20	1	
Sowerbaea laxiflora	40	1	
Styphelia conostephioides	30	1	
Trachymene pilosa	5	3	
**Ursinia anthemoides*	30	2	

Appendix F
Potential Breeding Trees

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.72946520	115.80706920	Jarrah (Eucalyptus marginata)	2800	24					d0ba65e4-7284-4124-bf93-2091067388c1	
-31.73080860	115.83016620	Tuart (Eucalyptus gomphocephala)	2300	26					83b09a65-2af2-491d-adaf-90c0476e6e3f	
-31.72954451	115.82617520	Jarrah (Eucalyptus marginata)	2150	18	7	5	1		4d242171-9fd7-4bb9-bd7e-8b971cd162d7	
-31.73374340	115.82952240	Tuart (Eucalyptus gomphocephala)	2120	16	1	1			107eb97c-c688-49a8-99aa-90e14cce1881	
-31.73008150	115.83049070	Tuart (Eucalyptus gomphocephala)	2000	26					45be8440-2d0f-4c2b-b602-9809ea02968e	
-31.73019554	115.83079360	Tuart (Eucalyptus gomphocephala)	2000	28	1	1		Can't see hollow clearly	1de1785c-3d9a-4568-8fbd-c36245f415f1	
-31.73005990	115.82953720	Tuart (Eucalyptus gomphocephala)	2000	24					e0679c8b-8d36-4292-ba69-a22a99840628	
-31.72976810	115.82984040	Tuart (Eucalyptus gomphocephala)	1990	16					054db3a4-e2b9-4cfb-8f60-8e7f778a0e12,685c663a-75d6-4f26-90e8-c5c77b3bd1e1	
-31.73219410	115.81472870	Introduced Eucalypt	1900	15					62fb310d-1d77-40ea-ac27-7b4b7ab86178	
-31.73116224	115.83068800	Jarrah (Eucalyptus marginata)	1800	18	2	2		Can't verify. No access to property	3dac4ecd-5659-475f-a70b-83e46276b0fc	
-31.73054258	115.82960510	Tuart (Eucalyptus gomphocephala)	1800	28	2	2		Can't access. Can't verify hollow	31525a4a-52fb-46d9-bcdd-6919b41e244f	
-31.72298118	115.82674753	Jarrah (Eucalyptus marginata)	1780	14	4	3			0c2f2ae1-2be6-4dc9-a546-b45782d7f595	
-31.73286606	115.82821336	Jarrah (Eucalyptus marginata)	1670	4	8	4		Can't see all hollows	7b3712e5-985a-4bf5-b3a6-110081bb18e1,2ca88d67-28b9-4083-aba8-b7f5cbef9b78	
-31.73255096	115.82668651	Tuart (Eucalyptus gomphocephala)	1630	16	4	4	3		9ef6004b-88fc-459c-a61f-d7e70e42f4ea	
-31.73477601	115.82364589	Introduced Eucalypt	1620	14					b7f831a4-7327-4b87-ad9a-fffd25ef5c2d	
-31.73569048	115.81865430	Stag	1620	3	4	4			8b9a2dce-6750-477e-a3b4-e3452d112c12,ad746d89-88a9-4f8e-a6e3-87253077f4a7,6fe16675-d888-430b-af4f-f2a3978376e5,596f266e-5d41-4521-b923-c36622b5d1bf,5954a486-8946-4628-b23b-6cad936ca1a4	
-31.73422330	115.82429040	Introduced Eucalypt	1610	19					7b80b5a1-fcd7-4656-ba7a-557335e3b44b	
-31.73395791	115.82993433	Tuart (Eucalyptus gomphocephala)	1600	15					4ba0f194-7ec6-4347-96ff-f3c18d1c9392	
-31.72883960	115.83013850	Tuart (Eucalyptus gomphocephala)	1600	17					3e519dd2-1010-40da-87b2-aecf7e4591bb	
-31.73019810	115.82942020	Tuart (Eucalyptus gomphocephala)	1600	25					b8dca185-56b8-4396-910e-721265be5701	8da76cf2-0ff7-43e5-8a3c-55d4d34f4ef8,fceee119-75be-46df-9b4b-61e96f8c179c,0e88435b-2376-4673-87f0-0354daecdf37,5eceecc5-7d0b-4e0b-981c-a5e5aafb7c9d,f801eb60-9be2-4523-905c-2242ad22f1bc
-31.72154640	115.80590878	Jarrah (Eucalyptus marginata)	1570	9	4	4		Can't confirm hollow	87dd8e54-5e41-45fa-9343-327dfbae2126	f70ed325-9b45-4601-9e8f-a173091f3ccb
-31.73423137	115.82963124	Stag	1530	7	4	4			33274e08-1788-43d2-b6ed-090582751624	
-31.73029420	115.83045190	Tuart (Eucalyptus gomphocephala)	1510	27					9874328f-bcaa-4b3e-996f-280dc81ae451	
-31.72205330	115.80602490	Stag	1500	3					c136b894-f8bd-44c9-84ce-aaceafbdc4e0	
-31.72943740	115.80806270	Stag	1500	7	3	3			28dfa6ef-2dd2-4b94-af5e-442da5f5ac89	
-31.73036977	115.82982940	Tuart (Eucalyptus gomphocephala)	1500	17	1	1		Can't access tree. Appears to have hollows	8a25b1a1-43e2-45c9-90d8-6d5039199f79	
-31.73430080	115.81798530	Introduced Eucalypt	1480	12					3f71050e-de3f-44cf-95d8-6818c94dd305	
-31.72390319	115.83321635	Jarrah (Eucalyptus marginata)	1470	11					b848f132-8d87-4da2-9d4c-4897ea6f0259	
-31.73136720	115.81250820	Stag	1450	4					72f4f087-0c4e-491c-bc5c-db2d44fb24cb	
-31.73452422	115.83060186	Stag	1440	8	4	4			458f1b1d-b616-4167-84cb-94ed644a5d03	
-31.73054520	115.82517860	Stag	1430	12	8	6	2		76dc0667-7e87-4c77-95e9-3c7ee178346d	
-31.73330800	115.81489130	Stag	1400	8	4	4			7290fc3a-fb9e-4697-bde9-666b9fc11402	
-31.73373008	115.83072592	Tuart (Eucalyptus gomphocephala)	1390	16					b2c19b47-6d20-42c9-94e2-b9528e649754	
-31.73458550	115.81885100	Jarrah (Eucalyptus marginata)	1350	14					4a5cb212-e70c-4373-9a40-dd76d0bb7aeb	
-31.72488020	115.82828590	Jarrah (Eucalyptus marginata)	1340	17					dff32f57-6a49-44eb-8ff1-47c8a074f4c6	
-31.72954170	115.83084260	Introduced Eucalypt	1300	16					8a9edb72-9fa9-4b42-b803-cd973e5e63cf	
-31.72011559	115.80854036	Introduced Eucalypt	1280	12					39c41e7b-101e-4bf5-8efd-02e88c72c30c	
-31.73389717	115.83018143	Tuart (Eucalyptus gomphocephala)	1280	16	1				c26fb02c-df78-47fe-9c7d-12a79d8bc550	
-31.73415410	115.81795659	Introduced Eucalypt	1260	12					1f968b71-bf07-4345-9bfa-3f1ef1228d3c	
-31.73470990	115.81956540	Jarrah (Eucalyptus marginata)	1260	12					74f5fc06-8080-46f3-bdd3-217ee51f54b5	
-31.73185033	115.81037633	Tuart (Eucalyptus gomphocephala)	1250	14					522a859b-c27d-44ea-901c-b2189aaa67de	
-31.73333115	115.81229914	Jarrah (Eucalyptus marginata)	1240	10					6e9dae74-a47c-4f0d-95c6-8690179e08bc	
-31.73387123	115.83039399	Tuart (Eucalyptus gomphocephala)	1220	17				Can't see if hollow	3b378510-d262-447c-9991-47a202eadc77	
-31.72812980	115.80820070	Introduced Eucalypt	1200	24					1b8dc8a2-7670-4e32-9321-e1aaa7372fc6	
-31.72869850	115.83112350	Introduced Eucalypt	1200	11					c06a7c68-13b0-4f10-9104-25b5ccbdb4d7	
-31.72990800	115.80907240	Jarrah (Eucalyptus marginata)	1200	14	4	2			61bc65db-97e9-42f5-b151-91adc93b6bd3	
-31.73196838	115.83063000	Jarrah (Eucalyptus marginata)	1200	20	3	3		Can't see all hollows	1ecd6f95-1706-40ed-b56b-090d06cb71e4	1e2ee2c0-b075-40fe-bc9d-9c347f8e877b
-31.73206280	115.83008020	Jarrah (Eucalyptus marginata)	1200	18					e4fa31cb-ef03-4f8a-be60-7bdc6b4ab6d9	
-31.72305847	115.83151280	Stag	1200	13	2	2			c295d9c2-5df1-4597-843e-8a646410249f	
-31.73120560	115.80607840	Tuart (Eucalyptus gomphocephala)	1200	20					48f4f934-4477-495e-88da-3dfa4d00de63	
-31.72930680	115.83089830	Jarrah (Eucalyptus marginata)	1180	16					c0056f5d-4c7b-4347-bbd6-67acac3ba24b,c62f42db-c977-45d2-8368-4ea0f646efb0,5d3914bc-9854-4e9a-b2af-66bdf4909405	d1a570f0-fc3b-43f4-818f-ea69fcaaccb2
-31.72111490	115.82823810	Coastal blackbutt (Eucalyptus todtiana)	1170	10	2				7ef27c4a-2f3d-42e5-b72e-6def4ccc78cc	
-31.73230230	115.82760014	Jarrah (Eucalyptus marginata)	1170	13	2				ad08c28e-3549-4321-b57a-bce8170a3781	52d0ef5a-b878-4f0d-94b3-b4ed558bc966
-31.73308363	115.82819726	Jarrah (Eucalyptus marginata)	1160	15					859fd1d7-77eb-4cd1-987c-c63a081e3bd0	
-31.72932880	115.83077110	Jarrah (Eucalyptus marginata)	1150	16					4ec4dbac-b0ed-4471-8428-94dcae54b40e	
-31.73291111	115.82749151	Stag	1150	12	5	3			e1c40c55-6678-4ee4-8630-fd5e9dd7eddc	

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.72268345	115.82640957	Jarrah (Eucalyptus marginata)	1120	9	4	4			4f3f5b4f-59f6-4b7c-a2e4-a25f1a8911b9	
-31.73365394	115.83073363	Tuart (Eucalyptus gomphocephala)	1120	16					b8ed5fd1-23ba-4494-8b77-05e7ef57335a	1a6e1ad1-0bd1-455a-920f-13e42c829594,6929b1f5-770b-41d4-aa46-d7a6e667905c
-31.72291759	115.82627345	Jarrah (Eucalyptus marginata)	1110	14	5	2			147f0eda-8f02-4528-977a-7f4f6b6984b1,147f0eda-8f02-4528-977a-7f4f6b6984b1	380a8aaa-3faf-44fd-aefb-4a2d5001495b,da1af06e-edfd-46b5-b82e-ef26305badcc,c5221ceb-2fb4-490d-9302-e8d6a8f7cbe3
-31.72318167	115.83339941	Jarrah (Eucalyptus marginata)	1110	13	4	3			c5e31f5f-18f7-4d8e-8824-6240f1ebc718,c5e31f5f-18f7-4d8e-8824-6240f1ebc718	7edc1b09-288a-4c1f-8fed-f27e2b321556,72103c56-e03e-485f-8072-83a0947411fe,4ac74cf9-95f6-45c2-b7bd-c60f736bbe7a
-31.73309532	115.82736343	Jarrah (Eucalyptus marginata)	1110	12	1	1			19b628b7-9a0b-4dee-a2f8-251f50d1e829	
-31.72109495	115.80568984	Jarrah (Eucalyptus marginata)	1110	10	1			Can't confirm hollow	32c79437-580d-4af8-b79f-0bdc8f9e8606	
-31.72254970	115.83289880	Stag	1110	16	5	3			8a8263ba-cbe9-47c6-960d-b68fdfa97fad	
-31.72492070	115.82353960	Flooded gum (Eucalyptus rudis)	1100	16					890bd84d-49ee-4df8-8065-be1df5fda50e	
-31.72176230	115.82705880	Introduced Eucalypt	1100	13					a30d07c7-bf56-447d-8a03-c68438513606	
-31.72883530	115.80998820	Introduced Eucalypt	1100	15						
-31.72625820	115.82987465	Jarrah (Eucalyptus marginata)	1100	14					a781facd-6d90-426e-8eaf-c401401d381e	
-31.73000505	115.80873080	Jarrah (Eucalyptus marginata)	1100	14	3		1		9a52ed4e-13ee-44ff-a739-74da19d7dfce	
-31.73088410	115.82635030	Jarrah (Eucalyptus marginata)	1100	12	4	3		Can't see all hollows	e2c05e54-ba47-4e43-9bf6-ed042a6c4f28	
-31.73236030	115.82960260	Jarrah (Eucalyptus marginata)	1100	20	4	3			5e27d257-8627-4ea1-8d91-fca4ad67aa52	
-31.73199450	115.81326890	Marri (Corymbia calophylla)	1100	12					666eb102-99b6-4e6e-be93-22ca875107e7	
-31.73241290	115.81419430	Marri (Corymbia calophylla)	1100	17					9f8ad0e1-25b5-489d-8ad6-923f8f398850	
-31.73670816	115.81617896	Stag	1100	5					3f715efd-a79e-45ba-b631-b6b2a4b62a86	
-31.73072309	115.82465842	Tuart (Eucalyptus gomphocephala)	1100	12					5733a06c-30a3-40d5-bb2f-ab660ffdc390	
-31.73175052	115.81038471	Tuart (Eucalyptus gomphocephala)	1090	10					30023a3d-494e-420c-98a6-e9158421ce72	
-31.72364253	115.83326295	Jarrah (Eucalyptus marginata)	1060	13					4fdb24fe-021b-4f51-b0a9-ef390f488138	
-31.72114742	115.80569822	Jarrah (Eucalyptus marginata)	1060	10	3	3			b5e573d0-bedc-47de-b5ae-220697619115	
-31.73011100	115.83182970	Jarrah (Eucalyptus marginata)	1050	17					17ceec04-56cb-4f71-ab31-c41ffc4c141b	
-31.73043935	115.80913280	Stag	1050	12	4	2	1		781c6c8a-af68-45c4-b80f-559722b935ec	
-31.73001988	115.83126910	Tuart (Eucalyptus gomphocephala)	1050	22					2716c1c6-0fdd-43f9-9fea-8e500fcbc7b4	
-31.73092156	115.81193134	Jarrah (Eucalyptus marginata)	1040	12					c498645f-ed34-481c-a893-c7daf459189d	
-31.73365365	115.83047815	Tuart (Eucalyptus gomphocephala)	1040	15					633bf25b-3d4e-4f58-a6af-23309ccb453f	45bff4dd-5adc-4fef-908f-086927069d2c,a716b938-dcad-40ed-b58f-e628c0e96a10
-31.73453730	115.83037160	Tuart (Eucalyptus gomphocephala)	1040	16					df400bef-8645-4d07-a1ff-c6f51909726f	90e69239-0963-46d6-8a58-33eb560c5db2,3b5b286c-40ad-4a6d-9893-6237b0bcb850
-31.73413014	115.82977876	Tuart (Eucalyptus gomphocephala)	1040	14					5dd3a5f7-07e5-4154-83fb-1a407c146841	33e2c2d4-591e-41d7-94eb-e180c5976e40
-31.72972986	115.82462624	Coastal blackbutt (Eucalyptus todtiana)	1030	12					4730f494-4b7e-482e-96f4-27d33cc03925	
-31.73473637	115.81940163	Jarrah (Eucalyptus marginata)	1030	15						9fa03a9c-adbd-4311-ae43-69d1f6054225
-31.73074134	115.81176035	Jarrah (Eucalyptus marginata)	1030	11	2	2		Can't see hollow	4748da72-26be-44f2-a8c9-e92cdff2a2d4	98c9eb45-d0e0-4248-8aa2-86ce4ff0d868
-31.72306132	115.83271240	Jarrah (Eucalyptus marginata)	1030	15					168d9817-0bf2-446f-a786-24255504e229	c42ac759-c3e8-4797-bab9-4716403cdfed
-31.72167645	115.82890302	Stag	1030	8	7	5			b89adb71-42fa-45bf-bf4b-6efc27dbb14d,5e4d47fd-39ef-4d36-8861-14e519e2163e	
-31.72343530	115.83174800	Stag	1030	10	1	1			561b0aae-59c9-41c5-90d7-064e054562e0	73efb292-f6d4-4623-9534-042f1a820756
-31.73405490	115.83056960	Tuart (Eucalyptus gomphocephala)	1030	14					aee2f89f-2f19-4bd2-83ad-c01866d2bf77	
-31.73378397	115.83014388	Tuart (Eucalyptus gomphocephala)	1030	16	1				3bc64e76-7107-4f69-b25e-14928c4aa07d	504ed7a1-2589-4183-871d-cdd660af497d,2f626863-dc06-440b-a94a-11fdbe35a207,870500a6-5952-430e-b726-1e781e49a021
-31.73307460	115.82875070	Introduced Eucalypt	1020	13					d943cf24-a553-430c-930f-7921342c0460	
-31.72531597	115.82925003	Jarrah (Eucalyptus marginata)	1020	12	5				1f297b3f-e771-4443-b12d-0b7fcd8980dc	70ef4d14-6067-47c4-937b-99ed4bc378b8,f600710d-6e6c-4979-8861-074eaf33245a,7f4567f1-40c1-45d4-b438-7003052445e9,ef954a49-4726-480d-8855-7fe0d2809b7d,2f2b04cb-402e-4fb7-8722-4cd292556aab,2242507d-8ee4-4249-9547-b29955d4bea1,5986cfe9-b020-4bd8-b62b-2b9bd542
-31.73295731	115.82750659	Jarrah (Eucalyptus marginata)	1010	12	2	2			49838f96-d6b5-40c0-9b65-8a7949f5cb94	
-31.72335210	115.83257130	Jarrah (Eucalyptus marginata)	1010	12					1222378f-7bf2-4e27-b014-719a51149313	
-31.73451139	115.83031990	Stag	1010	8	8	6	1		a7148047-0c3a-4bbb-bfb7-8d921594bd1c	
-31.72931580	115.80960650	Stag	1010	12	3	2	2		e8fb35b1-df84-4362-a733-7ecb01645880	31e8a360-22b6-4f4d-9009-6169d840f6bc,6d2fcd06-5f40-445e-9adc-845eed28f387
-31.72149070	115.82691860	Tuart (Eucalyptus gomphocephala)	1010	14					bc78d6ac-4104-4f37-9f01-7a45c90e60ae	
-31.73369814	115.83043825	Tuart (Eucalyptus gomphocephala)	1010	15					355a5976-c8ea-400a-a568-de2db560a418	
-31.73353104	115.83027933	Tuart (Eucalyptus gomphocephala)	1010	16					1253c678-5a70-4fdf-90c5-25135b15ccdd	
-31.73099760	115.81432490	Flooded gum (Eucalyptus rudis)	1000	10					e329ae36-7158-44c2-a444-9bf523425209	
-31.72590340	115.82410160	Flooded gum (Eucalyptus rudis)	1000	9					1ba24d69-364b-428e-91b3-e111018c050a	
-31.73058790	115.82563920	Introduced Eucalypt	1000	16					aa5efb5d-4f82-4a83-a138-ed03d35c00fa	
-31.73219880	115.81413420	Introduced Eucalypt	1000	14					76e1e857-118c-4da4-b6ec-ba213856f313	
-31.72392600	115.82478920	Introduced Eucalypt	1000	22						
-31.72170582	115.82850471	Jarrah (Eucalyptus marginata)	1000	8					1dee1eb5-91d4-405e-a96e-4602418f3482	
-31.73581120	115.81827140	Jarrah (Eucalyptus marginata)	1000	6					2e481216-56bb-4a66-9716-b4c343d67ea3	
-31.73013166	115.80883510	Jarrah (Eucalyptus marginata)	1000	10	1				b6e154a1-2f18-47f3-9813-f18300f34964	

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.73189681	115.83044190	Jarrah (Eucalyptus marginata)	1000	18					cbb1c6cd-05b5-4939-8662-6af64e06633d	
-31.73210700	115.83002160	Jarrah (Eucalyptus marginata)	1000	12					590fc54a-c7dd-4e42-a5be-416d558309a1	
-31.73058470	115.80803450	Stag	1000	10					f1d71968-1de4-4ffb-92ea-612a3ba1dd1a	
-31.73255438	115.82705833	Tuart (Eucalyptus gomphocephala)	1000	14	1	3	2		f38b732e-ef24-4947-9333-e3a0e2cc3aab	
-31.73051948	115.80644690	Tuart (Eucalyptus gomphocephala)	1000	22				Can't access. Done from road	a74e4b53-9e0c-4a0b-8c59-cd90976ca267	
-31.72996427	115.80602080	Tuart (Eucalyptus gomphocephala)	1000	25				Can't access, on property	680032bd-090c-4a74-937c-431ef1f89801	44cf4d9a-5cec-4244-8eee-22c1eb72a475,289cc9a0-6870-4451-8109-fbc52e5025ff
-31.73406342	115.82233295	Introduced Eucalypt	990	18					9e87f1a0-2e61-49f6-88ce-67885c1907c6	
-31.72172530	115.80655750	Introduced Eucalypt	990	16					51f5d36e-2e73-4127-9fa5-af2e9bd77df6	
-31.72389149	115.83088420	Jarrah (Eucalyptus marginata)	990	15					fe8401f7-26ae-4508-bf84-4788b3db3282	
-31.73362610	115.83049220	Tuart (Eucalyptus gomphocephala)	990	15					cd231115-c056-4e53-af0f-56a4addf51c2	
-31.73104080	115.80860300	Jarrah (Eucalyptus marginata)	980	13					de83d7a1-a072-4736-bd47-f767cf8651e4	
-31.72085225	115.80603853	Introduced Eucalypt	970	12					9b8b4346-286f-4522-86ea-6d7a6d393913	
-31.73161940	115.83080010	Jarrah (Eucalyptus marginata)	970	16					ee50656b-3ac4-465c-8dbb-e4433f3569d0	f0a9c82f-4c44-40c8-9423-f9be20729082,2d64088e-fa28-4da6-b7a5-9d25c740aae1,a9f38ed2-7dcc-4f29-885e-d32af34eb859
-31.73534203	115.81848398	Jarrah (Eucalyptus marginata)	950	10					8105639f-8a87-4ddc-97e1-b7ed86063d3f	
-31.73069260	115.82021120	Flooded gum (Eucalyptus rudis)	940	16					70c32189-39cb-4085-9771-5de06a5dfda5	
-31.73196040	115.82975960	Jarrah (Eucalyptus marginata)	940	14					1cee0f42-7489-4b70-8119-bd921acabd75	
-31.73426673	115.82969762	Tuart (Eucalyptus gomphocephala)	940	11					b85fb105-a72e-477a-94f3-0d83a4ce94f2	
-31.73041350	115.80806710	Jarrah (Eucalyptus marginata)	930	10					d64b61cf-479b-4545-9475-a05853c54b9b	
-31.72165649	115.80581389	Stag	930	11					a2e7a082-5dce-494c-957e-e63a21e94863	
-31.73257463	115.82636565	Tuart (Eucalyptus gomphocephala)	930	15					1e867dc1-7a1f-4789-8d0a-4a38587fdd30	
-31.72152100	115.80599320	Jarrah (Eucalyptus marginata)	920	9					e9db78e5-1926-4965-88d2-c0794a107a33	
-31.73010210	115.80894020	Stag	920	12	2		1		0e04e14d-90ad-40f0-ba0d-a967790c68dd	
-31.73154740	115.81761200	Tuart (Eucalyptus gomphocephala)	920	15				Cant access	1d8ecfd8-bf00-4b14-9b1e-32e4ae4249aa	30bf631d-b08e-4522-b64e-20bd66bfd229,3c0cac15-626e-48a4-81a5-318db923c97a
-31.72998460	115.82141890	Flooded gum (Eucalyptus rudis)	910	12					6c6e6672-79e4-4807-871c-528c17aadd56	
-31.73384613	115.82379274	Introduced Eucalypt	910	19					995d5738-3794-4a96-aa14-4f811c8e3aec	d2145ab6-1a32-46a9-ae5f-97e5dc74f306,3e9f9e41-303b-45c0-8935-0119edfe8b17,277449c5-ec76-4d1b-939f-739654a5cc0f
-31.72013841	115.80589268	Introduced Eucalypt	910	11					240fdf7b-abc0-4fe1-a4d3-ed3d8fa06a98	734d0c93-e8bc-42a7-918a-097d65463dd6,2ea447c0-cf0d-4f8f-a18a-2daa99bd2b46
-31.73332943	115.82714450	Jarrah (Eucalyptus marginata)	910	14					9aa52c56-f7bc-42de-aac4-c2e9f4eb0031	
-31.72930110	115.80906850	Jarrah (Eucalyptus marginata)	910	10	1	1			080d78f5-9dea-4da4-b7f7-db4e0f7d748c	3b31a1b9-0355-4f39-ac57-0c4a57e99adf
-31.73034010	115.82502350	Jarrah (Eucalyptus marginata)	900	10	1	1	1	Can't access, may be more hollows. Unsure on size	dd073616-e370-4d81-a5d1-b55bf3e8f667	
-31.73001018	115.82656279	Jarrah (Eucalyptus marginata)	900	13	1	1			b82f803a-7c93-4cde-adfe-e5fb6afd5424	
-31.73018460	115.83024440	Jarrah (Eucalyptus marginata)	900	17	3	2			6a8c15ef-f01b-4fdb-973f-42880784d1fb	
-31.72779960	115.80865200	Marri (Corymbia calophylla)	900	13					dba502b1-9374-4037-9155-d017134a3572	79a4b80b-578b-419b-955d-d4ded5960df0,d247f32c-0a62-4b9b-a3d8-15327e81ba58,a89575d8-fb8a-4fa9-982d-fd3efa90081e
-31.73180727	115.81039544	Tuart (Eucalyptus gomphocephala)	900	12					788f3319-a9cc-4483-955f-b1ba42dd3ffc	
-31.72354271	115.83268460	Jarrah (Eucalyptus marginata)	890	12					994f4d69-cd87-4461-a4fc-0fcc1158edd0	
-31.73339103	115.82738355	Jarrah (Eucalyptus marginata)	890	8					c97e2adc-002d-4f04-b0b3-d2fc06632317	
-31.73201990	115.82949370	Jarrah (Eucalyptus marginata)	890	13					2d342fb9-aba8-4653-b153-607e2d2a8bc5	b6b1570e-2abe-45ba-be39-afc58d647591,9239df08-05cf-40f7-af98-0c784e3113db
-31.72997824	115.83117720	Jarrah (Eucalyptus marginata)	890	18					437674dd-41ac-43f4-8f8d-30185916a185	bd0c519a-5973-47fd-9b02-48ef6336da29,3699743b-3c5e-4d6e-a64a-9950c7d03d97,b11d6a25-78a6-4b90-8d2d-ce080dc66f2b,452f0952-ec8e-4d25-ac37-e112ad979401
-31.72995343	115.83159930	Jarrah (Eucalyptus marginata)	890	18	3				37be4ffd-1de4-4402-94c5-fb2d74ba6416	
-31.72199215	115.80594365	Stag	890	9	4	4	1		c3fff3da-7501-47d4-980d-40d943be4110	
-31.73237300	115.81719320	Introduced Eucalypt	880	15					105d1c2b-96cd-44e5-94eb-a535652df393	
-31.73339559	115.81492030	Introduced Eucalypt	880	18					f9498ee9-3983-48b6-b28b-770714ed7c0b	
-31.72905259	115.80995990	Introduced Eucalypt	880	17					37989a3c-1279-4a20-b235-f12173fcd980	
-31.73292737	115.82500242	Jarrah (Eucalyptus marginata)	880	9	1	1			f2187124-b595-4d0f-b222-3f2291d9d62f	
-31.73221370	115.83007390	Jarrah (Eucalyptus marginata)	880	13					2a086667-2378-41bd-8343-49aae14ff4e5	
-31.72780210	115.80875460	Marri (Corymbia calophylla)	880	12					4de48880-20cb-45f8-a164-1c036924fee2	
-31.73172200	115.81404290	Marri (Corymbia calophylla)	880	13					5c8bc2d6-f29d-4b40-8909-58bf91b3111d	
-31.73367846	115.83045904	Tuart (Eucalyptus gomphocephala)	880	13					835bdb35-3d28-4580-ab3a-5410710387b2	
-31.72549678	115.80671813	Tuart (Eucalyptus gomphocephala)	880	15					131154ab-bbb9-4d20-97f4-8fd109ee3f3e	
-31.73083670	115.82747300	Jarrah (Eucalyptus marginata)	870	16	1	1		Cant see size of hollow	85d68f51-32f7-40d1-96a9-728865d06b30	
-31.73018600	115.83181060	Jarrah (Eucalyptus marginata)	870	15					f4301bb7-ee1c-4491-8b11-19c34e79d896	
-31.73516695	115.81789859	Stag	870	10					7350caee-992b-4afb-8d5a-2aaa43f3f27a	
-31.72135932	115.80679826	Stag	870	5					9126c7d3-0fda-4ef3-a225-77275337fc11	
-31.73183740	115.81617570	Flooded gum (Eucalyptus rudis)	860	11					7d51fea7-bc3f-47b9-9fde-140295144e11	
-31.73326585	115.82833908	Jarrah (Eucalyptus marginata)	860	14					796ab5cd-5c1e-40ca-8533-67de791eb9ed	
-31.72205810	115.80602490	Stag	860	4	1	1			0fbd40da-edff-4776-b527-c769157ae883	

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.72171930	115.80813350	Tuart (Eucalyptus gomphocephala)	860	11					7c1e88d6-51ce-4ad1-bfac-2da93bb62a81	801adbee-9ef0-4057-943f-c67375c4ebcf,6cf9687f-c43c-4827-a838-66744009c72f,a93e5d41-a1f3-4c1f-8088-8858d6707a4c,4d50c92f-375a-4a84-bc6f-ce80d6ce4494,195d22d5-2a77-4354-809f-b1cee595f35c
-31.72184630	115.82867040	Jarrah (Eucalyptus marginata)	850	8					36429ccc-7fc6-4124-b4da-2d082bb992b5	
-31.73010200	115.82988670	Jarrah (Eucalyptus marginata)	850	15					350873ad-1932-4379-a32b-cab4f2c60b26	
-31.73018527	115.82992930	Jarrah (Eucalyptus marginata)	850	16					9829af20-2cee-46c7-9b2d-1521831e8a6d	
-31.73482990	115.81907004	Stag	850	5					052c65d2-e9c8-4e81-a0a4-0c7dc67176f7	
-31.72981870	115.83032060	Introduced Eucalypt	840	12					9b80913f-ef24-4f0e-8f36-3633991dfeeb	
-31.73191677	115.81710231	Introduced Eucalypt	830	15					79b334ee-37c1-404c-bd67-f029643e65c3	
-31.73449999	115.82339812	Introduced Eucalypt	830	18					0aab04a4-520b-47f7-96c1-e99c742d11b6	
-31.72833520	115.80848030	Introduced Eucalypt	830	17					4a1388f4-ea83-47e8-9b7a-082b9eb59596	
-31.73202798	115.81128996	Jarrah (Eucalyptus marginata)	830	10						
-31.72184150	115.80576580	Jarrah (Eucalyptus marginata)	830	9					bfec2551-3551-41da-9bca-15274d53b8cc	
-31.73413813	115.82968690	Tuart (Eucalyptus gomphocephala)	830	14					e2ac3a77-c81b-4b5d-bc90-182cb83d1db3	
-31.72104846	115.82868375	Introduced Eucalypt	820	12					ec6ecdc6-28e3-47a9-90ab-97f7e223834c	
-31.72083840	115.80662620	Introduced Eucalypt	820	9					839d5926-bc6e-4af2-bc70-4ab1c85d1e1c	1b43376b-028c-4077-b76c-14ede75e031d
-31.73218967	115.82681358	Jarrah (Eucalyptus marginata)	820	15					2e52bd4d-4a4c-49d6-99b6-2542674049f9	ef00010b-62e3-463d-9cd2-7703224f4469
-31.72938730	115.82726860	Jarrah (Eucalyptus marginata)	820	10					4575a8d7-7f8e-4cef-817c-4a804aa09778	
-31.72572960	115.80675910	Jarrah (Eucalyptus marginata)	820	13					2fc86299-0579-49b9-922e-1a332f7d92f9	
-31.73132850	115.80783760	Jarrah (Eucalyptus marginata)	820	10					ec467535-8971-473c-b4d2-83ef18cb5455	8a358c9e-e5e8-4910-b1e8-0333474a86d2
-31.73083487	115.83042450	Jarrah (Eucalyptus marginata)	820	16	1				7e9a0b16-eba6-46d3-825f-68f3fc9e3b64	
-31.72114100	115.82917480	Tuart (Eucalyptus gomphocephala)	820	15					5a7a1d83-cf18-4812-aa4a-aa92ec5e0d58	
-31.73410420	115.83058443	Tuart (Eucalyptus gomphocephala)	820	14					e23be5be-33bf-4452-8980-9e8f4abc20e8	
-31.73005524	115.82974190	Tuart (Eucalyptus gomphocephala)	820	18					65a1b6fb-886e-447b-a601-f9aa54b97cb7	
-31.73482677	115.81798844	Introduced Eucalypt	810	13					adbc0c39-e403-4528-bd1b-95991a75ea01	
-31.73239120	115.81619710	Stag	810	13					8fa822b6-a5c5-4bc5-abf6-0dcedda5bef3	
-31.73376515	115.82972880	Tuart (Eucalyptus gomphocephala)	810	12	2	2			62b5797c-b3bc-4f62-b8a5-e23768cf431e	
-31.73208330	115.82544940	Introduced Eucalypt	800	12				Can't access	5b1df8b8-5173-4f72-a918-c9360e07e7a8	
-31.73503749	115.81855439	Jarrah (Eucalyptus marginata)	800	12					4a9c03ec-b3b5-42d7-8db0-f4deee91c7c2	
-31.72924110	115.80959890	Jarrah (Eucalyptus marginata)	800	8					178d2988-94e1-4f11-bb2c-ef1370cf30d6	
-31.72879410	115.83123710	Jarrah (Eucalyptus marginata)	800	10					c12040fb-57c7-4190-a1f7-26e16f7e308b	
-31.73077043	115.82970900	Jarrah (Eucalyptus marginata)	800	12					6486db80-3dbb-4bf4-bb88-9b96b5eed56b	
-31.73052460	115.80938780	Stag	800	8	2	2			76e2e827-3c88-4584-bf0e-8fb1ef2d67cc	
-31.73476250	115.82052860	Jarrah (Eucalyptus marginata)	790	13					d64ad60f-ba09-47f9-a389-90214bbcf39a	
-31.73163160	115.81285730	Marri (Corymbia calophylla)	790	18						
-31.73027910	115.83045160	Tuart (Eucalyptus gomphocephala)	790	23					97e72bf0-8fd5-4d85-871c-4cc4bce6aeb5	
-31.72231841	115.82705263	Introduced Eucalypt	780	15					c84b2958-2670-4772-8a6e-f45bbc9555b2	
-31.73189420	115.81738670	Introduced Eucalypt	780	15					ab8b6490-ade1-47d0-84db-d545e7c4631a	
-31.73165300	115.81730420	Introduced Eucalypt	780	16					6cf2f4e7-db09-4acd-bc4c-61d2d6d7db37	
-31.73028822	115.82483612	Tuart (Eucalyptus gomphocephala)	780	18					2945d80e-4b57-44ac-b2b1-c96df5c4eb34	
-31.73274287	115.82689237	Tuart (Eucalyptus gomphocephala)	780	16					f7b97525-26b5-454b-8ba2-89dea2dcc407	
-31.72086308	115.80647271	Introduced Eucalypt	770	8					75b0aad3-2955-48f2-8e95-8bcac2128e2b	
-31.72981220	115.83266930	Introduced Eucalypt	770	10					47349e82-7a4c-4609-bb9c-915f212087d9	
-31.72590544	115.82933217	Jarrah (Eucalyptus marginata)	770	10					c6031100-b8b2-4222-a85b-a1b1a19d98f6	
-31.72328920	115.83267970	Jarrah (Eucalyptus marginata)	770	10					1fdad964-c303-4169-a364-1ce91fb46551	
-31.72930640	115.80831800	Stag	770	10	3	3			8eb4bb05-580a-4147-b3b2-b2a4d67573b6	
-31.73390573	115.83026659	Tuart (Eucalyptus gomphocephala)	770	16					a1a14455-fa3c-436b-865a-cd053e9ed2e1	
-31.73391542	115.82196314	Introduced Eucalypt	760	18					9b9ab14a-6096-4575-b6c4-bb994fc3e406	
-31.73378840	115.83033400	Tuart (Eucalyptus gomphocephala)	760	15					afdea4d8-8ce3-4536-ae51-39abd4605b27	
-31.73250591	115.82631905	Flooded gum (Eucalyptus rudis)	750	10					420f1cac-da0e-4d5a-98e9-a4ebb34ff96c	
-31.73186580	115.81762840	Introduced Eucalypt	750	12					688c8da7-a943-4ad9-9270-a5e892b0ff17	
-31.72581874	115.82791395	Introduced Eucalypt	750	15					414f1372-3ff9-401d-89e8-c77908207633	
-31.72032606	115.80576293	Introduced Eucalypt	750	9					fc3f6637-4278-452d-bfb3-26b8f350145f	
-31.72364738	115.80638650	Introduced Eucalypt	750	22						
-31.73291539	115.81141267	Stag	750	8	2			Can't see hollows	480d1205-6ecb-4b02-808a-1e552172313f	
-31.73203730	115.81621990	Introduced Eucalypt	740	12					81217120-a5bd-4ebb-aa1e-e1a120b794a8	
-31.73188626	115.81747714	Introduced Eucalypt	740	15					fbd819b6-3b2b-4733-83a1-117e7e37547e	
-31.72565250	115.82759300	Introduced Eucalypt	740	12					8063e544-aad5-4851-b39b-b4a651f8a308	
-31.73385839	115.82234904	Introduced Eucalypt	740	19					89e5ca7f-13f3-4887-bf46-f69306fbbddb	
-31.73409108	115.82190245	Introduced Eucalypt	740	18					0ad3472f-3df4-4715-a8f4-03641377b5d6	
-31.72909640	115.80997380	Introduced Eucalypt	740	16					eae6f27b-22be-4166-bedf-028fbcb2f959	
-31.72238685	115.82627244	Jarrah (Eucalyptus marginata)	740	12	2	1			588c6e65-756d-449b-b0d9-4b4035609de2	
-31.73214689	115.82683973	Jarrah (Eucalyptus marginata)	740	12					83df27e4-7bc6-4474-a8b4-09e0b374fe5b	
-31.73048620	115.82660880	Jarrah (Eucalyptus marginata)	740	13					d32037aa-241d-4887-87e0-2bdff9652839	
-31.73467763	115.82016438	Jarrah (Eucalyptus marginata)	740	12						
-31.73236060	115.81675550	Flooded gum (Eucalyptus rudis)	720	10					f6cb03c8-3f6e-43fc-91ea-66d899df964a	
-31.73406000	115.83247639	Flooded gum (Eucalyptus rudis)	720	11					f1535e78-9c8d-4ba6-8169-6334da290d44	

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.72979950	115.82152900	Flooded gum (Eucalyptus rudis)	720	12	3	1	1		1823b120-8fb7-4a47-bc5f-e1a07335cb67,ee91cfb5-349a-4865-8532-e06cd3a52450	
-31.73033110	115.82578230	Introduced Eucalypt	720	12					7efe62f3-9cc0-46a9-8ccf-7efd9d65ef00	
-31.73157600	115.81661660	Introduced Eucalypt	720	10					d45fab2d-76b7-4aad-8907-147a8a2d0c53	
-31.72562800	115.82736910	Introduced Eucalypt	720	12					500a92e0-f8b1-4135-9904-1e476a93349c	dc0a5af6-e475-4407-b6b2-9a3fe6106c68
-31.73284710	115.82873840	Introduced Eucalypt	720	16					a9bf6980-e344-482c-b371-7b0bb2acda34,a9bf6980-e344-482c-b371-7b0bb2acda34	
-31.73408140	115.82332880	Introduced Eucalypt	720	19					b41b04e2-d1a3-48f8-a96d-b276578ef7ff	
-31.72823045	115.82496051	Introduced Eucalypt	720	13					773a5107-4bd9-42ca-9bce-31cf5b0a4623	
-31.73063970	115.82687080	Jarrah (Eucalyptus marginata)	720	12					15acd7df-146c-44e3-88d4-9aa0b6bee68e	
-31.72176628	115.80613006	Jarrah (Eucalyptus marginata)	720	9					47564d3f-f472-4742-8f21-e5d50005ed77	
-31.72147368	115.80596611	Jarrah (Eucalyptus marginata)	720	9					ee859aa9-65a6-4ce7-9a70-7ff5bb1a997d	
-31.73112430	115.80945190	Jarrah (Eucalyptus marginata)	720	13					a49f17a0-bd63-48a9-ab6e-a86847852c18	
-31.73402570	115.83030530	Tuart (Eucalyptus gomphocephala)	720	16					27bfd3d3-0822-4792-88a5-356e76555863	002f65df-c987-47cb-b3f3-a9bbfa23275f,66a8e78e-39c5-4600-a7df-09a2b51641af
-31.73397730	115.82233161	Introduced Eucalypt	710	19					de090048-9193-4668-af10-643aa389074c	
-31.73372380	115.82194235	Introduced Eucalypt	710	18					6062850e-b628-426e-a02b-ae8a1ce42b19	
-31.73237220	115.82819170	Jarrah (Eucalyptus marginata)	710	12					20ae27c4-1abd-4e5f-a8e5-eeaabcbdf6eb	
-31.73122010	115.81221720	Jarrah (Eucalyptus marginata)	710	13	1			Can't see hollow		
-31.73165470	115.81766700	Stag	710	9					fa4dd410-b4ec-4611-b4f4-1dbd0d5eb6ee	
-31.72175174	115.80576997	Stag	710	8	1	1		Can't confirm hollow	5f36e900-de1a-44f9-96cb-0b8941b1e0d7,091342dd-fe41-40e1-94bd-9971df1dc2ee	
-31.73460330	115.81843150	Coastal blackbutt (Eucalyptus todtiana)	700	8					99e6e96b-b748-4916-afd4-77afc48fe94f	
-31.72952312	115.82545236	Introduced Eucalypt	700	15					1b68b4fc-86e2-40b1-9524-2b77bc01c53f	
-31.73367390	115.81845582	Introduced Eucalypt	700	15					bdf38a31-f6d7-45b3-8e0a-12299b760582	
-31.73128780	115.82807420	Introduced Eucalypt	700	14					34d4db67-30f2-4b2c-8b42-2a8fe11e8fdf	
-31.72368800	115.80569490	Introduced Eucalypt	700	16					d7a0e7ba-98d2-4208-b2e0-d13b47cd40c5	
-31.73045988	115.83123490	Introduced Eucalypt	700	22						
-31.73330263	115.82755823	Jarrah (Eucalyptus marginata)	700	12					0c51dadd-5c85-4080-b1cd-c689289d53bb	
-31.73310017	115.82712539	Jarrah (Eucalyptus marginata)	700	12					1058085b-eb49-45d0-906a-48e1adef42e2	
-31.72959220	115.80809840	Jarrah (Eucalyptus marginata)	700	6					a650d349-151b-418a-b77d-0a9ecbaf23fd	
-31.72245017	115.83182400	Jarrah (Eucalyptus marginata)	700	12	3	3			fd99e185-0a06-444d-a539-593d4327e487	
-31.73082689	115.83053450	Jarrah (Eucalyptus marginata)	700	11	1	1		May have hollows. Can't see from ground	01e48ba9-a168-46ec-b460-b3c09e8c89d1	43ba56e1-5356-4c38-94e5-4bc6923718a8,38ae817c-4f52-4299-9e3b-7d4cd67f91df
-31.73070883	115.82503393	Tuart (Eucalyptus gomphocephala)	700	14					ff06354b-85a8-4804-a2f5-d739714efa90	
-31.73269150	115.82692480	Tuart (Eucalyptus gomphocephala)	700	15					80e29a00-ca01-4cfa-8e31-1c8c394fde30	
-31.73446862	115.83182026	Flooded gum (Eucalyptus rudis)	690	12					e5184d75-c065-433e-9489-1990fd6b0247	
-31.72173610	115.82740290	Introduced Eucalypt	690	14					2e074e1f-1314-4c1c-87a7-ec245eb61cfe	
-31.73335567	115.82908574	Introduced Eucalypt	690	15					630a6b90-1f6a-4174-846d-c6ea1dc3d5c4	
-31.73210430	115.82515960	Introduced Eucalypt	690	12				Can't access	887d3921-088b-431c-9b9c-ad5a16009cbc	
-31.72955140	115.83025080	Introduced Eucalypt	690	17					f0b60a3c-ebb6-4516-a05c-f1ad100bc53b	
-31.73085260	115.82077610	Introduced Eucalypt	690	18					99256353-3ad0-42e3-8ac1-147ef2c4aa67	
-31.73219960	115.83159300	Marri (Corymbia calophylla)	690	19					a6e69c69-16da-44f8-b41e-c45d010fb564	
-31.73387066	115.83022602	Tuart (Eucalyptus gomphocephala)	690	16	1	1			70d726ac-22f7-428d-bdfe-b17a2d42593e	
-31.73438535	115.82343299	Introduced Eucalypt	680	18					f01e8371-cf66-4bdf-9544-60297cbb69fd	
-31.73383701	115.81795659	Introduced Eucalypt	680	13					1929162d-d22a-48fe-bd5d-cb41ccb36921	
-31.72823559	115.82580373	Introduced Eucalypt	680	14					db867ab1-d02e-4a1d-b6af-f94629fad07d	
-31.73084380	115.82859150	Introduced Eucalypt	680	16					0ab4410c-e482-4a3a-b840-f2ac7e10a1db	
-31.72924650	115.83195190	Introduced Eucalypt	680	15					be8308b3-a3ba-44c3-b810-2e1410efe2fa	
-31.72865764	115.83005500	Introduced Eucalypt	680	18					90526408-3545-4b27-a85e-ba4fe075529f	
-31.72132440	115.80589710	Jarrah (Eucalyptus marginata)	680	9					6bec7de4-3f91-4905-8ab4-8bf7ed23433b	
-31.73111450	115.80890600	Jarrah (Eucalyptus marginata)	680	13					a45e74f3-c52b-493b-9549-f14a6dcb8bd1	aa3d5b6c-a1dc-4eb3-8dc2-5a5d87e6e995
-31.73217060	115.82677060	Tuart (Eucalyptus gomphocephala)	680	14	2	1	1		795ca791-e83a-4125-a5a7-c8f630956542	
-31.73072730	115.82005200	Flooded gum (Eucalyptus rudis)	670	16					dfb405a2-b8cf-4368-a58f-f7f9ee1cadb7	
-31.72163420	115.82712550	Introduced Eucalypt	670	12					e5873e81-70b8-4ea3-8935-9ecffb12bcbd	
-31.73425333	115.82351379	Introduced Eucalypt	670	18					20d9d066-6427-4133-8e90-5659ab77fb2e	eebe52b2-1b8a-41ac-a4aa-d3de02440ec2,d2414a1d-e56c-4763-ac26-5df912afa299,07cdd195-6f2e-447c-9e8c-89430b28be92,72b1ce3c-cdf3-427a-ac9a-dc12626f88f6
-31.73375602	115.81801426	Introduced Eucalypt	670	8					d0785496-bf04-4333-9789-264690e8aece	
-31.73400270	115.81795040	Introduced Eucalypt	670	10					46e1b85d-dfe3-421e-864f-75919d78090c	00273341-4003-42eb-8de2-9e004c89c754
-31.73486210	115.82120190	Jarrah (Eucalyptus marginata)	670	8					f82fec08-0a7f-4447-8a71-f33c0f0341d4	
-31.73153620	115.82802780	Marri (Corymbia calophylla)	670	14					cbe3ad7c-c382-4232-8a5b-cb232cafd2cd	d193869f-7fce-48e2-ad8a-b4e793ecc46e
-31.73189940	115.81658410	Introduced Eucalypt	660	13					1b316b24-2761-4ba8-9d37-b0cbaf6ea080	
-31.73263195	115.81253417	Introduced Eucalypt	660	15					df884c4d-4fe2-434c-978b-922e131ef0c6	55a81cc0-0946-4d36-8664-4584ce6c9879,c0996165-ba5b-4132-bff1-17394b96f9e4
-31.72155870	115.82717970	Introduced Eucalypt	660	14					86a7f8eb-a9f5-4285-ab7e-003a665e2c59	
-31.73369690	115.82384640	Introduced Eucalypt	660	18					c097857e-843a-42b2-a428-eebc42bcec95	
-31.72823188	115.82563441	Introduced Eucalypt	660	10					3cbc633b-b5e7-4970-a9cc-661023997acf	

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.72902921	115.80994380	Introduced Eucalypt	660	16					8b47bb1d-39f0-4703-8e2f-f50dce756016	
-31.72171153	115.82887352	Jarrah (Eucalyptus marginata)	660	15					354a11b0-75fa-4b74-b59b-8fe383a48d66	
-31.73062927	115.82678039	Jarrah (Eucalyptus marginata)	660	12					0800c988-8554-455a-875f-44e4af6b2d0f	
-31.73509395	115.81972349	Jarrah (Eucalyptus marginata)	660	10	2	2		Can't access property to see otherside	fd699f19-60f8-45bd-932c-3154e073a3a6	
-31.73200470	115.82735360	Jarrah (Eucalyptus marginata)	660	12					9b2445a9-b13d-48d3-a680-d4745567936c	
-31.73371154	115.83024547	Tuart (Eucalyptus gomphocephala)	660	15	1				65875eb0-9710-43c3-8038-b98136697e58	
-31.73388891	115.83186686	Flooded gum (Eucalyptus rudis)	650	12					97b1921d-fad8-4137-ab17-c19d89c71468	
-31.73060420	115.82035600	Flooded gum (Eucalyptus rudis)	650	14	1	1			3b8defad-b44e-4f30-88d2-0b348b299192	
-31.73341470	115.82635358	Introduced Eucalypt	650	11					60743333-a67d-4a5a-bc94-750fe6cbd1c1	
-31.73449115	115.82327474	Introduced Eucalypt	650	19					87b4c62a-151c-4f63-9a58-3511759dece2	
-31.72831880	115.80853470	Introduced Eucalypt	650	12					44330e9a-6beb-4ad6-bcc8-386c8262d6c7	
-31.72979450	115.83031800	Introduced Eucalypt	650	12					dab84e01-198e-4f57-bb71-8f2659f66e5b	
-31.73410020	115.83011870	Jarrah (Eucalyptus marginata)	650	9					045f83f8-a5f9-4714-a18a-e290f58c27b0	
-31.73218767	115.82635291	Jarrah (Eucalyptus marginata)	650	10					d0c08792-b2b5-42f7-a672-3fcac6ef4d6f	
-31.72996190	115.82656680	Jarrah (Eucalyptus marginata)	650	13					6e0bba24-eb16-477c-9312-e5ffe9303670	
-31.72957100	115.83078120	Jarrah (Eucalyptus marginata)	650	11					6ff83094-b1de-4471-be13-84948f805a46	
-31.73178150	115.82232390	Stag	650	8	2	2		Can't see in hollows	4e6b21c9-d1b0-4c56-a9a4-8e45c04f62ed	
-31.73042367	115.82576182	Tuart (Eucalyptus gomphocephala)	650	14					8b9c8666-586d-4875-a3ad-cb2bf2dea0c3	
-31.72208398	115.82730845	Introduced Eucalypt	640	13					90bc96f0-d05b-4857-9f94-300dcf209219	
-31.72204634	115.82732152	Introduced Eucalypt	640	13					90bc96f0-d05b-4857-9f94-300dcf209219	
-31.73273040	115.82750300	Introduced Eucalypt	640	12					54ec6702-2823-4542-be2a-e2533b5ce782	7233820a-755a-4ea8-ab37-16f6fded5ed0,8dcd264d-a796-4835-90cd-f535bc224287
-31.73379994	115.82332872	Introduced Eucalypt	640	19					d9e965a1-def9-461d-9b51-828bd48af66e	
-31.73248750	115.82886390	Jarrah (Eucalyptus marginata)	640	10					2f73e3eb-02bb-4438-b865-0b5004d733cf	310a569b-f8e5-4bd7-ae6d-5014b20a53f0
-31.73050730	115.82658810	Jarrah (Eucalyptus marginata)	640	14					7abce79c-9db1-472c-b2d3-e129f764dfd5	406003d0-ce03-4bb3-acf7-f598f1220b6b,dcfe14ce-f7bd-4df0-9a9b-1b89c3b17688
-31.72997340	115.82667243	Jarrah (Eucalyptus marginata)	640	13	1	1			5fbe10a1-6253-4d4a-a9fc-9324757c35b9	
-31.73111005	115.81023451	Jarrah (Eucalyptus marginata)	640	10					6d373207-347d-43d6-924c-61221291adac	
-31.72089331	115.80820408	Jarrah (Eucalyptus marginata)	640	10					200c164a-d6c3-4c26-9d2b-9500eeb0c388	
-31.73064182	115.80792610	Jarrah (Eucalyptus marginata)	640	10					c3c50011-3668-4cc1-b634-476ef5187137	
-31.73202070	115.82747460	Jarrah (Eucalyptus marginata)	640	12	3	2			e02b5be1-12f4-4784-9fcc-41c8ad05d7a0	
-31.72387770	115.83212770	Jarrah (Eucalyptus marginata)	640	14					8a2c8ceb-b3d2-4a5b-b76d-20fe58cfc7e2,88e6130b-a66f-47ec-96c5-d7e9614338cd,da5a6062-63f9-4be4-8dc2-8b16a373611f	
-31.72087090	115.80717950	Tuart (Eucalyptus gomphocephala)	640	16					aecd33e0-2634-482d-9931-1fbd9b0f8280,5b1c32ac-4487-422f-a72a-5c66d1a3dde1	ed05887b-35e7-492e-95ee-d5511f55f9ef
-31.72147420	115.80833420	Tuart (Eucalyptus gomphocephala)	640	11					b0bc1e73-5c74-4d4b-a5a8-245a1b3b5bf7	
-31.73320420	115.82623830	Introduced Eucalypt	630	9					22f5860e-547f-4021-9691-2e7124230ccf	d76c8f8f-fae0-403a-9011-e92a22bb53fe,ce6fc4ad-eeaa-4652-a0e0-99d0967caa8c,61984d96-89cd-45ed-858e-54a1a237668d,280759dc-4dbc-49a4-b251-bc1ce7a67b97
-31.72109894	115.80723044	Introduced Eucalypt	630	13					829ef61a-fddd-459d-8708-9fac500f778d	
-31.72822104	115.82505573	Introduced Eucalypt	630	13					4f7686f3-23d2-4640-8abb-532f5ecdcc87	
-31.72371750	115.83228620	Jarrah (Eucalyptus marginata)	630	12					228d92d4-1924-4d8e-b1e1-f22a061dbd82	
-31.72357620	115.83253080	Jarrah (Eucalyptus marginata)	630	12					2208eb7d-23ef-4ab0-9556-e1fbfdca0a11	
-31.73235107	115.82698725	Tuart (Eucalyptus gomphocephala)	630	15					71decfc6-05c4-4ac0-b545-58bf4c85a8eb	
-31.73190736	115.81038035	Tuart (Eucalyptus gomphocephala)	630	11					0f0fbe40-ac01-4b15-a23c-4931c63171a1	
-31.73265400	115.82891090	Coastal blackbutt (Eucalyptus todtiana)	620	9					2c8bcd9a-4d66-4058-b1e3-8842aade9374	
-31.73429011	115.81822112	Coastal blackbutt (Eucalyptus todtiana)	620	8					b48fd23c-c01f-41dc-bd7e-4ee7fbb35151	
-31.73455940	115.82301340	Flooded gum (Eucalyptus rudis)	620	14					f5249f09-d90d-4bef-873d-60399b18e5d1	
-31.72235120	115.82678810	Introduced Eucalypt	620	14					362ec28d-22b1-4897-a16d-24e4d168c3ac	
-31.73128971	115.81617024	Introduced Eucalypt	620	12					21ba1f72-a461-4281-8ce2-fb5059adef5d	
-31.73185350	115.81730870	Introduced Eucalypt	620	12					b955d1ea-a347-473d-83fe-8fea86809226	
-31.73190593	115.81756197	Introduced Eucalypt	620	12					a068cdb3-a770-4d10-94e9-e84c378d8278	
-31.72823017	115.82542621	Introduced Eucalypt	620	13					03652dda-b880-4fe4-a968-2c3566a5278a	
-31.72946530	115.83026550	Introduced Eucalypt	620	14					3b43a0f4-66b5-4499-8852-fcd83b730094,7f1d7a3d-6c87-4d37-b69e-c69162c74ecb	
-31.73101880	115.80907310	Jarrah (Eucalyptus marginata)	620	12					7da0b1a8-fd44-470a-912d-f9c987451178	9743e622-9253-4e20-b408-508575cd1e7c,fd8f35b7-fa66-4dd7-b157-5f991c7694b0
-31.73079894	115.82711160	Jarrah (Eucalyptus marginata)	620	16					1c5cb254-1a10-4419-bf14-4a9f02536f72	1805bb16-bdc2-4be4-be57-757fdeada346,7218f04a-4adf-4c22-b677-182153cbde3e,9ceebcbf-553f-4b1d-a31a-9d71f129259a
-31.73185000	115.81375440	Marri (Corymbia calophylla)	620	14					66ab1413-cdd6-436d-a3ec-14b56aafbb2e	268fb0b3-9878-42d5-9d68-cce79ff40306
-31.73032000	115.82662650	Jarrah (Eucalyptus marginata)	620	13					5d09e580-b27c-434b-b1f0-6c8717f8d158	86400fd1-e89a-4687-902d-5be7166b8fb0
-31.73340215	115.82693998	Introduced Eucalypt	610	10					53f3eaa5-a65d-43c0-b790-52b7c8bad45d	4c535a2c-19c6-4f40-897e-ea2717f33e4a,175d4a28-0dd7-484d-8f0a-c95dc8ef53aa,1233e81f-b2a5-46de-bb0d-e3dc6b9a20dd,b668c97d-fa48-4a21-b21a-1ec1c1fbd525
-31.73029570	115.82058160	Flooded gum (Eucalyptus rudis)	600	12					4773b48b-4785-42c3-9595-323d2d161ed5	

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.73342182	115.82782913	Introduced Eucalypt	600	14					a32afa2d-4a79-4648-8b68-f02895f7fca3	95fcf6fe-5b49-417b-95fa-0b65b74aaccb,88c627a0-a085-480f-ba8d-57f362c0ec4c
-31.73381505	115.82234334	Introduced Eucalypt	600	18					279391c3-3871-47da-9f63-dbd49be820e5	
-31.73377798	115.82194403	Introduced Eucalypt	600	14					c7b65a3c-0121-42c8-8af2-5a624207a6cc	
-31.72878511	115.83030950	Introduced Eucalypt	600	18					601b7bb9-bdd4-4971-82e1-af6126f967a6	
-31.73075617	115.82544900	Jarrah (Eucalyptus marginata)	600	15				Can't access	6792a5b1-0d69-478e-8000-dd740b227470	
-31.73053110	115.80815630	Jarrah (Eucalyptus marginata)	600	10					7af97a98-449d-4cc1-9055-d6a606b09a55	
-31.73003620	115.83007590	Jarrah (Eucalyptus marginata)	600	16					62972b2a-52ad-443a-99bc-90e70db844f2	
-31.72253544	115.83178270	Stag	600	12	1				5a640fb5-c910-49e0-90ea-888793ec544f	
-31.72885320	115.83013310	Stag	600	10	2	2			6ea7d905-7126-4903-8e4b-9199a06b6e04	
-31.72441965	115.82464100	Stag	600	10	3	3		Can't access propertey. Recorded from boundary. Hollows may be incorrect size	39091622-76e3-4e62-9bd6-fd287ae3676a	
-31.72451975	115.82452900	Stag	600	10	2	2		Can't access propertey. Recorded from boundary. Hollows may be incorrect size	39d6bb96-4ce9-4ce0-b65c-a58d73f18ff1	
-31.72176240	115.80736940	Introduced Eucalypt	590	9					e3cd183c-3969-43c7-b797-3fb288a38331	
-31.72825070	115.82483746	Introduced Eucalypt	590	13					e4191a0e-f036-4a2a-8a76-475a0fe1dbe2	
-31.72409550	115.80565310	Introduced Eucalypt	590	12					42088790-2d97-4062-97c2-e5c8f7e37e98	
-31.73488420	115.82001310	Jarrah (Eucalyptus marginata)	590	10					5bd0365b-fc81-41fc-9e5b-c3e7acbf73f8	ec530781-b062-461c-8fb4-8309e9124f76
-31.72980470	115.80813460	Jarrah (Eucalyptus marginata)	590	12					5a9677d6-947f-4ebf-8443-7531d2dbbbbd	
-31.73036435	115.82467888	Tuart (Eucalyptus gomphocephala)	590	13					08546032-27ac-457c-94a9-388241fd842f	
-31.73396430	115.83031090	Tuart (Eucalyptus gomphocephala)	590	15					77466295-786d-4099-8d0c-e95ac094970f	
-31.73382817	115.83033532	Tuart (Eucalyptus gomphocephala)	590	15	1	1	1		930586ba-fc78-46c5-8312-46dccaa3051e	
-31.72088590	115.80705442	Coastal blackbutt (Eucalyptus todtiana)	580	10					350e3882-4702-4039-9335-754d3d26e100	
-31.73188070	115.81649210	Introduced Eucalypt	580	14					dba96425-572a-4c7d-9d6b-1c1c48eda36a	
-31.73341698	115.82727861	Introduced Eucalypt	580	14					9bc616e6-3537-48c7-aae9-363e5191a6a8	
-31.73377484	115.82294013	Introduced Eucalypt	580	19					da4ec86a-8b13-4509-99ab-1fe8e82c4dee	
-31.73414660	115.82349630	Introduced Eucalypt	580	18					ad3ed97e-6e55-46af-8175-d0a8a34db3df	
-31.73412390	115.82359800	Introduced Eucalypt	580	18					868bdc00-b295-492c-b92d-1608c5e3df0b	7f986f25-3307-4da5-843f-e55f78ed62e2,a3a7d306-a590-4635-88c4-88e49e8a5956,1ba55fa6-e1fd-4ea7-8783-587668ebccb0,f80829f8-4472-43ef-843e-3f409ec97fb7
-31.72889974	115.82458634	Introduced Eucalypt	580	12					c955e0ad-0773-4102-b947-53df461b02c3	
-31.73439280	115.83024940	Jarrah (Eucalyptus marginata)	580	10					971d8ab8-4386-435e-b377-342068fc49b1	
-31.73242777	115.82817849	Jarrah (Eucalyptus marginata)	580	12					892aac59-83cf-4779-b73c-11951d227742	
-31.73315777	115.82699362	Jarrah (Eucalyptus marginata)	580	9					90029c27-37e6-4389-806e-3bea1b06786c	
-31.73075360	115.82671333	Jarrah (Eucalyptus marginata)	580	12					80a7ec09-6c86-45bb-94d6-7863c2212135	
-31.73469731	115.81988979	Jarrah (Eucalyptus marginata)	580	11					144e34a0-29e1-4510-9c44-eb07c98c0282	
-31.73203830	115.82733390	Jarrah (Eucalyptus marginata)	580	14					1b91e604-48a0-4c43-aebb-183a301d7cdd	eabf26d8-70e5-463a-b740-90df5f6cdc0c,5cb597c3-1d77-468d-a4b6-9e131569a30e
-31.73158500	115.81252500	Marri (Corymbia calophylla)	580	12					0f69739d-ec44-4f56-a365-68759a4e04c6	
-31.73156320	115.81281870	Marri (Corymbia calophylla)	580	12					b32065dd-d7e8-4b4d-a2a4-43a74f82bf25	
-31.73559060	115.81795060	Jarrah (Eucalyptus marginata)	570	13					ccb5c4b8-6c14-446f-a5de-13cf21720712	
-31.73306167	115.81679419	Jarrah (Eucalyptus marginata)	570	10					265c7ed1-216f-4538-8fa9-fb61b5cf9cf4	574cef0d-4afb-47e5-a044-fd00c170959d,6512aa8d-c481-45ed-a7e8-5fbe8a728a7d
-31.73194180	115.81358730	Marri (Corymbia calophylla)	570	16					1bc49e85-8c39-4491-bbe8-c50fa645f562	
-31.73029392	115.82562469	Tuart (Eucalyptus gomphocephala)	570	15					97f0a1fd-e49f-4787-8cbf-dc2ab667a6a1	
-31.73420130	115.82969550	Tuart (Eucalyptus gomphocephala)	570	12					dbdde057-431d-42e6-baff-4dc0e218cd79	28d4bb56-d40f-4c4d-8b4a-30b103d6f8a2
-31.73417121	115.83187424	Tuart (Eucalyptus gomphocephala)	570	17					6e123fce-6d8b-4b8c-ab73-2c194a1abc16	
-31.72262700	115.82647550	Introduced Eucalypt	560	11					7d67af3e-81c7-482e-ae11-cff8f57768f9	
-31.73375488	115.82408644	Introduced Eucalypt	560	18					b4216306-6ceb-4a49-aabf-56f593617a31	
-31.72011388	115.80888301	Introduced Eucalypt	560	11					b00ef036-9f36-47cf-be61-5a61ac7593e0	
-31.72878197	115.82458466	Introduced Eucalypt	560	11					121fb4a2-1959-4ffe-93d1-273a45dc7e85	
-31.73414920	115.83005550	Jarrah (Eucalyptus marginata)	560	12					466938d8-bc7c-4473-8682-2459555e99d4	
-31.73336650	115.82815167	Jarrah (Eucalyptus marginata)	560	12					eab5c09d-0139-4928-82eb-f2a093e3a03e	
-31.73177600	115.82236880	Jarrah (Eucalyptus marginata)	560	12					b2fc3016-20b2-4919-861c-5d7ed1bc7d5f	
-31.73189440	115.81354790	Marri (Corymbia calophylla)	560	16					938f8530-4db3-4de2-a6e9-f5232a0abad1	
-31.72107983	115.82886849	Flooded gum (Eucalyptus rudis)	550	10					d76d4abd-2cc3-49cb-ab80-5bb8c87be3a6	
-31.73116780	115.81484020	Flooded gum (Eucalyptus rudis)	550	12					d0090528-1581-48f9-ba43-f6834cd0344b	
-31.72512970	115.82730710	Introduced Eucalypt	550	12					73bb86d6-c07b-4d02-b624-08513440bd62	
-31.72829119	115.82456119	Introduced Eucalypt	550	12					7711222f-cd9c-4325-a982-7e09475600fe	
-31.72824272	115.82475565	Introduced Eucalypt	550	13					d2bd9761-3a26-490b-91a8-c22bd1616467	
-31.73100390	115.82903180	Introduced Eucalypt	550	16					135ade81-f105-4557-8160-c19e8af17675	
-31.73149720	115.82902020	Introduced Eucalypt	550	14					d888bf2e-8b40-4af6-9cb8-9319296faeca	
-31.72981230	115.83084980	Introduced Eucalypt	550	12					da73fc1b-c358-477f-9653-615d719516a0	
-31.72343490	115.83323540	Jarrah (Eucalyptus marginata)	550	13					9fbde4f9-1d39-42f4-a17b-a54cf8778a2d	
-31.73514328	115.81947941	Jarrah (Eucalyptus marginata)	550	12					d6f6ae47-1372-4131-8f1e-29e380d8c711	
-31.73109270	115.80778980	Jarrah (Eucalyptus marginata)	550	8					458c3f35-3685-4b1a-9e3a-13ad4cfdd2fe	
-31.73182450	115.82640490	Jarrah (Eucalyptus marginata)	550	10					9460d524-9bae-4922-9b9a-914465a3b4d6	
-31.73092540	115.82679010	Jarrah (Eucalyptus marginata)	550	12					afa8d67b-5ec1-493b-9bdf-e8a370521444	44a136eb-8dd5-451c-be2e-73bc9dfe548f

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.72939600	115.83107430	Jarrah (Eucalyptus marginata)	550	13					aed2ed59-48d9-454b-8a1f-2a6280c82acd	
-31.73180570	115.81401800	Marri (Corymbia calophylla)	550	13					dcf24382-3cdc-49f1-9f24-f4f6606991dc	
-31.73200545	115.81406470	Marri (Corymbia calophylla)	550	10					af224a86-6a59-4a78-bea1-919dcdf5dbbe	
-31.73022710	115.80821100	Stag	550	6					c1221253-ab1b-400a-a894-6bf3e18a939a	
-31.72243770	115.83183830	Stag	550	10	1	1			7cc27dbd-7189-48ef-8a40-49f4d981f7d8	
-31.72993380	115.80883590	Tuart (Eucalyptus gomphocephala)	550	14					11016742-ae81-4fd1-85f9-67f4df7dd2ba,fb57e1f6-0896-441d-bdfc-5634321fe523	
-31.72504277	115.82735304	Introduced Eucalypt	540	12					f459b174-fadd-4240-91ed-de14a47a1cdd	
-31.73532064	115.81804108	Introduced Eucalypt	540	16					ab87262f-9607-4052-b0ef-6ba2c1f6e01f	
-31.72011520	115.80830480	Introduced Eucalypt	540	12					6099283f-608c-499b-b87e-79864c2b0e94	
-31.72822903	115.82516100	Introduced Eucalypt	540	13					d7641e96-8b71-4231-aa78-a1e79355138c	
-31.72295152	115.82687896	Jarrah (Eucalyptus marginata)	540	9					4c99837e-007c-4306-82ea-892d8502ea30	3fc27efb-e113-4cfc-8c34-e73405036338,8eecb1db-7343-4534-9d58-98f393263230
-31.73464240	115.81881550	Jarrah (Eucalyptus marginata)	540	8					c9c096d7-9577-4d36-9647-34c4f949e782	cec003f1-de49-4ca4-9656-f9972b66056b
-31.73073290	115.81077500	Jarrah (Eucalyptus marginata)	540	10					ea4fa56d-f6a8-4262-9224-c4e10635868d	132c09f0-6d2f-47fa-bd19-c9b974cb8935,126b93c0-254b-4ed8-ac24-635ec623dee5
-31.72938460	115.80812100	Jarrah (Eucalyptus marginata)	540	8					6d395d4b-b5e6-444b-9a37-e1b9ccb77617	3d1ccc2f-037a-4973-8117-cba777069767
-31.73112380	115.81480460	Jarrah (Eucalyptus marginata)	540	12					44cd4de9-3dfa-4029-9e24-6fedf41e761c	
-31.73200390	115.82787370	Jarrah (Eucalyptus marginata)	540	12					1892cb39-ed95-4673-a14e-7ed46456116d	0b9c0c4a-25a4-411d-88c9-5e89e7aaaa96,e14ba32c-3060-4553-a927-641c5a29960a
-31.73363997	115.83044898	Tuart (Eucalyptus gomphocephala)	540	3					de268fef-f802-41f0-b8f3-abf9bac89658	
-31.72576313	115.82774028	Introduced Eucalypt	530	14					a0a36b1d-281e-43e6-bb4b-4baf5ba91c23	54ece253-58e5-49a7-b2ad-2887cb7751ea,7a06e864-1cdc-42ea-927c-4ac846c3817e,4ff86b5b-b469-4aa5-866b-cbc2fd60f41c
-31.72502310	115.82741920	Introduced Eucalypt	530	15					1897c9df-3e31-4993-b732-f187e5407c81,1897c9df-3e31-4993-b732-f187e5407c81	
-31.73384670	115.82294630	Introduced Eucalypt	530	18					c7a98b4f-ef96-402c-a9d6-9614f17cffff5	
-31.72012500	115.80607140	Introduced Eucalypt	530	11						085051f8-809b-4861-9495-ae047eb3edca
-31.72013926	115.80835126	Introduced Eucalypt	530	13					51be926e-a600-4443-bcb5-44678f5c710f	
-31.72010418	115.80873448	Introduced Eucalypt	530	11					5b2f6f33-e2c6-48f3-9560-7c0aa5be06c1	
-31.72821391	115.82526997	Introduced Eucalypt	530	13					cf4797d0-15f5-486d-80bb-2ab8372ab396	
-31.72823758	115.82555696	Introduced Eucalypt	530	14					a2a4968c-5eb7-42ee-9163-f6bab1546044	
-31.73247340	115.82797900	Jarrah (Eucalyptus marginata)	530	9					3fe1e182-2f62-4ae3-b3e6-1c6de3dcd9ea	
-31.72388590	115.83234710	Jarrah (Eucalyptus marginata)	530	14					f0167568-a753-4c88-b27e-fa79201a8c50	
-31.73338150	115.82630500	Introduced Eucalypt	520	9					79a6d13e-650f-48c5-a4c4-df7bd0f7a561	
-31.73404970	115.82300630	Introduced Eucalypt	520	10					d9f28f12-8795-43d9-b0e6-91af40b20b23	
-31.73549573	115.81809841	Introduced Eucalypt	520	16					1d2167a7-33c0-4ec8-9610-8fb1eb9524d7	
-31.72010060	115.80850710	Introduced Eucalypt	520	12					cf847935-a67f-4ff9-9112-d71637af36ed	
-31.72011245	115.80870096	Introduced Eucalypt	520	11					1a755527-e7a8-4ffc-8dd9-dec1ff2ed979	ca7c8485-1032-4a20-8cc7-a17a85ba4241,139a2a09-24a0-4475-8aa5-b4507c451c09
-31.72853844	115.82455918	Introduced Eucalypt	520	9					148b1eeb-7631-4c8e-98c6-e21ce07f836c	
-31.72301170	115.82682397	Jarrah (Eucalyptus marginata)	520	9					1ddaab58-19d5-45eb-a53e-c2dea5cedb00	
-31.73332972	115.82660202	Jarrah (Eucalyptus marginata)	520	10					56354cab-b909-4f5f-b442-67d24208873e	
-31.73533576	115.81805516	Jarrah (Eucalyptus marginata)	520	10					246e0140-d8f2-4ae3-a2b1-ac2facb29cef	
-31.72937900	115.80923180	Jarrah (Eucalyptus marginata)	520	12	1	1			b227e26a-47d3-41d4-8ecd-301834e36e51	
-31.73074290	115.80783830	Jarrah (Eucalyptus marginata)	520	10					2efd36fc-f68a-4947-acc1-9c537a7d9352	
-31.72341700	115.83259480	Jarrah (Eucalyptus marginata)	520	10					a3a26e74-3202-4114-8d7b-788f6eaccb23	
-31.73186990	115.81369360	Marri (Corymbia calophylla)	520	14					bf9bdf33-1ab3-401c-a236-98fe1fa30107	
-31.73182280	115.81367990	Marri (Corymbia calophylla)	520	14					fd09a1f0-4db7-48f1-9def-d324baa579f9	
-31.73171310	115.81303540	Marri (Corymbia calophylla)	520	12					73ad090f-9046-43e5-b8d8-4fdbddd85bf8	
-31.73469018	115.82298841	Flooded gum (Eucalyptus rudis)	510	12					c2f43939-781a-409c-9693-049c067cb9ba	
-31.73530297	115.81797771	Introduced Eucalypt	510	14					aa0ed60c-1589-4a02-a275-74c4aee59330	
-31.72084470	115.80588540	Introduced Eucalypt	510	8					0addf1c1-bc4e-4400-98fe-1ca41c46b5d3	
-31.72012020	115.80900920	Introduced Eucalypt	510	11					d36e1216-2a4a-4f0e-8c75-4a029d292766	
-31.72865792	115.82507014	Introduced Eucalypt	510	10					4118d191-6630-4122-ab25-8b5a90a71959	
-31.72883644	115.82459170	Introduced Eucalypt	510	11					f93d442f-a19a-4e41-8d5a-9bd1bf71848e	0758cc71-6faa-465b-89b0-b6faad5b8f61,9c4493e7-0ec0-4831-ba2f-6b7a7578b8bb
-31.73264991	115.82724139	Jarrah (Eucalyptus marginata)	510	10					d53fb55c-30b1-4935-9a51-6543483181a4	63572c1f-247c-4ba7-a38c-6ac7bfa70fc6,b9aac4b4-70db-4a57-b4ba-4a2bbc3c24c9,a8c9a149-4624-435a-87d4-83351196ab41
-31.73329094	115.82802728	Jarrah (Eucalyptus marginata)	510	12					10b9afef-6218-4d41-94d5-a034bc1faaf6,3f9cc60c-4a71-452e-8834-59b1acfd43cf	
-31.72280770	115.83332460	Stag	510	5					8e2e1a81-a89f-4b4f-a5f3-9c0c0b756c21	
-31.72305163	115.83321199	Stag	510	9					8b976bb6-deea-40c6-8e18-93b88be233f8	
-31.73245090	115.81623180	Flooded gum (Eucalyptus rudis)	500	13					cec567a4-9ca0-4400-adc7-8cdd8f289931	
-31.72969590	115.82146480	Flooded gum (Eucalyptus rudis)	500	12					05fcacb4-f0f1-4a7e-b4d1-4a59a8b18445	
-31.73068950	115.82063190	Flooded gum (Eucalyptus rudis)	500	12					ce4648dd-af6c-4ad1-a603-ea59b1c4efe8	70f20c67-cd7c-4403-8f74-8f63a1faaf35,6a91974e-890f-400c-85e4-ebd6e09c1ed6,e2ed3ea1-1033-469c-9bb9-91a9969103a2

Latitude	Longitude	Taxa	DBH (mm)	Approx height (m)	Number of hollows	Potentially suitable BC hollows	Hollows with bees	Comments	Tree photo ID	Hollow photo ID
-31.73057720	115.81999750	Flooded gum (Eucalyptus rudis)	500	14					b16a9fd6-657b-4889-a058-60ada6567a8c	
-31.73057010	115.81999530	Flooded gum (Eucalyptus rudis)	500	13					1fd745ad-7266-4525-ba2b-cd68e344c97c	
-31.73211581	115.81622690	Introduced Eucalypt	500	13					ece7f39f-95c7-4b95-9f8f-2716c0f1ee8d	58b4b655-892b-42e9-81b5-3073b5844562,710ccdd9-5329-4508-b4d1-b7f95026ae54,e3a36b10-c4b1-4c1f-b750-9a89d44c9dec,65edc421-88f8-411b-8e95-9a5e3cc052b6,e26693f0-c874-4fa1-b228-159f10824361,2a9e3ccf-0762-47da-b997-467439e249f3,3be02017-4f64-42f2-a553-0f86aff3
-31.72315543	115.82690343	Introduced Eucalypt	500	14				Can't access	cbbd0c65-a80d-4117-bd8a-19fa577c3f06	
-31.72289648	115.82699161	Introduced Eucalypt	500	14				Can't access	69fda405-5417-40bd-8e9e-032c9c23310e	
-31.72183159	115.82644444	Introduced Eucalypt	500	14				Can't access	c024b60a-e58e-4202-9510-8f5a80dcc185	
-31.73088790	115.82906410	Introduced Eucalypt	500	14					7561876c-c3eb-41f7-b792-72caea8e38a4	55c7b87e-d9ad-43c2-9a89-18aed61910ee
-31.73140590	115.82876060	Introduced Eucalypt	500	14					aa76e5b4-a6b4-47f1-a238-35154b1a09cb	
-31.73341498	115.81790290	Introduced Eucalypt	500	22				Can't access property		
-31.73285123	115.81819670	Introduced Eucalypt	500	20				Can't access property		
-31.73232854	115.81674990	Introduced Eucalypt	500	20				Can't access property		c3071ae8-2a7b-4a83-952a-cb0cea6e94be
-31.73430490	115.82978090	Jarrah (Eucalyptus marginata)	500	10					0bc8837f-77a5-4ed4-b74e-316770c5c060	
-31.72305020	115.83325591	Jarrah (Eucalyptus marginata)	500	10					4d208ccc-44a9-4305-8c51-e9798b117d26	
-31.73232911	115.82815234	Jarrah (Eucalyptus marginata)	500	10					f84e65ac-e365-4f2c-9d87-1d8b34646080	
-31.72938800	115.80956420	Jarrah (Eucalyptus marginata)	500	8					453eb302-f529-4ef8-9353-1f3022b48c0d	
-31.73070410	115.80783770	Jarrah (Eucalyptus marginata)	500	10					f214150f-8e34-4941-ad8d-ff66fffc60f8	a9d8ea2f-bc89-4861-ae42-f5f888fe30c0
-31.73119703	115.80863190	Jarrah (Eucalyptus marginata)	500	10					192a649b-6cc0-425d-981d-73d0b6a74351	a56712ca-b2d3-4b25-9bd1-c936343ace11
-31.72954520	115.80882540	Jarrah (Eucalyptus marginata)	500	10					30aace11-3273-42d5-b95d-1d16590535ef	
-31.72955500	115.80883790	Jarrah (Eucalyptus marginata)	500	10					eb3a8d27-777a-4649-a064-25efe65a9b02	
-31.73084600	115.82760690	Jarrah (Eucalyptus marginata)	500	10					a7be8790-3ad4-4d18-9436-e4928e681db2	630d68e8-842a-4217-99aa-2d2aff193230,6744a1c9-3ba1-48fa-ac05-9a350f49074d
-31.73115720	115.82820250	Jarrah (Eucalyptus marginata)	500	10					ecdc876b-a063-46de-999b-a059f32b666d	
-31.72313490	115.83233520	Jarrah (Eucalyptus marginata)	500	11					3c01ebd7-15f7-402d-b599-256cdac4b569	
-31.72316720	115.83215920	Jarrah (Eucalyptus marginata)	500	10					be5911a5-9f2f-47f8-9cc9-3c9676e4edb5	
-31.73000163	115.83101490	Jarrah (Eucalyptus marginata)	500	14					0f83f3b7-06a1-4d8e-b0ec-44c5eea2e27f	
-31.73249108	115.82870889	Marri (Corymbia calophylla)	500	8					b9c1a19e-66c4-44b4-a1e6-81215b9141d6	
-31.73106550	115.81276120	Marri (Corymbia calophylla)	500	9					b2f1b017-b8d1-4928-b96f-77e99110f228	
-31.73114410	115.81270070	Marri (Corymbia calophylla)	500	12	1	1			090e2ea4-5ec9-4484-929c-062129ee0142	d9665f79-01f9-40b8-896f-2a2030152b03
-31.73200890	115.82820320	Marri (Corymbia calophylla)	500	14					b5cd709c-0538-47c7-8ac3-257575254478	
-31.72451576	115.82444180	Stag	500	10	2	2		Can't access propertey. Recorded from boundary. Hollows may be incorrect size	796c0d47-b3e4-47c9-8a0f-1bfb92a157e0	
-31.72441794	115.82440930	Stag	500	10	2	2		Can't access propertey. Recorded from boundary. Hollows may be incorrect size	ec7c4f96-f309-4516-a924-26e7385c9797	
-31.72775422	115.82600050	Stag	500	7	1	1		Can't see in hollow	34030d33-56b1-42f8-aa1c-96b49c623960	
-31.72232640	115.80781281	Stag	440	6	1	1		Can't see in hollow	09379c54-1116-45a6-acbd-51fd0b7f57dc	
-31.73387037	115.82676295	Introduced Eucalypt	0	14				Can't access		
-31.73371126	115.82678206	Introduced Eucalypt	0	14				Can't access		
-31.72189091	115.83111420	Stag	0	8	2			Can't access property	d77ed154-3ab4-493c-813a-39eee6dc1e0d	aa3d5b6c-a1dc-4eb3-8dc2-5a5d87e6e995

Appendix G
Foraging Habitat Scoring Tool Results

Habitat	Area (ha)	Starting Score	Within Swan Coastal Plain	Suitable nest hollows	Primarily marri/jarrah	Contains trees DBH >500mm	Known roost	No feeding debris	No foraging habitat within 6km	>12km from known breeding site	>12km from known roosting site	>2km from water	Disease present e.g. dieback	Total	Quality
AfEm	4.57	7	3	3	2	2	0	-2	0	0	0	0	0	15	Very high quality
BaEm	0.46	7	3	0	2	2	0	-2	0	0	0	0	0	12	Very high quality
Cc	0.51	7	3	0	2	2	0	0	0	0	0	0	0	14	Very high quality
CcAs	0.72	7	3	0	2	2	0	-2	0	0	0	0	0	12	Very high quality
CcEmAfBspp.	0.52	7	3	0	2	2	0	-2	0	0	0	0	0	12	Very high quality
Eg	2.12	7	3	3	0	2	0	-2	0	0	0	0	0	13	Very high quality
Em	3.19	7	3	3	2	2	0	-2	0	0	0	0	0	15	Very high quality
EmBi	0.18	7	3	0	2	0	0	-2	0	0	0	0	0	10	Very high quality
EmCc	0.29	7	3	0	2	0	0	-2	0	0	0	0	0	10	Very high quality
EmJs	5.27	7	3	3	2	2	0	-2	0	0	0	0	0	15	Very high quality
Er	1.23	7	3	3	0	2	0	-2	0	0	0	0	0	13	Very high quality
ErAs	0.89	7	3	3	0	2	0	-2	0	0	0	0	0	13	Very high quality
ErBa	0.09	7	3	0	0	2	0	-2	0	0	0	0	0	10	Very high quality
*Egl	1.52	5	3	0	0	0	0	-2	0	0	0	0	0	6	High quality
Ac*Oe	1.27	7	3	0	0	0	0	-2	0	0	0	0	0	8	High quality
Ba	0.16	7	3	0	0	0	0	-2	0	0	0	0	0	8	High quality
BaBi	0.60	7	3	0	0	0	0	-2	0	0	0	0	0	8	High quality
BaBm	1.01	7	3	0	0	0	0	-2	0	0	0	0	0	8	High quality
BaJf	0.30	7	3	0	0	0	0	-2	0	0	0	0	0	8	High quality
Bh	0.64	7	3	0	0	0	0	-2	0	0	0	0	0	8	High quality
Ne	10.09	1	3	3	0	2	0	-2	0	0	0	0	0	7	High quality
*P	0.49	1	3	0	0	2	0	-2	0	0	0	0	0	4	Quality
Et	0.21	1	3	0	0	2	0	-2	0	0	0	0	0	4	Quality
*Oe	0.20	1	3	0	0	0	0	-2	0	0	0	0	0	2	Low quality
Af	0.23	1	3	0	0	0	0	-2	0	0	0	0	0	2	Low quality
Bg	0.00	1	3	0	0	0	0	-2	0	0	0	0	0	2	Low quality
Bi	0.01	1	3	0	0	0	0	-2	0	0	0	0	0	2	Low quality
Bm	0.05	1	3	0	0	0	0	-2	0	0	0	0	0	2	Low quality
EtBm	0.04	1	3	0	0	0	0	-2	0	0	0	0	0	2	Low quality

Appendix H
Sightings and Foraging Evidence

Latitude	Longitude	Species	Evidence type	Foraging material	Comments
-31.7221398	115.8268492	Carnaby's Black Cockatoo	Sighting		
-31.7305523	115.8251332	Carnaby's Black Cockatoo	Sighting		
-31.7282998	115.8077025	Carnaby's Black Cockatoo	Sighting		
-31.7247522	115.8059120	Carnaby's Black Cockatoo	Sighting		
-31.7208808	115.8066192	Carnaby's Black Cockatoo	Sighting		
-31.7303216	115.8089484	Carnaby's Black Cockatoo	Sighting		
-31.7318008	115.8140046	Carnaby's Black Cockatoo	Foraging	Marri nuts	
-31.7297786	115.8210552	Carnaby's Black Cockatoo	Call		

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Appendix D Targeted Flora Survey

East Wanneroo Environmental Assessment Report

Precinct 7

Hesperia

SLR Project No.: 675.V64310.00000

11 December 2023

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ1
Location MGA 50 389350 **mE** 6489629 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Quadrat

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey, Yellow at depth

Vegetation: *Eucalyptus marginata low open woodland over Jacksonia sternbergiana and Xanthorrhoea preissii tall open shrubland over Hibbertia hypericoides, Philotheca spicata and Tricoryne elatior low isolated clumps of shrubs*
Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia willdenowiana	30	0.5	
**Aira caryophyllea*	10	0.5	
Amphipogon turbinatus	20	1.5	
Anigozanthos manglesii	70	0.5	
Austrostipa compressa	20	0.5	
Bossiaea eriocarpa	30	0.5	
**Briza maxima*	15	3	
Burchardia congesta	60	0.5	
Caladenia sp.	30	0.5	
Calandrinia sp.	3	0.5	
Calandrinia corrigioloides	10	0.5	
Calectasia narragara	25	0.5	
Conostephium pendulum	35	0.5	
Conostylis aculeata subsp. cygnorum	15	1	
Crassula colorata	3	0.5	
Desmocladus flexuosus	15	5	
Eucalyptus marginata	550	6	
**Gladiolus caryophyllaceus*	110	0.5	
Gompholobium tomentosum	40	0.5	
Hardenbergia comptoniana	70	0.5	
Hibbertia hypericoides	45	5	
Hypocalymma robustum	45	1	
**Hypochaeris glabra*	1	0.5	
Jacksonia sternbergiana	300	7	
Laxmannia squarrosa	15	1	
Lepidosperma leptostachyum	30	0.5	
Leucopogon polymorphus	35	0.5	
Lomandra hermaphrodita	25	3	
Mesomelaena pseudostygia	50	1.5	
Opercularia vaginata	10	0.5	
Patersonia occidentalis	60	1	
Philotheca spicata	40	1	
Phyllangium paradoxum	5	0.5	
Podotheca gnaphalioides	30	0.5	
Stylidium androsaceum	10	0.5	
Stylidium neurophyllum	25	0.5	
Tetraria octandra	15	1	
Trachymene pilosa	5	0.5	
Tricoryne elatior	40	1	
**Ursinia anthemoides*	30	2	
Waitzia suaveolens	10	3	
Xanthorrhoea preissii	180	30	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ2
Location MGA 50 388837 **mE** 6489600 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Quadrat

Landform: Mid slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White

Vegetation: *Banksia attenuata, Banksia menziesii and Melaleuca preissiana low woodland over Philotheca spicata, Hypocalymma robustum and Eremaea pauciflora low isolated clumps of shrubs over Desmocladus flexuosus, Lepidosperma squamatum and Lyginia barbata low isolated clumps of herbs*

Condition: Degraded **Disturbance Type:** Weeds, Litter, Historical Clearing
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia pulchella	50	0.5	
Amphipogon turbinatus	35	1	
Anigozanthos humilis	25	0.5	
Banksia attenuata	700	15	
Banksia menziesii	600	4	
**Briza maxima*	25	4	
Burchardia congesta	45	0.5	
Caesia micrantha	100	0.5	
Conostylis aculeata subsp. cygnorum	40	1	
Dampiera linearis	25	0.5	
Desmocladus flexuosus	20	4	
Dianella revoluta	45	2	
**Ehrharta calycina*	120	10	
Eremaea pauciflora	120	1	
**Gladiolus caryophyllaceus*	130	1	
Haemodorum spicatum	120	0.5	
Hypocalymma robustum	45	1.5	
**Hypochaeris glabra*	2	0.5	
Lepidosperma squamatum	45	3	
Lyginia barbata	45	3	
Macrozamia riedlei	120	1	
Melaleuca preissiana	250	1	
Melaleuca seriata	60	2	
Patersonia occidentalis	50	0.5	
Petrophile linearis	40	0.5	
Philotheca spicata	60	2	
Sowerbaea laxiflora	50	0.5	
Stylidium schoenoides	50	0.5	
Trachymene pilosa	7	0.5	
**Ursinia anthemoides*	25	0.5	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ3
Location MGA 50 387191 **mE** 6488982 **mN**

Described by: NW, BD
Date: 19/10/2020
Type: Quadrat

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata and Banksia attenuata mid open woodland over Jacksonia sternbergiana tall open shrubland over *Ehrharta calycina mid tussock grassland*

Condition: Degraded **Disturbance Type:** Weeds, Litter, Dumping (Car bodies)
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Banksia attenuata	650	3	
Caladenia flava	20	0.5	
Conostylis aculeata subsp. cygnorum	35	0.5	
Corynotheca micrantha	40	2	
Dianella revoluta	40	0.5	
**Ehrharta calycina*	100	30	
Eucalyptus marginata	1100	8	
Gahnia trifida	80	2	
**Gladiolus caryophyllaceus*	80	0.5	
Gompholobium tomentosum	30	0.5	
Haemodorum laxum	70	0.5	
Hibbertia hypericoides	45	4	
Hybanthus calycinus	30	1	
**Hypochaeris glabra*	30	4	
Jacksonia sericea	10	1	P4
Jacksonia sternbergiana	400	15	
Lomandra caespitosa	50	1	
Macrozamia riedlei	220	1.5	
**Pelargonium capitatum*	45	0.5	
**Romulea rosea*	30	3	
Scaevola repens	6	0.5	
Trachymene pilosa	8	0.5	
Tricoryne elatior	30	1	
**Ursinia anthemoides*	40	8	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ4
Location MGA 50 389154 **mE** 6488673 **mN**

Described by: NW, BD
Date: 21/10/2020
Type: Quadrat

Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown,Grey

Vegetation: *Eucalyptus marginata and Banksia menziesii low woodland over Jacksonia sternbergiana tall shrubland over Gahnia trifida, Dianella revoluta and Alexgeorgea nitens low sparse sedgeland*

Condition: Degraded **Disturbance Type:** Weeds, Litter
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia iteaphylla*	250	1.5	
Alexgeorgea nitens	15	10	
**Briza maxima*	30	2	
Corynotheca micrantha	35	6	
Desmocladus flexuosus	5	1	
Dianella revoluta	60	1	
Drosera sp. "climbing"	50	0.5	
**Ehrharta calycina*	150	10	
Eucalyptus marginata	600	25	
Gahnia trifida	60	2.5	
**Gladiolus caryophyllaceus*	70	0.5	
Haemodorum laxum	100	0.5	
Hardenbergia comptoniana	230	1	
Hibbertia cuneiformis	200	1	
Hibbertia hypericoides	30	1.5	
Hibbertia racemosa	40	2	
**Hypochaeris glabra*	1	0.5	
Jacksonia sternbergiana	300	35	
**Leptospermum laevigatum*	200	1	
**Lysimachia arvensis*	10	0.5	
**Pelargonium capitatum*	30	0.5	
Pterostylis sp.	50	0.5	
Ptilotus polystachyus	70	0.5	
**Ursinia anthemoides*	30	10	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ5
Location MGA 50 387134 **mE** 6488896 **mN**

Described by: NW, BD
Date: 21/10/2020
Type: Quadrat

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown

Vegetation: *Eucalyptus marginata and Allocasuarina fraseriana mid open forest over Jacksonia sternbergiana tall open shrubland over *Ehrharta calycina and *Ehrharta longiflora mid open tussock grassland*

Condition: Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina fraseriana	800	4	
**Briza maxima*	10	1	
**Carpobrotus edulis*	10	15	
Conostylis aculeata subsp. cygnorum	35	0.5	
Conostylis juncea	20	0.5	
Corynotheca micrantha	35	2	
Desmocladus flexuosus	7	0.5	
**Disa bracteata*	15	0.5	
**Ehrharta calycina*	100	20	
**Ehrharta longiflora*	40	2	
Eucalyptus marginata	1200	40	
**Gladiolus caryophyllaceus*	90	0.5	
Haemodorum laxum	100	0.5	
Hardenbergia comptoniana	40	0.5	
Hypocalymma robustum	70	0.5	
**Hypochaeris glabra*	30	1	
Jacksonia sternbergiana	500	20	
Macrozamia riedlei	20	0.5	
Mesomelaena pseudostygia	30	0.5	
Microtis media subsp. media	30	0.5	
**Ornithopus sativus*	5	0.5	
Patersonia occidentalis	40	0.5	
**Romulea rosea*	15	1	
Sowerbaea laxiflora	50	0.5	
Stirlingia latifolia	70	0.5	
**Ursinia anthemoides*	10	0.5	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ6
Location MGA 50 387157 **mE** 6488746 **mN**

Described by: NW, BD
Date: 26/10/2020
Type: Quadrat

Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Banksia attenuata, Eucalyptus marginata and Banksia menziesii low open woodland over Jacksonia furcellata, Jacksonia sternbergiana and Macrozamia riedlei tall isolated clumps of shrubs over Hibbertia hypericoides low open shrubland over *Ursinia anthemoides low herbland*
Condition: Good **Disturbance Type:** Weeds, Litter
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia pulchella	45	1	
Alexgeorgea nitens	7	0.5	
Banksia attenuata	900	8	
Banksia ilicifolia	700	2	
Banksia menziesii	600	4	
**Briza maxima*	25	6	
Burchardia congesta	45	0.5	
Caladenia sp.	40	0.5	
Conostylis aculeata subsp. cygnorum	35	0.5	
Daviesia triflora	50	1	
Desmocladus flexuosus	10	1	
Dianella revoluta	45	3	
Eucalyptus marginata	800	5	
**Gladiolus caryophyllaceus*	100	2	
Gompholobium tomentosum	45	0.5	
Haemodorum spicatum	80	0.5	
Hardenbergia comptoniana	40	0.5	
Hemiandra pungens	15	1	
Hibbertia hypericoides	50	20	
Hypocalymma robustum	45	0.5	
**Hypochaeris glabra*	1	0.5	
Isotropis cuneifolia	15	0.5	
Jacksonia furcellata	250	2	
Jacksonia sternbergiana	250	4	
Lepidosperma squamatum	45	0.5	
Lomandra caespitosa	25	0.5	
Lomandra hermaphrodita	25	0.5	
Macrozamia riedlei	180	1	
Mesomelaena pseudostygia	45	1	
Opercularia vaginata	30	0.5	
Patersonia occidentalis	40	0.5	
**Pelargonium capitatum*	50	1	
Persoonia saccata	45	1	
Ptilotus manglesii	10	0.5	
Pyrorchis nigricans	2	0.5	
**Romulea rosea*	25	3	
Scaevola repens	10	1.5	
**Sonchus oleraceus*	50	0.5	
Styphelia propinqua	35	0.5	
Thysanotus patersonii	60	0.5	
Thysanotus sparteus	40	0.5	
Trachymene pilosa	7	0.5	
**Ursinia anthemoides*	25	30	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWQ7
Location MGA 50 387070 **mE** 6488935 **mN**

Described by: NW, BD
Date: 26/10/2020
Type: Quadrat

Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Allocasuarina fraseriana, Eucalyptus marginata and Banksia attenuata low open woodland over Jacksonia sternbergiana tall sparse shrubland over Xanthorrhoea preissii, Hibbertia hypericoides and Corynotheca micrantha mid open shrubland*
Condition: Very Good **Disturbance Type:** Weeds, Litter, Fire evidence
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alexgeorgea nitens	7	0.5	
Allocasuarina fraseriana	700	7	
Amphipogon turbinatus	25	0.5	
Banksia attenuata	650	3	
Banksia menziesii	130	1	
Billardiera heterophylla	40	0.5	
Bossiaea eriocarpa	35	0.5	
**Briza maxima*	30	8	
Burchardia congesta	50	0.5	
Conostylis aculeata subsp. cygnorum	30	0.5	
Corynotheca micrantha	40	1.5	
Dampiera linearis	25	0.5	
Daviesia triflora	70	1	
Desmocladus flexuosus	7	0.5	
**Ehrharta calycina*	100	1	
Eucalyptus marginata	700	3	
Gahnia trifida	55	2	
Gastrolobium capitatum	110	1.5	
**Gladiolus caryophyllaceus*	100	0.5	
Gompholobium tomentosum	40	0.5	
Hardenbergia comptoniana	40	0.5	
Hibbertia hypericoides	55	15	
Hypocalymma robustum	55	1.5	
Jacksonia sericea	40	1.5	P4
Jacksonia sternbergiana	300	6	
Lepidosperma squamatum	50	2	
Lomandra hermaphrodita	25	0.5	
Lomandra preissii	40	0.5	
Macrozamia riedlei	15	0.5	
Mesomelaena pseudostygia	50	4	
Microtis media subsp. media	35	0.5	
**Moraea flaccida*	45	0.5	
Philotheca spicata	70	1	
Poranthera microphylla	3	0.5	
Pterostylis sp.	25	0.5	
**Sonchus oleraceus*	40	1	
Stirlingia latifolia	70	1	
Thysanotus patersonii	50	0.5	
Tricoryne elatior	40	0.5	
**Ursinia anthemoides*	25	20	
Xanthorrhoea preissii	120	6	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR1
Location MGA 50 388835 **mE** 6488741 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown

Vegetation: *Banksia attenuata low open woodland over Kunzea glabrescens, Jacksonia sternbergiana and Adenanthos cygnorum tall shrubland over Gahnia trifida, Mesomelaena pseudostygia and Dianella revoluta low open sedgeland*
Condition: Good **Disturbance Type:** Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Adenanthos cygnorum	300	5	
Banksia attenuata	700	8	
Bossiaea eriocarpa	40	0.5	
**Briza maxima*	50	10	
Conospermum triplinervium	350	2	
Conostylis aculeata subsp. cygnorum	35	2	
Corynotheca micrantha	40	1	
Dianella revoluta	60	1	
**Ehrharta calycina*	70	15	
Gahnia trifida	55	20	
Gastrolobium capitatum	70	2	
Gompholobium tomentosum	40	1	
Hybanthus calycinus	20	1	
Jacksonia sericea	20	3	P4
Jacksonia sternbergiana	400	5	
Kunzea glabrescens	600	35	
Mesomelaena pseudostygia	45	4	
**Pelargonium capitatum*	50	6	
Phyllanthus calycinus	45	1	
Pterostylis vittata	35	0.5	
Scaevola repens	7	1	
Tricoryne elatior	45	2	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR2
Location MGA 50 388963 **mE** 6488670 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Releve

Landform: Plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown

Vegetation: *Eucalyptus marginata, Corymbia calophylla and Banksia attenuata mid isolated clumps of trees over Jacksonia sternbergiana, Adenanthos cygnorum and Macrozamia riedlei tall open shrubland over Hibbertia hypericoides, Jacksonia sericea and Philotheca spicata low isolated clumps of shrubs*
Condition: Degraded **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Adenanthos cygnorum	250	5	
Allocasuarina fraseriana	800	1	
Anigozanthos manglesii	80	0.5	
Banksia attenuata	700	2	
Banksia menziesii	250	1	
**Briza maxima*	25	10	
Burchardia congesta	50	0.5	
Caladenia sp.	40	0.5	
**Carpobrotus edulis*	15	3	
Conostylis aculeata subsp. cygnorum	35	0.5	
Corymbia calophylla	1500	3	
Desmocladus flexuosus	15	5	
Dianella revoluta	70	0.5	
**Ehrharta calycina*	100	30	
Eucalyptus marginata	1000	30	
Gahnia trifida	60	0.5	
**Gladiolus caryophyllaceus*	110	1	
Gompholobium tomentosum	80	0.5	
Hardenbergia comptoniana	50	0.5	
Hibbertia hypericoides	50	3	
Hypocalymma robustum	45	0.5	
**Hypochaeris glabra*	1	1	
Jacksonia sericea	4	2	P4
Jacksonia sternbergiana	300	15	
Macrozamia riedlei	200	1	
Microtis media subsp. media	50	0.5	
**Pelargonium capitatum*	60	4	
Philotheca spicata	60	1	
Tricoryne elatior	40	0.5	
**Ursinia anthemoides*	30	7	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR3
Location MGA 50 389288 **mE** 6489516 **mN**

Described by: NW, BD
Date: 13/10/2020
Type: Releve

Landform: Mid slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Allocasuarina fraseriana and Banksia attenuata low isolated trees over Adenanthos cygnorum, Jacksonia furcellata and *Olea europaea tall open shrubland over Gahnia trifida and Lyginia barbata low isolated clumps of sedges*
Condition: Degraded **Disturbance Type:** Weeds, Historical Clearing
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia willdenowiana	5	0.5	
Adenanthos cygnorum	400	20	
Allocasuarina fraseriana	350	1	
Anigozanthos manglesii	50	0.5	
Banksia attenuata	400	1	
**Briza maxima*	25	0.5	
Chamelaucium uncinatum	150	0.5	
Conostylis aculeata subsp. cygnorum	40	0.5	
Dampiera linearis	25	0.5	
Daviesia triflora	45	0.5	
Desmocladus flexuosus	15	0.5	
Gahnia trifida	70	4	
Gompholobium tomentosum	40	0.5	
Hibbertia hypericoides	50	2	
Hybanthus calycinus	25	0.5	
Hypocalymma robustum	30	0.5	
**Hypochaeris glabra*	1	1	
Jacksonia furcellata	450	15	
Jacksonia sternbergiana	200	3	
Kunzea glabrescens	300	2	
Laxmannia squarrosa	20	0.5	
Lomandra hermaphrodita	30	0.5	
Lyginia barbata	60	2	
Mesomelaena pseudostygia	45	0.5	
**Olea europaea*	400	10	Planted
**Pelargonium capitatum*	45	1	
Scaevola repens	7	0.5	
Tricoryne elatior	45	1	
**Ursinia anthemoides*	30	20	
Waitzia suaveolens	2	1	
Xanthorrhoea preissii	100	1	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR4
Location MGA 50 389487 **mE** 6488839 **mN**

Described by: NW, BD
Date: 21/10/2020
Type: Releve

Landform: Wetland
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus rudis and Melaleuca preissiana mid isolated clumps of trees over Jacksonia furcellata and Macrozamia riedlei mid isolated clumps of shrubs over *Ursinia anthemoides, *Carpobrotus edulis and *Hypochaeris glabra low sparse herbland*
Condition: Completely Degraded **Disturbance Type:** Heavy grazing, Weeds, Horse tracks/scats
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Arctotheca calendula*	10	1	
**Carpobrotus edulis*	10	5	
Corynotheca micrantha	40	3	
**Ehrharta calycina*	100	3	
Eucalyptus rudis	1200	5	
**Hypochaeris glabra*	1	2	
Jacksonia furcellata	220	2	
Macrozamia riedlei	150	2	
Melaleuca preissiana	600	5	
**Ursinia anthemoides*	30	6	

FLORA SITE SHEET

Project Name 3861 East Wanneroo Flora and Vegetation Survey
Site: EWR5
Location MGA 50 388253 **mE** 6488845 **mN**

Described by: NW, BD
Date: 19/10/2020
Type: Releve

Landform: Wetland
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown

Vegetation: *Eucalyptus rudis mid open forest over Hibbertia cuneiformis and Astartea scoparia mid isolated clumps of shrubs over *Ehrharta longiflora, *Hordeum leporinum and *Bromus diandrus low open grassland*

Condition: Degraded
Fire Age: >10 years
Disturbance Type: Heavy grazing, Weeds, Horse tracks/scats

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia longifolia*	250	3	
Astartea scoparia	130	1	
**Bromus diandrus*	20	5	
**Ehrharta longiflora*	50	10	
Eucalyptus rudis	1500	60	
**Euphorbia peplus*	20	10	
**Fumaria capreolata*	30	7	
Hibbertia cuneiformis	170	5	
**Hordeum leporinum*	20	10	
**Urtica urens*	45	0.5	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESQ01
Location MGA 50 387422 **mE** 6488593 **mN**

Described by: NW, GB
Date: 12/10/2021
Type: Quadrat

Landform: Mid slope
Slope: Northeast
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata and Banksia attenuata low woodland over Kunzea glabrescens, Acacia saligna and Macrozamia riedlei tall open shrubland over Gompholobium tomentosum, Hibbertia hypericoides and Jacksonia sericea low sparse shrubland over *Ehrharta calycina mid tussock grassland over Desmocladus flexuosus, Alexgeorgea nitens and Lepidosperma leptostachyum low open sedgeland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia saligna	300	2	
Alexgeorgea nitens	15	2	
Banksia attenuata	500	6	
Bossiaea eriocarpa	20	0.5	
**Briza maxima*	30	0.5	
Burchardia congesta	50	0.1	
Conostylis aculeata subsp. cygnorum	40	0.5	
Desmocladus flexuosus	15	10	
Dianella revoluta	40	0.5	
Drosera sp. "climbing"	80	0.1	
**Ehrharta calycina*	100	65	
Eucalyptus marginata	800	10	
**Gladiolus caryophyllaceus*	70	0.1	
Gompholobium tomentosum	45	1	
Hardenbergia comptoniana	100	0.5	
Hibbertia hypericoides	35	1	
Hovea trisperma	30	0.1	
**Hypochaeris glabra*	1	0.1	
Jacksonia sericea	40	1	P4
Jacksonia sternbergiana	75	1	
Kunzea glabrescens	200	10	
Lepidosperma leptostachyum	80	1	
Levenhookia pusilla	3	0.1	
**Lysimachia arvensis*	10	0.1	
Macrozamia riedlei	200	1.5	
Mesomelaena pseudostygia	45	1	
Morelotia octandra	80	4	
Patersonia occidentalis	40	0.1	
Ptilotus manglesii	10	0.5	
Pyrorchis nigricans	3	0.1	
**Romulea rosea*	25	0.1	
Scaevola repens	10	0.5	
**Silene gallica*	35	0.1	
**Sonchus oleraceus*	25	0.1	
Stylidium brunonianum	40	0.1	
Stylidium calcaratum	8	0.1	
Thysanotus manglesianus	50	0.1	
Wahlenbergia capensis	25	0.1	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR01
Location MGA 50 388830 **mE** 6489688 **mN**

Described by: NW, GB
Date: 12/10/2021
Type: Releve

Landform: Mid slope
Slope: South
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata and Allocasuarina fraseriana mid woodland over Banksia menziesii low open woodland over Jacksonia furcellata tall sparse shrubland over Gompholobium tomentosum, Petrophile linearis and Hibbertia hypericoides low open shrubland over *Ehrharta calycina low open tussock grassland over Phlebocarya ciliata, Dianella revoluta and Dampiera linearis low sparse herbland*

Condition: Good
Fire Age: > 15 years
Disturbance Type: Historical Clearing, Vehicle tracks, Weeds

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina fraseriana	1200	8	
Banksia menziesii	650	5	
Dampiera linearis	25	1	
Desmocladus flexuosus	15	4	
Dianella revoluta	60	2	
**Ehrharta calycina*	80	15	
Eucalyptus marginata	1400	15	
Gompholobium tomentosum	50	15	
Hibbertia hypericoides	45	2	
Jacksonia furcellata	250	5	
Petrophile linearis	45	4	
Philotheca spicata	55	1	
Phlebocarya ciliata	45	4	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR02
Location MGA 50 389459 **mE** 6489663 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Plain
Slope: N/A
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata mid open woodland over Banksia attenuata, Banksia menziesii and Eucalyptus todtiana low woodland over Jacksonia furcellata, Macrozamia riedlei and Jacksonia sternbergiana mid sparse shrubland over Petrophile linearis low sparse shrubland over *Ehrharta calycina tall closed tussock grassland over *Avena barbata, *Briza maxima and *Cynodon dactylon low open tussock grassland over *Carpobrotus edulis, *Oenothera stricta and *Oxalis pes-caprae low sparse herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Infrastructure, Weeds,Irrigation Pipes
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia applanata	25	0.1	
**Acacia longifolia*	200	1	
Allocasuarina fraseriana	400	3	
**Avena barbata*	45	10	
Banksia attenuata	1000	10	
Banksia menziesii	500	10	
**Briza maxima*	30	8	
Burchardia congesta	30	0.1	
**Carpobrotus edulis*	15	2	
**Cynodon dactylon*	20	3	
Drosera erythrorhiza	1	0.1	
**Ehrharta calycina*	160	90	
Eucalyptus marginata	1500	10	
Eucalyptus todtiana	600	10	
**Euphorbia terracina*	60	1	
**Gladiolus caryophyllaceus*	20	0.1	
Gompholobium tomentosum	55	3	
Hibbertia hypericoides	50	2	
Hypocalymma angustifolium	45	0.5	
Jacksonia furcellata	200	2	
Jacksonia sericea	15	0.5	P4
Jacksonia sternbergiana	200	1	
Lomandra hermaphrodita	35	0.1	
**Lupinus cosentinii*	30	1	
Macrozamia riedlei	200	2	
Mesomelaena pseudostygia	45	0.5	
**Oenothera stricta*	15	2	
**Oxalis pes-caprae*	25	2	
**Pelargonium capitatum*	50	4	
Petrophile linearis	40	1	
Philotheca spicata	50	0.5	
Scaevola repens	5	0.1	
**Sonchus oleraceus*	40	0.5	
Sowerbaea laxiflora	25	0.1	
Thysanotus dichotomus	50	0.5	
**Ursinia anthemoides*	25	1	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR03
Location MGA 50 388978 **mE** 6488644 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Mid slope
Slope: East
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata mid open woodland over Allocasuarina fraseriana, Banksia attenuata and Banksia menziesii low open woodland over Xanthorrhoea preissii mid sparse shrubland over Hibbertia hypericoides and Petrophile macrostachya low sparse shrubland over Mesomelaena pseudostygia low sparse sedgeland over Anigozanthos manglesii and Sowerbaea laxiflora mid sparse herbland*

Condition: Completely Degraded **Disturbance Type:** Historical Clearing, Weeds, Lawn
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina fraseriana	1000	6	
Anigozanthos manglesii	80	1	
Banksia attenuata	500	3	
Banksia menziesii	400	1	
Conostylis aculeata subsp. cygnorum	35	0.1	
Eucalyptus marginata	1100	5	
Hibbertia hypericoides	45	1	
Mesomelaena pseudostygia	45	1	
Petrophile macrostachya	90	0.5	
Sowerbaea laxiflora	50	0.5	
Xanthorrhoea preissii	200	2	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR04
Location MGA 50 388209 **mE** 6488341 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Plain
Slope: N/A
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Eucalyptus marginata mid woodland over Banksia attenuata, Alocasuarina fraseriana and Banksia menziesii low woodland over *Leptospermum laevigatum and *Acacia iteaphylla tall sparse shrubland over Hibbertia hypericoides low sparse shrubland over *Ehrharta calycina and *Briza maxima low to mid closed tussock grassland over Desmocladus flexuosus and Mesomelaena pseudostygia low sparse sedgeland over *Pelargonium capitatum and *Ursinia anthemoides mid sparse herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Litter, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia iteaphylla*	400	3	
Allocasuarina fraseriana	800	5	
Banksia attenuata	600	8	
Banksia menziesii	200	6	
**Briza maxima*	30	3	
Burchardia congesta	40	0.1	
Desmocladus flexuosus	15	3	
**Ehrharta calycina*	90	80	
Eucalyptus marginata	1500	20	
Hibbertia hypericoides	45	2	
**Leptospermum laevigatum*	300	6	
Mesomelaena pseudostygia	40	0.5	
**Pelargonium capitatum*	60	4	
Sowerbaea laxiflora	40	0.1	
**Ursinia anthemoides*	30	3	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR05
Location MGA 50 388199 **mE** 6488327 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Open woodland
Slope: North
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Banksia attenuata, Eucalyptus marginata and Banksia menziesii low open forest over *Acacia longifolia and Hibbertia cuneiformis tall open shrubland over Hibbertia hypericoides and Stirlingia latifolia low sparse shrubland over *Briza maxima, *Ehrharta calycina and *Ehrharta longiflora low to mid tussock grassland over *Ursinia anthemoides and *Pelargonium capitatum low open herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Infrastructure, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Acacia longifolia*	300	10	
Banksia attenuata	500	20	
Banksia menziesii	350	3	
**Briza maxima*	25	20	
**Ehrharta calycina*	60	20	
**Ehrharta longiflora*	20	5	
Eucalyptus marginata	400	10	
Hibbertia cuneiformis	200	2	
Hibbertia hypericoides	40	2	
**Pelargonium capitatum*	40	4	
Stirlingia latifolia	70	1	
**Ursinia anthemoides*	20	10	

FLORA SITE SHEET

Project Name 4660 East Wanneroo Flora and Vegetation Survey
Site: HESR06
Location MGA 50 388130 **mE** 6488317 **mN**

Described by: NW, GB
Date: 13/10/2021
Type: Releve

Landform: Open woodland
Slope: North
Rock Type: None
Soil Type: Sand
Soil Colour: Grey

Vegetation: *Banksia attenuata, Banksia menziesii and Banksia ilicifolia low open forest over Jacksonia furcellata and Macrozamia riedlei tall open shrubland over Hibbertia hypericoides, Acacia huegelii and Hypocalymma robustum low sparse shrubland over *Ehrharta calycina mid closed tussock grassland over Alexgeorgea nitens low sparse sedgeland over Trachymene pilosa, *Ursinia anthemoides and Burchardia congesta low open herbland*

Condition: Degraded **Disturbance Type:** Historical Clearing, Weeds
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia huegelii	40	1	
Alexgeorgea nitens	10	6	
Austrostipa sp.	20	0.1	
Banksia attenuata	350	15	
Banksia ilicifolia	300	1	
Banksia menziesii	350	15	
Bossiaea eriocarpa	40	1	
Burchardia congesta	30	2	
Caladenia flava	5	0.1	
Conostylis aculeata subsp. cygnorum	30	0.5	
Dampiera linearis	25	0.5	
Dianella revoluta	40	0.5	
**Ehrharta calycina*	70	80	
Eremaea pauciflora	40	0.5	
**Gladiolus caryophyllaceus*	70	1	
Haemodorum laxum	50	0.5	
Hibbertia hypericoides	40	2	
Hypocalymma robustum	40	1	
Jacksonia furcellata	300	2	
Lyginia barbata	40	2	
Macrozamia riedlei	200	1	
Scholtzia involucrata	20	1	
Sowerbaea laxiflora	40	1	
Styphelia conostephioides	30	1	
Trachymene pilosa	5	3	
**Ursinia anthemoides*	30	2	

Appendix E PMST Search Results

East Wanneroo Environmental Assessment Report

Precinct 7

Hesperia

SLR Project No.: 675.V64310.00000

11 December 2023

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: 09-Nov-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:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	66
Listed Migratory Species:	50

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:	69
Commonwealth Heritage Places:	None
Listed Marine Species:	77
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:	12
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	69
Key Ecological Features (Marine):	None
Biologically Important Areas:	10
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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
Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
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 feature area
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 buffer area only
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 likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
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 likely to occur within 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
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 likely 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
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
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 buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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			
Galaxiella nigrostriata			
Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat likely to occur within area	In buffer area only
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 feature area
MAMMAL			
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In buffer area only
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 buffer area only
Macroderma gigas			
Ghost Bat [174]	Vulnerable	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 buffer area only
Pseudocheirus occidentalis			
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
Anigozanthos viridis subsp. terraspectans Dwarf Green Kangaroo Paw [3435]	Vulnerable	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 feature area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area	In feature area
Caleana dixonii listed as Paracaleana dixonii Sandplain Duck Orchid [87944]	Endangered	Species or species habitat may occur within area	In buffer area only
Chamelaucium lullfitzii listed as Chamelaucium sp. Gingin (N.G.Marchant 6) Gingin Wax [92777]	Endangered (listed as Chamelaucium sp. Gingin	Species or species habitat may occur within area	In buffer area only
Darwinia foetida Muchea Bell [83190]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may 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 likely to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area	In feature area
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grevillea christineae Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea curviloba subsp. curviloba Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area	In buffer area only
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In feature area
Marianthus paralius [83925]	Endangered	Species or species habitat known to occur within area	In buffer area only
Melaleuca sp. Wanneroo (G.J. Keighery 16705) [89456]	Endangered	Species or species habitat known to occur within area	In buffer area only
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
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
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
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 buffer area only
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely 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 buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within 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
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Species or species habitat may 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 buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
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 buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
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 buffer area only
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 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 buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
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	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 buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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 buffer area only
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat likely 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 likely to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Species or species habitat known to occur within area	In feature area
[Calidris subminuta](#) Long-toed Stint [861]		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 likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica			
Bar-tailed Godwit [844]		Species or species habitat likely to occur within area	In buffer area only
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat known to occur within area	In feature area
Tringa glareola			
Wood Sandpiper [829]		Species or species habitat known to occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - MUCHEA ARMAMENT RANGE [50091]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50090]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50075]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50074]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50073]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50071]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50083]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50064]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50088]	WA	In buffer area only
Defence - MUCHEA ARMAMENT RANGE [50089]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [50563]	WA	In buffer area only
Commonwealth Land - [50562]	WA	In buffer area only
Commonwealth Land - [50316]	WA	In buffer area only
Commonwealth Land - [50700]	WA	In buffer area only
Commonwealth Land - [50312]	WA	In buffer area only
Commonwealth Land - [50682]	WA	In buffer area only
Commonwealth Land - [50705]	WA	In buffer area only
Commonwealth Land - [50702]	WA	In buffer area only
Commonwealth Land - [50553]	WA	In buffer area only
Commonwealth Land - [50667]	WA	In buffer area only
Commonwealth Land - [50626]	WA	In buffer area only
Commonwealth Land - [51120]	WA	In buffer area only
Commonwealth Land - [50689]	WA	In buffer area only
Commonwealth Land - [50439]	WA	In buffer area only
Commonwealth Land - [50716]	WA	In buffer area only
Commonwealth Land - [50448]	WA	In buffer area only
Commonwealth Land - [50561]	WA	In buffer area only
Commonwealth Land - [50706]	WA	In buffer area only
Commonwealth Land - [50440]	WA	In buffer area only
Commonwealth Land - [50704]	WA	In buffer area only
Commonwealth Land - [50560]	WA	In buffer area only
Commonwealth Land - [50701]	WA	In buffer area only
Commonwealth Land - [50630]	WA	In buffer area only
Commonwealth Land - [50502]	WA	In buffer area only
Commonwealth Land - [50271]	WA	In buffer area only
Commonwealth Land - [50713]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50508]	WA	In buffer area only
Commonwealth Land - [50587]	WA	In buffer area only
Commonwealth Land - [50680]	WA	In buffer area only
Commonwealth Land - [50588]	WA	In buffer area only
Commonwealth Land - [50489]	WA	In buffer area only
Commonwealth Land - [50582]	WA	In buffer area only
Commonwealth Land - [50583]	WA	In buffer area only
Commonwealth Land - [50584]	WA	In buffer area only
Commonwealth Land - [50585]	WA	In buffer area only
Commonwealth Land - [50586]	WA	In buffer area only
Commonwealth Land - [50430]	WA	In buffer area only
Commonwealth Land - [51118]	WA	In buffer area only
Commonwealth Land - [50436]	WA	In buffer area only
Commonwealth Land - [50747]	WA	In buffer area only
Commonwealth Land - [50801]	WA	In buffer area only
Commonwealth Land - [50413]	WA	In buffer area only
Commonwealth Land - [51130]	WA	In buffer area only
Commonwealth Land - [50598]	WA	In buffer area only
Commonwealth Land - [50593]	WA	In buffer area only
Commonwealth Land - [50592]	WA	In buffer area only
Commonwealth Land - [50494]	WA	In buffer area only
Commonwealth Land - [50594]	WA	In buffer area only
Commonwealth Land - [51111]	WA	In buffer area only
Commonwealth Land - [50606]	WA	In buffer area only
Commonwealth Land - [51132]	WA	In buffer area only
Commonwealth Land - [50576]	WA	In buffer area only
Commonwealth Land - [50625]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50668]	WA	In buffer area only
Commonwealth Land - [50711]	WA	In buffer area only
Commonwealth Land - [50574]	WA	In buffer area only
Commonwealth Land - [50575]	WA	In buffer area only
Commonwealth Land - [50559]	WA	In buffer area only
Commonwealth Land - [50703]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
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]		Species or species habitat likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may 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]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely 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 likely to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
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]		Species or species habitat known to occur within area overfly marine area	In feature area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within 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 may occur within area	In feature area
[Onychoprion anaethetus as Sterna anaethetus](#) Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Pachyptila turtur](#) Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area	In feature area
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[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 buffer area only
[Recurvirostra novaehollandiae](#) Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In feature area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 buffer area only
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may 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 buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
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 buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In feature area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In buffer area only
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In buffer area only
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In buffer area only

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 buffer area only
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophoca cinerea			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In buffer area only
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	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Disteira kingii			
Spectacled Seasnake [1123]		Species or species habitat may occur within area	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
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			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
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 buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		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
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Errina Road	Nature Reserve	WA	In buffer area only
Jandabup	Nature Reserve	WA	In feature area
Lake Joondalup	Nature Reserve	WA	In buffer area only
Marmion	Marine Park	WA	In buffer area only
Neerabup	Nature Reserve	WA	In buffer area only
Neerabup	National Park	WA	In buffer area only
Unnamed WA21176	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA43290	Conservation Park	WA	In buffer area only
Unnamed WA46756	Conservation Park	WA	In buffer area only
Unnamed WA46926	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA50514	5(1)(h) Reserve	WA	In buffer area only
Woodvale	5(1)(h) Reserve	WA	In buffer area only

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Joondalup Lake	WA	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Alkimos Seawater Desalination	2019/8453		Assessment	In feature area
Expansion of Limestone Extraction	2022/09324		Assessment	In buffer area only
Land clearing for timber storage	2022/09367		Assessment	In buffer area only
Land Development, James Street and Well Street, East Wanneroo, Elberton Property	2021/9106		Assessment	In feature area
Residential Subdivision development	2011/6040		Post-Approval	In buffer area only
Wattle Avenue East Quarry	2022/09326		Referral Decision	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Catalina Residential Development	2010/5785	Controlled Action	Post-Approval	In buffer area only
East Landsdale Residential Development	2008/4676	Controlled Action	Post-Approval	In buffer area only
East Wanneroo Cell 9 residential subdivision - Lots 50,51,52,154 & 404	2010/5772	Controlled Action	Completed	In buffer area only
Excavate sand and limestone resources	2010/5621	Controlled Action	Completed	In buffer area only
Limestone extraction on Lot 8 Wattle Avenue, Nowergup	2013/6767	Controlled Action	Post-Approval	In buffer area only
Lot 1665 Wanneroo Road, Sinagra.	2017/7921	Controlled Action	Post-Approval	In buffer area only
Lot 9000 Wanneroo Road Sinagra Mixed Use Development, Western Australia	2020/8798	Controlled Action	Proposed Decision	In buffer area only
Meridian Business Park Industrial Development	2007/3479	Controlled Action	Post-Approval	In buffer area only
Mitchell Freeway Extension and Wanneroo Road Upgrade, WA	2018/8367	Controlled Action	Post-Approval	In buffer area only
Mitchell Freeway Extension between Burns Beach Rd and Hester Av, Neerabup, WA	2013/7091	Controlled Action	Post-Approval	In buffer area only
Mitchell Freeway Principal Shared Path Gaps Project Ocean Reef Road to Hepburn Avenue	2020/8833	Controlled Action	Post-Approval	In buffer area only
National Lifestyle Villages Development	2011/6020	Controlled Action	Post-Approval	In feature area
Nava-1 Cable System	2001/510	Controlled Action	Completed	In buffer area only
Neerabup Industrial Area, WA	2021/8917	Controlled Action	Assessment Approach	In buffer area only
Neerabup Industrial Estate, Lot 701 Flynn Drive Neerabup WA	2012/6424	Controlled Action	Post-Approval	In buffer area only
Ocean Reef Marina Development	2009/4937	Controlled Action	Completed	In buffer area only
Perth-Darwin National Highway alignment (Swan Valley Section), WA	2013/7042	Controlled Action	Post-Approval	In buffer area only
Shark Hazard Mitigation Drum Line Program, WA	2014/7174	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Subdivision of Lot 902 Flynn Drive Neerabup for Industrial Development	2021/8977	Controlled Action	Assessment Approach	In buffer area only
Vegetation Clearing, Wannaroo Rd and Nowergup Rd	2011/5955	Controlled Action	Completed	In buffer area only
Not controlled action				
Butler Railway Extension Project - Nowergup Depot Eastern Alignment	2011/5989	Not Controlled Action	Completed	In buffer area only
Commercial development of Lot 9004 Hodges Drive, Joondalup, WA	2016/7844	Not Controlled Action	Completed	In buffer area only
Connect Joondalup - Lot 9000 McLarty Ave and Lot 999 Piccadilly Circus, Joondalup, WA	2016/7758	Not Controlled Action	Completed	In buffer area only
Construction of an International Rifle Range	2011/6068	Not Controlled Action	Completed	In buffer area only
Container Deposit Scheme Project	2019/8517	Not Controlled Action	Completed	In buffer area only
Development of 39 (Lot 3000) Hardcastle Avenue, Landsdale, WA	2017/8100	Not Controlled Action	Completed	In buffer area only
Development of ECU Engineering Annex, Joondalup Campus, WA	2017/7995	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 feature area
Extension of 7.5km of the Joondalup Line electrified passenger railway from Cla	2010/5632	Not Controlled Action	Completed	In buffer area only
Flynn Drive / Pinjar Road Intersection Works, Lot 9000 Flynn Drive, Neerabup, WA	2017/7983	Not Controlled Action	Completed	In buffer area only
Gnangara Road upgrade project, city of Swan, WA	2013/6966	Not Controlled Action	Completed	In buffer area only
Groundwater Replenishment Scheme (GWRS) Stage 2	2016/7786	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 West Submarine Telecommunications Cable, WA	2017/8126	Not Controlled Action	Completed	In buffer area only
Landsdale Primary School Development, WA	2015/7597	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Landsdale Residential Subdivision Development	2011/6027	Not Controlled Action	Completed	In buffer area only
Lot 158 Landsdale Rd, Landsdale, WA	2012/6403	Not Controlled Action	Completed	In buffer area only
Lot 594 Wanneroo Road development, Hocking	2020/8621	Not Controlled Action	Completed	In buffer area only
Lots 71 & 72 Queensway Rd, East Landsdale	2012/6541	Not Controlled Action	Completed	In buffer area only
Ocean Reef Marina Development, City of Joondalup, WA	2014/7237	Not Controlled Action	Completed	In buffer area only
Pearsall Primary School, Lots 62, 269, 1008, 1009 & Part Lot 23, Pearsall, WA	2012/6405	Not Controlled Action	Completed	In buffer area only
Pinjar Motorcycle Park Raceway Development	2012/6419	Not Controlled Action	Completed	In buffer area only
Quinns Main sewer extension, Clarkson - Neerabup, WA	2018/8215	Not Controlled Action	Completed	In buffer area only
Realignment of Flynn Drive	2011/6170	Not Controlled Action	Completed	In buffer area only
Residential and commercial development, Lot 1981 Alexander Drive & Lot 152 Gnangara Road, Landsdale,	2013/6982	Not Controlled Action	Completed	In buffer area only
Residential Development, 50 Lot 2 Driver Road, Darch, Western Australia	2020/8677	Not Controlled Action	Completed	In buffer area only
Residential development, Landsdale, WA	2013/6964	Not Controlled Action	Completed	In buffer area only
Residential Development, Lot 4 Coogee Road, Mariginiup, WA	2019/8452	Not Controlled Action	Completed	In feature area
Residential development, Lot 55 Alexander Drive, Landsdale, WA	2013/6971	Not Controlled Action	Completed	In buffer area only
Residential Development, Lots 10 Dundebar Road and 28 and 29 Belgrade Road, East Wanneroo, WA	2019/8521	Not Controlled Action	Completed	In buffer area only
Residential development of 118 Coogee Road, Mariginiup, WA	2017/8011	Not Controlled Action	Completed	In buffer area only
Residential Subdivision	2012/6410	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Residential subdivision - lot 169 Kingsway Road, Landsdale WA	2012/6412	Not Controlled Action	Completed	In buffer area only
Residential Subdivision - Lots 12, 36 & 38 Capron St, Wanneroo	2012/6409	Not Controlled Action	Completed	In feature area
Residential subdivision - Lots 156 and 157 Landsdale Road Landsdale WA	2012/6407	Not Controlled Action	Completed	In buffer area only
Telstra PITC O3B Clearing Application	2011/6147	Not Controlled Action	Completed	In buffer area only
Wangara Industrial Extension Area, WA	2012/6501	Not Controlled Action	Completed	In buffer area only
Wanneroo Road/Ocean Reef Road Grade Separation, Pearsall, WA	2017/8110	Not Controlled Action	Completed	In buffer area only
Wanneroo Road Duplication, WA	2015/7632	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Ocean Reef Road Extension Works in Wangara	2010/5388	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Road realignment and widening	2009/4926	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Subdivision Lot 4 Flynn Drive and earthworks for industrial development, 240 Fl	2009/5028	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Boundary Road Sand Quarry	2019/8560	Referral Decision	Completed	In buffer area only

Biologically Important Areas			
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna pacifica			
Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In buffer area only
Hydroprogne caspia			
Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Larus pacificus Pacific Gull [811]	Foraging (in high numbers)	Former Range	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
Sterna dougallii Roseate Tern [817]	Foraging	Known to occur	In buffer area only
Sternula nereis Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
Seals			
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Likely to occur	In buffer area only
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 F Bushfire Management Plan

East Wanneroo Environmental Assessment Report

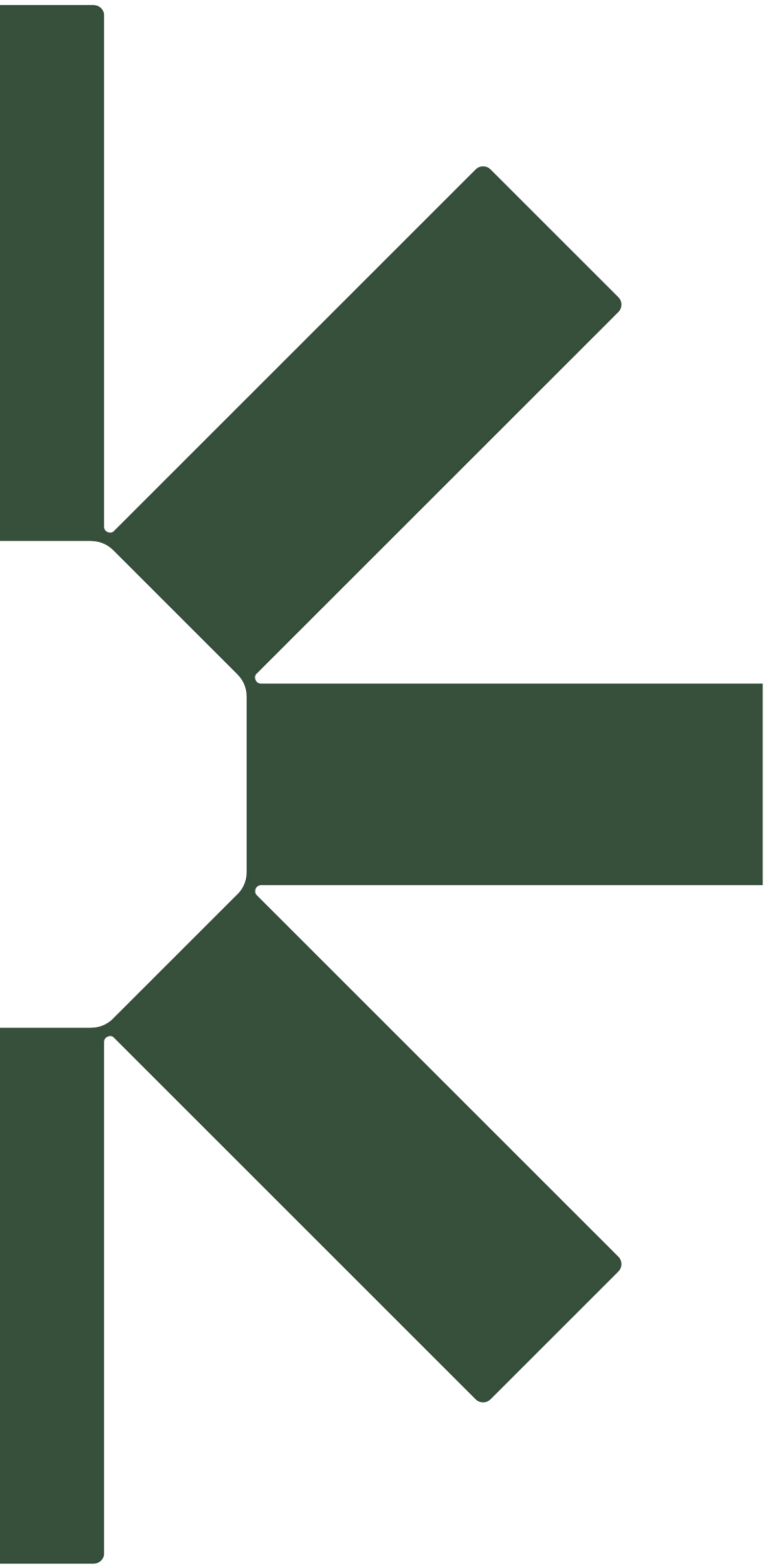
Precinct 7

Hesperia

SLR Project No.: 675.V64310.00000

11 December 2023

REFER TO LOCAL STRUCTURE PLAN REPORT
APPENDIX 4:
BUSHFIRE MANAGEMENT PLAN



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