LandCorp

Denmark East Development Precinct
Flora and Fauna Survey

October 2016

Executive summary

Introduction

Through the Royalties for Regions “Growing our South” initiative, the Shire of Denmark has received funding to provide a second crossing of the Denmark River, to upgrade approximately 6.5 km of local roads and to support the delivery of an industrial estate adjacent to McIntosh Road.

GHD Pty Ltd (GHD) was commissioned by LandCorp to undertake a biological assessment of the project survey area. The purpose of the assessment was to identify and describe flora, vegetation and fauna within the survey area. The outcomes of the assessment will be used in the environmental assessment and approvals process and will identify the possible need for, and scope of, further field investigations will inform environmental impact assessment of the road upgrades. The survey area is approximately 68.5 ha in area and includes a broad area of land between Scotsdale Road and the Denmark River and the road reserve and adjacent land along East River Road and McIntosh Road between the Denmark Mt Barker Road and South Western Highway. A 200 m section north and south along the Denmark Mt Barker Road from East River Road was also surveyed.

The biological assessment involved a desktop review and three separate field surveys, including a winter flora and fauna survey, spring flora and fauna survey and spring nocturnal fauna survey. Fauna surveys also included the use of movement sensitive cameras in key locations.

Key biological aspects

The key biological aspects and constraints identified for the survey area are summarised in the following table.

Key biological aspects within the survey area

Biological values	Constraints identified
Remnant vegetation	The three pre-European vegetation types mapped by Beard (1979) are represented by at least 32% remaining at the Local Government, bioregional and Western Australian scales
Conservation significant vegetation types	No vegetation representative of Threatened or Priority Ecological Communities was recorded or is considered likely to be present.
Riparian vegetation	Vegetation associated with riparian/ wetland zones was recorded within the survey area and includes: — Karri forest over tall to medium shrubland over sedges — *Melaleuca preissiana, Homalospermum firmum* and *Kunzea ericifolia* shrubland — *Evandra aristata, Anarthria prolifera* and *Leptocarpus tenax* sedgeland — *Tremulina tremula, Mesomelaena tetragona* and *Lepidosperma pubisquameum* sedgeland

Conservation significant flora species	One record of a Priority 4 flora species, *Laxmannia jamesii*, was recorded during the surveys. The likelihood of occurrence identified an additional 25 conservation significant species which may occur within the survey area but, during at least two surveys over the area, none were recorded.
Conservation significant fauna species	The field surveys and camera trapping identified five conservation significant species: Baudin's and the Forest Red-tailed Black Cockatoos (EPBC Act listed), the Southern Bushtailed Phascogale (Vulnerable, Wildlife Protection Act), the Water Rat, a Priority 4 species and the Quenda, a Priority 5 species. The likelihood of occurrence assessment identified seven conservation significant species which are considered likely to occur within the survey area. Of these, two species are listed under the EPBC Act (Carnaby's Black Cockatoo and Western Ring-tailed Possum). However, thorough searching and camera trapping did not indicate the presence of the possum.
Black Cockatoo habitat	Approximately 45 ha of suitable foraging and roosting habitat was recorded throughout the survey area in the Eucalyptus and *Allocasuarina* woodland habitats. 902 potential breeding trees were recorded within the survey area, of which 40 trees were recorded as having hollows, with 8 trees having 9 large hollows, 8 trees had 10 medium hollows and 28 trees had 43 small hollows. The timing of the September survey was within the breeding season of all species. A Baudins Black Cockatoo was recorded as nesting within a large hollow in a Redgum in the western section of the survey area and one Forest Red-tailed Black Cockatoo was recorded sitting in the entrance to a hollow.
Southern Brush-tailed Phascogale habitat	Species was recorded during the survey and is known from the local area and region. Primarily uses all of the drier woodland (20.7 ha) as habitat in the survey area. The remainder of the habitat may be utilised opportunistically as a foraging/hunting resource or for dispersal.

Environmental approvals and referrals

The following recommendations are provided based on a preliminary assessment of key biological constraints for the survey area (not the impact area):

Referral under the EPBC Act

Matters of National Environmental Significance	Species/ Community	Assessment of referral requirement
Threatened Species (flora) and Ecological Communities	None identified from July/September assessment	Not required

Matters of National Environmental Significance	Species/ Community	Assessment of referral requirement
Threatened Species (fauna)	Baudin's Black Cockatoo were recorded feeding and breeding in the survey area	Referral will depend on the final impact area and quality of impacted habitat.
Threatened Species (fauna)	Carnaby's Black-Cockatoo are likely to be present	Referral will depend on the final impact area and quality of impacted habitat.
Threatened Species (fauna)	Forest Red-tailed Black-Cockatoo were recorded feeding in the survey area and sitting in a nest hollow	Referral will depend on the final impact area and quality of impacted habitat.
Threatened Species (fauna)	Chuditch are potentially present	Referral unlikely to be required. No Chuditch were recorded during either the field surveys or camera survey.
Western Ring-tailed Possum	Western Ring-tailed Possums are potentially present	Referral unlikely to be required. Not identified in daytime and night-time surveys, or motion sensor cameras. No dreys (resting and nesting platforms) recorded.
Listed Migratory Species	None present – no species were recorded from the survey area during the July or September 2016 surveys.	

Western Australian approvals

Referral under Part IV of Environmental Protection Act, 1986 is not considered necessary, as the impacts are primarily associated with flora and fauna, which can be considered under Part V of the Act (Native Vegetation Clearing Permit).

The Federal and Western Australian governments have entered into a bilateral agreement under the EPBC Act relating to environmental assessment (assessment bilateral agreement). Specifically, this agreement now includes the clearing permit assessment process under Part V Division 2 of the EP Act. Under the assessment bilateral agreement, if a native vegetation clearing permit is required and the clearing will have or is likely to have an impact on a MNES, the assessment of the clearing application including the potential impacts to the MNES can be conducted by the DER or Department of Minerals and Petroleum under delegation.

Four fauna species listed under the EPBC Act (MNES) and Wildlife Conservation Act were recorded within the survey area during the field surveys, and a further seven fauna species listed under the Acts were considered likely to occur as they are known from the area and suitable habitat is present for them.

As such, any clearing permit application should assess the significance of any potential impacts of the proposed clearing area on these aspects, and the assessment of the potential impacts to the MNES can be can be assessed by DER under the bilateral agreement.

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1. Introduction

1.1 Background and purpose of this report

Through the Royalties for Regions “Growing our South” initiative, the Shire of Denmark has received funding to provide a second crossing of the Denmark River, to upgrade approximately 6.5 km of local roads and to support the delivery of an industrial estate adjacent to McIntosh Road.

GHD Pty Ltd (GHD) was commissioned by LandCorp to undertake a biological assessment of the project survey area. The purpose of the assessment was to identify and describe flora, vegetation and fauna within the survey area. The outcomes of the assessment will be used in the environmental assessment and approvals process and will identify the possible need for, and scope of, further field investigations will inform environmental impact assessment of the road upgrades.

1.2 Location

1.2.1 Survey area

The survey area is approximately 35 ha in area and includes a broad area of land between Scotsdale Road and the Denmark River and the road reserve and adjacent land along East River Road and McIntosh Road between the Denmark Mt Barker Road and South Western Highway. A 200 m section north and south along the Denmark Mt Barker Road from East River Road was also surveyed.

The location of the survey area is shown in Figure 1, Appendix A.

1.2.2 Study area

A study area has been defined for the desktop based searches for the biological assessment and includes a 10 km buffer around the survey area. This area provides local context for the assessment.

1.3 Scope of works

The scope of works, as detailed in the LandCorp Request for Service was to:

- Undertake a desktop assessment of the study area
- Undertake a biological survey of the survey area to provide:
  - Description and mapping of vegetation units and vegetation condition
  - Assessment of plant species diversity, density, composition, structure and weed cover in quadrats
  - Location and extents of any Threatened or Priority Flora
  - Inventory of flora and fauna species
  - Description and mapping of fauna habitat
  - Identification and mapping of trees / areas which are potential Black Cockatoo or Western Ringtail Possum habitat (i.e. >500 mm diameter at breast height, DBH), or with suitable hollows or known possum habitat species
- Prepare a biological survey report that documents the results of the desktop assessment and field survey, assesses (and where applicable recommends) the requirement for referral to statutory authorities or other clearances for the project.

1.4 Relevant legislation, conservation codes and background information

In Western Australia some ecological communities, flora and fauna are protected under both Australian 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.

1.5 Report limitations and assumptions

This report has been prepared by GHD for LandCorp and may only be used and relied on by LandCorp for the purpose agreed between GHD and the LandCorp as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than LandCorp 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 LandCorp 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, operational works, services 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 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 study area and to assist in survey design. This included a review of:

- Available and relevant reports of the survey area and surrounds
- The Department of the Environment (DotE) Protected Matters Search Tool (PMST) to identify communities and species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within the study area (DotE 2016a) (Appendix C)
- The Department of Parks and Wildlife (DPaW) Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC) database to determine the potential for TECs or PECs to be present within the study area
- The DPaW's NatureMap database for flora and fauna species previously recorded within the study 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 the *Wildlife Conservation Act 1950* (WC Act) and listed as Priority by DPaW, previously recorded within the study area
- Existing datasets including previous vegetation mapping of the study area (Beard 1979), 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 botanist (Gaynor Owen) conducted the first phase of the Level 2 vegetation and flora assessment of the survey area from 27 to 29 July 2016. Megan Dilly (GHD Botanist) conducted the second phase of the Level 2 survey from the 5 to 7 September 2016. The field surveys were 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. Searches for conservation significant ecological communities and flora taxa were also undertaken.

The survey methodology employed by GHD was undertaken in accordance with the Environmental Protection Authority (EPA) *Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004a)

Data collection

Field survey methods involved sampling quadrats and releves located in identified vegetation units and traversing the survey area by foot and vehicle. Nine quadrats (measuring 10 m x 10 m – area of 100 m^2) were utilised for data collection within the survey area. Field data at each quadrat was recorded on a pro-forma data sheet and included the parameters detailed in Table 1.

Table 1 Data collected in quadrats

Aspect	Measurement
Collection attributes	Personnel/recorder; date, quadrat dimensions, photograph of the quadrat.
Physical features	Aspect, soil attributes, ground surface cover, leaf and wood litter.
Location	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 Bushland Vegetation Condition rating scale (EPA/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. 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/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 seven rating levels as outlined in Appendix B.

Flora identification and nomenclature

Species that were well known to the survey botanist were identified in the field; all other species were collected and assigned a unique collection number to facilitate tracking. Flora identification was undertaken by Megan Dilly. 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.

The conservation status of all recorded flora was compared against the current lists available on *FloraBase* (WA Herbarium 1998–) and the EPBC Act List of Threatened Flora (DotE 2016b).

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

Surveys for conservation significant flora

Prior to the field survey, information obtained from the desktop assessments (e.g. aerial photography, EPBC Act PMST, TPFL, *NatureMap* and the WAHERB databases search results) was reviewed to determine conservation significant flora taxa potentially present within the survey area. Additionally, ecological information (e.g. habitat, associated flora taxa and phenology) was sourced from *FloraBase* (WA Herbarium 1998–) and other relevant publications where available, to provide further details.

Potential habitats were searched by transect sampling and opportunistic sampling. Locations within the survey area with differing hydrology, fire or disturbance history to the surrounding areas were also searched, where identified.

2.3 Fauna

GHD ecologist (Glen Gaikhorst) undertook a Level 1 fauna survey (reconnaissance survey) of the survey area from 27 to 28 July and again from the 5 to 7 September 2016. The fauna surveys were undertaken in conjunction with the vegetation and flora assessment and with reference to EPA *Guidance Statement No. 56* T*errestrial Fauna Survey for Environmental Impact Assessment in Western Australia* (EPA 2004b). The purpose of the reconnaissance survey was to verify the accuracy of the desktop study, and to delineate and characterise the fauna and faunal assemblages present in the survey area.

The majority of the survey area was traversed on foot and by vehicle over the course of five days (in total) to identify and describe the dominant fauna habitat types present and their condition, assess habitat connectivity, identify and record fauna species within the survey area. An assessment of the likelihood of conservation significant fauna and their habitats occurring within the survey area was also undertaken.

Following the reconnaissance surveys a targeted night-time survey was undertaken over three nights from the 4 to 6 October by GHD Senior Ecologist Craig Grabham.

Habitat assessment

A fauna habitat assessment was undertaken to document the type, condition and extent of habitats within the survey area. The following information was recorded:

- Habitat structure (e.g. vegetation type, presence/absence of structural layers such as ground cover and mid storey)
- Presence/absence of refuge including: density of ground covers, 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
- Location of the habitat within the survey area in comparison to the habitat within the surrounding landscape
- Habitat connectivity and identification of wildlife corridors within and immediately adjacent to the survey area
- Current land use and disturbance history
- Evaluation of key habitat features and types identified during the desktop assessment relevant to fauna of conservation significance
- Evaluation of the likelihood of occurrence of conservation significant fauna within the habitat (based on presence of suitable habitat)

- A representative photograph of each habitat type.

Opportunistic fauna searches

Opportunistic fauna searches were also conducted across the survey area. Opportunistic searches involved:

- Searching the survey area for tracks, scats, bones, diggings and feeding areas for both native and feral fauna
- Searching through microhabitats including turning over logs or rocks, turning over leaf litter and examining tree hollows and hollow logs
- Visual and aural surveys, which accounted for many bird species potentially utilising the survey area
- Establishing three, movement sensitive cameras within the survey area for a total survey period of 120 nights. The cameras were set up at locations which were potential usage areas for Southern Brush-tailed Phascogale and Western Ringtail Possum. These cameras were deployed to supplement the species inventory list and to assist in verifying the presence/absence of conservation significant fauna species.
- Recording GPS locations of any conservation significant fauna species.

Black Cockatoos

A targeted survey for Black Cockatoo was conducted in accordance with the EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's Cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's Cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest Red-tailed Black Cockatoo (vulnerable) *Calyptorhynchus banksii naso*, (Department of Sustainability, Environment, Water, Populations, and Communities (DSEWPaC 2012). The assessment included:

- The identification and recording (via GPS) of the locations of potential and actual breeding habitat within the survey area (relevant tree species with a DBH of >500 mm)
- Identifying, describing and recording the size of existing tree hollows and any evidence of use by Black Cockatoos within the survey area
- Identifying, describing and recording the diameter at breast height (DBH) of trees with existing hollows within the survey area.
- Identifying, recording and describing the locations of potential night roosting habitat
- Identifying, recording and describing the locations of potential foraging habitat.

The survey distinguished between actual and potential breeding habitat as per the following:

1) Actual nest trees: Evidenced as currently being used or have been used in the past

2) Potential habitat: Trees with available hollows that do not show evidence of use now or in the past

3) Potential habitat: Trees with hollows that do not show evidence of use now or in the past where the hollow is not available (e.g. hollows are occupied by bees or galahs)

4) Potential habitat: Those trees without hollows but which have the potential to develop hollows in the future, and which have DBH >500 mm for Jarrah, Marri and Karri.

Targeted nocturnal animal survey

Spotlighting surveys were conducted to target the Southern Brush-tailed Phascogale, Western Ringtail Possum and other nocturnal fauna. Two ecologists using hand held spotlights walked

seven pre-determined transects (totalling 2.2 km) each night for three consecutive nights. All fauna observed or heard were recorded including the following details: species; GPS point; approximate distance from the observer and habitat.

In addition to the pre-determined transect walks, random spotlighting searches were undertaken of areas located between the transects to increase survey effort within the survey area. Spotlighting surveys were also undertaken in the western precinct along the length of the Denmark River to increase survey effort and understand the local extent of the target species. All fauna observed or heard were recorded including species and GPS point.

Fauna species identification

Identification of fauna species was made in the field using available field guides and electronic guides (e.g. Morcombe 2014). Where identification was not possible, photographs of specimens were collected to be later identified.

Nomenclature used in this report follows that used by the Western Australian Museum and the DPaW NatureMap database (DPaW 2007–) with the exception of birds, whereby Christidis and Boles (2008) was used.

2.4 Limitations

2.4.1 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.

2.4.2 Field survey limitations

Guidance Statements No. 51 and No. 56 (EPA 2004a, 2004b) state 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 Beard (1979) and digitised by Shepherd et al. (2002) • Hearn et al., 2002
Scope (what life forms were sampled etc.)	Nil	Vascular flora and terrestrial vertebrate fauna were sampled during the survey. Non-vascular flora, invertebrate and aquatic fauna were not surveyed.
Proportion of flora collected and identified (based on sampling, timing and intensity) Proportion of fauna identified, recorded and/or collected	Moderate	The vegetation and flora survey was undertaken over two phases for a Level 2 flora survey, undertaken in winter and spring 2016. The winter assessment was undertaken in July 2016 and the spring assessment was undertaken in early September 2016. The flora recorded from the field survey is detailed in Section **Error! Reference source not found.**3.3.4 and a full flora species list is provided in **Error! Reference source not found.**. The portion of flora collected and identified was considered moderate; and it is likely that the survey under-recorded some grass species (Poaceae), herbs and orchids due to an early spring field assessment. Annuals and orchids were observed during the spring assessment as coming into flower, however were not identifiable, and as such, are likely to be underrepresented in the flora collected. The fauna survey was undertaken in winter and spring 2016 and was a reconnaissance survey only. The fauna assessment sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings, etc. Many cryptic species would not have been identified during a reconnaissance survey and seasonal variation within species often requires targeted surveys at a particular time of the year. Of the fauna species recorded during the survey, all species were identified to species level. The fauna assessment was aimed at identifying habitat types and terrestrial vertebrate fauna utilising the survey area. 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	Moderate	Flora determination was undertaken by GHD ecologists in the field and by Megan Dilly at the WA Herbarium. Seven taxa could only be identified to family level only, 33 taxa could be identified to genus level only, and 13 taxa could be tentatively identified to species level, due to lack of flowering and fruiting material required for identification. Some species, particularly grasses, sedges and herbs, may have been overlooked due to lack of material. A small number of potential conservation significant sedge, herbs and orchid species were not observed during the spring 2016 assessment.

Table 2 Survey limitations

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Scope (what life forms were sampled etc.)	Nil	Vascular flora and terrestrial vertebrate fauna were sampled during the survey. Non-vascular flora, invertebrate and aquatic fauna were not surveyed.
Proportion of flora collected and identified (based on sampling, timing and intensity) Proportion of fauna identified, recorded and/or collected	Moderate	The vegetation and flora survey was undertaken over two phases for a Level 2 flora survey, undertaken in winter and spring 2016. The winter assessment was undertaken in July 2016 and the spring assessment was undertaken in early September 2016. The flora recorded from the field survey is detailed in Section 4.2 and a full flora species list is provided in Appendix D. The portion of flora collected and identified was considered moderate; and it is likely that the survey under-recorded some grass species (Poaceae), herbs and orchids due to an early spring field assessment. Annuals and orchids were observed during the spring assessment as coming into flower, however were not identifiable, and as such, are likely to be underrepresented in the flora collected. The fauna survey was undertaken in winter and spring 2016 and was a reconnaissance survey only. The fauna assessment sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings, etc. Many cryptic species would not have been identified during a reconnaissance survey and seasonal variation within species often requires targeted surveys at a particular time of the year. Of the fauna species recorded during the survey, all species were identified to species level. The fauna assessment was aimed at identifying habitat types and terrestrial vertebrate fauna utilising the survey area. 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.
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Aspect	Constraint	Comment
		The taxonomy and conservation status of the Western Australian flora is dynamic. This report was prepared with reliance on taxonomy and conservation status current at the time report development, but it should be noted this may change in response to ongoing research and review of International Union for Conservation Nature (IUCN) criteria.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Minor	The majority of the survey area was accessed on foot or traversed by vehicle. The access tracks created as a result of infrastructure development (road, water and electrical services) allowed access to the majority of the survey area. Information gained from the survey was extrapolated across those sections of the survey area not accessed on foot during the field survey to assist with determining the vegetation and habitat types for the entire survey area.
Mapping reliability	Minor	The vegetation was mapped at a scale of 1:6,000 using high resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1979) and field data. Data was recorded in the field using hand-held GPS tools (e.g. Nomad Juno and Garmin GPS). Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units used for this survey are accurate to within ±5 metres on average. Therefore the data points consisting of coordinates recorded from the GPS may contain inaccuracies.
Timing/weather/ season/cycle	Moderate	The field surveys was conducted during winter (27 to 29 July 2016) and spring (5 to 7 September 2016). In the three months prior to the winter survey (April-June), Denmark weather recording station (No. 09531, BoM 2016) recorded a total of 417.4 mm of rainfall. This total is approximately 15% higher than the long term average for the same period (April - June; 362.2 mm) (BoM 2016). The weather conditions (when recorded) during the winter field survey included: • Daily maximum temperature ranging from 17.7 to 20.3 °C (Albany weather station No. 09999; 41 km from survey area). • Daily minimum temperature ranging from 6.6 to 10.0 °C (Albany weather station No. 09999) • Daily rainfall 0.8 mm. In the three months prior to the spring survey (June-August), Denmark weather recording station (No. 09531, BoM 2016) recorded a total of 439.6 mm of rainfall. This total is approximately 7% lower than the long term average for the same period (June-September; 471.6 mm) (BoM 2016). The weather conditions (when recorded) during the winter field survey included: • Daily maximum temperature ranging from 16.6 to 19.8 °C (Albany weather station No. 09999; 41 km from survey area). • Daily minimum temperature ranging from 4.3 to 9.2 °C (Albany weather station No. 09999) • Daily rainfall 0.2 to 9.2 mm.

Aspect	Constraint	Comment
		The weather conditions recorded during the survey period are 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)	Nil	Much of the survey area has been subjected to historical disturbance events (e.g. clearing, grazing); however, these disturbances did not impact the survey.
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 to EPA (2004b) for Level 2 surveys. The survey area was sufficiently covered by a GHD zoologist and botanist during the survey.
Resources	Nil	Adequate resources were employed during the field survey. A total of 11 person days was spent undertaking the survey using a dedicated zoologist and botanist.
Access restrictions	Nil	No access problems were encountered during the survey.
Experience levels	Nil	The zoologist and botanist who executed the survey are practitioners suitably qualified and experienced in their respective fields. Glen Gaikhorst (zoologist) has over 20 years' experience undertaking fauna surveys within Western Australia. Craig Grabham (zoologist) has over 18 years undertaking fauna surveys. Gaynor Owen (botanist) has over 9 years' experience within Western Australia.

3. Desktop assessment

3.1 Regional biogeography

The Survey area is situated in the South-West Botanical Province (Beard 1990), within the Warren bioregion and Warren sub-region as described by the Interim Biogeographic Regionalisation of Australia (IBRA) (DotE 2015c).

The Warren subregion is a “dissected undulating country of the Leeuwin Complex, Southern Perth Basin (Blackwood Plateau), South-West intrusions of the Yilgarn Craton and western parts of the Albany Orogen with loamy soils supporting Karri forest, laterites supporting Jarrah–marri forest, leached sandy soils in depressions and plains supporting low Jarrah woodlands and paperbark/sedge swamps, and Holocene marine dunes with *Agonis flexuosa* and *Banksia* woodlands and heaths. The climate is moderate Mediterranean. The bioregion is not further divided into subregions and the area is 1, 027, 639 hectares (ha).” (Hearn et al., 2002).

Many of the region’s plants and animals are endemic, especially in plant groups such as Myrtaceae, Rutaceae, Proteaceae, Papilionaceae, Restionaceae, Stylidiaceae and Sterculiaceae. The bioregion is a biodiversity hotspot with hundreds of taxa of vascular plants per square kilometre (Department of Conservation and Land Management (McKenzie et al. 2002).

3.2 Hydrology

The Denmark River and Scotsdale Brook intersect the western section of the survey area at three locations (Figure 2).

A summary of the Geographic Data Atlas queries for the survey area is provided in Table 3.

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).	None present
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)	PDWSA 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* (MWSSD) or the *Country Area Water Supply Act 1947* (CAWS).	None present
Waterway Management Areas	Areas proclaimed under the *Waterway Conservation Act 1976*.	Wilson Inlet Management Area

3.3 Vegetation and flora

3.3.1 Broad vegetation associations and extent

Mapping of pre-European vegetation associations at a broad scale (1:250,000) was undertaken by Beard (1979). The mapping indicates that the following three vegetation associations are present within the survey area:

- Tall forest; karri (*Eucalyptus diverscolor*) (association 1) – intersects the western part of the survey area
- Medium forest; jarrah-marri (association 3) – intersects the eastern and central part of the survey area
- Mosaic: Medium forest; jarrah-marri / Low forest; jarrah (association 969) – intersects the western part of the survey area.

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 (latest update June 2014 – Government of Western Australia (GoWA) 2015). As shown in Table 4, the current extents remaining of vegetation associations 1, 3 and 969 are greater than 32 % of their pre-European extents at all scales [e.g. State, IBRA bioregion, IBRA subregion and (Local Government Authority) LGA)], and are therefore above the 30 per cent threshold level[1].

Table 4 Broad vegetation association extents

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DPaW managed lands
1	State	72,410.18	56,300.61	77.75	83.52
	IBRA bioregion	69,118.21	53,821.56	77.87	83.86
	IBRA subregion	69,118.21	53,821.56	77.87	83.86
	LGA	12,550.36	6,032.08	48.06	25.7
3	State	2,661,405.06	1,810,489.41	68.03	81.09
	IBRA bioregion	250,262.66	195,368.73	78.07	86.96
	IBRA subregion	250,262.66	195,368.73	78.07	86.96
	LGA	76,437.34	60,628.97	79.32	85.80
969	State	27,711.96	9,054.79	32.67	10.53
	IBRA bioregion	19,159.43	7,600.29	39.67	9.47
	IBRA subregion	19,159.43	7,600.29	39.67	9.47
	LGA	17,721.25	7,271.22	41.03	10.62

3.3.2 Previous surveys

A vegetation and flora survey of part of McIntosh Road and adjacent areas was undertaken in October 2015 by AECOM for the proposed industrial area and access. This survey included McIntosh Road from South Western Highway up to the northern end of the McIntosh Road

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

Nature Reserve as well as a strip of that Reserve. The vegetation communities identified and species recorded were included in this report where relevant.

3.3.3 Conservation significant ecological communities

A search of the EPBC PMST identified one Commonwealth listed Threatened Ecological Community (TEC) within the study area:

- Subtropical and Temperate Coastal Saltmarsh: The ecological community consists of organisms associated with saltmarsh in coastal regions of subtropical and temperate Australia. The physical environment for the ecological community is coastal areas under regular or intermittent tidal influence. The coastal saltmarsh ecological community consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs (EPBC Act 1999).

A search of the DPaW TEC and PEC database identified one PEC within the study area:

- *Melaleuca spathulata /Melaleuca viminea* Swamp Heath (Priority 1): Seasonally wet heath dominated by *Melaleuca spathulata* and *Melaleuca viminea* in the upper stratum over an open sedgeland characterised by *Meeboldina roycei*; occurs on brown to orange brown loam overlying clay in winter-wet sumplands (DPaW 2015).

3.3.4 Flora diversity

A search of the *NatureMap* database identified 1072 plant taxa, representing 125 families and 411 genera, which have previously been recorded within 10 km of the survey area. This total comprised 923 native flora taxa and 149 naturalised (non-native) flora taxa. Dominant families included Fabaceae (122 taxa), Orchidaceae (82 taxa) and Myrtaceae (82 taxa).

3.3.5 Conservation significant flora

Desktop searches of the EPBC Act PMST database, *NatureMap* database, and the DPaW TPFL and WAHERB databases identified the presence/potential presence of 43 conservation significant flora taxa within the study area.

The desktop searches recorded:

- Ten taxa listed as Threatened under the EPBC Act and/or as Declared Rare Flora under the WC Act
- One taxa listed as Declared Rare Flora under the WC Act
- Two Priority 1 taxa
- Seven Priority 2 taxa
- Eleven Priority 3 taxa
- Twelve Priority 4 taxa.

The locations of conservation significant flora registered on the DPaW databases are provided in Figure 2.

3.4 Fauna

3.4.1 Fauna diversity

A search of the NatureMap identified 643 fauna species that have been previously recorded within 10 km of the study area. This total included 264 birds, 25 reptiles, 12 amphibians and 24 mammals. The remainder are imvertebrate species, which were not considered in this survey.

3.4.2 Conservation significant fauna

Searches of the EPBC Act PMST and *NatureMap* database identified the presence, or potential presence, of 27 conservation significant fauna species (Appendix C). Species identified by the PMST as marine or migratory/marine and migratory wetland were excluded from this assessment as no marine or wetland habitat was present within or nearby the survey area.

In addition to the 27 species identified by the database searches, three species were considered for this assessment as a result of a review of the species listed under Schedules 1-4 of the WC Act (revised 3 November 2015) to occur within the DPaW Warren and South Coast regions (DPaW 2015).

3.5 Land use

3.5.1 Conservation reserves and estate

A search of the Department of Environment Regulation (DER) Native vegetation map viewer (DER 2016) indicates a number of DPaW managed lands/ Nature Reserves within the study area. These are:

- McIntosh Road Nature Reserve – adjoining the eastern side of McIntosh Road within the survey area
- Denmark Catchment State Forest – approximately 1.5 km north of the survey area.
- Scotsdale Road Nature Reserve – approximately 2.3 km west of the survey area
- Un-named Timber Reserve – approximately 2.7 km east of the survey area

3.5.2 Environmentally sensitive areas

A search of the Department of Environmental Regulation's map viewer did not identify any Environmentally Sensitive Areas within the study area (DER 2016).

4. Field survey results

4.1 Vegetation

4.1.1 Vegetation types

Nine vegetation types (VT) (not including highly disturbed areas and planted trees) were identified and described from the survey area (Table 5 and Figure 3). The survey area is dominated by eucalypt woodlands and forests: mixes of *Eucalyptus diversicolor, Eucalyptus marginata, Eucalyptus staeri, Corymbia calophylla, Agonis flexuosa* and *Allocasuarina fraseriana* woodlands to open forests. Myrtaceous shrublands and sedgelands occur throughout the survey area in lower lying areas. The soil types for the survey area range from dark loamy and grey sandy soils in the lower lying areas of the survey area to lateritic outcrops in higher areas of the survey area. The vegetation types are closely allied with the landform feature in which they occur. Vegetation type 1 is present in heavier soils in the vicinity of the Denmark River, VT2, VT7 and VT8 are associated with plains; VT4 is associated with lateritic stony rises; and VT5 and VT6 are associated with lower lying areas.

VT1 aligns with Beard (1979) vegetation association 1 (Tall forest; Karri), VT7 may align with vegetation association 3 (Medium forest; jarrah-marri); and VT2, VT4 and VT8 may align with vegetation association 969 **(**Mosaic: Medium forest; jarrah-marri / Low forest; jarrah).

Vegetation types are presented in Table 5 mapped in Figure 3, Appendix A.

Table 5 Vegetation types within survey area

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Notes and quadrat reference	Photograph
Eucalyptus diversicolor, Corymbia calophylla and *Agonis flexuosa* open forest VT1	*Eucalyptus diversicolor, Corymbia calophylla* and *Agonis flexuosa* open forest with scattered *Banksia* seminuda and *Allocasuarina decussata* over *Trymalium odoratissimum* subsp. *trifidum*, *Pteridium esculentum* and *Xanthosia rotundifolia* tall to mid open shrubland over *Lepidosperma effusum, Schoenus* sp. (insufficient material) and *Desmocladus flexuosus* sedgeland The vegetation varied in plant species composition depending on the where it was in landscape. Vegetation along the river banks was more dense with sedges, while *Banksia* seminuda and *Allocasuarina decussata* occurred in vegetation located higher along the banks	Denmark River with dark loamy soils	19.1	Q10, Q11	 

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Notes and quadrat reference	Photograph
Eucalyptus marginata, Eucalyptus staeri and Allocasuarina fraseriana woodland VT2	*Eucalyptus marginata, Eucalyptus staeri and Allocasuarina fraseriana* woodland over *Banksia* spp., and *Taxandria parviceps* tall shrubland over *Beaufortia decussata, Agonis theiformis* and *Adenanthos obovatus* mid sparse shrubland over *Xanthosia rotundifolia* and *Pultenaea reticulata* sparse low shrubland over *Anarthria spp. Dasypogon bromeliifolius and Cyathochaeta avenacea* sedgeland over *Drosera* spp. and *Dampiera leptoclada* sparse herbland	Plains with grey sands	14.81	Q4, Q7, Q9	
Eucalyptus marginata, Allocasuarina fraseriana and *Banksia grandis* open forest VT4	*Eucalyptus marginata, Allocasuarina fraseriana* and *Banksia grandis* open forest over *Agonis theiformis, Bossiaea linophylla* and *Persoonia longifolia* mid to tall shrubland over *Hovea chorizemifolia*, *Acacia browniana* var. *browniana* and *Xanthosia rotundifolia* low sparse shrubland over *Desmocladus fasciculatus*, *Anarthria prolifera* and *Lepidosperma* aff. *squamatum* open sedgeland over *Patersonia umbrosa* var. *umbrosa, Lomandra* spp. and *Drosera* spp. sparse herbland	Lateritic stony rises	2.73	Q2, Q3	

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Notes and quadrat reference	Photograph
Melaleuca preissiana, *Homalospermum firmum* and *Kunzea ericifolia* shrubland VT5	*Melaleuca preissiana*, *Homalospermum firmum* and *Kunzea ericifolia* mid to tall shrubland over *Evandra aristata, Anarthria* spp., *Leptocarpus scariosa* and **Cyperus congestus* open sedgeland	Low lying damplands with dark loamy soils	2.02	Q12 This vegetation type creates a mosaic throughout the survey area with vegetation types VT4, VT6 and VT2.	
Evandra aristata, *Anarthria prolifera* and *Leptocarpus tenax* sedgeland VT6	*Evandra aristata*, *Anarthria prolifera* and *Leptocarpus tenax* sedgeland with an emergent shrubland of *Kunzea ericifolia, Taxandria parviceps* and *Beaufortia sparsa*	Low lying damplands with dark loamy soils	1.26	Q1	

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Notes and quadrat reference	Photograph
Eucalyptus marginata, Corymbia calophylla and *Agonis flexuosa/Allocasuarina fraseriana* open forest VT7	*Eucalyptus marginata, Corymbia calophylla* and *Agonis flexuosa/Allocasuarina fraseriana* open forest over *Xanthorrhoea preissii*, *Bossiaea linophylla* and *Taxandria parviceps* mid to tall sparse shrubland over *Desmocladus fasciculatus* sparse shrubland	Plains and undulating hills of dark loamy soils over laterite	3.04	Q6 *Allocasuarina fraseriana* occurs on the uplands within the survey area and *Agonis flexuosa* occurs on the lowlands in the survey area.	
Eucalyptus marginata and *Allocasuarina fraseriana* open forest VT8	*Eucalyptus marginata* and *Allocasuarina fraseriana* open forest over *Beaufortia decussata, Taxandria parviceps* and *Petrophile diversifolia* mid to tall open shrubland over *Desmocladus fasciculatus, Leptocarpus tenax* and *Anarthria* spp. open sedgeland over *Dampiera leptoclada* isolated herbs	Plains with grey sands	1.18	Q5	

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Notes and quadrat reference	Photograph
Tremulina tremula, Mesomelaena tetragona and *Lepidosperma pubisquameum* sedgeland VT9	*Tremulina tremula, Mesomelaena tetragona* and *Lepidosperma pubisquameum* sedgeland with *Darwinia oederoides* and *Taxandria parviceps* open mid to low open shrubland	Low lying area with black, grey loamy sand	1.29	Q8	
Planted trees and rehabilitated areas PT	The planted trees comprised of mostly introduced species. Planted *Eucalyptus diversicolor* was recorded alongside the northern part of McIntosh road.	Various	0.84	-	
Scattered native plants SN	Paddock and roadside areas with scattered native plants	Various	13.30	-	

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Notes and quadrat reference	Photograph
Water body WB	Denmark River and Scotsdale Brook	River/ creek, loamy peat	0.43	-	
Highly Disturbed HD	Previously cleared areas, roads and tracks	Throughout survey area	8.25	-	

4.2.2 Conservation significant flora

No EPBC Act/WC Act listed flora were recorded during the two survey periods. One plant of the DPaW, Priority 4 listed species, *Laxmannia jamesii*, was recorded within the survey area at 536979 E and 6133283 N. *Laxmannia jamesii* is a tufted, stilt-rooted perennial, herb, 0.05 - 0.2 m high. The flowers are red and white, and it flowers between May to July. This species grows in grey sand in winter-wet locations (WA Herbarium 1998 -). The identification of the *Laxmannia* was confirmed by taxonomists from the WA Herbarium.

Likelihood of occurrence assessment

A likelihood of occurrence assessment of conservation significant species (based on the range, habitat requirements and previous records of the species, Appendix D**Error! Reference source not found.**, summarised in Table 7) determined that 15 species could possibly occur, one species may be known to occur within the impact area (impact area to be confirmed), one species is known to occur and 25 species could possibly occur within the survey area. The remaining species were considered as unlikely or highly unlikely to occur within the survey area. The survey was conducted in winter and spring 2016. The spring assessment however was conducted early in the season and many spring flowering plants were observed as in flower bud in the field. As such, some cryptic and annual conservation significant species may not have been observed during the spring survey.

One *Andersonia* specimen and one *Leucopogon* specimen collected could not be fully identified. Based on *NatureMap* records a Priority 3 *Andersonia* and a Priority 3 *Leucopogon* are potentially present within the survey area. However, the previously recorded species flower during the Winter and Spring and should have been identifiable during the survey.

Table 7 Conservation significant flora species possibly occurring within the survey area

Taxon	Status		Likelihood of occurrence within impact area	Likelihood of occurrence within survey area
	EPBC Act	WC Act /DPaW		
Chordifex abortivus	EN	T	Unlikely	Possible
Banksia goodii	VU	T	Unlikely	Possible
Synaphea incurva		P1	Possible	Possible
Anthocercis sylvicola		P2	Unlikely	Possible
Isopogon buxifolius var. *buxifolius*		P2	Possible	Possible
Lepyrodia extensa		P2	Possible	Possible
Melaleuca ordinifolia		P2	Unlikely	Possible
Melaleuca viminalis		P2	Unlikely	Possible
Spyridium riparium		P2	Unlikely	Possible
Andersonia sp. Mitchell River		P3	Possible	Possible
Andersonia sp. Virolens		P3	Possible	Possible
Lasiopetalum sp. Denmark (B.G. Hammersley 2012)		P3	Possible	Possible
Leucopogon alternifolius		P3	Possible	Possible
Pimelea rosea subsp. *annelsii*		P3	Unlikely	Possible
Sphaerolobium calcicola		P3	Possible	Possible
Tetraria sp. Blackwood River		P3	Possible	Possible
Banksia serra		P4	Unlikely	Possible

4.1.2 Vegetation condition

The vegetation condition of the survey area ranged from *Pristine* to *Completely Degraded*. One fifth (13.46 ha) of the survey area is highly disturbed and includes roads, gravel tracks and other infrastructure. Approximately 44% of the survey area was in *Excellent* to *Very Good* condition. These areas are located throughout the survey area and include minor tracks or isolated occurrences of weeds. Areas with scattered native vegetation remaining within highly disturbed areas were rated as in *Completely Degraded* condition. Remnant vegetation varies in condition depending upon its location within the survey area. Due to edge effects and previous clearing, vegetation alongside cleared areas was generally in poorer condition (*Good* to *Degraded*) than that in the middle of vegetated areas (*Excellent*). Open water makes up 0.43 ha in addition to these calculations.

Vegetation condition mapping areas are provided in Table 6 and Figure 4, Appendix A.

Table 6 Extent of vegetation condition ratings within the Study Area

Vegetation Condition	Hectares within survey area
Pristine to Excellent	0.69
Excellent	8.9
Excellent to Very Good	12.29
Very Good	8.13
Very Good to Good	1.02
Good	4.26
Good to Degraded	5.29
Degraded	1.6
Degraded to Completely Degraded	2.96
Completely Degraded	14.36
Highly Disturbed	13.46
Total	**68.47 ha**

4.1.3 Conservation significant ecological communities

No EPBC Act listed TECs and/or State listed TECs or DPaW listed PECs were recorded during the field survey or are considered likely to be present.

4.2 Flora

4.2.1 Flora diversity

A total of 253 plant taxa (including subspecies and varieties) representing 56 families and 147 genera were recorded within the survey area. This total is comprised of 208 native species and 45 introduced (exotic) species. Dominant families recorded within the survey area include:

- Fabaceae: 42 species
- Myrtaceae: 30 species
- Proteaceae: 21 species
- Cyperaceae: 14 species.

Thirty-three (seven introduced) taxa could not be formally identified to species level due to the lack of suitable flowering or fruiting material. Six taxa recorded by Aecom (2016) have not previously been recorded within study area (based on *NatureMap* records). GHD did not record these species during the surveys.

4.2.2 Conservation significant flora

No EPBC Act/WC Act listed flora were recorded during the two survey periods. One plant of the DPaW, Priority 4 listed species, *Laxmannia jamesii*, was recorded within the survey area at 536979 E and 6133283 N. *Laxmannia jamesii* is a tufted, stilt-rooted perennial, herb, 0.05 - 0.2 m high. The flowers are red and white, and it flowers between May to July. This species grows in grey sand in winter-wet locations (WA Herbarium 1998 -). The identification of the *Laxmannia* was confirmed by taxonomists from the WA Herbarium.

Likelihood of occurrence assessment

A likelihood of occurrence assessment of conservation significant species (based on the range, habitat requirements and previous records of the species, Appendix D, summarised in Table 7) determined that 15 species could possibly occur, one species may be known to occur within the impact area (impact area to be confirmed), one species is known to occur and 25 species could possibly occur within the survey area. The remaining species were considered as unlikely or highly unlikely to occur within the survey area. The survey was conducted in winter and spring 2016. The spring assessment however was conducted early in the season and many spring flowering plants were observed as in flower bud in the field. As such, some cryptic and annual conservation significant species may not have been observed during the spring survey.

One *Andersonia* specimen and one *Leucopogon* specimen collected could not be fully identified. Based on *NatureMap* records a Priority 3 *Andersonia* and a Priority 3 *Leucopogon* are potentially present within the survey area. However, the previously recorded species flower during the Winter and Spring and should have been identifiable during the survey.

Table 7 Conservation significant flora species possibly occurring within the survey area

Taxon	Status		Likelihood of occurrence within impact area	Likelihood of occurrence within survey area
	EPBC Act	WC Act /DPaW		
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Anthocercis sylvicola		P2	Unlikely	Possible
Isopogon buxifolius var. *buxifolius*		P2	Possible	Possible
Lepyrodia extensa		P2	Possible	Possible
Melaleuca ordinifolia		P2	Unlikely	Possible
Melaleuca viminalis		P2	Unlikely	Possible
Spyridium riparium		P2	Unlikely	Possible
Andersonia sp. Mitchell River		P3	Possible	Possible
Andersonia sp. Virolens		P3	Possible	Possible
Lasiopetalum sp. Denmark (B.G. Hammersley 2012)		P3	Possible	Possible
Leucopogon alternifolius		P3	Possible	Possible
Pimelea rosea subsp. *annelsii*		P3	Unlikely	Possible
Sphaerolobium calcicola		P3	Possible	Possible
Tetraria sp. Blackwood River		P3	Possible	Possible
Banksia serra		P4	Unlikely	Possible
Boronia virgata		P4	Unlikely	Possible

Taxon	Status		Likelihood of occurrence within impact area	Likelihood of occurrence within survey area
	EPBC Act	WC Act /DPaW		
Laxmannia jamesii		P4	Possible/Known	Known
Lepidium pseudotasmanicum		P4	Possible	Possible
Microtis pulchella		P4	Possible	Possible
Microtis quadrata		P4	Possible	Possible
Ornduffia submersa		P4	Possible	Possible
Thomasia quercifolia		P4	Unlikely	Possible
Trithuria australis		P4	Possible	Possible

EN – Endangered; VU – Vulnerable; T – Threatened; P1 – Priority 1

4.2.1 Other significant flora

The July and September field surveys did not identify any other significant flora, as defined by the EPA (2004a).

4.2.2 Introduced flora

Seventy-eight introduced (exotic) species were recorded during the survey.

Two species (Blackberry and Bridal Creeper) are listed as Pest Plants under Section 37 of the *Agricultural and Related Resources Protection Act 1976 (WA)* and WoNS (Australian Weeds Committee, 2010). Arum Lily was also recorded throughout the survey area and is a Pest Plant. Two other WoNS species recoded were *Genista monspessulana* and *Asparagus scandens*. Locations of each species are provided in Table 8 and mapped in Figure 4, Appendix A.

Table 8 Locations of Declared Plants and Weeds of National Significance

Species	Count	Easting	Northing
Arum Lily	1	532818.8	6132802
	1	533378.3	6133188
	1	533255.1	6133095
	3	532827.8	6132667
	1	533292.9	6133151
	20	532848.1	6132531
	50	532848.1	6132531
	2	532990.5	6133194
	1	532778.5	6132684
Blackberry	1	533115.3	6132932
Bridal Creeper	1	532777.2	6133080
	1	532696	6133059
	10	532827.8	6132667
	1	533136.2	6132914
	1	533099.5	6132811
	1	533101	6132848
	2	532932.4	6132903
	1	532749.3	6133051
	1	532654.5	6133323

Species	Count	Easting	Northing
	1	532654.5	6133323
	2	532937.4	6133234
	1	532718.8	6132665
	1	533134.5	6132949
	1	533047.9	6133063
	1	532966.6	6133182
	10	532745.9	6132662
	2	532948.5	6133071
	2	532950	6133127
	20	532791.7	6133061

4.3 Fauna

4.3.1 Fauna habitats

The survey identified six fauna habitat types within the survey area. These habitat types are closely aligned to the vegetation types described in section 4.1.1. and are presented below in Table 9. They consist of:

- Karri forest
- Myrtaceous shrublands
- Jarrah, Sheoak and Banksia woodland/forest
- Water body / riverbank areas
- Planted trees / scattered native species
- Highly Disturbed

Table 9 Fauna habitat descriptions

Habitat type	Indicative photograph
Karri, Marri and Peppermint forest – 19.1 (VT1) Associated with river areas This vegetation is defined by a *Eucalyptus diversicolor (*Karri overstorey of varying densities and contains areas of *Corymbia calophylla* and *Agonis flexuosa* open forest with scattered *Banksia* seminuda and *Allocasuarina decussata* over tall to medium shrubland over *Lepidosperma effusum, Schoenus* sp. And *Desmocladus flexuosus* sedgeland The vegetation varies in plant species composition depending on the where it is in landscape. Vegetation along the immediate river bank is more dense with sedges, while *Banksia* seminuda and *Allocasuarina decussata* occur in vegetation located higher above the banks. The Karri trees offer tall canopies for bird foraging and the lower shrublands sometimes provide dense shelter for ground dwelling species. <u>Conservation Significant Species</u> Three species of conservation significance were recorded in this habitat type, Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii subsp. naso)*, Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) and Southern Brown Bandicoot (*Isoodon obesulus fusciventer*). The Baudin's Black Cockatoo were recorded feeding on *Adenanthos obovatus* in amongst sedges and Melaleuca and the Southern Brown Bandicoot were recorded active on cameras. Forest Red-tailed Black Cockatoos were also recorded sitting a potential nest hollow and there was significant evidence of feeding on Eucalypt trees. A range of other conservation significant species could be present within this habitat including: Masked Owl, Barking Owl, Chuditch, and Western False Pipistrelle, all of which could utilise the area for foraging and/ or breeding. The Threatened Pill Millipede is found under Karri bark and litter. This fauna habitat type covers approximately 9.1 ha and is of high value to fauna.	 

Habitat type	Indicative photograph
Myrtaceous shrublands – 3.28 ha (VT06 and VT05) This vegetation type consists of shrublands to 2- 3 metres high of *Taxandria parviceps, Kunzea ericifolia*, *Petrophile sp*. and Melaleuca and is very dense with a fine leaf and woody debris layer. The ground cover consists of dense sedges and low shrubs over litter on grey sandy soils. Typically, this shrubland is associated to damp areas low in the environment with water inundation present at the corner of Mount Barker Road / East River Road and again along McIntosh Road near to the intersection of East River Road. Most of this habitat type is long unburnt except for Mount Barker Road / East River Road intersection which appeared to have been burnt approximately 5 years ago. Tall shrubland provides excellent cover for small bush birds and mammals with numerous species recorded during the survey. The low lying areas were also utilised by amphibians with numerous species recorded in these areas. <u>Conservation Significant Species</u> Two species of conservation significance were recorded in this habitat type Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) and Southern Brown Bandicoot (*Isoodon obesulus fusciventer*). The Baudin's Black Cockatoo were recorded feeding on *Adenanthos obovatus* in amongst sedges and Melaleuca and the Southern Brown Bandicoot were recorded active on cameras. This habitat is also likely to be utilised by Short-nosed Snake (*Elapognathus minor*) and Western Brush Wallaby (*Macropus irma*) if present in the survey area. The Western False Pipistrelle (*Falsistrellus mackenziei*) and Peregrine Falcon (*Falco peregrinus*) are likely to use the habitat for foraging purposes only. This fauna habitat type covers approximately 4.57 ha and is of high value to fauna.	 

Habitat type	Indicative photograph
Jarrah, Marri and Sheoak woodland/forest – 21.75 ha (VT07) The Jarrah, Marri and Sheoak woodland/forest is the most dominant habitat type over the study area. The habitat also includes small areas where *Agonis flexuosa*, *Banksia* sp. and *Eucalyptus staeri* are dominant but form only a small part of the greater habitat type. The habitat type has dense understorey consisting of sedges, low shrubs with thick leaf litter and woody debris. Large logs scattered the woodland/forest floor and the vegetation was mostly long unburnt. Large logs typically had hollows suitable for species refugia. The above *Eucalyptus* species are recognised as valuable habitat for Black Cockatoo for breeding, feeding and roosting. Hollows suitable for breeding for a variety of fauna taxa were recorded in the Eucalypts within the study area. <u>Conservation Significant Species</u> Four species of conservation significance were recorded in this habitat type including the Southern Brush-tailed Phascogale, Forest Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Southern Brown Bandicoot. Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Baudin's Black Cockatoo were recorded feeding in Jarrah, Marri, E. staeri and Allocasurina in this habitat type. The Southern Brush-tailed Phascogale and Southern Brown Bandicoot were recorded via movement sensitive camera. This environment would also provide supportive habitat for the Western Ringtail Possum (*Pseudocheirus occidentalis*) which is known to utilise this habitat for foraging and nesting. The dense understorey provides habitat for Western Brush Wallaby as refuge and foraging. Both the Western False Pipistrelle and Peregrine Falcon is likely to use the habitat for foraging with hollows potentially utilised for roosting and nesting by both species. This fauna habitat type covers approximately 21.75 ha and is of high value to fauna.	 
Sedgeland – 1.28 ha (VT06 and VT09) Two mixed sedgelands with emergent shrubs were present in low lying areas. The habitat included mostly Myrtaceous shrubs over medium to dense sedgelands. <u>Conservation Significant Species</u> The Southern Brown Bandicoot may utilise the habitat. Both the Western False Pipistrelle and Peregrine Falcon are likely to use the habitat for foraging only.	

Habitat type	Indicative photograph
Water bodies / riverbank areas – 0.43 ha The Denmark River is the main open water body present with the Survey area, as well as small parts of Scotsdale Brook. The open water and banks of the river provide habitat for a small number of native fish and crustacean species which utilise the tree roots, fallen vegetation and mud or sediment for food and shelter. The condition of the river is good, with seasonal flows providing flushing. <u>Conservation Significant Species</u> A small number of conservation significant species could potentially occur in the river including: Water Rat, the Western Mud Minnow and possibly, Balston's Pygmy Perch.	
Planted trees/ rehabilitated areas / scattered native species – 14.12 ha Several small areas of planted native and non-native trees were present in the study area. These consisted of Blue Gums, Karri and other assorted species. The tree species formed good canopy cover and connectivity for areal species however lacked dense native understorey. Some logs, branches and litter were present in these environments that may assist in the presence of native species. <u>Conservation Significant Species</u> No species of conservation significance were recorded in this habitat type however the Southern Brush-tailed Phascogale, Forest Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Southern Brown Bandicoot may opportunistically utilise the habitat. Both the Western False Pipistrelle and Peregrine Falcon are likely to use the habitat for foraging only.	

Habitat type	Indicative photograph
Highly Disturbed – 8.52 ha Highly disturbed areas provide very little to fauna species but can be used by common insectivorous bird species for foraging and by avian and ground dwelling species as corridors.	

4.3.1 Fauna habitat connectivity

The habitat within the survey area is connected locally to habitat in the surrounding area with the exception of the surrounding cleared farmland and local road network which creates minor level of local fragmentation. Regionally, the survey area is connected to continuous tracts of remnant vegetation from most sections, and there are several bushland linkages through agricultural land.

4.3.2 Disturbance

Localised variation in habitat was evident throughout the survey area and this is likely attributable to fire and previously disturbed /cleared areas. The fire age of the survey area is estimated to be greater than 10 years except for a small area at the Mount Barker and East River Roads intersection that appears to be approximately 5 years old. Large disturbance footprints are evident within the study area particularly on private property where clearing has been undertaken for farming. There are also power alignments and roads intersecting habitat areas.

4.3.3 Habitat quality

The fauna habitat available is largely in good to excellent condition with the overall habitat value considered to be high. Whilst fauna diversity was limited, particularly for amphibians and reptiles, this is likely due to the cooler conditions experienced at the time of the surveys.

4.3.4 Fauna diversity

The fauna survey recorded 79 vertebrate fauna species, including 52 birds, nine reptiles, six amphibia and 12 mammals. The results the surveys are summarized in Appendix E.

4.3.5 Introduced fauna

Two introduced mammal species and one introduced bird species were recorded in the survey area during the field surveys. These species include the Fox, Rabbit and Laughing Kookaburra. All three species are known from the area/region.

4.3.6 Conservation significant fauna

The desktop queries identified 30 conservation significant species within 10 km of the survey area. Three Threatened fauna the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii subsp. naso*), Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) and Southern Brush-tailed Phascogale (*Phascogale tapoatafa subsp. tapoatafa*) were recorded during the field surveys and one DPaW listed Priority 4 species, the Quenda (*Isoodon obesulus* subsp. *fusciventer*), was recorded.

Black Cockatoos

The survey area is located within the modelled distribution of all three Black Cockatoo species, Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) and all three species have been recorded within 10 km of the survey area (DPaW 2007 - 2016).

The value of habitat within the survey area for Black Cockatoo foraging, roosting and breeding is discussed below. For the purpose of this assessment, the DSWEPaC (2012) referral guidelines are used to define breeding, foraging and night roosting habitat.

Two species of Black Cockatoo were recorded within the survey area, the Forest Red-tailed Black Cockatoo (Vulnerable under the EPBC Act and Vulnerable Schedule 3 under the WC Act)

and Baudin's Black Cockatoo (Vulnerable under the EPBC Act and Endangered Schedule 2 under the WC Act).

Both species were recorded in the survey area feeding in Eucalyptus species including Jarrah, Marri and *Eucalyptus staeri* nuts. Numerous other areas of discarded nuts were recorded suggesting feeding had occurred throughout the survey area.

Foraging

Foraging habitat for Black Cockatoos includes proteaceous species such as Banksia, Hakea, and Grevillea as well as *Allocasuarina, Corymbia* and *Eucalyptus* species (DSEWPaC 2012). *Allocasuarina, Corymbia* and *Eucalyptus* species were recorded within the woodland habitats and planted trees during the field survey and would provide foraging habitat. Based on the mapped vegetation types there is a total of approximately 20 ha of foraging habitat present within the survey area. Feeding evidence on Jarrah, Marri and *Allocasuarina* nuts was recorded during the field survey, which were from Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo.

Roosting

Baudin's, Carnaby's and Forest Red-tailed Black Cockatoos generally roost in or near riparian environments, or permanent water sources, in Eucalyptus species. Forest Red-tailed Black Cockatoos generally roost in tall Jarrah or Marri trees, within, or on the edges of forests (DSEWPaC, 2012). Suitable roosting habitat was recorded throughout the survey area in the woodland habitats and it is likely that it is used by Black Cockatoos. No evidence of roosting was recorded during the field survey.

Breeding

Breeding habitat is defined 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 in the future (DSWEPaC, 2012).

Breeding habitat predominantly applies to those areas within the breeding range of the respective species, as shown in the maps in DSWEPaC (2012). However, given incomplete knowledge of breeding activity, there is potential for these areas to change and there is known breeding areas outside the mapped breeding ranges. Habitat that meets the above breeding habitat definition (but is outside of the predicted breeding range) was considered to be potential breeding habitat (unless proven otherwise during the assessment of habitat during this survey).

The survey area is situated within the known breeding range of Baudin's, Carnaby's and Red-tailed Black Cockatoos. The timing of the September survey was within the breeding season of all species DSWEPaC (2012). During the field survey, 902 potential breeding trees were recorded within the survey area, of which 40 trees were recorded as having hollows, with 8 trees having 9 large hollows, 8 trees had 10 medium hollows and 28 trees had 43 small hollows. A Baudins Black Cockatoo was recorded as nesting within a large hollow in a Redgum in the western section of the survey area and one Forest Red-tailed Black Cockatoo was recorded sitting in the entrance to a hollow.

Plate 1 Marri nuts utilised in the survey area

Plate 2 *Allocasuarina* nuts utilised in the survey area

Plate 3 Large hollow in a Jarrah showing chews present

Southern Brown Bandicoot

The Quenda, or Southern Brown Bandicoot, is listed as a Priority 5 by DPaW. This species is widely distributed in the south west of Western Australia from Guilderton, north of Perth, to east of Esperance. They are patchily distributed through the south west of Western Australia where they are often associated with wetlands or low lying areas that provide dense cover. 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). Two Quenda were recorded active along McIntosh Road and also from a movement sensitive camera positioned at the intersection of McIntosh Road and East river Road. Additionally, a number of diggings were recorded throughout the survey area in areas where habitat is dense and continuous. An example of one of the camera images and a diggings is shown in Plate 4 and Plate 5

Plate 4 Southern Brown Bandicoot captured on camera

Plate 5 Quenda digging

Southern Brush-tailed Phascogale

Southern Brush-tailed Phascogale are listed as Vulnerable under the WC Act of Western Australia. The species prefers 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). The species is widespread in the south

west, ranging from Perth and the hills to the Albany region. Southern Brush-tailed Phascogales were identified via camera in the Jarrah, Sheoak and Banksia woodland/forest on low lying areas habitat (see Plate 6). Phascogales are known from the region, and within the Study area and would primarily utilise all of the woodland (20.07 ha) as habitat in the survey area. The remainder of the habitat may be utilised opportunistically as a foraging/hunting resource or for dispersal.

Plate 6 Southern Brush-tailed Phascogale captured on camera (note the large black brush tail)

Water Rat

The Water Rat is listed as a Priority 4 species by DPaW, it occupies habitat in the vicinity of permanent water and nests are constructed in logs or at the end of tunnels dug into banks. Unlike many other Australian rodents, the Water Rat is not entirely nocturnal, with activity usually high at sunset, though animals have been seen foraging during the day. The Water Rat is an opportunistic predator, feeding upon large aquatic insects, fish, crustaceans and mussels. They are also known to feed on frogs, lizards, small mammals, fresh carrion, and birds. The Water Rat is widely distributed, occurring from Barrow Island in the Pilbara to the south coast, as well as in all other States.

The Water Rat was sighted within the western section of the survey area on two occasions. The river provides habitat for this species within the survey area.

Likelihood of occurrence assessment

An initial assessment on the likelihood of these species occurring in the survey area was conducted. This assessment was based on species biology, habitat requirements, the quality and availability of suitable habitat and records of the species in the area and results are presented in Table 10 and Appendix E. The assessment concluded that one species is known to occur, 18 species were likely to occur within the survey area, area and the remaining species were unlikely/highly unlikely to occur within the survey area. Following the field surveys, four conservation significant species were recorded and it was considered that only eight species were likely to occur, based on the available habitat (Table 10).

Table 10 Fauna species of conservation significance determined likely to occur within the Survey area

Species and status	Status			Likelihood
	EPBC Act	WC Act	DPaW	
Calyptorhynchus latirostris (Carnaby's Black Cockatoo)	En	En		Likely -Feeding habitat is available to this species and they are known to occur and opportunistically visit the region. No breeding has previously been recorded in the Denmark area.
Falco peregrinus (Peregrine Falcon)		SP (S7)		Likely –The Peregrine Falcon is known from the region and habitat is available to this species for foraging with a small amount of potential breeding habitat in shallow tree hollows.
Ninox connnivens connivens (Barking Owl)		P2		Likely– This species has not been recorded within 10 km of the survey area however some habitat is present for this species within the survey area.
Tyto novaehollandiae novaehollandiae (Masked Owl)		P3		Likely – This species has not been recorded within 10 km of the Survey area however habitat for this species is present. This species is known to occur within the region.
Dasyurus geoffroii (Western Quoll)	Vu	Vu		Likely –This species has been recorded within the 10 km of the Survey area. Habitat is available to this species and they are known to occur in the region.
Macropus Irma (Western Brush Wallaby)			P4	Likely – The species is known from the region with individuals recorded approximately 8 km south east and 15 km north east of the survey area. Habitat is available to this species.
Falsistrellus mackenziei (Western False Pipistrelle)			P4	Likely – The species is known from the region with individuals recorded approximately 13 km north east of the survey area. Habitat is available to this species for both foraging and roosting in hollows.
Elapognathus minor (Short-nosed Snake)			P2	Likely -Habitat is available to this species and they are

Species and status	Status			Likelihood
	EPBC Act	WC Act	DPaW	
				known to occur within 1 km of the survey area.

En – Endangered, Vu – Vulnerable, SP (S7)- Special Protection, Schedule 7, P4 - Priority 4 listed species, P2 – Priority 2 listed species.

5. Project constraints and approvals

This section provides preliminary advice on potential environmental approvals and referrals required, based on the ecological values identified within the survey area. As the project is in concept design there will be opportunities to avoid and minimise the impacts on these biological constraints. In particular, the survey assessed a larger area than necessary for the upgrade of the roads a much smaller area will ultimately be required for the works.

5.1 Key biological constraints

The key biological constraints identified during the biological assessment are summarised below in Table 11 and mapped in Appendix A.

Table 11 Key biological constraints within the survey area

Biological values	Constraints identified
Riparian vegetation	Vegetation associated with riparian zones and damplands was recorded within the survey area and includes: • Karri forest and tall shrublands on river banks • *Melaleuca preissiana, Homalospermum firmum* and *Kunzea ericifolia* shrubland • *Evandra aristata, Anarthria prolifera* and *Leptocarpus tenax* sedgeland • *Tremulina tremula, Mesomelaena tetragona* and *Lepidosperma pubisquameum* sedgeland
Conservation significant flora species	The July and September 2016 assessment identified one plant of the one Priority 4 species, *Laxmannia jamesii*. The likelihood of occurrence determined that 25 species could possibly occur within the survey area.
Conservation significant fauna species	The field surveys and camera trapping identified four conservation significant species: Baudin's and the Forest Red-tailed Black Cockatoos, the Southern Brush-tailed Phascogale (EPBC Act listed) the Quenda, a Priority 5 species. The likelihood of occurrence identified eight conservation significant species which are considered likely to occur within the survey area. Of these, two species are listed under the EPBC Act.
Black Cockatoo habitat	Approximately 45 ha of suitable foraging and roosting habitat was recorded throughout the survey area in the Eucalyptus and Allocasuarina woodland habitats. 902 potential breeding trees were recorded within the survey area, with 40 trees recorded as having hollows; 8 trees had 9 large hollows; 8 trees had 10 medium hollows; and 28 trees had 43 small hollows. The timing of the September survey was within the breeding season of all species. A Baudins Black Cockatoo was recorded as nesting within a large hollow in a Redgum in the western section of the survey area and one Forest Red-tailed Black Cockatoo was recorded sitting in the entrance to a hollow.
Southern Brush-tailed Phascogale habitat	Species was recorded during the survey and is known from the local area and region. Primarily uses all of the woodland (42 ha) as habitat in the survey area. The remainder of the habitat may be utilised opportunistically as a foraging/hunting resource or for dispersal.

5.2 Commonwealth Government approval

Referral to the Federal Department of the Environment under the EPBC Act is triggered if a proposed action has or potentially has a significant impact on any Matters of National Environmental Significance (MNES). Outcomes of an assessment of the Project against key biological MNES are summarised in Table 12.

The assessment is based on the total survey area, and not the impact area.

Table 12 Assessment of Matters of National Environmental Significance

Matters of National Environmental Significance	Species/ Community	Assessment of referral requirement
Threatened Species (flora) and Ecological Communities	None identified from July/September assessment	Not required
Threatened Species (fauna)	Baudin's Black Cockatoo were recorded feeding and breeding in the survey area	Referral will depend on the final impact area and quality of impacted habitat.
Threatened Species (fauna)	Carnaby's Black-Cockatoo are likely to be present	Referral will depend on the final impact area and quality of impacted habitat.
Threatened Species (fauna)	Forest Red-tailed Black-Cockatoo were recorded feeding in the survey area	Referral will depend on the final impact area and quality of impacted habitat.
Threatened Species (fauna)	Chuditch are likely to be present	Referral unlikely to be required. No Chuditch were recorded during either the field surveys or camera survey.
Listed Migratory Species	None present – no species were recorded from the survey area during the July or September 2016 surveys.	

5.1 Western Australian government approval

5.1.1 Environmental Protection Authority

Significant proposals must be referred to the EPA under Section 38 of the *Environmental Protection Act 1986* (EP Act). In deciding whether a proposal will be subject to the formal environmental impact assessment process, the EPA takes into account the environmental significance of any potential impacts that may result from the implementation of the scheme or proposal.

In the absence of a broader environmental assessment, the majority of the likely environmental impacts associated with the Project are linked to native vegetation clearing and loss of fauna

habitat. The potential impacts from the loss of native vegetation clearing and loss of fauna habitat for the Project may be effectively assessed through the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Therefore, with consideration of the biological values discussed in this report and in the absence of a broader environmental assessment, it is considered unlikely that the Project would require referral to the EPA under Section 38 of the EP Act.

5.1.2 Department of Environment Regulation

The Federal and Western Australian governments have entered into a bilateral agreement under the EPBC Act relating to environmental assessment (assessment bilateral agreement). Specifically, this agreement now includes the clearing permit assessment process under Part V Division 2 of the EP Act. Under the assessment bilateral agreement, if a native vegetation clearing permit is required and the clearing will have or is likely to have an impact on a MNES, the assessment of the clearing application including the potential impacts to the MNES can be conducted by the DER or Department of Minerals and Petroleum under delegation.

Four fauna species listed under the EPBC Act (MNES) and WC Act were recorded within the survey area during the September field survey, being Baudin's Black Cockatoo, the Forest Red-tailed Black Cockatoo, the Southern Brush-tailed Phascogale and the Southern Brown Bandicoot. In addition, eight fauna species listed under the Acts were considered likely to occur as they have previously been recorded in the area and suitable habitat is present for them.

As such, any clearing permit application should assess the significance of any potential impacts of the proposed clearing area on these aspects, and the assessment of the potential impacts to the MNES can be can be assessed by DER under the bilateral agreement.

6. Conclusions

6.1 Key findings

6.1.1 Vegetation and flora

Eight vegetation types (not including highly disturbed areas, planted trees and water bodies) were identified and described from the survey area. The survey area is dominated by eucalypt woodlands and forests; Mixed *Eucalyptus marginata, Eucalyptus staeri, Corymbia calophylla, Agonis flexuosa* and *Allocasuarina fraseriana* woodlands to open forests. Myrtaceous shrublands and sedgelands occur throughout the survey area in lower lying areas. The survey area contains 37.3 ha of native vegetation of which 16.4 ha was in *Excellent* to *Very Good* condition

Four vegetation types recorded during the field survey are associated with riparian /dampland zones:

- Karri forest over tall to medium shrubland over sedges
- *Melaleuca preissiana, Homalospermum firmum* and *Kunzea ericifolia* shrubland
- *Evandra aristata, Anarthria prolifera* and *Leptocarpus tenax* sedgeland
- *Tremulina tremula, Mesomelaena tetragona* and *Lepidosperma pubisquameum* sedgeland

The pre-European mapping of the survey area, determined by the State-wide vegetation remaining extent calculations indicate vegetation associations 1, 3 and 969 are remain at greater than 32 % of their pre-European extents at all scales and are therefore above the 30 % threshold level.

No EPBC Act listed TECs and/or State listed TECs or DPaW listed PECs were recorded during the field survey.

No EPBC Act/WC Act listed flora were recorded during the two survey periods. One plant of the DPaW, Priority 4 listed species, *Laxmannia jamesii*, was recorded within the survey area at 536979 E and 6133283 N.

6.1.2 Fauna

Six fauna habitat types were identified within the survey area. The Jarrah, Marri and Sheoak forest habitat had the largest extent throughout the survey area (21.76 ha).

The field surveys and camera trapping identified five conservation significant species. A likelihood of occurrence assessment identified seven additional species as likely to occur within the survey area. Of these, two species are listed under the EPBC Act.

Habitat for the Baudin's, Carnaby's and Red-tailed Black Cockatoos occurs within the survey area, including a total of approximately 45 ha of foraging habitat. Feeding evidence on Jarrah nuts was recorded, which is likely to be from Forest Red-tailed Black Cockatoo. Suitable roosting habitat was recorded throughout the survey area in the *Eucalyptus* and *Allocasuarina* woodland habitats and it is likely that it is used by Black Cockatoos for this purpose. No evidence of roosting was recorded during the field survey. 902 potential breeding trees were recorded within the survey area, of which 40 trees were recorded as having 9 large hollows, 10 medium hollows and 43 small hollows. A Baudins Black Cockatoo was recorded as nesting within a large hollow in a Redgum in the western section of the survey area and one Forest Red-tailed Black Cockatoo was recorded sitting in the entrance to a hollow.

Appendix B – Relevant legislation, conservation codes and background information

Appendix C – Desktop searches

EPBC Act PMST Report (10 km buffer)

NatureMap Flora Report (10 km buffer)

NatureMap Fauna Report (10 km buffer)

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Appendices

Appendix A - Figures

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Kilometres

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

N

LEGEND

- Town
- Survey Area
- Major Road
- Mnor Road

LandCorp
Denmark East Development Precinct

Job Number	61-34762
Revision	0
Date	13 Oct 2016

Locality

Figure 1

G:\61\34762\GIS\Maps\Working\6134762_001_Rev0_Fig1Locality.mxd

Data source: Geoscience Australia: GeoData Topo 250k Series III, Landsat Imagery; MRWA: Roads - 20140723; LandCorp: Study Area - 20160726. Created by: afeeney

999 Hay Street Perth WA 6000 Australia **T** 61 8 6222 8222 **F** 61 8 6222 8555 **E** permail@ghd.com.au **W** www.ghd.com.au

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6,134,000

6,132,000

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Denmark Catchment State Forest

Scotsdale Road Nature Reserve

Redmond Road Nature Reserve

McLean Road Nature Reserve

McIntosh Road Nature Reserve

Denmark Mt Barker

DENMARK

South Western Hwy

DENMARK RIVER

Page size A3

0 250 500 1,000

Metres

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

N

LEGEND

Conservation Significant Flora

- Threatened Flora
- Priority 1 - Poorly Known Taxa
- Priority 2 - Poorly Known Taxa
- Priority 3 - Poorly Known Taxa
- Priority 4 - Rare Taxa

- Road
- Watercourse
- Waterbody
- Survey Area

DPaW Managed Land

- Nature Reserve
- State Forest
- Timber Reserve

LandCorp
Denmark East Development Precinct

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Biological Context

Figure 2

G:\61\34762\GIS\Maps\Working\6134762_002_Rev0_Fig2BiologicalContext.mxd

Data source: Landgate: Imagery (Virtual Mosaic), Roads, Waterbody, Watercourse - 20160815; LandCorp: Study Area, 20160726; DPaW: Managed Land - 20160323, Conservation Significant Flora - 20160718. Created by: afeeney

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6,132,600

Vegetation Associations

- VT1 *Eucalyptus diversicolor, Corymbia calophylla* and *Agonis flexuosa* open forest
- VT2 *Eucalyptus marginata, Eucalyptus staeri* and *Allocasuarina fraseriana* woodland
- VT4 *Eucalyptus marginata, Allocasuarina fraseriana* and *Banksia grandis* open forest
- VT5 *Melaleuca preissiana, Homalospermum firmum* and *Kunzea ericifolia* shrubland
- VT6 *Evandra aristata, Anarthria prolifera* and *Leptocarpus tenax* sedgeland
- VT7 *Eucalyptus marginata, Corymbia calophylla* and *Agonis flexuosa/Allocasuarina fraseriana* open forest
- VT8 *Eucalyptus marginata* and *Allocasuarina fraseriana* open forest
- VT9 *Tremulina tremula, Mesomelaena tetragona* and *Lepidosperma pubisquameum* sedgeland
- SN Scattered native plants
- PT Planted trees
- WB Water body
- HD Highly disturbed

Tulley Rd
East River Rd
Riche Rd
Scotsdale Rd
Riverbend L
Denmark Mt Barker
Q1
Q6
Q10
Q11
Q12

Index Map
1
2
3

Page size A3

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Metres

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

N

LEGEND

Conservation Significant Flora
Priority 4
Quadrat Location
Survey Area
Roads

LandCorp
Denmark East Development Precinct

Job Number 61-34762
Revision 0
Date 13 Oct 2016

Vegetation Types, Survey Locations and Significant Flora Locations

Sheet 1 of 3

Figure 3

G:\61\34762\GIS\Maps\Working\6134762_003_Rev0_Fig3VegType.mxd

Data source: GHD: Vegetation Associations, Study Sites - 20161013; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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6,133,800 6,133,200 6,132,600

Vegetation Associations

- VT1 *Eucalyptus diversicolor, Corymbia calophylla* and *Agonis flexuosa* open forest
- VT2 *Eucalyptus marginata, Eucalyptus staeri* and *Allocasuarina fraseriana* woodland
- VT4 *Eucalyptus marginata, Allocasuarina fraseriana* and *Banksia grandis* open forest
- VT5 *Melaleuca preissiana, Homalospermum firmum* and *Kunzea ericifolia* shrubland
- VT6 *Evandra aristata, Anarthria prolifera* and *Leptocarpus tenax* sedgeland
- VT7 *Eucalyptus marginata, Corymbia calophylla* and *Agonis flexuosa/Allocasuarina fraseriana* open forest
- VT8 *Eucalyptus marginata* and *Allocasuarina fraseriana* open forest
- VT9 *Tremulina tremula, Mesomelaena tetragona* and *Lepidosperma pubisquameum* sedgeland
- SN Scattered native plants
- PT Planted trees
- WB Water body
- HD Highly disturbed

Jarrah Cl
Sheoak Dr
East River Rd
Wrightson Rd
Paxillus Wy
McIntosh Rd
Laxmannia jamesii
Q1 Q2 Q3 Q4 Q5 Q8 Q9

Index Map
1 2 3

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Metres

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

N

LEGEND

Conservation Significant Flora
Priority 4
Quadrat Location
Survey Area
Roads

LandCorp
Denmark East Development Precinct

Job Number	61-34762
Revision	0
Date	13 Oct 2016

Vegetation Types, Survey Locations and Significant Flora Locations

Figure 3

G:\61\34762\GIS\Maps\Working\6134762_003_Rev0_Fig3VegType.mxd

Data source: GHD: Vegetation Associations, Study Sites - 20161013; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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Page size A3

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Metres

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

N

LEGEND

Conservation Significant Flora

Priority 4

Quadrat Location

Survey Area

Roads

LandCorp
Denmark East Development Precinct

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Vegetation Types, Survey Locations and Significant Flora Locations

Sheet 3 of 3

Figure 3

G:\61\34762\GIS\Maps\Working\6134762_003_Rev0_Fig3VegType.mxd

Data source: GHD: Vegetation Associations, Study Sites - 20161013; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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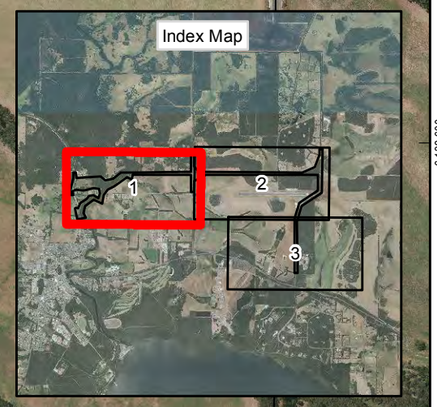
Boobook Cl
Tulley Rd
East River Rd
Riche Rd
Scotsdale Rd
Riverbend L
Denmark Mt Barker

6,132,600



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Metres

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

N

LEGEND

Declared Weeds
- Arum Lily
- Blackberry
- Bridal Creeper

Roads
Survey Area

Vegetation Condition (EPA & DPaW 2015)
- Pristine to excellent
- Excellent
- Excellent to very good
- Very good
- Very good to good
- Good
- Good to degraded
- Degraded
- Degraded to completely degraded
- Completely degraded
- Highly disturbed
- Water body

LandCorp
Denmark East Development Precinct

Job Number 61-34762
Revision 0
Date 13 Oct 2016

Sheet 1 of 3

Vegetation Condition and Significant Weeds

Figure 4

G:\61\34762\GIS\Maps\Working\6134762_004_Rev0_Fig4VegCondition.mxd

Data source: GHD: Vegetation Condition, Significant Weeds - 20161013; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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6,133,800 6,133,200 6,132,600

Jarrah Cl
Sheoak Dr
East River Rd
Wrightson Rd
Paxillus Wy
McIntosh Rd

Index Map
1
2
3

Page size A3

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Metres

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

N

LEGEND

Declared Weeds
- Arum Lily
- Blackberry
- Bridal Creeper

- Roads
- Survey Area

Vegetation Condition (EPA & DPaW 2015)
- Pristine to excellent
- Excellent
- Excellent to very good
- Very good
- Very good to good
- Good
- Good to degraded
- Degraded
- Degraded to completely degraded
- Completely degraded
- Highly disturbed
- Water body

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Vegetation Condition and Significant Weeds

Job Number	61-34762
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Date	13 Oct 2016

Sheet 2 of 3

Figure 4

G:\61\34762\GIS\Maps\Working\6134762_004_Rev0_Fig4VegCondition.mxd

Data source: GHD: Vegetation Condition, Significant Weeds - 20161013; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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535,600 536,200 536,800 537,400

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6,132,000

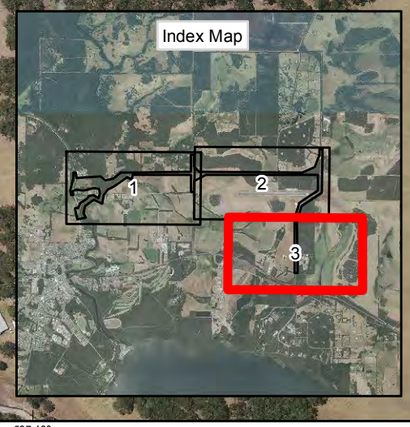
6,131,400

Triggerplant Loop

South Western Hwy

McIntosh Rd

Randall Rd



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

N

LEGEND

Declared Weeds
- Arum Lily
- Blackberry
- Bridal Creeper

- Roads
- Survey Area

Vegetation Condition (EPA & DPaW 2015)
- Pristine to excellent
- Excellent
- Excellent to very good
- Very good
- Very good to good
- Good
- Good to degraded
- Degraded
- Degraded to completely degraded
- Completely degraded
- Highly disturbed
- Water body

LandCorp
Denmark East Development Precinct

Vegetation Condition and Significant Weeds

Job Number 61-34762
Revision 0
Date 13 Oct 2016

Sheet 3 of 3

Figure 4

G:\61\34762\GIS\Maps\Working\6134762_004_Rev0_Fig4VegCondition.mxd

Data source: GHD: Vegetation Condition, Significant Weeds - 20161013; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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6,133,200

6,132,600

Fauna Habitat Type

- Karri, Marri and Peppermint forest
- Planted trees and scattered natives
- Jarrah, Marri and Sheoak woodland
- Jarrah, Sheoak and Banksia open forest
- Jarrah, Sheoak and Bull Banksia open forest on rocky rises
- Myrtaceous shrublands
- Sedgeland
- Water body
- Highly disturbed

Tulley Rd
East River Rd
Riche Rd
Scotsdale Rd
Riverbend L
Denmark-Mt Barker

Index Map
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2
3

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Metres

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

N

LEGEND

- Observed Black Cockatoo / breeding
- Evidence of Black Cockatoo feeding
- Possible Black Cockatoo breeding in past
- Hollows potentially suitable for Black Cockatoo breeding
- Black Cockatoo Trees with DBH > 500 mm
- Roads
- Survey Area

LandCorp
Denmark East Development Precinct

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Date	13 Oct 2016

Sheet 1 of 3

Fauna Habitat

Figure 5

G:\61\34762\GIS\Maps\Working\6134762_005_Rev0_Fig5Fauna.mxd

Data source: GHD: Fauna Habitat, Cockatoo Trees - 20160815; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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Fauna Habitat Type

- Karri, Marri and Peppermint forest
- Planted trees and scattered natives
- Jarrah, Marri and Sheoak woodland
- Jarrah, Sheoak and Banksia open forest
- Jarrah, Sheoak and Bull Banksia open forest on rocky rises
- Myrtaceous shrublands
- Sedgeland
- Water body
- Highly disturbed

Jarrah Cl
Sheoak Dr
East River Rd
Wrightson Rd
Paxillus Wy
McIntosh Rd

Index Map
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Page size A3

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Metres

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

N

LEGEND

- Observed Black Cockatoo breeding
- Evidence of Black Cockatoo feeding
- Possible Black Cockatoo breeding in past
- Hollows potentially suitable for Black Cockatoo breeding
- Black Cockatoo Trees with DBH > 500 mm
- Roads
- Survey Area

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Sheet 2 of 3

Fauna Habitat

Figure 5

G:\61\34762\GIS\Maps\Working\6134762_005_Rev0_Fig5Fauna.mxd

Data source: GHD: Fauna Habitat, Cockatoo Trees - 20160815; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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6,132,600 6,132,000 6,131,400

Fauna Habitat Type

- Karri, Marri and Peppermint forest
- Planted trees and scattered natives
- Jarrah, Marri and Sheoak woodland
- Jarrah, Sheoak and Banksia open forest
- Jarrah, Sheoak and Bull Banksia open forest on rocky rises
- Myrtaceous shrublands
- Sedgeland
- Water body
- Highly disturbed

McIntosh Rd

Triggerplant Loop

South Western Hwy

Randall Rd

Index Map

1 2 3

Page size A3

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Metres

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

N

LEGEND

- Observed Black Cockatoo breeding
- Evidence of Black Cockatoo feeding
- Possible Black Cockatoo breeding in past
- Hollows potentially suitable for Black Cockatoo breeding
- Black Cockatoo Trees with DBH > 500 mm
- Roads
- Survey Area

LandCorp
Denmark East Development Precinct

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Sheet 3 of 3

Fauna Habitat

Figure 5

G:\61\34762\GIS\Maps\Working\6134762_005_Rev0_Fig5Fauna.mxd

Data source: GHD: Fauna Habitat, Cockatoo Trees - 20160815; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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Boobook Cl
Tulley Rd
Riche Rd
East River Rd
Riverbend L
Scotsdale Rd
Denmark Mt Barker

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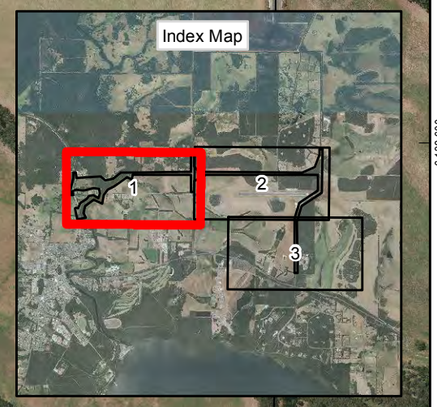

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

LEGEND

Roads

Riparian and River Habitat

Constraint

Low

Medium

High

Survey Area

GHD

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Denmark East Development Precinct

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Sheet 1 of 3

Biological Constraints

Figure 6

G:\61\34762\GIS\Maps\Working\6134762_006_Rev0_Fig6BiologicalConstraints.mxd

Data source: GHD: Constraints, Riparian Habitat - 20160815; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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Jarrah Cl
Sheoak Dr
East River Rd
Wrightson Rd
Paxillus Wy
McIntosh Rd

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

N

LEGEND

Roads
Riparian and River Habitat

Constraint
Low
Medium
High

Survey Area

GHD

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LandCorp
Denmark East Development Precinct

Job Number	61-34762
Revision	0
Date	13 Oct 2016

Sheet 2 of 3

Biological Constraints

Figure 6

G:\61\34762\GIS\Maps\Working\6134762_006_Rev0_Fig6BiologicalConstraints.mxd

Data source: GHD: Constraints, Riparian Habitat - 20160815; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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6,132,000

6,131,400

McIntosh Rd

Triggerplant Loop

South Western Hwy

Randall Rd

Index Map

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Metres

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

N

LEGEND

Roads

Riparian and River Habitat

Constraint

Low

Medium

High

Survey Area

LandCorp
Denmark East Development Precinct

Job Number 61-34762
Revision 0
Date 13 Oct 2016

Sheet 3 of 3

Biological Constraints

Figure 6

G:\61\34762\GIS\Maps\Working\6134762_006_Rev0_Fig6BiologicalConstraints.mxd

Data source: GHD: Constraints, Riparian Habitat - 20160815; Landgate: Aerial Photography - Virtual Mosaic; MRWA: Roads - 20140723; LandCorp: Study Area, 20160726. Created by: mmikkonen

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Appendix A – 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

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

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

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.

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 Beard (1979).

Vegetation condition

The vegetation condition in the Warren 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

Class	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.

Class	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 B – Desktop searches

EPBC Act PMST Report (10 km buffer)

NatureMap Flora Report (10 km buffer)

NatureMap Fauna Report (10 km buffer)

Australian Government

Department of the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

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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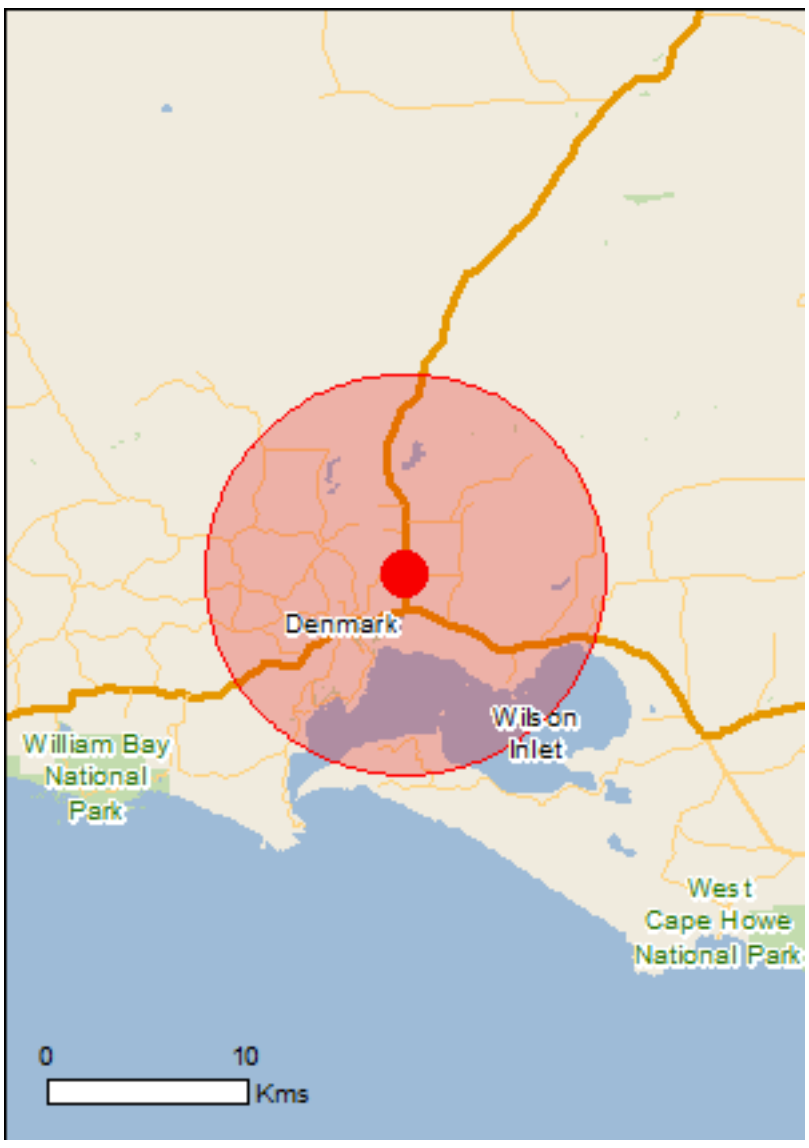
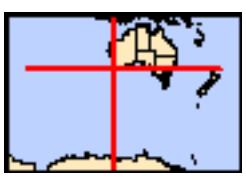


Coordinates

Buffer: 10.0Km



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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	49
Listed Migratory Species:	58

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:	82
Whales and Other Cetaceans:	12
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:	7
Regional Forest Agreements:	1
Invasive Species:	23
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may 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	Breeding likely to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to 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	Status	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
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 likely to occur within area
Phoebetria fusca		
Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to 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
Fish		
Nannatherina balstoni		
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Eubalaena australis		
Southern Right Whale [40]	Endangered	Breeding known to occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat likely 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	Species or species habitat may occur within area
Setonix brachyurus		
Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Calectasia cyanea		
Blue Tinsel Lily [7669]	Critically Endangered	Species or species habitat likely to occur within area
Chordifex abortivus		
Manypeaks Rush [64868]	Endangered	Species or species habitat may occur within area
Conostylis misera		
Grass Conostylis [21320]	Endangered	Species or species habitat may occur within area
Drakaea micrantha		
Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Isopogon uncinatus		
Hook-leaf Isopogon [20871]	Endangered	Species or species habitat likely to occur within area
Kennedia glabrata		
Northcliffe Kennedia [16452]	Vulnerable	Species or species habitat likely to occur within area
Sphenotoma drummondii		
Mountain Paper-heath [21160]	Endangered	Species or species habitat likely to occur within area
Verticordia apecta		
Hay River Featherflower, Scruffy Verticordia [65545]	Critically Endangered	Species or species habitat may occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Sharks		
Carcharias taurus (west coast population)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias		
Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
[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 antipodensis](#) Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to 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
[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 likely to occur within area
[Puffinus carneipes](#) Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour 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]		Breeding 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

Name	Threatened	Type of Presence
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	Breeding likely to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Breeding likely 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	Species or species habitat likely 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		
Actitis hypoleucos		
Common Sandpiper [59309]		Roosting known to occur within area
Arenaria interpres		
Ruddy Turnstone [872]		Roosting known to occur

Name	Threatened	Type of Presence
		within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Roosting known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting 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]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur

Name	Threatened	Type of Presence within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Roosting known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Roosting known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Roosting known to occur within area

Name	Threatened	Type of Presence
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to 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
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Roosting known 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]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
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
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to 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]		Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting 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]		Breeding 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

Name	Threatened	Type of Presence
		habitat known to occur within area
[Tringa glareola](#) Wood Sandpiper [829]		Roosting 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]		Roosting known to occur within area
[Xenus cinereus](#) Terek Sandpiper [59300]		Roosting 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
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		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
[Histiogamphelus cristatus](#) Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
[Leptoichthys fistularius](#) Brushtail Pipefish [66248]		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 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
[Nannocampus subosseus](#) Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
[Notiocampus ruber](#) Red Pipefish [66265]		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

Name	Threatened	Type of Presence
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
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	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely 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

Name	Status	Type of Presence
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
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		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
McIntosh Road	WA
McLean Road	WA
Mount Lindesay	WA
Redmond Road	WA
Rudyard Beach	WA
Scotsdale Road	WA
Unnamed WA15623	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

Name	Status	Type of Presence
		within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
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		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

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

-34.94216 117.38072

Acknowledgements

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-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
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Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

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

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NatureMap
Mapping Western Australia's biodiversity

NatureMap Flora Species Report

Created By Guest user on 04/07/2016

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 117° 22' 50" E,34° 56' 30" S
Buffer 10km
Group By Family

Family	Species	Records
Acrobolbaceae	2	2
Aizoaceae	1	2
Amaranthaceae	3	3
Anarthriaceae	6	37
Aneuraceae	4	10
Anthocerotaceae	1	2
Apiaceae	19	54
Asparagaceae	20	40
Aspleniaceae	1	3
Asteraceae	30	43
Bartramiaceae	1	2
Basellaceae	1	1
Boraginaceae	1	2
Boryaceae	2	5
Brassicaceae	5	6
Bryaceae	9	14
Campanulaceae	4	8
Caprifoliaceae	2	2
Caryophyllaceae	5	7
Casuarinaceae	3	15
Celastraceae	1	1
Centrolepidaceae	5	13
Cephalotaceae	1	3
Cephaloziellaceae	3	4
Ceramiaceae	1	2
Chenopodiaceae	6	10
Colchicaceae	3	3
Commelinaceae	1	13
Convolvulaceae	2	3
Crassulaceae	2	2
Cyperaceae	52	132
Dasypogonaceae	2	8
Dennstaedtiaceae	2	2
Dicranaceae	5	10
Dilleniaceae	15	49
Ditrichaceae	3	4
Droseraceae	13	35
Elaeocarpaceae	6	23
Ericaceae	44	147
Euphorbiaceae	3	9
Fabaceae	118	446
Fissidentaceae	4	8
Fossombroniaceae	1	1
Frullaniaceae	2	7
Funariaceae	4	4
Gentianaceae	2	2
Geraniaceae	1	2
Goodeniaceae	23	91
Haemodoraceae	11	30
Haloragaceae	3	4
Hedwigiaceae	2	2
Hemerocallidaceae	7	22
Hydatellaceae	1	2
Iridaceae	6	14
Isoetaceae	1	1
Juncaceae	12	43
Juncaginaceae	1	1
Lamiaceae	9	19
Lauraceae	3	8
Lentibulariaceae	3	6
Lepidoziaceae	1	2
Linaceae	1	1
Lindsaeaceae	1	5
Loganiaceae	4	8
Lophocoleaceae	1	3
Loranthaceae	1	1
Lythraceae	1	3
Malvaceae	14	81
Menyanthaceae	4	13
Myrtaceae	74	287
Olacaceae	1	9
Onagraceae	3	4
Orchidaceae	77	130
Orobanchaceae	2	2
Orthodontiaceae	1	2

Orthotrichaceae	1	1
Oxalidaceae	4	4
Papaveraceae	2	2
Passifloraceae	1	1
Philydraceae	1	1
Phyllanthaceae	2	3
Phytolaccaceae	1	2
Pittosporaceae	12	51
Plantaginaceae	3	3
Pleurophascaceae	1	4
Poaceae	66	134
Podocarpaceae	1	7
Polygalaceae	8	18
Polygonaceae	8	12
Polyphysaceae	1	1
Pottiaceae	5	11
Primulaceae	2	3
Proteaceae	55	198
Racopilaceae	1	1
Radulaceae	1	3
Ranunculaceae	1	2
Restionaceae	31	106
Rhamnaceae	5	23
Ricciaceae	1	1
Rosaceae	6	18
Rubiaceae	2	4
Rutaceae	19	96
Salviniaceae	1	3
Santalaceae	6	22
Sapindaceae	1	1
Scapaniaceae	1	2
Schizaeaceae	1	1
Scrophulariaceae	2	6
Sematophyllaceae	3	5
Solanaceae	3	5
Sphagnaceae	1	1
Splachnaceae	1	3
Stylidiaceae	34	97
Thuidiaceae	1	1
Thymelaeaceae	15	44
Verbenaceae	1	1
Xanthorrhoeaceae	3	5
Xyridaceae	2	6
Zamiaceae	1	1
TOTAL	**1008**	**2909**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acrobolbaceae					
1.		*Goebelobryum unguiculatum*			
2.		*Lethocolea pansa*			
Aizoaceae					
3.	2823	*Tetragonia implexicoma (Bower Spinach)*			
Amaranthaceae					
4.		*Amaranthus sp.*			
5.	2720	*Ptilotus esquamatus*			
6.	2727	*Ptilotus gaudichaudii*			
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*			
Aneuraceae					
13.		*Riccardia aequicellularis*			
14.		*Riccardia bipinnatifida*			
15.		*Riccardia graeffei*			
16.		*Riccardia sp.*			
Anthocerotaceae					
17.		*Anthoceros punctatus*			
Apiaceae					
18.	6203	*Actinotus glomeratus*			
19.	6206	*Actinotus omnifertilis*			
20.	6211	*Apium prostratum (Sea Celery)*			
21.	11399	*Apium prostratum var. filiforme*			
22.	12040	*Apium prostratum var. prostratum (Sea Celery)*			
23.	6214	*Centella asiatica*			
24.	10871	*Daucus carota (Wild Carrot)*	Y		
25.	6218	*Daucus glochidiatus (Australian Carrot)*			
26.	6221	*Foeniculum vulgare (Fennel)*	Y		
27.	6246	*Pentapeltis silvatica (Southern Pentapeltis)*			
28.	6250	*Platysace deflexa*			
29.	6253	*Platysace filiformis*			
30.	6258	*Platysace pendula*			
31.	6263	*Schoenolaena juncea*			
32.	6284	*Xanthosia candida*			
33.	18453	*Xanthosia eichleri*		P4	
34.	6289	*Xanthosia huegelii*			
35.	6292	*Xanthosia rotundifolia (Southern Cross)*			
36.		*Xanthosia sp.*			
Asparagaceae					
37.	1208	*Acanthocarpus preissii*			
38.	8779	*Asparagus asparagoides (Bridal Creeper)*	Y		
39.	24020	*Asparagus scandens*	Y		
40.	1303	*Laxmannia grandiflora*			
41.	1302	*Laxmannia jamesii (James' Paperlily)*		P4	
42.	1222	*Lomandra brittanii*			
43.	1229	*Lomandra integra*			
44.	14542	*Lomandra micrantha subsp. micrantha*			
45.	1234	*Lomandra nigricans*			
46.	1236	*Lomandra odora (Tiered Matrush)*			
47.	1238	*Lomandra pauciflora*			
48.	1240	*Lomandra purpurea (Purple Mat Rush)*			
49.	1243	*Lomandra sericea (Silky Mat Rush)*			
50.	1244	*Lomandra sonderi*			
51.	1246	*Lomandra suaveolens*			
52.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
53.	1333	*Thysanotus glaucifolius*			
54.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
55.	1351	*Thysanotus sparteus*			
56.	1354	*Thysanotus tenellus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Aspleniaceae					
57.	61	*Asplenium aethiopicum (Forked Spleenwort)*			
Asteraceae					
58.	7829	*Angianthus drummondii*		P3	
59.	8616	*Angianthus platycephalus*			
60.	7833	*Angianthus preissianus*			
61.	7871	*Brachyscome ciliaris*			
62.	7902	*Calotis erinacea (Tangled Burr-daisy)*			
63.	7909	*Carduus pycnocephalus (Slender Thistle)*	Y		
64.	7937	*Cirsium vulgare (Spear Thistle, Scotch Thistle)*	Y		
65.	20074	*Conyza sumatrensis*	Y		
66.	44528	*Coreopsis lanceolata (Common Tickseed)*	Y		
67.	7943	*Cotula australis (Common Cotula)*			
68.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
69.	7947	*Cotula turbinata (Funnel Weed)*	Y		
70.	7962	*Dittrichia viscosa*	Y		
71.	29594	*Helichrysum luteoalbum (Jersey Cudweed)*			
72.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
73.	8092	*Ixiolaena viscosa (Sticky Ixiolaena)*			
74.	8099	*Leontodon saxatilis (Hairy Hawkbit)*	Y		
75.		*Leontodon sp.*			Y
76.	8133	*Olearia elaeophila*			
77.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
78.	13300	*Rhodanthe citrina*			
79.	8208	*Senecio hispidulus (Hispid Fireweed)*			
80.	20663	*Senecio multicaulis subsp. multicaulis*			
81.		*Senecio sp.*			
82.		*Siloxerus sp.*			
83.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
84.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
85.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
86.		*Vellereophyton sp.*			
87.	19938	*Xerochrysum bracteatum*			
Bartramiaceae					
88.	32327	*Breutelia affinis*			
Basellaceae					
89.	17455	*Anredera cordifolia*	Y		
Boraginaceae					
90.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
Boryaceae					
91.	1270	*Borya longiscapa*		P3	
92.	1273	*Borya sphaerocephala (Pincushions)*			
Brassicaceae					
93.	3011	*Diplotaxis muralis (Wall Rocket)*	Y		
94.	3021	*Lepidium bonariense (Peppercress)*	Y		
95.	19989	*Lepidium didymum*	Y		
96.	3042	*Lepidium pseudotasmanicum*		P4	
97.	3048	*Lobularia maritima (Sweet Alyssum)*	Y		
Bryaceae					
98.		*Bryum sp.*			
99.	32375	*Gemmabryum chrysoneuron*			
100.	32380	*Gemmabryum pachythecum*			
101.	32417	*Ptychostomum angustifolium*			
102.	32424	*Rosulabryum albolimbatum*			
103.	44608	*Rosulabryum billarderii*			
104.	32426	*Rosulabryum campylothecium*			
105.		*Rosulabryum sp.*			
106.	32429	*Rosulabryum torquescens*			
Campanulaceae					
107.	9289	*Lobelia anceps (Angled Lobelia)*			
108.	7405	*Lobelia rarifolia*			
109.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
110.	36840	*Lobelia tenuior subsp. tenuior*			
Caprifoliaceae					
111.	7367	*Centranthus ruber (Red Valerian)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
112.	35322	*Centranthus ruber subsp. ruber*	Y		
Caryophyllaceae					
113.	13119	*Cerastium balearicum*	Y		
114.	2891	*Corrigiola litoralis (Strapwort)*	Y		
115.	2905	*Polycarpon tetraphyllum (Fourleaf Allseed)*	Y		
116.	2906	*Sagina apetala (Annual Pearlwort)*	Y		
117.	11803	*Silene gallica var. quinquevulnera*	Y		
Casuarinaceae					
118.	1724	*Allocasuarina decussata (Karri She-oak)*			
119.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
120.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
Celastraceae					
121.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
Centrolepidaceae					
122.	1117	*Aphelia cyperoides*			
123.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
124.	1125	*Centrolepis drummondiana*			
125.	1133	*Centrolepis pilosa*			
126.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
Cephalotaceae					
127.	3148	*Cephalotus follicularis (Albany Pitcher Plant)*			
Cephaloziellaceae					
128.		*Cephaloziella exiliflora*			
129.		*Cephaloziella hirta*			
130.		*Cephaloziella varians*			
Ceramiaceae					
131.	27310	*Spyridia filamentosa*			
Chenopodiaceae					
132.	2462	*Atriplex hypoleuca*			
133.	2471	*Atriplex prostrata (Hastate Orache)*	Y		
134.	2483	*Chenopodium album (Fat Hen)*	Y		
135.	2494	*Chenopodium murale (Nettle-leaf Goosefoot)*	Y		
136.	33480	*Dysphania pumilio (Clammy Goosefoot)*			
137.	2593	*Sarcocornia quinqueflora (Beaded Samphire)*			
Colchicaceae					
138.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
139.	12072	*Wurmbea dioica subsp. alba*			
140.	1402	*Wurmbea sinora*			
Commelinaceae					
141.		*Tradescantia sp.*			
Convolvulaceae					
142.	6630	*Ipomoea indica (Morning Glory)*	Y		
143.	6659	*Wilsonia humilis (Silky Wilsonia)*			
Crassulaceae					
144.	3137	*Crassula colorata (Dense Stonecrop)*			
145.	15706	*Crassula natans var. minus*	Y		
Cyperaceae					
146.	741	*Baumea articulata (Jointed Rush)*			
147.	743	*Baumea juncea (Bare Twigrush)*			
148.	744	*Baumea laxa*			
149.	747	*Baumea rubiginosa*			
150.		*Baumea sp.*			
151.	748	*Baumea vaginalis (Sheath Twigrush)*			
152.	763	*Chorizandra enodis (Black Bristlerush)*			
153.	768	*Cyathochaeta avenacea*			
154.	769	*Cyathochaeta clandestina*			
155.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
156.		*Cyperus sp.*			
157.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
158.	834	*Evandra aristata*			
159.	20216	*Ficinia nodosa (Knotted Club Rush)*			
160.	907	*Gahnia trifida (Coast Saw-sedge)*			
161.	908	*Gymnoschoenus anceps*			
162.	20199	*Isolepis cernua var. cernua*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
163.	20200	*Isolepis cernua var. setiformis*			
164.	911	*Isolepis congrua*			
165.	912	*Isolepis cyperoides*			
166.	916	*Isolepis inundata (Swamp Club Rush)*			
167.	917	*Isolepis marginata (Coarse Club-rush)*			
168.	10831	*Isolepis prolifera (Budding Club-rush)*	Y		
169.		*Isolepis sp.*			
170.	925	*Lepidosperma angustatum*			
171.	932	*Lepidosperma effusum (Spreading Sword-sedge)*			
172.	934	*Lepidosperma gracile (Slender Sword Sedge)*			
173.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
174.		*Lepidosperma sp.*			
175.	945	*Lepidosperma squamatum*			
176.	948	*Lepidosperma tetraquetrum*			
177.	953	*Mesomelaena graciliceps*			
178.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
179.	970	*Schoenus acuminatus*			
180.	975	*Schoenus bifidus*			
181.	983	*Schoenus cruentus*			
182.	986	*Schoenus efoliatus*			
183.	996	*Schoenus laevigatus*			
184.	8312	*Schoenus maschalinus*			
185.	1001	*Schoenus multiglumis*			
186.	1004	*Schoenus nitens (Shiny Bog-rush)*			
187.	1006	*Schoenus odontocarpus*			
188.	1017	*Schoenus subbulbosus*			
189.	1018	*Schoenus subfascicularis*			
190.	1021	*Schoenus sublaxus*			
191.	1023	*Schoenus tenellus*			
192.	1036	*Tetraria octandra*			
193.		*Tetraria sp.*			
194.	35578	*Tetraria sp. Blackwood River (A.R. Annels 3043)*		P3	
195.	35579	*Tetraria sp. Jarrah Forest (R. Davis 7391)*			
196.	1038	*Tricostularia neesii*			
197.		*Tricostularia sp.*			
Dasypogonaceae					
198.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
199.	1221	*Kingia australis (Kingia, Pulonok)*			
Dennstaedtiaceae					
200.	13758	*Histiopteris incisa*			
201.	57	*Pteridium esculentum (Bracken)*			
Dicranaceae					
202.	32335	*Campylopus bicolor*			
203.	32461	*Campylopus bicolor var. bicolor*			
204.	32338	*Campylopus introflexus*	Y		
205.	32344	*Dicranoloma diaphanoneuron*			
206.	32400	*Leucobryum subchlorophyllosum*			
Dilleniaceae					
207.	5114	*Hibbertia commutata*			
208.	5117	*Hibbertia cuneiformis (Cutleaf Hibbertia)*			
209.	5118	*Hibbertia cunninghamii*			
210.	5119	*Hibbertia depressa*			
211.	20051	*Hibbertia diamesogenos*			
212.	5126	*Hibbertia furfuracea*			
213.	19777	*Hibbertia glomerata subsp. glomerata*			
214.	5132	*Hibbertia grossulariifolia*			
215.	5137	*Hibbertia inconspicua*			
216.	5144	*Hibbertia microphylla*			
217.	19687	*Hibbertia notibractea*			
218.	5154	*Hibbertia perfoliata*			
219.	5155	*Hibbertia pilosa (Hairy Guinea Flower)*			
220.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
221.	5169	*Hibbertia serrata (Serrate Leaved Guinea Flower)*			
Ditrichaceae					
222.	32462	*Ceratodon purpureus subsp. convolutus*			
223.	32351	*Eccremidium pulchellum*			
224.	32478	*Pleuridium nervosum var. nervosum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Droseraceae					
225.	13218	*Drosera erythrogyne*			
226.	13216	*Drosera menziesii subsp. penicillaris*			
227.	3110	*Drosera microphylla (Golden Rainbow)*			
228.	3111	*Drosera modesta (Modest Rainbow)*			
229.	3112	*Drosera myriantha (Star Rainbow)*			
230.	3113	*Drosera neesii (Jewel Rainbow)*			
231.	11768	*Drosera neesii subsp. neesii*			
232.	3118	*Drosera pallida (Pale Rainbow)*			
233.	3122	*Drosera platypoda (Fan-leaved Sundew)*			
234.	3124	*Drosera pulchella (Pretty Sundew)*			
235.	13186	*Drosera roseana*			
236.	3131	*Drosera stolonifera (Leafy Sundew)*			
237.	8914	*Drosera sulphurea (Sulphur-flowered Sundew)*			
Elaeocarpaceae					
238.	4524	*Platytheca galioides*			
239.	4525	*Platytheca juniperina*			
240.	4526	*Tetratheca affinis*			
241.	4536	*Tetratheca hispidissima*			
242.	4547	*Tremandra diffusa*			
243.	4548	*Tremandra stelligera*			
Ericaceae					
244.	6295	*Acrotriche cordata (Coast Ground Berry)*			
245.	6301	*Andersonia auriculata*		P3	
246.	6306	*Andersonia caerulea (Foxtails)*			
247.	25844	*Andersonia caerulea subsp. caerulea*			
248.	19623	*Andersonia depressa*			
249.	6320	*Andersonia simplex (Spiked Andersonia)*			
250.	16997	*Andersonia sp. Mitchell River (B.G. Hammersley 925)*		P3	
251.	41741	*Andersonia sp. Virolens (G.J. Keighery 12000)*		P3	
252.	6321	*Andersonia sprengelioides*			
253.	6325	*Astroloma drummondii*			
254.		*Astroloma sp.*			
255.	6352	*Cosmelia rubra (Spindle Heath)*			
256.	40865	*Dielsiodoxa lycopodioides*			
257.	38261	*Dielsiodoxa tamariscina*		P2	
258.	6355	*Leucopogon alternifolius*		P3	
259.	6360	*Leucopogon australis (Spiked Beard-heath)*			
260.	6367	*Leucopogon capitellatus*			
261.	6387	*Leucopogon distans*			
262.	6396	*Leucopogon glabellus*			
263.	33380	*Leucopogon interstans*			
264.	6417	*Leucopogon obovatus*			
265.	40940	*Leucopogon obovatus subsp. obovatus*			
266.	40941	*Leucopogon obovatus subsp. revolutus*			
267.	35499	*Leucopogon paradoxus*			
268.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
269.	6428	*Leucopogon pendulus*			
270.	29611	*Leucopogon penicillatus*			
271.	6435	*Leucopogon polystachyus*			
272.	6436	*Leucopogon propinquus*			
273.	6439	*Leucopogon pulchellus (Beard-heath)*			
274.	6440	*Leucopogon racemulosus*			
275.	6441	*Leucopogon reflexus (Heart-leaf Beard-heath)*			
276.	10755	*Leucopogon rubricaulis*			
277.	19202	*Leucopogon sp. Walpole (R.J. Cranfield 10940)*			
278.	6453	*Leucopogon unilateralis*			
279.	6454	*Leucopogon verticillatus (Tassel Flower)*			
280.	6456	*Lysinema ciliatum (Curry Flower)*			
281.	6457	*Lysinema conspicuum*			
282.	34736	*Lysinema pentapetalum*			
283.	31931	*Sphenotoma capitata*			
284.	31952	*Sphenotoma gracilis (Swamp Paper-heath)*			
285.	31951	*Sphenotoma parviflora*			
286.		*Sphenotoma sp.*			
287.	31932	*Sphenotoma squarrosa*			
Euphorbiaceae					
288.	4585	*Amperea ericoides*			
289.	16493	*Calycopeplus oligandrus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
290.	4695	*Ricinocarpos glaucus*			

Fabaceae

291.	15429	*Acacia alata var. alata*			
292.	15466	*Acacia applanata*			
293.	3247	*Acacia browniana*			
294.	11731	*Acacia browniana var. browniana*			
295.	3282	*Acacia cyclops (Coastal Wattle)*			
296.	3307	*Acacia divergens*			
297.	3331	*Acacia extensa (Wiry Wattle)*			
298.	3347	*Acacia gilbertii*			
299.	3363	*Acacia hastulata*			
300.	3383	*Acacia incurva*			
301.	18217	*Acacia iteaphylla*	Y		
302.	3428	*Acacia luteola*			
303.	3453	*Acacia myrtifolia*			
304.	3484	*Acacia pentadenia (Karri Wattle)*			
305.	35624	*Acacia pentadenia subsp. pentadenia*			
306.	3496	*Acacia preissiana*			
307.		*Acacia provincialis*			Y
308.	3502	*Acacia pulchella (Prickly Moses)*			
309.	15482	*Acacia pulchella var. goadbyi*			
310.	15483	*Acacia pulchella var. pulchella*			
311.	30036	*Acacia saligna subsp. stolonifera*			
312.	3530	*Acacia scalpelliformis*			
313.	3576	*Acacia tetragonocarpa*			
314.	3591	*Acacia urophylla*			
315.	15487	*Acacia varia var. varia*			
316.	3602	*Acacia willdenowiana (Grass Wattle)*			
317.	3689	*Aotus intermedia*			
318.	3690	*Aotus passerinoides*			
319.	14396	*Bossiaea aquifolium subsp. aquifolium*			
320.	14397	*Bossiaea aquifolium subsp. laidlawiana*			
321.	3707	*Bossiaea dentata*			
322.	3713	*Bossiaea linophylla*			
323.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
324.	14291	*Bossiaea praetermissa*			
325.	3723	*Bossiaea webbii (Water Bush)*			
326.	10861	*Callistachys lanceolata (Wonnich)*			
327.	13112	*Chorizema aciculare subsp. aciculare*			
328.	8971	*Chorizema cordatum*			
329.	3754	*Chorizema diversifolium*			
330.	3757	*Chorizema glycinifolium*			
331.	3760	*Chorizema reticulatum (Showy Flame Pea)*			
332.	13107	*Chorizema retrorsum*			
333.	3761	*Chorizema rhombeum*			
334.	14586	*Chorizema spathulatum*			
335.	3791	*Daviesia alternifolia*			
336.	3811	*Daviesia flexuosa*			
337.	3817	*Daviesia inflata*			
338.	3867	*Dipogon lignosus (Dolichos Pea)*	Y		
339.	3872	*Euchilopsis linearis (Swamp Pea)*			
340.	20214	*Eutaxia myrtifolia*			
341.	3879	*Eutaxia parvifolia*			
342.	3880	*Eutaxia virgata*			
343.	3891	*Gastrolobium bilobum (Heart Leaf Poison)*			
344.	3893	*Gastrolobium brownii*			
345.	20490	*Gastrolobium coriaceum*			
346.	19190	*Gastrolobium cuneatum*			
347.	20453	*Gastrolobium latifolium*			
348.	20511	*Gastrolobium minus*			
349.	20500	*Gastrolobium sericeum*			
350.	3947	*Gompholobium burtonioides*			
351.	3948	*Gompholobium capitatum*			
352.	10909	*Gompholobium confertum*			
353.	3950	*Gompholobium knightianum*			
354.	3953	*Gompholobium ovatum*			
355.	3954	*Gompholobium polymorphum*			
356.	11083	*Gompholobium scabrum*			
357.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
358.	3958	*Gompholobium venustum (Handsome Wedge-pea)*			

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359.	11115	*Gompholobium villosum*			
360.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
361.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
362.	3965	*Hovea elliptica (Tree Hovea)*			
363.	4017	*Jacksonia horrida*			
364.	4028	*Jacksonia spinosa*			
365.	4036	*Kennedia carinata*			
366.	4037	*Kennedia coccinea (Coral Vine)*			
367.	4047	*Lathyrus tingitanus (Tangier Pea)*	Y		
368.	4048	*Latrobea brunonis*			
369.	4049	*Latrobea diosmifolia*			
370.	4050	*Latrobea genistoides*			
371.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
372.	8564	*Lotus subbiflorus*	Y		
373.	4063	*Lotus uliginosus (Greater Lotus)*	Y		
374.	4072	*Medicago arabica (Spotted Medic)*	Y		
375.	4076	*Medicago lupulina (Black Medic)*	Y		
376.	4079	*Medicago polymorpha (Burr Medic)*	Y		
377.	4085	*Melilotus indicus*	Y		
378.	4090	*Mirbelia dilatata (Holly-leaved Mirbelia)*			
379.	4096	*Mirbelia ovata*			
380.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
381.	3618	*Paraserianthes lophantha (Albizia)*			
382.	17114	*Paraserianthes lophantha subsp. lophantha*			
383.	4140	*Phyllota barbata*			
384.	4155	*Psoralea pinnata (African Scurfpea)*	Y		
385.	4165	*Pultenaea barbata*			
386.	4181	*Pultenaea reticulata*			
387.	17020	*Robinia pseudoacacia*	Y		
388.	4200	*Sphaerolobium alatum*			
389.	17551	*Sphaerolobium drummondii*			
390.	4204	*Sphaerolobium grandiflorum*			
391.	20302	*Sphaerolobium hygrophilum*			
392.	4205	*Sphaerolobium linophyllum*			
393.	4207	*Sphaerolobium medium*			
394.	17547	*Sphaerolobium pubescens*			
395.	17548	*Sphaerolobium rostratum*			
396.	4211	*Sphaerolobium vimineum (Leafless Globe Pea)*			
397.	4256	*Templetonia retusa (Cockies Tongues)*			
398.	17145	*Trifolium angustifolium var. angustifolium*	Y		
399.	17542	*Trifolium arvense var. arvense*	Y		
400.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
401.	4293	*Trifolium cernuum (Drooping Flower Clover)*	Y		
402.	4295	*Trifolium dubium (Suckling Clover)*	Y		
403.	4302	*Trifolium ligusticum (Ligurian Clover)*	Y		
404.	4312	*Trifolium striatum (Knotted Clover)*	Y		
405.	4313	*Trifolium subterraneum (Subterranean Clover)*	Y		
406.	15509	*Trifolium tomentosum var. tomentosum*	Y		
407.	4320	*Vicia hirsuta (Hairy Vetch)*	Y		
408.	11474	*Vicia sativa subsp. nigra*	Y		
Fissidentaceae					
409.	32363	*Fissidens curvatus*			
410.	32365	*Fissidens leptocladus*			
411.	32469	*Fissidens taylorii var. taylorii*			
412.	32369	*Fissidens tenellus*			
Fossombroniaceae					
413.		*Fossombronia sp.*			
Frullaniaceae					
414.		*Frullania falciloba*			
415.		*Frullania probosciphora*			
Funariaceae					
416.	32353	*Entosthodon apophysatus*			
417.	32354	*Entosthodon productus*			
418.	32370	*Funaria hygrometrica*			
419.		*Funaria sp.*			
Gentianaceae					
420.	6542	*Centaurium tenuiflorum*	Y		
421.	41660	*Schenkia australis*			

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Geraniaceae					
422.	4346	*Pelargonium littorale*			
Goodeniaceae					
423.	7411	*Anthotium humile (Dwarf Anthotium)*			
424.	7420	*Dampiera alata (Winged-stem Dampiera)*			
425.	7444	*Dampiera hederacea (Karri Dampiera)*			
426.	7452	*Dampiera leptoclada (Slender-shooted Dampiera)*			
427.	7454	*Dampiera linearis (Common Dampiera)*			
428.	7462	*Dampiera pedunculata*			
429.	7484	*Dampiera trigona (Angled-stem Dampiera)*			
430.	7487	*Diaspasis filifolia (Thread-leaved Diaspasis)*			
431.	7505	*Goodenia eatoniana*			
432.	7523	*Goodenia leptoclada (Thin-stemmed Goodenia)*			
433.	13165	*Goodenia pusilla*			
434.	7572	*Lechenaultia expansa*			
435.	7590	*Lechenaultia tubiflora (Heath Leschenaultia)*			
436.	7598	*Scaevola auriculata*			
437.	7602	*Scaevola calliptera*			
438.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
439.	7614	*Scaevola globulifera*			
440.	7624	*Scaevola microphylla (Small-leaved Scaevola)*			
441.	7646	*Scaevola striata (Royal Robe)*			
442.	13175	*Scaevola striata var. striata*			
443.	7651	*Selliera radicans*		P1	
444.	7662	*Velleia macrophylla (Large-leaved Velleia)*			
445.	7665	*Velleia trinervis*			
Haemodoraceae					
446.	1406	*Anigozanthos bicolor (Little Kangaroo Paw)*			
447.	1407	*Anigozanthos flavidus (Tall Kangaroo Paw)*			
448.	1413	*Anigozanthos preissii (Albany Catspaw)*			
449.	11826	*Conostylis aculeata subsp. aculeata*			
450.	1454	*Conostylis setigera (Bristly Cottonhead)*			
451.	11597	*Conostylis setigera subsp. setigera*			
452.	1468	*Haemodorum laxum*			
453.	1474	*Haemodorum sparsiflorum*			
454.	1475	*Haemodorum spicatum (Mardja)*			
455.	1481	*Tribonanthes australis*			
456.		*Tribonanthes sp.*			
Haloragaceae					
457.	16746	*Gonocarpus benthamii subsp. benthamii*			
458.	6183	*Haloragodendron racemosum (Shrubby Raspwort)*			
459.	34963	*Trihaloragis hexandra*			
Hedwigiaceae					
460.	32391	*Hedwigia ciliata*			
461.	32421	*Rhacocarpus purpurascens*			
Hemerocallidaceae					
462.	23474	*Agrostocrinum hirsutum*			
463.	16326	*Dianella brevicaulis*			
464.	1297	*Johnsonia lupulina (Hooded Lily)*			
465.	1299	*Johnsonia teretifolia (Hooded Lily)*			
466.	1260	*Stypandra glauca (Blind Grass)*			
467.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
468.	1362	*Tricoryne humilis*			
Hydatellaceae					
469.	33019	*Trithuria australis*		P4	
Iridaceae					
470.	1514	*Crocosmia x crocosmiiflora*	Y		
471.	1532	*Ixia maculata (Yellow Ixia)*	Y		
472.	1540	*Orthrosanthus polystachyus (Many Spike Orthrosanthus)*			
473.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
474.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
475.	14432	*Patersonia umbrosa var. umbrosa*			
Isoetaceae					
476.	11	*Isoetes drummondii (Quillwort)*			
Juncaceae					

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477.	1177	*Juncus articulatus (Jointed Rush)*	Y		
478.	1178	*Juncus bufonius (Toad Rush)*	Y		
479.	1179	*Juncus caespiticius (Grassy Rush)*			
480.	1180	*Juncus capitatus (Capitate Rush)*	Y		
481.	1184	*Juncus holoschoenus (Jointleaf Rush)*			
482.	11922	*Juncus kraussii subsp. australiensis*			
483.	1186	*Juncus microcephalus*	Y		
484.	1187	*Juncus oxycarpus*	Y		
485.	1188	*Juncus pallidus (Pale Rush)*			
486.	1190	*Juncus planifolius (Broadleaf Rush)*			
487.		*Juncus sp.*			
488.	1196	*Juncus usitatus (Common Rush)*	Y		
Juncaginaceae					
489.	151	*Triglochin striata*			
Lamiaceae					
490.	6839	*Hemiandra pungens (Snakebush)*			
491.	6842	*Hemigenia barbata*			
492.	6855	*Hemigenia humilis*			
493.	6856	*Hemigenia incana (Silky Hemigenia)*			
494.	6865	*Hemigenia podalyrina*			
495.	6883	*Mentha pulegium (Pennyroyal)*	Y		
496.	6927	*Prunella vulgaris (Self Heal)*	Y		
497.	6930	*Stachys arvensis (Staggerweed)*	Y		
498.	6939	*Westringia dampieri*			
Lauraceae					
499.	2956	*Cassytha pomiformis (Dodder Laurel)*			
500.	2957	*Cassytha racemosa (Dodder Laurel)*			
501.	11799	*Cassytha racemosa forma racemosa*			
Lentibulariaceae					
502.	7148	*Utricularia multifida*			
503.	7150	*Utricularia simplex (Bluecoats)*			
504.		*Utricularia sp.*			
Lepidoziaceae					
505.		*Kurzia compacta*			
Linaceae					
506.	4363	*Linum trigynum (French Flax)*	Y		
Lindsaeaceae					
507.	59	*Lindsaea linearis (Screw Fern)*			
Loganiaceae					
508.	6506	*Logania campanulata (Bell-flowered Logania)*			
509.	14551	*Logania serpyllifolia subsp. serpyllifolia*			
510.	6515	*Logania vaginalis (White Spray)*			
511.	16177	*Phyllangium paradoxum*			
Lophocoleaceae					
512.		*Chiloscyphus semiteres var. semiteres*			
Loranthaceae					
513.	2380	*Amyema miquelii (Stalked Mistletoe)*			
Lythraceae					
514.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
Malvaceae					
515.	40863	*Commersonia corylifolia (Hazel-leaved Rulingia)*			
516.	40864	*Commersonia cygnorum*			
517.	40920	*Commersonia grandiflora*			
518.	5033	*Lasiopetalum floribundum (Free Flowering Lasiopetalum)*			
519.	33498	*Lasiopetalum sp. Denmark (B.G. Hammersley 2012)*		P3	
520.	36522	*Malva pseudolavatera*	Y		
521.	4963	*Modiola caroliniana*	Y		
522.	5091	*Thomasia paniculata*			
523.	5092	*Thomasia pauciflora (Few Flowered Thomasia)*			
524.	5094	*Thomasia purpurea*			
525.	5096	*Thomasia quercifolia (Oak Leaved Thomasia)*		P4	
526.	5097	*Thomasia rhynchocarpa*			
527.	5100	*Thomasia solanacea*		P4	
528.	33488	*Thomasia sp. Vasse (C. Wilkins & K. Shepherd CW 581)*			

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Menyanthaceae					
529.	36178	*Liparophyllum lasiospermum*			
530.	36180	*Liparophyllum latifolium*			
531.	36181	*Ornduffia parnassifolia*			
532.	36200	*Ornduffia submersa*		P4	
Myrtaceae					
533.	5315	*Actinodium cunninghamii (Albany Daisy)*			
534.	17202	*Agonis flexuosa var. flexuosa*			
535.	17203	*Agonis flexuosa var. latifolia*			
536.		*Agonis sp.*			
537.	19789	*Agonis theiformis*			
538.	20361	*Astartea arbuscula*			
539.	20125	*Astartea corniculata*			
540.	5330	*Astartea fascicularis*			
541.	20127	*Astartea glomerulosa*			
542.	20249	*Astartea leptophylla*			
543.	45213	*Astartea pulchella*			
544.	20283	*Astartea scoparia*			
545.		*Astartea sp.*			
546.	5381	*Beaufortia decussata (Gravel Bottlebrush)*			
547.	5392	*Beaufortia sparsa (Swamp Bottlebrush)*			
548.	5415	*Calothamnus lateralis*			
549.	5425	*Calothamnus preissii*			
550.	5430	*Calothamnus schaueri*			
551.	5440	*Calytrix asperula (Brush Starflower)*			
552.	5483	*Calytrix tetragona (Common Fringe-myrtle)*			
553.	5501	*Conothamnus neglectus*			
554.	17104	*Corymbia calophylla (Marri)*			
555.	42080	*Cyathostemon blackettii*			
556.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
557.	5519	*Darwinia oederoides*			
558.	5533	*Darwinia vestita (Pom-pom Darwinia)*			
559.	5625	*Eucalyptus diversicolor (Karri)*			
560.	5667	*Eucalyptus guilfoylei (Yellow Tingle, Dingul Dingul)*			
561.	5678	*Eucalyptus jacksonii (Red Tingle, Dingul Dingul)*			
562.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
563.	5709	*Eucalyptus megacarpa (Bullich, Pulidj)*			
564.	5723	*Eucalyptus occidentalis (Flat-topped Yate, Moidj)*			
565.	5739	*Eucalyptus patens (Swan River Blackbutt, Dwuda)*			
566.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
567.	5776	*Eucalyptus staeri (Albany Blackbutt)*			
568.	19629	*Eucalyptus virginea*		P4	
569.	5816	*Homalospermum firmum*			
570.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
571.	5818	*Hypocalymma cordifolium*			
572.	43120	*Hypocalymma minus*			
573.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
574.	13106	*Hypocalymma scariosum*			
575.	5827	*Hypocalymma strictum*			
576.	5832	*Kunzea ericifolia (Spearwood, Pondil)*			
577.	17506	*Kunzea ericifolia subsp. ericifolia*			
578.	15498	*Kunzea glabrescens (Spearwood)*			
579.	5841	*Kunzea recurva*			
580.	5844	*Kunzea sulphurea*			
581.	40780	*Melaleuca citrina*	Y		
582.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
583.	5902	*Melaleuca densa*			
584.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
585.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
586.	5938	*Melaleuca microphylla*			
587.	13274	*Melaleuca ordinifolia*		P2	
588.	5946	*Melaleuca pauciflora*			
589.	5952	*Melaleuca preissiana (Moonah)*			
590.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
591.		*Melaleuca sp.*			
592.	5968	*Melaleuca spathulata*			
593.	5980	*Melaleuca thymoides*			
594.	37683	*Melaleuca viminalis*		P2	
595.	5987	*Melaleuca viminea (Mohan)*			

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596.	11109	*Pericalymma crassipes*			
597.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
598.	15501	*Pericalymma spongiocaule*			
599.	6027	*Rinzia schollerifolia*			
600.	20100	*Taxandria angustifolia*			
601.	20114	*Taxandria fragrans*			
602.	20115	*Taxandria juniperina*			
603.	20135	*Taxandria linearifolia*			
604.	20134	*Taxandria marginata*			
605.	20133	*Taxandria parviceps*			
606.	12459	*Verticordia sieberi var. curta*			
Olacaceae					
607.	2366	*Olax phyllanthi*			
Onagraceae					
608.	11992	*Epilobium billardiereanum subsp. intermedium*			
609.	18300	*Fuchsia magellanica*	Y		Y
610.	6139	*Oenothera glazioviana (Evening Primrose)*	Y		
Orchidaceae					
611.	15328	*Caladenia applanata subsp. applanata*			
612.	15329	*Caladenia applanata subsp. erubescens*			
613.	15335	*Caladenia brownii*			
614.	1580	*Caladenia cairnsiana (Zebra Orchid)*			
615.	1581	*Caladenia corynephora*			
616.		*Caladenia elongata*			
617.	10776	*Caladenia ensata*			
618.	15350	*Caladenia flava subsp. sylvestris*			
619.		*Caladenia formosa*			Y
620.	1596	*Caladenia huegelii (Grand Spider Orchid)*		T	
621.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
622.	1602	*Caladenia longicauda (Common White Spider Orchid)*			
623.	1604	*Caladenia macrostylis (Leaping Spider Orchid)*			
624.	1605	*Caladenia marginata (White Fairy Orchid)*			
625.	1608	*Caladenia nana (Pink Fan Orchid)*			
626.	15372	*Caladenia nana subsp. unita*			
627.	1609	*Caladenia pectinata (King Spider Orchid)*			
628.	1612	*Caladenia radiata (Ray Spider Orchid)*			
629.	19868	*Caladenia x hypata*			
630.	1627	*Cryptostylis ovata (Slipper Orchid)*			
631.	15114	*Cyanicula gemmata*			
632.	15404	*Cyanicula sericea*			
633.	10916	*Cyrtostylis huegelii*			
634.	10942	*Cyrtostylis tenuissima*			
635.	19649	*Disa bracteata*	Y		
636.	11049	*Diuris corymbosa*			
637.	1633	*Diuris laevis (Nannygoat Orchid)*			
638.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
639.		*Diuris sp.*			
640.	1640	*Drakaea glyptodon (King-in-his-carriage)*			
641.	1642	*Drakaea thynniphila*			
642.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
643.	1645	*Epiblema grandiflorum (Babe-in-a-cradle)*			
644.	15412	*Eriochilus dilatatus subsp. multiflorus*			
645.	15414	*Eriochilus helonomos*			
646.	15415	*Eriochilus scaber subsp. scaber*			
647.		*Eriochilus sp.*			
648.	10802	*Eriochilus tenuis*			
649.	1656	*Lyperanthus serratus (Rattle Beak Orchid)*			
650.	1657	*Microtis alba (White Mignonette Orchid)*			
651.	34158	*Microtis alboviridis*			
652.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
653.	8814	*Microtis brownii*			
654.	10954	*Microtis media (Tall Mignonette Orchid)*			
655.	12761	*Microtis media subsp. densiflora*			
656.	15419	*Microtis media subsp. media*			
657.	1662	*Microtis pulchella (Beautiful Mignonette Orchid)*		P4	
658.		*Microtis sp.*			
659.	1667	*Paracaleana nigrita (Flying Duck Orchid)*			
660.	20460	*Pheladenia deformis*			
661.		*Plumatichilos turfosa*			

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662.	15424	*Praecoxanthus aphyllus*			
663.	1668	*Prasophyllum brownii*			
664.	11066	*Prasophyllum cucullatum (Hooded Leek Orchid)*			
665.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
666.	1671	*Prasophyllum elatum (Tall Leek Orchid)*			
667.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
668.	1673	*Prasophyllum gibbosum (Humped Leek Orchid)*			
669.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
670.	17650	*Prasophyllum odoratissimum*			
671.	1679	*Prasophyllum ovale (Little Leek Orchid)*			
672.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
673.		*Prasophyllum paulinae*			
674.	1681	*Prasophyllum regium (King Leek Orchid)*			
675.	44084	*Prasophyllum sp. early (G. Brockman GBB 1626)*			
676.	1683	*Prasophyllum triangulare (Dark Leek Orchid)*			
677.	1693	*Pterostylis recurva (Jug Orchid)*			
678.	18655	*Pterostylis sp. crinkled leaf (G.J. Keighery 13426)*			
679.	18658	*Pterostylis sp. short sepals (W. Jackson BJ259)*			
680.	16368	*Pyrorchis forrestii*			
681.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
682.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
683.	1704	*Thelymitra cornicina (Lilac Sun Orchid)*			
684.	1706	*Thelymitra cucullata (Swamp Sun Orchid)*			
685.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
686.	11053	*Thelymitra macrophylla*			
687.	20730	*Thelymitra paludosa*			
Orobanchaceae					
688.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
689.	7090	*Parentucellia viscosa (Sticky Bartsia)*	Y		
Orthodontiaceae					
690.	32406	*Orthodontium lineare*			
Orthotrichaceae					
691.	32457	*Zygodon intermedius*			
Oxalidaceae					
692.	4349	*Oxalis corniculata (Yellow Wood Sorrel)*	Y		
693.	18331	*Oxalis debilis var. corymbosa (Pink Shamrock)*	Y		
694.	30375	*Oxalis exilis*			
695.	4354	*Oxalis incarnata*	Y		
Papaveraceae					
696.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
697.	31532	*Fumaria muralis subsp. muralis*	Y		
Passifloraceae					
698.	5225	*Passiflora filamentosa*	Y		
Philydraceae					
699.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
Phyllanthaceae					
700.	4690	*Poranthera huegelii*			
701.	4691	*Poranthera microphylla (Small Poranthera)*			
Phytolaccaceae					
702.	2793	*Phytolacca octandra (Red Ink Plant)*	Y		
Pittosporaceae					
703.	3154	*Billardiera coriacea*			
704.	25787	*Billardiera drummondii*			
705.	3157	*Billardiera floribunda (White-flowered Billardiera)*			
706.	25798	*Billardiera fusiformis (Australian Bluebell)*			
707.	25796	*Billardiera heterophylla (Australian Bluebell)*			
708.	3159	*Billardiera laxiflora*			
709.		*Billardiera sp.*			
710.	3165	*Billardiera variifolia*			
711.	3169	*Cheiranthera preissiana*			
712.	17637	*Marianthus candidus (White Marianthus)*			
713.	17636	*Marianthus coeruleopunctatus (Blue-spotted Marianthus)*			
714.	25822	*Marianthus sylvaticus*			
Plantaginaceae					
715.	7303	*Plantago lanceolata (Ribwort Plantain)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
			Y		
716.	7108	*Veronica arvensis (Wall Speedwell)*	Y		
717.	7112	*Veronica plebeia (Creeping Speedwell)*			
Pleurophascaceae					
718.	19062	*Pleurophascum occidentale*		P4	
Poaceae					
719.	177	*Agrostis capillaris*	Y		
720.		*Agrostis sp.*			
721.	182	*Agrostis stolonifera (Creeping Bent)*	Y		
722.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
723.	187	*Aira praecox (Early Hairgrass)*	Y		
724.	13380	*Amphibromus nervosus*			
725.		*Amphibromus sp.*			
726.	194	*Amphipogon amphipogonoides*			
727.	197	*Amphipogon debilis*			
728.	20184	*Amphipogon laguroides subsp. laguroides*			
729.	20196	*Amphipogon setaceus*			
730.	202	*Anthoxanthum odoratum (Sweet Vernal Grass)*	Y		
731.	11542	*Arrhenatherum elatius var. bulbosum (Onion Twitch)*	Y		
732.	17240	*Austrostipa flavescens*			
733.	17241	*Austrostipa hemipogon*			
734.	17245	*Austrostipa mollis*			
735.	17253	*Austrostipa semibarbata*			
736.	233	*Avena barbata (Bearded Oat)*	Y		
737.	20013	*Axonopus fissifolius*	Y		
738.	244	*Briza maxima (Blowfly Grass)*	Y		
739.	245	*Briza minor (Shivery Grass)*	Y		
740.	248	*Bromus catharticus (Prairie Grass)*	Y		
741.	41564	*Cenchrus clandestinus (Kikuyu Grass)*	Y		
742.	283	*Cynodon dactylon (Couch)*	Y		
743.	285	*Cynosurus echinatus (Rough Dogstail)*	Y		
744.	287	*Dactylis glomerata (Cocksfoot)*	Y		
745.		*Danthonia sp.*			
746.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
747.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
748.	11105	*Echinochloa crus-galli*	Y		
749.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
750.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
751.	373	*Eragrostis brownii (Brown's Lovegrass)*			
752.	376	*Eragrostis curvula (African Lovegrass)*	Y		
753.	430	*Festuca arundinacea (Tall Fescue)*	Y		
754.	439	*Hemarthria uncinata (Matgrass)*			
755.	11451	*Hemarthria uncinata var. uncinata*			
756.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
757.	449	*Hordeum leporinum (Barley Grass)*	Y		
758.	20019	*Lachnagrostis filiformis*			
759.	475	*Lolium multiflorum (Italian Ryegrass)*	Y		
760.	476	*Lolium perenne (Perennial Ryegrass)*	Y		
761.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
762.	485	*Microlaena stipoides (Weeping Grass)*			
763.	516	*Parapholis incurva (Coast Barbgrass)*	Y		
764.	527	*Paspalum dilatatum*	Y		
765.	533	*Paspalum vaginatum (Salt Water Couch)*	Y		
766.	548	*Phalaris aquatica (Phalaris)*	Y		
767.	577	*Poa poiformis (Coastal Poa)*			
768.	578	*Poa porphyroclados*			
769.		*Poa sp.*			
770.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
771.	40431	*Rytidosperma acerosum*			
772.	40425	*Rytidosperma caespitosum*			
773.	40430	*Rytidosperma pilosum*			
774.	40428	*Rytidosperma racemosum*			
775.	40427	*Rytidosperma setaceum*			
776.	19453	*Setaria parviflora*	Y		
777.	8710	*Sporobolus africanus (Parramatta Grass)*	Y		
778.	635	*Sporobolus virginicus (Marine Couch)*			
779.	636	*Stenotaphrum secundatum (Buffalo Grass)*	Y		
780.	667	*Tetrarrhena laevis (Forrest Ricegrass)*			
781.		*Tribolium confusum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
782.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
783.	33101	*Vulpia myuros forma myuros*	Y		
784.		*Vulpia sp.*			
Podocarpaceae					
785.	86	*Podocarpus drouynianus (Wild Plum, Kula)*			
Polygalaceae					
786.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
787.	4551	*Comesperma ciliatum*			
788.	4552	*Comesperma confertum*			
789.	4554	*Comesperma flavum*			
790.	4557	*Comesperma nudiusculum*			
791.		*Comesperma sp.*			
792.	4564	*Comesperma virgatum (Milkwort)*			
793.	4578	*Polygala virgata*	Y		
Polygonaceae					
794.	17774	*Acetosella vulgaris*	Y		
795.	11020	*Persicaria hydropiper*			
796.	2419	*Polygonum aviculare (Wireweed)*	Y		
797.	2432	*Rumex conglomeratus (Clustered Dock)*	Y		
798.	2433	*Rumex crispus (Curled Dock)*	Y		
799.	2437	*Rumex frutescens*	Y		
800.	12017	*Rumex pulcher subsp. pulcher (Fiddle Dock)*	Y		
801.	2447	*Rumex x pseudopulcher*	Y		
Polyphysaceae					
802.	13146	*Acetabularia peniculus*			
Pottiaceae					
803.	32315	*Barbula calycina*			
804.	32346	*Didymodon torquatus*			
805.	36219	*Pseudocrossidium hornschuchianum*			
806.	32439	*Syntrichia papillosa*			
807.	32450	*Trichostomum eckelianum*			
Primulaceae					
808.	6483	*Samolus junceus*			
809.	6484	*Samolus repens (Creeping Brookweed)*			
Proteaceae					
810.	10824	*Acidonia microcarpa*			
811.	1773	*Adenanthos cuneatus (Coastal Jugflower)*			
812.	1791	*Adenanthos obovatus (Basket Flower)*			
813.	32684	*Banksia arctotidis*			
814.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
815.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
816.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
817.	1837	*Banksia occidentalis (Red Swamp Banksia)*			
818.	1844	*Banksia quercifolia (Oak-leaved Banksia)*			
819.	1848	*Banksia seminuda (River Banksia)*			
820.	32084	*Banksia serra (Serrate-leaved Dryandra)*		P4	
821.	1862	*Conospermum caeruleum (Blue Brother)*			
822.	15610	*Conospermum caeruleum subsp. caeruleum*			
823.	16854	*Conospermum capitatum subsp. capitatum*			
824.		*Conospermum sp.*			
825.	1883	*Conospermum teretifolium (Spider Smokebush)*			
826.	1944	*Franklandia fucifolia (Lanoline Bush)*			
827.	1977	*Grevillea cirsiifolia (Varied-leaf Grevillea)*			
828.	13084	*Grevillea fuscolutea*		T	
829.	2043	*Grevillea muelleri*			
830.	2052	*Grevillea occidentalis*			
831.	15991	*Grevillea pulchella subsp. pulchella*			
832.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
833.	2112	*Grevillea trifida*			
834.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
835.	2137	*Hakea ceratophylla (Horned Leaf Hakea)*			
836.	2150	*Hakea cucullata (Hood Leaved Hakea)*			
837.	2159	*Hakea falcata*			
838.	2162	*Hakea florida*			
839.	2171	*Hakea laurina (Pincushion Hakea, Kodjet)*			
840.	2174	*Hakea linearis*			
841.	2191	*Hakea oleifolia (Dungyn)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
842.	2197	*Hakea prostrata (Harsh Hakea)*			
843.		*Hakea sp.*			
844.	2212	*Hakea sulcata (Furrowed Hakea)*			
845.	2223	*Isopogon axillaris*			
846.	12908	*Isopogon buxifolius var. buxifolius*		P2	
847.	2230	*Isopogon formosus (Rose Coneflower)*			
848.		*Isopogon sp.*			
849.	2253	*Lambertia uniflora*			
850.	2262	*Persoonia elliptica (Spreading Snottygobble)*			
851.	2267	*Persoonia longifolia (Snottygobble)*			
852.	2282	*Petrophile acicularis*			
853.	2293	*Petrophile diversifolia*			
854.	17765	*Petrophile squamata subsp. squamata*			
855.	2318	*Stirlingia tenuifolia*			
856.	2320	*Strangea stenocarpoides*			
857.	2322	*Synaphea favosa*			
858.	2323	*Synaphea gracillima*			
859.	16859	*Synaphea incurva*		P1	
860.	12911	*Synaphea obtusata*			
861.	16864	*Synaphea petiolaris subsp. petiolaris*			
862.	16863	*Synaphea petiolaris subsp. triloba*			
863.	2326	*Synaphea polymorpha (Albany Synaphea, Pinda)*			
864.	2328	*Synaphea reticulata*			
Racopilaceae					
865.	32480	*Racopilum cuspidigerum var. convolutaceum*			
Radulaceae					
866.		*Radula buccinifera*			
Ranunculaceae					
867.	2929	*Clematis pubescens (Common Clematis)*			
Restionaceae					
868.	17685	*Chaetanthus aristatus*			
869.	1065	*Chaetanthus leptocarpoides*			
870.	17687	*Chaetanthus tenellus*			
871.	17689	*Chordifex laxus*			
872.	17691	*Desmocladus fasciculatus*			
873.	16595	*Desmocladus flexuosus*			
874.	1067	*Empodisma gracillimum*			
875.	1070	*Hypolaena exsulca*			
876.	19918	*Hypolaena grandiuscula*			
877.	17841	*Hypolaena pubescens*			
878.	19833	*Leptocarpus laxus*			
879.		*Leptocarpus sp.*			
880.	1082	*Leptocarpus tenax (Slender Twine Rush)*			
881.	1084	*Lepyrodia drummondiana*			
882.	17954	*Lepyrodia extensa*		P2	
883.	1087	*Lepyrodia hermaphrodita*			
884.	1089	*Lepyrodia monoica*			
885.	1090	*Lepyrodia muirii*			
886.	1092	*Loxocarya cinerea*			
887.	17679	*Meeboldina coangustata*			
888.	1098	*Meeboldina denmarkica*			
889.	17677	*Meeboldina roycei*			
890.	17694	*Meeboldina scariosa*			
891.		*Meeboldina sp.*			
892.	17693	*Meeboldina thysanantha*		P3	
893.		*Meeboldina thysanantha MS*			
894.	14917	*Sporadanthus rivularis*			
895.	14915	*Sporadanthus strictus*			
896.	18381	*Stenotalis ramosissima*			
897.	15827	*Taraxis grossa*			
898.	17684	*Tremulina tremula*			
Rhamnaceae					
899.	29919	*Polianthion wichurae*			
900.	4828	*Spyridium globulosum (Basket Bush)*			
901.	14813	*Spyridium riparium*		P2	
902.	33438	*Trymalium odoratissimum subsp. trifidum*			
903.	15145	*Trymalium venustum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Ricciaceae					
904.		*Riccia bifurca*			
Rosaceae					
905.	3185	*Acaena novae-zelandiae*	Y		
906.	18319	*Cotoneaster glaucophyllus*	Y		
907.	16243	*Rosa canina*	Y		
908.	20506	*Rubus anglocandicans*	Y		
909.		*Rubus sp.*			
910.	3192	*Sanguisorba minor (Sheep's Burnet)*	Y		
Rubiaceae					
911.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
912.	7354	*Opercularia volubilis (Twining Stinkweed)*			
Rutaceae					
913.	4403	*Boronia alata (Winged Boronia)*			
914.	4413	*Boronia crenulata (Aniseed Boronia)*			
915.	11503	*Boronia crenulata var. crenulata*			
916.	4416	*Boronia denticulata*			
917.	4422	*Boronia gracilipes (Karri Boronia)*			
918.	4423	*Boronia heterophylla (Kalgan Boronia)*			
919.	16631	*Boronia juncea subsp. micrantha*			
920.	4428	*Boronia megastigma (Scented Boronia)*			
921.	4429	*Boronia molloyae (Tall Boronia)*			
922.	4430	*Boronia nematophylla*			
923.	4441	*Boronia spathulata (Boronia)*			
924.	4442	*Boronia stricta*			
925.	4443	*Boronia subsessilis*			
926.	4447	*Boronia virgata*		P4	
927.	4448	*Chorilaena quercifolia (Chorilaena)*			
928.	11306	*Crowea angustifolia var. angustifolia*			
929.	17729	*Crowea angustifolia var. platyphylla*			
930.		*Leionema lamprophyllum subsp. lamprophyllum*			
931.	18530	*Philotheca nodiflora*			
Salviniaceae					
932.	79	*Salvinia molesta (Salvinia)*	Y		
Santalaceae					
933.	2335	*Choretrum lateriflorum (Dwarf Sour Bush)*			
934.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
935.	17703	*Leptomeria ellytes*			
936.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
937.	2353	*Leptomeria scrobiculata*			
938.	2355	*Leptomeria squarrulosa*			
Sapindaceae					
939.	4765	*Dodonaea humifusa*			
Scapaniaceae					
940.		*Chaetophyllopsis whiteleggei*			
Schizaeaceae					
941.	24	*Schizaea fistulosa (Narrow Comb Fern)*			
Scrophulariaceae					
942.	7295	*Myoporum tetrandrum (Boobialla)*			
943.	7107	*Verbascum virgatum (Twiggy Mullein)*	Y		
Sematophyllaceae					
944.	32422	*Rhaphidorrhynchium amoenum*			
945.	32433	*Sematophyllum homomallum*			
946.	32483	*Sematophyllum subhumile var. contiguum*			
Solanaceae					
947.	16321	*Anthocercis sylvicola*		P2	
948.	7017	*Solanum laciniatum (Kangaroo Apple)*	Y		
949.	9259	*Solanum nodiflorum (Glossy Nightshade)*			
Sphagnaceae					
950.		*Sphagnum sp.*			
Splachnaceae					
951.	32440	*Tayloria octoblepharum*			
Stylidiaceae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
952.	7674	*Levenhookia preissii (Preiss's Stylewort)*			
953.	7676	*Levenhookia pusilla (Midget Stylewort)*			
954.	7677	*Levenhookia stipitata (Common Stylewort)*			
955.	39881	*Stylidium acuminatum subsp. meridionale*			
956.	7678	*Stylidium adnatum (Common Beaked Triggerplant)*			
957.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
958.	17669	*Stylidium amoenum var. caulescens*			
959.	39880	*Stylidium angustifolium subsp. glaucifolium*			
960.	7687	*Stylidium assimile (Bronze-leaved Triggerplant)*			
961.	7695	*Stylidium caespitosum (Fly-away Triggerplant)*			
962.	7696	*Stylidium calcaratum (Book Triggerplant)*			
963.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
964.	40944	*Stylidium decipiens*			
965.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
966.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
967.	7733	*Stylidium glaucum (Grey Triggerplant)*			
968.	7734	*Stylidium guttatum (Dotted Triggerplant)*			
969.	7745	*Stylidium junceum (Reed Triggerplant)*			
970.	7746	*Stylidium laciniatum (Tattered Triggerplant)*			
971.	7757	*Stylidium luteum (Yellow Triggerplant)*			
972.	25851	*Stylidium nymphaeum*			
973.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
974.	20694	*Stylidium planirosulum*			
975.	7778	*Stylidium pritzelianum (Royal Triggerplant)*			
976.	7782	*Stylidium pulchellum (Thumbelina Triggerplant)*			
977.	7784	*Stylidium pygmaeum (Pygmy Triggerplant)*			
978.	7785	*Stylidium repens (Matted Triggerplant)*			
979.	7787	*Stylidium rhynchocarpum (Black-beaked Triggerplant)*			
980.	7796	*Stylidium scandens (Climbing Triggerplant)*			
981.	7798	*Stylidium schoenoides (Cow Kicks)*			
982.		*Stylidium sp.*			
983.	7799	*Stylidium spathulatum (Creamy Triggerplant)*			
984.	11223	*Stylidium spinulosum subsp. spinulosum*			
985.	7802	*Stylidium squamosotuberosum (Fleshy-rhizomed Trigger Plant)*			
Thuidiaceae					
986.	32442	*Thuidium sparsum*			
Thymelaeaceae					
987.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
988.	5239	*Pimelea clavata*			
989.	5242	*Pimelea erecta*			
990.	5249	*Pimelea hispida (Bristly Pimelea)*			
991.	11402	*Pimelea imbricata var. piligera*			
992.	5252	*Pimelea lanata*			
993.	5255	*Pimelea longiflora*			
994.	11639	*Pimelea longiflora subsp. longiflora*			
995.	5261	*Pimelea rosea (Rose Banjine)*			
996.	18117	*Pimelea rosea subsp. rosea*			
997.		*Pimelea sp.*			
998.	5264	*Pimelea spectabilis (Bunjong)*			
999.	5266	*Pimelea suaveolens (Scented Banjine)*			
1000.	5269	*Pimelea sylvestris*			
1001.	5270	*Pimelea tinctoria*			
Verbenaceae					
1002.	36096	*Verbena incompta (Purple-top Verbena)*	Y		
Xanthorrhoeaceae					
1003.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1004.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1005.		*Xanthorrhoea sp.*			
Xyridaceae					
1006.	1149	*Xyris lacera*			
1007.	1150	*Xyris lanata*			
Zamiaceae					
1008.	18119	*Macrozamia fraseri*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement

Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

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 Fauna Species Report

Created By Guest user on 04/07/2016

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	117° 22' 50" E,34° 56' 31" S
Buffer	10km
Group By	Species Group

Species Group	Species	Records
Amphibian	12	67
Bird	260	5524
Fish	79	195
Invertebrate	228	510
Mammal	22	122
Reptile	25	218
TOTAL	**626**	**6636**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25398	*Crinia georgiana (Quacking Frog)*			
2.	25399	*Crinia glauerti (Clicking Frog)*			
3.		*Crinia sp.*			
4.	25404	*Geocrinia leai (Ticking Frog)*			
5.	25410	*Heleioporus eyrei (Moaning Frog)*			
6.	25411	*Heleioporus inornatus (Whooping Frog)*			
7.	25412	*Heleioporus psammophilus (Sand Frog)*			
8.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
9.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
10.	25388	*Litoria moorei (Motorbike Frog)*			
11.	25419	*Metacrinia nichollsi (Forest Toadlet)*			
12.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Bird					
13.		*Acanthiza (Acanthiza) apicalis subsp. apicalis*			
14.		*Acanthiza (Geobasileus) chrysorrhoa*			
15.		*Acanthiza (Geobasileus) chrysorrhoa subsp. chrysorrhoa*			
16.		*Acanthiza (Geobasileus) inornata*			
17.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
18.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
19.	24262	*Acanthiza inornata (Western Thornbill)*			
20.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
21.		*Accipiter (Leucospiza) fasciatus subsp. fasciatus*			
22.		*Accipiter (Paraspizias) cirrocephalus subsp. cirrocephalus*			
23.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
24.	24281	*Accipiter cirrocephalus subsp. cirrocephalus (Collared Sparrowhawk)*			
25.	25536	*Accipiter fasciatus (Brown Goshawk)*			
26.		*Acrocephalus (Acrocephalus) australis subsp. gouldi*			
27.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
28.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
29.	24301	*Aegotheles cristatus subsp. cristatus (Australian Owlet-nightjar)*			
30.	24310	*Anas castanea (Chestnut Teal)*			
31.	24312	*Anas gracilis (Grey Teal)*			
32.	24313	*Anas platyrhynchos (Mallard)*			
33.	24315	*Anas rhynchotis (Australasian Shoveler)*			
34.	24316	*Anas superciliosa (Pacific Black Duck)*			
35.		*Anhinga novaehollandiae*			
36.		*Anthochaera (Anellobia) chrysoptera*			
37.		*Anthochaera (Anellobia) lunulata*			
38.		*Anthochaera (Anthochaera) carunculata*			
39.	24561	*Anthochaera carunculata (Red Wattlebird)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
40.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
41.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
42.	24285	*Aquila audax (Wedge-tailed Eagle)*			
43.	24286	*Aquila morphnoides subsp. morphnoides (Little Eagle)*			
44.	25558	*Ardea ibis (Cattle Egret)*		IA	
45.	41324	*Ardea modesta (Eastern Great Egret)*		IA	
46.	24341	*Ardea pacifica (White-necked Heron)*			
47.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
48.		*Artamus (Angroyan) cyanopterus*			
49.		*Artamus (Angroyan) cyanopterus subsp. perthi*			
50.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
51.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
52.	24358	*Atrichornis clamosus (Noisy Scrub-bird)*		T	
53.	24318	*Aythya australis (Hardhead)*			
54.		*Barnardius zonarius*			
55.		*Barnardius zonarius subsp. semitorquatus*			
56.	24319	*Biziura lobata (Musk Duck)*			
57.		*Burhinus (Burhinus) grallarius*			
58.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
59.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
60.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
61.	24427	*Cacomantis flabelliformis subsp. flabelliformis (Fan-tailed Cuckoo)*			
62.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
63.		*Calidris (Erolia) acuminata*			
64.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
65.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
66.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
67.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
68.	24790	*Calidris tenuirostris (Great Knot)*		T	
69.		*Calyptorhynchus (Calyptorhynchus) banksii subsp. naso*			
70.		*Calyptorhynchus (Zanda) baudinii*			
71.		*Calyptorhynchus (Zanda) latirostris*			
72.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
73.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)*		T	
74.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)*		T	
75.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)*		T	
76.		*Calyptorhynchus sp.*			
77.		*Charadrius (Charadrius) ruficapillus*			
78.	25573	*Charadrius bicinctus (Double-banded Plover)*			
79.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		IA	
80.	25576	*Charadrius mongolus (Lesser Sand Plover)*		T	
81.	24376	*Charadrius rubricollis (Hooded Plover)*		P4	
82.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
83.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
84.		*Chroicocephalus novaehollandiae*			
85.		*Chroicocephalus novaehollandiae subsp. novaehollandiae*			
86.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
87.	24432	*Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)*			
88.	24288	*Circus approximans (Swamp Harrier)*			
89.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
90.		*Climacteris (Climacteris) rufa*			
91.	24396	*Climacteris rufa (Rufous Treecreeper)*			
92.		*Colluricincla (Colluricincla) harmonica subsp. rufiventris*			
93.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
94.	24613	*Colluricincla harmonica subsp. rufiventris (Grey Shrike-thrush)*			
95.	24399	*Columba livia (Domestic Pigeon)*	Y		
96.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
97.	24362	*Coracina novaehollandiae subsp. novaehollandiae (Black-faced Cuckoo-shrike)*			
98.	25592	*Corvus coronoides (Australian Raven)*			
99.		*Corvus sp.*			
100.	24671	*Coturnix pectoralis (Stubble Quail)*			
101.	25701	*Coturnix ypsilophora (Brown Quail)*			
102.	25595	*Cracticus tibicen (Australian Magpie)*			
103.	25596	*Cracticus torquatus (Grey Butcherbird)*			
104.		*Cygnus (Chenopis) atratus*			
105.	24322	*Cygnus atratus (Black Swan)*			
106.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
107.	30902	*Dacelo novaeguineae subsp. novaeguineae (Laughing Kookaburra)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
108.		*Daphoenositta (Neositta) chrysoptera subsp. pileata*			
109.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
110.	24440	*Dasyornis longirostris (Western Bristlebird)*		T	
111.	24470	*Dromaius novaehollandiae (Emu)*			
112.		*Egretta garzetta*			
113.		*Egretta novaehollandiae*			
114.		*Elanus axillaris*			
115.		*Elseyornis melanops*			
116.		*Eolophus roseicapillus*			
117.		*Eopsaltria (Eopsaltria) griseogularis subsp. griseogularis*			
118.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
119.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
120.	24567	*Epthianura albifrons (White-fronted Chat)*			
121.	24814	*Eudyptes chrysocome subsp. moseleyi (Rockhopper Penguin)*			
122.	25746	*Eudyptula minor (Little Penguin)*			
123.	24818	*Eudyptula minor subsp. novaehollandiae (Little Penguin)*			
124.		*Falco (Falco) longipennis subsp. longipennis*			
125.		*Falco (Ieracidea) berigora subsp. berigora*			
126.		*Falco (Ieracidea) berigora subsp. occidentalis*			
127.	25621	*Falco berigora (Brown Falcon)*			
128.	25622	*Falco cenchroides (Australian Kestrel)*			
129.	25623	*Falco longipennis (Australian Hobby)*			
130.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
131.	25677	*Falcunculus frontatus (Crested Shrike-tit)*			
132.	24616	*Falcunculus frontatus subsp. leucogaster (Western Shrike-tit, Crested Shrike-tit)*			
133.	24617	*Falcunculus frontatus subsp. whitei (Northern Shrike-tit, Crested Shrike-tit)*		P4	
134.	25727	*Fulica atra (Eurasian Coot)*			
135.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
136.		*Gelochelidon nilotica*			
137.	25530	*Gerygone fusca (Western Gerygone)*			
138.	24271	*Gerygone fusca subsp. fusca (Western Gerygone)*			
139.		*Gliciphila melanops*			
140.		*Gliciphila melanops subsp. melanops*			
141.	24735	*Glossopsitta porphyrocephala (Purple-crowned Lorikeet)*			
142.	24443	*Grallina cyanoleuca (Magpie-lark)*			
143.	25627	*Haematopus fuliginosus (Sooty Oystercatcher)*			
144.	24485	*Haematopus fuliginosus subsp. fuliginosus (Sooty Oystercatcher)*			
145.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
146.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*		IA	
147.	24295	*Haliastur sphenurus (Whistling Kite)*			
148.	25734	*Himantopus himantopus (Black-winged Stilt)*			
149.	24491	*Hirundo neoxena (Welcome Swallow)*			
150.	24492	*Hirundo nigricans subsp. nigricans (Tree Martin)*			
151.		*Hydroprogne caspia*			
152.	24347	*Ixobrychus flavicollis subsp. australis (Australian Black Bittern)*		P1	
153.		*Larus (Larus) pacificus subsp. georgii*			
154.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
155.	25638	*Larus pacificus (Pacific Gull)*			
156.		*Lichmera (Lichmera) indistincta*			
157.	25661	*Lichmera indistincta (Brown Honeyeater)*			
158.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
159.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
160.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
161.		*Lophoictinia isura*			
162.		*Malurus (Leggeornis) elegans*			
163.		*Malurus (Malurus) splendens*			
164.		*Malurus (Malurus) splendens subsp. splendens*			
165.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
166.	25654	*Malurus splendens (Splendid Fairy-wren)*			
167.	25758	*Megalurus gramineus (Little Grassbird)*			
168.	24838	*Megalurus gramineus subsp. gramineus (Little Grassbird)*			
169.		*Megalurus gramineus subsp. thomasi*			
170.		*Melithreptus (Melithreptus) lunatus*			
171.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
172.		*Microcarbo melanoleucos*			
173.		*Microcarbo melanoleucos subsp. melanoleucos*			
174.	24654	*Microeca fascinans subsp. assimilis (Jacky Winter)*			
175.		*Morus serrator*			
176.		*Neophema (Neonanodes) elegans subsp. carteri*			
177.	24738	*Neophema elegans (Elegant Parrot)*			

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178.	24739	*Neophema petrophila (Rock Parrot)*			
179.	25748	*Ninox novaeseelandiae (Boobook Owl)*			
180.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
181.	24350	*Nycticorax caledonicus subsp. hilli (Rufous Night Heron)*			
182.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
183.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
184.		*Pachycephala (Pachycephala) pectoralis*			
185.	25679	*Pachycephala pectoralis (Golden Whistler)*			
186.	24623	*Pachycephala pectoralis subsp. fuliginosa (Golden Whistler)*			
187.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
188.	25707	*Pachyptila salvini (Salvin's Prion)*			
189.		*Pandion cristatus*			
190.		*Pardalotus (Pardalotus) punctatus*			
191.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
192.	24625	*Pardalotus punctatus subsp. punctatus (Spotted Pardalote)*			
193.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
194.	25682	*Pardalotus striatus (Striated Pardalote)*			
195.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
196.		*Petroica (Petroica) boodang*			
197.		*Petroica (Petroica) multicolor*			
198.	24660	*Petroica multicolor subsp. campbelli (Scarlet Robin)*			
199.	41348	*Pezoporus flaviventris (Western Ground Parrot)*		T	
200.	25697	*Phalacrocorax carbo (Great Cormorant)*			
201.	24664	*Phalacrocorax carbo subsp. novaehollandiae (Great Cormorant)*			
202.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
203.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
204.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
205.	25699	*Phalacrocorax varius (Pied Cormorant)*			
206.	24409	*Phaps chalcoptera (Common Bronzewing)*			
207.	25587	*Phaps elegans (Brush Bronzewing)*			
208.		*Phylidonyris (Meliornis) novaehollandiae*			
209.		*Phylidonyris (Meliornis) novaehollandiae subsp. longirostris*			
210.	24594	*Phylidonyris melanops (Tawny-crowned Honeyeater)*			
211.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
212.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
213.		*Platycercus (Violania) icterotis*			
214.		*Platycercus (Violania) icterotis subsp. icterotis*			
215.	25720	*Platycercus icterotis (Western Rosella)*			
216.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
217.	24747	*Platycercus spurius (Red-capped Parrot)*			
218.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
219.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
220.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
221.	25703	*Podargus strigoides (Tawny Frogmouth)*			
222.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
223.		*Podargus strigoides subsp. strigoides*			
224.	24680	*Podiceps cristatus subsp. australis (Great Crested Grebe)*			
225.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
226.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
227.		*Porphyrio (Porphyrio) porphyrio subsp. bellus*			
228.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
229.		*Porzana (Porzana) pusilla subsp. palustris*			
230.		*Porzana (Porzana) tabuensis*			
231.	24771	*Porzana tabuensis (Spotless Crake)*			
232.		*Pterodroma (Pterodroma) macroptera subsp. macroptera*			
233.	24703	*Pterodroma lessonii (White-headed Petrel)*			
234.		*Purpureicephalus spurius*			
235.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
236.		*Rhipidura (Rhipidura) albiscapa subsp. albiscapa*			
237.		*Rhipidura (Rhipidura) albiscapa subsp. preissi*			
238.		*Rhipidura (Rhipidura) fuliginosa*			
239.	24452	*Rhipidura fuliginosa subsp. preissi (Grey Fantail)*			
240.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
241.		*Sericornis (Sericornis) frontalis*			
242.		*Sericornis (Sericornis) frontalis subsp. maculatus*			
243.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
244.	24279	*Sericornis frontalis subsp. maculatus (White-browed Scrubwren)*			
245.	30948	*Smicrornis brevirostris (Weebill)*			
246.		*Stagonopleura (Zonaeginthus) oculata*			
247.	24645	*Stagonopleura oculata (Red-eared Firetail)*			

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248.	24523	*Sterna caspia (Caspian Tern)*		IA	
249.	25644	*Sterna nereis (Fairy Tern)*			
250.	24530	*Sterna nereis subsp. nereis (Fairy Tern)*		T	
251.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
252.	24554	*Stipiturus malachurus subsp. westernensis (Southern Emu-wren)*			
253.		*Strepera (Neostrepera) versicolor*			
254.		*Strepera (Neostrepera) versicolor subsp. plumbea*			
255.	25597	*Strepera versicolor (Grey Currawong)*			
256.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
257.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
258.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
259.	34007	*Thalassarche chlororhynchos (Atlantic Yellow-nosed Albatross)*		T	
260.		*Thalasseus bergii*			
261.		*Thinornis rubricollis*			
262.	24844	*Threskiornis molucca (Australian White Ibis)*			
263.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
264.		*Todiramphus (Todiramphus) sanctus*			
265.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
266.	24754	*Trichoglossus haematodus subsp. rubritorquis (Red-collared Lorikeet)*			
267.	24808	*Tringa nebularia (Common Greenshank)*		IA	
268.		*Turnix (Austroturnix) varius subsp. varius*			
269.	24849	*Turnix varia subsp. varia (Painted Button-quail)*			
270.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
271.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
272.	24856	*Zosterops lateralis subsp. gouldi (Grey-breasted White-eye)*			

Fish

273.		*? ?*			
274.		*Acanthaluteres brownii*			
275.		*Acanthistius serratus*			
276.		*Acanthopagrus butcheri*			
277.		*Achoerodus gouldii*			
278.		*Afurcagobius suppositus*			
279.		*Afurcagobius tamarensis*			
280.		*Aldrichetta forsteri*			
281.		*Aldrichetta sp.*			Y
282.		*Ammotretis rostratus*			
283.		*Aplodactylus westralis*			
284.		*Arius thalassinus*			
285.		*Arripis georgiana*			
286.		*Arripis georgianus*			
287.		*Atherinosoma elongata*			
288.		*Atherinosoma wallacei*			
289.		*Callogobius depressus*			
290.		*Callogobius mucosus*			
291.		*Cheilodactylus gibbosus*			
292.		*Cheilopogon pinnatibarbatus*			Y
293.		*Chelidonichthys kumu*			
294.		*Cnidoglanis macrocephalus*			
295.		*Conger wilsoni*			
296.		*Contusus brevicaudus*			
297.		*Cristiceps australis*			
298.		*Diaphus sp.*			
299.		*Engraulis australis*			
300.		*Enoplosus armatus*			
301.		*Favonigobius lateralis*			
302.		*Favonigobius sp.*			
303.	34028	*Galaxias occidentalis (Western Minnow)*			
304.		*Galaxias sp.*			
305.	34026	*Galaxiella munda (Western Mud Minnow)*		T	
306.	34030	*Geotria australis (Pouched Lamprey)*		P1	
307.		*Girella zebra*			
308.		*Gnathanodon speciosus*			
309.		*Gonorynchus greyi*			
310.		*Haletta semifasciata*			
311.		*Hemiramphus sp.*			
312.		*Hyporhamphus melanochir*			
313.		*Ichthyscopus barbatus*			
314.		*Iso rhothophilus*			
315.		*Kyphosus gladius MS*			
316.		*Labrid sp.*			

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					Y
317.		*Lepidoblennius marmoratus*			
318.		*Limnichthys fasciatus*			
319.		*Meuschenia galii*			
320.		*Mugil cephalus*			
321.	34033	*Nannatherina balstoni (Balston's Pygmy Perch)*		T	
322.		*Nannoperca vittata*			
323.		*Neopataecus waterhousii*			
324.		*Notolabrus parilus*			
325.		*Ophisurus serpens*			
326.		*Pagrus auratus*			
327.		*Parablennius tasmanianus*			
328.		*Paraplagusia sp.*			
329.		*Paraplesiops meleagris*			
330.		*Pelates octolineatus*			
331.		*Pelsartia humeralis*			
332.		*Platycephalus caeruleopunctatus*			
333.		*Platycephalus laevigatus*			
334.		*Platycephalus speculator*			
335.		*Pomatomus saltatrix*			
336.		*Pseudocaranx dentex*			
337.		*Pseudocaranx georgianus*			
338.		*Pseudogobius olorum*			
339.		*Pseudolabrus sp.*			
340.		*Pseudophycis breviuscula*			
341.		*Pseudorhombus jenynsii*			
342.		*Rhabdosargus sarba*			
343.		*Scomber australasicus*			
344.		*Sillaginodes punctata*			
345.		*Sillaginodes punctatus*			
346.		*Sillago bassensis*			
347.		*Sillago maculata*			
348.		*Siphonognathus beddomei*			
349.		*Threpterius maculosus*			
350.		*Torquigener pleurogramma*			
351.		*Vanacampus phillipi*			
Invertebrate					
352.		*Abantiades ocellatus*			
353.		*Agonocheila ruficollis*			
354.		*Akamptogonus novarae*			
355.		*Allodessus bistrigatus*			
356.		*Ambicodamus marae*			
357.		*Amblychilepas oblonga*			
358.		*Amblyopone australis*			
359.		*Amblyopone sp.*			
360.		*Amelora conia*			Y
361.		*Amitermes modicus*			
362.		*Amitermes obeuntis*			
363.		*Aname tepperi*			
364.		*Ancylis colonota*			Y
365.		*Anisops thienemanni*			
366.		*Annoselix dolosa*			
367.		*Anonychomyrma sp.*			
368.		*Antiporus femoralis*			
369.		*Araneus cyphoxis*			
370.		*Araneus senicaudatus*			
371.		*Archiargiolestes pusillissimus*			
372.		*Archiargiolestes pusillus*			
373.		*Archiargiolestes sp.*			
374.		*Argathona sp.*			Y
375.		*Arrhythmica semifusca*			
376.		*Artoria cingulipes*			
377.		*Artoria flavimana*			
378.		*Ascorhis occidua*			
379.		*Atelomastix ellenae*			
380.		*Austracantha minax*			
381.		*Australomimetus diabolicus*			
382.		*Austroagrion cyane*			
383.		*Austrolestes analis*			
384.		*Austrolestes io*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
385.		*Austrosynthemis cyanitincta*			
386.		*Badumna microps*			
387.		*Baiami tegenarioides*			
388.		*Barea zeugmatophora*			Y
389.		*Boccardia chilensis*			Y
390.		*Bothriembryon (Bothriembryon) fuscus*			
391.		*Bothriembryon (Bothriembryon) kingii*			
392.		*Bothriembryon (Bothriembryon) revectus*			
393.		*Bucolellus ornatus*			
394.		*Calymmachernes angulatus*			
395.		*Camponotus ceriseipes*			
396.		*Camponotus terebrans*			
397.		*Cantharidus sp.*			
398.		*Carposina sp.*			Y
399.		*Castiarina anchoralis*			
400.		*Castiarina pallidiventris*			
401.		*Castiarina placida*			
402.		*Castiarina sanguinolenta*			
403.		*Castulo doubledayi*			Y
404.		*Cerapus sp.*			
405.		*Cercophonius granulosus*			
406.		*Cercophonius sulcatus*			
407.	33939	*Cherax cainii (Marron)*			
408.		*Cherax quinquecarinatus*			
409.	33940	*Cherax tenuimanus (Margaret River Marron, Hairy Marron)*		T	
410.		*Clarana GROUP arrosta*			Y
411.		*Cominella (Josepha) tasmanica*			
412.		*Commonia hesychima*			
413.		*Conicochernes crassus*			
414.		*Conus cocceus*			
415.		*Conus dorreensis*			
416.		*Conus rutilus*			
417.		*Coptotermes acinaciformis subsp. raffrayi*			
418.		*Cormocephalus hartmeyeri*			
419.		*Cormocephalus michaelseni*			
420.		*Coscinasterias calamaria*			
421.		*Crepidomenus occidualis*			
422.		*Cyclosa trilobata*			
423.	43347	*Cynotelopus notabilis (WA Pill Millipede)*		T	
424.		*Danaus petilia*			
425.		*Diaea socialis*			
426.		*Dicathais orbita*			
427.		*Dicherotropis damelii*			
428.		*Diphucrania aberrans*			
429.		*Doleromyrma sp.*			
430.		*Dolichoderus rufotibialis*			
431.		*Emertonella maga*			
432.		*Epicoma melanosticta*			
433.		*Eulechria homopela*			Y
434.		*Eulechria sp.*			
435.		*Eumarcia fumigata*			Y
436.		*Euomus stephensii*			
437.		*Euphyia phaulophanes*			Y
438.		*Euphyia propinqua*			Y
439.		*Euplica sp.*			
440.		*Exosphaeroma sp.*			
441.		*Fluviolanatus subtortus*			
442.		*Fraus furcata*			Y
443.		*Fraus mediaspina*			Y
444.		*Fraus serrata*			Y
445.		*Geitoneura minyas*			
446.		*Gonocephalum alternatum*			Y
447.		*Haliotis laevigata*			
448.		*Hecatesia thyridion*			
449.		*Hednota ancylosticha*			
450.		*Hednota crypsichroa*			
451.		*Hednota pedionoma*			
452.		*Helea echidna*			
453.		*Heliocidaris erythrogramma*			
454.		*Henicops dentatus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
455.		*Hesperotermes infrequens*			
456.		*Heteronympha merope subsp. duboulayi*			
457.		*Heterotermes platycephalus*			
458.		*Holocola zopherana*			Y
459.		*Homalictus sp.*			
460.		*Hyborrhinus furcatus*			
461.		*Hyperlopha aridela*			Y
462.		*Hypochrysops ignitus subsp. olliffi*			
463.		*Intruda signata*			
464.		*Iridomyrmex bicknelli*			
465.		*Iridomyrmex calvus*			
466.		*Iridomyrmex discors*			
467.		*Iridomyrmex dromus*			
468.		*Iridomyrmex innocens*			
469.		*Iridomyrmex purpureus*			
470.		*Iridomyrmex turbineus*			
471.		*Isopeda leishmanni*			
472.		*Ixodes australiensis*			
473.		*Kalotermes aemulus*			
474.		*Lagynochthonius australicus*			
475.		*Lampona brevipes*			
476.		*Lampona cylindrata*			
477.		*Lasioglossum (Chilalictus) sculpturatum*			
478.		*Leiopyrga octona subsp. octona*			
479.		*Leptochiton (Leptochiton) matthewsianus*			
480.		*Leptopius sp.*			
481.		*Limnoperna sp.*			
482.		*Linepithema humile*			
483.		*Machimia holochra*			Y
484.		*Menneus wa*			
485.		*Miniargiolestes minimus*			
486.		*Missulena occatoria*			
487.		*Mitrella (Zemitrella) menkeana*			
488.		*Mituliodon tarantulinus*			
489.		*Moaciria sphenomorphi*			Y
490.		*Monomorium rubriceps*			
491.		*Monomorium sordidum*			
492.		*Myrmecia analis*			
493.		*Myrmecia chasei*			
494.		*Myrmecia clarki*			
495.		*Myrmecia desertorum*			
496.		*Myrmecia infima*			
497.		*Myrmecia mandibularis*			
498.		*Myrmecia michaelseni*			
499.		*Myrmecia regularis*			
500.		*Myrmecia sp.*			
501.		*Myrmecia tepperi*			
502.		*Myrmecia testaceipes*			
503.		*Myrmecia vindex*			
504.		*Myrmecorhynchus emeryi*			
505.		*Nebothriomyrmex majeri*			
506.		*Neolucia agricola subsp. occidens*			
507.		*Neosparassus diana*			
508.		*Nola lechriotropa*			Y
509.		*Notoncus hickmani*			
510.		*Notoplax subviridis*			
511.		*Nyctemera amicus*			
512.		*Occasitermes occasus*			
513.		*Oecobius navus*			
514.		*Ogyris idmo*			
515.		*Olganereis edmondsi*			
516.		*Onthophagus haagi*			
517.		*Oratemnus curtus*			
518.		*Oxycanus occidentalis*			Y
519.		*Oxycanus poeticus*			Y
520.		*Oxycanus promiscuus*			Y
521.		*Pagurus sinuatus*			Y
522.		*Palimmeces vernilis*			Y
523.		*Papyrius sp.*			
524.		*Paracassidina sp.*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
525.		*Paracymus pygmaeus*			
526.		*Patella (scutellastra)*			
527.		*Patelloida alticostata*			
528.		*Pelororhinus crassus*			
529.		*Petricia vernicina*			
530.		*Phloioletes spanioleuca*			Y
531.		*Pholcus phalangioides*			
532.		*Phryctora GROUP phryctora*			Y
533.		*Phryganoporus candidus*			
534.		*Phyllacanthus irregularis*			
535.		*Platylytron amplipenne*			
536.		*Poecilasthena ischnophrica*			Y
537.		*Poecilasthena pisicolor*			Y
538.		*Poecilasthena scoliota*			Y
539.		*Protogarypinus giganteus*			
540.		*Pterolocera sp.*			Y
541.		*Pyrgoptila zalotypa*			Y
542.		*Rhinoecetes sp.*			
543.		*Rhyssoplax tricostalis*			
544.		*Sabia australis*			
545.		*Samichus decoratus*			
546.		*Saprinus (Saprinus) pseudocyaneus*			
547.		*Saprinus sp.*			
548.		*Scoliacma pactolias*			Y
549.		*Servaea incana*			
550.		*Servaea melaina*			
551.		*Servaea sp.*			
552.		*Simplisetia aequisetis*			
553.		*Siphonotus flavomarginatus*			
554.		*Sphaeromatidae sp.*			
555.		*Spinicrus minimus*			
556.		*Steriphus curvisetosus*			Y
557.		*Sternopriscus browni*			
558.		*Storosa tetrica*			
559.		*Strepsicrates ejectana*			
560.		*Succinea (succinea)*			
561.		*Synemon directa*			
562.		*Synemon sophia*			
563.		*Syneora mundifera*			
564.		*Synothele rastelloides*			
565.		*Tanystola isabella*			
566.		*Tatea rufilabris*			
567.		*Technitis GROUP procapna*			Y
568.		*Temnosewellia chaeropsis*			Y
569.		*Tetragnatha demissa*			
570.		*Transorchestia marlo*			Y
571.		*Uraba lugens*			
572.		*Uracanthus regalis*			Y
573.		*Urodacus novaehollandiae*			
574.		*Venator immansueta*			
575.		*Venatrix pullastra*			
576.		*Xanthagrion erythroneurum*			
577.		*Xanthorhoe emmelopis*			Y
578.		*Xylochomitermes occidualis*			
579.		*Xylopsocus rubidus*			

Mammal

580.	24039	*Canis lupus subsp. dingo (Dingo)*	Y		
581.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
582.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
583.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
584.	24215	*Hydromys chrysogaster (Water-rat)*		P4	
585.	25478	*Isoodon obesulus (Southern Brown Bandicoot)*		P5	
586.	24153	*Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)*		P5	
587.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
588.	24133	*Macropus irma (Western Brush Wallaby)*		P4	
589.	24223	*Mus musculus (House Mouse)*	Y		
590.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
591.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
592.	24098	*Phascogale calura (Red-tailed Phascogale, Kenngoor)*		T	
593.	25508	*Phascogale tapoatafa (Brush-tailed Phascogale)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
594.	24099	*Phascogale tapoatafa subsp. tapoatafa (Southern Brush-tailed Phascogale, Wambenger)*		T	
595.	24243	*Rattus fuscipes (Western Bush Rat)*			
596.	24245	*Rattus rattus (Black Rat)*	Y		
597.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
598.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
599.	24082	*Tasmacetus shepherdi (Shepherd's Beaked Whale)*			
600.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
601.	24206	*Vespadelus regulus (Southern Forest Bat)*			
Reptile					
602.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
603.	25335	*Caretta caretta (Loggerhead Turtle)*		T	
604.	24980	*Christinus marmoratus (Marbled Gecko)*			
605.	25031	*Ctenotus catenifer*			
606.	25049	*Ctenotus labillardieri*			
607.	25251	*Echiopsis curta (Bardick)*			
608.	25096	*Egernia kingii (King's Skink)*			
609.	25100	*Egernia napoleonis*			
610.	25250	*Elapognathus coronatus (Crowned Snake)*			
611.	25290	*Elapognathus minor (Short-nosed Snake)*		P2	
612.	30919	*Hemiergis gracilipes*			
613.	25475	*Hemiergis peronii*			
614.	25117	*Hemiergis peronii subsp. peronii*			
615.	43384	*Hydrophis platurus (Yellow-bellied Seasnake)*			
616.	25154	*Lerista microtis subsp. microtis*			
617.	25005	*Lialis burtonis*			
618.	41416	*Liopholis pulchra subsp. pulchra (South-western Rock Skink, Spectacled Rock Skink)*			
619.	42413	*Lissolepis luctuosa (Western Swamp Skink)*			
620.	25252	*Notechis scutatus (Tiger Snake)*			
621.	25253	*Parasuta gouldii*			
622.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
623.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
624.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
625.	30818	*Rhinoplocephalus bicolor (Square-nosed Snake)*			
626.	25225	*Varanus rosenbergi (Heath Monitor)*			

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

Quadrat data

Flora likelihood of occurrence assessment guidelines

Flora likelihood of occurrence assessment

Flora species list

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Agavaceae	*Agave*	*americana*	*			
Alliaceae	*Agapanthus*	*praecox*	*			
Alliaceae	*Allium*	*triquetrum*	*			
Amaryllidaceae	*Leucojum*	*aestivum*	*		x	
Amaryllidaceae	*Narcissus*	sp. (insufficient material)	*		x	
Anarthriaceae	*Anarthria*	*gracilis*				x
Anarthriaceae	*Anarthria*	*prolifera*		x	x	x
Anarthriaceae	*Anarthria*	*scabra*		x	x	x
Anarthriaceae	*Lyginia*	*barbata*				x
Anarthriaceae	*Lyginia*	*imberbis*				x
Apiaceae	*Platysace*	sp. (insufficient material)				x
Apiaceae	*Xanthosia*	*huegelii*				
Apiaceae	*Xanthosia*	*rotundifolia*		x	x	x
Apiaceae	*Xanthosia*	*tasmanica*				x
Apocynaceae	*Vinca*	*major*	*		x	
Araceae	*Zantedeschia*	*aethiopica*	*DP		x	
Araliaceae	*Hedera*	*helix*	*		x	
Araliaceae	*Trachymene*	sp. (insufficient material)				
Asparagaceae	*Asparagus*	*asparagoides*	*DP/ WoNS		x	x
Asparagaceae	*Asparagus*	*scandens*	*WoNS			
Asparagaceae	*Chamaescilla*	*corymbosa*				x
Asparagaceae	*Laxmannia*	*jamesii*	P4			x
Asparagaceae	*Lomandra*	*micrantha* subsp. *micrantha*				
Asparagaceae	*Lomandra*	*nigricans*			x	x
Asparagaceae	*Lomandra*	*pauciflora*				x
Asparagaceae	*Lomandra*	*purpurea*				x
Asparagaceae	*Lomandra*	*sericea*		x		x
Asparagaceae	*Lomandra*	*sonderi*				x
Asparagaceae	*Lomandra*	sp. (insufficient material)			x	
Asparagaceae	*Thysanotus*	*thyrsoideus*		x		
Asteraceae	*Arctotheca*	*calendula*	*			
Asteraceae	*Cirsium*	*vulgare*	*		x	x
Asteraceae	*Conyza*	*canadensis*	*			x
Asteraceae	*Conyza*	sp. (insufficient material)	*			x
Asteraceae	*Cotula*	*turbinata*	*			x
Asteraceae	*Dimorphotheca*	*ecklonis*	*			
Asteraceae	*Helichrysum*	*lutealbum*	*			x
Asteraceae	*Hypochaeris*	*glabra*	*	x		x

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*			x
Asteraceae	*Sonchus*	*asper*	*			
Asteraceae	*Sonchus*	*oleraceus*	*		x	x
Asteraceae	*Vellerophyton*	*dealbatum*	*			x
Bignoniaceae	*Pandorea*	*pandorans*	* ?garden escape			
Boraginaceae	*Myosotis*	*sylvatica*	*			
Brassicaceae	*Brassica*	*tournefortii*	*			x
Brassicaceae	*Cardamine*	*hirsuta*	*			x
Brassicaceae	*Raphanus*	*raphanistrum*	*			x
Bromeliaceae	*sp.*		* garden escape			
Caryophyllaceae	*Cerastium*	*glomeratum*	*			x
Caryophyllaceae	*Silene*	*gallica var. quinquevulnera*	*			x
Casuarinaceae	*Allocasuarina*	*decussata*			x	
Casuarinaceae	*Allocasuarina*	*fraseriana*		x	x	
Celastraceae	*Stackhousia*	*monogyna*		x		
Centrolepidaceae	*Aphelia*	*cyperoides*				
Centrolepidaceae	*Centrolepis*	*?pilosa*				x
Centrolepidaceae	*Centrolepis*	*aristata*				x
Colchicaceae	*Burchardia*	*congesta*		x		x
Crassulaceae	*Crassula*	*closiana*				x
Cyperaceae	*?Tetraria*	*octandra*			x	x
Cyperaceae	*Baumea*	*articulata*				x
Cyperaceae	*Baumea*	*juncea*				
Cyperaceae	*Baumea*	*rubignosa*				
Cyperaceae	*Cyathochaeta*	*avenacea*				x
Cyperaceae	*Cyperus*	*congestus*			x	
Cyperaceae	*Evandra*	*aristata*		x	x	
Cyperaceae	*Ficinia*	*nodosa*				x
Cyperaceae	*Hypolaena*	*exsulca*			x	
Cyperaceae	*Isolepis*	sp. (insufficient material)				x
Cyperaceae	*Lepidosperma*	aff. *squamatum*		x	x	
Cyperaceae	*Lepidosperma*	*effusum*		x	x	
Cyperaceae	*Lepidosperma*	*gracile*		x		
Cyperaceae	*Lepidosperma*	*leptostachyum*				x
Cyperaceae	*Lepidosperma*	*pubisquameum*				
Cyperaceae	*Mesomelaena*	*tetragona*		x		
Cyperaceae	*Schoenus*	*efoliatus*			x	
Cyperaceae	*Schoenus*	sp. (insufficient material)			x	
Cyperaceae	*Schoenus*	*sublateralis*				x

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Cyperaceae	*Tetraria*	*capillaris*	not previously recorded in area	x		
Dasypogonaceae	*Dasypogon*	*bromeliifolius*		x		x
Dasypogonaceae	*Kingia*	*australis*				x
Dennstaedtiaceae	*Histiopteris*	*incisa*	*			
Dennstaedtiaceae	*Pteridium*	*esculentum*		x		x
Dilleniaceae	*Hibbertia*	*amplexicaulis*			x	
Dilleniaceae	*Hibbertia*	*commutata*			x	x
Dilleniaceae	*Hibbertia*	*cuneiformis*		x		
Dilleniaceae	*Hibbertia*	*furfuracea*			x	
Droseraceae	*Drosera*	?*erythrogyne* (not flowering)				x
Droseraceae	*Drosera*	*erythrorhiza*			x	x
Droseraceae	*Drosera*	*glanduligera*				x
Droseraceae	*Drosera*	*macrantha* subsp. *macrantha*		x		
Droseraceae	*Drosera*	*pallida*				x
Droseraceae	*Drosera*	*pulchella*				x
Droseraceae	*Drosera*	sp. (insufficient material)			x	x
Elaeocarpaceae	*Tetratheca*	*affinis*				
Elaeocarpaceae	*Tetratheca*	*hispidissima*		x setigera	x	
Elaeocarpaceae	*Tetratheca*	*setigera*				x
Elaeocarpaceae	*Tremandra*	*diffusa*			x	
Ericaceae	*Andersonia*	*caerulea*		x	x	
Ericaceae	*Astroloma*	sp. 1 (insufficient material)			x	
Ericaceae	*Astroloma*	sp. 2 (insufficient material)			x	
Ericaceae	*Astroloma*	sp. 3 (insufficient material)			x	
Ericaceae	*Dielsiodoxa*	lycopodiodes				x
Ericaceae	*Leucopogon*	*?propinquus*			x	
Ericaceae	*Leucopogon*	*australis*				x
Ericaceae	*Leucopogon*	*capitellatus*		x		
Ericaceae	*Leucopogon*	*glabellus*				x
Ericaceae	*Leucopogon*	*obovatus subsp. revolutus*				
Ericaceae	*Leucopogon*	*propinquus*				
Ericaceae	*Leucopogon*	sp. Southern Forests (B. G. Hammersley 1000)				x
Ericaceae	*Leucopogon*	*verticillatus*				x
Ericaceae	*Sphenotoma*	?*gracilis* (not flowering)				x

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Euphorbiaceae	*Euphorbia*	*peplus*	*			x
Fabaceae	*Acacia*	?*elata* (not flowering)	*			
Fabaceae	*Acacia*	*applanata*			x	
Fabaceae	*Acacia*	*browniana* var. *browniana*				x
Fabaceae	*Acacia*	*cyclops*				x
Fabaceae	*Acacia*	*drummondii* subsp. *candolleana*	not previously recorded in area	x		
Fabaceae	*Acacia*	*extensa*				
Fabaceae	*Acacia*	*hastulata*			x	
Fabaceae	*Acacia*	*iteaphylla*	*			
Fabaceae	*Acacia*	*longifolia*	*			
Fabaceae	*Acacia*	*luteola*			x	x
Fabaceae	*Acacia*	*myrtifolia*		x	x	x
Fabaceae	*Acacia*	*pentadenia*			x	
Fabaceae	*Acacia*	*podalyriifolia*	*		x	
Fabaceae	*Acacia*	*urophylla*			x	
Fabaceae	*Acacia*	*varia* var. *varia*			x	x
Fabaceae	*Bossiaea*	*?praetermissa*				x
Fabaceae	*Bossiaea*	*linophylla*		x	x	
Fabaceae	*Callistachys*	*lanceolata*				x
Fabaceae	*Chorizema*	*reticulatum*				
Fabaceae	*Chorizema*	*retrorsum*			x	
Fabaceae	*Chorizema*	*rhombeum*			x	
Fabaceae	*Daviesia*	*flexuosa*				x
Fabaceae	*Daviesia*	*inflata*				
Fabaceae	*Genista*	*monspessulana*	* WONS			
Fabaceae	*Gompholobium*	*capitatum*				x
Fabaceae	*Gompholobium*	*confertum*			x	
Fabaceae	*Gompholobium*	*knightianum*				x
Fabaceae	*Gompholobium*	*ovatum*			x	x
Fabaceae	*Gompholobium*	*polymorphum*				x
Fabaceae	*Gompholobium*	*scabrum*				x
Fabaceae	*Gompholobium*	sp. (insufficient material)			x	
Fabaceae	*Gompholobium*	*venustum*				x
Fabaceae	*Gompholobium*	*villosum*				x
Fabaceae	*?Gompholobium*	*polymorphum*			x	
Fabaceae	*?Gompholobium*	*knightianum*			x	
Fabaceae	*Hardenbergia*	*comptoniana*				
Fabaceae	*Hovea*	*chorizemifolia*		x	x	x

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Fabaceae	*Hovea*	*elliptica*			x	
Fabaceae	*Hovea*	*trisperma*			x	x
Fabaceae	*Jacksonia*	*horrida*			x	
Fabaceae	*Jacksonia*	*spinosa*				x
Fabaceae	*Kennedia*	*carinata*				
Fabaceae	*Kennedia*	*coccinea* subsp. *coccinea*				x
Fabaceae	*Lotus*	sp. (insufficient material)	*		x	
Fabaceae	*Lotus*	*suaveolens*	*			x
Fabaceae	*Medicago*	*polymorpha*	*			x
Fabaceae	*Ornithopus*	*compressus*	*			
Fabaceae	*Phyllota*	*barbata*				x
Fabaceae	*Pultenaea*	*reticulata*				x
Fabaceae	*Sphaerolobium*	*alatum*				x
Fabaceae	*Sphaerolobium*	*grandiflorum*		X		x
Fabaceae	*Sphaerolobium*	sp. 1 (insufficient material)				x
Fabaceae	*Sphaerolobium*	sp. 2 (insufficient material)				x
Gentianaceae	*Centaurium*	*erythraea*	*			x
Gentianaceae	*Cicendia*	*filiformis*	*			x
Geraniaceae	*Pelargonium*	x *domesticum*	*			
Goodeniaceae	*Dampiera*	hederacea			x	
Goodeniaceae	*Dampiera*	leptoclada			x	
Goodeniaceae	*Dampiera*	linearis		x		x
Goodeniaceae	*Scaevola*	calliptera		x		
Goodeniaceae	*Scaevola*	striata			x	x
Haemodoraceae	*Anigozanthos*	flavidus		x		x
Haemodoraceae	*Anigozanthos*	sp. (insufficient material)			x	
Haemodoraceae	*Conostylis*	*setigera* subsp. *setigera*		x	x	x
Haemodoraceae	*Haemodorum*	*?laxum*				
Haemodoraceae	*Haemodorum*	*spicatum*				x
Haemodoraceae	*Phlebocarya*	*ciliata*			x	
Hemerocallidaceae	*Agrostocrinum*	*hirsutum*				
Hemerocallidaceae	*Johnsonia*	*lupulina*		x	x	
Iridaceae	*Patersonia*	*occidentalis*		x		x
Iridaceae	*Patersonia*	*umbrosa* var. *umbrosa*			x	x
Iridaceae	*Romulea*	*rosea*	*			x
Iridaceae	*Watsonia*	*meriana var. bulbillifera*	*			x
Juncaceae	*Juncus*	*articulatus*	*			x
Juncaceae	*Juncus*	*microcephalus*	*			

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Juncaceae	*Juncus*	*pallidus*				
Lamiaceae	*Mentha*	*pulegium*	*			
Lamiaceae	*Stachys*	*arvensis*	*			
Lamiaceae	*Westringia*	*dampieri*				
Lauraceae	*Cassytha*	sp. (insufficient material)			x	x
Lindsaeaceae	*Lindsaea*	*linearis*			x	x
Loganiaceae	*Orianthera*	*serpyllifolia*			x	x
Loranthaceae	*Nuytsia*	*floribunda*		x		x
Myrtaceae	*?Babingtonia*	sp. (insufficient material)				x
Myrtaceae	*?Taxandria*	*parviceps*			x	
Myrtaceae	*Agonis*	*flexuosa* var. *flexuosa*				x
Myrtaceae	*Agonis*	*flexuosa* var. *latifolia*				x
Myrtaceae	*Agonis*	*theiformis*		x	x	x
Myrtaceae	*Astartea*	sp. 1 (insufficient material)			x	
Myrtaceae	*Astartea*	sp. 2 (insufficient material)			x	
Myrtaceae	*Beaufortia*	*decussata*		x	x	x
Myrtaceae	*Beaufortia*	*sparsa*			x	
Myrtaceae	*Callistemon*	*glaucus*				x
Myrtaceae	*Calothamnus*	*schaueri*				x
Myrtaceae	*Conothamnus*	*neglectus*				x
Myrtaceae	*Corymbia*	*calophylla*		x		x
Myrtaceae	*Darwinia*	*citriodora*		x		x
Myrtaceae	*Darwinia*	*oederoides*				x
Myrtaceae	*Darwinia*	*vestita*		x		x
Myrtaceae	*Eucalyptus*	*?cornuta*			x	
Myrtaceae	*Eucalyptus*	*?patens*			x	
Myrtaceae	*Eucalyptus*	*diversicolor*				
Myrtaceae	*Eucalyptus*	*marginata*		x	x	x
Myrtaceae	*Eucalyptus*	*megacarpa*				
Myrtaceae	*Eucalyptus*	*staeri*				x
Myrtaceae	*Homalospermum*	*firmum*			x	
Myrtaceae	*Hypocalymma*	*?strictum*			x	
Myrtaceae	*Hypocalymma*	*cordifolium*			x	
Myrtaceae	*Hypocalymma*	sp. (insufficient material)				x
Myrtaceae	*Kunzea*	*ericifolia* subsp. *ericifolia*			x	x
Myrtaceae	*Kunzea*	*recurva*		x		
Myrtaceae	*Melaleuca*	*?thymoides*			x	
Myrtaceae	*Melaleuca*	*lanceolata*				

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Myrtaceae	*Melaleuca*	*preissiana*			x	x
Myrtaceae	*Melaleuca*	*thymoides*		x		
Myrtaceae	*Taxandria*	*?juniperina*			x	
Myrtaceae	*Taxandria*	*?linearifolia*				
Myrtaceae	*Taxandria*	*fragrans*				x
Myrtaceae	*Taxandria*	*linearifolia*				
Myrtaceae	*Taxandria*	*parviceps*				x
Orchidaceae	*Caladenia*	sp. (not flowering)				x
Orchidaceae	*Diuris*	sp. (insufficient material)		x		
Orchidaceae	*Drakaea*	*glyptodon*				x
Orchidaceae	*Drakaea*	*thynniphila*				x
Orchidaceae	*Eriochilus*	sp.				
Orchidaceae	*Prasophyllum*	sp. (insufficient material. Not flowering)				x
Orchidaceae	*Pterostylis*	*pyramidalis*			x	x
Orchidaceae	*Pterostylis*	*recurva*				x
Orchidaceae	*Pterostylis*	*vittata*			x	x
Orobanchaceae	*Orobanche*	*minor*	*			x
Oxalidaceae	*Oxalis*	*incarnata*	*			x
Oxalidaceae	*Oxalis*	*pes-caprae*	*			x
Oxalidaceae	*Oxalis*	*purpurea*	*			x
Pittosporaceae	*Billardiera*	*fusiformis*		x		x
Pittosporaceae	*Billardiera*	*heterophylla*				x
Pittosporaceae	*Billardiera*	*laxiflora*			x	x
Pittosporaceae	*Pittosporum*	*undulatum*	*			
Plantaginaceae	*Plantago*	*lanceolata*	*			x
Poaceae	*Amphipogon*	*setaceus*		X	x	x
Poaceae	*Anthoxanthum*	*odoratum*	*	x		x
Poaceae	*Briza*	*maxima*	*			x
Poaceae	*Briza*	*minor*	*			x
Poaceae	*Cenchrus*	*clandestinus*	*			x
Poaceae	*Ehrharta*	*calycina*	*			
Poaceae	*Ehrharta*	*longifolia*	*			x
Poaceae	*Eragrostis*	*curvula*	*			x
Poaceae	*Holcus*	*lanatus*	*	x	x	x
Poaceae	*Phalaris*	*sp. (insufficient material)*	*			
Poaceae	*Poa*	*annua*	*			x
Poaceae	*sp. (insufficient material)*				x	
Poaceae	*Sporobolus*	*africanus*	*			x
Poaceae	*Stenotaphrum*	*secundatum*	*			
Poaceae	*Tetrarrhena*	*laevis*				

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Podocarpaceae	*Podocarpus*	*drouynianus*		x	x	x
Polygalaceae	*Comesperma*	*confertum*		x		
Polygalaceae	*Comesperma*	*virgatum*				x
Polygalaceae	*Polygala*	*myrtifolia*	*		x	
Polygonaceae	*Acetosella*	*vulgaris*	*			
Polygonaceae	*Rumex*	sp. (insufficient material)	*			
Primulaceae	*Lysimachia*	*arvensis*	*			
Proteaceae	*Adenanthos*	*cuneatus*				x
Proteaceae	*Adenanthos*	*obovatus*				x
Proteaceae	*Banksia*	*attenuata*			x	x
Proteaceae	*Banksia*	*grandis*		x		x
Proteaceae	*Banksia*	*ilicifolia*		x	x	x
Proteaceae	*Banksia*	*littoralis*				
Proteaceae	*Banksia*	*occidentalis*			x	
Proteaceae	*Banksia*	*quercifolia*				x
Proteaceae	*Banksia*	*seminuda*				
Proteaceae	*Conospermum*	*caeruleum* subsp. *caeruleum*			x	x
Proteaceae	*Grevillea*	*occidentalis*		x		x
Proteaceae	*Grevillea*	*pulchella*				x
Proteaceae	*Grevillea*	*quercifolia*				
Proteaceae	*Grevillea*	*trifida*				x
Proteaceae	*Hakea*	*amplexicaulis*				x
Proteaceae	*Hakea*	*ceratophylla*			x	x
Proteaceae	*Hakea*	*florida*				x
Proteaceae	*Hakea*	*linearis*				
Proteaceae	*Hakea*	*ruscifolia*				x
Proteaceae	*Isopogon*	*longifolius*				x
Proteaceae	*Persoonia*	*elliptica*		x		x
Proteaceae	*Persoonia*	*longifolia*		x	x	x
Proteaceae	*Petrophile*	*acicularis*			x	
Proteaceae	*Petrophile*	*diversifolia*			x	x
Proteaceae	*Stirlingia*	*tenuifolia*				x
Pteridaceae	*Cheilanthes*	*sieberi*	not previously recorded in area	x		
Pteridaceae	*Cheilanthes*	sp. (insufficient material)				x
Ranunculaceae	*Clematis*	*pubescens*			x	
Restionaceae	*Chordifex*	*laxus*				x
Restionaceae	*Democladus*	*fasciculatus*		x	x	
Restionaceae	*Desmocladus*	*fasciculatus*			x	x
Restionaceae	*Desmocladus*	*flexuosus*				
Restionaceae	*Empodisma*	*gracillimum*				

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Restionaceae	*Hypolaena*	*grandiuscula*				x
Restionaceae	*Leptocarpus*	*?thysananthus* (insufficient material)				
Restionaceae	*Leptocarpus*	*laxus*				x
Restionaceae	*Leptocarpus*	*scariosus*				
Restionaceae	*Leptocarpus*	*coangustatus*				
Restionaceae	*Leptocarpus*	*tenax*				x
Restionaceae	*Tremulina*	*tremula*				x
Rhamnaceae	*Trymalium*	*?odoratissimum* subsp. *trifidum*			x	
Rhamnaceae	*Trymalium*	*?venustum*			*	
Rhamnaceae	*Trymalium*	*odoratissimum* subsp. *trifidum*		x	x	
Rosaceae	*Cotoneaster*	*glaucophyllus*	*			
Rosaceae	*Rubus*	*anglocandians*	* DP/WONS			
Rubiaceae	*Galium*	sp. (insufficient material)	*			
Rubiaceae	*Opercularia*	*echinocephala*	not previously recorded in area	x		
Rubiaceae	*Opercularia*	*hispidula*			x	x
Rubiaceae	*Opercularia*	*vaginata*		x		
Rubiaceae	*Opercularia*	*volubilis*			x	
Rutaceae	*Boronia*	*crenulata* var. *crenulata*				
Rutaceae	*Boronia*	*spathulata*		x		x
Rutaceae	*Chorilaena*	*quercifolia*				
Rutaceae	*Philotheca*	*spicata*	not previously recorded in area	x		
Santalaceae	*Leptomeria*	*preissiana*	not previously recorded in area	x		
Santalaceae	*Leptomeria*	*squarrulosa*				x
Solanaceae	*Solanum*	*nigrum*	*			
Stylidiaceae	*Stylidium*	*?amoenum* (insufficient material)			x	
Stylidiaceae	*Stylidium*	*?nymphaeum* (insufficient material)				x
Stylidiaceae	*Stylidium*	*nymphaeum*		x		
Stylidiaceae	*Stylidium*	*piliferum*		x		x
Stylidiaceae	*Stylidium*	*repens*		x		x
Stylidiaceae	*Stylidium*	*spathulatum*				x

Family	Genus	Species	Status	Aecom Flora List	Winter Flora List	Spring Flora List
Thymelaeaceae	*Pimelea*	*longiflora* subsp. *longiflora*		x		x
Thymelaeaceae	*Pimelea*	sp. 1 (insufficient material)				
Thymelaeaceae	*Pimelea*	sp. 2 (insufficient material)				
Thymelaeaceae	*Pimelea*	*suaveolens*		x		
Tropaeolaceae	*Tropaeolum*	*majus*	*			
Violaceae	*Viola*	*odorata*	*		x	
Xanthorrhoeaceae	*Xanthorrhoea*	*gracilis*				x
Xanthorrhoeaceae	*Xanthorrhoea*	*preissii*		x		x
Xyridaceae	*Xyris*	*lanata*				x
Xyridaceae	*Xyris*	sp. (insufficient material)				x
Zamiaceae	*Macrozamia*	*riedlei*				

Refer to Appendix B for conservation codes; * = introduced flora; DP = Declared Pest; WONS = Weed of National Significance

Quadrat data

Site ID:	Q01	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10 m
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA 50	534824 mE	6133328 mN
Landform and slope:	Drainage depression, gentle slope		
Drainage:	Poor drainage, seasonal wet		
Soil colour & type:	Black sandy loam		
Vegetation condition:	2		
Fire age & intensity:	No damage		
Disturbances:	Minor tracks		
Surface component:			
Loose soil (%):	100%		
Leaf litter:	Moderate		
Wood litter:	Moderate		

Species List:

Family	Taxon	Status	Cover (%)	Height (m)	Recorded Winter 2016	Recorded Spring 2016
Anarthriaceae	*Anarthria prolifera*		<10	0.8	x	x
Myrtaceae	*Beaufortia sparsa*		<10	1	x	x
Restionaceae	*Leptocarpus tenax*		<10	1.3	x	
Droseraceae	*Drosera pulchella*		<2N	0.01		x
Asteraceae	*Hypochaeris sp.*	*	<2N	0.01		x
Cyperaceae	*Schoenus efoliatus*		<2N	0.5	x	x
Xyridaceae	*Xyris lanata*		<2N	0.8		x
Fabaceae	*Acacia hastulata*		<2T	0.8	x	x
Fabaceae	*Acacia myrtifolia*		<2T	0.8		x
Proteaceae	*Adenanthos obovatus*		<2T	0.9		x
Poaceae	*Amphipogon laguroides*		<2T	0.2	x	x
Ericaceae	*Andersonia caerulea*		<2T	0.2	x	x
Myrtaceae	*Astartea sp.*		<2T	1.2	x	x

Family	Taxon	Status	Cover (%)	Height (m)	Recorded Winter 2016	Recorded Spring 2016
Goodeniaceae	*Dampiera leptoclada*		<2T	CREEPER	x	x
Dasypogonaceae	*Dasypogon bromeliifolius*		<2T	0.6		x
Myrtaceae	*Eucalyptus marginata*		<2T	0.5		x
Fabaceae	*Hovea elliptica*		<2T	0.3	x	x
Myrtaceae	*Hypocalymma ericifolium*		<2T	0.7		x
Cyperaceae	*Hypolaena exsulca*		<2T	0.3	x	x
Hemerocallidaceae	*Johnsonia ?lupulina*		<2T	0.4	x	x
Ericaceae	*Leucopogon glabellus*		<2T	0.2	x	x
Ericaceae	*Leucopogon sp.*		<2T	0.3		x
Fabaceae	*Lotus sp.*	*	<2T	0.01		x
Goodeniaceae	*Scaevola striata*		<2T	0.2	x	x
Poaceae	*Poaceae sp.*		<2T	0.1		
Ericaceae	*Sphenotoma ?gracilis*		<2T	0.7		x
Stylidiaceae	*Stylidium ?nymphaeum*		<2T	0.5		x
Stylidiaceae	*Stylidium spathulatum*		<2T	0.01		
Myrtaceae	*Taxandria ?fragrans*		<2T	0.8	x	x
Myrtaceae	*Taxandria fragrans*		<2T	0.8	x	x
Anarthriaceae	*Anarthria scabra*		30-10	0.8	x	
Myrtaceae	*Kunzea ericifolia*		30-10	2	x	x
Myrtaceae	*Taxandria parviceps*		30-10	1.9	x	x
Cyperaceae	*Evandra aristata*		70-30	2.2	x	x
Restionaceae	*Lepidosperma effusum*		2-10	1.5	x	

Site ID:	Q02	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10 m
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA50	535730 mE	6133316 mN
Landform and slope:	Mid-upper slope, moderate slope		
Drainage:	Good		
Soil colour & type:	Brown loam		
Vegetation condition:	1		
Fire age & intensity:	Moderate (1-5 yrs), minor impact, scars on most trees		
Disturbances:	Fire <5 years		
Surface component:			
Loose soil (%):	10-30		
Stony/stones (20-60 cm)	Laterite >70%		
Leaf litter:	Plentiful		
Wood litter:	Moderate		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Recorded Spring 2016
Proteaceae	*Persoonia longifolia*		<2T	0.8	x	
Anarthriaceae	*Anarthria prolifera*		70-30	0.4	x	x
Apiaceae	*Xanthosia rotundifolia*		2-10	0.3		x
Asparagaceae	*Lomandra pauciflora*		<2T	0.2		x
Asparagaceae	*Lomandra purpurea*		<2T	0.3		x
Asparagaceae	*Lomandra* sp.		<2N	0.2		x
Casuarinaceae	*Allocasuarina fraseriana*		70-30	8	x	x
Cyperaceae	*?Tetraria octandra*		2-10	0.5	x	x
Cyperaceae	*Lepidosperma* aff. *squamatum*		2-10	0.8	x	x
Cyperaceae	*Lepidosperma gracile*		<2N	0.4		x
Dilleniaceae	*Hibbertia commutata*		<2T	0.2		x
Droseraceae	*Drosera* sp.		<2T	CREEPER	x	x
Eriaceae	*Leucopogon verticillatus*		<2T	1	x	x

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Recorded Spring 2016
Ericaceae	*Leucopogon* sp. Southern Forests (B. G. Hammersley 1000)		<2T	0.4		x
Fabaceae	*Acacia browniana* var. *browniana*				x	x
Fabaceae	*Acacia varia* var. *varia*		<2T	0.3	x	x
Fabaceae	*Acacia myrtifolia*		<2T	2	x	x
Fabaceae	*Bossiaea linophylla*		10-30	1.1	x	x
Fabaceae	*Gompholobium ovatum*		<2N	0.2		x
Fabaceae	*Gompholobium polymorphum*		<2T	0.2		x
Fabaceae	*Hovea chorizemifolia*		<2N	0.8	x	x
Fabaceae	*Hovea elliptica*		<2T	3.5	x	x
Fabaceae	*Sphaerolobium alatum*		<2N	0.5	x	x
Fabaceae	*Sphaerolobium* sp.		<2T	0.9		
Haemodoraceae	*Conostylis setigera* subsp. *setigera*		<2T	0.2	x	x
Iridaceae	*Patersonia umbrosa* var. *umbrosa*		<2T	0.3		x
Lauraceae	*Cassytha pomiformis*		<2N	Creeper		x
Loganiaceae	*Orianthera serpyllifolia*		<2N	0.2	x	x
Myrtaceae	*?Taxandria parviceps*		<2T	1.5	x	
Myrtaceae	*Agonis theiformis*		<10	1.9	x	
Myrtaceae	*Agonis theiformis*		<10	2.5	x	x
Myrtaceae	*Corymbia calophylla*		30-10	11	x	x
Myrtaceae	*Eucalyptus marginata*		10-30	9	x	x
Orchidaceae	*Pterostylis pyramidalis*		<2N	0.2	x	
Orchidaceae	*Pterostylis vittata*		<2N	0.2	x	
Poaceae	*Amphipogon ?laguroides*		<10	0.2	x	
Poaceae	*Poaceae* sp.		<2T	0.2		x
Proteaceae	*Banksia grandis*		10-30	6	x	x
Proteaceae	*Conospermum caeruleum* subsp. *caeruleum*		<2T	1	x	x
Proteaceae	*Grevillea pulchella*		<2T	1		x
Proteaceae	*Persoonia longifolia*		<2T	0.3		x
Proteaceae	*Petrophile diversifolia*		<2T	1	x	x
Restionaceae	*Desmocladus fasciculatus*		<2N	0.3	x	x

Site ID:	Q03	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10 m
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA50	535813 mE	6133326 mN
Landform and slope:	Upper slope, gentle slope		
Drainage:	Good		
Soil colour & type:	Brown loam		
Vegetation condition:	2		
Fire age & intensity:	Moderate (1-5 yrs), minor impact scars on most trees		
Disturbances:	Rubbish and fire		
Surface component:			
Loose soil (%):	100		
Leaf litter:	Plentiful		
Wood litter:	Moderate		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Recorded Spring 2016
Apiaceae	*Xanthosia rotundifolia*		2-10	0.2		x
Anarthriaceae	*Anarthria prolifera*		70-30	0.3	x	x
Asparagaceae	*Lomandra pauciflora*		<2T	0.2		x
Asparagaceae	*Lomandra sericea*		<2T	0.2		x
Asparagaceae	*Lomandra sp.*		<2T	0.2		x
Casuarinaceae	*Allocasuarina fraseriana*		70-30	13	x	x
Colchicaceae	*Burchardia congesta*		<2T	0.2		x
Cyperaceae	*?Tetraria octandra*		<2N	0.5	x	x
Cyperaceae	*Lepidosperma* aff. *Squamatum*		<10	0.8	x	x
Cyperaceae	*Lepidosperma leptostachyum*		<2N	0.5		x
Dilleniaceae	*Hibbertia amplexicaulis*		<2T	0.3	x	x
Droseraceae	*Drosera ?erythrogyne*		<2T	Creeper		X
Droseraceae	*Drosera sp.*		<2N	Creeper	x	x
Eriaceae	*Leucopogon* sp. Southern Forests (B. G. Hammersley 1000)		<2N	0.8		x

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Recorded Spring 2016
Eriaceae	*Leucopogon verticillatus*			1	x	x
Fabaceae	*?Gompholobium polymorphum*		<2T	Creeper	x	
Fabaceae	*Acacia ?browniana* var. *browniana*		<2T	0.4	x	x
Fabaceae	*Acacia luteola*		<2T	0.3	x	x
Fabaceae	*Bossiaea linophylla*		2-10	2	x	x
Fabaceae	*Gompholobium polymorphum*		<2T	Creeper		x
Fabaceae	*Hovea chorizemifolia*		30-10	0.2	x	x
Fabaceae	*Hovea elliptica*		<2T	2		x
Fabaceae	*Sphaerolobium alatum*		<2T	0.6	x	x
Haemodoraceae	*Anigozanthos flavidus*		<2T	1.3		x
Iridaceae	*Patersonia umbrosa* var. *umbrosa*		2-10	0.8		x
Loganiaceae	*Orianthera serpyllifolia*		<10	0.8	x	x
Myrtaceae	*Taxandria parviceps*		<2T	0.8	x	x
Myrtaceae	*Agonis theiformis*		<10	2.5	x	x
Myrtaceae	*Agonis theiformis*			1.3	x	
Myrtaceae	*Eucalyptus marginata*		70-30	13	x	x
Orchidaceae	*Eriochilus* sp.		<2T	0.05		x
Orchidaceae	*Pterostylis vittata*		<2N	0.2	x	x
Podocarpaceae	*Podocarpus drouynianus*		<10	2	x	x
Proteaceae	*Banksia grandis*		2-10	4		x
Proteaceae	*Conospermum caeruleum subsp. Caeruleum*		<2T	0.3	x	x
Restionaceae	*Desmocladus fasciculatus*		30-10	1.8	x	x
Restionaceae	*Desmocladus fasciculatus*		<2N	0.2	x	
Rubiaceae	*Opercularia hispidula*		<2T	0.3	x	x
Proteaceae	*Banksia grandis*		<10	4	x	
Orchidaceae	Pterostylis sp.		<2N	0.1	x	

Site ID:	Q04	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10 m
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA50	536991 mE	6133416 mN
Landform and slope:	Mid-slope, moderate slope		
Drainage:	Good		
Soil colour & type:	Grey loamy sand		
Vegetation condition:	1		
Fire age & intensity:	No damage		
Disturbances:	Clearing for power lines adjacent		
Surface component:			
Loose soil (%):	100		
Leaf litter:	Sparse		
Wood litter:	Moderate		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Recorded Spring 2016
Anarthriaceae	*Anarthria prolifera*		<10	0.3	x	x
Anarthriaceae	*Anarthria scabra*		70-100	1	x	x
Anarthriaceae	*Lyginia barbata*		<2T	0.3	x	x
Apiaceae	*Xanthosia rotundifolia*		<2N	0.6		x
Casuarinaceae	*Allocasuarina fraseriana*		30-10	6	x	x
Colchicaceae	*Burchardia congesta*		<2T	0.2		x
Cyperaceae	*Cyathochaeta avenacea*		<2T	2.1	x	x
Dasypogonaceae	*Dasypogon bromeliifolius*		70-30	0.8	x	x
Droseraceae	*Drosera erythrorhiza*		<2N	0.01		x
Droseraceae	*Drosera pallida*		<2T	Creeper		x
Droseraceae	*Drosera* sp.		<2N	Creeper	x	x
Ericaceae	*Astroloma* sp. (insufficient material)		<2T	0.8	x	x
Ericaceae	*Astroloma* sp. (insufficient material)		<2T	0.3	x	x

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Recorded Spring 2016
Fabaceae	*Acacia applanata*		<2T	0.6	x	
Fabaceae	*Bossiaea ?rufa*		<2T	0.2		x
Fabaceae	*Gompholobium scabrum*		<2T	0.8	x	x
Fabaceae	*Pultenaea reticulata*		<2T	0.4	x	x
Goodeniaceae	*Dampiera leptoclada*		<2T	0.2	x	x
Goodeniaceae	*Scaevola striata*		<2T	0.1		x
Lauraceae	*Cassytha pomiformis*		<2T	Creeper		x
Myrtaceae	*Agonis theiformis*		<2N	1	x	x
Myrtaceae	*Eucalyptus marginata*		30-10	8	x	x
Myrtaceae	*Hypocalymma ?strictum*		<10	0.8	x	x
Myrtaceae	*Melaleuca ?thymoides*		<10	3	x	x
Myrtaceae	*Taxandria parviceps*		<2N	4	x	x
Proteaceae	*Adenanthos obovatus*		<2T	0.8	x	x
Proteaceae	*Banksia attenuata*		<10	4	x	x
Proteaceae	*Banksia grandis*		<2T	0.15	x	
Proteaceae	*Banksia ilicifolia*		<10	2.5	x	x
Restionaceae	*Hypolaena exsulca*		<2T	0.4	x	x
Stylidiaceae	*Stylidium repens*		<2T	0.02		x

Site ID:	Q05	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10 m
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA50	535548 mE	6133319 mN
Landform and slope:	Lower slope		
Drainage:	Good		
Soil colour & type:	Black sandy loam		
Vegetation condition:	1		
Fire age & intensity:	No damage		
Disturbances:			
Surface component:			
Loose soil (%):	100		
Leaf litter:	Sparse		
Wood litter:	Moderate		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016
Xanthorrhoeaceae	*Xanthorrhoea preissii*		<2T	1	x
Dasypogonaceae	*Dasypogon bromeliifolius*		30-10	0.5	x
Anarthriaceae	*Anarthria prolifera*		<10	0.4	x
Anarthriaceae	*Anarthria scabra*		30-10	0.3	x
Casuarinaceae	*Allocasuarina fraseriana*		<10	4	x
Goodeniaceae	*Dampiera leptoclada*		<2N	0.3	x
Myrtaceae	*Beaufortia decussata*		<10	2	x
Myrtaceae	*Eucalyptus marginata*		70-30	7	x
Myrtaceae	*Taxandria parviceps*		30-10	2	x
Proteaceae	*Petrophile diversifolia*		<2T	1	x
Restionaceae	*Desmocladus fasciculatus*		30-10	0.2	x
Restionaceae	*Leptocarpus tenax*		30-10	0.4	x
Iridaceae	*Patersonia occidentalis*		70-30	0.3	x

Site ID:	Q06	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10 m
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA50	534776 mE	6133541 mN
Landform and slope:	Lower slope		
Drainage:	Good		
Soil colour & type:	Black sandy loam		
Vegetation condition:	1		
Fire age & intensity:	No damage		
Disturbances:	Cleared in past		
Surface component:			
Loose soil (%):	100		
Leaf litter:	Sparse		
Wood litter:	Moderate		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016
Stylidiaceae	*Stylidium* sp.		<2T	0.1	x
Fabaceae	*Hovea elliptica*		<2T	0.3	x
Haemodoraceae	*Haemodorum* sp.		<2T	0.2	x
Poaceae	*Poaceae* sp.		<2T	0.2	x
Xanthorrhoeaceae	*Xanthorrhoea preissii*		<2T	1	x
Proteaceae	*Hakea amplexicaulis*		<2T	0.8	x
Iridaceae	*Watsonia meriana* var. *bulbillifera*		<2T	0.6	x
Dennstaedtiaceae	*Pteridium esculentum*		<2T	0.5	x
Fabaceae	*Bossiaea linophylla*		2-10	1	x
Myrtaceae	*Agonis theiformis*		2-10	1.1	x
Myrtaceae	*Corymbia calophylla*		70-30	15	x

Myrtaceae	*Eucalyptus marginata*		70-30	15	x
Myrtaceae	*Taxandria parviceps*		2-10	0.8	x
Fabaceae	*Acacia browniana* var. *browniana*		<2T	0.5	x
Restionaceae	*Desmocladus fasciculatus*		<2N	0.2	x

Site ID:	**Q07**	**Project:**	**6134762**
Type:	Quadrat	**Size:**	10 x 10 m
Date:	5/9/2016, 23/102015	**Described by:**	Aecom and MD
Co-ordinates:	MGA50	536612 mE	6132293 mN
Landform and slope:	Flat		
Drainage:	Good		
Soil colour & type:	Grey loamy sand		
Vegetation condition:	2		
Fire age & intensity:	Old >5 years		
Disturbances:	Nearby, old roadworks		
Surface component:			
Loose soil (%):	<2		
Leaf litter:	plentiful		
Wood litter:	sparse		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Aecom Spring 2015
Anarthriaceae	*Anarthria scabra*		30-70	0.8	x	x
Anarthriaceae	*Anarthria prolifera*		2-10	0.6	x	x
Apiaceae	*Xanthosia rotundifolia*		<2T	0.2	x	x
Apiaceae	*Xanthosia tasmanica*		<2T	0.05	x	
Casuarinaceae	*Allocasuarina fraseriana*		2-10	5	x	x
Cyperaceae	*Mesomelaena tetragona*		2-10	0.9	x	x

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Aecom Spring 2015
Cyperaceae	*Schoenus* sp.		<2N	0.1	x	
Cyperaceae	*Schoenus sublateralis*		<2T	0.8	x	
Dasypogonaceae	*Dasypogon bromeliifolius*		2-10	0.4	x	x
Droseraceae	*Drosera ?erythrogyne*		<2N	Creepeer	x	
Ericaceae	*Leucopogon australis*		<2T	0.8	x	
Fabaceae	*Hovea chorizemifolia*		<2T	0.1	x	
Fabaceae	*Sphaerolobium alatum*		0.1	0.2		x
Fabaceae	*Sphaerolobium grandiflorum*		0.3	1.3		x
Fabaceae	*Sphaerolobium sp.*		<2T	2	x	
Goodeniaceae	*Dampiera leptoclada*		<2N	0.2	x	
Goodeniaceae	*Dampiera linearis*					x
Goodeniaceae	*Dampiera* sp.		<2T	0.1	x	
Goodeniaceae	*Scaevola calliptera*					x
Haemodoraceae	*Conostylis setigera*		0.1	0.15		x
Lauraceae	*Cassytha* sp.		<2N	Creeper	x	
Loranthaceae	*Nuytsia floribunda*		<2T	3	x	
Myrtaceae	*Agonis theiformis*		2	2.2		x
Myrtaceae	*Beaufortia decussata*		<2T	1.5	x	x
Myrtaceae	*Darwinia citriodora*					x
Myrtaceae	*Eucalyptus staeri*		10-30	14	x	
Myrtaceae	*Eucalyptus marginata*		30	5		x
Myrtaceae	*Taxandria parviceps*		30-70	2.5	x	x
Proteaceae	*Adenanthos obovatus*		<2T	1.1	x	
Proteaceae	*Grevillea occidentalis*					x
Restionaceae	*Desmocladus fasciculatus*		<2N	0.1	x	x
Restionaceae	*Hypolaena exsulca*		<2T	0.5	x	x
Restionaceae	*Tremulina tremula*		2-10	0.5	x	
Rhamnaceae	*Trymalium odoratissimum* subsp. *trifidum*			3.5		x
Stylidiaceae	*Stylidium nymphaeum*					
Stylidiaceae	*Stylidium ?piliferum* (not flowering)		<2T	0.1		x
Thymelaeaceae	*Pimelea longiflora* subsp. *longiflora*		0.1	1.2		x
Xanthorrhoeaceae	*Xanthorrhoea preissii*		2-10	1.7	x	

Site ID:	**Q08**	**Project:**	**6134762**
Type:	Quadrat	**Size:**	10 x 10 m
Date:	5/9/2016	**Described by:**	MD
Co-ordinates:	MGA50	536962 mE	6133159 mN
Landform and slope:	Slope-middle, gentle		
Drainage:	Seasonally wet		

Soil colour & type:	Black sandy-loam
Vegetation condition:	2
Fire age & intensity:	Old>5 years
Disturbances:	Weeds, previous clearing/grazing
Surface component:	
Loose soil (%):	30-70 (with standing water)
Leaf litter:	Sparse
Wood litter:	Sparse

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016
Asteraceae	*Hypochaeris* sp.	*	<2N	0.01	x
Centrolepidaceae	*Centrolepis ?pilosa*		<2N	0.01	x
Cyperaceae	*Lepidosperma pubisquameum*		2-10	1	x
Cyperaceae	*Mesomelaena tetragona*		2-10	0.8	x
Droseraceae	*Drosera glanduligera*		<2N	0.02	x
Fabaceae	*Lotus sp.*	*	<2T	0.1	x
Myrtaceae	*Darwinia oederoides*		10-30	0.1	x
Myrtaceae	*Hypocalymma sp.*		<2N	0.4	x
Myrtaceae	*Taxandria parviceps*		10-30	3	x
Orchidaceae	sp.		<2T	0.05	x
Poaceae	*Anthoxanthum odoratum*	*	<2N	0.2	x
Pteridaceae	*Cheilanthes* sp.		<2T	0.03	x
Restionaceae	*Tremulina tremula*		30-70	0.6	x
Xanthorrhoeaceae	*Xanthorrhoea preissii*		<2T	1.3	x

Site ID:	**Q09**	**Project:**	**6134762**
Type:	Quadrat	**Size:**	10 x 10 m
Date:	5/9/2016, 23/102015	**Described by:**	Aecom and MD
Co-ordinates:	MGA50	536765 mE	6132779 mN

Landform and slope:	Slope-middle, gentle
Drainage:	Good
Soil colour & type:	Black-grey loamy-sand
Vegetation condition:	2
Fire age & intensity:	Old>5 years
Disturbances:	
Surface component:	
Loose soil (%):	<2
Leaf litter:	Plentiful
Wood litter:	Moderate

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Aecom Spring 2015
Anarthriaceae	*Anarthria prolifera*		2-10	0.4	x	
Anarthriaceae	*Anarthria scabra*		10-30	0.9	x	x
Anarthriaceae	*Lyginia barbata*		<2T	0.3	x	
Apiaceae	*Xanthosia rotundifolia*		2-10	0.2	x	x
Casuarinaceae	*Allocasuarina fraseriana*		2-10	14	x	x
Colchicaceae	*Burchardia congesta*		<2T	0.2	x	
Cyperaceae	*Cyathochaeta avenacea*		2-10	1.5	x	
Cyperaceae	*Lepidosperma effusum*					x
Cyperaceae	*Lepidosperma gracile*					x
Dasypogonaceae	*Dasypogon bromeliifolius*		10-30	0.8	x	x
Dennstaedtiaceae	*Pteridium esculentum*					x
Droseraceae	*Drosera erythrorhiza*		<2T	0.01	x	
Droseraceae	*Drosera sp.*		<2N	Creeper	x	
Eleocarpaceae	*Tetratheca hispidissima*		<2N	0.5	x	
Elaeocarpaceae	*Tetratheca setigera*		30	0.1		x
Ericaceae	*Andersonia caerulea*		<2T	0.3	x	
Ericaceae	*Leucopogon glabellus*		<2T	0.2	x	x

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Aecom Spring 2015
Fabaceae	*Bossiaea ?praetermissa*		<2T	0.3	x	
Fabaceae	*Daviesia flexuosa*		2-10	1.2	x	x
Fabaceae	*Gompholobium* sp.		<2T	0.2	x	
Fabaceae	*Gompholobium capitatum*		<2T	0.2	x	
Fabaceae	*Pultenaea reticulata*		<2T	0.8	x	
Goodeniaceae	*Scaevola calliptera*		0.5	0.1		x
Haemodoraceae	*Anigozanthos flavidus*					x
Hemerocallidaceae	*Johnsonia lupulina*		<2T	0.5	x	x
Iridaceae	*Patersonia umbrosa* var. *umbrosa*		2-10	1.2	x	
Lindsaeaceae	*Lindsaea linearis*		<2N	0.2	x	
Myrtaceae	*Agonis theiformis*		<2T	0.5	x	x
Myrtaceae	*Darwinia vestita*		0.1	0.5		x
Myrtaceae	*Eucalyptus marginata*		2-10	14	x	x
Myrtaceae	*Eucalyptus staeri*		10-30	12	x	
Myrtaceae	*Hypocalymma* sp.		<2T	0.2	x	
Myrtaceae	*Taxandria parviceps*		30-70	3	x	x
Proteaceae	*Adenanthos obovatus*		<2T	0.8	x	
Proteaceae	*Banksia ilicifolia*		10-30	12	x	x
Proteaceae	*Persoonia longiflora*		<2T	1.5	x	x
Restionaceae	*Hypolaena exsulca*		<2T	0.4	x	
Rubiaceae	*Opercularia vaginata*					x
Stylidiaceae	*Stylidium ?nymphaeum*		<2T	Creeper	x	x
Thymelaeaceae	*Pimelea longiflora* subsp. *longiflora*		0.2	0.7		x

Site ID:	**Q10**	**Project:**	**6134762**
Type:	Quadrat	**Size:**	50 x 50 m
Date:	29/7/2016	**Described by:**	GO
Co-ordinates:	MGA50		
Landform and slope:	Lower slope, gentle slope		
Drainage:	Good		
Soil colour & type:	Brown loam		
Vegetation condition:	2		
Fire age & intensity:	No damage		
Disturbances:	Weeds, some clearing, tracks nearby		
Surface component:			
Loose soil (%):	100		
Leaf litter:	Plentiful		
Wood litter:	Plentiful		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016	Aecom Spring 2015
Casuarinaceae	*Allocasuarina decussata*		<10	4	x	x
Cyperaceae	*Lepidosperma effusum*		70-30	2	x	x
Dennstaedtiaceae	*Pteridium esculentum*		<10	1.5	x	x
Myrtaceae	*Agonis flexuosa*		70-30	8	x	x
Myrtaceae	*Eucalyptus diversicolor*		70-30	30	x	x
Oxalidaceae	*Oxalis incarnata*	*	<2T	0.2	x	x
Poaceae	*Tetrarrhena laevis*		<2N	0.4		x
Proteaceae	*Banksia seminuda*		2-10	15	x	x
Ranunculaceae	*Clematis pubescens*		<2T	CREEPER	x	x
Rhamnaceae	*Trymalium odoratissimum* subsp. *trifidum*		30-10	3	x	x

Site ID:	**Q11**	**Project:**	**6134762**
Type:	Quadrat	**Size:**	50 x 50 m
Date:	29/7/2016	**Described by:**	GO
Co-ordinates:	MGA50		
Landform and slope:	Lower slope, valley, moderate slope		
Drainage:	Good		
Soil colour & type:	Brown loam		
Vegetation condition:	4		
Fire age & intensity:	No damage		
Disturbances:	Logging, weeds, past clearing		
Surface component:			
Loose soil (%):	100		
Leaf litter:	Moderate		
Wood litter:	Plentiful		

Species List

Family	*Taxon*	Status	Cover	Height	Recorded Winter 2016	Aecom Spring 2015
Apiaceae	*Xanthosia rotundifolia*		70-30	0.7	x	x
Asparagaceae	*Asparagus asparagoides*		<2T	CREEPER	x	x
Asparagaceae	*Lomandra pauciflora*		<2T	0.3		x
Asteraceae	*Hypochaeris sp.*	*	<2T	0.02	x	x
Cyperaceae	*Baumea juncea*		2-10	1.2		x
Cyperaceae	*Lepidosperma* aff. *pubisquameum*		2-10	0.7		x
Cyperaceae	*Lepidosperma gracile*		2-10	0.6		x
Cyperaceae	*Schoenus* sp. (insufficient material)		10-30	0.7	x	x
Dennstaedtiaceae	*Pteridium esculentum*		<10	1	x	x
Fabaceae	*Hovea elliptica*		<2T	2		x
Fabaceae	*Lotus* sp.	*	30-10	0.1	x	x
Iridaceae	*Watsonia meriana* var. *bulbillifera*	*	<2N	0.8	x	x
Myrtaceae	*Agonis flexuosa*		70-30	7	x	x
Myrtaceae	*Agonis theiformis*		<2T	1.9	x	x
Myrtaceae	*Corymbia calophylla*		<10	18	x	x
Oxalidaceae	*Oxalis* sp.	*	<10	CREEPER	x	
Poaceae	*Cenchrus setaceus*	*	30-70	0.8		x
Poaceae	*Ehrharta longiflora*	*	<2N	0.3		
Poaceae	*Phalaris* sp.	*	<2T	0.4		x
Poaceae	*Poaceae* sp.		<2N	0.2	x	
Poaceae	*Poaceae* sp.		Creeper	CREEPER	x	
Poaceae	*Tetrarrhena laevis*		<2T	0.6		x
Restionaceae	*Desmocladus flexuosus*		<10	0.3	x	x
Rhamnaceae	*Trymalium odoratissimum* subsp. *trifidum*		<2T	1.5		x

Site ID:	Q12	Project:	6134762
Type:	Quadrat	**Size:**	10 x 10
Date:	27/7/2016	**Described by:**	GO
Co-ordinates:	MGA50	534634 mE	6133301 mN
Landform and slope:	Wetland/drainage area		
Poor drainage, seasonal wet	Poor drainage, seasonal wet		
Black sandy loam	Black sandy loam		
Vegetation condition:	5		
Fire age & intensity:	Old>5 years		
Disturbances:	Weeds and previous clearing/grazing		
Surface component:			
Loose soil (%):	100		
Leaf litter:	<10 %		
Wood litter:	-		

Species List

Family	Taxon	Status	Cover	Height	Recorded Winter 2016
Iridaceae	*Watsonia meriana* var. *bulbillifera*	*	<2	0.3	x
Anarthriaceae	*Anarthria scabra*		30-10	4	x
Cyperaceae	*Cyathochaeta avenacea*		<10	3	x
Cyperaceae	*Cyperus congestus*		<10	0.8	x
Haemodoraceae	*Anigozanthos* sp.		<2	0.3	x
Myrtaceae	*Homalospermum firmum*		<10	3	x
Myrtaceae	*Melaleuca preissiana*		70-30	7	x
Restionaceae	*Leptocarpus scariosus*		<10	0.6	x
Haemodoraceae	*Haemodorum* sp.		<2	0.2	x

Family	Taxon	Status	Cover	Height	Recorded Winter 2016
Poaceae	*Cenchrus clandestinus*	*	30-70	0.2	x
Primulaceae	*Lysimachia arvensis*	*	<2	0.1	x
Solanaceae	*Solanum nigrum*	*	<2	0.4	x

Flora likelihood of occurrence assessment guidelines

Likelihood of occurrence	Guideline
Known	Species recorded within survey area from field survey results.
Likely	Species previously recorded within study area and large areas of suitable habitat occur in survey area.
Possible	Species previously recorded within study area and areas of suitable habitat occur/may occur in survey area.
Unlikely	Species previously recorded within study area, but suitable habitat does not occur in survey area.
Highly unlikely	Species not previously recorded within study area, suitable habitat does not occur in 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

Definitions

Study area = a 10 km buffer around the survey area for Naturemap and PMST and 5 km buffer around the survey area for DPaW.

Source information - desktop searches

PMST – DotE PMST to identify flora listed under the EPBC Act potentially occurring within 10 km of the survey area.
DPaW – DPaW (2007 -) records of Threatened flora, database search includes a 5 km buffer of the survey area (accessed July 2016).
NM – DPaW NatureMap (accessed September 2016) and includes a 10 km buffer of the survey area.

Flora likelihood of occurrence assessment

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Source	Efficacy of field survey	Likelihood of occurrence within impact area	Efficacy of field survey within survey area	Likelihood of occurrence within survey area
		EPBC Act	WC Act /DPaW						
Apiaceae	*Xanthosia eichleri*		P4	Erect, procumbent or decumbent shrub (subshrub), 0.05-0.25 m high, leaves simple, cuneate; umbels simple; petals shorter than sepals. Fl. white-cream, Oct to Nov. Grey sand over granite, sandy loam. Granite outcrops, jarrah/marri woodland.	NM, WAHERB	High	Unlikely – there is no suitable habitat within the impact area.	High	Unlikely – there is no suitable habitat within the survey area.
Asparagaceae	*Laxmannia jamesii*		P4	Tufted, stilt-rooted perennial, herb, 0.05-0.2 m high. Fl. red & white, May to Jul. Grey sand. Winter-wet locations.	NM, TPFL, WAHERB	Moderate	Possible/Known – this species may have been recorded within the impact area. during the spring assessment. Impact area is to be confirmed.	Moderate	Known – the species was recorded within the survey area during the spring assessment.
Asteraceae	*Angianthus drummondii*		P3	Erect annual, herb, to 0.1 m high. Fl. yellow, Oct to Dec. Grey or brown clay soils, ironstone. Seasonally wet flats.	NM	High	Unlikely – there is no suitable habitat within the impact area.	High	Unlikely – there is no suitable habitat within the survey area.
Boryaceae	*Borya longiscapa*		P3	Dwarf domed perennial, herb, to 0.6 m high. Fl. cream-white-yellow, Oct to Dec. Grey sand. Granite outcrops.	NM, TPFL, WAHERB	High	Unlikely – there is no suitable habitat within the impact area.	High	Unlikely – there is no suitable habitat within the survey area.
Brassicaceae	*Lepidium pseudotasmanicum*		P4	Erect annual or biennial, herb, 0.2-0.4(-1) m high. Fl. white-green, Feb or Dec. Loam, sand.	NM, WAHERB	Low	Possible – the species has been recorded within the study area and suitable habitat is present within the impact area. The surveys were outside this species flowering period.	Low	Possible – the species has been recorded within the study area and suitable habitat is present within the survey area. The surveys were outside this species flowering period.

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Source	Efficacy of field survey	Likelihood of occurrence within impact area	Efficacy of field survey within survey area	Likelihood of occurrence within survey area
		EPBC Act	WC Act /DPaW						
Cyperaceae	*Tetraria* sp. Blackwood River		P3		NM, WAHERB	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the survey area.
Dasypogonaceae	*Calectasia cyanea*	CR	T	Rhizomatous, clump forming, woody perennial, herb, 0.1-0.6 m high, to 0.3 m wide. Fl. blue/purple, Jun to Oct. White, grey or yellow sand, gravel.	EPBC	High	Highly unlikely – this species is restricted to the Torndirrup National Park south of Albany and there is no/limited suitable habitat within the impact area.	High	Highly unlikely – this species is restricted to the Torndirrup National Park south of Albany and there is no/limited suitable habitat within the survey area.
Ericaceae	*Andersonia auriculata*		P3	Erect or spreading shrub, 0.1-0.3(-0.5) m high. Fl. white & blue, Apr to Oct. Grey or peaty sand, often over laterite. Swampy areas, granite outcrops.	NM	High	Unlikely – there is no suitable habitat within the impact area.	High	Unlikely – there is no suitable habitat within the survey area.
Ericaceae	*Andersonia* sp. Mitchell River		P3	Low, spreading, cushion-like shrub, 0.05-0.4 m high. Fl. blue/blue-white-pink, Jun to Sep. Grey sand over laterite or granite.	NM, TPFL	High	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area.
Ericaceae	*Andersonia* sp. Virolens		P3		NM	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.
Ericaceae	*Dielsiodoxa tamariscina*		P2		NM	High	Highly unlikely – this species is restricted to the Stirling Ranges.	High	Highly unlikely – this species is restricted to the Stirling Ranges.
Ericaceae	*Lasiopetalum* sp. Denmark		P3		TPFL, WAHERB	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the survey area.
Ericaceae	*Leucopogon alternifolius*		P3	Erect or semi-erect, scrambling shrub, 0.1-1(-2) m high. Fl. white/white-pink, Aug to Dec. Grey/white sand. Swampy areas, seasonally wet areas.	NM	Low	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area.
Ericaceae	*Sphenotoma drummondii*	EN	T	Tufted shrub, 0.15-0.5 m high. Fl. white, Sep to Dec. Stony or shallow soils over granite or quartzite. Steep rocky slopes, crevices of rocks.	EPBC	High	Highly unlikely – this species is restricted to the eastern Stirling Range and there is no suitable habitat within the impact area.	High	Highly unlikely – this species is restricted to the eastern Stirling Range and there is no suitable habitat within the survey area.
Fabaceae	*Kennedia glabrata*	VU	T	Prostrate shrub, 0.05-0.5 m high, to 5 m wide. Fl. red, Aug to Nov. Soil pockets, sandy soils. Granite outcrops.	EPBC	High	Unlikely – this species has not been recorded within the study area and there is no suitable habitat within the impact area.	High	Unlikely – this species has not been recorded within the study area and there is no suitable habitat within the survey area.
Fabaceae	*Sphaerolobium calcicola*		P3	Slender, multi-stemmed, scandent or erect shrub, to 1.5 m high. Fl. orange-red, Jun or Sep to Nov. White-grey-brown sand, sandy clay over limestone, black peaty sandy clay. Tall dunes, winter-wet flats, interdunal swamps, low-lying areas.	NM	Moderate	Possible – this species has previously been recorded within the study area and some suitable habitat is present within the impact area.	Moderate	Possible – the species has been recorded within the study area and some suitable habitat is present within the survey area.

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Source	Efficacy of field survey	Likelihood of occurrence within impact area	Efficacy of field survey within survey area	Likelihood of occurrence within survey area
		EPBC Act	WC Act /DPaW						
Goodeniaceae	*Selliera radicans*		P1	Prostrate, woody perennial, herb. Saline mud. Estuarine areas.	NM, TPFL, WAHERB	High	Unlikely – this species has been recorded within the study area, however there is no suitable habitat within the impact area.	High	Unlikely – this species has been recorded within the study area, however there is no suitable habitat within the survey area.
Haemodoraceae	*Conostylis misera*	EN	T	Rhizomatous, tufted perennial, grass-like or herb, 0.05-0.18 m high. Fl. yellow, Oct to Nov. White or grey sand, sandy loam. Winter-wet flats.	EPBC	High	Unlikely – this species current distribution occurs from north of the Stirling Range to Narrikup, however there is suitable habitat within the impact area.	High	Unlikely – this species current distribution occurs from north of the Stirling Range to Narrikup, however there is suitable habitat within the survey area.
Hydatellaceae	*Trithuria australis*		P4		NM	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the survey area.
Malvaceae	*Lasiopetalum* sp. Denmark (B.G. Hammersley 2012*)*		P3		TPFL , WAHERB	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the impact area.
Malvaceae	*Thomasia quercifolia*		P4	Shrub, ca 1 m high.	NM	Moderate	Unlikely– this species has been recorded within the study area and suitable habitat may be present. The impact area was traversed during the spring survey.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the survey area.
Malvaceae	*Thomasia solanacea*		P4	Erect shrub, 0.5-3 m high. Fl. blue-purple-pink, Sep to Dec. Alluvium, sand over limestone, rocky loam. Coastal areas.	NM, WAHERB	High	Unlikely – there is no suitable habitat within the impact area.	High	Unlikely – there is no suitable habitat within the survey area.
Menyanthaceae	*Ornduffia submersa*		P4	Aquatic with leaves floating on surface and flowers above, to 20 cm. Flowers yellow.	NM, TPFL, WAHERB	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area.
Myrtaceae	*Eucalyptus virginea*		P4	Tree, to 12 m high, bark smooth, powdery, white. Fl. white, Dec or Jan or Jul. Clay or sandy loam, shallow soil over granite, laterite loam over clay. Lower slopes near watercourses, edge of rock outcrops, gently sloping sites.	NM	High	Unlikely – the species has been recorded within the study area and suitable habitat is present. Habitat for this species was traversed during the preliminary assessment.	High	Unlikely – the species has been recorded within the study area and suitable habitat is present. Habitat for this species was traversed during the preliminary assessment.
Myrtaceae	*Melaleuca ordinifolia*		P2	Compact, spreading shrub, 0.3-1.5 m high. Fl. white-cream, Aug to Oct. Sandy loam or clay.	NM	Moderate	Unlikely– this species has been recorded within the study area and suitable habitat may be present. The impact area was traversed during the spring survey during this species flowering period.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the survey area.
Myrtaceae	*Melaleuca viminalis*		P2	Slender erect weeping shrub, 3 m high x 2 m wide. Flowers crimson red, in flower.	NM, WAHERB	High	Unlikely– this species has been recorded within the study area and suitable habitat may be present. The impact area was traversed during the spring survey.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat may be present within the survey area.

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Source	Efficacy of field survey	Likelihood of occurrence within impact area	Efficacy of field survey within survey area	Likelihood of occurrence within survey area
		EPBC Act	WC Act /DPaW						
Myrtaceae	*Verticordia apecta*	CR	T	Slender, erect shrub, 0.2-0.45 m high. Fl. white-pink, Nov. Sandy clay with loam & broken granite. Slopes.	EPBC	High	Highly unlikely – this species is restricted to a single population in the Mt Barker area and there is no suitable habitat within the impact area.	High	Highly unlikely – this species is restricted to a single population in the Mt Barker area and there is no suitable habitat within the survey area.
Orchidaceae	*Caladenia huegelii*	EN	T	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green & cream & red, Sep to Oct. Grey or brown sand, clay loam.	NM	High	Unlikely – the species has been recorded within the study area however limited suitable habitat is present. This species predominantly occurs on the Swan Coastal Plain.	High	Unlikely – the species has been recorded within the study area however limited suitable habitat is present. This species predominantly occurs on the Swan Coastal Plain.
Orchidaceae	*Drakaea micrantha*	VU	T	Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow, Sep to Oct. White-grey sand.	EPBC	High	Unlikely – the species has not been recorded within the study area and limited suitable habitat is present.	High	Unlikely – the species has not been recorded within the study area and limited suitable habitat is present.
Orchidaceae	*Microtis pulchella*		P4	Tuberous, perennial, herb, 0.12-0.25 m high. Fl. white, Nov to Dec or Jan. Peaty sand. Winter-wet swamps.	NM	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the impact area. Due to the early spring survey, this species may not have been observed in the field.	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the survey area. Due to the early spring survey, this species may not have been observed in the field.
Orchidaceae	*Microtis quadrata*		P4		NM	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the impact area. Due to the early spring survey, this species may not have been observed in the field.	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the survey area. Due to the early spring survey, this species may not have been observed in the field.
Proteaceae	*Banksia goodii*	Vu	T	Lignotuberous, prostrate shrub, ca 0.2 m high. Fl. orange-brown-red, May or Nov. White or grey sand over laterite.	NM	Moderate	Unlikely– this species has previously been recorded within the study area and suitable habitat is present within the impact area. The impact area was traversed during the spring survey.	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the survey area.
Proteaceae	*Banksia serra*		P4	Annual, prostrate shrub 1-3 m high. Yellow flowers. Tap roots.	NM, WAHERB	High	Unlikely– this species has previously been recorded within the study area and suitable habitat is present within the impact area. The impact area was traversed during the spring survey.	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the survey area.
Proteaceae	*Grevillea fuscolutea*		T	Open, erect shrub, 0.5-2.5 m high. Fl. yellow, Apr to Nov. Coarse grey sand or brown-black loam over granite. Granite outcrops.	NM, WAHERB	High	Unlikely – the species has been recorded within the study area, however no suitable habitat is present.	High	Unlikely – the species has been recorded within the study area, however no suitable habitat is present.
Proteaceae	*Isopogon buxifolius* var. *buxifolius*		P2	Upright shrub, 0.45-1 m high. Fl. pink-cream, Jul to Dec. Grey sand. Swampy areas.	NM	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area. This species may not have been	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area. This species may not have been

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Source	Efficacy of field survey	Likelihood of occurrence within impact area	Efficacy of field survey within survey area	Likelihood of occurrence within survey area
		EPBC Act	WC Act /DPaW						
							flowering during the time of the spring survey.		flowering during the time of the spring survey.
Proteaceae	*Isopogon uncinatus*	EN	T	Tufted spreading or prostrate, non-lignotuberous shrub, 0.05-0.4 m high. Fl. yellow/cream, Oct to Nov. Loam or sand on granite, peaty sand. Swampy depressions, hillslopes.	EPBC	High	Highly Unlikely – the species is confined to the Albany area. It is found in seasonally damp areas in shallow sandy clay over granite, or gravelly soil from decomposed laterite over granite. No suitable habitat is present within the impact area.	High	Highly Unlikely – the species is confined to the Albany area. It is found in seasonally damp areas in shallow sandy clay over granite, or gravelly soil from decomposed laterite over granite. No suitable habitat is present within the survey area.
Proteaceae	*Synaphea incurva*		P1	Clumped, spreading shrub. Fl. yellow, Sep to Nov. Gravelly loam, sandy soils. Slopes.	NM, WAHERB, WAHERB	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the impact area. This species may not have been flowering during the time of the spring survey.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area. This species may not have been flowering during the time of the spring survey.
Restionaceae	*Chordifex abortivus*	EN	T	Rhizomatous, erect perennial, herb, to 0.5 m high. Fl. brown, Sep to Oct. Sand. Low rises & undulating areas.	EPBC	Moderate	Unlikely – this species has not been recorded within the study area and some suitable habitat is present. The impact area was traversed during the spring survey.	Moderate	Possible – this species has not been previously recorded within the study area however some suitable habitat is present.
Restionaceae	*Lepyrodia extensa*		P2	Herb (sedge-like), ca. 0.3 m high. Sand & sandy peat. Seasonally inundated swamps.	NM	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the impact area.	Moderate	Possible – the species has been recorded within the study area, and suitable habitat is present within the survey area.
Rhamnaceae	*Spyridium riparium*		P2	Erect shrub, 0.8-1.5 m high. Fl. white/cream, Jul to Oct. Sandy or gravelly soils over laterite. River banks, slopes.	NM	High	Unlikely– this species has previously been recorded within the study area and suitable habitat is present within the impact area. The impact area was traversed during the spring survey.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area.
Rutaceae	*Boronia virgata*		P4	Slender, erect or sprawling shrub, 0.3-2 m high. Fl. pink, Aug to Dec or Jan to Feb. Peaty sand or clay. Swampy or waterlogged places.	NM	High	Unlikely– this species has previously been recorded within the study area and suitable habitat is present within the impact area. The impact area was traversed during the spring survey during this species flowering period.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area.
Solanaceae	*Anthocercis sylvicola*		P2	Shrub, 0.45-1.3 m high. Fl. yellow & purple, Oct. Sand.	NM	High	Unlikely– this species has previously been recorded within the study area and some suitable habitat is present within the impact area. The impact area was traversed during the spring survey during this species flowering period.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area.

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DotE 2015d)	Source	Efficacy of field survey	Likelihood of occurrence within impact area	Efficacy of field survey within survey area	Likelihood of occurrence within survey area
		EPBC Act	WC Act /DPaW						
Thymelaeaceae	*Pimelea rosea* subsp. *annelsii*		P3	Shrub, 0.3-0.8 m high. Fl. pink, Sep to Nov. Sandy soils with gravel, laterite. Upper slopes.	NM	High	Unlikely– this species has previously been recorded within the study area and some suitable habitat is present within the impact area. The impact area was traversed during the spring survey during this species flowering period.	Moderate	Possible – this species has previously been recorded within the study area and suitable habitat is present within the survey area.

Appendix E – Fauna Data

Fauna species list

Fauna likelihood of occurrence assessment guidelines

Fauna likelihood of occurrence assessment

Fauna species recorded during the assessment

Family	Scientific Name	Common Name	Status	July 2016	August 2016	October 2016 (nocturnal)
Birds						
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill		20		
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill		4		
Acanthizidae	*Gerygone fusca*	Western Gerygone		2	2	
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren		4	4, (1) camera	
Acanthizidae	*Sericornis brevirostris*	Weebill			18	
Anatidae	*Anus superciliosa*	Black Duck			2, camera	
Anatidae	*Tadorna tadornoides*	Australian Shelduck		2		
Anatidae	*Chenonetta jubata*	Australian Wood Duck		2	12	
Ardeidae	*Egretta novaehollandiae*	White-faced Heron		1	1	
Ardeidae	*Ardea ibis*	Cattle Egret		12		
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow			2	
Artamidae	*Cracticus tibicen*	Australian Magpie		4	8	1
Artamidae	*Strepera versicolor*	Grey Currawong		2		
Cacatuidae	*Calyptorhynchus baudinii*	Baudin's Black Cockatoo	Vu, En, S2	2	6	1
Cacatuidae	*Eolophus roseicapillus*	Galah		4	4	
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike		2	2	

Family	Scientific Name	Common Name	Status	July 2016	August 2016	October 2016 (nocturnal)
Casuariidae	*Dromaius novaehollandiae*	Emu		2		
Charadriidae	*Vanellus tricolor*	Banded Lapwing		2		
Climacteridae	*Climacteris rufa*	Rufous Treecreeper			1	
Columbidae	*Phaps chalcoptera*	Common Bronzewing		1	2, (3) camera	
Columbidae	*Phaps elegans*	Brush Bronzewing			1	
Corvidae	*Corvus coronoides*	Australian Raven		5	4	
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed cuckoo		2		1
Cuculidae	*Cacomantis pallidus*	Pallid Cuckoo			1	
Halcyonidae	*Dacelo novaeguineae*	Laughing Kookaburra	intro	2		2
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull		4		
Maluridae	*Malurus splendens*	Splendid Fairy-wren			4	2
Maluridae	*Malurus elegans*	Red-winged Fairy-wren		4	(12) camera	
Meliphagidae	*Melithreptus whitlocki*	White-naped Honeyeater		2	2	
Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater		10	2	
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird		4	2	1
Meliphagidae	*Anthochaera lunulata*	Western Wattlebird		2	2	
Meliphagidae	*Lichenostomus virescens*	Singing Honeyeater		2	1	1
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater		4	2	1

Family	Scientific Name	Common Name	Status	July 2016	August 2016	October 2016 (nocturnal)
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater		8	6	1
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush		1	(1) camera	
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler			2	1
Pachycephalidae	*Pachycephala westraliensis*	Golden Whistler			1	
Pardalotidae	*Pardalotus striatus*	Striated Pardalote		2	2	
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote		6		
Petroicidae	*Petroica boodang*	Scarlet Robin			4	
Petroicidae	*Petroica goodenovii*	Red-capped Robin		1	1	1
Petroicidae	*Eopsaltria georgiana*	White-breasted Robin		1	1 (3) camera	
Petroicidae	*Microeca fascinans*	Jacky Winter			10	1
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican		1		
Podargidae	*Podargus strigoides*	Tawny Frogmouth			1	1
Psittacidae	*Glossopsitta porphyrocephala*	Purple-crowned Lorikeet		2	12	1
Psittacidae	*Platycercus icterotis*	Western Rosella		2	4	1
Psittacidae	*Purpureicephalus spurius*	Red-capped Parrot			2	
Psittacidae	*Barnardius zonarius*	Australian Ringneck		2	16	1
Rallidae	*Porphyrio porphyrio*	Purple Swamphen			1	

Family	Scientific Name	Common Name	Status	July 2016	August 2016	October 2016 (nocturnal)
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail		6	4	1
Strigidae	*Ninox Boobook*	Southern Boobook				1
Reptiles						
Scincidae	*Egernia kingi*	King skink			1	
Scincidae	*Hemiergis peronii peronii*	Four-toed Mulch Skink			2	1
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink		1	1	
Scincidae	*Tiliqua rugosa*	Bobtail			1	
Varanidae	*Varanus rosenbergi*	Heath Monitor		1		
Amphibia						
Hylidae	*Litoria adelaidensis*	Slender Tree Frog		10	many	many
Hylidae	*Litoria moorei*	Motorbike Frog				many
Limnodynastes	*Metacrinia nichollsi*	Forrest Froglet		1		
Myobatrachidae	*Crinia georgiana*	Quacking Frog		2	3	many
Myobatrachidae	*Crinia glauerti*	Clicking Froglet		2	many	many
Mammal						
Dasyuridae	*Antechinus flavipes*	Yellow-footed Antechinus			(many) camera	1
Canidae	*Vulpes vulpes*	Fox	intro	2	(10) camera	1
Felidae	*Felis catus*	Cat	intro		(1) camera	
Leporidae	*Oryctolagus cuniculus*	Rabbit	intro	1	3	1

Family	Scientific Name	Common Name	Status	July 2016	August 2016	October 2016 (nocturnal)
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo		2	8	4
Muridae	*Rattus fuscipes*	Bush Rat			(many) camera	
Muridae	*Rattus rattus*	Black Rat	intro		(many) camera	
Peramelidae	*Isoodon obesulus fusciventer*	Quenda	P4	digs	1, (many) camera	1
Phalangeridae	*Trichosurus vulpecula*	Common Brushtail Possum		scats	(many) camera	1
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat				BR
Vespertilionidae	*Chalinolobus morio*	Chocolate Wattled Bat				BR
Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat				BR
Vespertilionidae	*Nyctophilus species*	Long-eared Bat				BR

Legend:

X = recorded during current survey (observed or heard); S = scat, tracks or digs;

R = roadkill record; *= introduced species; BR = full spectrum recording from hand held Echo Meter Touch bat recorder

Note: all species previously recorded within 10 km of Survey area (DPaW 2007–)

All species recorded during October 2016 as a result of opportunistic observations during or prior to spot lighting surveys or spot lighting surveys within the survey area.

Conservation codes – Appendix B

Parameters of fauna likelihood of occurrence assessment

Assessment outcome	Description
Present	Species recorded during the field survey or from recent, reliable records from within or close proximity to 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 10 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.

Definitions:

Study area = a 10 km buffer around the Survey area

Locality = the area within an approximate 50 km radius of the Survey area

Source information - desktop searches

PMST – DotE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the study area

DPaW – DPaW (2007–) records of threatened fauna, database search within the study area (accessed September 2015)

NM – DPaW NatureMap (accessed September 2015)

Add – DPaW 2015. WA Government, Department of Parks and Wildlife Threatened and Priority fauna rankings (current as of 20 November 2015) - *Wildlife Conservation Act 1950* for the DPaW Goldfields region http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals

Fauna likelihood of occurrence assessment

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Birds							
Atrichornis clamosus (Noisy Scrub Bird)	Vu	En	x		x	The Noisy Scrub-bird inhabits ecological communities that support a dense understorey or lower stratum of sedges and shrubs, a dense accumulation of leaf litter and an abundant population of litter-dwelling invertebrates. The Noisy Scrub-bird currently occurs in two sub-populations, one on the mainland in coastal areas from Two Peoples Bay Nature Reserve to Cheyne Beach and the other is located offshore on Bald Island. The core areas of male Noisy Scrub-bird territories are found in dense, long-unburnt vegetation characterised as low forest (5-15 m high), scrub/thicket and (rarely) heath. These vegetation formations occur in the gullies and drainage lines of hills and granite mountains and, in lowland areas, in overgrown swamps, lake margins and beside streams (Danks et al. 1996).	Unlikely - The species is known from two populations (Two Peoples Bay Nature Reserve to Cheyne Beach and Bald Island) and no habitat is present in the study area which is suitable for this species. The nearest record is approximately 8 km from the Survey area.
Botaurus poiciloptilus (Australasian Bittern)	En	En		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. It also occurs around swamps, lakes, pools, rivers and channels fringed with lignum *Muehlenbeckia*, canegrass *Eragrostis* or other dense vegetation. It occasionally ventures into areas of open water or onto banks	Highly Unlikely - The species has not been recorded within 10 km of Survey area and is known to use the coastal and estuarine regions around Walpole. The habitat present in the study area is not suitable for this species.
Cacatua pastinator pastinator (Muir's Corella)	Vu	CD			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	Unlikely – Habitat for this species occurs within the Survey area, however this species has not been

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
						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).	recorded within 10 km of the Survey area.
Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)	Vu	Vu	x	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 (*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).	Present – Recorded during the winter survey. This species has been recorded within 10 km of the Survey area and they are known to occur within and/or visit the region. Feeding and potential breeding habitat is available to this species. There are 6 records within approximately 7 km of the Survey area.
Calyptorhynchus baudinii (Baudin's Black Cockatoo)	Vu	En	x	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	Present – Recorded during the winter survey. This species has been recorded within 10 km of the Survey area and they are known to occur within and/ or visit the region. Feeding and potential breeding habitat is available to this species. There are numerous records within 10 km of the Survey area.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
						permanent sources of water, that provide the birds with protection from weather conditions (DSEWPaC, 2012).	
Calyptorhynchus latirostris (Carnaby's Black Cockatoo)	En	En	x	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 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).	Likely – This species has been recorded within 10 km of the Survey area and they are known to occur and or visit the region. Feeding and potential breeding habitat is available to this species. There are numerous records within 10 km of the Survey area.
Dasyornis longirostris (Western Bristlebird)	Vu	Vu	x		x	The Western Bristlebird is restricted to floristically diverse low dense coastal heathland. The distribution of the Western Bristlebird is fragmented, with populations in Fitzgerald National Park separated from those in the Hassell Beach/Waychinicup National Park/Two Peoples Bay Nature Reserve area (Gilfillan et al. 2007). Within this distribution, the species occurs in heathland that is 0.5–1.5 m tall, comprising a diverse variety of shrubs such as banksias, paperbarks, hakeas, sheoaks and Leptospermum sp. The Western Bristlebird occurs in similar areas to the Western Whipbird (*Psophodes nigrogularis nigrogularis*), Noisy Scrub-bird (*Atrichornis clamosus*) and the western subspecies of the Ground Parrot (*Pezoporus wallicus flaviventris*).	Unlikely - The species is known from fragmented populations along the south coast and no habitat is present in the Survey area.
Elanus scriptus (Letter winged Kite)	P4				x	This species habitat includes grasslands, with trees; tree lined watercourses (Pizzey and Knight 2012). Breeds typically in loose colony; often in coolibahs on inland watercourses; mostly spring, but whenever food is abundant (Pizzey and Knight 2012).	Highly Unlikely – This species has not been recorded within 10 km of the survey area and no habitat for this species is present within the survey area.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
							There are no records of this species within the region.
Falco peregrinus (Peregrine Falcon)		SP, s7			x	The Peregrine Falcon is not confined to a specific habitat. Found everywhere from woodlands to open grasslands and coastal cliffs - though less frequently in desert regions - it feeds almost entirely on other birds. In Western Australia, the Peregrine is widespread, although uncommon species, which is threatened by eggshell thinning due to pesticides, illegal hunting as a pest, capture for falconry and the cage trade.	Likely –The Peregrine Falcon is known from the region and habitat is available to this species for foraging with a small amount of potential breeding habitat in shallow tree hollows.
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 Victoria, to Tasmania. The species is readily seen on freshwater lakes and billabongs where deep fresh water is present (Morcombe 2004).	Unlikely - The species has been recorded within 10 km of the Survey area however no habitat is present in the Survey area. The nearest record is approximately 5 km from the Survey area.
Leipoa ocellata (Malleefowl)	Vu	Vu			x	The Malleefowl generally occurs in semi-arid areas of Western Australia, from Carnarvon to south east of the Eyre Bird Observatory (south-east Western Australia). It occupies shrublands and low woodlands that are dominated by mallee vegetation, as well as native pine Callitris woodlands, Acacia shrublands, Broombush Melaleuca uncinata vegetation or coastal heathlands. The nest is a large mound of sand or soil and organic matter (Jones and Goth 2008; Morcombe, 2004).	Highly Unlikely – This species has not been recorded within 10 km of the Survey area and no habitat for this species is present within the Survey area. There are no records of this species within the region.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Northiella haematogaster narethae (Naretha Blue Bonnet)		P4			x	The Naretha Blue Bonnet occurs on the western side of the Nullabor Plain. Naretha Blue Bonnets are usually found in or within sight of casuarina and acacia woodland, and usually near chenopod shrubland. They are often far from water. They nest in tree hollows, and eat the seeds of both native and exotic plants (Garnett and Crowley 2000).	Highly Unlikely – This species has not been recorded within 10 km of the survey area and no habitat for this species is present 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 eucalyptus 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 60 cm diameter and a high density of hollow trees of a range of sizes, including large hollows greater than 15 cm diameter which are suitable nesting places for Barking Owls. Roost sites are often located near waterways or wetlands.	Likely– This species has not been recorded within 10 km of the survey area however some habitat is present for this species within the survey area.
Platycercus icterotis xanthogenys (Western Rosella inland subspecies)		P4			x	The inland sub- species of the Western Rosella is found in open and partly cleared eucalypt woodland and forest, riverine forest, farmland, orchards, wooded savannah and shrubland. The inland populations have been affected by large scale deforestation. The bird feeds on grass seeds, herbs, insects, fruits, berries, flowers, nectar and buds. The species often f forms larger flocks where food is abundant and breeds in August to September in nests in tree-hollows (Higgins 1999).	Unlikely– Habitat for this species is present within the Survey area, however this species has not been recorded within 10 km of survey area and there are no records in the region.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Psophodes nigrogularis nigrogularis (Western Whipbird (Western heath)	En	En			x	The western heath subspecies of the Western Whipbird is known only to occur in one small population in south Western Australia, in the Two-Peoples Bay- Mt Manypeaks region. The population at Two Peoples Bay-Mt Manypeaks region is estimated as less than 100 pairs and occurs in dense coastal heath (Simpson and Day, 2004, Smith, 1991). The preferred habitat is thicket, a two to three metre high formation of varied floristic composition. Other vegetation types are used infrequently, although all nests are usually found in dense heath adjacent to areas of thicket (Smith 1991).	Highly Unlikely – This species has not been recorded within 10 km and is restricted to the Peoples Bay- Mt Manypeaks region. No habitat for this species is present within the Survey area.
Pezoporus flaviventris (Western Ground Parrot)	Cr	CR	x		x	There is only one population remaining of the western sub-species of the Ground Parrot, in coastal heath east of Albany in southwest Western Australia. There are only two remaining areas of refuge, Arid and Fitzgerald River National Parks, with about 110 individuals still thought to live in the wild. The Western Ground Parrot inhabits low, dry or swampy, near-coastal heathlands on sandplains and uplands in areas that receive 400-500 mm of rainfall annually (Gilfillan et al 2007, McNee 1999, 2000). The vegetation in such heathlands consists of moderately dense, low shrubs (usually not more than 0.5-1.0 m tall) and often with an open understorey of low sedges, including *Mesomelaena* species, that are usually less than 0.5 m tall. The vegetation usually includes scattered clumps of emergent, stunted (DEWHA 2010l) low-mallee (Eucalyptus species), and sometimes taller shrubs, or occasionally with some scattered tussock-grasses (Gilfillan et al 2007, McNee 1999). The Western Ground Parrot is usually recorded in areas of vegetation that have remained unburnt for five or more years.	Unlikely – This species been recorded within 10 km, however is restricted to coastal heath east of Albany. No habitat for this species is present within the Survey area.
Motacilla cinerea (Grey Wagtail)	Mi Te	IA		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 a seasonal visitor to Western Australia but the species is not known from this region.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Tyto novaehollandiae novaehollandiae (Masked Owl)		P3			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 100-300 m of the boundary of two vegetation types (Bell & Mooney, 2002).	Likely – This species has not been recorded within 10 km of the Survey area however habitat for this species is present. This species is known to occur within the region.
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 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).	Unlikely - The species has not been recorded within 10 km of the Survey area, however there is habitat present in the Survey area. There are 2 records within 35 km of the Survey area.
Dasyurus geoffroii (Chuditch, Western Quoll)	Vu	Vu	x	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.	Likely –This species has been recorded within the 10 km of the Survey area. Habitat is available to this species and they are known to occur in the region.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Falsistrellus mackenziei (Western False Pipistrelle)		P4			x	The Western False Pipistrelle occurs in wet sclerophyll forest dominated by Karri (E*ucalyptus 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).	Likely –This species has not been recorded within 10 km of the Survey area, however habitat is available. One record of this species is located within 15 km of 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)	Present – This specie was sighted within the survey area and has been recorded within 10 km of the Survey area. Habitat is available for this species.
Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)		P5	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 – This species was identified in the Survey area via diggings and has been recorded within 10 km of the Survey area. Habitat is available for this species.
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 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	Highly Unlikely - The species has not been recorded within 10 km of the survey area and no habitat is present in the Survey area.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
						property near Pingelly, Jaloran Road timber reserve near Wagin, Hopetown, Stirling Range National Park, and Fitzgerald River National Park (Van Dyck and Strahan 2008).	
Macropus Irma (Western Brush Wallaby)		P4	x		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).	Likely – This species has been recorded within 10 km of the Survey area and habitat is available for this species.
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 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).	Highly Unlikely - The species has not been recorded within 10 km of the Survey area and no habitat is present in the Survey area. The nearest record is within 17 km of the Survey area. There are scattered records of this species in the region.
Parantechinus apicalis (Dibbler)	En	En			x	Dibblers have been recorded over an extensive area and it is likely that they can occupy a diverse range of habitats (Friend 2004). However, the species seem to prefer vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years or more (Baczocha & Start 1997). Typically, captures have been on sandy substrates although occasional records are on laterite soils.	Unlikely - The species has not been recorded within 10 km of the Survey area and some habitat is present in the Survey area. The

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
							nearest records are 53 km from the Survey area.
Phascogale calura (Red-tailed Phascogale)	En	CD	x		x	The Red-tailed Phascogale inhabits Wandoo (*Eucalyptus wandoo*) and dense Sheoak (*Allocasuarina huegeliana*) woodland associations, with populations being most dense in the latter vegetation type. The species prefers vegetation that is unburnt for a long time, which provides continuous canopy cover to assist their arboreal habits. Trees need to be of a sufficient age to provide hollows for nesting in limbs or logs, and grass trees need to have ample skirts to provide cover. Small, scattered populations still occur in remnant vegetation in the Wheatbelt (DEC 2007).	Unlikely – This species has been recorded within 10 km of the Survey area however no suitable habitat is present within the Survey area.
Potorous gilbertii (Gilbert's Potoroo)	Cr	Cr			x	Gilbert's Potoroo is now known only from the Mount Gardner headland at Two Peoples Bay. Within that small area (1000 ha), it occurs in at least five separate patches of long-unburnt, dense shrubland on the valley slopes. There are only 30-40 individuals in the population. Today, the species is found in dense long-unburnt shrubland on the flanks of Mount Gardner, Two Peoples Bay Nature Reserve. Preferred habitat is tall shrubland dominated by Melaleuca striata between 1.5 and 2 metres tall, forming a 70-100% canopy cover over dense sedges including Lepidosperma and Anarthria. This grows on deep sandy soil on the slopes of valleys running between the granite ridges on this rocky headland. The fruiting bodies of underground fungi make up over 90% of the diet of Gilbert's Potoroo, all year round (Van Dyck and Strahan, 2008).	Highly Unlikely – This species has not been recorded within 10 km of the Survey area. This species is only known from the Mount Gardner headland at Two Peoples Bay Nature Reserve.
Phascogale tapoatafa subsp. *tapoatafa* (Southern Brush-tailed		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).	Present – This species was recorded on a motion sensor camera during the July survey. Habitat is available for this species and they have previously been

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Phascogale, Wambenger)							recorded within 10 km of the Survey area.
Pseudocheirus occidentalis (Western Ringtail Possum)	Vu	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).	Unlikely - Habitat is available for this species and they have been recorded within 10 km of the Survey area. Camera surveys and nocturnal spotlighting did not record this species.
Pseudomys occidentalis (Western Mouse)		P4			x	The western mouse shows a preference for long unburnt habitat (between 30 and 50 yrs) on sandy lay loam or sandy loam. Vegetation in suitable habitats is variable an includes sparse low shrubland, tall dense shrubland, sparse to dense shrub mallee and mid-dense woodland. All sites where the western mouse has been collected have had patches of extremely dense vegetation. On some sites, populations occur in dense vegetation surrounded by granite rocks, which may afford them protection from fire. Quandong (*Santalum acuminatum*) and sedge species are thought to be important habitat requirements in the northern part of the western mouse's range. Populations are fragmented and restricted to this type of (fragmented) habitat (Van Dyck and Strahan, 2008).	Highly Unlikely – This species has not been recorded within 10 km of the survey area and no habitat is available for this species within the survey area.
Pseudomys shortridgei (Heath Mouse)	Vu	Vu			x	In WA, the Heath Mouse is known from Fitzgerald River NP, Lake Magenta Reserve, the Lake Biddy area, Dragon Rocks Reserve, Hyden and Ravensthorpe (Cooper et al 2003). Prior to European colonisation, the species was more extensive, occurring from Shark Bay to Esperance (Cooper et al. 2003). The species occurs in mallee scrub over heath and mixed scrub (with Banksia spp.) over sedge, unburnt for at least 20 years in areas with 350 mm annual rainfall (Van Dyck and Strahan, 2008).	Highly Unlikely – This species has not been recorded within 10 km of the Survey area and no habitat is available within the Survey area.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
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 – Limited quality and extent of habitat is available for this species. They have been recorded within 10 km of the Survey area.
Reptiles							
Acanthophis antarcticus (Southern Death Adder)		P3			x	The Southern Death Adder habitat ranges from rainforest to shrublands and heaths. This species is declining in many areas, probably due to habitat destruction and altered fire regimes (Wilson and Swan, 2013).	Highly Unlikely – This species has not been recorded within 10 km of the survey area and limited habitat is available within the Survey area. This species has not been recorded within the region.
Elapognathus minor (Short-nosed Snake)		P2	x		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 10 km of the survey area and suitable habitat for this species is present within the Survey area.
Fish							
Nannatherina balstoni (Balston's Pygmy Perch)	Vu	T	x	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	Unlikely – No suitable habitat is available for this species.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
						commonly associated with tall sedge thickets and inundated riparian vegetation (Allen et al. 2002).	
Nannoperca pygmaea (Little Pygmy Perch)		En			x	Due to its extremely restricted range (Hay River system) where it is known from only 0.06 km².	Unlikely – No suitable habitat is available for this species and the species has not been recorded within 10 km of the Survey area.
Galaxiella munda (Western Mud Minnow)	Vu	T	x		x	The species occurs in swift flowing streams within karri forests and is typically found near submerged vegetation, occasionally in the still water of ponds, swamps and roadside drains, and often inhabiting darkly tannin-stained and acidic water. The water where the Mud Minnow is found exhibits marked seasonal temperature fluctuations. Occurs in a number of systems between Donnelly and Angove rivers (Allen et al. 2002).	Likely – No suitable habitat is available for this species.
Galaxiella nigrostriatal (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 – No suitable habitat is available for this species and the species has not been recorded within 10 km of 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.	Unlikely – the species has not been recorded within 10 km of the Survey area.

Species Name	Status		Desktop Search				
	EPBC Act Status	WA Status	NM	PMST	DPaW – Warren and South Coast	Description and habitat requirements	Likelihood
Invertebrates							
Cherax tenuimanus (Margaret River Marron)	Cr	T	x			They are a large freshwater crayfish that can grow to more than 38 cm in total length. They are one of the largest freshwater crayfish species in the world with specimens having been recorded in excess of 2 kg (Nguyen et al., 2002 in DotE 2016). The hairy marron has tufts of hair-like setae on the carapace and other body surfaces (Molony et al., 2004, cited in TSSC, 2006 in DotE 2016). Adults are readily identified as being different to the smooth marron (*C. cainii*), but hybrids are more difficult to identify (Lawrence, cited in Molony, 2002 in DotE 2016).	Unlikely – No suitable habitat is available for this species and they have not been recorded within 10 km of the Survey area..
Cynotelopus notabilis (WA Pill Millipede)		T	x			This species habitat includes deep leaf litter and under logs and rocks. They have been collected in areas associated with granite tors, from under the bark of Karri bark and under leaf litter (Main et al. 2002).	Likely – Suitable habitat is not present for this species, and they have been recorded within 10 km of the Survey area.

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