Water Corporation

Vasse Diversion Drain Upgrade
Flora and Fauna Study

April 2017

Executive summary

The Water Corporation (the Corporation) proposes to upgrade the Vasse Diversion Drain within the City of Busselton. The Vasse Diversion Drain (hereon referred to as the survey area) is located approximately 220 km from Perth on the shores of Geographe Bay. The Corporation requires a biological survey to understand the key flora, vegetation and fauna values, specifically the presence of Black Cockatoos and Western Ringtail Possum habitat within the drain areas proposed for upgrading.

GHD Pty Ltd (GHD) was commissioned to undertake a biological survey of the survey area (approximately 31.9 ha). The purpose of the survey was to define the biological values within the survey area, in particular their spatial location and conservation significance. The outcomes of the assessment will be used in the environmental assessment and approvals process and will inform the need for and scope of further field investigations and/or more detailed environmental impact assessment.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.6 and the assumptions and qualifications contained throughout the Report.

The biological survey included a desktop assessment of the survey area and a field assessment that was conducted on 28 and 29 September 2016. This assessment determined the following:

- The survey area occurs within the Busselton-Capel Groundwater Area
- No conservation areas occur within the survey area, however an unnamed C Class Nature Reserve is adjacent to the most northern section of the survey area
- Seven Geomorphic Wetlands occur within the survey area. Two Conservation Category Wetlands, UFI 223 and UFI 13198 occur within a small section of the survey area, located between Bussell Highway and Busselton Bypass
- A large Environmentally Sensitive Area occurs within the survey area and is likely to be associated with the Conservation Category wetland
- An assessment of vegetation extents remaining indicates that the vegetation within the survey area are not well represented in the locality and region. The current extents remaining of vegetation association 1000 are less than the 30% threshold level at both the State and Local Government Area (LGA) level. The remaining extent of vegetation association 27 is below the 30% threshold at the Interim Biogeographic Regionalisation of Australia (IBRA) bioregion level and LGA level. Vegetation association 949 is below the 30% threshold level at the LGA level only
- Three broad floristic formations containing six vegetation types (in addition to rehabilitated areas, the drain and highly disturbed areas) were identified from the survey area
- No Threatened Ecological Communities were recorded within the survey area during the time of the assessment. Two vegetation types recorded during the assessment (Marri and Flooded Gum woodland and Peppermint woodland (total of 2.88 ha)) align with the Department of Parks and Wildlife (DPaW) Priority 1 listed Priority Ecological Community, *Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton)
- The vegetation within the survey area was rated as Very Good to Completely Degraded in condition. The vegetation throughout the survey area has been impacted by historical clearing and weed invasion

- Vegetation association, Tall *Melaleuca* shrubland (0.74 ha) located within the Geomorphic Wetlands survey area is considered riparian vegetation, and is restricted to these areas within the landscape and considered significant vegetation
- Seventy-three flora taxa (including subspecies and varieties) representing 32 families and 62 genera were recorded from the survey area during the 2016 field survey. This total comprised 35 native taxa and 38 introduced flora taxa
- No flora taxa listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Wildlife Conservation Act* (WC Act) or by DPaW were identified during the survey
- A flora likelihood of occurrence assessment concluded that seven taxa may possibly occur within the survey area and the remaining 54 taxa are unlikely or highly unlikely to occur within the survey area
- Six habitat types were recorded in the survey area and included Marri and Flooded Gum woodland, Peppermint woodland, Tall Melaleuca shrubland, Rehabilitated Areas, Vasse Drain and Highly Disturbed Areas
- 37 fauna species, consisting of 22 bird species, three reptiles, eight mammals, three amphibians and one mollusc were recorded within the survey area during the surveys
- Evidence of four species of conservation significance were recorded within the survey area during the survey. They included the Western Ringtail Possum (*Pseudocheirus occidentalis*), listed as Endangered under the EPBC Act and Critically Endangered under the WC Act, Carter's Freshwater Mussel (*Westralunio carteri*) listed as Vulnerable under the WC Act, the Quenda (*Isoodon obesulus* subsp. *fusciventer*), listed as Priority 4 by DPaW and the Osprey (*Pandion haliaetus*), listed under Schedule 5 under the WC Act
- There is 5.67 ha of core and supportive habitat within the survey area for the Western Ringtail Possum. The Peppermint woodland provides high value breeding habitat for the species. Although no dreys were identified within the survey area, a number were identified adjacent to the survey area.
- Approximately 38 individuals of the Vulnerable, WC Act listed Carters Mussel were recorded within one population identified in the south of survey area (9.6 ha) during the 2016 assessment
- An assessment on the likelihood of conservation significant fauna species occurring in the survey area was undertaken. Four conservation significant fauna species were identified as present within the survey area and 18 species are considered as likely to occur within the survey area.
- The Baudin's Cockatoo (listed as Vulnerable under the EPBC Act and Endangered under the WC Act), the Forest Red-tailed Black-Cockatoo (listed as Vulnerable under the EPBC Act and WC Act) and the Carnaby's Black Cockatoo (listed as Endangered under the EPBC Act and WC Act) may forage on the mixed woodlands and shrubs (5.67 ha) within the survey area. 2.41 ha of roosting habitat was recorded within the survey area in the form of Marri and Flooded Gum woodland. Additionally, there are 37 Marri and Flooded Gum trees within the survey area with a Diameter at Breast Height (DBH) of greater than 500 millimetres (mm) that are classified as 'potential breeding trees' for Black Cockatoos (DSEWPaC 2012). One tree contains one medium hollow and two trees contain three small hollows that could provide suitable breeding habitat in the future.

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1. Introduction

1.1 Background

The Water Corporation (the Corporation) proposes to upgrade the Vasse Diversion Drain (VDD) within the City of Busselton. The Corporation requires a biological survey to understand the key flora, vegetation and fauna values, specifically the presence of Black Cockatoos and Western Ringtail Possum habitat within the drain areas proposed for upgrading.

1.2 Purpose of this report

GHD Pty Ltd (GHD) was commissioned to undertake a level 1 flora and fauna survey of the survey area. The purpose of the survey was to define the flora, vegetation and fauna values within the survey area, in particular their spatial location and conservation significance. The outcomes of the assessment will be used in the environmental assessment and approvals process and will inform the need for and scope of further field investigations and/or more detailed environmental impact assessment.

1.3 Survey area

The VDD is located in the City of Busselton approximately 220 km from Perth on the shores of Geographe Bay. GHD completed a flora and fauna assessment of a 6.3 km section of the VDD from the ocean outfall point at Geographe Bay in the north to the Busselton Golf Course in the south in 2009. The survey area incorporates the area assessed in 2009, as well as an additional area not previously surveyed.

The survey area associated with this assessment is approximately 31.9 hectare (ha)) and is shown in Figure 1, Appendix A.

1.4 Scope of works

This flora and fauna assessment included both desktop and field assessments. The scope of works included:

- A review of the previous GHD (2010) report for the VDD
- A review of the Department of the Environment and Energy (DotEE) Protected Matters database to identify species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) potentially occurring within the survey area
- A review of the Department of Parks and Wildlife (DPaW) *NatureMap* database for flora and fauna species previously recorded within a 5 kilometre (km) buffer of the survey area
- A review of DPaW Threatened and Priority Ecological Communities and Flora databases. These databases will identify conservation significant communities or species (flora) present within the survey area and surrounds that are contained in DPaW records
- Consideration of previous vegetation mapping of the survey area (Smith 1973) and the pre-European extent remaining
- An assessment of aerial photography, geology/soils and hydrology information to provide background information on the variability of the environment and likely vegetation types
- Desktop identification of Environmentally Sensitive Areas, Bush Forever Sites, Environmental Protection Policy Areas and DPaW-managed conservation estates and reserves

- Desktop identification of Geomorphic wetlands and hydrological features
- A level 1 flora and vegetation survey to verify and refine the desktop information collated
- A level 1 fauna survey including targeted assessment for the three EPBC Act listed Black Cockatoo species and EPBC Act listed Western Ringtail Possum to verify and refine the desktop information collated
- Prepare a concise flora and vegetation and fauna survey report (this document)
- Prepare a letter report outlining recommendations and providing referral advice.

The field survey aimed to verify the outcomes of the desktop study and provide a detailed assessment of the existing environment in the survey area and its relationship to adjoining areas.

1.5 Relevant legislations, conservation codes and background information

In Western Australia significant communities, flora and fauna are protected under both Federal and State Government legislation. In addition regulatory authorities also provide a range of guidance and information on expected standards and protocols for environmental surveys.

An overview of key legislation and guidelines, conservation codes and background information relevant to this Project is provided in Appendix B

1.6 Limitations and assumptions

This report has been prepared by GHD for Water Corporation and may only be used and relied on by Water Corporation for the purpose agreed between GHD and Water Corporation as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Water Corporation arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Water Corporation and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of access tracks, services, third party operational works and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

This report has assessed the flora, vegetation and fauna within the survey area (Figure 1, Appendix A). Should the survey area change or be refined, further assessment may be required.

2. Methodology

2.1 Desktop assessment

Prior to the commencement of the field survey a desktop assessment was undertaken to identity relevant environmental information pertaining to the survey area and to assist in survey design. This included a review of:

- GHD 2010, Report for Vasse Diversion Drain Upgrade, Flora and Fauna Study, unpublished report for the Water Corporation
- The DotEE Protected Matters Search Tool (PMST) to identify communities and species listed under the EPBC Act potentially occurring within a 5 km buffer of the survey area (DotE 2016b) (Appendix C)
- The DPaW Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC) database to determine the potential for TECs or PECs to be present within 5 km of the survey area
- The DPaW's *NatureMap* database for flora and fauna species previously recorded within 10 km of the survey area (DPaW 2007–) (Appendix C)
- The DPaW Threatened and Priority Flora database (TPFL) and Western Australian Herbarium database (WAHERB) for Threatened and Priority flora species listed under *Wildlife Conservation Act 1950* (WC Act) and listed as priority by DPaW, previously recorded within a 5 km buffer of the survey area
- Existing datasets including: previous vegetation mapping of the survey area (e.g. Smith 1973), aerial photography, geology/soils and hydrology information to provide background information on the variability of the environment, likely vegetation units and fauna habitats and to identify areas with potential to contain TECs, PECs, and Threatened and Priority listed flora and fauna species.

2.2 Field survey

2.2.1 Vegetation and flora

GHD ecologist (Gaynor Owen, SL011312) conducted a single season vegetation and flora assessment of the survey area on 28 and 29 September 2016. The field survey was undertaken to verify the results of the desktop assessment, identify and describe the dominant vegetation units, assess vegetation condition and identify and record vascular flora taxa present at the time of survey. Additionally, opportunistic searching for conservation significant or other significant ecological communities and flora taxa was undertaken.

The survey methodology employed by GHD was undertaken with reference to the Environmental Protection Authority (EPA) *Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004a) and EPA and Department of Parks and Wildlife, *Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA and DPaW 2015).

Data collection

Field assessment methodology involved quadrats and opportunistic sampling. Quadrats were established in areas representative of a vegetation assemblage. Quadrats were 10 m x 10 m in size (area of 100 m^2), with shape and/or size adjusted as necessary. Field data at each quadrat was recorded on a pro-forma data sheet and included the parameters indicated in Table 1.

Eight non-permanent quadrats were described throughout the survey area.

Table 1 Data collected during the field survey

Aspect	Measurement
Collection attributes	Personnel/recorder; quadrat code, date, quadrat dimensions, photograph of the quadrat.
Physical features	Aspect/slope, landform/soil attributes. Ground surface cover. Leaf and wood litter.
Location of important features	Coordinates recorded in GDA94 datum using a hand-held Global Positioning System (GPS) tool to accuracy approximately ± 5 m.
Vegetation condition	Vegetation condition was assessed using the Vegetation Condition rating scale (EPA and DPaW 2015)
Disturbance	Level and nature of disturbances (e.g. weed presence, fire — and time since last fire, impacts from grazing, exploration activities).
Flora	List of dominant flora from each structural layer. List of all species within the quadrat including average height and cover (using a modified Braun-Blanquet scale)

A flora inventory was compiled from taxa listed in described quadrats and from opportunistic floristic records throughout the survey area.

Vegetation units

Vegetation units were identified and boundaries delineated using a combination of aerial photography, topographical features and field data/observations.

Vegetation units were described based on structure, dominant taxa and cover characteristics as defined by quadrat data and field observations. No floristic analysis was undertaken to assist in the classification of vegetation units. Vegetation units were compared to known TECs and PECs by inference only, no floristic/statistical analysis was undertaken.

Vegetation unit descriptions follow the National Vegetation Information System (NVIS) and are consistent with NVIS Level V (association), and are grouped within NVIS Level III (broad floristic formation). At Level V up to three taxa per stratum are used to describe the association (Executive Steering Committee for Australian Vegetation Information (ESCAVI) 2003).

Vegetation mapping has been undertaken at a scale of 1:6,000; this is considered a suitable scale for this project.

Vegetation condition

The vegetation condition of the survey area was assessed and mapped in accordance with the vegetation condition rating scale published by EPA and DPaW 2015. The scale recognises the intactness of vegetation, level of disturbance and weeds and the inherent ability of the remnant to be returned to a natural state without intensive intervention and consists of six rating levels as outlined in Appendix B

Flora identification and nomenclature

Species that were well known to the survey ecologist were identified in the field, while species that could not be identified in the field were collected and assigned a unique number to facilitate

tracking. Plant species were identified by the use of local and regional flora keys and by comparison with the named species held at the Western Australian Herbarium (WA Herbarium).

The conservation status of all recorded flora was compared against the current lists available on *FloraBase* (WA Herbarium 1998–) and the EPBC Act Threatened species database provided by DotE (2016a).

Nomenclature used in this report follows that used by the WA Herbarium as reported on *FloraBase* (WA Herbarium 1998–).

2.2.2 Fauna

The fauna field assessment was undertaken concurrently with the vegetation and flora assessment on 28 and 29 September 2016. The field survey was undertaken to identify fauna habitat types, assess habitat value and connectivity, identify and record fauna taxa present at the time of survey, and identify fauna habitats for conservation significant species.

The survey methodology employed by GHD was undertaken with reference to the EPA *Guidance Statement No. 56 Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004b) and *Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2010).

Habitat assessment

A fauna habitat assessment was undertaken to document the type, condition and extent of habitats within the survey area, this included:

- Habitat structure (e.g. vegetation type, presence/absence of overstorey, midstorey, understorey and ground cover)
- Presence/absence of refuge including: fallen timber (coarse woody debris), hollow bearing trees and stags and rocks/boulder piles, and the type and extent of each refuge
- Presence/absence of waterways including type, extent and habitat quality within waterways
- Identification of wildlife corridors within and immediately adjacent to the survey area
- A photograph of the habitat type.

Opportunistic fauna searches

The fauna survey was an opportunistic survey and did not involve any fauna trapping. The survey involved visual and aural surveys for any fauna species utilising the survey area. The survey area was also searched for any fauna signs, such as tracks, scats, bones, diggings and feeding signs.

Surveys also included systematic searching across all habitat types, which is an effective method of surveying for many wildlife species. This involved searching through microhabitats where wildlife is known to frequent, including turning over logs or rocks, turning over leaf litter and examining hollow logs.

Targeted survey for Black Cockatoo

In addition to the targeted searches for conservation significant fauna species, a targeted habitat assessment for the Carnaby's Black Cockatoo, Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo was undertaken. The aim of the habitat assessment was to assess the presence, quality and extent of habitat for Black Cockatoos within the survey area. The assessment involved visual and aural assessment of the survey area identifying breeding habitat (presence/absence of actual and potential breeding trees), foraging habitat, roosting

areas, current activity and any other signs of use by Black Cockatoos. For the purpose of this assessment, the DSEWPaC (2012) Black Cockatoo referral guidelines were used to define breeding, foraging and night roosting habitat.

Information collected during the field survey included:

- Foraging habitat – the location and extent of suitable Black Cockatoo foraging habitat was identified for the survey area, based on the vegetation associations and presence/absence of known foraging species. During the field surveys any direct or indirect evidence of foraging by Black Cockatoos was recorded via GPS
- Breeding habitat – suitable breeding habitat for Black Cockatoo is defined by DSEWPaC (2012) as trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, suitable DBH is 500 millimetres (mm). Breeding habitat was identified and recorded via GPS, and mapped according to the presence of suitable breeding trees (including the presence and size of tree hollows). On average, Black Cockatoos are known to nest in hollows with an entrance diameter greater than 20-30 centimetres (cm) (Johnstone and Storr 1998; Groom 2011). Therefore, during the field survey a suitable nesting hollow currently able to support breeding was defined as a tree hollow with an entrance diameter greater than 20 cm. All trees with hollows with an entrance diameter less than 20 cm were also recorded
- Night roosting habitat – suitable roosting habitat is defined by DSEWPaC (2012). Suitable roosting habitat was identified based on the presence of suitable tall trees, proximity of known roosting sites and the presence of suitable foraging habitat
- Opportunistic observations (both visual and aural) of Black Cockatoos within the survey area and surrounding region.

This information was used to map and calculate the amount of foraging habitat, potential breeding habitat and night roosting sites within the survey area. Any area containing known foraging species or potential nesting trees was considered as habitat for Black Cockatoos. It is important to note that the accuracy of the GPS used to record breeding habitat is approximately ± 5 m, and therefore location data for individual trees includes up to ± 5 m error.

Fauna nomenclature

Nomenclature used in this report follows that used by the Western Australian Museum and the DPaW NatureMap database with the exception of birds where Christidis and Boles (2008) was used.

2.3 Desktop and survey limitations

2.3.1 Desktop limitations

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, this does not represent actual records of the species within the area. The records from the DPaW searches of threatened flora and fauna provide more accurate information for the general area. However, some records of collections, sightings or trappings can be dated and often misrepresent the current range of threatened species.

New Wildlife Conservation (Rare Flora) and Wildlife Conservation (Specially Protected Fauna) Notices were gazetted on 3 November 2015. The format of these Notices has been changed to align with the EPBC Act threatened species lists. To date information contained in publically available databases such as *NatureMap* does not reflect these newly gazetted Notices. This report has been updated to reflect the conservation status of flora and fauna listed in these

Notices. However, the outputs of database searches contained in this report such as *NatureMap*, does not reflect the conservation status of flora and fauna listed in these Notices.

2.3.2 Field survey limitations

Guidance Statement No. 51 and No. 56 (EPA 2004a, 2004b) states that flora and fauna survey reports for environmental impact assessment in Western Australia should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 2.

Table 2 Survey limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information.	Minor	Adequate information is available for the survey area, this includes: • Broad scale (1:250,000) mapping by Smith (1973) and digitised by Shepherd et al. (2002)
Scope (what life forms were sampled etc.)	Nil	Vascular flora species were sampled during the survey. Non-vascular flora, invertebrates and aquatic fauna were not sampled as part of the survey.
Proportion of flora collected and identified (based on sampling, timing and intensity) Proportion of fauna identified, recorded and/or collected	Minor	The vegetation and flora survey was a single season survey only and was undertaken in late September. This is generally considered as a suitable time for surveying in the Swan Coastal Plain region as it falls within the peak flowering period. The flora recorded from the field survey is detailed in Section 4.2 and a full flora species list provided in Appendix D. The portion of flora collected and identified is considered high. The fauna survey was a habitat assessment and recording of opportunistic sightings only. The fauna assessment only sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings etc. This survey was conducted over two days only and sightings of fauna species were limited. Many cryptic and nocturnal species would not have been identified during the survey and seasonal variation within species often requires multiple targeted surveys at a particular time of the year. No sampling for invertebrates or aquatic species occurred. The information available on the identification, distribution and conservation status of invertebrates is generally less extensive than that of vertebrate species.
Flora determination	Minor	Flora determination was undertaken by the GHD ecologist in the field and at the Western Australian Herbarium. Of the 94 flora species, one flora collection could be identified to family only, two flora collections could be identified to genus only and three were tentative identifications ('?') only due to lack of flowering and fruiting material required for identification. The taxonomy and conservation status of the Western Australian flora is dynamic. This report was prepared with reliance on taxonomy and conservation current at the time issuing, but it should be noted this may change.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	Most of the survey area was surveyed during the field survey. A small section of private property in the north of the survey area was not accessed during the assessment. The survey was only conducted in a single season only.
Mapping reliability	Nil	The vegetation was mapped using high resolution ESRI aerial imagery, topographical features and

Aspect	Constraint	Comment
		field data. Data was recorded in the field using a hand-held GPS tool. Certain atmospheric factors and other sources of error can affect the accuracy of such GPS receivers. On average, the GPS units used during this field survey (Garmin GPS, Trimble Nomad or Trimble Juno units) have an accuracy to approximately ± 5 metre (m). Therefore the data points consisting of coordinates recorded from the GPS may contain small inaccuracies.
Timing/weather/ season/cycle	Minor	In the three months prior to the spring survey (June-August), Busselton weather recording station (No. 09515, BoM 2016) recorded a total of 380.1 mm of rainfall. This total is approximately 15% lower than the long term average for the same period (June-August; 445.5 mm) (BoM 2016). The weather conditions recorded during the field survey included (BoM 2016): • Daily maximum temperature ranged from 17.8 °C to 18.8 °C • Daily minimum temperature ranged from 8.8 °C to 9.5 °C • Daily rainfall ranged from 6.6 mm to 0.2 mm The weather conditions recorded during the survey period were considered unlikely to have impacted upon the vegetation and flora survey. The survey timings were considered appropriate for the flora and fauna field survey.
Disturbances (e.g. fire, flood, accidental human intervention)	Major	No major recent disturbances were recorded during the assessment.
Intensity (in retrospect, was the intensity adequate)	Nil	The vascular flora of the survey area was sampled in accordance with EPA (2004a) and terrestrial fauna sampled in accordance with EPA (2004b). The survey area was sufficiently covered by a GHD ecologist during the survey with transects walked along vegetated sections of the survey area.
Resources	Nil	A total of two person days were spent undertaking the vegetation and flora survey and habitat assessment.
Access restrictions	Minor	Most of the survey area was surveyed during the field survey. A small section of private property in the north of the survey area was not accessed during the assessment.
Experience levels	Nil	The survey ecologist is suitably qualified and experienced, having over 11 years' experience working as an ecologist in Western Australia, including in the south west region.

3. Desktop assessment

3.1 Regional biogeography

The survey area is located within the Perth subregion of the Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) bioregion of Western Australia. The Swan Coastal Plain IBRA region is classified as warm Mediterranean climate with rainfall ranges between 1000 and 600 mm annually. It includes urban development and is dominated by woodlands of *Banksia* and tuart on sandy soils, sheoak on outwash plains, and paperbark in swampy areas (Mitchell et al. 2002).

The Perth subregion is composed of colluvial and Aeolian sands, alluvial river flats, coastal limestone. Heath and/or Tuart woodlands occur on limestone, *Banksia* and Jarrah- *Banksia* woodlands on Quaternary marine dunes of various ages, and Marri on colluvial and alluvials. Iincludes a complex series of seasonal wetlands and also includes Rottnest, Carnac and GardeIslands. Rainfall ranges between 600 and 1000 mm annually and the climate is Mediterranean. The subregional area is 1,333,901 ha (Mitchell et al. 2002).

3.2 Hydrology

The survey area is a constructed watercourse, which runs into the ocean. A summary of the Department of Water (DoW) Geographic Data Atlas queries for the survey area is provided in Table 3 (DoW 2016).

Table 3 Department of Water geographic atlas queries for the survey area

Aspect	Details	Result
Groundwater areas	Groundwater areas proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act).	Busselton-Capel Groundwater Area
Surface water areas	Surface water areas proclaimed under the RIWI Act.	None present
Irrigation district	Irrigation Districts proclaimed under the RIWI Act.	None present
Rivers	Rivers proclaimed under the RIWI Act.	None present
Public Drinking Water Source Areas (PDWSA)	PDWSAs is a collective term used for the description of Water Reserves, Catchment Areas and Underground Pollution Control Areas declared (gazetted) under the provisions of the *Metropolitan Water Supply, Sewage and Drainage Act 1909* or the *Country Area Water Supply Act 1947*.	None present
Waterway Management Areas	Areas proclaimed under the *Waterway Conservation Act 1976*.	None present

3.3 Land use

There are five conservation areas (DPaW managed lands) within 5 km of the survey area which are listed below in Table 4.

Table 4 Conservation reserves within 5 km of the survey area

Name	Class	Location
Broadwater Nature Reserve	C	3.2 km to the west of the survey area
Unnamed Nature Reserve	C	1.6 km to the west of the survey area
Unnamed Nature Reserve	C	Adjacent to the most northern point of the survey area
Unnamed Nature Reserve	C	3.5 km north east of the survey area
Sabina Nature Reserve	A	4.5 km to the north east of the survey area

3.4 Wetlands

Seven Geomorphic Wetlands occur within the survey area (Table 5). Two Conservation Category Wetlands occur within a small section of the survey area, located between Bussell Highway and Busselton Bypass.

Approximately one quarter of the survey area is classified as Palusplain Multiple Use wetland.

Table 5 Geomorphic Wetlands within the survey area

UFI	Wetland Category	Wetland Type	Area within survey area (ha)
223	Conservation	Estuary-Peripheral	0.45
15809	Multiple Use	Palusplain	7.16
13995	Multiple Use	Estuary-Waterbody	0.31
222	Multiple Use	Estuary-Peripheral	0.22
260	Multiple Use	Dampland	0.045
224	Multiple Use	Estuary-Peripheral	0.07
13198	Conservation	Estuary-Waterbody	0.39

3.1 Environmentally sensitive areas

A search of the Governetment of Western Australia's map viewer identified a large Environmentally Sensitive Areas within the survey area (GoWA) 2016). This ESA is likely to be associated with the Conservation Category wetland UFI 223 and UFI 13198.

3.2 Vegetation and flora

3.2.1 Broad vegetation associations and extent

Broad scale (1:250,000) pre-European vegetation mapping of the region was completed by Smith (1973) at an association level. The mapping indicates that three vegetation associations are present within the survey area:

- Vegetation association 1000- Mosaic: Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree (*Melaleuca* spp.)
- Vegetation association 27: Low woodland; paperbark (*Melaleuca* sp.)
- Vegetation association 949: Low woodland; *banksia*

The pre-European mapping has been adapted and digitised by Shepherd et al. (2002). The extent of the vegetation associations has been determined by the state-wide vegetation remaining extent calculations maintained by the DPaW (Current as of October 2016 – Government of Western Australia (GoWA) 2016). As shown in Table 6, the current extents remaining of vegetation association 1000 are less than the 30%[1] threshold level at both the State and Local Government Area (LGA) level. The remaining extent of Vegetation association 27 is below the 30% threshold at the IBRA bioregion level and LGA level. Vegetation association 949 is below the 30% threshold level at the LGA level only.

Table 6 Extents of vegetation associations mapped within the survey area (Smith 1973 and GoWA 2016)

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DPaW managed lands
Swan Coastal Plain bioregion		1,501,221.93	578,432.17	38.58	37.85
Association 1000	State: WA	99,835.86	26,570.66	26.61	18.61
	IBRA bioregion: Swan Coastal Plain	94,175.31	23,669.68	25.13	19.88
	LGA: Shire of Busselton	12,034.21	4,245.32	35.28	19.40
Association 27	State: WA	130,384.77	92,795.70	71.17	83.14
	IBRA bioregion: Swan Coastal Plain	5,836.25	1,750.12	29.99	41.31
	LGA: Shire of Busselton	2,740.16	313.98	11.46	32.47
Association 949	State: WA	218,193.94	123,038.57	56.39	55.80
	IBRA bioregion: Swan Coastal Plain	209,983.26	120,178.91	57.23	56.43
	LGA: Shire of Busselton	2,688.98	417.58	15.53	0.05

3.2.2 Conservation significant ecological communities

One TEC and two PECs and/or their buffers occur within the survey area. The EPBC Act listed Vulnerable TEC, Subtropical and Temperate Coastal Saltmarsh, occurs in the middle of the survey area and is associated with the wetland, Vasse and Wonnerup estuaries. Two DPaW listed Priority 1 PECs and/or their buffers occur within the survey area and include:

[1] The 30 per cent threshold level is the level below which species loss appears to accelerate exponentially at an ecosystem level (EPA 2000).

- *Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton)
- *Eucalyptus cornuta, Agonis flexuosa* and *Eucalyptus decipiens* forest on deep yellow-brown siliceous sands over limestone.

3.2.3 Flora diversity

A search of the *Naturemap* database identified 934 plant taxa, representing 102 families, which have previously been recorded within 5 km of the survey area. This total comprised 782 native taxa and 152 naturalised (non-native) flora taxa. Dominant families included Fabaceae (110 species), Proteaceae (70 species) and Myrtaceae (68 species).

3.2.4 Conservation significant flora

Desktop searches of the EPBC Act PMST database and the *NatureMap* database identified the presence/potential presence of 61 conservation significant flora taxa within 5 km of the survey area.

The desktop searches for a 5 km buffer of the survey area recorded the following:

- 24 threatened taxa (EPBC Act – Critically Endangered, Endangered, Vulnerable and WC Act – Threatened)
- Three Priority 1 taxa
- Seven Priority 2 taxa
- 16 Priority 3 taxa
- 11 Priority 4 taxa.

3.3 Fauna

3.3.1 Fauna diversity

A search of the *Naturemap* database identified 690 fauna species that have been previously recorded within 5 km of the survey area of which 680 species are native and 10 are introduced species. This total included 209 birds, 28 mammals, 25 reptiles and four amphibians. The remainder are invertebrates or misnamed species.

3.3.2 Conservation significant fauna

Desktop searches of the EPBC Act PMST database and the *Naturemap* database identified the presence/potential presence of 52 conservation significant fauna species within 5 km of the survey area, including survey area the following:

- 14 threatened taxa (EPBC Act – Critically Endangered, Endangered, Vulnerable and WC Act listed species)
- Two species listed as Vulnerable under the WC Act
- One species as Migratory under the EPBC Act and Vulnerable under the WC Act
- Two Priority 1 taxa
- Two Priority 2 taxa
- Three Priority 3 taxa
- Nine Priority 4 taxa.

- Thirteen species listed as Migratory under the EPBC Act and Schedule under the WC Act
- Six Schedule listed species under the WC Act.

This included a number of species listed as Marine under the EPBC Act that are considered to utilise marine and coastal environments only and therefore have been excluded from the desktop results. Therefore, only 11 species are considered as part of this assessment.

3.4 Review of previous survey report (GHD 2010)

The key survey results from the previous VDD flora and fauna survey (GHD 2010) included:

- Plant species diversity within the study area is considered to represent a low degree of diversity, with a total of 77 taxa from 29 families recorded
- No Declared Rare Flora or Priority Flora species were recorded from the study area during the field survey
- Five vegetation types were identified within the study area
- The vegetation ranged between *Very Good* (3) to *Completely Degraded* (6)
- A total of 39 bird, seven mammals, 11 reptile, five amphibian, two fish and one crustacean species were recorded during the reconnaissance survey within the study area
- Two significant fauna species were identified along the alignment. These species were the Western Ringtail Possum and the Quenda (Southern Brown Bandicoot).

4. Field survey results

4.1 Vegetation

4.1.1 Vegetation type

Three broad floristic formations containing six vegetation types (not including rehabilitated areas, the drain and highly disturbed areas) were identified and described from the survey area (Table 7 and Figure 3, Appendix A). The survey area consists of remnant vegetation in varying condition, historically and recently cleared areas, and existing infrastructure such as roads and tracks.

Native vegetation was located throughout the survey area in the form of *Eucalyptus* woodland on plains and damplands in the south of survey area, *Melaleuca* shrublands in the middle of the survey area, associated with the wetland and *Agonis flexuosa* tall shrublands to woodlands on dunes in the north of the survey area. The survey area in the south was dominated by *Eucalyptus* woodland, while the north of the survey area was dominated *Agonis flexuosa* shrublands and woodlands.

4.1.2 Conservation significant ecological communities

No TECs were recorded within the survey area during the time of the assessment. Two vegetation types recorded during the assessment however align with the DPaW Priority 1 listed PEC, *Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton). Vegetation types Marri and Flooded Gum woodland (VT1) and Peppermint woodland (VT2) (total of 2.88 ha) align with this PEC as the dominant overstorey are composed of the same species.

Table 7 Vegetation types present within survey area

Vegetation association	Description	Landform, sample locations and extent (ha)	Notes	Representative photograph
Marri and Flooded Gum woodland (VT1)	*Eucalyptus rudis, Corymbia calophylla* and *Agonis flexuosa* open woodland over *Melaleuca rhaphiophylla* tall shrubland over **Avena fatua* tussock grassland over **Watsonia meriana* and **Oxalis pes-caprae* herbland	Plain, damp areas Q1 2.41 ha	Aligns with the DPaW Priority 1 listed PEC, *Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton)	
Peppermint woodland (VT2)	*Agonis flexuosa* woodland with scattered *Corymbia calophylla* trees over *Acacia saligna* and *Melaleuca rhaphiophylla* mid to tall shrubland over **Ehrharta longifolia* tussock grassland over **Zantedeschia aethiopica*, **Watsonia meriana* and **Oxalis pes-caprae* open herbland	Plain Q2, Q3 0.47 ha	Aligns with the DPaW Priority 1 listed PEC, *Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton)	
Acacia and Peppermint shrubland (VT3 and VT4)	*Agonis flexuosa, Acacia saligna* and *Jacksonia furcellata* tall shrubland over Poaceae sp. tussock grassland over *Conostylis aculeata* subsp. *aculeata* open sedgeland over **Pelargonium capitatum*, **Romulea rosea* and **Watsonia meriana* open herbland	Plain Q4 1.22 ha		

Vegetation association	Description	Landform, sample locations and extent (ha)	Notes	Representative photograph
Tall *Melaleuca* shrubland (VT5)	*Melaleuca cuticularis, M. lanceolata and M. rhaphiophylla* tall open shrubland over *Lepidosperma carphoides* and *Gahnia trifida* sedgeland	Dune Q8 0.74 ha	Aligns with Smith (1973) vegetation association 27	
Peppermint woodland over sedgeland (VT6)	*Agonis flexuosa* woodland over *Acacia littorea, Olearia axillaris* and *Spyridium globulosum* tall open shrubland over *Spinifex longifolius* and **Bromus diandrus* tussock grassland over *Lepidosperma effusum* sedgeland over *Acanthocarpus preissii* and **Fumaria capreolata* herbland	Dune Q6, Q7 1.57 ha		
Rehabilitated areas (RA)	Consists of areas rehabilitated with local and regional native species	0.04 ha		

Vegetation association	Description	Landform, sample locations and extent (ha)	Notes	Representative photograph
Vasse Drain		9.60 ha		
Highly disturbed	Areas that have been cleared and include infrastructure, roads and tracks	Throughout survey area 15.83 ha		

4.1.3 Vegetation condition

The vegetation condition throughout the survey area was rated as Very Good to Completely Degraded. The majority of vegetation within the survey area was rated as Degraded to Completely Degraded in condition, with little to no understorey remaining. Approximately 0.71 ha of the vegetation within the survey area was Very Good to Good in condition. In these areas the vegetation structure was significantly altered by obvious signs of disturbance, largely weeds and clearing, however retained basic vegetation structure.

Disturbances throughout the survey area included the presence of weeds at varying densities, historical clearing and vehicle tracks.

The extents of the vegetation condition ratings mapped within the survey area are detailed in Table 8 with the vegetation condition of the survey area mapped in Appendix A - Figure 4.

Table 8 Extent of vegetation condition ratings within the survey area

Condition rating	Extent (ha)
Very Good	0.05
Very Good to Good	0.66
Good to Degraded	0.53
Degraded	0.80
Degraded to Completely Degraded	1.25
Completely Degraded	19.00
Watercourse	9.60
Total	**31.89**

4.1.4 Other significant vegetation

During the field survey the vegetation was assessed to determine whether any vegetation occurs within the survey area that may be considered as significant due to reasons defined by the EPA (2004a).

Three vegetation associations recorded within the survey area were below the 30 % threshold of their pre-European extent remaining. These vegetation associations are considered significant vegetation, as defined by the EPA (2004a). They include:

- Vegetation association 1000: Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree (*Melaleuca* spp.), is below the 30 % threshold at the State and LGA level
- Vegetation association 27: Low woodland; paperbark (*Melaleuca* sp.), is below the 30 % threshold at the IBRA bioregion level and LGA level
- Vegetation association 949: Low woodland; *banksia,* is below the 30 % threshold at the LGA level only.

Vegetation association, Tall *Melaleuca* shrubland (0.74 ha) located within the Geomorphic Wetlands UFI 222, UFI 223, UFI 224, UFI 13198 and UFI 13995 in the survey area is considered riparian vegetation and significant, as it is restricted to these areas within the landscape. The Marri and Flooded Gum woodland (2.41 ha) comprises species that require a seasonally high water table. A small section of this vegetation association occurs within the Multiple Use Geomorphic Wetland UFI 15809, however

during the survey, no water was observed within this area and the vegetation in this area was in Degraded to Completely Degraded condition.

4.2 Flora

4.2.1 Flora diversity

Seventy-three flora taxa (including subspecies and varieties) representing 32 families and 62 genera were recorded from the survey area during the 2016 field survey. This total comprised 35 native taxa and 38 introduced flora taxa.

Dominant families recorded from the survey area included:

- Poaceae (12 taxa)
- Fabaceae (10 taxa)
- Myrtaceae (7 taxa)
- Asteraceae (5 taxa).

4.2.2 Conservation significant flora

No EPBC Act, WC Act or DPaW priority flora were recorded during the 2016 assessment of the survey area.

Likelihood of occurrence

A likelihood of occurrence assessment was conducted post-field survey for all conservation significant flora taxa identified in the desktop assessment (Appendix D). This assessment took into account previous records, habitat requirements, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of species.

The likelihood of occurrence assessment post-field survey concluded that seven taxa may possibly occur and the remaining 54 taxa are unlikely or highly unlikely to occur within the survey area. The taxa that may possibly within the survey area are presented in Table 9.

Table 9 Flora species possibly occurring within the survey area

Taxon	Status		Likelihood of occurrence
	EPBC Act	WC Act /DPaW	
Calystegia sepium subsp. *roseata*		P2	Possible
Johnsonia inconspicua		P3	Possible
Lepidium pseudotasmanicum		P4	Possible
Ornduffia submersa		P4	Possible
Schoenus benthamii		P3	Possible
Tetraria australiensis	Vu	T	Possible
Thysanotus glaucus		P4	Possible

4.2.3 Other significant flora

No other significant vegetation as defined by the EPA (2004a) was identified within the survey area during the field survey.

4.2.4 Introduced flora

Thirty-seven introduced flora taxa were recorded within the survey area. One weed species, **Zantedeschia aethiopica* (Arum Lily) (Plate 1) listed under the BAM Act was recorded throughout the southern section of the survey area. Locations of this species are presented in Appendix D. No weeds of national environmental significance were recorded within the survey area.

Plate 1 Arum Lily in the southern section of the survey area

4.3 Fauna

4.3.1 Fauna habitats

Six habitat types were recorded in the survey area. These habitat types are closely aligned with the different vegetation types described in section 4.1. The habitat types are described in Table 10 and mapped in Figure 5, Appendix A.

Overall, while large sections of the survey area have previously been disturbed, where native vegetation remains it retains some structure and provides habitat for fauna. Anthropogenic disturbances include past clearing for infrastructure (roads, tracks and building), other agricultural practices and weed encroachment.

Table 10 Fauna habitat types

Habitat	Comment
Marri and Flooded Gum woodland (VT1) – 2.41 ha	Eucalypt woodlands are the dominant habitat type in the southern section of the survey area and are comprised largely of two species; Marri and Flooded Gum. The woodlands structural diversity generally consisted of a woodland, which was very open in sections, with a sparse understorey of native species. Typically, the leaf litter occurs around trees. Most of the ground cover was dense with weeds. Throughout this woodland there are also micro habitat features such as tree hollows which provide important habitat for birds such as Galahs and Parrots. Large, medium and small hollows were found throughout the woodland. There is extensive disturbances in this habitat type consisting of previous clearing and weed invasion with little to no remaining understorey. These woodlands provide foraging and refuge for birds, however limited habitat for reptiles and ground dwelling mammals as there is little understorey remaining. Black Cockatoos may forage within this habitat. This habitat type is well-represented in the local area and region.

Habitat	Comment
Peppermint woodland (VT2, VT3, VT4, VT6) – 3.26 ha	Peppermint woodlands are the dominant habitat type in the northern section of the survey area, with small sections located in the southern section. The woodlands structural diversity generally consisted of a woodland over a mid storey of shrubs over an understorey of shrubs and sedges. Typically, the leaf litter occurs around the trees, shrubs and sedges. This woodland provides microhabitat for the Western Ringtail Possum, with numerous dreys recorded in the canopy of the woodland. Sections of the woodland have been severely disturbed, in the form of clearing and weed incursion, with little to no remaining understorey. The habitat in the north of the survey area had a dense understorey of shrubs and sedges, which would provide foraging and refuge for reptiles and ground dwelling mammals as the thick understorey remaining. Black Cockatoos may forage within this habitat. Peppermint woodland forms a large proportion of habitat within the survey area and overall, the trees, shrubs and sedges provide mid to high value habitat for fauna. This habitat type is well-represented in the local area and region.
Tall Melaleuca shrubland (VT5) – 0.74 ha	Small sections of the tall Melaleuca shrubland are located in the middle section of the survey area, associated with the wetland. The shrublands structural diversity generally consisted of a tall shrub layer over a dense sedgeland. Minimal disturbance was recorded within this habitat, with weed incursion occurring on the edges. The tall shrubland habitat would provide foraging and refuge for bird species, while the dense sedgeland would provide foraging and refuge for reptiles and ground dwelling mammals. This habitat type is well-represented in the local area and region.
Rehabilitated Areas – 0.04 ha	A small section of rehabilitated areas are present in the north of the survey area. The floristic and structural diversity of this habitat is low, with little to no remaining over storey and mid storey. Typically, the leaf litter is sparse around the shrubs, and the ground cover relatively negligible/sparse. Generally, the shrubs and sedges were young in age and micro-habitat features, such as tree hollows, cavities and hollow logs were not evident. Rehabilitated areas form a small proportion of habitat within the survey area and overall, the shrubs and sedges provide low value habitat for fauna.
Vasse Drain – Water body – 9.6 ha	The drain runs throughout the middle section of the survey area. The edges of the drain were vegetated mostly with weeds, however in the north west, native vegetation remains with Peppermint and sedges on the banks of the drain. The drain provides habitat for fish, molluscs amphibians and birds within the survey area. The drain forms a large proportion of habitat within the survey area and overall provide mid to high value habitat for fauna.
Highly Disturbed Areas – 15.83 ha	Areas completely cleared of native vegetation, including infrastructure areas such as roads and tracks, as well as highly modified areas occur in sections of the survey area. These areas provide little to no value for fauna species, however in some areas the scattered trees or shrubs may provide cover for birds and reptiles, as well as foraging opportunities for small birds.

4.3.2 Regional linkages and habitat corridors

Several habitat corridors for fauna are located adjacent to the survey area. There is a corridor in the north of the survey area running in an east west direction, associated with the wetland. Bushland adjacent to the middle of the survey area also provide corridors for fauna in the local area. In the south of the survey area, a habitat corridor extends from the survey area further south along the drain. The remaining survey area is surrounded by paddocks and crops.

The drain creates a link between the ocean and fresh water and may be suitable and important for the survival for species that may migrate, such as the Pouched Lamprey.

4.3.3 Fauna diversity

The field survey recorded a total of 37 fauna species, consisting of 22 bird species, three reptiles, eight mammals, three amphibians and one mollusc. A list of the fauna species recorded during the field survey are provided in Appendix E.

4.3.4 Introduced fauna species

Seven introduced fauna species were identified within the survey area. These are listed below:

- Cat (*Felis catus*)
- Fox (*Vulpes vulpes*)
- Dog (*Canus domesticus*)
- European Rabbit (*Oryctolagus cuniculus*)
- Cow (*Bos taurus*)
- Feral Pigeon (*Columba livia*)
- Laughing Kookaburra (*Dacelo novaeguineae*)

4.3.5 Conservation significant fauna

During the survey, evidence of four species of conservation significance were recorded within the survey area. They included:

- Western Ringtail Possum (*Pseudocheirus occidentalis*) – listed as Endangered under the EPBC and Critically Endangered under the WC Act
- Carter's Freshwater Mussel (*Westralunio carteri*) – listed as Vulnerable under the WC Act
- Quenda (*Isoodon obesulus* subsp. *fusciventer*) – listed as Priority 4 by DPaW
- Osprey (*Pandion haliaetus*) – listed under Schedule 5 of the WC Act.

Western Ringtail Assessment

The Western Ringtail Possum was recorded within the survey area during the 2016 assessment. Dreys and scats were recorded throughout (and adjacent to) the survey area during the 2016 assessment (Plate 2) and sightings of this species were recorded during the 2009 assessment. Evidence of the Western Ringtail Possum from the 2016 assessment have been mapped in Figure 5. This mapping includes evidence both within and adjacent to the survey area.

A description of the extent of habitat for this species within the survey area is summarised below and mapped in Figure 5.

- Habitat – approximately 5.67 ha of core and supportive habitat (DEWHA 2009) for the Western Ringtail Possum occurs within the survey area, comprising of Peppermint woodlands and Marri and Flooded Gum woodland. The Peppermint woodland provides high value breeding and foraging habitat for the species. One Western Ringtail Possum scat was recorded within the survey area.
- Dreys – Although no dreys were identified within the survey area, a number were identified adjacent to the survey area (Plate 2).

Plate 2 Western Ringtail Possum drey adjacent to survey area

Carters Mussel Assessment

A population of Carters Mussel was recorded within the south of survey area during the 2016 assessment (Plate 3). Approximately 38 individual mussels were recorded in this area (Figure 5, Appendix A). This species can be 'found in freshwater streams, rivers, billabongs, ponds, wetlands and lakes inland from the coast' (Murdoch University and SERCUL 2016) and is likely to occur throughout the remainder of the drain (9.6 ha). Livestock and impacts from urban development may cause erosion of habitat for this species, while livestock have been known to crush shells (Murdoch University and SERCUL 2016). This species is also prone to decrease levels of oxygen within the water and increased levels of salinity.

Plate 3 Carters Mussel recorded within the Vasse Diversion Drain

Quenda

The Quenda was not observed directly within the survey area, however “runs”, Quenda tunnels, were observed during the 2010 assessment and dense vegetation associated with wetlands provides the ideal habitat for this species. Quenda inhabit scrubby, often swampy, vegetation with dense cover up to 1 m high and often feed in adjacent forest and woodland (Van Dyck and Strahan 2008). This species is widely distributed in the south west of Western Australia from Guilderton, north of Perth, to east of Esperance.

Osprey

An Osprey was observed perched on a *Melaleuca* within the survey area during the 2016 assessment. This species is a migratory wetland species and is not restricted to the survey area.

Likelihood of occurrence

An assessment on the likelihood of conservation significant species occurring in the survey area was undertaken. This assessment is based on species biology, habitat requirements, the quality and availability of suitable habitat, as determined during the field survey, and records of the species in the survey area and locality. Species specific searches of the DPaW *NatureMap* database with a buffer of 5 km were also conducted in order to gather information about the broader regional occurrence of species to further inform the likelihood of occurrence assessment.

The likelihood of occurrence assessment identified four species as present within the survey area, 18 species considered as likely to occur within the survey area, with the remaining species considered either unlikely or highly unlikely to occur. Table 11 summarises the species of conservation significance present and considered as likely to occur in the survey area. The parameters of assessment for this likelihood of occurrence assessment and the full likelihood of occurrence assessment are provided in Appendix E.

Table 11 Conservation significant fauna ‘likely’ to occur in the survey area

Species Name	EPBC Act Status	WA Status	Likelihood
Isoodon obesulus subsp. *fusciventer* (Quenda, Southern Brown Bandicoot)		P4	Present
Pandion haliaetus (Osprey)	MiW		Present
Pseudocheirus occidentalis (Western Ringtail Possum)	En	CR	Present
Westralunio carteri (Carter’s Freshwater Mussel)		Vu	Present
Actitis hypoleucos (Common Sandpiper)	MiW	IA	Likely
Ardea ibis (Cattle Egret)		IA	Likely
Ardea modesta (Eastern Great Egret)		IA	Likely
Calidris acuminata (Sharp-tailed Sandpiper)	MiW	IA	Likely
Calidris ferruginea (Curlew Sandpiper)	CR, MiW	Vu, IA	Likely
Calidris subminuta (Long-toed Stint)	MiW	IA	Likely
Calidris tenuirostris (Great Knot)	CR, MiW	Vu, IA	Likely
Calyptorhynchus banksii subsp. *naso* (Forest Red-tailed Black-Cockatoo)	Vu	Vu	Likely
Calyptorhynchus baudinii (Baudin's Cockatoo)	Vu	En	Likely

Species Name	EPBC Act Status	WA Status	Likelihood
Calyptorhynchus latirostris (Carnaby's Black Cockatoo)	En	En	Likely
Elapognathus minor (Short-nosed Snake)		P2	Likely
Falco peregrinus (Peregrine Falcon)		OS	Likely
Geotria australis (Pouched Lamprey)		P1	Likely
Hydromys chrysogaster (Water Rat)		P4	Likely
Nannatherina balstoni (Balston's Pygmy Perch)	Vu	Vu	Likely
Phascogale tapoatafa subsp. *wambenger* (Southern Brush-tailed Phascogale)		CD	Likely
Tringa nebularia (Common Greenshank)	MiW	IA	Likely
Tringa stagnatilis (Marsh Sandpiper)	MiW	IA	Likely

*Conservation codes are outlined in Appendix B.

Black Cockatoo Assessment

A likelihood of occurrence assessment determined that all three Black Cockatoo species were likely to occur within the survey area.

A description of the extent of habitat for these species within the survey area is summarised below and mapped in Figure 5

- Foraging – approximately 5.67 ha of suitable foraging habitat for Black Cockatoos within the survey area, comprising mixed woodlands and shrubs. Marri and Flooded Gum woodlands provide high value foraging habitat for the species. The Black Cockatoos may opportunistically forage within the survey area. No evidence of foraging was observed during the field survey.
- Potential Breeding – The habitat assessment identified 37 potential breeding trees with a suitable DBH throughout the survey area (≥500 mm DBH, DSEWPaC 2012). These trees occur within the Marri and Flooded Gum woodland habitat. One tree contained one medium hollow and two trees contain three small hollows that could provide suitable breeding habitat in the future.
- Roosting – No roosting sites were recorded during the field survey. 2.41 ha of roosting habitat was recorded within the survey area in the form of Marri and Flooded Gum woodland, which was located adjacent to the drain.

5. Conclusions

5.1 Key findings

The key findings of the flora and fauna assessment for the survey area include:

- Three broad floristic formations containing six vegetation types were identified from the survey area. Of this, approximately 0.71 ha of native vegetation was in Very Good to Good condition
- No TECs were recorded within the survey area during the assessment. However, two vegetation types (totalling 2.88 ha) align with the DPaW Priority 1 listed PEC, *Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton)
- The vegetation within the survey area is considered 'other significant vegetation' as it represents native vegetation/natural areas in a highly fragmented landscape and vegetation that is poorly reserved
- Vegetation association, Tall *Melaleuca* shrubland (0.74 ha) located within the survey area is considered riparian vegetation, and is restricted to these areas within the landscape and are considered as significant
- An assessment on the likelihood of conservation significant flora species occurring in the survey area determined that seven conservation significant flora species may possibly to occur within the survey area
- Evidence of four fauna species of conservation significance were recorded within the survey area including:
  - The Western Ringtail Possum – 5.67 ha of core and supportive habitat is present and one scat was recorded within the survey area. Although no dreys were identified within the survey area, a number were identified adjacent to the survey area
  - Carters Mussel – Approximately 38 individual mussels were recorded and 9.6 ha of habitat occurs within the survey area
  - The Quenda was not observed directly within the survey area, however Quenda tunnels were observed during the 2010 assessment
  - An Osprey was observed perched on a *Melaleuca* within the survey area during the 2016 assessment. This species is a migratory wetland species and is not restricted to the survey area
- An assessment on the likelihood of conservation significant fauna species occurring in the survey area determined that 18 conservation significant fauna species are considered likely to occur within the survey area
- A Black Cockatoo assessment identified 5.67 ha of suitable foraging habitat, 2.41 ha of roosting habitat and 37 potential breeding trees with suitable DBH within the survey area. Of the potential breeding trees, one tree contained one medium hollow and two trees contain three small hollows that could provide suitable breeding habitat in the future.

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Appendices

Appendix A – Figures

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6,271,000

Map Index

Paper Size A3

0 100 200 300 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

Weed Species

Asparagus asparagoides (Bridal Creeper)

Zantedeschia aethiopica (Arum Lily)

Study Area

Vegetation Condition (EPA and DPaW 2015)

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

GHD

WATER CORPORATION

SLIP POWERED BY LANDGATE

Water Corporation
Vasse Diversion Drain Upgrade

Vegetation Condition and Significant Weeds

Job Number	61-34862
Revision	0
Date	25 Oct 2016

Figure 4

G:\61\34862\GIS\Maps\MXD\61348862_004_Rev0_Fig4VegCond.mxd

Data source: GHD: Study Area - 20160922, Vegetation Condition, Weeds - 20161014; LGATE: Imagery (Virtual Mosaic) - 20160923 . Created by:afeeney

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LEGEND

- Major Road
- Study Area
- Waterbody

Paper Size A3

0 1 2 3

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

Water Corporation
Vasse Diversion Drain Upgrade

Job Number 61-34862
Revision 0
Date 25 Oct 2016

Study Area Location

Figure 1

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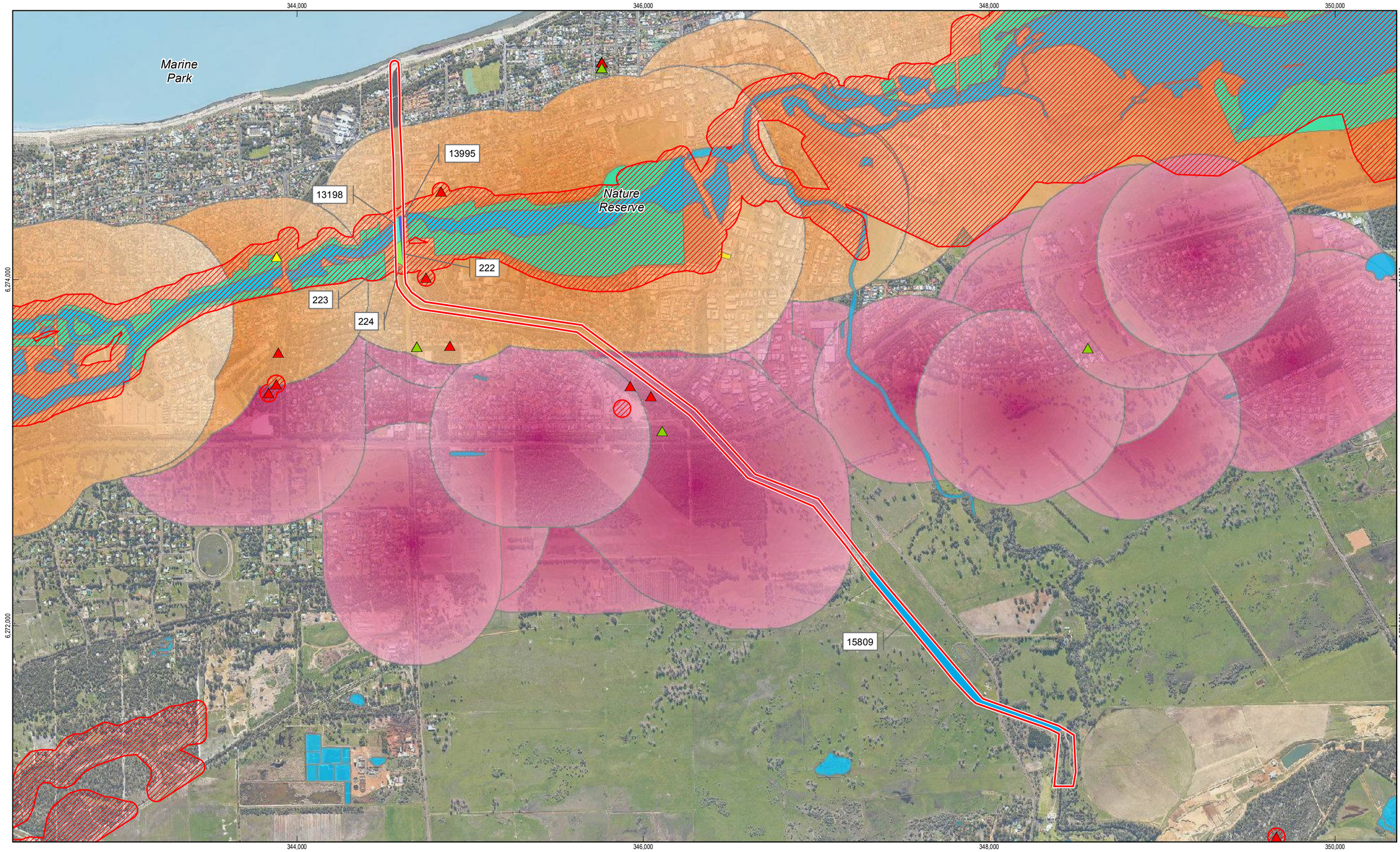
Data source: GHD: Study Area - 20160922; Landgate: Roads, Waterbody - 20160923; Imagery - Busselton 2013; GeoData Topo Series III. Created by:afeeney



Paper Size A3

0 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

Threatened (Declared Rare) & Priority Taxa

- Threatened Rare Flora - Extant Taxa
- Priority Flora - P1
- Priority Flora - P2
- Priority Flora - P3
- Priority Flora - Rare Taxa

- Study Area
- Environmentally Sensitive Area
- Waterbody
- Priority Ecological Community
- Threatened Ecological Community

DPaW Managed Lands

- CALM Exec Body Freehold
- Marine Park
- Nature Reserve

222 Geomorphic Wetland UFI

Water Corporation
Vasse Diversion Drain Upgrade

Job Number	61-34862
Revision	0
Date	25 Oct 2016

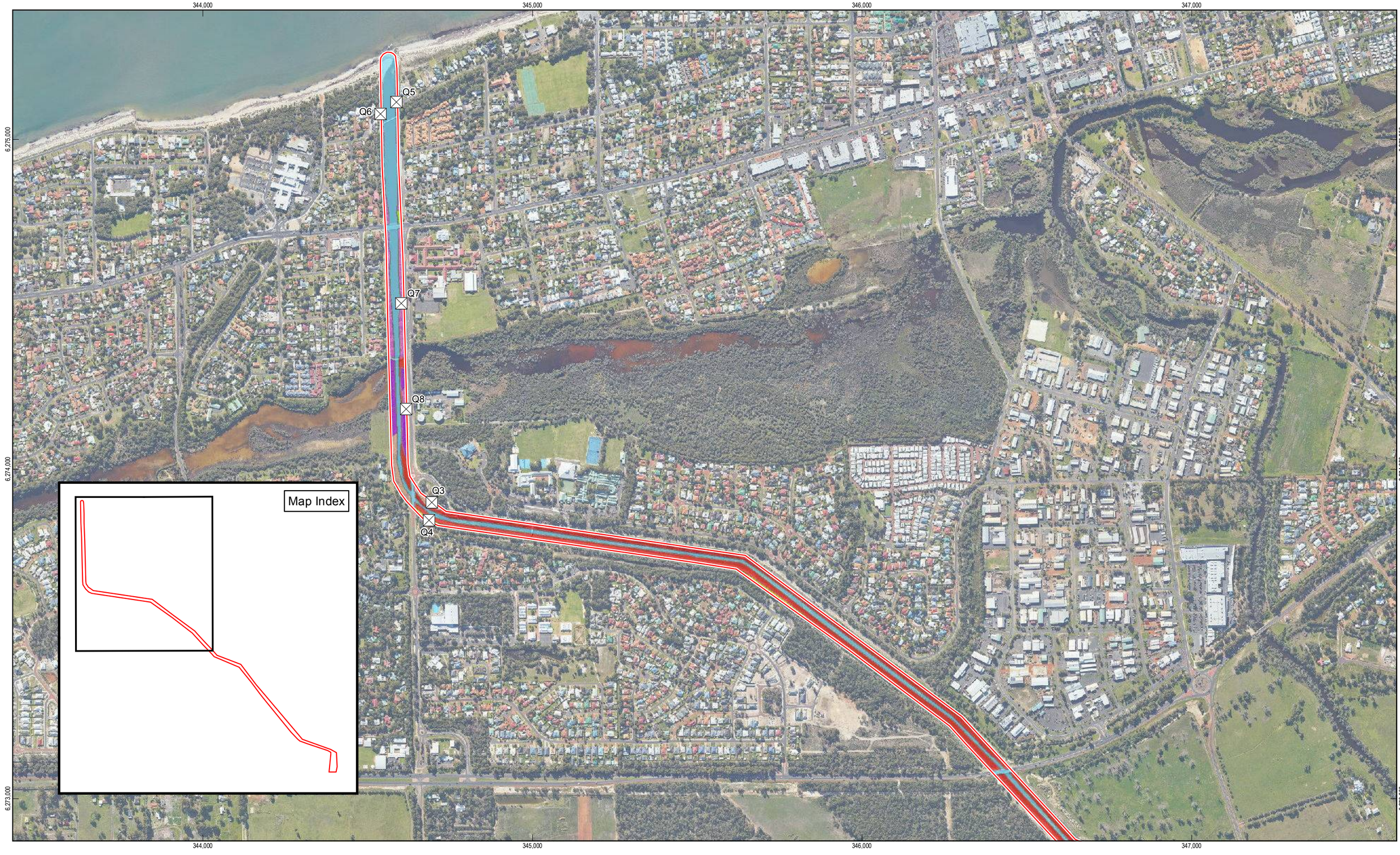
Biological Constraints

Figure 2

G:\61\34862\GIS\Maps\MXD\61134862_002_Rev0_Fig2BiologicalConstraints.mxd

Data source: GHD: Study Area - 20160922; DPAW: TECPEC - 20091208, TPFL - 20091209, WA Herb - 20091209, DPAW Managed Lands - 20160302, Geomorphic Wetlands - 20160114; LGATE: Waterbodies, Imagery (Virtual Mosaic) - 20160923; DER: Environmentally Sensitive Areas - 2013: . Created by:afeeney

999 Hay Street, Perth WA 6000 Australia **T** 61 8 6222 8555 **F** 61 8 6222 8555 **E** permail@ghd.com.au **W** www.ghd.com.au



Paper Size A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

- Quadrat
- Study Area

Vegetation Type

- Marri and Flooded Gum woodland
- Peppermint woodland
- *Acacia* and Peppermint shrubland
- Tall *Melaleuca* shrubland
- Peppermint woodland over sedgeland
- Rehabilitated Areas
- Highly Disturbed
- Watercourse

Water Corporation
Vasse Diversion Drain Upgrade

Job Number	61-34862
Revision	0
Date	14 Nov 2016

Vegetation Units, Sample Locations and Significant Flora Locations

Figure 3

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Data source: GHD: Study Area - 20160922, Quadrat Location, Vegetation Type - 20161014; LGATE: Roads, Imagery (Virtual Mosaic) - 20160923 . Created by:afeeney

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Q2

Map Index

Paper Size A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

- Quadrat
- Study Area

Vegetation Type

- Marri and Flooded Gum woodland
- Peppermint woodland
- *Acacia* and Peppermint shrubland
- Tall *Melaleuca* shrubland
- Peppermint woodland over sedgeland
- Rehabilitated Areas
- Highly Disturbed
- Watercourse

Water Corporation
Vasse Diversion Drain Upgrade

Job Number 61-34862
Revision 0
Date 14 Nov 2016

Vegetation Units, Sample Locations and Significant Flora Locations

Figure 3

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Data source: GHD: Study Area - 20160922, Quadrat Location, Vegetation Type - 20161014; LGATE: Roads, Imagery (Virtual Mosaic) - 20160923 . Created by:afeeney

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Map Index

Paper Size A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

Weed Species

Asparagus asparagoides (Bridal Creeper)

Zantedeschia aethiopica (Arum Lily)

Study Area

Vegetation Condition (EPA and DPaW 2015)

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

GHD

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Vasse Diversion Drain Upgrade

Vegetation Condition and Significant Weeds

Job Number	61-34862
Revision	0
Date	25 Oct 2016

Figure 4

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Data source: GHD: Study Area - 20160922, Vegetation Condition, Weeds - 20161014; LGATE: Imagery (Virtual Mosaic) - 20160923 . Created by:afeeney

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Map Index

Paper Size A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

- Carters Mussel *(Westralunio carteri)*
- Black Cockatoo *(Calyptorhynchus latirostris)* hollows (large)
- Black Cockatoo trees with DBH > 500mm

Ringtail Possum *(Pseudocheirus peregrinus)* Observation

- Drey
- Drey and scat
- Scat

- Study Area

Fauna Habitat

- Flooded Gum and Marri Woodland
- *Agonis* woodland
- *Melaleuca* over shrubland
- Highly Disturbed

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Water Corporation
Vasse Diversion Drain Upgrade

Job Number 61-34862
Revision 0
Date 25 Oct 2016

Fauna Habitat Types

Figure 5

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Data source: GHD: Study Area - 20160922, Fauna Observations 20161014; LGATE: Imagery (Virtual Mosaic) - 20160923 . Created by:afeeney

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Map Index

Paper Size A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

- Carters Mussel *(Westralunio carteri)*
- Black Cockatoo *(Calyptorhynchus latirostris)* hollows (large)
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Ringtail Possum *(Pseudocheirus peregrinus)* Observation

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- Flooded Gum and Marri Woodland
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WATER CORPORATION

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Water Corporation
Vasse Diversion Drain Upgrade

Job Number	61-34862
Revision	0
Date	25 Oct 2016

Fauna Habitat Types

Figure 5

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Data source: GHD: Study Area - 20160922, Fauna Observations 20161014; LGATE: Imagery (Virtual Mosaic) - 20160923 . Created by:afeeney

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Appendix B – Relevant legislation, conservation codes and background information

Legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

- Nationally threatened flora and fauna species and ecological communities
- Migratory species

A person must not take an action that has, will have, or is likely to have a significant impact MNES, without approval from the Federal Minister for the Environment.

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Australian Government Minister for the Environment.

State *Environmental Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the above.

Clearing of native vegetation in Western Australia requires a permit from the Department of Environment Regulation (DER) (formerly the Department of Environment and Conservation – DEC), unless exemptions apply. Native vegetation includes aquatic and terrestrial vegetation indigenous to Western Australia, and intentionally planted vegetation declared by regulation to be native, but not vegetation planted in a plantation or planted with commercial intent.

In the EP Act Section 51A, clearing is defined as the killing or destruction of; the removal of; the severing or ringbarking of trunks or stems of; or the doing of substantial damage of some or all of the native vegetation in an area, including the flooding of land, the burning of vegetation, the grazing of stock or an act or activity that results in the above.

When making a decision to grant or refuse a permit to clear native vegetation the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

a) Native vegetation should not be cleared if it comprises a high level of biodiversity.

b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.

c) Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.

d) Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.

e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

g) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

h) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

There are a number of Environmentally Sensitive Areas (ESAs) within Western Australia where exemptions in regulations do not apply. ESAs include locations of threatened communities and species.

State *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*

ESAs are declared by a notice under Section 51B of the EP Act. The Table below outlines the aspects of areas declared as ESA (under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 – Reg 6).

Aspects of Environmentally Sensitive Areas

Aspects of Environmentally Sensitive Areas
A declared World Heritage property as defined in Section 13 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
An area that is registered on the Register of the National Estate (RNE), because of its natural values, under the *Australian Heritage Commission Act 1975* of the Commonwealth (the RNE was closed in 2007 and is no longer a statutory list – all references to the RNE were removed from the EPBC Act on 19 February 2012).
A defined wetland and the area within 50 m of the wetland.
The area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located.
The area covered by a TEC.
A Bush Forever Site.
The areas covered by the following policies:
a) The *Environmental Protection (Gnangara Mound Crown Land) Policy 1992*.
b) The *Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002*.
The areas covered by the lakes to which the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (SCPL) (EPP Lakes) applies.
Protected wetlands as defined in the *Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998*.
Areas of fringing native vegetation in the policy area as defined in the *Environmental Protection (Swan and Canning Rivers) Policy 1997*.

State *Wildlife Conservation Act 1950*

The *Wildlife Conservation Act 1950* (WC Act) provides for the conservation and protection of wildlife. It is administered by the Department of Parks and Wildlife (DPaW) (formerly the DEC) and applies to both flora and fauna. Any person wanting to capture, collect, disturb or study fauna requires a permit to do so. A permit is required under the WC Act if removal of threatened species is required.

State *Biosecurity and Agriculture Management Act 2007*

Under the *Biosecurity and Agriculture Management Act 2007* (BAM Act), a Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) is in force. The Department of Agriculture and Food Western Australia (DAFWA) maintains a list of Declared Pests for Western Australia. If a Pest is declared for the whole of the State or for particular Local Government Areas, all landholders are obliged to comply with the specific category of control. Declared plants are gazetted under categories, which define the action required. The category may apply to the whole of the State, districts, individual properties or even paddocks. Categories of control are defined below. Among the factors considered in categorising Declared Pests are:

- The impact of the plant on individuals, agricultural production and the community in general
- Whether it is already established in the area
- The feasibility and cost of possible control measures

The BAM Act replaces the repealed *Agriculture and Related Resources Protection Act 1976* (ARRP Act).

Department of Agriculture and Food (Western Australia) Categories for Declared Pests under the *Biosecurity and Agriculture Management Act 2007*

Control class code	Description
C1 (Exclusion)	Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 (Eradication)	Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3 (Management)	Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Background information and conservation codes

Reserves and conservation areas

Bush Forever

Bush Forever, which was released in December 2000 and proclaimed in 2010, is a Government initiate aimed to retain and protect regionally significant bushland on the Swan Coastal Plain within the Perth Metropolitan Region. Bush Forever aims to protect more than 51,000 hectares of regionally significant bushland within 287 sites across the metropolitan portion of the Swan Coastal Plain (Government of Western Australia 2000). Bush Forever sites constitute ESAs as declared by a notice under Section 51B of the EP Act.

Department of Parks and Wildlife managed lands and waters

DPaW manages lands and waters throughout Western Australia to conserve ecosystems and species, and to provide for recreation and appreciation of the natural environment. DPaW managed lands and waters include national parks, conservation parks and reserves, marine parks and reserves, regional parks, nature reserves, State forest and timber reserves. DPaW managed conservation estate, is vested with the Conservation Commission of Western Australia. Access to, or through, some areas of DPaW managed lands may require a permit or could be restricted due to management activities. Proposed land use changes and development proposals that abut DPaW managed lands will generally be referred to DPaW throughout the assessment process.

Wetlands

Wetlands include not only lakes with open water, but areas of seasonally, intermittently or permanently waterlogged soil. Approximately 25 percent of the Swan Coastal Plain between Moore River and Mandurah is classified as wetland (Hill et al. 1996).

Though extensive in area, not all wetlands retain significant ecological values due to the concentration of urban and agricultural development in the region. Most wetlands have been cleared, filled or developed over, leaving only 20 percent of all the wetlands that were present on the Swan Coastal Plain prior to European settlement. Of these, an estimated 15 percent of the wetland area has retained high ecological values (Hill et al. 1996).

Ramsar Listed Wetlands

The Convention of Wetlands of International Importance was signed in 1971 at the Iranian town of Ramsar. The Convention has since been referred to as the Ramsar Convention. Ramsar Listed wetlands are “sites containing representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity … because of their ecological, botanical, zoological, limnological or hydrological importance” (DotE 2016b). Once a Ramsar Listed Wetland is designated, the country agrees to manage its conservation and ensure its wise use. Under the Convention, wise use is broadly defined as “maintaining the ecological character of a wetland” (DotE 2016b).

Nationally important wetlands

Wetlands of national significance are listed under the Directory of Important Wetlands in Australia. Nationally important wetlands are wetlands which meet at least one of the following criteria (DoE 2016a):

- It is a good example of a wetland type occurring within a biogeographic region in Australia
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex

- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail
- The wetland supports one percent or more of the national populations of any native plant or animal taxa
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level
- The wetland is of outstanding historical or cultural significance

Lakes covered under the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*

The *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (EPP Lakes) protects the environmental values of selected lakes/wetlands on the Swan Coastal Plain.

Geomorphic wetlands

Categorisation of wetlands has been conducted by Hill et al. (1996), delineating Swan Coastal Plain wetlands into levels of protection and management categories. Conservation Category Wetlands are wetlands that support high levels of attributes and functions. Resource Enhancement Wetlands are those that have been partly modified but still support substantial functions and attributes. Multiple Use Wetlands are classified as those wetlands with few attributes that still provide important wetland functions. Multiple Use wetlands have few important ecological attributes and functions remaining.

The Geomorphic Wetlands Swan Coastal Plain dataset displays the location, boundary, geomorphic classification (wetland type) and management category of wetlands on the Swan Coastal Plain.

Vegetation extent and status

The National Objectives and Targets for Biodiversity Conservation 2001–2005 (Commonwealth of Australia 2001) recognise that the retention of 30 percent or more of the pre-clearing extent of each ecological community is necessary if Australia's biological diversity is to be protected. This is the threshold level below which species loss appears to accelerate exponentially and loss below this level should not be permitted. This level of recognition is in keeping with the targets recommended in the review of the National Strategy for the Conservation of Australia's Biological Diversity (ANZECC 2000) and in Environmental Protection Authority (EPA) Position Statement No. 2 on environmental protection of native vegetation in Western Australia (EPA 2000).

From a purely biodiversity perspective and taking no account of any other land degradation issues, there are a number of key criteria now being applied to the clearing of native vegetation in Western Australia (EPA 2000).

- The "threshold level" below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being at a level of 30 percent of the pre-European extent of the vegetation type.
- A level of 10 percent of the original extent is regarded as being a level representing Endangered.
- Clearing which would put the threat level into the class below should be avoided.
- From a biodiversity perspective, stream reserves should generally be in the order of at least 200 metres (m) wide.

Within the Swan Coastal Plain, EPA Position Statement No. 9 (EPA 2006a) identifies vegetation complexes with 30 percent or less or their pre-clearing extent remaining in a bioregion, or 10 percent or less of their pre-clearing extent remaining in constrained areas (i.e. areas of urban development in cities and major town) on the Swan Coastal Plain, to be critical assets.

The extent of remnant native vegetation has been assessed by Shepherd et al. (2002) and the Government of Western Australia (2013), based on broadscale vegetation association mapping by Smith 1973.

It is important to note that the "remnant native vegetation mapping used in the Region is derived from dated aerial photography (in this case 1998) with limited ground-truthing. As a consequence, the percentages of ecological communities remaining are generally an overestimate of the native vegetation remaining at present and at the date of this Guidance (2006). The principal factors contributing to this overestimation are:

- The preferential mapping of treed landscapes, leading to some mapping of areas that are parkland cleared or completely degraded
- The inclusion of areas that are approved for clearing through development approvals and/or clearing permits
- Some areas that have been cleared since the time of the aerial photography

It is therefore important to bear these issues in mind when the percentage of the vegetation complexes remaining is approaching 30 percent" (EPA 2006b). Furthermore, as a result of the clearing of the Swan Coastal Plain since 1998, it is likely that the actual percentage remaining of each vegetation type is less.

Vegetation condition

The vegetation condition in the Perth IBRA bioregion can be assessed in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces (devised by Keighery (1994) and adapted by EPA and DPaW (2015). The scale recognises the intactness of vegetation and consists of six rating levels as outlined below.

Vegetation condition rating scale

Condition	South West and Interzone Botanical Provinces description
Pristine	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.

Condition	South West and Interzone Botanical Provinces description
Completely Degraded	The structure of vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Conservation codes

Species of significant flora, fauna and communities are protected under both Federal and State Acts. The Federal EPBC Act provides a legal framework to protect and manage nationally important flora and communities. The State WC Act is the primary wildlife conservation legislation in Western Australia. Information on the conservation codes is summarised in the following sections.

Conservation significant communities

Ecological communities are defined as naturally occurring biological assemblages that occur in a particular type of habitat (English and Blyth 1997). Federally listed Threatened Ecological Communities (TECs) are protected under the EPBC Act administered by the Department of the Environment (DotE) (formerly Department of Sustainability, Environment, Water, Population and Communities – DSEWPaC). The DPaW also maintains a list of TECs for Western Australia; some of which are also protected under the EPBC Act. TECs are ecological communities that have been assessed and assigned to one of four categories related to the status of the threat to the community, i.e. Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable.

Possible TEC that do not meet survey criteria are added to the DPaW Priority Ecological Community (PEC) List under Priorities 1, 2 and 3. These are ecological communities that are adequately known; are rare but not threatened, or meet criteria for Near Threatened. PECs that have been recently removed from the threatened list are placed in Priority 4. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in Priority 5. PECs are not listed under any formal Federal or State legislation.

Conservation codes and definitions for Threatened Ecological Communities endorsed by the Western Australian Minister for the Environment and listed under the *Environment Protection and Biodiversity Conservation Act 1999*

Western Australia conservation categories		Federal Government Conservation Categories (EPBC Act)	
Presumed Totally Destroyed (PD)	The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.	Critically Endangered (CR)	If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated	Endangered (EN)	If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.	Vulnerable (VU)	If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.		

Conservation categories and definitions for Priority Ecological Communities as listed by the Department of Parks and Wildlife

Category	Description
Priority 1	**Poorly known ecological communities.** Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2	**Poorly known ecological communities.** Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3	**Poorly known ecological communities.** (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
Priority 4	**Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.** (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Category	Description
Priority 5	**Conservation Dependent ecological communities.** Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Other significant vegetation

Vegetation may be significant for a range of reasons, other than a statutory listing as TEC or because the extent is below a threshold level. The EPA (2004) states that significant vegetation may include vegetation that includes the following:

- Scarcity
- Unusual species
- Novel combinations of species
- A role as a refuge
- A role as a key habitat for Threatened species or large population representing a significant proportion of the local to regional total population of a species
- Being representative of the range of a unit (particularly, a good local and/or regional example of a unit in 'prime' habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)
- A restricted distribution

This may apply at a number of levels, so the unit may be significant when considered at the fine-scale (intra-locality), intermediate-scale (locality or inter-locality) or broad-scale (local to region).

Conservation significant flora and fauna

Species of significant flora are protected under both Federal and State legislation. Any activities that are deemed to have a significant impact on species that are recognised by the EPBC Act, and/or the WC Act can warrant referral to the DotE and/or the EPA.

The Federal conservation level of flora and fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act are those recommended by the International Union for the Conservation of Nature and Natural Resources (IUCN).

Threatened species have been published as Specially Protected under the WC Act 1950, and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora. The schedules align with the categories of the EPBC Act. Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such.

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

For the purposes of this assessment, all species listed under the EPBC Act, WC Act and DPaW Priority species are considered conservation significant.

Conservation categories and definitions for *Environment Protection and Biodiversity Conservation Act 1999* listed flora & fauna species

Conservation category	Definition
Extinct	Taxa not definitely located in the wild during the past 50 years
Extinct in the Wild	Taxa known to survive only in captivity
Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Taxa facing a very high risk of extinction in the wild in the near future
Vulnerable	Taxa facing a high risk of extinction in the wild in the medium-term
Near Threatened	Taxa that risk becoming Vulnerable in the wild
Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known)	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern	Taxa that are not considered Threatened

Conservation codes and descriptions for Western Australian flora and fauna

Code	Conservation category	Description
Wildlife Conservation Act 1950		
T	Threatened species	Published as Specially Protected under the *Wildlife Conservation Act 1950,* and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora). ***Threatened fauna*** is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the Wildlife Conservation Act. ***Threatened flora*** is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the Wildlife Conservation Act. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.
CR	Critically endangered species	Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
EN	Endangered species	Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
VU	Vulnerable species	Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
EX	Presumed extinct species	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
IA	Migratory birds protected under an international agreement	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
CD	Conservation dependent fauna	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
OS	Other specially protected fauna	Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

Code	Conservation category	Description
DPaW Priority Listed		
1	Priority One: Poorly-known taxa	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
2	Priority Two: Poorly-known taxa	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
3	Priority Three: Poorly-known taxa	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
4	Priority Four: Rare, Near Threatened and other taxa in need of monitoring	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Migratory species listed under the EPBC Act

The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

- Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)

- Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
- Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

Other significant flora and fauna

Flora species, subspecies, varieties, hybrids and ecotypes may be significant for a range of reasons, other than as Threatened (Declared Rare) Flora or Priority Flora. The EPA (2004) states that significant flora may include taxa that have:

- A keystone role in a particular habitat for threatened species or supporting large populations representing a significant proportion of the local regional population of a species
- Relic status
- Anomalous features that indicate a potential new discovery
- Being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)
- The presence of restricted subspecies, varieties, or naturally occurring hybrids
- Local endemism/a restricted distribution
- Being poorly reserved

The application of the degree of significance may apply at a range of scales.

Introduced plants (weeds)

Declared Pests

Information on species considered to be Declared Pests is provided under *State Biosecurity and Agriculture Management Act 2007.*

Weeds of National Significance

The spread of weeds across a range of land uses or ecosystems is important in the context of socio-economic and environmental values. The assessment of Weeds of National Significance (WoNS) is based on four major criteria:

- Invasiveness
- Impacts
- Potential for spread
- Socio-economic and environmental values

Australian state and territory governments have identified thirty two Weeds of National Significance (WoNS); a list of 20 WoNS was endorsed in 1999 and a further 12 were added in 2012 (Australian Government 2014).

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Appendix C – Desktop searches

EPBC Act PMST Report (5 km buffer)

NatureMap Flora Report (5 km buffer)

NatureMap Fauna Report (5 km buffer)

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.

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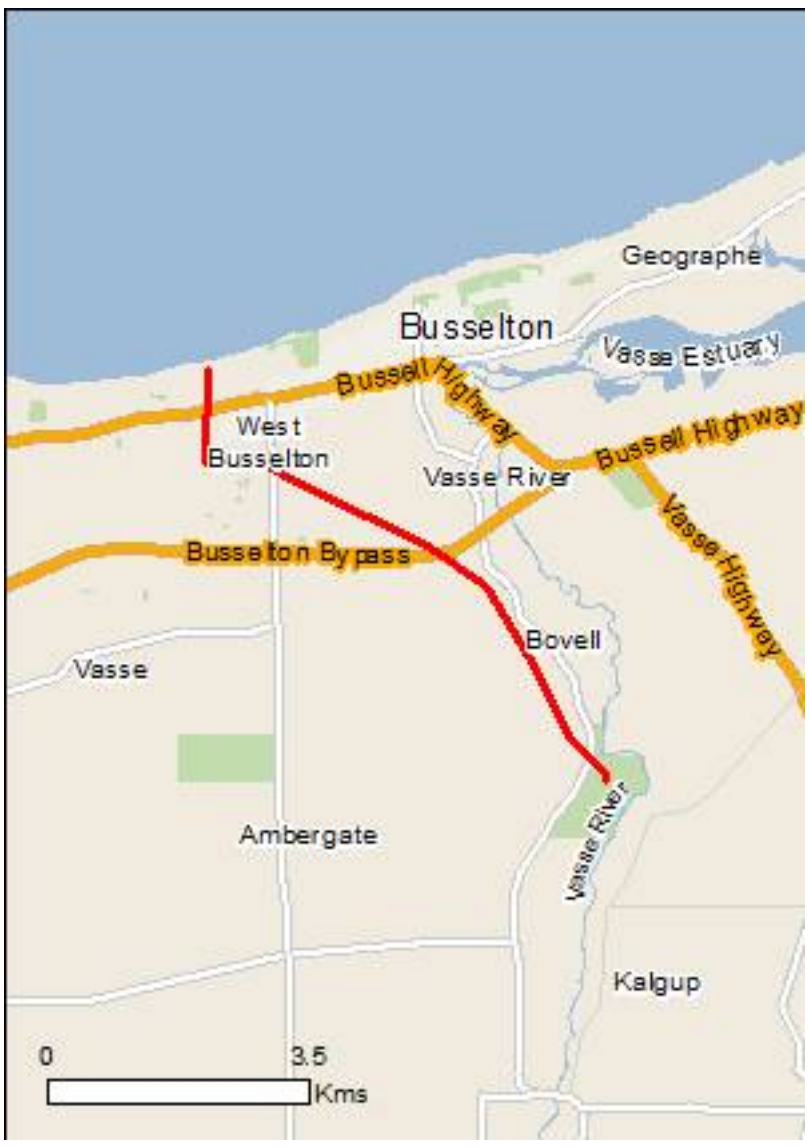

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 5.0Km

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:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	59
Listed Migratory Species:	45

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:	73
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	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:	12
Regional Forest Agreements:	1
Invasive Species:	24
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Vasse-wonnerup system	Within Ramsar site

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
Claypans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	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 known to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Breeding known to occur within area
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely

Name	Status	Type of Presence
		to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Extinct within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Breeding known to occur within area
Plants		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Banksia nivea subsp. uliginosa Swamp Honeypot [82766]	Endangered	Species or species habitat likely to occur within area
Banksia squarrosa subsp. argillacea Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat likely to occur within area
Brachyscias verecundus Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may 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
Caladenia procera Carbunup King Spider Orchid [68679]	Critically Endangered	Species or species habitat known to occur within area
Chamelaucium sp. S coastal plain (R.D.Royce 4872) Royce's Waxflower [87814]	Vulnerable	Species or species habitat known to occur within area
Darwinia whicherensis Abba Bell [83193]	Endangered	Species or species habitat may occur within area
Daviesia elongata subsp. elongata Long-leaved Daviesia [64883]	Vulnerable	Species or species habitat may occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leafed Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat known to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Gastrolobium papilio Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
Grevillea brachystylis subsp. grandis Large-flowered Short-styled Grevillea [85001]	Critically Endangered	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Grevillea elongata Ironstone Grevillea [64578]	Vulnerable	Species or species habitat may occur within area
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
Petrophile latericola Laterite Petrophile [64532]	Endangered	Species or species habitat likely to occur within area
Tetraria australiensis Southern Tetraria [10137]	Vulnerable	Species or species habitat likely to occur within area
Verticordia plumosa var. vassensis Vasse Featherflower [55804]	Endangered	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	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
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca		
Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Sterna anaethetus		
Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
Sterna caspia		
Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta (sensu stricto)		
Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Caperea marginata		
Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharodon carcharias		
Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area

Name	Threatened	Type of Presence
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to 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 bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to 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
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		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		
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may 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]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to 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
Catharacta skua Great Skua [59472]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may 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
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Sterna anaethetus Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
Sterna caspia Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour 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
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stigmatopora olivacea a pipefish [74966]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
[Vanacampus phillipi](#) Port Phillip Pipefish [66284]		Species or species habitat may occur within area
[Vanacampus poecilolaemus](#) Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammals		
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
Reptiles		
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
[Balaenoptera acutorostrata](#) Minke Whale [33]		Species or species habitat may occur within area
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
[Caperea marginata](#) Pygmy Right Whale [39]		Species or species habitat may occur within area
[Delphinus delphis](#) Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Breeding known to occur within area
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Name	Status	Type of Presence
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Broadwater	WA
Fish Road	WA
Sabina	WA
Unnamed WA25836	WA
Unnamed WA26620	WA
Unnamed WA41568	WA
Unnamed WA41597	WA
Unnamed WA42879	WA
Unnamed WA48837	WA
Unnamed WA49385	WA
Unnamed WA50017	WA
Unnamed WA50270	WA

Regional Forest Agreements	[Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

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		
Anas platyrhynchos Mallard [974]		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

Name	Status	Type of Presence
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
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
Feral deer Feral deer species in Australia [85733]		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 rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		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
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Olea europaea Olive, Common Olive [9160]		Species or species 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
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

Nationally Important Wetlands	[Resource Information]
Name	State
Vasse-Wonnerup Wetland System	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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

-33.65333 115.316971,-33.662617 115.316542,-33.662379 115.322693,-33.664879 115.328844,-33.670951 115.343149,-33.674999 115.350159,-33.682379 115.355881,-33.689759 115.360172,-33.693806 115.36475,-33.694282 115.364607,-33.694282 115.364607

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
-Parks and Wildlife Commission NT, Northern Territory Government
-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, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-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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NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 16/08/2016

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Line'
Vertices 33° 39' 03" S,115° 19' 24" E 33° 39' 48" S,115° 19' 27" E 33° 39' 50" S,115° 19' 58" E 33° 40' 04" S,115° 20' 19" E 33° 40' 16" S,115° 20' 34" E 33° 40' 29" S,115° 20' 58" E 33° 40' 55" S,115° 21' 23" E 33° 41' 25" S,115° 21' 51" E 33° 41' 25" S,115° 21' 51" E
Group By Family

Family	Species	Records
Aizoaceae	1	1
Amaranthaceae	5	6
Anarthriaceae	6	13
Apiaceae	10	16
Apodanthaceae	1	1
Araceae	2	2
Araliaceae	6	10
Asparagaceae	17	25
Asphodelaceae	2	2
Asteraceae	58	100
Aytoniaceae	1	1
Bonnemaisoniaceae	1	1
Boraginaceae	1	3
Brassicaceae	11	15
Bryaceae	1	1
Campanulaceae	7	9
Caprifoliaceae	2	2
Caryophyllaceae	7	9
Casuarinaceae	2	3
Celastraceae	2	5
Centrolepidaceae	5	9
Chenopodiaceae	15	16
Codiaceae	2	5
Colchicaceae	3	7
Commelinaceae	1	1
Convolvulaceae	4	8
Corallinaceae	1	1
Crassulaceae	3	4
Cymodoceaceae	2	4
Cyperaceae	41	61
Dasypogonaceae	3	11
Delesseriaceae	1	1
Dilleniaceae	15	44
Droseraceae	12	19
Elaeocarpaceae	4	21
Ericaceae	30	55
Euphorbiaceae	8	12
Fabaceae	110	244
Fossombroniaceae	1	1
Funariaceae	1	1
Gentianaceae	1	1
Geraniaceae	5	6
Goodeniaceae	17	449
Gracilariaceae	1	1
Haemodoraceae	11	19
Haloragaceae	5	8
Hemerocallidaceae	10	25
Hydatellaceae	1	1
Hypericaceae	1	1
Hypoxidaceae	1	1
Iridaceae	11	18
Juncaceae	5	10
Juncaginaceae	6	12
Lamiaceae	11	21
Lauraceae	3	4
Lentibulariaceae	2	2
Loganiaceae	2	2
Loranthaceae	1	1
Malvaceae	4	9
Melianthaceae	1	1
Menyanthaceae	4	11
Myrtaceae	68	219
Nymphaeaceae	1	1
Oleaceae	1	1
Onagraceae	3	5
Orchidaceae	66	125
Orobanchaceae	4	7
Oxalidaceae	3	6
Papaveraceae	2	3
Philydraceae	1	1
Phyllanthaceae	4	6
Pittosporaceae	3	5
Plantaginaceae	3	3
Poaceae	62	81

Podocarpaceae	1	3
Polygalaceae	4	7
Polygonaceae	5	7
Posidoniaceae	2	3
Potamogetonaceae	2	3
Pottiaceae	2	2
Primulaceae	3	5
Proteaceae	70	190
Pteridaceae	1	1
Ranunculaceae	3	6
Restionaceae	26	56
Rhamnaceae	4	11
Rhodomelaceae	8	12
Rosaceae	1	1
Rubiaceae	6	7
Rutaceae	14	29
Santalaceae	6	26
Sapindaceae	2	2
Scrophulariaceae	5	7
Sematophyllaceae	1	3
Siphonocladaceae	1	1
Solanaceae	5	12
Stylidiaceae	13	18
Thymelaeaceae	16	34
Urticaceae	1	1
Violaceae	1	3
Xyridaceae	1	1
Zygophyllaceae	1	2
TOTAL	**934**	**2269**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Aizoaceae					
1.	2820	*Tetragonia decumbens (Sea Spinach)*	Y		
Amaranthaceae					
2.	2648	*Alternanthera denticulata (Lesser Joyweed)*			
3.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
4.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
5.	15856	*Ptilotus sericostachyus subsp. sericostachyus*			
6.		*Ptilotus sp.*			
Anarthriaceae					
7.	1058	*Anarthria gracilis*			
8.	1060	*Anarthria laevis*			
9.	1062	*Anarthria prolifera*			
10.	1063	*Anarthria scabra*			
11.	1097	*Lyginia barbata*			
12.	18049	*Lyginia imberbis*			
Apiaceae					
13.	12040	*Apium prostratum var. prostratum (Sea Celery)*			
14.	6214	*Centella asiatica*			
15.	6218	*Daucus glochidiatus (Australian Carrot)*			
16.	6219	*Eryngium pinnatifidum (Blue Devils)*			
17.		*Platysace sp.*			
18.	6259	*Platysace tenuissima*			
19.	6263	*Schoenolaena juncea*			
20.	6285	*Xanthosia ciliata*			
21.		*Xanthosia sp.*			
22.	19330	*Xanthosia tasmanica*			
Apodanthaceae					
23.	2408	*Pilostyles hamiltonii*			
Araceae					
24.	1051	*Lemna disperma (Duckweed)*			
25.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
Araliaceae					
26.	6223	*Hydrocotyle alata*			
27.	6224	*Hydrocotyle blepharocarpa*			
28.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
29.	6229	*Hydrocotyle diantha*			
30.	6266	*Trachymene coerulea (Blue Lace Flower)*			
31.	6280	*Trachymene pilosa (Native Parsnip)*			
Asparagaceae					
32.	1208	*Acanthocarpus preissii*			
33.	43820	*Albuca flaccida*	Y		
34.	11299	*Chamaescilla corymbosa var. corymbosa*			
35.	1287	*Dichopogon capillipes*			
36.	1304	*Laxmannia minor*			
37.	11464	*Laxmannia sessiliflora subsp. australis*			
38.	1229	*Lomandra integra*			
39.	1232	*Lomandra micrantha (Small-flower Mat-rush)*			
40.	14542	*Lomandra micrantha subsp. micrantha*			
41.	1234	*Lomandra nigricans*			
42.	1372	*Ornithogalum arabicum (Lesser Cape Lily)*	Y		
43.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
44.	1319	*Thysanotus arenarius*			
45.	1334	*Thysanotus glaucus*		P4	
46.	1343	*Thysanotus patersonii*			
47.		*Thysanotus sp.*			
48.	1354	*Thysanotus tenellus*			
Asphodelaceae					
49.	1366	*Bulbine semibarbata (Leek Lily)*			
50.	1368	*Trachyandra divaricata*	Y		
Asteraceae					
51.	7821	*Ambrosia psilostachya (Perennial Ragweed)*	Y		
52.	7833	*Angianthus preissianus*			
53.	7838	*Arctotheca calendula (Cape Weed)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
54.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
55.	7878	*Brachyscome iberidifolia*			
56.	7916	*Centaurea melitensis (Maltese Cockspur)*	Y		
57.	7918	*Centipeda cunninghamii (Common Sneezewood)*			
58.	11900	*Chrysanthemoides monilifera subsp. monilifera*	Y		
59.	7935	*Cichorium intybus (Chicory)*	Y		
60.	7940	*Conyza canadensis (Canadian Fleabane)*	Y		
61.	7941	*Conyza parva*	Y		
62.	7943	*Cotula australis (Common Cotula)*			
63.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
64.	7946	*Cotula cotuloides (Smooth Cotula)*			
65.	7947	*Cotula turbinata (Funnel Weed)*	Y		
66.		*Craspedia sp.*			
67.	13354	*Craspedia variabilis*			
68.	19893	*Cynara cardunculus subsp. flavescens (Artichoke Thistle, Wild Artichoke, Cardoon)*	Y		
69.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
70.	15137	*Euchiton sphaericus*			
71.	7976	*Galinsoga parviflora (Potato Weed)*	Y		
72.	20346	*Gamochaeta coarctata*	Y		
73.	16311	*Gazania linearis*	Y		
74.	8002	*Gnephosis tenuissima*			
75.	29594	*Helichrysum luteoalbum (Jersey Cudweed)*			
76.	12741	*Hyalosperma cotula*			
77.	12717	*Hyalosperma pusillum*			
78.	16758	*Hyalosperma simplex subsp. graniticola*			
79.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
80.	9352	*Hypochaeris radicata (Flat Weed)*	Y		
81.	18585	*Lagenophora huegelii*			
82.	44490	*Leontodon rhagadioloides*	Y		
83.	8099	*Leontodon saxatilis (Hairy Hawkbit)*	Y		
84.	8105	*Millotia myosotidifolia*			
85.	8117	*Myriocephalus helichrysoides*			
86.	14187	*Myriocephalus occidentalis*			
87.		*Myriocephalus sp.*			
88.	8133	*Olearia elaeophila*			
89.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
90.	42281	*Pithocarpa cordata*			
91.	8175	*Podolepis gracilis (Slender Podolepis)*			
92.	8177	*Podolepis lessonii*			
93.	8182	*Podotheca angustifolia (Sticky Longheads)*			
94.	8188	*Pogonolepis stricta*			
95.	13241	*Rhodanthe chlorocephala subsp. rosea*			
96.	13300	*Rhodanthe citrina*			
97.	15035	*Rhodanthe corymbosa*			
98.	13246	*Rhodanthe humboldtiana*			
99.	13234	*Rhodanthe manglesii*			
100.	25878	*Senecio condylus*			
101.		*Senecio sp.*			
102.	45036	*Solidago chilensis*	Y		
103.	9367	*Sonchus hydrophilus (Native Sowthistle)*			
104.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
105.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
106.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
107.	19938	*Xerochrysum bracteatum*			
108.		*Xerochrysum sp.*			
Aytoniaceae					
109.		*Asterella drummondii*			
Bonnemaisoniaceae					
110.		*Delisea sp.*			
Boraginaceae					
111.	6675	*Buglossoides arvensis (Corn Gromwell)*	Y		
Brassicaceae					
112.	3002	*Cakile maritima (Sea Rocket)*	Y		
113.	3004	*Capsella bursa-pastoris (Shepherd's Purse)*	Y		
114.	3005	*Cardamine hirsuta (Common Bittercress)*	Y		
115.		*Cardamine sp.*			
116.	3011	*Diplotaxis muralis (Wall Rocket)*	Y		
117.	3016	*Heliophila pusilla*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
118.	19989	*Lepidium didymum*	Y		
119.	3040	*Lepidium pseudohyssopifolium*		P1	
120.	3042	*Lepidium pseudotasmanicum*		P4	
121.	3048	*Lobularia maritima (Sweet Alyssum)*	Y		
122.	3080	*Stenopetalum robustum*			
Bryaceae					
123.		*Bryum pachytheca*			
Campanulaceae					
124.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
125.	7399	*Isotoma scapigera (Long-scaped Isotome)*			
126.	9289	*Lobelia anceps (Angled Lobelia)*			
127.	36863	*Lobelia heterophylla subsp. heterophylla*			
128.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
129.	36840	*Lobelia tenuior subsp. tenuior*			
130.	7386	*Wahlenbergia gracilenta (Annual Bluebell)*			
Caprifoliaceae					
131.	7366	*Centranthus macrosiphon*	Y		
132.	35322	*Centranthus ruber subsp. ruber*	Y		
Caryophyllaceae					
133.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
134.	13120	*Cerastium vulgare*	Y		Y
135.	2894	*Moenchia erecta (Erect Chickweed)*	Y		
136.	19825	*Petrorhagia dubia*	Y		
137.	2910	*Silene nocturna (Mediterranean Catchfly)*	Y		
138.	2912	*Spergula arvensis (Corn Spurry)*	Y		
139.	2918	*Stellaria media (Chickweed)*	Y		
Casuarinaceae					
140.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
141.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
Celastraceae					
142.		*Stackhousia sp.*			
143.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
Centrolepidaceae					
144.	1117	*Aphelia cyperoides*			
145.	1118	*Aphelia drummondii*			
146.	1120	*Centrolepis alepyroides*			
147.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
148.	1125	*Centrolepis drummondiana*			
Chenopodiaceae					
149.	2451	*Atriplex bunburyana (Silver Saltbush)*			
150.	2452	*Atriplex cinerea (Grey Saltbush)*			
151.	2462	*Atriplex hypoleuca*			
152.	11525	*Atriplex paludosa subsp. baudinii*			
153.	2471	*Atriplex prostrata (Hastate Orache)*	Y		
154.	2490	*Chenopodium glaucum (Glaucous Goosefoot)*	Y		
155.	2491	*Chenopodium macrospermum*	Y		
156.	2494	*Chenopodium murale (Nettle-leaf Goosefoot)*	Y		
157.	33517	*Dysphania multifida (Scented Goosefoot)*	Y		
158.	11341	*Rhagodia baccata subsp. baccata*			
159.	2593	*Sarcocornia quinqueflora (Beaded Samphire)*			
160.	14281	*Sarcocornia quinqueflora subsp. quinqueflora (Bearded Glasswort)*			
161.	2639	*Suaeda australis (Seablite)*			
162.	31716	*Tecticornia syncarpa*			
163.	2644	*Threlkeldia diffusa (Coast Bonefruit)*			
Codiaceae					
164.	26677	*Codium mamillosum*			
165.	26683	*Codium spongiosum*			
Colchicaceae					
166.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
167.	12072	*Wurmbea dioica subsp. alba*			
168.	1403	*Wurmbea tenella (Eight Nancy)*			
Commelinaceae					
169.	31595	*Commelina benghalensis*	Y		
Convolvulaceae					

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170.	43142	*Calystegia sepium subsp. roseata*			Y
171.	6663	*Cuscuta epithymum (Lesser Dodder, Greater Dodder)*	Y		
172.	6658	*Wilsonia backhousei (Narrow-leaf Wilsonia)*			
173.	6659	*Wilsonia humilis (Silky Wilsonia)*			
Corallinaceae					
174.	26984	*Jania affinis*			
Crassulaceae					
175.	11563	*Crassula colorata var. colorata*			
176.	3140	*Crassula glomerata*	Y		
177.	3142	*Crassula natans*	Y		
Cymodoceaceae					
178.	126	*Amphibolis antarctica (Sea Nymph)*			
179.	127	*Amphibolis griffithii*			
Cyperaceae					
180.	741	*Baumea articulata (Jointed Rush)*			
181.	743	*Baumea juncea (Bare Twigrush)*			
182.		*Baumea sp.*			
183.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
184.	753	*Carex appressa (Tall Sedge)*			
185.	754	*Carex divisa (Divided Sedge)*	Y		
186.	762	*Chorizandra cymbaria (Heron Bristle Rush)*			
187.	763	*Chorizandra enodis (Black Bristlerush)*			
188.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
189.	792	*Cyperus eragrostis (Umbrella Sedge)*	Y		
190.	794	*Cyperus gymnocaulos (Spiny Flat-sedge)*			
191.	834	*Evandra aristata*			
192.	20216	*Ficinia nodosa (Knotted Club Rush)*			
193.	907	*Gahnia trifida (Coast Saw-sedge)*			
194.	910	*Isolepis cernua (Nodding Club-rush)*			
195.	917	*Isolepis marginata (Coarse Club-rush)*			
196.	921	*Isolepis producta*			
197.	925	*Lepidosperma angustatum*			
198.	932	*Lepidosperma effusum (Spreading Sword-sedge)*			
199.	933	*Lepidosperma gladiatum (Coast Sword-sedge, Kerbin)*			
200.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
201.		*Lepidosperma sieberi*			
202.	29141	*Lepidosperma sp. Gosnells (A. Markey 1145)*			
203.	29150	*Lepidosperma sp. Margaret River (B.J. Lepschi 1841)*			
204.	945	*Lepidosperma squamatum*			
205.	946	*Lepidosperma striatum*			
206.	953	*Mesomelaena graciliceps*			
207.	11473	*Mesomelaena stygia subsp. stygia*			
208.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
209.	973	*Schoenus asperocarpus (Poison Sedge)*			
210.	974	*Schoenus benthamii*		P3	
211.	975	*Schoenus bifidus*			
212.	978	*Schoenus brevisetis*			
213.	984	*Schoenus curvifolius*			
214.	986	*Schoenus efoliatus*			
215.	987	*Schoenus elegans*			
216.	996	*Schoenus laevigatus*			
217.	1005	*Schoenus obtusifolius*			
218.	1011	*Schoenus rigens*			
219.	1017	*Schoenus subbulbosus*			
220.	1033	*Tetraria australiensis*		T	
Dasypogonaceae					
221.	19309	*Calectasia narragara*			
222.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
223.	1219	*Dasypogon hookeri (Pineapple Bush)*			
Delesseriaceae					
224.	27055	*Martensia australis*			
Dilleniaceae					
225.	5109	*Hibbertia amplexicaulis*			
226.	5112	*Hibbertia aurea*			
227.	5114	*Hibbertia commutata*			
228.	5117	*Hibbertia cuneiformis (Cutleaf Hibbertia)*			
229.	20051	*Hibbertia diamesogenos*			

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230.	5125	*Hibbertia ferruginea*			
231.	5126	*Hibbertia furfuracea*			
232.	5129	*Hibbertia glomerata*			
233.	19777	*Hibbertia glomerata subsp. glomerata*			
234.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
235.	5161	*Hibbertia quadricolor*			
236.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
237.		*Hibbertia sp. Bankstown (R.T.Miller & C.P.Gibson s.n. 18/10/06)*			
238.	5172	*Hibbertia stellaris (Orange Stars)*			
239.	5176	*Hibbertia vaginata*			
Droseraceae					
240.	13200	*Drosera enodes*			
241.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
242.	3097	*Drosera gigantea (Giant Sundew)*			
243.	15453	*Drosera gigantea subsp. gigantea*			
244.	3106	*Drosera macrantha (Bridal Rainbow)*			
245.	14298	*Drosera macrantha subsp. macrantha*			
246.	3109	*Drosera menziesii (Pink Rainbow)*			
247.	13216	*Drosera menziesii subsp. penicillaris*			
248.	11768	*Drosera neesii subsp. neesii*			
249.	3118	*Drosera pallida (Pale Rainbow)*			
250.		*Drosera sp.*			
251.	13385	*Drosera stelliflora*			
Elaeocarpaceae					
252.	4524	*Platytheca galioides*			
253.	4535	*Tetratheca hirsuta (Black Eyed Susan)*			
254.	4544	*Tetratheca setigera*			
255.	4548	*Tremandra stelligera*			
Ericaceae					
256.	6306	*Andersonia caerulea (Foxtails)*			
257.	6311	*Andersonia heterophylla*			
258.	6317	*Andersonia micrantha*			
259.	6322	*Astroloma baxteri*			
260.	6323	*Astroloma ciliatum (Candle Cranberry)*			
261.	6334	*Astroloma pallidum (Kick Bush)*			
262.	6348	*Conostephium pendulum (Pearl Flower)*			
263.		*Conostephium sp.*			
264.	6360	*Leucopogon australis (Spiked Beard-heath)*			
265.	6367	*Leucopogon capitellatus*			
266.	6374	*Leucopogon conostephioides*			
267.	6389	*Leucopogon elatior*			
268.	6396	*Leucopogon glabellus*			
269.	6402	*Leucopogon hirsutus*			
270.	41260	*Leucopogon microcarpus*			
271.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
272.	6428	*Leucopogon pendulus*			
273.	6436	*Leucopogon propinquus*			
274.	6439	*Leucopogon pulchellus (Beard-heath)*			
275.		*Leucopogon sp.*			
276.	29492	*Leucopogon sp. Busselton (D. Cooper 243)*		P2	
277.	6451	*Leucopogon tenuis*			
278.	6454	*Leucopogon verticillatus (Tassel Flower)*			
279.	6456	*Lysinema ciliatum (Curry Flower)*			
280.	34736	*Lysinema pentapetalum*			
281.		*Lysinema sp.*			
282.	6464	*Needhamiella pumilio*			
283.	31931	*Sphenotoma capitata*			
284.		*Sphenotoma sp.*			
285.		*Styphelia tenuifolia*			
Euphorbiaceae					
286.	4586	*Amperea micrantha*		P2	
287.	16493	*Calycopeplus oligandrus*			
288.	4638	*Euphorbia peplus (Petty Spurge)*	Y		
289.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
290.	4662	*Monotaxis grandiflora (Diamond of the Desert)*			
291.	4666	*Monotaxis occidentalis*			
292.	4695	*Ricinocarpos glaucus*			
293.	19942	*Ricinocarpos undulatus*			

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Fabaceae					
294.	15429	*Acacia alata var. alata*			
295.	11731	*Acacia browniana var. browniana*			
296.	3262	*Acacia cochlearis (Rigid Wattle)*			
297.	3282	*Acacia cyclops (Coastal Wattle)*			
298.	16975	*Acacia decurrens*	Y		
299.	3331	*Acacia extensa (Wiry Wattle)*			
300.	3339	*Acacia flagelliformis*		P4	
301.	14117	*Acacia heteroclita subsp. valida*		P2	
302.	3374	*Acacia huegelii*			
303.	3383	*Acacia incurva*			
304.	3410	*Acacia lateriticola*			
305.	14930	*Acacia lateriticola glabrous variant (B.R. Maslin 6765)*		P3	
306.	3424	*Acacia littorea*			
307.	3448	*Acacia mooreana*			
308.	3454	*Acacia nervosa (Rib Wattle)*			
309.	3464	*Acacia obovata*			
310.	3496	*Acacia preissiana*			
311.	15481	*Acacia pulchella var. glaberrima*			
312.	15483	*Acacia pulchella var. pulchella*			
313.	3504	*Acacia pycnantha (Golden Wattle)*	Y		
314.	30036	*Acacia saligna subsp. stolonifera*			
315.	3537	*Acacia semitrullata*		P4	
316.		*Acacia sp.*			
317.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
318.	3576	*Acacia tetragonocarpa*			
319.	3688	*Aotus gracillima*			
320.	14396	*Bossiaea aquifolium subsp. aquifolium*			
321.	3708	*Bossiaea disticha*		P4	
322.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
323.	3713	*Bossiaea linophylla*			
324.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
325.	3717	*Bossiaea pulchella*			
326.	10861	*Callistachys lanceolata (Wonnich)*			
327.	13112	*Chorizema aciculare subsp. aciculare*			
328.	13111	*Chorizema aciculare subsp. laxum*			
329.	13113	*Chorizema carinatum*		P3	
330.	8971	*Chorizema cordatum*			
331.	3754	*Chorizema diversifolium*			
332.	3757	*Chorizema glycinifolium*			
333.	12765	*Chorizema nanum*			
334.	3760	*Chorizema reticulatum (Showy Flame Pea)*			
335.	14586	*Chorizema spathulatum*			
336.	3793	*Daviesia angulata*			
337.	3799	*Daviesia cordata (Bookleaf)*			
338.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			
339.	3816	*Daviesia incrassata*			
340.	3817	*Daviesia inflata*			
341.	3819	*Daviesia longifolia*			
342.	3832	*Daviesia physodes*			
343.		*Daviesia sp.*			
344.		*Dillwynia sp.*			
345.	3867	*Dipogon lignosus (Dolichos Pea)*	Y		
346.	3872	*Euchilopsis linearis (Swamp Pea)*			
347.	20214	*Eutaxia myrtifolia*			
348.	3880	*Eutaxia virgata*			
349.	3895	*Gastrolobium calycinum (York Road Poison)*			
350.	20475	*Gastrolobium capitatum*			
351.	20473	*Gastrolobium ebracteolatum*			
352.	20512	*Gastrolobium praemorsum*			
353.	3920	*Gastrolobium pyramidale*			
354.	30453	*Gastrolobium sp. Yoongarillup (S.Dilkes s.n. 1/9/1969)*		P1	
355.	3948	*Gompholobium capitatum*			
356.	10909	*Gompholobium confertum*			
357.	3950	*Gompholobium knightianum*			
358.	3951	*Gompholobium marginatum*			
359.	3953	*Gompholobium ovatum*			
360.	3954	*Gompholobium polymorphum*			
361.	11083	*Gompholobium scabrum*			
362.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			

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363.	11115	*Gompholobium villosum*			
364.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
365.		*Hardenbergia sp.*			
366.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
367.	3965	*Hovea elliptica (Tree Hovea)*			
368.	3967	*Hovea stricta*			
369.	3968	*Hovea trisperma (Common Hovea)*			
370.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
371.	19700	*Isotropis cuneifolia subsp. cuneifolia*			
372.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
373.	20462	*Jacksonia gracillima*		P3	
374.	4017	*Jacksonia horrida*			
375.	4036	*Kennedia carinata*			
376.	4037	*Kennedia coccinea (Coral Vine)*			
377.	37940	*Kennedia coccinea subsp. coccinea*			
378.	33518	*Kennedia lateritia (Augusta Kennedia)*		T	
379.	4041	*Kennedia microphylla*			
380.		*Kennedia parviflora*			
381.	4044	*Kennedia prostrata (Scarlet Runner)*			
382.	4045	*Kennedia stirlingii (Bushy Kennedia)*			
383.	3669	*Labichea punctata (Lance-leaved Cassia)*			
384.	4052	*Latrobea tenella*			
385.	4073	*Medicago intertexta (Calvary Medic)*	Y		
386.	4085	*Melilotus indicus*	Y		
387.	4090	*Mirbelia dilatata (Holly-leaved Mirbelia)*			
388.	3618	*Paraserianthes lophantha (Albizia)*			
389.	20195	*Pultenaea brachytropis*			
390.	4179	*Pultenaea pinifolia*		P3	
391.	4180	*Pultenaea radiata*			
392.	20302	*Sphaerolobium hygrophilum*			
393.	4206	*Sphaerolobium macranthum*			
394.	4207	*Sphaerolobium medium*			
395.	4210	*Sphaerolobium scabriusculum*			
396.	4256	*Templetonia retusa (Cockies Tongues)*			
397.	4297	*Trifolium glomeratum (Cluster Clover)*	Y		
398.	4298	*Trifolium hirtum (Rose Clover)*	Y		
399.	15659	*Trifolium lappaceum var. lappaceum*	Y		
400.	17115	*Trifolium repens var. repens*	Y		
401.	14738	*Trifolium resupinatum var. resupinatum*	Y		
402.	4319	*Vicia benghalensis (Purple Vetch)*	Y		
403.	4325	*Viminaria juncea (Swishbush, Koweda)*			
Fossombroniaceae					
404.		*Fossombronia alata*			
Funariaceae					
405.	32370	*Funaria hygrometrica*			
Gentianaceae					
406.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
Geraniaceae					
407.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
408.	4339	*Geranium molle (Dove's Foot Cranesbill)*	Y		
409.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
410.	4346	*Pelargonium littorale*			
411.		*Pelargonium sp.*			
Goodeniaceae					
412.	12724	*Anthotium junciforme*			
413.	7444	*Dampiera hederacea (Karri Dampiera)*			
414.	7452	*Dampiera leptoclada (Slender-shooted Dampiera)*			
415.	7454	*Dampiera linearis (Common Dampiera)*			
416.		*Dampiera sp.*			
417.	7484	*Dampiera trigona (Angled-stem Dampiera)*			
418.	7487	*Diaspasis filifolia (Thread-leaved Diaspasis)*			
419.	7523	*Goodenia leptoclada (Thin-stemmed Goodenia)*			
420.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
421.	7572	*Lechenaultia expansa*			
422.	7595	*Scaevola anchusifolia*			
423.	7602	*Scaevola calliptera*			
424.	7606	*Scaevola crassifolia (Thick-leaved Fan-flower)*			
425.	7614	*Scaevola globulifera*			

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426.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
427.	7626	*Scaevola nitida (Shining Fanflower)*			
428.	7665	*Velleia trinervis*			
Gracilariaceae					
429.	26712	*Curdiea obesa*			
Haemodoraceae					
430.	1407	*Anigozanthos flavidus (Tall Kangaroo Paw)*			
431.	1409	*Anigozanthos humilis (Catspaw)*			
432.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
433.	11261	*Anigozanthos manglesii subsp. manglesii*			
434.	1416	*Anigozanthos viridis (Green Kangaroo Paw, Kurulbardang)*			
435.	11566	*Anigozanthos viridis subsp. viridis*			
436.	11826	*Conostylis aculeata subsp. aculeata*			
437.	12109	*Conostylis aculeata subsp. preissii*			
438.	11597	*Conostylis setigera subsp. setigera*			
439.	1481	*Tribonanthes australis*			
440.	1486	*Wachendorfia paniculata*	Y		
Haloragaceae					
441.	33620	*Glischrocaryon angustifolium*			
442.	34676	*Meionectes brownii (Swamp Raspwort)*			
443.	6185	*Myriophyllum aquaticum (Brazilian Water Milfoil)*	Y		
444.	6198	*Myriophyllum salsugineum*			
445.		*Myriophyllum sp.*			
Hemerocallidaceae					
446.	23474	*Agrostocrinum hirsutum*			
447.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
448.	1276	*Caesia micrantha (Pale Grass Lily)*			
449.	1277	*Caesia occidentalis*			
450.	1294	*Hodgsoniola junciformis*			
451.	1296	*Johnsonia inconspicua*		P3	
452.	1297	*Johnsonia lupulina (Hooded Lily)*			
453.	1260	*Stypandra glauca (Blind Grass)*			
454.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
455.	1362	*Tricoryne humilis*			
Hydatellaceae					
456.	1139	*Trithuria bibracteata*			
Hypericaceae					
457.	5181	*Hypericum japonicum (Matted St John's Wort)*			
Hypoxidaceae					
458.	43762	*Pauridia occidentalis var. quadriloba*			
Iridaceae					
459.	18280	*Babiana nana*	Y		
460.	1513	*Chasmanthe floribunda (African Cornflag)*	Y		
461.	19177	*Moraea setifolia*	Y		
462.	1537	*Orthrosanthus laxus (Morning Iris)*			
463.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
464.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
465.		*Patersonia sp.*			
466.	1553	*Patersonia umbrosa (Yellow Flags)*			
467.	11550	*Patersonia umbrosa var. xanthina (Yellow Flags)*			
468.	14485	*Romulea flava var. minor*	Y		
469.	1558	*Sparaxis bulbifera*	Y		
Juncaceae					
470.	1178	*Juncus bufonius (Toad Rush)*	Y		
471.	1184	*Juncus holoschoenus (Jointleaf Rush)*			
472.	11922	*Juncus kraussii subsp. australiensis*			
473.	1188	*Juncus pallidus (Pale Rush)*			
474.	1195	*Juncus subsecundus (Finger Rush)*			
Juncaginaceae					
475.	146	*Triglochin minutissima*			
476.	147	*Triglochin mucronata*			
477.	148	*Triglochin muelleri*			
478.	18587	*Triglochin nana*			
479.		*Triglochin sp.*			
480.	152	*Triglochin trichophora*			

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Lamiaceae					
481.	6837	*Hemiandra leiantha*			
482.	6839	*Hemiandra pungens (Snakebush)*			
483.		*Hemiandra sp. Jurien (B.J.Conn 3885 & M.E.Tozer)*			
484.	6856	*Hemigenia incana (Silky Hemigenia)*			
485.		*Hemigenia sp.*			
486.	41020	*Hemiphora bartlingii (Woolly Dragon)*			
487.	6880	*Leonotis leonurus (Lion's Ear)*	Y		
488.	6883	*Mentha pulegium (Pennyroyal)*	Y		
489.	6886	*Mentha x piperita*	Y		
490.	15994	*Mentha x piperita var. citrata*	Y		
491.	6906	*Moluccella laevis (Molucca Balm)*	Y		
Lauraceae					
492.	2956	*Cassytha pomiformis (Dodder Laurel)*			
493.	2957	*Cassytha racemosa (Dodder Laurel)*			
494.	11799	*Cassytha racemosa forma racemosa*			
Lentibulariaceae					
495.	7138	*Utricularia inaequalis*			
496.	7145	*Utricularia menziesii (Redcoats)*			
Loganiaceae					
497.	13128	*Logania serpyllifolia subsp. angustifolia*			
498.	6515	*Logania vaginalis (White Spray)*			
Loranthaceae					
499.	2380	*Amyema miquelii (Stalked Mistletoe)*			
Malvaceae					
500.	40863	*Commersonia corylifolia (Hazel-leaved Rulingia)*			
501.	45084	*Lasiopetalum laxiflorum*		P3	
502.	36522	*Malva pseudolavatera*	Y		
503.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
Melianthaceae					
504.	4785	*Melianthus major*	Y		
Menyanthaceae					
505.	36160	*Liparophyllum capitatum*			
506.	36178	*Liparophyllum lasiospermum*			
507.	36181	*Ornduffia parnassifolia*			
508.	36200	*Ornduffia submersa*		P4	
Myrtaceae					
509.	5315	*Actinodium cunninghamii (Albany Daisy)*			
510.	5316	*Agonis flexuosa (Peppermint, Wonil)*			
511.	17202	*Agonis flexuosa var. flexuosa*			
512.	5392	*Beaufortia sparsa (Swamp Bottlebrush)*			
513.	5394	*Callistemon glaucus*			
514.	5415	*Calothamnus lateralis*			
515.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush, Kwowdjard)*			
516.	35796	*Calothamnus quadrifidus subsp. teretifolius*		P4	
517.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
518.	5458	*Calytrix flavescens (Summer Starflower)*			
519.	5465	*Calytrix leschenaultii*			
520.	5482	*Calytrix tenuiramea*			
521.	5491	*Chamelaucium ciliatum*			
522.	43980	*Chamelaucium sp. S coastal plain (R.D.Royce 4872)*		T	
523.	35657	*Chamelaucium sp. Yoongarillup (G.J. Keighery 3635)*		P4	
524.	17104	*Corymbia calophylla (Marri)*			
525.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
526.	5533	*Darwinia vestita (Pom-pom Darwinia)*			
527.	5605	*Eucalyptus cornuta (Yate, Yeid)*			
528.	5615	*Eucalyptus decipiens (Limestone Marlock, Moit)*			
529.	5625	*Eucalyptus diversicolor (Karri)*			
530.	5659	*Eucalyptus gomphocephala (Tuart, Duart)*			
531.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
532.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
533.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
534.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
535.	5818	*Hypocalymma cordifolium*			
536.	5819	*Hypocalymma ericifolium*			
537.	5825	*Hypocalymma robustum (Swan River Myrtle)*			

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538.		*Hypocalymma sp.*			
539.	5835	*Kunzea micrantha*			
540.	17508	*Kunzea micrantha subsp. oligandra*			
541.	17505	*Kunzea praestans*			
542.	5841	*Kunzea recurva*			
543.	14776	*Kunzea rostrata*			
544.		*Leptospermum sp.*			
545.	37580	*Melaleuca acutifolia*			
546.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
547.	13273	*Melaleuca incana subsp. incana*			
548.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
549.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
550.	5930	*Melaleuca leiopyxis*			
551.	20297	*Melaleuca osullivanii*			
552.	18394	*Melaleuca parviceps*			
553.	5946	*Melaleuca pauciflora*			
554.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
555.		*Melaleuca sp.*			
556.	18598	*Melaleuca systena*			
557.	5980	*Melaleuca thymoides*			
558.	5984	*Melaleuca uncinata (Broom Bush, Kwidjard)*			
559.	5987	*Melaleuca viminea (Mohan)*			
560.	13280	*Melaleuca viminea subsp. viminea*			
561.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
562.	16477	*Pericalymma ellipticum var. ellipticum*			
563.	16478	*Pericalymma ellipticum var. floridum*			
564.		*Pericalymma sp.*			
565.	20135	*Taxandria linearifolia*			
566.	20133	*Taxandria parviceps*			
567.	12392	*Verticordia attenuata*		P3	
568.	12411	*Verticordia densiflora var. cespitosa*			
569.	15432	*Verticordia densiflora var. densiflora*			
570.	12412	*Verticordia densiflora var. pedunculata*		T	
571.	6084	*Verticordia habrantha (Hidden Featherflower)*			
572.	6093	*Verticordia lehmannii*		P4	
573.	6110	*Verticordia plumosa (Plumed Featherflower)*			
574.	12448	*Verticordia plumosa var. ananeotes*		T	
575.	15618	*Verticordia plumosa var. plumosa*			
576.	12453	*Verticordia plumosa var. vassensis*		T	
Nymphaeaceae					
577.	2922	*Nymphaea mexicana (Yellow Waterlily)*	Y		
Oleaceae					
578.	11937	*Olea europaea subsp. europaea*	Y		
Onagraceae					
579.	11992	*Epilobium billardiereanum subsp. intermedium*			
580.		*Epilobium sp.*			
581.	16390	*Oenothera drummondii subsp. drummondii*	Y		
Orchidaceae					
582.	13853	*Caladenia arrecta*			
583.	18035	*Caladenia bicalliata subsp. bicalliata*			
584.	15579	*Caladenia chapmanii*			
585.	15341	*Caladenia citrina*			
586.	15354	*Caladenia hirta subsp. hirta*			
587.	1596	*Caladenia huegelii (Grand Spider Orchid)*		T	
588.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
589.	15365	*Caladenia longicauda subsp. longicauda*			
590.	1604	*Caladenia macrostylis (Leaping Spider Orchid)*			
591.	1605	*Caladenia marginata (White Fairy Orchid)*			
592.	1608	*Caladenia nana (Pink Fan Orchid)*			
593.	15372	*Caladenia nana subsp. unita*			
594.	15503	*Caladenia paludosa*			
595.	1609	*Caladenia pectinata (King Spider Orchid)*			
596.	1610	*Caladenia plicata (Crab-lipped Spider Orchid)*			
597.	18038	*Caladenia procera*		T	
598.		*Caladenia sp.*			
599.	18040	*Caladenia thinicola*			
600.		*Caladenia versicolor*			
601.	1624	*Corybas despectans*			

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602.	15114	*Cyanicula gemmata*			
603.	15404	*Cyanicula sericea*			
604.	11049	*Diuris corymbosa*			
605.	1633	*Diuris laevis (Nannygoat Orchid)*			
606.	1634	*Diuris laxiflora (Bee Orchid)*			
607.	1637	*Diuris purdiei (Purdie's Donkey Orchid)*		T	
608.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
609.		*Diuris sp.*			
610.	1639	*Drakaea elastica (Glossy-leaved Hammer Orchid)*		T	
611.	1640	*Drakaea glyptodon (King-in-his-carriage)*			
612.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
613.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
614.		*Elythranthera sp.*			
615.	15410	*Eriochilus dilatatus subsp. dilatatus*			
616.	15412	*Eriochilus dilatatus subsp. multiflorus*			
617.	1647	*Eriochilus scaber (Pink Bunny Orchid)*			
618.	15415	*Eriochilus scaber subsp. scaber*			
619.	15418	*Leptoceras menziesii*			
620.	1656	*Lyperanthus serratus (Rattle Beak Orchid)*			
621.	1657	*Microtis alba (White Mignonette Orchid)*			
622.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
623.	10954	*Microtis media (Tall Mignonette Orchid)*			
624.	15419	*Microtis media subsp. media*			
625.	15424	*Praecoxanthus aphyllus*			
626.	1668	*Prasophyllum brownii*			
627.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
628.	1674	*Prasophyllum giganteum (Bronze Leek Orchid)*			
629.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
630.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
631.	15426	*Pterostylis aspera*			
632.	1693	*Pterostylis recurva (Jug Orchid)*			
633.	1694	*Pterostylis rogersii (Curled-tongue Shell Orchid)*			
634.	12217	*Pterostylis sanguinea*			
635.		*Pterostylis sp.*			
636.	1698	*Pterostylis vittata (Banded Greenhood)*			
637.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
638.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
639.	1702	*Thelymitra campanulata (Shirt Orchid)*			
640.	1704	*Thelymitra cornicina (Lilac Sun Orchid)*			
641.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
642.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
643.	11143	*Thelymitra graminea*			
644.	1715	*Thelymitra spiralis (Curlylocks)*			
645.	1717	*Thelymitra variegata (Queen of Sheba)*		P2	
646.	1718	*Thelymitra villosa (Custard Orchid)*			
647.	20731	*Thelymitra vulgaris*			
Orobanchaceae					
648.	15037	*Bartsia trixago*	Y		
649.		*Orobanche cernua var. australiana*			
650.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
651.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
Oxalidaceae					
652.	17212	*Oxalis depressa*	Y		Y
653.	4354	*Oxalis incarnata*	Y		
654.		*Oxalis sp.*			
Papaveraceae					
655.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
656.	2971	*Fumaria muralis (Wall Fumitory)*	Y		
Philydraceae					
657.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
Phyllanthaceae					
658.	4675	*Phyllanthus calycinus (False Boronia)*			
659.		*Phyllanthus gunnii*			Y
660.	17794	*Phyllanthus tenellus*	Y		
661.	4690	*Poranthera huegelii*			
Pittosporaceae					
662.	3157	*Billardiera floribunda (White-flowered Billardiera)*			

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663.	25796	*Billardiera heterophylla (Australian Bluebell)*			
664.	3165	*Billardiera variifolia*			
Plantaginaceae					
665.	4717	*Callitriche stagnalis (Common Starwort)*	Y		
666.	14282	*Gratiola pubescens*			
667.	7299	*Plantago debilis*			
Poaceae					
668.	177	*Agrostis capillaris*	Y		
669.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
670.	35159	*Ammophila arenaria subsp. arenaria*	Y		
671.	13380	*Amphibromus nervosus*			
672.	197	*Amphipogon debilis*			
673.	198	*Amphipogon laguroides*			
674.	17233	*Austrostipa campylachne*			
675.	17240	*Austrostipa flavescens*			
676.	17253	*Austrostipa semibarbata*			
677.	37421	*Austrostipa sp. Marchagee (B.R. Maslin 1407)*			
678.	17254	*Austrostipa tenuifolia*			
679.	233	*Avena barbata (Bearded Oat)*	Y		
680.	234	*Avena fatua (Wild Oat)*	Y		
681.	245	*Briza minor (Shivery Grass)*	Y		
682.	250	*Bromus hordeaceus (Soft Brome)*	Y		
683.	252	*Bromus madritensis (Madrid Brome)*	Y		
684.		*Bromus sp.*			
685.	13685	*Catapodium rigidum (Rigid Fescue)*	Y		
686.	41564	*Cenchrus clandestinus (Kikuyu Grass)*	Y		
687.	277	*Cortaderia selloana (Pampas Grass)*	Y		
688.	283	*Cynodon dactylon (Couch)*	Y		
689.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
690.	311	*Digitaria ciliaris (Summer Grass)*	Y		
691.	338	*Echinochloa telmatophila (Swamp Barnyard Grass)*	Y		
692.	351	*Ehrharta villosa (Pyp Grass)*	Y		
693.	352	*Eleusine coracan*	Y		
694.		*Eragrostis sp.*			
695.	17043	*Glyceria declinata*	Y		
696.	438	*Hainardia cylindrica (Common Barbgrass)*	Y		
697.	439	*Hemarthria uncinata (Matgrass)*			
698.	11451	*Hemarthria uncinata var. uncinata*			
699.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
700.	450	*Hordeum marinum*	Y		
701.	20019	*Lachnagrostis filiformis*			
702.	19955	*Lachnagrostis plebeia*			
703.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
704.	8682	*Lolium loliaceum (Stiff Ryegrass)*	Y		
705.	11766	*Lolium temulentum forma arvense*	Y		
706.	485	*Microlaena stipoides (Weeping Grass)*			
707.	516	*Parapholis incurva (Coast Barbgrass)*	Y		
708.	19681	*Phalaris arundinacea var. picta*	Y		Y
709.	551	*Phalaris minor (Lesser Canary Grass)*	Y		
710.	571	*Poa annua (Winter Grass)*	Y		
711.	573	*Poa drummondiana (Knotted Poa)*			
712.	577	*Poa poiformis (Coastal Poa)*			
713.	578	*Poa porphyroclados*			
714.	579	*Poa pratensis (Kentucky Bluegrass)*	Y		
715.		*Polypogon lutosus*			Y
716.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
717.	583	*Polypogon tenellus*			
718.	31673	*Puccinellia vassica*		P1	
719.	40431	*Rytidosperma acerosum*			
720.	40425	*Rytidosperma caespitosum*			
721.	40430	*Rytidosperma pilosum*			
722.	625	*Spinifex longifolius (Beach Spinifex)*			
723.	626	*Spinifex sericeus*	Y		
724.	627	*Spinifex x alterniflorus*			
725.	635	*Sporobolus virginicus (Marine Couch)*			
726.	636	*Stenotaphrum secundatum (Buffalo Grass)*	Y		
727.	11137	*Vulpia fasciculata*	Y		
728.	12052	*Vulpia myuros forma megalura*	Y		
729.	33101	*Vulpia myuros forma myuros*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Podocarpaceae					
730.	86	*Podocarpus drouynianus (Wild Plum, Kula)*			
Polygalaceae					
731.	4552	*Comesperma confertum*			
732.	4554	*Comesperma flavum*			
733.	4564	*Comesperma virgatum (Milkwort)*			
734.	8395	*Polygala myrtifolia (Myrtleleaf Milkwort)*	Y		
Polygonaceae					
735.	14934	*Persicaria orientalis*	Y		
736.	11052	*Persicaria prostrata*			
737.	2419	*Polygonum aviculare (Wireweed)*	Y		
738.	2430	*Rumex brownii (Swamp Dock)*	Y		
739.	11541	*Rumex dumosus var. dumosus*			
Posidoniaceae					
740.	123	*Posidonia australis (Fibreball Weed)*			
741.	125	*Posidonia sinuosa*			
Potamogetonaceae					
742.	110	*Potamogeton drummondii*			
743.	111	*Potamogeton ochreatus (Blunt Pondweed)*			
Pottiaceae					
744.	32345	*Didymodon australasiae*			
745.	32445	*Tortula muralis*			
Primulaceae					
746.	6483	*Samolus junceus*			
747.	6484	*Samolus repens (Creeping Brookweed)*			
748.	6485	*Samolus valerandi (Water Pimpernel)*	Y		
Proteaceae					
749.	14970	*Adenanthos barbiger*			
750.	1790	*Adenanthos meisneri*			
751.	1791	*Adenanthos obovatus (Basket Flower)*			
752.		*Adenanthos sp.*			
753.	28281	*Adenanthos sp. Whicher Range (G.J. Keighery 9736)*			
754.	32676	*Banksia biterax*			
755.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
756.	32202	*Banksia nivea (Honeypot Dryandra, Pudjarn)*			
757.	32204	*Banksia nivea subsp. uliginosa*		T	
758.	1848	*Banksia seminuda (River Banksia)*			
759.	32078	*Banksia sessilis var. cordata*		P4	
760.		*Banksia sp.*			
761.	15607	*Conospermum acerosum subsp. acerosum*			
762.	1862	*Conospermum caeruleum (Blue Brother)*			
763.	16875	*Conospermum caeruleum subsp. debile*			
764.	15609	*Conospermum caeruleum subsp. marginatum*			
765.	1872	*Conospermum flexuosum (Tangled Smokebush)*			
766.	16850	*Conospermum flexuosum subsp. laevigatum*			
767.	16847	*Conospermum paniculatum*		P3	
768.	1883	*Conospermum teretifolium (Spider Smokebush)*			
769.	1945	*Franklandia triaristata (Lanoline Bush)*		P4	
770.	1967	*Grevillea brachystylis (Short-styled Grevillea)*			
771.	14011	*Grevillea brachystylis subsp. brachystylis*		P3	
772.	12219	*Grevillea bronwenae*		P3	
773.	14526	*Grevillea elongata*		T	
774.	2029	*Grevillea leptobotrys*			
775.	13427	*Grevillea manglesioides subsp. manglesioides*			
776.	2078	*Grevillea pulchella (Beautiful Grevillea)*			
777.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
778.	2112	*Grevillea trifida*			
779.	12824	*Grevillea vestita subsp. vestita*			
780.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
781.	2137	*Hakea ceratophylla (Horned Leaf Hakea)*			
782.	2152	*Hakea cyclocarpa (Ramshorn)*			
783.		*Hakea cycloptera*			
784.	2190	*Hakea oldfieldii*		P3	
785.	2194	*Hakea petiolaris (Sea Urchin Hakea)*			
786.	2203	*Hakea ruscifolia (Candle Hakea)*			
787.	2206	*Hakea stenocarpa (Narrow-fruited Hakea)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
788.	2212	*Hakea sulcata (Furrowed Hakea)*			
789.	2217	*Hakea verrucosa*			
790.	2223	*Isopogon axillaris*			
791.	8844	*Isopogon crithmifolius*			
792.	2230	*Isopogon formosus (Rose Coneflower)*			
793.	16522	*Isopogon formosus subsp. dasylepis*		P3	
794.		*Isopogon sp.*			
795.	2237	*Isopogon sphaerocephalus (Drumstick Isopogon)*			
796.	17734	*Lambertia echinata subsp. occidentalis*		T	
797.	19186	*Lambertia orbifolia subsp. Scott River Plains (L.W. Sage 684)*		T	
798.	2267	*Persoonia longifolia (Snottygobble)*			
799.	2283	*Petrophile anceps*			
800.	2293	*Petrophile diversifolia*			
801.	14395	*Petrophile glauca*			
802.	2299	*Petrophile linearis (Pixie Mops)*			
803.	2302	*Petrophile media*			
804.	2309	*Petrophile serruriae*			
805.		*Petrophile sp.*			
806.	2311	*Petrophile squamata*			
807.	17765	*Petrophile squamata subsp. squamata*			
808.	2316	*Stirlingia latifolia (Blueboy)*			
809.	2317	*Stirlingia simplex*			
810.	2320	*Strangea stenocarpoides*			
811.	15529	*Synaphea floribunda*			
812.	16769	*Synaphea hians*		P3	
813.	2324	*Synaphea petiolaris (Synaphea)*			
814.	16864	*Synaphea petiolaris subsp. petiolaris*			
815.	16862	*Synaphea petiolaris subsp. simplex*		P2	
816.	16863	*Synaphea petiolaris subsp. triloba*			
817.	15535	*Synaphea whicherensis*			
818.	2331	*Xylomelum occidentale (Woody Pear, Djandin)*			
Pteridaceae					
819.	8462	*Cheilanthes tenuifolia (Rock Fern)*			
Ranunculaceae					
820.	2929	*Clematis pubescens (Common Clematis)*			
821.	2932	*Ranunculus colonorum (Common Buttercup)*			
822.	2933	*Ranunculus muricatus (Sharp Buttercup)*	Y		
Restionaceae					
823.	17685	*Chaetanthus aristatus*			
824.	1065	*Chaetanthus leptocarpoides*			
825.	17687	*Chaetanthus tenellus*			
826.	17688	*Chordifex amblycoleus*			
827.	17689	*Chordifex laxus*			
828.	17692	*Cytogonidium leptocarpoides*			
829.	15831	*Desmocladus castaneus*			
830.	17846	*Desmocladus parthenicus*			
831.	1070	*Hypolaena exsulca*			
832.	17841	*Hypolaena pubescens*			
833.	16836	*Hypolaena viridis*			
834.	15556	*Leptocarpus elegans*			
835.		*Leptocarpus elegans MS*			
836.	1085	*Lepyrodia glauca*			
837.	1090	*Lepyrodia muirii*			
838.	1092	*Loxocarya cinerea*			
839.	13779	*Loxocarya magna*		P3	
840.	17679	*Meeboldina coangustata*			
841.	17747	*Meeboldina decipiens*			
842.	1098	*Meeboldina denmarkica*			
843.	17677	*Meeboldina roycei*			
844.		*Meeboldina roycei MS*			
845.	17694	*Meeboldina scariosa*			
846.	17682	*Melanostachya ustulata*			
847.	18381	*Stenotalis ramosissima*			
848.	17684	*Tremulina tremula*			
Rhamnaceae					
849.	13484	*Cryptandra arbutiflora var. tubulosa*			
850.	4809	*Cryptandra pungens*			
851.	4828	*Spyridium globulosum (Basket Bush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
852.	13479	*Trymalium ledifolium var. rosmarinifolium*			
Rhodomelaceae					
853.	26663	*Cladurus elatus*			
854.	26998	*Laurencia brongniartii*			
855.	26999	*Laurencia clavata*			
856.	27001	*Laurencia filiformis*			
857.	27107	*Osmundaria prolifera*			
858.	27162	*Pollexfenia pedicellata*			
859.	27190	*Protokuetzingia australasica*			
860.	27360	*Vidalia spiralis*			
Rosaceae					
861.	20506	*Rubus anglocandicans*	Y		
Rubiaceae					
862.	29283	*Coprosma repens*	Y		
863.	17348	*Galium aparine (Goosegrass)*	Y		
864.	7323	*Galium murale (Small Goosegrass)*	Y		
865.	25797	*Galium spurium*	Y		
866.	18254	*Opercularia apiciflora*			
867.	18256	*Opercularia spermacocea*			
Rutaceae					
868.	4406	*Boronia busselliana*			
869.	17653	*Boronia crenulata subsp. pubescens*			
870.	4417	*Boronia dichotoma*			
871.	4423	*Boronia heterophylla (Kalgan Boronia)*			
872.	4428	*Boronia megastigma (Scented Boronia)*			
873.	4429	*Boronia molloyae (Tall Boronia)*			
874.	4436	*Boronia pulchella (Pink Boronia)*			
875.	17665	*Boronia purdieana subsp. purdieana*			
876.	4441	*Boronia spathulata (Boronia)*			
877.	20392	*Boronia tenuior*			
878.	4448	*Chorilaena quercifolia (Chorilaena)*			
879.	4454	*Diplolaena dampieri (Southern Diplolaena)*			
880.	18529	*Philotheca spicata (Pepper and Salt)*			
881.	18547	*Rhadinothamnus anceps*			
Santalaceae					
882.	10907	*Exocarpos odoratus (Scented Ballart)*			
883.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
884.	17703	*Leptomeria ellytes*			
885.	17702	*Leptomeria furtiva*		P2	
886.	2355	*Leptomeria squarrulosa*			
887.	2356	*Santalum acuminatum (Quandong, Warnga)*			
Sapindaceae					
888.	4757	*Dodonaea ceratocarpa*			
889.	17338	*Dodonaea viscosa subsp. viscosa*	Y		
Scrophulariaceae					
890.	7054	*Dischisma arenarium*	Y		
891.	17175	*Eremophila glabra subsp. albicans*			
892.	7292	*Myoporum oppositifolium (Twin-leaf Myoporum)*			
893.		*Myoporum sp.*			
894.	7107	*Verbascum virgatum (Twiggy Mullein)*	Y		
Sematophyllaceae					
895.	32433	*Sematophyllum homomallum*			
Siphonocladaceae					
896.	26770	*Dictyosphaeria sericea*			
Solanaceae					
897.	6949	*Anthocercis littorea (Yellow Tailflower)*			
898.	6965	*Datura wrightii (Hairy Thornapple)*	Y		
899.	6970	*Nicandra physalodes (Apple of Peru)*	Y		
900.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
901.	7037	*Solanum symonii*			
Stylidiaceae					
902.	7673	*Levenhookia pauciflora (Deceptive Stylewort)*			
903.	7676	*Levenhookia pusilla (Midget Stylewort)*			
904.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
905.	30278	*Stylidium androsaceum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
906.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
907.	7718	*Stylidium diversifolium (Touch-me-not)*			
908.	7719	*Stylidium ecorne (Foot Triggerplant)*			
909.	7745	*Stylidium junceum (Reed Triggerplant)*			
910.	19248	*Stylidium megacarpum*			
911.	25829	*Stylidium neurophyllum (Coastal Plain Triggerplant)*			
912.	7772	*Stylidium perpusillum (Tiny Triggerplant)*			
913.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
914.	7796	*Stylidium scandens (Climbing Triggerplant)*			
Thymelaeaceae					
915.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
916.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
917.	12077	*Pimelea ciliata subsp. longituba*		P3	
918.	5243	*Pimelea ferruginea*			
919.	5249	*Pimelea hispida (Bristly Pimelea)*			
920.	11402	*Pimelea imbricata var. piligera*			
921.	5252	*Pimelea lanata*			
922.	5253	*Pimelea lehmanniana*			
923.	11182	*Pimelea lehmanniana subsp. nervosa*			
924.	5259	*Pimelea preissii*			
925.	5261	*Pimelea rosea (Rose Banjine)*			
926.	18117	*Pimelea rosea subsp. rosea*			
927.	5264	*Pimelea spectabilis (Bunjong)*			
928.	5266	*Pimelea suaveolens (Scented Banjine)*			
929.	12041	*Pimelea suaveolens subsp. suaveolens*			
930.	5269	*Pimelea sylvestris*			
Urticaceae					
931.	1765	*Soleirolia soleirolii (Babys Tears)*	Y		
Violaceae					
932.	5216	*Hybanthus calycinus (Wild Violet)*			
Xyridaceae					
933.	1151	*Xyris laxiflora*			
Zygophyllaceae					
934.	4383	*Tribulus terrestris (Caltrop)*	Y		

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

Created By Guest user on 16/08/2016

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Line'
Vertices	33° 39' 04" S,115° 19' 25" E 33° 39' 44" S,115° 19' 28" E 33° 39' 53" S,115° 20' 06" E 33° 40' 03" S,115° 20' 21" E 33° 40' 30" S,115° 20' 46" E 33° 40' 32" S,115° 20' 58" E 33° 40' 54" S,115° 21' 23" E 33° 41' 13" S,115° 21' 39" E 33° 41' 33" S,115° 21' 55" E
Group By	Family

Family	Species	Records
Acanthizidae	7	84
Acariformes	1	3
Accipitridae	11	93
Actinopodidae	2	3
Adeonidae	1	1
Aeshnidae	1	2
Amphiuridae	1	1
Ampithoidae	1	1
Anatidae	16	693
Anhingidae	2	88
Antedonidae	1	1
Antennariidae	2	2
Anthicidae	1	1
Apidae	5	51
Aplodactylidae	1	1
Apogonidae	2	2
Araneidae	5	6
Arctiidae	3	3
Ardeidae	7	197
Artamidae	2	14
Asterinidae	1	1
Atherinidae	1	2
Atopomelidae	1	1
Balaenopteridae	1	2
Blenniidae	3	3
Bovidae	1	1
Bramidae	1	1
Buccinidae	4	10
Bullidae	1	2
Buprestidae	3	4
Burramyidae	1	1
Cacatuidae	1	69
Callionymidae	1	1
Calliostomatidae	1	3
Campephagidae	1	66
Cancellariidae	1	1
Canidae	1	1
Caprimulgidae	1	1
Carabidae	5	11
Carangidae	2	2
Carcharhinidae	1	1
Cardiidae	1	1
Carditidae	2	2
Carybdeidae	1	2
Cerambycidae	1	1
Cerithiidae	2	6
Cetorhinidae	1	1
Chaetodontidae	1	1
Chamidae	2	3
Charadriidae	7	86
Cheilodactylidae	2	3
Cheloniidae	1	1
Cheluidae	1	2
Chromodorididae	2	3
Clavulariidae	1	1
Clinidae	4	10
Coccinellidae	1	1
Coenagrionidae	1	1
Colletidae	12	42
Columbellidae	6	17
Columbidae	6	238
Congridae	1	1
Conidae	2	5
Corvidae	5	150
Costellariidae	2	2
Cracticidae	5	142
Crambidae	1	2
Cuculidae	1	2
Curculionidae	4	8
Cynoglossidae	1	2
Cypraeidae	8	20
Cyprinidae	1	1
Cystiscidae	1	4
Dasyuridae	3	13

Delphinidae	5	30
Dendrodoridae	1	1
Dermochelyidae	1	1
Dicaeidae	1	1
Dicruridae	6	233
Diodontidae	1	2
Diomedeidae	5	7
Dolichopodidae	1	3
Donacidae	1	5
Dytiscidae	1	1
Echeneidae	1	2
Elapidae	9	47
Ellobiidae	1	1
Elopidae	1	2
Epitoniidae	1	3
Falconidae	4	22
Fasciolariidae	2	5
Felidae	1	3
Fergusoninidae	1	4
Fissurellidae	4	5
Formicidae	7	26
Galaxiidae	1	1
Galeommatidae	1	2
Garypidae	1	2
Gekkonidae	1	2
Geometridae	5	5
Gerreidae	1	1
Glacidorbidae	1	1
Glycymeridae	2	2
Gobiidae	2	5
Gonorynchidae	1	1
Gorgonocephalidae	1	1
Haematopodidae	1	7
Halcyonidae	4	37
Halictidae	4	24
Haliotidae	4	5
Helicidae	1	1
Hemiramphidae	1	1
Hersiliidae	1	1
Hesperiidae	3	15
Heterodontidae	1	1
Hipponicidae	3	3
Hirundinidae	3	135
Hydrophilidae	2	3
Hygromiidae	1	1
Hylidae	1	5
Hymenosomatidae	1	1
Hypnidae	1	1
Hyriidae	1	11
Istiophoridae	1	1
Kalliapseudidae	1	1
Labridae	9	24
Lamponidae	1	4
Laridae	8	220
Leporidae	1	1
Lestidae	1	6
Limidae	1	2
Limnodynastidae	1	3
Limnoriidae	2	5
Lottiidae	3	8
Lucinidae	3	4
Lumbrineridae	1	1
Lycosidae	4	5
Macropodidae	2	2
Mactridae	1	1
Maeridae	1	5
Maluridae	3	39
Marginellidae	3	4
Megachilidae	8	65
Megapodagrionidae	2	2
Meliphagidae	12	334
Melitidae	1	2
Meropidae	2	20
Mesodesmatidae	1	4
Microcanthidae	1	1
Miturgidae	1	1
Molidae	1	1
Monacanthidae	9	17
Monocentridae	1	4
Moridae	1	1
Muricidae	3	3
Muridae	3	15
Myobatrachidae	2	10
Myrmeleontidae	1	1
Mytilidae	1	3
Nannopercidae	1	7
Nassariidae	2	9
Naticidae	3	9
Nemesiidae	1	2
Neobalaenidae	1	1
Neosebastidae	1	1
Neosittidae	2	2
Neotylenchidae	1	2
Nephilidae	1	3
Nereididae	1	1
Neritidae	1	1
Noctuidae	7	8
Notodontidae	2	2
Nymphalidae	1	12
Octopodidae	2	4
Olivellidae	1	2
Olividae	2	3
Ophichthidae	3	4
Ophidiidae	2	3
Ophiocomidae	2	2

Ophiodermatidae	1	1
Ophionereididae	1	2
Ostraciidae	5	8
Pachycephalidae	6	26
Palaemonidae	1	1
Paradoxosomatidae	1	2
Paralichthyidae	1	1
Parascylliidae	1	1
Parastacidae	1	1
Pardalotidae	2	16
Patellidae	1	1
Pectinidae	2	5
Pelecanidae	1	56
Pentacerotidae	1	1
Peramelidae	2	16
Percichthyidae	2	9
Petroicidae	4	4
Phaethontidae	1	2
Phalacrocoracidae	5	262
Phalangeridae	2	9
Phasianidae	2	4
Pinguipedidae	1	2
Platycephalidae	2	2
Plesiopidae	1	1
Pleurobranchidae	1	1
Pleuronectidae	1	1
Podargidae	2	2
Podicipedidae	2	63
Polyclinidae	1	1
Polynoidae	1	1
Pomacentridae	2	2
Pontogeneiidae	1	1
Pristiophoridae	2	2
Procellariidae	11	126
Pseudocheiridae	1	3822
Psittacidae	16	208
Pygopodidae	3	7
Rachycentridae	1	1
Rallidae	9	240
Ranellidae	3	3
Raspailiidae	1	6
Recurvirostridae	4	94
Regalecidae	1	3
Rhinobatidae	1	1
Rissoidae	2	2
Scarabaeidae	4	5
Scincidae	10	15
Scolopacidae	10	90
Scolopendridae	1	4
Scombridae	3	4
Sepiadariidae	2	2
Sepiidae	3	5
Serranidae	1	1
Sillaginidae	2	3
Soleidae	1	1
Sparassidae	1	1
Sparidae	1	1
Spheniscidae	1	1
Sphingidae	1	1
Spondylidae	1	1
Squatinidae	1	1
Staphylinidae	14	16
Stichasteridae	1	1
Stichopodidae	1	1
Sylviidae	3	16
Syngnathidae	7	19
Tarsipedidae	1	6
Tellinidae	1	3
Tenebrionidae	1	8
Terebellidae	3	3
Terebridae	1	1
Tetraodontidae	4	6
Tetrarogidae	1	1
Tettigoniidae	2	3
Theridiidae	1	1
Thomisidae	1	1
Threskiornithidae	4	262
Tortricidae	1	2
Triglidae	3	8
Tripterygiidae	1	2
Triviidae	1	2
Trochidae	22	44
Turbinidae	7	19
Turridae	1	1
Tytonidae	1	1
Uranoscopidae	1	1
Urodacidae	1	5
Veneridae	5	10
Veretillidae	1	1
Vermetidae	1	1
Vespertilionidae	2	4
Volutidae	1	1
Volutomitridae	1	1
Ziphiidae	1	2
Zosteropidae	2	133
Zygaenidae	1	2
TOTAL	**690**	**9526**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthizidae					
1.		*Acanthiza (Acanthiza) apicalis subsp. apicalis*			
2.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
3.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
4.	24262	*Acanthiza inornata (Western Thornbill)*			
5.	25530	*Gerygone fusca (Western Gerygone)*			
6.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
7.	30948	*Smicrornis brevirostris (Weebill)*			
Acariformes					
8.		*Acarina sp.*			
Accipitridae					
9.		*Accipiter (Leucospiza) fasciatus subsp. fasciatus*			
10.	24281	*Accipiter cirrocephalus subsp. cirrocephalus (Collared Sparrowhawk)*			
11.	25536	*Accipiter fasciatus (Brown Goshawk)*			
12.	24285	*Aquila audax (Wedge-tailed Eagle)*			
13.	24288	*Circus approximans (Swamp Harrier)*			
14.		*Elanus axillaris*			
15.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
16.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*		IA	
17.	24295	*Haliastur sphenurus (Whistling Kite)*			
18.	25542	*Milvus migrans (Black Kite)*			
19.		*Pandion cristatus*			
Actinopodidae					
20.		*Missulena granulosa*			
21.		*Missulena occatoria*			
Adeonidae					
22.		*Adeonellopsis sp.*			
Aeshnidae					
23.		*Adversaeschna brevistyla*			
Amphiuridae					
24.		*Amphiura (Amphiura) stictacantha*			
Ampithoidae					
25.		*Cymadusa sp.*			
Anatidae					
26.	24310	*Anas castanea (Chestnut Teal)*			
27.	24312	*Anas gracilis (Grey Teal)*			
28.	24313	*Anas platyrhynchos (Mallard)*			
29.	24315	*Anas rhynchotis (Australasian Shoveler)*			
30.		*Anas sp.*			
31.	24316	*Anas superciliosa (Pacific Black Duck)*			
32.		*Anser sp.*			
33.	24318	*Aythya australis (Hardhead)*			
34.	24319	*Biziura lobata (Musk Duck)*			
35.		*Cairina moschata*			
36.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
37.	24322	*Cygnus atratus (Black Swan)*			
38.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
39.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
40.	24329	*Stictonetta naevosa (Freckled Duck)*			
41.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
Anhingidae					
42.	25553	*Anhinga melanogaster (Darter)*			
43.		*Anhinga novaehollandiae*			
Antedonidae					
44.		*Antedon incommoda*			
Antennariidae					
45.		*Phyllophryne scortea*			
46.		*Rhycherus gloveri*			
Anthicidae					
47.		*Anthicus imitator*			Y
Apidae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
48.		*Amegilla (asaropoda)*			
49.		*Exoneura (Exoneura) bicolor*			
50.		*Exoneura (Exoneura) pictifrons*			
51.		*Exoneura (Exoneura) robusta*			
52.		*Exoneura nigrescens*			
Aplodactylidae					
53.		*Aplodactylus westralis*			
Apogonidae					
54.		*Siphamia cephalotes*			
55.		*Vincentia punctata*			
Araneidae					
56.		*Arkys walckenaeri*			
57.		*Austracantha minax*			
58.		*Cyclosa fuliginata*			
59.		*Dolophones turrigera*			Y
60.		*Eriophora biapicata*			
Arctiidae					
61.		*Arrhythmica semifusca*			
62.		*Philenora elegans*			Y
63.		*Scoliacma xuthopis*			Y
Ardeidae					
64.	25558	*Ardea ibis (Cattle Egret)*		IA	
65.	41324	*Ardea modesta (Eastern Great Egret)*		IA	
66.	24341	*Ardea pacifica (White-necked Heron)*			
67.		*Egretta garzetta*			
68.		*Egretta novaehollandiae*			
69.	24347	*Ixobrychus flavicollis subsp. australis (Australian Black Bittern)*		P1	
70.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
Artamidae					
71.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
72.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
Asterinidae					
73.		*Meridiastra gunnii*			
Atherinidae					
74.		*Atherinosoma sp.*			
Atopomelidae					
75.		*Cytostethum tasmaniense*			Y
Balaenopteridae					
76.	24046	*Balaenoptera borealis (Sei Whale)*		T	
Blenniidae					
77.		*Parablennius postoculomaculatus*			
78.		*Parablennius sp.*			
79.		*Parablennius tasmanianus*			
Bovidae					
80.	24251	*Bos taurus (European Cattle)*	Y		
Bramidae					
81.		*Brama brama*			
Buccinidae					
82.		*Buccinulum bednalli*			
83.		*Cantharus sp.*			
84.		*Cominella (Cominella) eburnea*			
85.		*Cominella (Josepha) tasmanica*			
Bullidae					
86.		*Bulla quoyii*			
Buprestidae					
87.		*Castiarina eremita*			
88.		*Castiarina subtrifasciata*			
89.		*Melobasis vittata*			
Burramyidae					
90.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
Cacatuidae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
91.		*Eolophus roseicapillus*			
Callionymidae					
92.		*Pseudocalliurichthys goodladi*			
Calliostomatidae					
93.		*Astele (Astele) ciliare*			
Campephagidae					
94.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
Cancellariidae					
95.		*Cancellaria (nevia)*			
Canidae					
96.	30883	*Canis lupus subsp. familiaris (Dog)*	Y		
Caprimulgidae					
97.	24368	*Eurostopodus argus (Spotted Nightjar)*			
Carabidae					
98.		*Clivina angustipes*			Y
99.		*Clivina suturalis*			
100.		*Euthenarus comes*			
101.		*Haplaner velox*			
102.		*Scaraphites lucidus*			
Carangidae					
103.		*Gnathanodon speciosus*			
104.		*Trachurus declivis*			
Carcharhinidae					
105.		*Carcharhinus brevipinna*			
Cardiidae					
106.		*Fulvia (Fulvia) tenuicostata*			
Carditidae					
107.		*Cardita aviculina*			
108.		*Cardita sp.*			
Carybdeidae					
109.		*Carybdea xaymacana*			
Cerambycidae					
110.		*Ancita sp.*			
Cerithiidae					
111.		*Bittium sp.*			
112.		*Cacozeliana granarium*			
Cetorhinidae					
113.		*Cetorhinus maximus*			
Chaetodontidae					
114.		*Chelmonops curiosus*			
Chamidae					
115.		*Chama pulchella*			
116.		*Chama ruderalis*			
Charadriidae					
117.		*Charadrius (Charadrius) ruficapillus*			
118.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
119.		*Elseyornis melanops*			
120.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
121.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
122.	25577	*Vanellus miles (Masked Lapwing)*			
123.	24386	*Vanellus tricolor (Banded Lapwing)*			
Cheilodactylidae					
124.		*Cheilodactylus gibbosus*			
125.		*Dactylophora nigricans*			
Cheloniidae					
126.	25335	*Caretta caretta (Loggerhead Turtle)*		T	
Cheluidae					
127.	43380	*Chelodina colliei (Oblong Turtle)*			
Chromodorididae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
128.		*Ceratosoma amoenum*			
129.		*Mexichromis macropus*			
Clavulariidae					
130.		*Carijoa sp.*			
Clinidae					
131.		*Cristiceps aurantiacus*			
132.		*Cristiceps australis*			
133.		*Heteroclinus sp.*			
134.		*Ophiclinops sp.*			Y
Coccinellidae					
135.		*Coccinella transversalis*			
Coenagrionidae					
136.		*Austroagrion cyane*			
Colletidae					
137.		*Callomelitta sp.*			
138.		*Hylaeus (Euprosopis) violaceus*			
139.		*Hylaeus (Euprosopoides) obtusatus*			
140.		*Hylaeus (Euprosopoides) ruficeps*			
141.		*Hylaeus (Prosopisteron) perhumilis*			
142.		*Hylaeus (Prosopisteron) subcoronatus*			Y
143.		*Hylaeus (macrohylaeus)*			
144.		*Hylaeus (prosopisteron)*			
145.		*Hyleoides zonalis*			
146.		*Leioproctus (Leioproctus) clarki*			
147.		*Leioproctus (Leioproctus) plumosus*			
148.		*Paracolletes sp.*			
Columbellidae					
149.		*Aesopus sp.*			
150.		*Euplica sp.*			
151.		*Mitrella (Dentimitrella) austrina*			
152.		*Mitrella (Dentimitrella) lincolnensis*			
153.		*Mitrella (Dentimitrella) semiconvexa*			
154.		*Mitrella (Zemitrella) menkeana*			
Columbidae					
155.	24399	*Columba livia (Domestic Pigeon)*	Y		
156.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
157.		*Phaps (Phaps) elegans subsp. occidentalis*			
158.	24409	*Phaps chalcoptera (Common Bronzewing)*			
159.		*Streptopelia (Spilopelia) senegalensis*			
160.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
Congridae					
161.		*Gnathophis longicaudatus*			
Conidae					
162.		*Conus anemone*			
163.		*Conus rutilus*			
Corvidae					
164.	24416	*Corvus bennetti (Little Crow)*			
165.	25592	*Corvus coronoides (Australian Raven)*			
166.		*Corvus coronoides subsp. coronoides*			
167.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
168.		*Corvus sp.*			
Costellariidae					
169.		*Vexillum (Pusia) hansenae*			
170.		*Vexillum (Pusia) marrowi*			
Cracticidae					
171.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
172.	25595	*Cracticus tibicen (Australian Magpie)*			
173.	24422	*Cracticus tibicen subsp. dorsalis (White-backed Magpie)*			
174.	25596	*Cracticus torquatus (Grey Butcherbird)*			
175.		*Strepera (Neostrepera) versicolor*			
Crambidae					
176.		*Metallarcha sp.*			Y
Cuculidae					

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177.	24432	*Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)*			
Curculionidae					
178.		*Catasarcus coruscus*			
179.		*Catasarcus hopei*			
180.		*Catasarcus spinipennis*			
181.		*Sitona discoideus*			
Cynoglossidae					
182.		*Paraplagusia sp.*			
Cypraeidae					
183.		*Monetaria sp.*			
184.		*Notocypraea comptoni*			
185.		*Notocypraea declivis*			
186.		*Notocypraea piperita*			
187.		*Notocypraea pulicaria*			
188.		*Zoila friendii*			
189.		*Zoila friendii subsp. friendii*			
190.		*Zoila venusta*			
Cyprinidae					
191.		*Carassius auratus*			
Cystiscidae					
192.		*Gibberula sp.*			
Dasyuridae					
193.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
194.	24099	*Phascogale tapoatafa subsp. tapoatafa (Southern Brush-tailed Phascogale, Wambenger)*		T	
195.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
Delphinidae					
196.	24052	*Delphinus delphis (Common Dolphin)*			
197.	24055	*Globicephala melas (Long-finned Pilot Whale)*			
198.	24063	*Pseudorca crassidens (False Killer Whale)*			
199.		*Stenella coeruleoalba*			
200.	24069	*Tursiops truncatus (Bottlenose Dolphin)*			
Dendrodorididae					
201.		*Doriopsilla carneola*			Y
Dermochelyidae					
202.	25346	*Dermochelys coriacea (Leatherback Turtle)*		T	
Dicaeidae					
203.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
Dicruridae					
204.	24443	*Grallina cyanoleuca (Magpie-lark)*			
205.	25610	*Myiagra inquieta (Restless Flycatcher)*			
206.		*Rhipidura (Rhipidura) albiscapa subsp. preissi*			
207.		*Rhipidura (Rhipidura) fuliginosa*			
208.	24452	*Rhipidura fuliginosa subsp. preissi (Grey Fantail)*			
209.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
Diodontidae					
210.		*Diodon nicthemerus*			
Diomedeidae					
211.	25619	*Diomedea cauta (Shy Albatross)*		T	
212.	24468	*Diomedea chrysostoma (Grey-headed Albatross)*		T	
213.	25618	*Diomedea exulans (Wandering Albatross)*		T	
214.	24462	*Phoebetria fusca (Sooty Albatross)*		T	
215.	24463	*Phoebetria palpebrata (Light-mantled Sooty Albatross)*		P4	
Dolichopodidae					
216.		*Parentia sp.*			
Donacidae					
217.		*Donax (Latona) columbella*			
Dytiscidae					
218.		*Rhantus suturalis*			
Echeneidae					
219.		*Echeneis naucrates*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Elapidae					
220.	25251	*Echiopsis curta (Bardick)*			
221.	25250	*Elapognathus coronatus (Crowned Snake)*			
222.	25290	*Elapognathus minor (Short-nosed Snake)*		P2	
223.	25366	*Hydrophis elegans (Elegant Seasnake, Bar-bellied Seasnake)*			
224.	42410	*Hydrophis ornatus*			
225.	43384	*Hydrophis platurus (Yellow-bellied Seasnake)*			
226.	25252	*Notechis scutatus (Tiger Snake)*			
227.	25255	*Parasuta nigriceps*			
228.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
Ellobiidae					
229.		*Allochroa layardi*			
Elopidae					
230.		*Elops hawaiensis*			
Epitoniidae					
231.		*Opalia (Opalia) australis*			
Falconidae					
232.	25622	*Falco cenchroides (Australian Kestrel)*			
233.	25623	*Falco longipennis (Australian Hobby)*			
234.	24474	*Falco longipennis subsp. longipennis (Australian Hobby)*			
235.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Fasciolariidae					
236.		*Fusinus (Fusinus) australis*			
237.		*Fusinus (Fusinus) tessellatus*			
Felidae					
238.	24041	*Felis catus (Cat)*	Y		
Fergusoninidae					
239.		*Fergusonina sp.*			
Fissurellidae					
240.		*Amblychilepas nigrita*			
241.		*Emarginula (Emarginula) candida*			
242.		*Scutus (Scutus) antipodes*			
243.		*Tugali cicatricosa*			
Formicidae					
244.		*Amblyopone clarki*			
245.		*Amblyopone sp.*			
246.		*Camponotus darlingtoni*			Y
247.		*Iridomyrmex conifer*			
248.		*Iridomyrmex hartmeyeri*			
249.		*Iridomyrmex turbineus*			
250.		*Sphinctomyrmex occidentalis*			
Galaxiidae					
251.	34028	*Galaxias occidentalis (Western Minnow)*			
Galeommatidae					
252.		*Myllita (Myllita) deshayesi*			
Garypidae					
253.		*Synsphyronus magnus*			
Gekkonidae					
254.	24980	*Christinus marmoratus (Marbled Gecko)*			
Geometridae					
255.		*Dichromodes galactica*			Y
256.		*Phallaria sp.*			Y
257.		*Scopula optivata*			
258.		*Syneora nigrilinea*			Y
259.		*Taxeotis exaereta*			Y
Gerreidae					
260.		*Parequula melbournensis*			
Glacidorbidae					
261.	34115	*Helicarion castanea (Albany land snail)*		X	
Glycymeridae					
262.		*Glycymeris (Glycymeris) radians*			
263.		*Tucetona sordida*			

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Gobiidae					
264.		*Favonigobius sp.*			
265.		*Pseudogobius olorum*			
Gonorynchidae					
266.		*Gonorynchus greyi*			
Gorgonocephalidae					
267.		*Conocladus australis*			
Haematopodidae					
268.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
Halcyonidae					
269.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
270.	30902	*Dacelo novaeguineae subsp. novaeguineae (Laughing Kookaburra)*	Y		
271.		*Todiramphus (Todiramphus) sanctus subsp. sanctus*			
272.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
Halictidae					
273.		*Lasioglossum (Chilalictus) cognatum*			
274.		*Lasioglossum (Chilalictus) lanarium*			
275.		*Lipotriches (Austronomia) australica*			
276.		*Lipotriches (austronomia)*			
Haliotidae					
277.		*Haliotis roei*			
278.		*Haliotis scalaris subsp. scalaris*			
279.		*Haliotis sp.*			
280.		*Haliotis varia*			
Helicidae					
281.		*Theba pisana*			
Hemiramphidae					
282.		*Hyporhamphus melanochir*			
Hersiliidae					
283.		*Tamopsis perthensis*			
Hesperiidae					
284.		*Hesperilla chrysotricha subsp. chrysotricha*			
285.		*Hesperilla donnysa subsp. albina*			
286.		*Taractrocera papyria subsp. agraulia*			
Heterodontidae					
287.		*? ?*			
Hipponicidae					
288.		*Antisabia foliacea*			
289.		*Hipponix sp.*			
290.		*Sabia australis*			
Hirundinidae					
291.		*Cheramoeca leucosterna*			
292.		*Hirundo (Hirundo) neoxena subsp. carteri*			
293.	24491	*Hirundo neoxena (Welcome Swallow)*			
Hydrophilidae					
294.		*Limnoxenus zealandicus*			
295.		*Paracymus pygmaeus*			
Hygromiidae					
296.		*Cochlicella acuta*			
Hylidae					
297.	25388	*Litoria moorei (Motorbike Frog)*			
Hymenosomatidae					
298.		*Halicarcinus ovatus*			
Hypnidae					
299.		*Hypnos monopterygium*			
Hyriidae					
300.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Istiophoridae					
301.		*Tetrapturus audax*			Y

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Kalliapseudidae					
302.		*Kalliapseudes struthi*			
Labridae					
303.		*Austrolabrus maculatus*			
304.		*Dotalabrus aurantiacus*			
305.		*Haletta semifasciata*			
306.		*Halichoeres brownfieldi*			
307.		*Neoodax sp.*			
308.		*Odax cyanomelas*			
309.		*Pseudolabrus sp.*			
310.		*Siphonognathus argyrophanes*			
311.		*Siphonognathus radiatus*			
Lamponidae					
312.		*Lampona cylindrata*			
Laridae					
313.	24505	*Anous stolidus subsp. pileatus (Common Noddy)*		IA	
314.	24506	*Anous tenuirostris subsp. melanops (Australian Lesser Noddy)*		T	
315.		*Chroicocephalus novaehollandiae*			
316.		*Hydroprogne caspia*			
317.	25638	*Larus pacificus (Pacific Gull)*			
318.		*Stercorarius antarcticus*			
319.	24520	*Sterna anaethetus subsp. anaethetus (Bridled Tern)*			
320.		*Thalasseus bergii*			
Leporidae					
321.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
Lestidae					
322.		*Austrolestes analis*			
Limidae					
323.		*Lima (Lima) nimbifer*			
Limnodynastidae					
324.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
Limnoriidae					
325.		*Limnoria agrostisa*			
326.		*Lynseia annae*			
Lottiidae					
327.		*Lottia onychitis*			
328.		*Patelloida alticostata*			
329.		*Patelloida insignis*			
Lucinidae					
330.		*Anodontia (Cavatidens) perplexa*			
331.		*Callucina (Pseudolucinisca) lacteola*			
332.		*Wallucina assimilis*			
Lumbrineridae					
333.		*Lumbrineris sp.*			
Lycosidae					
334.		*Tasmanicosa leuckartii*			
335.		*Tetralycosa oraria*			
336.		*Venator immansueta*			
337.		*Venatrix pullastra*			
Macropodidae					
338.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
339.		*Macropus sp.*			
Mactridae					
340.		*Lutraria sp.*			
Maeridae					
341.		*Elasmopus rapax*			
Maluridae					
342.		*Malurus (Malurus) splendens*			
343.	25654	*Malurus splendens (Splendid Fairy-wren)*			
344.	24554	*Stipiturus malachurus subsp. westernensis (Southern Emu-wren)*			
Marginellidae					
345.		*Austroginella muscaria*			

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					Y
346.		*Serrata sp.*			
347.		*Volvarina occidua*			
Megachilidae					
348.		*Coelioxys (Coelioxys) froggatti*			
349.		*Megachile (Chalicodomoides) aethiops*			
350.		*Megachile (Eutricharaea) chrysopyga*			
351.		*Megachile (Hackeriapis) tosticauda*			
352.		*Megachile apicata*			
353.		*Megachile aurifrons*			
354.		*Megachile erythropyga*			
355.		*Megachile sp.*			
Megapodagrionidae					
356.		*Archiargiolestes parvulus*			
357.		*Miniargiolestes minimus*			
Meliphagidae					
358.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
359.		*Anthochaera (Anellobia) chrysoptera*			
360.		*Anthochaera (Anthochaera) carunculata*			
361.		*Anthochaera (Anthochaera) carunculata subsp. woodwardi*			
362.	24561	*Anthochaera carunculata (Red Wattlebird)*			
363.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
364.	24567	*Epthianura albifrons (White-fronted Chat)*			
365.	42314	*Gavicalis virescens (Singing Honeyeater)*			
366.	25661	*Lichmera indistincta (Brown Honeyeater)*			
367.		*Melithreptus (Melithreptus) lunatus subsp. chloropsis*			
368.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
369.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
Melitidae					
370.		*Dulichiella australis*			
Meropidae					
371.		*Merops (Merops) ornatus*			
372.	24598	*Merops ornatus (Rainbow Bee-eater)*		IA	
Mesodesmatidae					
373.		*Paphies (Amesodesma) elongata*			
Microcanthidae					
374.		*Tilodon sexfasciatus*			
Miturgidae					
375.		*Mituliodon tarantulinus*			
Molidae					
376.		*Ranzania laevis*			
Monacanthidae					
377.		*Acanthaluteres brownii*			
378.		*Acanthaluteres spilomelanurus*			
379.		*Acanthaluteres vittiger*			
380.		*Brachaluteres jacksonianus*			
381.		*Chaetodermis penicilligera*			
382.		*Meuschenia freycineti*			
383.		*Meuschenia hippocrepis*			
384.		*Nelusetta ayraudi*			
385.		*Scobinichthys granulatus*			
Monocentridae					
386.		*Cleidopus gloriamaris*			
Moridae					
387.		*Lotella rhacinus*			
Muricidae					
388.		*Dicathais orbita*			
389.		*Lepsiella (bedeva)*			
390.		*Phycothais reticulata*			
Muridae					
391.	24215	*Hydromys chrysogaster (Water-rat)*		P4	
392.	24223	*Mus musculus (House Mouse)*	Y		
393.	24245	*Rattus rattus (Black Rat)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Myobatrachidae					
394.	25400	*Crinia insignifera (Squelching Froglet)*			
395.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Myrmeleontidae					
396.		*Heoclisis fundata*			
Mytilidae					
397.		*Brachidontes erosus*			
Nannopercidae					
398.	34033	*Nannatherina balstoni (Balston's Pygmy Perch)*		T	
Nassariidae					
399.		*Nassarius (Niotha) nigellus*			
400.		*Nassarius (Zeuxis) pyrrhus*			
Naticidae					
401.		*Naticarius colliei*			
402.		*Polinices (Conuber) conicus*			
403.		*Tanea sagittata*			
Nemesiidae					
404.		*Aname mainae*			
Neobalaenidae					
405.	24072	*Caperea marginata (Pygmy Right Whale)*			
Neosebastidae					
406.		*Maxillicosta scabriceps*			
Neositidae					
407.		*Daphoenositta (Neositta) chrysoptera subsp. pileata*			
408.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
Neotylenchidae					
409.		*Fergusobia sp.*			
Nephilidae					
410.		*Nephila edulis*			
Nereididae					
411.		*Nereis sp.*			
Neritidae					
412.		*Nerita (Melanerita) atramentosa*			
Noctuidae					
413.		*Australothis rubrescens*			
414.		*Corgatha pleuroplaca*			Y
415.		*Hecatesia thyridion*			
416.		*Proteuxoa confinis*			Y
417.		*Proteuxoa flexirena*			
418.		*Proteuxoa sanguinipuncta*			
419.		*Sophta sp.*			Y
Notodontidae					
420.		*Antimima cryptica*			
421.		*Epicoma melanosticta*			
Nymphalidae					
422.		*Geitoneura minyas*			
Octopodidae					
423.		*Hapalochlaena sp.*			
424.		*Octopus tetricus*			
Olivellidae					
425.		*Cupidoliva nympha*			
Olividae					
426.		*Amalda sp.*			
427.		*Oliva australis*			
Ophichthidae					
428.		*Cirrhimuraena calamus*			
429.		*Ophichthus melanochir*			
430.		*Ophisurus serpens*			
Ophidiidae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
431.		*Genypterus blacodes*			
432.		*Genypterus tigerinus*			
Ophiocomidae					
433.		*Clarkcoma canaliculata*			
434.		*Clarkcoma pulchra*			
Ophiodermatidae					
435.		*Ophiopsammus assimilis*			
Ophionereididae					
436.		*Ophionereis schayeri*			
Ostraciidae					
437.		*Anoplocapros lenticularis*			
438.		*Anoplocapros robustus*			
439.		*Aracana aurita*			
440.		*Caprichthys gymnura*			
441.		*Lactoria cornuta*			
Pachycephalidae					
442.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
443.		*Pachycephala (Pachycephala) pectoralis*			
444.	25679	*Pachycephala pectoralis (Golden Whistler)*			
445.	24623	*Pachycephala pectoralis subsp. fuliginosa (Golden Whistler)*			
446.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
447.	24624	*Pachycephala rufiventris subsp. rufiventris (Rufous Whistler)*			
Palaemonidae					
448.		*Palaemonella rotumana*			
Paradoxosomatidae					
449.		*Oxidus gracilis*			
Paralichthyidae					
450.		*Pseudorhombus jenynsii*			
Parascylliidae					
451.		*Parascyllium variolatum*			
Parastacidae					
452.		*Cherax quinquecarinatus*			
Pardalotidae					
453.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
454.	25682	*Pardalotus striatus (Striated Pardalote)*			
Patellidae					
455.		*Patella (scutellastra)*			
Pectinidae					
456.		*Mimachlamys asperrima*			
457.		*Semipallium aktinos*			
Pelecanidae					
458.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
Pentacerotidae					
459.		*Paristiopterus sp.*			Y
Peramelidae					
460.	25478	*Isoodon obesulus (Southern Brown Bandicoot)*		P5	
461.	24153	*Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)*		P5	
Percichthyidae					
462.		*Bostockia porosa*			
463.		*Nannoperca vittata*			
Petroicidae					
464.		*Eopsaltria (Eopsaltria) griseogularis subsp. griseogularis*			
465.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
466.		*Melanodryas (Melanodryas) cucullata*			
467.	24660	*Petroica multicolor subsp. campbelli (Scarlet Robin)*			
Phaethontidae					
468.	24663	*Phaethon rubricauda (Red-tailed Tropicbird)*		P4	
Phalacrocoracidae					
469.		*Microcarbo melanoleucos*			
470.		*Phalacrocorax (Phalacrocorax) carbo subsp. novaehollandiae*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
471.	25697	*Phalacrocorax carbo (Great Cormorant)*			
472.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
473.	25699	*Phalacrocorax varius (Pied Cormorant)*			
Phalangeridae					
474.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
475.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
Phasianidae					
476.		*Coturnix (Coturnix) pectoralis*			
477.	24671	*Coturnix pectoralis (Stubble Quail)*			
Pinguipedidae					
478.		*Parapercis haackei*			
Platycephalidae					
479.		*Leviprora inops*			
480.		*Platycephalus speculator*			
Plesiopidae					
481.		*Trachinops noarlungae*			
Pleurobranchidae					
482.		*Pleurobranchus sp.*			
Pleuronectidae					
483.		*Ammotretis elongatus*			
Podargidae					
484.	25703	*Podargus strigoides (Tawny Frogmouth)*			
485.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
Podicipedidae					
486.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
487.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
Polyclinidae					
488.		*Aplidium clivosum*			
Polynoidae					
489.		*Lepidonotus bowerbankii*			
Pomacentridae					
490.		*Parma mccullochi*			
491.		*Parma victoriae*			
Pontogeneiidae					
492.		*Paramoera sp.*			
Pristiophoridae					
493.		*Pristiophorus cirratus*			
494.		*Pristiophorus nudipinnis*			
Procellariidae					
495.	24687	*Daption capense (Cape Petrel)*			
496.	24690	*Macronectes giganteus (Southern Giant Petrel)*			
497.	24692	*Pachyptila belcheri (Slender-billed Prion)*			
498.	24693	*Pachyptila desolata (Antarctic Prion)*			
499.	25707	*Pachyptila salvini (Salvin's Prion)*			
500.	24695	*Pachyptila salvini subsp. macgillivrayi (Salvin's Prion)*			Y
501.	24696	*Pachyptila turtur (Fairy Prion)*			
502.	24697	*Pachyptila vittata (Broad-billed Prion)*			
503.	24703	*Pterodroma lessonii (White-headed Petrel)*			
504.	24706	*Pterodroma macroptera subsp. gouldi (Great-winged Petrel)*			
505.		*Pterodroma macroptera subsp. macoptera*			
Pseudocheiridae					
506.	24166	*Pseudocheirus occidentalis (Western Ringtail Possum)*		T	
Psittacidae					
507.		*Barnardius zonarius*			
508.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
509.	24724	*Cacatua pastinator subsp. pastinator (Muir's Corella, Muir's Corella (Western Corella SW WA))*		S	
510.	25715	*Cacatua roseicapilla (Galah)*			
511.	25716	*Cacatua sanguinea (Little Corella)*			
512.		*Cacatua sp.*			
513.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)*		T	
514.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
		Cockatoo)		T	
515.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)*		T	
516.		*Calyptorhynchus sp.*			
517.	24738	*Neophema elegans (Elegant Parrot)*			
518.	25720	*Platycercus icterotis (Western Rosella)*			
519.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
520.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
521.	25722	*Polytelis anthopeplus (Regent Parrot)*			
522.		*Purpureicephalus spurius*			
Pygopodidae					
523.	24990	*Aprasia pulchella (Granite Worm-lizard)*			
524.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
525.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
Rachycentridae					
526.		*Rachycentron canadum*			
Rallidae					
527.	25727	*Fulica atra (Eurasian Coot)*			
528.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
529.	24764	*Gallinula ventralis (Black-tailed Native-hen)*			
530.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
531.	24765	*Gallirallus philippensis subsp. mellori (Buff-banded Rail)*			
532.		*Porphyrio (Porphyrio) porphyrio*			
533.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
534.	24771	*Porzana tabuensis (Spotless Crake)*			
535.		*Tribonyx ventralis*			
Ranellidae					
536.		*Cabestana tabulata*			
537.		*Cymatium (Reticutriton) pfeifferianum*			
538.		*Cymatium (Turritriton) labiosum*			
Raspailiidae					
539.		*Echinodictyum clathrioides*			
Recurvirostridae					
540.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
541.	25734	*Himantopus himantopus (Black-winged Stilt)*			
542.	24775	*Himantopus himantopus subsp. leucocephalus (Black-winged Stilt)*			
543.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
Regalecidae					
544.		*Regalecus glesne*			
Rhinobatidae					
545.		*Aptychotrema vincentiana*			
Rissoidae					
546.		*Rissoina (Rissoina) elegantula*			
547.		*Zebina (Zebina) tridentata*			
Scarabaeidae					
548.		*Colpochila crassiventris*			
549.		*Liparetrus striatus*			
550.		*Maechidius major*			
551.		*Onthophagus ferox*			
Scincidae					
552.	30893	*Cryptoblepharus buchananii*			
553.	25020	*Cryptoblepharus plagiocephalus*			
554.	25031	*Ctenotus catenifer*			
555.	25047	*Ctenotus impar*			
556.	25100	*Egernia napoleonis*			
557.	25117	*Hemiergis peronii subsp. peronii*			
558.	25119	*Hemiergis quadrilineata*			
559.	25131	*Lerista distinguenda*			
560.	25184	*Menetia greyii*			
561.	25191	*Morethia lineoocellata*			
Scolopacidae					
562.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
563.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
564.	24780	*Calidris alba (Sanderling)*		IA	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
565.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
566.	24786	*Calidris melanotos (Pectoral Sandpiper)*		IA	
567.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
568.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
569.	24790	*Calidris tenuirostris (Great Knot)*		T	
570.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
571.	24808	*Tringa nebularia (Common Greenshank)*		IA	
Scolopendridae					
572.		*Cormocephalus aurantiipes*			
Scombridae					
573.		*Sarda orientalis*			
574.		*Thunnus alalunga*			
575.		*Thunnus maccoyii*			
Sepiadariidae					
576.		*Sepiadarium sp.*			
577.		*Sepioloidea sp.*			
Sepiidae					
578.		*Sepia apama*			
579.		*Sepia braggi*			
580.		*Sepia novaehollandiae*			
Serranidae					
581.		*Hypoplectrodes annulata*			
Sillaginidae					
582.		*Sillaginodes punctata*			
583.		*Sillago bassensis*			
Soleidae					
584.		*Phyllichthys punctatus*			
Sparassidae					
585.		*Isopeda leishmanni*			
Sparidae					
586.		*Pagrus auratus*			
Spheniscidae					
587.	24814	*Eudyptes chrysocome subsp. moseleyi (Rockhopper Penguin)*			
Sphingidae					
588.		*Hippotion celerio*			
Spondylidae					
589.		*Spondylus tenuitas*			Y
Squatinidae					
590.		*Squatina australis*			
Staphylinidae					
591.		*Aleochara sp.*			Y
592.		*Bledius minax*			
593.		*Carpelimus (Paratrogophloeus) bilineatus*			Y
594.		*Carpelimus siamensis*			
595.		*Eupines (byraxis)*			
596.		*Euplectops biplagiatus*			Y
597.		*Paraplectus dubius*			
598.		*Paraplectus sp.*			
599.		*Rybaxis hortensis*			
600.		*Rybaxis sp.*			
601.		*Tachyporus rarus*			Y
602.		*Tiracerus cultripes*			
603.		*Tiracerus foveicollis*			
604.		*Tyraphus major*			
Stichasteridae					
605.		*Allostichaster polyplax*			
Stichopodidae					
606.		*Stichopus ludwigi*			
Sylviidae					
607.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
608.	24833	*Cincloramphus cruralis (Brown Songlark)*			
609.	25758	*Megalurus gramineus (Little Grassbird)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Syngnathidae					
610.		*Filicampus tigris*			
611.		*Histiogamphelus cristatus*			
612.		*Phyllopteryx taeniolatus*			
613.		*Pugnaso curtirostris*			
614.		*Stigmatopora argus*			
615.		*Vanacampus phillipi*			
616.		*Vanacampus poecilolaemus*			
Tarsipedidae					
617.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
Tellinidae					
618.		*Pseudarcopagia victoriae*			
Tenebrionidae					
619.		*Leichenum canaliculatum*			
Terebellidae					
620.		*Nicolea amnis*			
621.		*Nicolea sp.*			Y
622.		*Polycirrus nephrosus*			Y
Terebridae					
623.		*Terebra sp.*			
Tetraodontidae					
624.		*Contusus brevicaudus*			
625.		*Lagocephalus sceleratus*			
626.		*Omegophora cyanopunctata*			
627.		*Polyspina piosae*			
Tetrarogidae					
628.		*Gymnapistes marmoratus*			
Tettigoniidae					
629.		*Dexerra vigescens*			
630.		*Metaballus litus*			
Theridiidae					
631.		*Latrodectus hasseltii*			
Thomisidae					
632.		*Stephanopis aspera*			Y
Threskiornithidae					
633.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
634.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
635.	24844	*Threskiornis molucca (Australian White Ibis)*			
636.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
Tortricidae					
637.		*Technitis GROUP tessulatana*			Y
Triglidae					
638.		*Chelidonichthys kumu*			
639.		*Lepidotrigla papilio*			
640.		*Pterygotrigla polyommata*			
Tripterygiidae					
641.		*Helcogramma decurrens*			
Triviidae					
642.		*Trivia (ellatrivia)*			
Trochidae					
643.		*Austrocochlea rudis*			
644.		*Cantharidus lepidus*			
645.		*Cantharidus sp.*			
646.		*Clanculus consobrinus*			
647.		*Clanculus limbatus*			
648.		*Clanculus maxillatus*			
649.		*Clanculus personatus*			
650.		*Clanculus plebejus*			
651.		*Clanculus ringens*			
652.		*Diloma sp.*			
653.		*Granata imbricata*			
654.		*Herpetopoma aspersus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
655.		*Monilea callifera*			
656.		*Notogibbula lehmanni*			
657.		*Notogibbula preissiana*			
658.		*Odontotrochus chlorostomus*			
659.		*Phasianotrochus bellulus*			
660.		*Phasianotrochus irisodontes*			
661.		*Prothalotia lehmanni*			
662.		*Stomatella impertusa*			
663.		*Thalotia conica*			
664.		*Vaceuchelus ampullus*			
Turbinidae					
665.		*Astralium aureum*			
666.		*Astralium squamiferum*			
667.		*Phasianella australis*			
668.		*Phasianella ventricosa*			
669.		*Tricolia rosea*			
670.		*Tricolia tomlini*			
671.		*Turbo (Ninella) torquatus*			
Turridae					
672.		*Crassispira (Crassispira) harpularia*			
Tytonidae					
673.	24855	*Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southern subsp))*		P3	
Uranoscopidae					
674.		*Ichthyscopus barbatus*			
Urodacidae					
675.		*Urodacus novaehollandiae*			
Veneridae					
676.		*Gomphina (Gomphina) undulosa*			
677.		*Placamen flindersi*			
678.		*Placamen tiara*			
679.		*Tawera lagopus*			
680.		*Timoclea (Chioneryx) cardioides*			
Veretillidae					
681.		*Cavernularia sp.*			
Vermetidae					
682.		*Serpulorbis (Cladopoda) sipho*			
Vespertilionidae					
683.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
684.	24206	*Vespadelus regulus (Southern Forest Bat)*			
Volutidae					
685.		*Melo sp.*			
Volutomitridae					
686.		*Waimatea obscura*			Y
Ziphiidae					
687.	24078	*Mesoplodon grayi (Gray's Beaked Whale)*			
Zosteropidae					
688.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
689.	24856	*Zosterops lateralis subsp. gouldi (Grey-breasted White-eye)*			
Zygaenidae					
690.		*Pollanisus empyrea*			

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

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

Appendix D – Flora data

Flora species list

Significant weeds recorded during the survey

Flora quadrat sheets

Flora likelihood of occurrence assessment guidelines

Flora likelihood of occurrence assessment

Flora species list – Survey September 2016 and September 2009 (GHD 2010)

Family	*Taxon*	Status	GHD 2010	GHD 2016
Aizoaceae	*Tetragonia decumbens*	*	X	X
Apiaceae	*Apium graveolens*	*	X	
Araceae	*Zantedeschia aethiopica*	*DP		X
Asparagaceae	*Acanthocarpus preissii*			X
Asparagaceae	*Ornithogalum arabicum*	*	X	
Asphodelaceae	*Trachyandra divaricata*	*	X	X
Asteraceae	*Arctotheca calendula*	*	X	
Asteraceae	*Cotula turbinata*	*	X	X
Asteraceae	*Hypochaeris glabra*	*	X	
Asteraceae	*Hypochaeris* sp.	*	X	X
Asteraceae	*Leucophyta brownii*		X	X
Asteraceae	*Olearia axillaris*			X
Asteraceae	*Ursinia anthemoides*	*	X	X
Asteraceae	*Lactuca serriola*	*	X	
Brassicaceae	*Raphanus raphanistrum*	*	X	X
Caryophyllaceae	*Pelargonium capitatum*	*	X	X
Caryophyllaceae	*Petrorhagia dubia*	*	X	X
Chenopodiaceae	*Rhagodia baccata*			X
Colchicaceae	*Burchardia congesta*		X	X
Crassulaceae	*Crassula decumbens*		X	X
Cucurbitaceae	*Cucumis myriocarpus*	*	X	X
Cyperaceae	*Cyperus tenellus*	*		X
Cyperaceae	*Cyperus* sp.		X	X
Cyperaceae	*Ficinia nodosa*			X
Cyperaceae	*Gahnia trifida*		X	X
Cyperaceae	*Lepidosperma ?obtusum* (insufficient material)		X	
Cyperaceae	*Lepidosperma carphoides*		X	X
Cyperaceae	*Lepidosperma effusum*			
Cyperaceae	*Lepidosperma striatum*			X
Dennstaedtiaceae	*Pteridium esculentum*			X
Droseraceae	*Drosera glanduligera*			X
Euphorbiaceae	*Euphorbia paralias*	*	X	X
Euphorbiaceae	*Euphorbia terracina*	*		X
Euphorbiaceae	*Ricinus communis*	*		X
Fabaceae	*Acacia cochlearis*		X	X
Fabaceae	*Acacia cyclops*		X	
Fabaceae	*Acacia littorea*		X	X
Fabaceae	*Acacia saligna*		X	X
Fabaceae	*Acacia stenoptera*		X	
Fabaceae	*Hardenbergia comptoniana*			X
Fabaceae	*Jacksonia furcellata*		X	X
Fabaceae	*Lathyrus tingitanus*	*	X	

Family	*Taxon*	Status	GHD 2010	GHD 2016
Fabaceae	*Lupinus angustifolius*	*	X	X
Fabaceae	*Melilotus indicus*	*		X
Fabaceae	*Vicia sativa*	*	X	X
Fabaceae	*Eutaxia virgata*		X	
Fabaceae	*Trifolium campestre*	*	X	X
Fabaceae	*Trifolium* sp.	*		X
Geraniaceae	*Erodium botrys*	*		X
Goodeniaceae	*Scaevola crassifolia*		X	X
Hemerocallidaceae	*Agrostocrinum scabrum*		X	
Hemerocallidaceae	*Conostylis aculeata* subsp. *aculeata*		X	X
Iridaceae	*Freesia alba x leichtlinii*	*	X	
Iridaceae	*Ixia maculata*	*	X	X
Iridaceae	*Romulea rosea*		*	X
Iridaceae	*Watsonia meriana*	*	X	X
Juncaceae	*Juncus kraussii*		X	X
Myrtaceae	*Agonis flexuosa*			X
Myrtaceae	*Astartea scoparia*			X
Myrtaceae	*Corymbia calophylla*			X
Myrtaceae	*Eucalyptus rudis*		X	
Myrtaceae	*Kunzea glabrescens*		X	
Myrtaceae	*Melaleuca cuticularis*		X	X
Myrtaceae	*Melaleuca lanceolata*		X	X
Myrtaceae	*Melaleuca rhaphiophylla*		X	X
Myrtaceae	*Taxandria linearifolia*		X	
Orchidaceae	*Microtis media*		X	X
Oxalidaceae	*Oxalis pes-caprae*	*	X	X
Papaveraceae	*Fumaria capreolata*	*	X	X
Papaveraceae	*Fumaria muralis*	*	X	X
Pinaceae	*Pinus* sp.	*	X	X
Poaceae	*Avena fatua*	*		X
Poaceae	*Briza minor*	*	X	
Poaceae	*Briza maxima*	*	X	X
Poaceae	*Bromus diandrus*	*		X
Poaceae	*Cenchrus clandestinus*	*		X
Poaceae	*Cynodon dactylon*	*	X	X
Poaceae	*Eragrostis curvula*	*	X	X
Poaceae	*Ehrharta calycina*	*	X	X
Poaceae	*Ehrharta longifolia*	*		X
Poaceae	*Lagurus ovatus*	*	X	X
Poaceae	*Lolium perenne*	*		X
Poaceae	*Spinifex longifolius*			X
Poaceae	sp. (insufficient material)			X
Polygonaceae	*Rumex vulgaris*	*	X	

Family	*Taxon*	Status	GHD 2010	GHD 2016
Polygonaceae	*Rumex bucephalophorus*	*	X	
Primulaceae	*Lysimachia arvensis*	*		X
Proteaceae	*Adenanthos meisneri*		X	X
Proteaceae	*Conospermum caeruleum subsp. marginatum*		X	X
Rhamnaceae	*Spyridium globulosum*		X	X
Rutaceae	*Diplolaena dampieri*			X
Solanaceae	*Solanum nigrum*	*	X	X

Plant	Number	Easting	Northing
Arum Lily	20	348476.3	6271360
Arum Lily	1	348461.5	6271214
Arum Lily	1	348222.8	6271451
Arum Lily	10	348415.3	6271191
Arum Lily	10	348493.2	6271169
Arum Lily	10	348486.5	6271215
Arum Lily	15	348463.4	6271179
Arum Lily	20	348462.5	6271088
Arum Lily	20	348473.1	6271222
Arum Lily	3	348399.3	6271328
Arum Lily	50	348485.2	6271257
Arum Lily	8	348494	6271287
Arum Lily	1	348412.3	6271402
Arum Lily	1	348447.9	6271314
Arum Lily	1	344606.8	6274197
Arum Lily	1	344597.4	6273946
Arum Lily	2	348418.5	6271147
Arum Lily	5	348435.3	6271344
Bridal Creeper	1	344621.4	6274087

Site ID:	Q01	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	28/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	348414 mE	6271181 mN
Location:	Vasse		
Landform and slope:	Bank of river		
Drainage:	Poor drainage		
Soil colour & type:	Brown loam		
Vegetation condition:	Completely Degraded		
Fire age & intensity:	Nil		
Disturbances:	Clearing and weeds		
Surface component:			
Loose soil (%):	100		
Leaf litter:	2-10		
Wood litter:	<2		

Species List:

Taxon	Status	Cover (%)	Height (m)
Eucalyptus rudis		2-10	18
Agonis flexuosa		2-10	7
Melaleuca rhaphiophylla		30-70	7
Watsonia meriana	*	30-70	1.2
Zantedeschia aethiopica	*DP	<2	0.8
Oxalis pes-caprae	*	2-10	0.3
Avena fatua	*	>70	0.8
Eragrostis curvula	*	2-10	0.9

Site ID:	Q02	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	28/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	348483 mE	6271109 mN
Location:	Vasse		
Landform and slope:	Plain, negligible slope		
Drainage:	Good drainage		
Soil colour & type:	Grey brown loamy sand		
Vegetation condition:	Completely Degraded		
Fire age & intensity:	Nil		
Disturbances:	Weeds and clearing		
Surface component:			
Loose soil (%):	<2		
Leaf litter:	<2		
Wood litter:	<2		

Species List:

Taxon	Status	Cover (%)	Height (m)
Agonis flexuosa		30-70	9
Corymbia calophylla		2-10	15
Acacia saligna		2-10	3
Ehrharta longifolia	*	>70	0.8
Zantedeschia aethiopica	*DP	2-10	1
Lupinus angustifolius	*	<2	0.6
Trifolium sp.	*	<2	0.15
Oxalis pes-caprae	*	2-10	0.2

Site ID:	Q03	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	29/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	344695 mE	6273899 mN
Location:	Vasse		
Landform and slope:	Plain, negligible slope		
Drainage:	Good		
Soil colour & type:	Grey brown sand		
Vegetation condition:	Degraded		
Fire age & intensity:	Nil		
Disturbances:	Clearing, weeds and kangaroos grazing		
Surface component:			
Loose soil (%):	30-70		
Leaf litter (%):	30-70		
Wood litter(%):	10-30		

Species List:

Taxon	Status	Cover (%)	Height (m)
Corymbia calophylla		30-70	10
Agonis flexuosa		30-70	9
Hypochaeris sp.	*	<2	0.1
Poaceae sp.		30-70	0.15
Euphorbia terracina	*	2-10	0.15
Oxalis pes-caprae	*	30-70	0.2
Zantedeschia aethiopica	*DP	<2	0.5
Jacksonia furcellata		<2	0.5
Watsonia meriana	*	2-10	0.5
Cotula turbinata	*	<2	0.2
Erodium botrys	*	<2	0.2
Hardenbergia comptoniana		<2	creeper
Solanum nigrum	*	<2	0.2
Briza maxima	*	<2	0.2

Site ID:	Q04	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	29/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	344686 mE	6273845 mN
Location:	Vasse		
Landform and slope:	Plain		
Drainage:	Good		
Soil colour & type:	Grey loamy sand		
Vegetation condition:	Good		
Fire age & intensity:	Nil		
Disturbances:	Weeds and clearing		
Surface component:			
Loose soil (%):	10-30		
Leaf litter (%):	10-30		
Wood litter (%):	2-10		

Species List:

Taxon	Status	Cover (%)	Height (m)
Agonis flexuosa		2-10	4
Acacia saligna		2-10	5
Avena fatua	*	2-10	1
Poaceae sp.		2-10	0.2
Conostylis aculeata subsp. *aculeata*		2-10	0.3
Ehrharta longifolia	*	2-10	1
Briza maxima	*	2-10	0.2
Pelargonium capitatum	*	10-30	0.3
Jacksonia furcellata		30-70	2.2
Ursinia anthemoides	*	<2	0.2
Romulea rosea	*	10-30	0.2
Poaceae sp.		30-70	0.15
Watsonia meriana	*	2-10	1
Cotula turbinata	*	<2	0.2

Taxon	Status	Cover (%)	Height (m)
Erodium botrys	*	<2	0.1
Euphorbia terracina	*	<2	0.2
Ehrharta calycina	*	<2	0.5
Trachyandra divaricata	*	<2	0.2

Site ID:	Q05	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	29/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	344587 mE	6275114 mN
Location:	Vasse – narrow strip between drain and pathway		
Landform and slope:	Bank		
Drainage:	Good		
Soil colour & type:	White yellow sand		
Vegetation condition:	Good		
Fire age & intensity:	Nil		
Disturbances:	Weeds and clearing		
Surface component:			
Loose soil (%):	10-30		
Leaf litter (%) :	2-10		
Wood litter (%):	<2		

Species List:

Taxon	Status	Cover (%)	Height (m)
Lepidosperma effusum		10-30	1.1
Scaevola crassifolia		2-10	0.5
Spyridium globulosum		2-10	2
Raphanus raphanistrum	*	2-10	1
Bromus diandrus	*	30-70	0.8
Arctotheca calendula	*	<2	0.2
Oxalis pes-caprae	*	10-30	0.2
Ficinia nodosa		2-10	1.1
Cenchrus clandestinus	*	10-30	0.2

Taxon	Status	Cover (%)	Height (m)
Avena fatua	*	2-10	0.8
Tetragonia decumbens	*	<2	0.3
Fumaria capreolata	*	<2	0.2
Pelargonium capitatum	*	2-10	1
Lysimachia arvensis	*	<2	0.02
Diplolaena dampieri		<2	0.2
Juncus kraussii		2-10	2
Romulea rosea	*	<2	0.15
Ricinus communis	*	<2	0.2
Scaevola crassifolia		2-10	0.8

Site ID:	Q06	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	29/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	344539 mE	6275077 mN
Location:	Vasse		
Landform and slope:	Riparian bank		
Drainage:	Good		
Soil colour & type:	Black sand		
Vegetation condition:	Very Good		
Fire age & intensity:	Nil		
Disturbances:	Weeds and clearing		
Surface component:			
Loose soil (%):	100		
Leaf litter:	30-70		
Wood litter:	2-10		

Species List:

Taxon	Status	Cover (%)	Height (m)
Lysimachia arvensis	*	2-10	0.02
Erodium botrys	*	<2	0.2
Lepidosperma effusum		70-30	1.2
Fumaria capreolata	*	70-30	.5
Acacia littorea		2-10	2.2
Olearia axillaris		10-30	2
Bromus diandrus		70-30	.2
Rhagodia baccata		<2T	.2
Ricinus communis	*	2-10	.4
Diplolaena dampieri		<2T	1.5
Spyridium globulosum		2-10	2
Acanthocarpus preissii		2-10	.5
Spinifex longifolius		2-10	0.6

Site ID:	Q07	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	29/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	344603 mE	6274503 mN
Location:	Vasse		
Landform and slope:	Riparian bank		
Drainage:	Good		
Soil colour & type:	Grey sand		
Vegetation condition:	3		
Fire age & intensity:	Nil		
Disturbances:	Weeds and clearing		
Surface component:			
Loose soil (%):	2-10		
Leaf litter:	2-10		
Wood litter (%):	2-10		

Species List:

Taxon	Status	Cover (%)	Height (m)
Agonis flexuosa		70-30	8.0
Avena fatua	*	70-30	1
Ricinus communis	*	10-30	.5
Romulea rosea		10-30	.15
Fumaria capreolata	*	2-10	.5
Lepidosperma effusum		70-30	1
Acacia cochlearis		2-10	1.5
Acacia littorea		2-10	1
Cenchrus clandestinus	*	10-30	.2
Lysimachia arvensis	*	<2N	.15
Crassula decumbens		<2N	0.02
Spyridium globulosum		2-10	1.2
Euphorbia terracina	*	<2N	.5
Scaevola crassifolia		<2T	1.2

Taxon	Status	Cover (%)	Height (m)
Burchardia congesta		<2N	0.3
Poaceae sp.		<2N	.2
Cotula turbinata	*	<2N	.15
Hardenbergia comptoniana	<2T	CREEPER	

Site ID:	Q08	Project:	6134862
Type:	Quadrat	**Size:**	10 x 10 m
Date:	29/9/2016	**Described by:**	GO
Co-ordinates:	MGA 50	344617 mE	6274182 mN
Location:	Vasse		
Landform and slope:	Swamp		
Drainage:	Poor		
Soil colour & type:	Loam		
Vegetation condition:	3-4		
Fire age & intensity:	Nil		
Disturbances:	Weeds and clearing		
Surface component:			
Loose soil (%):	100		
Leaf litter (%):	10-30		
Wood litter (%):	<2		

Species List:

Taxon	Status	Cover (%)	Height (m)
Melaleuca lanceolata		10-30	4
Melaleca cuticularis		10-30	4
Melaleuca rhaphiophylla		2-10	4
Lepidosperma carphoides		70-100	1.1
Pelargonium capitatum	*	<2T	0.5
Poaceae sp.	*	2-10	0.8
Gahnia trifida		30-70	1
Lagurus ovatus	*	<2	0.2
Euphorbia terracina	*	<2	0.2
Watsonia meriana	*	<2T	1

Flora likelihood of occurrence guidelines

Likelihood of occurrence	Guideline
Known	Species recorded within survey area from field survey results.
Likely	Species previously recorded within 5 km and large areas of suitable habitat occur in the survey area.
Possible	Species previously recorded within 5 km and areas of suitable habitat occur/may occur in the survey area.
Unlikely	Species previously recorded within 5 km, but suitable habitat does not occur in the survey area.
Highly unlikely	Species not previously recorded within 5 km, suitable habitat does not occur in the survey area and/or survey area is outside the natural distribution of the species.
Other considerations	Intensity of survey, availability of access, growth form type, recorded flowering times, cryptic nature of species

Flora likelihood of occurrence assessment

Family	Taxon	Source	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Habitat	Likelihood of occurrence
			EPBC Act	WC Act /DPaW			
Apiaceae	*Brachyscias verecundus*	EPBC	CE	T	Annual (or ephemeral), herb, 0.012-0.022 m high, entirely glabrous. Fl. white/cream.	In a moss sward. On a granite outcrop.	Highly unlikely: this species does not occur within 5 km of the survey area and no habitat for this species occurs within the survey area.
Asparagaceae	*Thysanotus glaucus*	NM		P4	Caespitose, glaucose perennial, herb, 0.1-0.2 m high. Fl. purple, Oct to Dec or Jan to Mar.	White, grey or yellow sand, sandy gravel.	Possible: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. This species was not flowering during the time of the study.
Brassicaceae	*Lepidium pseudohyssopifolium*	NM		P1	Erect annual or perennial, herb, to 0.4(-0.6) m high. Fl. Jun to Sep.	Swampy ground.	Unlikely: this species has previously been recorded within 5 km of the survey area and small areas of habitat occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Brassicaceae	*Lepidium pseudotasmanicum*	NM		P4	Erect annual or biennial, herb, 0.2-0.4(-1) m high. Fl.	Loam, sand.	Possible: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. This species was not flowering during the time of the study.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
					white-green, Feb or Dec.		
Convolvulaceae	*Calystegia sepium* subsp. *roseate*	DPAW		P2	Description unknown.		Possible: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area.
Cyperaceae	*Schoenus benthamii*	NM		P3	Tufted perennial, grass-like or herb (sedge), 0.15-0.45 m high. Fl. brown, Oct to Nov.	White, grey sand, sandy clay. Winter-wet flats, swamps.	Possible: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. This species was not flowering during the time of the study.
Cyperaceae	*Tetraria australiensis*	NM, EPBC	Vu	T	Rhizomatous, tufted perennial, grass-like or herb (sedge), to 1 m high. Fl. brown, Nov to Dec.		Possible: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. This species was not flowering during the time of the study.
Ericaceae	*Andersonia gracilis*	EPBC	En	T	Slender erect or open straggly shrub, 0.1-0.5(-1) m high. Fl. white-pink-purple, Sep to Nov.	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps. Andersonia gracilis is currently known from the Badgingarra, Dandaragan and Kenwick areas (Stack et al. 2008)	Highly unlikely: this species is restricted to the Badgingarra, Dandaragan and Kenwick areas.
Ericaceae	*Leucopogon* sp. Busselton (D. Cooper 243)	NM		P2	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and small areas of habitat occur within the survey area.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
							Large portions of the vegetated areas were traversed during the assessment.
Euphorbiaceae	*Amperea micrantha*	NM, DPaW		P2	Low, spreading, bushy perennial, herb, 0.1-0.3 m high. Fl. brown, Oct to Nov.	Sandy soils.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Fabaceae	*Acacia flagelliformis*	NM, DPaW		P4	Rush-like, erect or sprawling shrub, 0.3-0.75(-1.6) m high. Fl. yellow, May to Sep.	Sandy soils. Winter-wet areas.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. A large portion of the vegetated areas were traversed during the assessment.
Fabaceae	*Acacia heteroclita* subsp. *valida*	NM		P2	Erect, spreading shrub or tree, 1-4 m high, phyllodes 4-9 mm wide. Fl. yellow, Sep to Nov.	Shallow soils over granite. Rocky granite slopes & outcrops.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Fabaceae	*Acacia lateriticola* glabrous variant (B.R. Maslin 6765)	NM		P3	Shrub, 0.4-0.8 m high. Fl. yellow, Aug or Oct.	Lateritic soils.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Fabaceae	*Acacia semitrullata*	NM		P4	Slender, erect, pungent shrub, (0.1-	White/grey sand, sometimes over laterite, clay. Sandplains, swampy	Unlikely: this species has previously been recorded within 5 km of the survey area and some small areas of habitat occur within the survey area. Large portions of the vegetated

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
					)0.2-0.7(-1.5) m high. Fl. cream-white, May to Oct.	areas.	areas were traversed during the assessment.
Fabaceae	*Bossiaea disticha*	NM		P4	Erect or straggly to spreading shrub, 0.1-1.5 m high. Fl. yellow & brown/red, Sep to Nov.	Sandy soils over limestone.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Fabaceae	*Chorizema carinatum*	NM		P3	Erect or spreading shrub, 0.1-0.6 m high. Fl. yellow, Oct to Dec.	Sand, sandy clay.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Fabaceae	*Daviesia elongata* subsp. *elongata*	EPBC	Vu	T	Spreading shrub, 0.4-1 m high. Fl. yellow/orange & red, Dec or Jan to Feb.	Sandy soils. This species occurs within the Carbunup area (TSSC 2008).	Unlikely: this species has not previously been recorded within 5 km of the survey area however some habitat occurs within the survey area.
Fabaceae	*Gastrolobium papilio*	EPBC	En	T	Tangled, clumped shrub, to 1.5 m high. Fl. cream-red, Oct to Dec.	Sandy clay over ironstone and laterite. Flat plains.	Highly unlikely: this species does not occur within 5 km of the survey area and no habitat for this species occurs within the survey area.
Fabaceae	*Gastrolobium* sp. Yoongarillup (S.Dilkes s.n. 1/9/1969)	NM, DPaW		P1	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
Fabaceae	*Jacksonia gracillima*	NM, DPaW		P3	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Fabaceae	*Kennedia lateritia*	NM	En	T	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Fabaceae	*Pultenaea pinifolia*	NM		P3	Erect, slender shrub, 1-3 m high. Fl. yellow-orange, Oct to Nov.	Loam or clay. Floodplains, swampy areas.	Unlikely: this species has previously been recorded within 5 km of the survey area and some small areas of habitat occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Hemerocallidaceae	*Johnsonia inconspicua*	NM, DPaW		P3	Rhizomatous, tufted perennial, grass-like or herb, 0.1-0.3 m high, to 0.2 m wide. Fl. green-white/pink, Oct to Nov.	White-grey or black sand. Low dunes, winter-wet flats.	Possible: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. This species was not flowering during the time of the study.
Malvaceae	*Lasiopetalum laxiflorum*	NM		P3	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Menyanthaceae	*Ornduffia submersa*	NM, DPaW		P4	Description unknown.		Possible: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. This species was not flowering during the time of the

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
							study.
Myrtaceae	*Calothamnus quadrifidus* subsp. *teretifolius*	NM		P4	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Myrtaceae	*Chamelaucium* sp. S coastal plain (R.D.Royce 4872)	NM, EPBC	Vu	T	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Myrtaceae	*Chamelaucium* sp. Yoongarillup (G.J. Keighery 3635)	NM		P4	Description unknown.		Unlikely: this species has previously been recorded within 5 km of the survey area and habitat may occur within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Myrtaceae	*Darwinia whicherensis*	EPBC	En	T	Erect or sometimes spreading shrub, up to 70 cm tall x 40 cm wide.	The species occurs in a winter-wet area of shrubland on shallow red clay over ironstone under a tall shrubland of Dryandra squarrosa. This species is known from a wild and translocated population near the Whicher Range (TSSC 2016)	Highly unlikely: this species does not occur within 5 km of the survey area and no habitat for this species occurs within the survey area.
Myrtaceae	*Verticordia attenuata*	NM		P3	Shrub, 0.4-1 m high. Fl. pink, Dec or Jan to May.	White or grey sand. Winter-wet depressions.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
Myrtaceae	*Verticordia densiflora* var. *pedunculata*	NM, DPaW	En	T	Erect to spreading shrub, 0.3-0.6 m high. Fl. pink/pink-white, Dec or Jan.	Grey/yellow sand, sandy loam. Winter-wet low-lying areas.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Myrtaceae	*Verticordia lehmannii*	NM		P4	er shrub, 0.2-1 m high. Fl. pink, Jan or Apr to Jun or Aug or Dec.	Sandy clay. Winter-wet flats.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Myrtaceae	*Verticordia plumosa* var. *ananeotes*	NM	En	T	Erect, sparsely branched shrub, 0.3-0.5 m high. Fl. pink-purple/white, Nov to Dec.	Sandy loam. Seasonally inundated plains.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Myrtaceae	*Verticordia plumosa* var. *vassensis*	NM, DPaW, EPBC	En	T	Shrub, 0.3-1 m high. Fl. pink, Sep to Dec or Jan to Feb.	White/grey sand. Winter-wet flats.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Orchidaceae	*Caladenia huegelii*	NM, DPaW, EPBC	En	T	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green & cream & red, Sep to Oct.	Grey or brown sand, clay loam.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Orchidaceae	*Caladenia procera*	NM, DPaW, EPBC	CE	T	Tuberous, perennial, herb, 0.35-	Rich clay loam. Alluvial loamy flats, jarrah/marri/peppermint	Unlikely: this species has previously been recorded within 5 km of the survey area and some habitat occurs within the survey area. Large

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
					0.9 m high. Fl. yellow, Sep to Oct.	woodland, dense heath, sedges.	portions of the vegetated areas were traversed during the assessment.
Orchidaceae	*Diuris micrantha*	EPBC	Vu	T	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown, Sep to Oct.	Brown loamy clay. Winter-wet swamps, in shallow water.	Unlikely: this species does not occur within 5 km of the survey area however some habitat for this species occurs within the survey area. Large portions of the vegetated areas were traversed during the study and this species is likely to have been flowering during the time of the assessment.
Orchidaceae	*Diuris purdiei*	NM	En	T	Tuberous, perennial, herb, 0.15-0.35 m high. Fl. yellow, Sep to Oct.	Grey-black sand, moist. Winter-wet swamps.	Unlikely: this species has previously been recorded within 5 km of the survey area and some degraded habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Orchidaceae	*Drakaea elastica*	NM, DPaW, EPBC	Vu	T	Tuberous, perennial, herb, 0.12-0.3 m high. Fl. red & green & yellow, Oct to Nov.	White or grey sand. Low-lying situations adjoining winter-wet swamps.	Unlikely: this species has previously been recorded within 5 km of the survey area and some degraded habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Orchidaceae	*Drakaea micrantha*	EPBC	Vu	T	Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow, Sep to Oct.	White-grey sand. The species is usually found in cleared fire breaks or open sandy patches that have been disturbed, and where competition from other plants has been removed (TSSC 2008)	Unlikely: this species does not occur within 5 km of the survey area however some habitat for this species occurs within the survey area. Large portions of the vegetated areas were traversed during the study and this species is likely to have been flowering during the time of the assessment.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
Orchidaceae	*Thelymitra variegata*	NM		P2	Tuberous, perennial, herb, 0.1-0.35 m high. Fl. orange & red & purple & pink, Jun to Sep.	Sandy clay, sand, laterite.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Poaceae	*Puccinellia vassica*	NM, DPaW		P1	Caespitose annual or perennial, grass-like or herb, 0.41-0.55 m high.	Saline soils. On the outer margins of coastal saltmarshes.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Proteaceae	*Banksia nivea* subsp. *uliginosa*	NM, DPaW, EPBC	En	T	Dense, erect, non-lignotuberous shrub, 0.2-1.5 m high. Fl. yellow-brown, Aug to Sep.	Sandy clay, gravel.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Proteaceae	*Banksia sessilis* var. *cordata*	NM		P4	Non-lignotuberous shrub, to 2.5 m high. Fl. cream-yellow, Jul to Oct.	White/grey sand. Coastal limestone.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Proteaceae	*Banksia squarrosa* subsp. *argillacea*	EPBC	Vu	T	Erect, open, non-lignotuberous shrub, 1.2-4 m high. Fl. yellow, Jun to Nov.	White/grey sand, gravelly clay or loam. Winter-wet flats, clay flats.	Highly unlikely: this species does not occur within 5 km of the survey area and no habitat for this species occurs within the survey area.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
Proteaceae	*Conospermum paniculatum*	NM		P3	Spreading, open shrub, 0.3-1.25 m high. Fl. blue-white, Jul to Nov.	Sandy or clayey soils. Swampy areas, plains, slopes.	Unlikely: this species has previously been recorded within 5 km of the survey area and some habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Proteaceae	*Franklandia triaristata*	NM, DPaW		P4	Erect, lignotuberous shrub, 0.2-1 m high. Fl. white-cream-yellow/brown-purple, Aug to Oct.	White or grey sand.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Proteaceae	*Grevillea brachystylis* subsp. *brachystylis*	NM, DPaW		P3	uch-branched, prostrate or decumbent, non-lignotuberous shrub, 0.2-0.5 m high, to 3 m wide. Fl. red, Aug to Nov.	Black sand, sandy clay. Swampy situations.	Unlikely: this species has previously been recorded within 5 km of the survey area and some habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Proteaceae	*Grevillea brachystylis* subsp. *grandis*	EPBC	CE	T	Shrubs, 0.3–1 m high. Branchlets not glaucous. Leaves simple, 70–110 mm long overall. Leaf blade 2–10 mm wide,	Amongst medium trees, or tall (sclerophyll) shrubland; in sand, or loam. It grows on brown lateritic clay loam soils (TSSC 2008)	Highly unlikely: this species does not occur within 5 km of the survey area and no habitat for this species occurs within the survey area.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
					undissected, flat, narrowly elliptic. Margins entire, recurved. Hairs straight. Flowers red, August, or September.		
Proteaceae	*Grevillea bronwenae*	NM, DPaW		P3	Slender, erect shrub, 0.5-1.6 m high. Fl. red, Jun to Dec.	Grey sand over laterite, lateritic loam. Hillslopes.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Proteaceae	*Grevillea elongata*	NM, DPaW, EPBC	Vu	T	Shrub, 1.5-2 m high. Fl. white-cream, Oct.	Gravelly clay, sandy clay, sand. Road verges, swamps, creek banks.	Unlikely: this species has previously been recorded within 5 km of the survey area and some habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Proteaceae	*Hakea oldfieldii*	NM		P3	Open, straggling shrub, up to 2.5 m high. Fl. white-cream/yellow, Aug to Oct.	Red clay or sand over laterite. Seasonally wet flats.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Proteaceae	*Isopogon formosus* subsp. *dasylepis*	NM, DPaW		P3	Low, bushy or slender, upright, non-lignotuberous shrub, 0.2-2 m high. Fl. pink-purple/red,	Sand, sandy clay, gravelly sandy soils over laterite. Often swampy areas.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
					Jun to Dec.		
Proteaceae	*Lambertia echinata* subsp. *occidentalis*	NM, DPaW, EPBC	En	T	Prickly, much-branched, non-lignotuberous shrub, to 3 m high. Fl. yellow, Feb or Apr or Dec.	White sandy soils over laterite, orange/brown-red clay over ironstone. Flats to foothills, winter-wet sites.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Proteaceae	*Lambertia orbifolia* subsp. Scott River Plains (L.W. Sage 684)	NM, DPaW	En	T	Small tree or shrub, to 5 m high. Fl. red-orange, Oct to Nov or Jan.	Yellow-brown sandy clay, grey sand, sandy gravel, laterite. Along riverbanks, sand dunes, plains & ridges, seasonally-inundated areas.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.
Proteaceae	*Petrophile latericola*	EPBC	En	T	Multi-stemmed shrub, 0.4-1.5 m high. Fl. yellow, Nov.	Red lateritic clay. Winter-wet flats.	Highly unlikely: this species does not occur within 5 km of the survey area and no habitat for this species occurs within the survey area.
Proteaceae	*Synaphea hians*	NM, DPaW		P3	Prostrate or decumbent shrub, 0.15-0.6 m high, to 1 m wide. Fl. yellow, Jul or Sep to Nov.	Sandy soils. Rises.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Proteaceae	*Synaphea petiolaris* subsp. *simplex*	NM, DPaW		P2	Tufted shrub, 0.1-0.6 m high. Fl.	Sandy soils. Flats, winter-wet areas.	Unlikely: this species has previously been recorded within 5 km of the survey area and habitat occurs within the survey area. Large

Family	Taxon	Source	Status		Description and closest record	Habitat	Likelihood of occurrence
					yellow, Sep to Oct.		portions of the vegetated areas were traversed during the assessment.
Restionaceae	*Loxocarya magna*	NM, DPaW		P3	Rhizomatous, perennial, herb (sedge-like), 0.5-1.5 m high. Fl. Sep or Nov.	Sand, loam, clay, ironstone. Seasonally inundated or damp habitats.	Unlikely: this species has previously been recorded within 5 km of the survey area however limited habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Santalaceae	*Leptomeria furtiva*	NM		P2	Lax, sprawling shrub, 0.2-0.45 m high. Fl. orange-brown, Aug to Oct.	Grey or black peaty sand. Winter-wet flats.	Unlikely: this species has previously been recorded within 5 km of the survey area however limited habitat occurs within the survey area. Large portions of the vegetated areas were traversed during the assessment.
Thymelaeaceae	*Pimelea ciliata* subsp. *longituba*	NM, DPaW		P3	Erect shrub, 0.3-1 m high. Fl. pink, Oct to Dec.	Grey sand over clay, loam.	Unlikely: this species has previously been recorded within 5 km of the survey area however no habitat occurs within the survey area.

Appendix E - (Fauna data)

Fauna species list

Fauna likelihood of occurrence assessment

Fauna species list – species recorded during the September 2009 (GHD 2010) and 2016 surveys

Family	Genus	Species	Common Name	Conservation listing	Introduced Fauna	GHD 2010	GHD 2016
Birds							
Acanthizinae	*Acanthiza*	*inornata*	Western Thornbill			X	
Acanthizinae	*Smicrornis*	*brevirostris occidentalis*	Weebill			X	
Alcedinidae	*Dacelo*	*novaeguineae*	Laughing Kookaburra	int	X	X	X
Anatidae	*Anus*	*superciliosa*	Pacific Black Duck			X	X
Anatidae	*Anus*	*gracilis*	Grey Teal			X	
Anatidae	*Chenonetta*	*jubata*	Australian Wood Duck			X	X
Ardeidae	*Ardea*	*intermedia*	Intermediate Egret			X	
Ardeidae	*Egretta*	*novaehollandiae*	White-faced Heron			X	X
Campephagidae	*Coracina*	*novaehollandiae*	Black-faced Cuckoo-shrike			X	
Charadriidae	*Elseyornis*	*melanops*	Black-fronted Dotterel			X	
Columbidae	*Columba*	*livia*	Feral Pigeon	int	X	X	X
Columbidae	*Phaps*	*chalcoptera*	Common Bronzewing			X	X
Corvidae	*Corvus*	*coronoides perplexus*	Australian Raven			X	X
Cracticidae	*Cracticus*	*tiibicen dorsalis*	Australian Magpie			X	X
Cuculidae	*Cuculus*	*pallidus*	Pallid Cuckoo			X	
Dricruridae	*Grallina*	*cyanoleuca*	Magpie-lark			X	
Dricruridae	*Rhipidura*	*fuliginosa keasti*	Grey Fantail			X	
Dricruridae	*Rhipidura*	*leucophrys*	Willie Wagtail			X	X
Falconidae	*Falco*	*cenchroides*	Nankeen Kestrel			X	X
Hirundinidae	*Hirundo*	*neoxena*	Welcome Swallow			X	X
Hirundinidae	*Hirundo*	*ariel*	Fairy Martin			X	
Laridae	*Larus*	*novaehollandiae*	Silver Gull			X	X
Malurinae	*Malurus*	*splendens*	Splendid Fairy-wren			X	
Meliphagidae	*Anthochaera*	*carunculata*	Red Wattlebird			X	
Meliphagidae	*Anthochaera*	*lunulata*	Western Wattlebird			X	X
Meliphagidae	*Lichmera*	*indistincta*	Brown Honeyeater			X	

Family	Genus	Species	Common Name	Conservation listing	Introduced Fauna	GHD 2010	GHD 2016
Meliphagidae	*Phylidonyris*	*novaehollandiae*	New Holland Honeyeater			X	X
Meliphagidae	*Lichenostomus*	*virescens*	Singing Honeyeater			X	
Meliphagidae	*Lichenostomus*	*ornatus*	Yellow-plumed Honeyeater			X	
Motacillidae	*Anthus*	*australis*	Australian Pipit			X	X
Phalacrocoracidae	*Phalacrocorax*	*carbo*	Great Cormorant			X	X
Phalacrocoracidae	*Phalacrocorax*	*melanoleucos*	Little Pied Cormorant			X	X
Rallidae	*Gallinula*	*tenebrosa*	Dusky Moorhen			X	
Rallidae	*Fulica*	*atra*	Eurasian Coot			X	
Cacatuidae	*Cacatua*	*sanguinea westralensis*	Little Corella			X	
Cacatuidae	*Eolophurus*	*roseicapilla*	Pink and Grey Galah			X	
Psittacidae	*Platycercus*	*zonarius semitorquatus*	Twenty-eight Parrot			X	X
Threskiornithidae	*Threskiornis*	*molucca*	Australian White Ibis			X	X
Charadrius	*Charadrius*	*ruficapillus*	Red Capped Dotterel				X
Psittaculidae	*Platycercus*	*zonarius*	Australian Ringneck				X
Pandionidae	*Pandion*	*haliaetus*	Osprey	Mi We, S5			X
Zosteropidae	*Zosterops*	*lateralis gouldi*	Silvereye			X	
Reptiles							
Cheluidae	*Chelodina*	*oblonga*	Oblong Turtle			X	
Elapidae	*Echiopsis*	*curta*	Bardick			X	
Elapidae	*Elapognathus*	*coronatus*	Crown Snake			X	
Elapidae	*Pseudonaja*	*affinis*	Dugite			X	
Elapidae	*Notechis*	*scutatus*	Tiger Snake			X	X
Scincidae	*Cryptoblephorus*	*buchanani*	Fence Skink			X	
Scincidae	*Egernia*	*kingii*	King Skink			X	
Scincidae	*Egernia*	*luctuosa*	Mourning Skink			X	
Scincidae	*Lerista*	*distinguenda*	Southwest Four-toed Lerista			X	X
Scincidae	*Menetia*	*greyii*	Common Dwarf Skink			X	

Family	Genus	Species	Common Name	Conservation listing	Introduced Fauna	GHD 2010	GHD 2016
Scincidae	*Tiliqua*	*rugosa rugosa*	Bobtail			X	X
Amphibians							
Hylidae	*Litoria*	*adelaidensis*	Slender Tree Frog			X	X
Hylidae	*Litoria*	*moorei*	Motorbike Frog			X	
Myobatrachidae	*Crinia*	*glauerti*	Clicking Froglet			X	X
Myobatrachidae	*Crinia*	*insignifera*	Squelching Froglet			X	
Myobatrachidae	*Heleioporus*	*eyrei*	Moaning Frog			X	X
Mammals							
Canidae	*Vulpes*	*vulpes*	Fox	int	X	X	X
Canidae	*Canus*	*domesticus*	Dog	int	X	X	X
Leporidae	*Oryctolagus*	*cuniculus*	European Rabbit	int	X	X	X**
Bovidae	*Bos*	*taurus*	Cow	int	X	X	X
Macropodidae	*Macropus*	*fuliginosus*	Western Grey Kangaroo			X	X**
Peramelidae	*Isoodon*	*obesulus fusciventer*	Southern Brown Bandicoot	P4		X*	X*
Felidae	*Felis*	*catus*	Cat	int	X		X**
Pseudocheiridae	*Pseudocheirus*	*occidentalis*	Western Ringtail Possum	Vu, S1		X	X**
Fish							
Galaxiidae	*Galaxias*	*occidentalis*	Western Minnow			X	
Mugilidae	*Aldrichetta*	*forsteri*	Yelloweye Mullet			X	
Crustaceans							
Portunidae	*Portunus*	*pelagicus*	Blue Manna Crab			X	
Mollusca							
Hyriidae	*Westralunio*	*carteri*	Carter's Freshwater Mussel	En	En, S2		X

* identified via diggings; ** identified by scats, int: introduced

Black Cockatoo trees recorded during 2016 survey (within and adjacent to the survey area)

SPECIES	DBH	HOLLOW	FEEDING	Easting	Northing	Location
Flooded Gum	500			344579.8	6274013	Outside
Flooded Gum	1600	3 small		348394.3	6271339	Outside
Flooded Gum	900	1 large		348397	6271333	Outside
Flooded Gum	100	1 small		348397.4	6271326	Outside
Flooded Gum	700	1 large		348397.4	6271327	Outside
Flooded Gum	700			348402.6	6271321	Inside
Flooded Gum	1400			348409	6271395	Inside
Flooded Gum	1200			348417	6271114	Inside
Flooded Gum	600	1 medium		348417.6	6271123	Inside
Flooded Gum	1000			348417.7	6271168	Inside
Flooded Gum	500			348419.8	6271145	Inside
Flooded Gum	600	2 small		348420.9	6271132	Inside
Flooded Gum	500			348421.8	6271380	Inside
Flooded Gum	700			348422.5	6271380	Inside
Flooded Gum	500			348425.1	6271366	Inside
Flooded Gum	500			348426.2	6271371	Inside
Flooded Gum	500			348435.3	6271345	Inside
Flooded Gum	500			348435.3	6271333	Inside
Flooded Gum	500			348438.5	6271329	Inside
Flooded Gum	600			348439.8	6271332	Inside
Flooded Gum	600			348441.5	6271327	Inside
Flooded Gum	1000			348444.8	6271311	Inside
Flooded Gum	600			348453.8	6271259	Inside
Flooded Gum	700			348455.9	6271276	Inside
Flooded Gum	600			348458.4	6271275	Inside
Flooded Gum	900			348464.7	6271360	Inside
Flooded Gum	600			348470.6	6271361	Inside
Flooded Gum	700			348472.4	6271216	Inside
Flooded Gum	1100			348501	6271181	Outside
Flooded Gum	500	1 small		348508.5	6271164	Outside
Flooded Gum	120	3 small		348509.5	6271161	Outside
Flooded Gum	500			348516.7	6271171	Outside
Flooded Gum, dying	700	1 small		344599.4	6273939	Inside
Marri	700			348412.5	6271270	Inside
Marri	700			348412.7	6271289	Inside
Marri	500			348419.5	6271131	Inside
Marri	800			348450.3	6271157	Inside
Marri	120			348451.2	6271383	Inside
Marri	500			348452.3	6271170	Inside
Marri	110			348457.3	6271158	Inside

SPECIES	DBH	HOLLOW	FEEDING	Easting	Northing	Location
Marri	500			348473.8	6271238	Inside
Marri	600			348482.2	6271303	Inside
Marri	500			348482.7	6271234	Inside
Marri	600			348485	6271262	Inside
Marri	900			348490.3	6271384	Outside
Marri	1000	1 medium		348490.5	6271385	Outside
Marri	600			348492.6	6271317	Inside
Marri	1400			348494.5	6271317	Outside
Marri	1000			348497.2	6271273	Outside

Western Ringtail Possum Scats and Dreys recorded during the 2016 survey

Drey/Scat	Easting	Northing	Location (inside/outside survey area)
Drey	344719.3	6273897	Outside
Scat	344535.8	6275080	Outside
Scat	344594	6275081	Outside
Scat	344587.2	6273970	Inside
Scat	345227.5	6273810	Outside
Scat	344536.6	6275160	Outside
Scat	344614.3	6273881	Outside
Scat	345139.8	6273761	Outside
Drey	344843.5	6273807	Outside
Drey	344950.8	6273787	Outside
Drey	346431.5	6273157	Outside
Drey	344864.2	6273806	Outside
Drey	344535.3	6275086	Outside
Drey	344837.4	6273807	Outside
Drey and scat	344717.8	6273894	Outside
Scat	344594.7	6274973	Outside
Drey	348497.8	6271097	Outside
Scat	348494.6	6271102	Outside

Parameters of fauna likelihood of occurrence assessment

Assessment outcome	Description
Present	Species recorded during the field survey or from recent, reliable records from within the survey area.
Likely	Species are **likely** to occur in the survey area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the survey area. OR Species known distribution overlaps with the survey area and there is suitable habitat within the survey area.
Unlikely*	Species assessed as **unlikely** include those species previously recorded within 5 km of the survey area however: • There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the survey area. • The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area. OR Those species that have a known distribution overlapping with the survey area however: • There is limited habitat in the survey area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). • The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.
Highly unlikely	Species that are considered **highly unlikely** to occur in the survey area include: • Those species that have no suitable habitat within the survey area. • Those species that have become locally extinct, or are not known to have ever been present in the region of the survey area.

*It is important to note that an unlikely assessment of likelihood does not indicate that the species will not occur within the survey area. This definition indicates that there is a low likelihood of the species occurring within the survey area.

Fauna likelihood of occurrence assessment

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Birds							
Actitis hypoleucos (Common Sandpiper)	MiW	IA, S5	x		X	Habitat for this species is varied: coastal and interior wetlands – narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches. Avoids wide open mudflats. This species is widespread and scattered, common on the north and west coasts and uncommon in the south-east and interior (Morcombe 2004).	Likely - The species is known to use the coastal and estuarine regions around Bunbury and Busselton.
Calidris ferruginea (Curlew Sandpiper)	CR, MiW	Vu, S3	X	X		Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (DSEWPaC 2013).	Likely: this species has been recorded within 5 km of the survey area and some habitat for this species occurs within the survey area. This species would be a visitor to the survey area.
Calidris tenuirostris (Great Knot)	Vu, MiW	Vu, S3	X			In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot	Likely: this species has been recorded within 5 km of the survey area and some habitat for this species occurs within the survey area. This species would be a visitor to the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						rarely occurs on inland lakes and swamps.Typically, the Great Knot roosts in large groups in open areas, often at the waters edge or in shallow water close to feeding grounds (DSEWPaC 2013).	
Calidris acuminata (Sharp-tailed Sandpiper)	MiW	IA, S5	X	X		In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves (Higgins and Davies 1996)	Likely: this species has been recorded within 5 km of the survey area and some habitat for this species occurs within the survey area. This species would be a visitor to the survey area.
Calidris alba (Sanderling)		IA, S5	X			In Australia, the species is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed. Sanderlings also occur on beaches that may contain wave-washed rocky outcrops. Less often the species occurs on more sheltered sandy shorelines of estuaries, inlets and harbours. Rarely, they are recorded in near-coastal wetlands, such as lagoons, hypersaline lakes, saltponds and samphire flats (Higgins and Davies 1996)	Unlikely: this species has been recorded within 5 km of the survey area however very limited habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Calidris melanotos (Pectoral Sandpiper)		IA, S5	X			The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands (Higgins & Davies 1996).	Unlikely: this species has been recorded within 5 km of the survey area however limited habitat for this species occurs within the survey area. This species would be an occasional visitor to the survey area.
Calidris ruficollis (Red-necked Stint)	MiW	IA, S5	X	X		The Red-necked Stint is distributed along most of the Australian coastline with large densities on the Victorian and Tasmanian coasts. It is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, near spits, islets and banks (DSEWPaC 2013).	Unlikely: this species has been recorded within 5 km of the survey area however limited habitat for this species occurs within the survey area. This species would be an occasional visitor to the survey area.
Calidris subminuta (Long-toed Stint)	MiW	IA, S5	X	X		In Australia, the Long-toed Stint occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire (Higgins and Davies 1996)	Likely: this species has been recorded within 5 km of the survey area and some habitat for this species occurs within the survey area. This species would be a visitor to the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Ixobrychus flavicollis subsp. australis (Australian Black Bittern)		P1	X		X	The Black Bittern inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, this species may occur in flooded grassland, forest, woodland, rainforest and mangroves (Marchant & Higgins 1990).	Unlikely: this species has been recorded within 5 km of the survey area however no habitat for this species occurs within the survey area.
Ixobrychus minutus (little Bittern)		P4			X	The Little Bittern inhabits areas of reed and cumbungi-choked freshwater swamps, lakes, rivers, tussocks in wetland areas and well vegetated lakes (Pizzey and Knight 2012)	Unlikely: this species has not been recorded within 5 km of the survey area and there are very scattered records of this species in the region.
Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)	Vu	Vu	X	X		Forest Red-tailed Black Cockatoo typically occurs in dense Jarrah (*Eucalyptus marginata*), Karri (*E. diversicolor*) and Marri (*Corymbia calophylla*) forests, however the species also occurs in a range of other forest and woodland types, including Blackbutt (*E. patens*), Wandoo (*E. wandoo*), Tuart (*E. gomphocephala*), Albany Blackbutt, Yate (*E. cornuta*), and Flooded Gum	Likely: feeding and potential breeding habitat is available within the survey area and this species is known to occur and/or visit the region.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						(*E. rudis*) (DSEWPaC, 2012). Habitats also tend to have an understorey of *Banksia spp., Persoonia spp., Allocasuarina* spp. The Forest red-tailed Black Cockatoo generally nests in hollows in live or dead trees of Marri, Karri, Wandoo, Bullich, Blackbutt, Tuart and Jarrah (DSEWPaC 2012).	
Calyptorhynchus baudinii (Baudin's Black Cockatoo)	Vu	En	X	X		Baudin's Black Cockatoo occurs in high-rainfall areas, usually at sites that are heavily forested and dominated by Marri (*Corymbia calophylla*) and Eucalyptus species, especially Karri (*E. diversicolor*) and Jarrah (*E. marginata*). The species also occurs in woodlands of Wandoo (*E. wandoo*), Blackbutt *(E. patens*), Flooded Gum (*E. rudis*), and Yate (*E. cornuta*) . Baudin's Black Cockatoo breeds in the Jarrah, Marri and Karri forests of the deep south-west in areas averaging more than 750 mm of rainfall annually. The range of the species extends from Albany northward to Gidgegannup and Mundaring (east of Perth), and inland to the Stirling Ranges and near Boyup Brook. Preferred roosts are in areas with a dense canopy close to permanent sources of water, that provide the birds with protection from weather conditions (DSEWPaC, 2012).	Likely: feeding and potential breeding habitat is available within the survey area and this species is known to occur and/or visit the region.
Calyptorhynchus latirostris (Carnaby's Black Cockatoo)	En	En	X	X		This species mainly occurs in uncleared or remnant native eucalypt woodlands and in shrubland or kwongan heathland dominated by *Hakea, Dryandra, Banksia* and *Grevillea* species. The species also occurs in forests containing Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*) or Karri (E*. diversicolor*). Breeding usually occurs in the Wheatbelt region of	Likely: feeding and potential breeding habitat is available within the survey area and this species is known to occur and/or visit the region.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						Western Australia, with flocks moving to the higher rainfall coastal areas to forage after the breeding season. Feeds on the seeds of a variety of native plants, including *Allocasuarina, Banksia, Dryandra, Eucalyptus, Grevillea and Hakea,* and some introduced plants (DSEWPaC, 2012).	
Cacatua pastinator subsp. pastinator (Muir's Corella)		S6	X			Muir's Corella is now confined to a small region from Boyup Brook, McAlinden and Qualeup, south to Lake Muir and the lower Perup River, and east to Frankland and Rocky Gully (DEC 2008). Muir's Corella occurs in eucalyptus woodlands that are dominated by Wandoo (Eucalyptus wandoo), Marri, (Corymbia calophylla), or Jarrah, (E. marginata). Most suitable woodland habitat for this species now consists of remnant patches. These patches occur in or adjacent to farmland, or along roadsides, paddock boundaries or watercourses, and sometimes as a few, isolated shade trees in otherwise cleared paddocks (Garnett & Crowley 2000).	Unlikely: this species current distribution is confined to a small region, east of the survey area. A small amount of habitat for this occurs within the survey area.
Charadrius rubricollis (Hooded Plover)		P4	x			The Hooded Plover is a wader that is endemic to Australia with most of the remaining birds occurring in southern Western Australia. Hooded Plovers primarily inhabit sandy, ocean beaches, with the highest densities on beaches with large amounts of beach-washed seaweed, that are backed by extensive open dunes. In Western Australia the species also inhabits inland and coastal salt lakes. This species is known to occur on coastal areas and inland lakes in the Esperance region. They are mainly found on the coast during the dry season, but some birds	Unlikely: this species has been recorded within 5 km of the survey area however limited habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						move inland during the wet season (Morcombe, 2004).	
Charadrius leschenaultii leschenaultii (Greater Sand Plover)	MiW	VU, S3, IA, S5			X	In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps (DSEWPaC 2013).	Highly unlikley: this species has not been recorded within 5 km of the survey area and no habitat for this species occurs within the survey area.
Charadrius mongolus (Lesser Sand Plover)	En, MiW	En, S2, IA, S5		X		In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometime occurs in short saltmarsh or among mangroves. The species also inhabits saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds (Marchant & Higgins 1993).	Highly unlikley: this species has not been recorded within 5 km of the survey area and no habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Charadrius bicinctus (Double-banded Plover)	MiW	IA, S5		X		The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. The species is sometimes associated with coastal lagoons, inland saltlakes and saltworks. It is also found on seagrass beds, especially *Zostera*, which, when exposed at low tide, remain heavily saturated or have numerous water-filled depressions (R.J Pierce in Marchant and Higgins 1993)	Unlikley: this species has not been recorded within 5 km of the survey area however habitat for this species occurs within the survey area.
Limosa lapponica (Bar-tailed Godwit)	Mi We	IA, S5		x		The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh (Morcombe 2004). They usually forage near the edge of water or in shallow water, mainly in tidal estuaries and harbours and roost on sandy beaches, sandbars, spits and also in near-coastal saltmarshs (Marchant & Higgins 1993).	Highly unlikley: this species has not been recorded within 5 km of the survey area and no habitat for this species occurs within the survey area.
Oxyura australis (Blue-billed Duck)		P4	X		X	The blue-billed duck is a small Australian almost entirely aquatic duck, with both the male and female growing to a length of 40 cm. The male has a slate-blue bill which changes to bright-blue during the breeding season (Morcombe 2004). The blue-billed duck is endemic to Australia's temperate regions, ranging from the south west of Western Australia, extending to southern Queensland, through New South Wales and	Unlikely - The species is known from the region however the habitat present in the survey area is not suitable for this species.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						Victoria, to Tasmania. The species is readily seen on freshwater lakes and billabongs where deep fresh water is present (Morcombe 2004).	
Pandion haliaetus (Osprey)	Mi We	IA, S5		X		Osprey are a widespread bird of prey found around the entire coast line of Australia. The species feeds on fish and nests on large platforms of sticks and vegetation including seaweed and debris. Osprey do follow esteries and large rivers inland to arid areas where large pools are formed (Morcombe 2004). However shelter and food source is required.	Present: this species was sighted during the assessment.
Motacilla cinerea (Grey Wagtail)	Mi Te	IA, S5		X		The Grey Wagtail is an opportunistic migrant to Australia. The species typically migrates to Indonesia occasionally landing in Australia. Most records for the species are from Northern Australia and South Australia. Habitat for the species is often associated with water bodies and/ or grassed areas (Morcombe 2004)	Unlikely - this species is not known from this region.
Botaurus poiciloptilus (Australasian Bittern)	En	En, S2		X		The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands. The species favours foraging in tall, dense vegetation in shallow permanent or seasonal fresh water. In the southwest of Western Australia, the Bittern is now largely confined to coastal areas especially along the south coast where it is found in beds of tall rush mixed with or near short fine sedge or open pools (Burbridge 2004). It also occurs around swamps, lakes, pools, rivers and channels fringed with lignum Muehlenbeckia,	Unlikely: this species has not been recorded within 5 km of the survey area however some habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						canegrass Eragrostis or other dense vegetation (Marchant & Higgins 1990). It occasionally ventures into areas of open water or onto banks.	
Plegadis falcinellus (Glossy Ibis)	MiW	IA, S5	X			Within Australia, the Glossy Ibis is generally located east of the Kimberley. The species is also known to be patchily distributed in the rest of Western Australia. Its preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewerage ponds, rice-fields and cultivated areas under irrigation (DSEWPaC 2013).	Unlikely: this species has been recorded within 5 km of the survey area however limited to no habitat for this species occurs within the survey area.
Pluvialis fulva (Pacific Golden Plover)	MiW	IA, S5	X			In non-breeding grounds in Australia this species usually inhabits coastal habitats, though it occasionally occurs around inland wetlands. Pacific Golden Plovers usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as *Sarcocornia,* or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks. The species is also sometimes recorded on islands, sand and coral cays and exposed reefs and rocks. They are less often recorded in terrestrial habitats, usually wetlands such as fresh, brackish or saline lakes, billabongs, pools, swamps and wet claypans, especially those with muddy margins and often with submerged vegetation or short emergent grass (Marchant and Higgins 1993)	Unlikely: this species has been recorded within 5 km of the survey area however limited to no habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Tringa glareola (Wood Sandpiper)	MiW	IA, S5	X	X	X	The Wood Sandpiper has its largest numbers recorded in north-west Australia. Typical habitat includes well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. This species does not breed in Australia (DSEWPaC 2013).	Unlikely: this species has been recorded within 5 km of the survey area however limited to no habitat for this species occurs within the survey area.
Ninox connivens connivens (Barking Owl)		P2			X	The southwest subspecies of the Barking Owl is found in the lower south-west region and is very scarce. There is little known about the subspecies (Nevill 2008). Barking Owls are found in open woodlands and the edges of forests, often adjacent to farmland. They are less likely to use the interior of forested habitat. They are usually found in habitats that are dominated by eucalytpus species, particularly red gum, and, in the tropics, paperbark species. They prefer woodlands and forests with a high density of large trees and particularly sites with hollows that are used by the owls as well as their prey. Habitat preference is strongly biased towards areas that provide a high density of large trees greater than 60cm diameter and a high density of hollow trees of a range of sizes, including large hollows greater than 15cm diameter which are suitable nesting places for Barking Owls. Roost sites are often located near waterways or wetlands.	Unlikely: this species has not been recorded within 5 km of the survey area however limited to no habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Tringa nebularia (Common Greenshank)	MiW	IA, S5	X	X	X	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands and will also use artificial wetlands (Higgins and Davis 1996)	Likely: this species has been recorded within 5 km of the survey area however habitat for this species occurs within the survey area.
Tringa stagnatilis (Marsh Sandpiper)	MiW	IA, S5	X		X	The Marsh Sandpiper is found on coastal and inland wetlands throughout Australia. It lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks (DSEWPaC 2013).	Likely: this species has been recorded within 5 km of the survey area however habitat for this species occurs within the survey area.
Tyto novae-hollandiae subsp. novae-hollandiae (Masked Owl)		P3	X		X	The Masked Owl is found across a range of habitats from wet sclerophyll forest, dry sclerophyll forest, non eucalypt dominated forest, scrub and cleared land with remnant old growth trees. There are however several aspects of habitat preference which appear to be common: the Masked Owl requires large hollows in old growth eucalypts for nesting; it often favours areas with dense understorey or ecotones comprising dense and sparse ground cover, they are often recorded foraging within 100-300m of the boundary of two vegetation types (Bell & Mooney, 2002).	Unlikely: this species has been recorded within 5 km of the survey area however limited habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Ardea ibis (Cattle Egret)		IA, S5	X			The Cattle Egret is a common and widespread species. Typical habitat includes tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands and roosts in trees, or amongst ground vegetation in or near lakes and swamps (Morcombe, 2004).	Likely: this species has been recorded within 5 km of the survey area and habitat for this species occurs within the survey area.
Ardea modesta (Eastern Great Egret)		IA, S5	X			The eastern Great Egret is widespread in Australia. They have been reported in a wide range of wetland habitats, include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pasture or agricultural lands; reservoirs; sewerage treatment ponds; drainage channels; salt pans; salt marshes; mangrove, and a range of coastal/marine habitats (DSEWPaC 2013)	Likely: this species has been recorded within 5 km of the survey area and habitat for this species occurs within the survey area.
Falco peregrinus (Peregrine Falcon)		S7	X			The Peregrine Falcon is seen occasionally anywhere in the south-west of Western Australia. It is found everywhere from woodlands to open grasslands and coastal cliffs - though less frequently in desert regions. The species nests primarily on ledges of cliffs, shallow tree hollows, and ledges of building in cities. (Morcombe, 2004).	Likely: this species has been recorded within 5 km of the survey area and habitat for this species occurs within the survey area.
Reptiles							

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Elapognathus minor (Short-nosed Snake)		P2	X			The Short-nosed Snake occurs from Busselton south to Two-Peoples Bay. Inhabits heaths edging swamps and shelters in low dense vegetation such as tussocks and sedges (Wilson & Swan 2013).	Likely: this species has been recorded within 5 km of the survey area and habitat for this species occurs within the survey area.
Ctenotus delli (dell's Skink)		P4			X	Associated with Jarrah-Marri woodland that has a shrub-dominated understorey, on laterite, sandy or clay soils. It is occasionally found on granite outcrops, and is absent from the Swan Coastal Plain (Wilson and Swan, 2013).	Highly unlikely: this species has not been recorded within 5 km of the survey area and not habitat for this species occurs within the survey area.
Ctenotus ora (Coastal Plains Skink)		P3			X	The Coastal Plains Skink is locally restricted the sandy regions of the Swan Coastal Plain south of Perth. It inhabits open euclaypt woodland over Banksia, as well as sandy coastal plain and coastal dunes between Pinjarra and Yallingup Brook (Wilson and Swan 2013).	Unlikely: habitat for this species occurs within the survey area, however this species has been recorded within 27 km of the survey area.
Mammals							
Bettongia penicillata ogilbyi (Woylie)	En	CR			X	Preferred habitat for the Woylie includes dense undergrowth, logs and rock-cavities and occasionally in burrows (Burbidge 2004). Scattered Woylie populations may be found throughout the Jarrah forest in the south-west corner of Western Australia. Extant naturally occurring populations of the species are	Highly unlikely: this species has not been recorded within 5 km of the survey area and no habitat for this species occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						restricted to three small wheatbelt reserves in WA – Dryandra Woodland, Tutanning Nature Reserve and Perup Forest. All are characterised by the presence of thickets of the plant Gastrolobium (Van Dyck and Strahan 2008). The species historically occurred in a wide variety of habits, however is now restricted to forests and areas where predation has been controlled (or excluded).	
Dasyurus geoffroii (Chuditch, Western Quoll)	Vu	Vu		X	X	The Chuditch inhabits eucalypt forest (especially Jarrah, *Eucalyptus marginata*), dry woodland and mallee shrublands. In Jarrah forest, Chuditch populations occur in both moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest. Most diurnal resting sites in sclerophyll forest consist of hollow logs or earth burrows (Van Dyke & Strahan, 2008). The species can travel large distances, has a large home range and is sparsely populated through a large portion of its range.	Unlikely: there are three records of this species within 5 km of the survey area (latest record 2010), however limited habitat for this species occurs within the survey area. This species may occasionally visit the survey area.
Hydromys chrysogaster (Water Rat)		P4	X		X	Water-rats live primarily in a wide variety of freshwater habitats, from sub-alpine streams and other inland waterways to lakes, swamps, farm dams and irrigation channels and are thought to be one of the few native species to have at least partially benefited from human encroachment (Gardner and Serena, 1995)	Likely - there are three records of this species within 5 km of the survey area (latest record 2011). The drain links into the Vasse River and a wetland which are both permanent water bodies with suitable habitat for maintaining a Water Rat population.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)		P4	X		X	The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Van Dyck and Strahan, 2008).	Present – Quenda were recorded in the current and previous survey by GHD (2010).
Phascogale tapoatafa subsp. tapoatafa (Southern Brush-tailed Phascogale, Wambenger)		Vu	X		X	Dry sclerophyll forests and open woodlands with a generally sparse ground-storey, which contain suitable nesting resources such as tree hollows, rotted stumps and tree cavities (Van Dyck and Strahan, 2008).	Likely: habitat is available to this species and they are known to occur in the region, however this species would be restricted to the Eucalypt woodland.
Pseudocheirus occidentalis (Western Ringtail Possum)	En	En	X	X	X	The Western Ringtail Possum occurs in and near coastal Peppermint Tree (*Agonis flexuosa*) forest and Tuart (*Eucalyptus gomphocephala*) dominated forest with a Peppermint Tree understorey from Bunbury to Albany. Also occurs in Jarrah (*Eucalyptus marginata*) forest and Jarrah-Marri (*Corymbia calophylla*) forest associated with Peppermint Tree (Van Dyck and Strahan, 2008).	Present: Western Ringtail Possum was recorded in the current and previous survey.
Macropus eugenii derbianus (Tammar Wallaby)		P4			X	The Tammar Wallaby inhabits dense, low vegetation for daytime shelter and open grassy areas for feeding. Inhabits coastal scrub, heath, dry sclerophyll (leafy) forest and thickets in mallee and woodland The tammar wallaby is currently known to inhabit three islands in the Houtman Abrolhos group, Garden Island near	Highly unlikely: this species is restricted to three islands off WA and nine sites on the mainland. The nearest record of this species is over 50 km from the

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						Perth, Middle and North Twin Peak Islands in the Archipelago of the Recherche, and at least nine sites on the mainland including, Dryandra, Boyagin, Tutanning Batalling (reintroduced) Perup, private property near Pingelly, Jaloran Road timber reserve near Wagin, Hopetown, Stirling Range National Park, and Fitzgerald River National Park (Van Dyck and Strahan 2008).	survey area.
Macropus Irma (Western Brush Wallaby)		P4			X	The Western Brush Wallaby is a grazer found primarily in open forest or woodland,particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland, and is uncommon in karri forest. This species was once very common in the south-west of Western Australia but has undergone a reduction in range and a significant decline in abundance in its current habitat. (Van Dyke & Strahan, 2008).	Unlikely: this species has been recorded within 11 km of the survey area (record dated 1995), however some habitat occurs within the survey area.
Myrmecobius fasciatus (Numbat)	Vu	EN			X	The Numbat's distribution once encompassed a number of habitat types, including eucalypt forest, eucalypt woodland, Acacia woodland and Triodia grasslands. Current populations occupy several different habitat types: upland Jarrah forest, open eucalypt woodland, banksia woodland and tall closed shrubland. There are currently two remnant native populations at Dryandra and Perup, WA and several reintroduced populations including Boyagin Nature Reserve, Tutanning Nature Reserve, Batalling block and Karroun Hill Nature Reserve. At Dryandra, numbats inhabit brown mallet (Eucalyptus astringens) plantations. Habitats	Highly unlikely: this species has been recorded 40 km from the survey area (record dated 1973), however some habitat occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
						usually have an abundance of termites in the soil, hollow logs and branches for shelter (Friend 2008). This species has been part of a recovery plan since the late 1980's and has been relocated into several areas of the south west (Van Dyck and Strahan, 2008).	
Falsistrellus mackenziei (Western False Pipistrelle)		P4			X	The Western False Pipistrelle occurs in wet sclerophyll forest dominated by Karri (Eucalyptus diversicolor), and in the high rainfall zones of the Jarrah (E. marginata) and Tuart (E. gomphocephala) forests. The species is restricted to areas in or adjacent to stands of old growth forest. It has also been recorded in mixed Tuart-Jarrah tall woodlands on the adjacent coastal plain. Marri (E. calophylla), Sheoak (Casuarina heugeliana) and Peppermint (Agonis flexuosa) trees are often co-dominant at its collection localities (Churchill 2008; McKenzie & Start 1999).	Unlikely: this species has been recorded 17 km from the survey area, however some habitat occurs within the survey area in the form of the eucalypts in the southern section.
Setonix brachyurus (Quokka)	Vu	Vu	x	x	x	Dense forests and thickets, streamside vegetation, heaths and shrublands *Agonis linearifolia*-dominated swamps in the Jarrah (*Eucalyptus marginata*) forest. The northern extent of the current distribution on the mainland is in the Jarrah forest immediately south-east of the Perth metropolitan area, from where it extends southward through the southern Jarrah, Marri and Karri forests to the south coast, but largely confined throughout to areas receiving an annual rainfall of 1,000 millimetres or more (Van Dyck and Strahan, 2008).	Unlikely: an old record (1931) of this species occurs within 6 km from the survey area and limited to no habitat occurs within the survey area.

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Fish							
Nannatherina balstoni (Balston's Pygmy Perch)	Vu	Vu, S3	X		X	Balston's Pygmy Perch inhabits acidic, tannin-stained freshwater pools, streams and lakes in peat flats within 30 km of the coast of south-west Western Australia, preferring shallow water, and commonly associated with tall sedge thickets and inundated riparian vegetation (Allen et al. 2002).	Likely: a record from 2008 of this species occurs within 5 km of the survey area and habitat occurs within the survey area.
Galaxiella nigrostriata (Black-stripe minnow)		P3			X	This freshwater fish generally lives in acidic black water (tannin stained) in seasonal wetlands between Muchea and Albany, but mostly within the Swan Coastal Plain. These wetlands only hold water for about half of the year. Also found in a range of conditions from slow-flowing rivers, swamps, freshwater lakes and pools, and road side ditches. It can often be found in and around submerged vegetation in lakes and swamps (Morgan et al. 1996; Allen et al. 2002).	Unlikely: this species has not been recorded within 5 km of the survey area (nearest record is over 70 km from survey area) however some habitat occurs within the survey area.
Geotria australis (Pouched Lamprey)		P1			X	This species utilises freshwater streams in the south west (Perth to Albany) to breed and grow before migrating to the ocean to mature (Allen et al. 2002). Dams and weirs are the main obstacles for the species. Sporadic records exist throughout the South West Coast Drainage Division between Perth and Albany including the Swan, Canning, Serpentine, Margaret, Donnelly, Warren and Goodga rivers.	Likely: a record of this species from 1996 occurs 23 km north west of the survey area and habitat for this species occurs within the survey area. This species is known from scattered occurrences throughout the south west.
Invertebrates							

Species Name	EPBC Act Status	WA Status	Naturemap	EPBC PMST	DPaW South-West Region	Description and habitat requirements	Likelihood
Westralunio carteri (Carter's Freshwater Mussel)		Vu	X			Carter's Freshwater Mussel is usually found in freshwater river pools. They are most common in areas with muddy, silty and sandy bottoms and flowing permanent water. Environmental tolerances of W. carteri are not precisely known but they can be found where water temperatures range from 4° C to over 30° C.	Present: this species was sighted during the assessment.
Engaewa reducta (Dusnborough burrowing Crayfish)	CR	EN			X	All Engaewa reducta records have been within the Busselton Shire boundary, bounded by the Carbunup River to the east and the Leeuwin-Naturaliste Ridge to the west. This species is usually found in ephemeral drainage swamp systems and to date have only been located in headwater seepage/swamp areas of drainage systems that flow north into Carbunup River, Mary Brook and Station Gully or directly into Geographe Bay. The vegetation is usually very dense heathland dominated by myrtaceous shrubs and the soils have a high sand content (DEC 2008)	Unlikely: the nearest record of this species is over 18 km from the survey area. Limited to no habitat for this species occurs within the survey area.

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