



Natural Area
CONSULTING MANAGEMENT SERVICES

City of Canning

Flora, Vegetation and Fauna Survey Southern Link Road

Final – 18 May 2016, V1.2

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Executive Summary

Natural Area Consulting Management Services was contracted by the City of Canning to carry out a level 2 flora and vegetation survey and a level 2 fauna survey at the proposed Southern Link Road site in Cannington. Survey outcomes provide baseline data of flora, fauna and ecological communities present within the site that will assist with the environmental approval process associated with the proposed development of Southern Link Road.

The flora and vegetation survey within Southern Link Road assessment site confirmed:

- the presence of 111 flora species, of which 69 were dicotyledons and 42 were monocotyledons
- 57 native and 54 introduced flora species were present
- presence of the Priority 4 listed *Ornduffia submersa*, and the threatened *Eremophila glabra* subsp. *Chlorella*.
- presence of the threatened ecological community Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain
- nine vegetation types were identified, with the dominant vegetation type being the *Melaleuca lateritia* Heathland
- vegetation condition ranged from Completely Degraded to Excellent, with the majority being classed as Completely Degraded
- one weed of national significance (WoNS), Bridal Creeper (*Asparagus asparagoides*) was present, this species and the Arum Lily (*Zantedeschia aethiopica*) found are category C3 declared pests under the *Biosecurity and Agricultural Management Act 2007* (WA).

The fauna survey within Southern Link Road assessment site confirmed:

- the presence of three mammals, 15 birds, five reptiles, four amphibians and 42 invertebrates
- no significant fauna species were recorded
- the presence of the introduced European Red Fox (*Vulpes vulpes*), and the European Rabbit (*Oryctolagus cuniculus*), which are both listed as category C3 declared pests under the *Biosecurity and Agriculture Management Act 2007* (WA).

As the flora, vegetation and fauna surveys were carried out during spring in a degraded site they are considered to be sufficient for environmental assessment purposes with no further surveys recommended.

The proposed Southern Link Road layout will impact 0.16 ha of the threatened ecological community (TEC) (5.8 ha) within the south-east of the site; this includes 0.04 ha (0.7%) in Very Good condition, 0.05 ha (0.9%) of Good condition and 0.07 ha (1.2%) in Degraded vegetation condition (Figure 9). This represents 2.75% of the TEC directly impacted by the Southern Link Road. However, since the fire occurred in November 2015 in the south-east of the site the vegetation has been reduced to Degraded in burnt areas. The proposed road layout will impact 0.44 ha of the conservation category wetland (6.71 ha) (Figure 2).

If the proposed road construction is undertaken, clearing of 0.37 ha overall of native vegetation will be required, of which 0.16 ha is located within the threatened ecological community (Figure 8). No threatened or priority flora species will be impacted by the proposed road development.

The threatened ecological community is listed as a matter of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth), with the level of impact unlikely to be considered significant due to the degraded nature of the site and the affected area being limited to 0.09 ha of vegetation in Good or Very Good condition. On that basis, a referral to the Commonwealth Department of the Environment is not warranted. A pre-referral meeting with the Perth Office of the Commonwealth Department of the Environment can be undertaken to ensure there is no requirement for referral.

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1.0 Introduction

The City of Canning commissioned Natural Area Consulting Management Services (Natural Area) to carry out level 2 flora, vegetation and fauna surveys to support environmental approvals processes associated with the construction of the Southern Link Road within the Canning city centre. The survey site included portions of the Western Power substation between Grose Avenue, and undeveloped land around Grey and Lake Streets, and covers approximately 12.4 ha (Figure 1).

The on-ground flora survey activities were carried out by Natural Area botanist Sharon Hynes assisted by Taryn Brebner over three separate days in 2015 (29 September, 09 October and 09 November) targeting flowering times of declared rare or priority flora species identified as potentially occurring at the site and during the main flowering period for flora on the Swan Coastal Plain. Natural Area biologists carried out the fauna survey activities over a 10-day period between 16 and 26 November 2015, with traps installed on the 16th and left in situ until the 26th. A night survey for nocturnal fauna species was undertaken on the 17th December 2015.

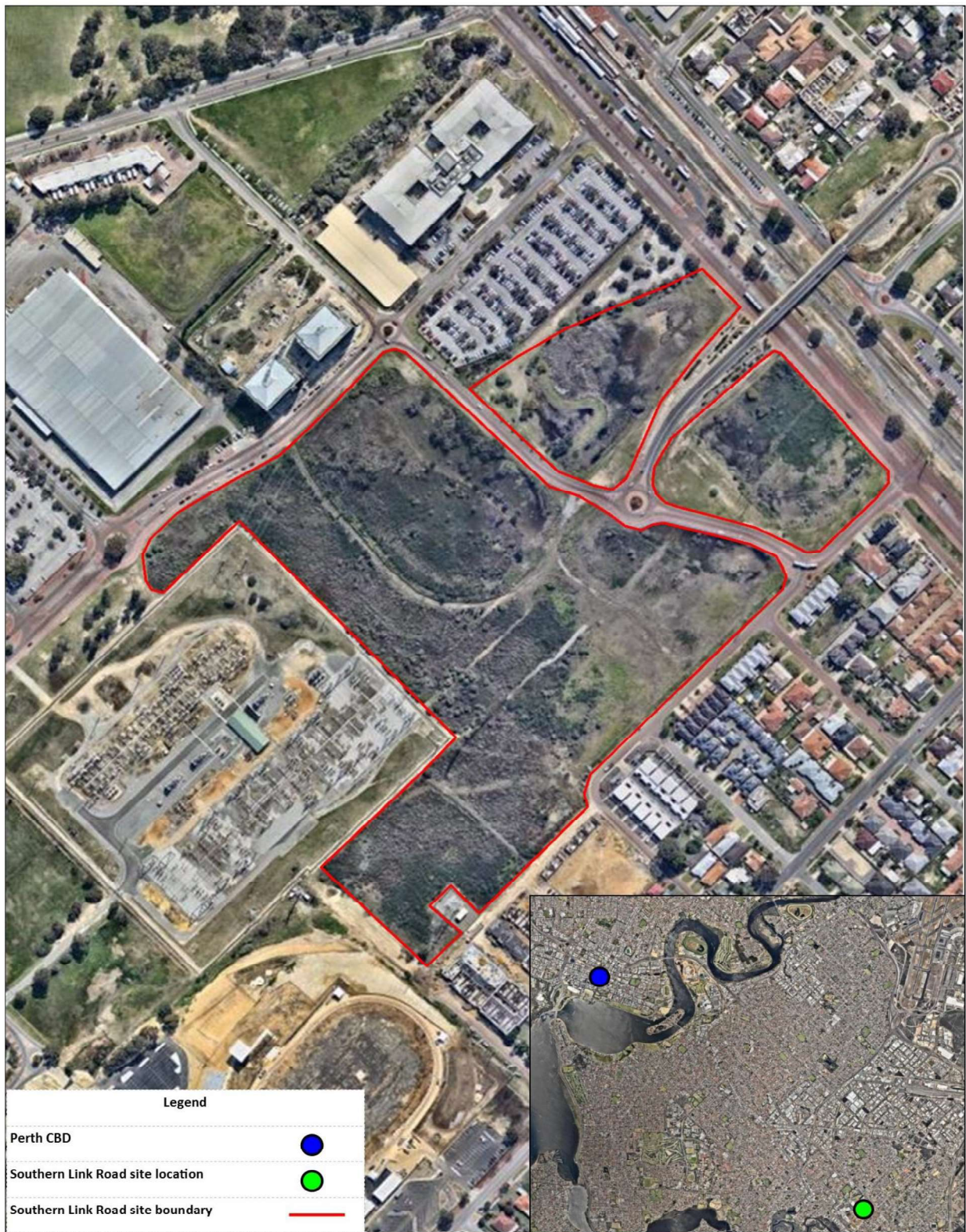
This report outlines:

- the site location
- description of the existing environment
- survey aims and objectives
- methodology
- survey results
- discussion of results.

1.1 Scope of Works

Natural Area's scope of works associated with the surveys included the following:

- undertake searches of various State and Federal databases to identify the likely presence of flora and fauna species, including any declared rare or priority species, along with any threatened or priority ecological communities
- identify the flora and vegetation species on site
- assess vegetation type and condition
- review the presence of threatened or priority ecological communities
- install a series of pitfall, funnel and Elliott traps and motion activated cameras on site to identify fauna present
- undertake opportunistic fauna sightings during other site activities and during a dusk/evening survey
- document results.



 **Figure 1:**
 Site location, Southern Link Road assessment site, Cannington



Client: City of Canning
 Project: Flora and Fauna Report,
 Southern Link Road
 Image Source: Nearmap, 2015
 Prepared by: Sharon Hynes
 Datum: GDA 94, Zone 50



2.0 Site Characteristics

The flora, vegetation and fauna found at a particular location are directly influenced by several key factors, including:

- climate
- soils
- topography
- disturbance processes, such as land clearing.

2.1 Regional Context

According to Interim Biogeographical Regionalisation of Australia (IBRA) descriptions, Perth is located within the Swan Coastal Plain region. The Swan Coastal Plain comprises two major divisions, the Swan Coastal Plain 1 - Dandaragan Plateau and Swan Coastal Plain 2 - Perth Coastal Plain (Mitchell, Williams and Desmond, 2002), with the City of Canning situated in the latter.

2.2 Climate

The climate experienced in the area is Mediterranean, with dry, hot summers and cool, wet winters.

According to the Bureau of Meteorology (Perth Airport, Station ID 009021, 2015):

- average rainfall is 771.6 mm pa, with the majority falling between May and August;
- average maximum temperature ranges from 17.9 °C in winter to 31.9 °C in summer, with the highest recorded maximum being 46.7 °C;
- average minimum temperatures range from 8.0 °C in winter to 17.5 °C in summer, with the lowest recorded minimum being -1.3 °C; and
- predominant wind directions include morning easterlies and westerly sea breezes during summer months, with an average wind speed of 23.8 km/h and gusts of more than 100 km/h.

2.3 Soil Type

According to the SLIP NRM Portal (Department of Agriculture and Food, 2015), the soil type present at the survey site is the 213Pj-S10 Pinjarra S10 phase that is described as being sand of eolian origin present as a relatively thin veneer over sandy clay to clayey sand.

2.4 Topography

The topography of the site is relatively flat at 2 m AHD, with small areas where the height is 4 m AHD.

2.5 Hydrology

The Southern Link Road assessment site is a seasonal wetland that becomes inundated during the winter months and early spring. The majority of the site is classified as a conservation category wetland (6.71 ha), which is considered environmentally significant and has restrictions on land use and management practices within the area. Approximately 0.44 ha occurs within the proposed road boundary. The north-east of the site is classified as multiple use wetland and a small portion on the north-west side is no longer considered a wetland, which are not considered environmentally sensitive areas (Figure 2) (Landgate, 2016).



2.6 Vegetation Complex

The vegetation complex located at the site is the Guildford Complex (WALGA, 2015a). This is described as being a mixture of open-forest or tall open-forest of Marri (*Corymbia calophylla*), Wandoo (*Eucalyptus wandoo*) and Jarrah (*Eucalyptus marginata*) in dry areas, with Flooded Gum (*Eucalyptus rudis*) and Swamp Paperbark (*Melaleuca raphiophylla*) in wetter areas with much of the vegetation cleared since European settlement (Hedde, Loneragan and Havel, 1980).

According to the WALGA (2013), the pre-European extent of the Guildford Complex was 92281.43 ha, of which 5412.79 ha or 5.87% remained in 2013. Within the City of Canning, the extent of Guildford Complex vegetation was 305 ha, of which 4.66 ha or 1.53% remains (WALGA, 2013), representing 0.51% of the pre-European extent of the vegetation complex within the Perth and Peel areas. The remnant portion of the Guildford Complex vegetation is located within the survey boundary.

2.7 Threatened Ecological Community

The threatened ecological community Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain has been identified at the site (Department of Parks and Wildlife, 2015b). The Department of the Environment (2015c) indicates that this community supports a rich layer of herbaceous annuals under a dense, diverse shrub layer on heavy soils. Flora species present are typically associated with the Tamala limestone soils in coastal rather than inland areas, such as *Eucalyptus decipiens*, *Eucalyptus foecunda*, *Exocarpos sparteus*, *Melaleuca huegelii*, *Melaleuca acerosa*, *Conostylis candidans* and *Thysanotus arenarius*.

While this threatened ecological community was not identified on the protected matters search tool report, it is listed as a matter of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (DPaW, 2015e; Department of the Environment, 2015c). The Department of Parks and Wildlife indicate that this threatened ecological community is also present in seven other sites nearby, namely Kenwick, Brentwood and Wattle Grove (DPaW, 2015e). The proposed Southern Link Road layout will require clearing 0.16 ha of the threatened ecological community, of which 0.09 ha is vegetation in Good or Very Good condition. The threatened ecological community and the proposed road layout is shown in Figure 3.

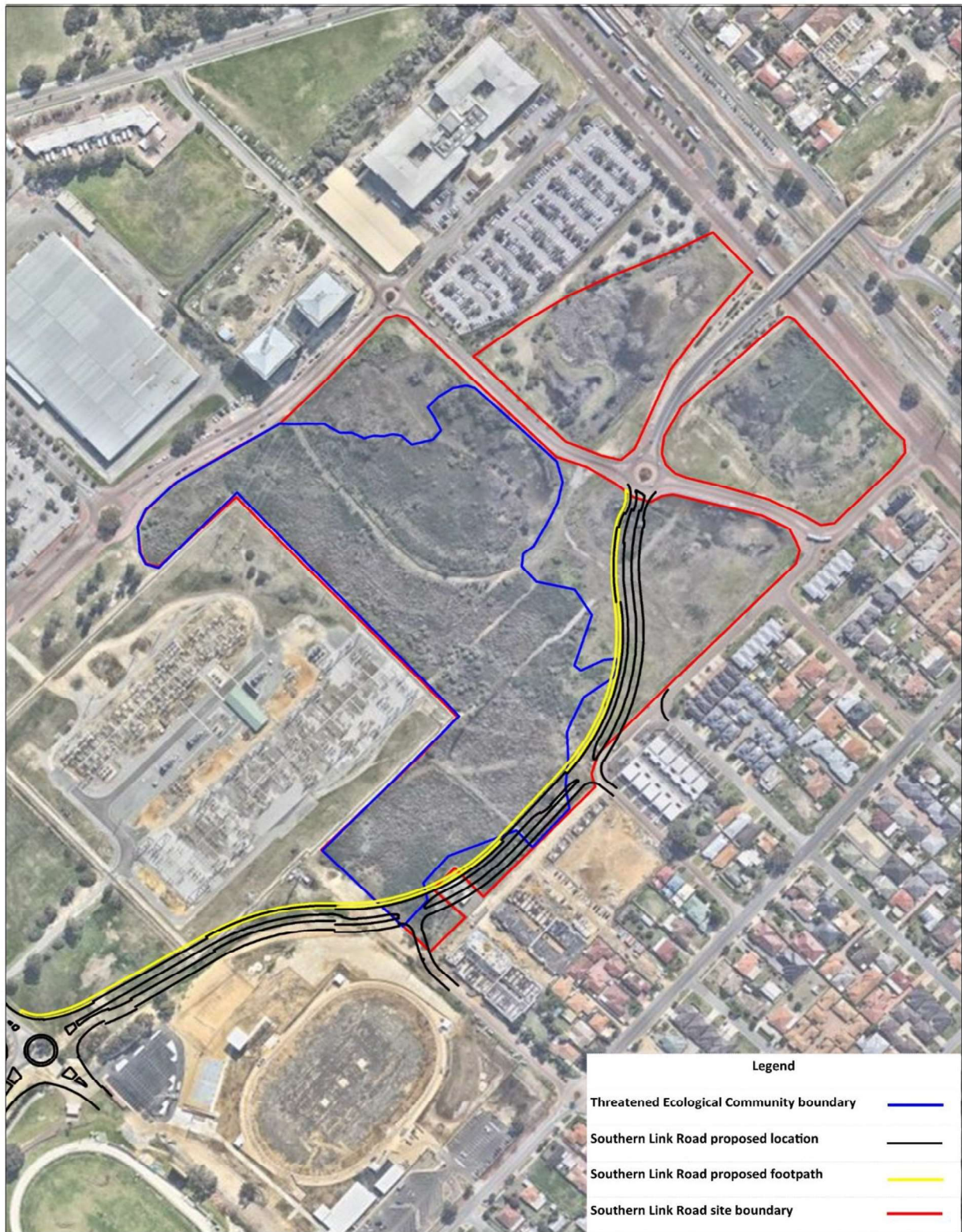
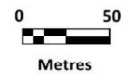


Figure 3:
 Threatened ecological community and proposed road boundary, Southern Link Road assessment site, Cannington



Client: City of Canning
 Project: Flora and Fauna Report, Southern Link Road
 Image Source: Nearmap, 2015
 Prepared by: Sharon Hynes
 Datum: GDA 94, Zone 50



3.0 Flora and Vegetation Survey Methodology

3.1 Objectives

The major objective of the flora and vegetation survey was to reconfirm the flora and vegetation values at the site and use the outcomes to assist with planning and associated development approvals processes.

3.2 Desktop and Literature Review

The flora and vegetation survey was carried out in accordance with *EPA Guidance Statement 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (Environmental Protection Authority, 2004), and included a desktop review of literature and databases.

The desktop flora and vegetation survey was undertaken to determine the:

- native and non-native flora species present
- current extent of native vegetation
- general floristic community types
- likely presence of threatened or priority flora species
- likely presence of any threatened or priority ecological communities.

The following databases were used to gather the above information:

- NatureMap (DPaW, 2015b)
- Protected Matters Search Tool (Department of Environment (DotE), 2015a) (Cwlth)
- Threatened (Declared Rare) and Priority Flora Database (DPaW, 2015b)
- Western Australian Herbarium Specimen Database (DPaW, 2015b)
- Threatened and Priority Flora List (DPaW, 2015b)
- FloraBase (DPaW, 2015a).

The NatureMap and Protected Matters Search Tool reports included the site and a 2 km buffer.

3.3 On-ground Methodology

Natural Area Botanists Sharon Hynes and Taryn Brebner traversed the site on foot over three separate days (29 September 2015, 09 October 2015 and 11 November 2015), with key data recorded using a Trimble GPS unit including:

- identification of species present by walking the site, including targeting declared rare and priority species
- assessment of weed presence, including type and density
- confirm vegetation type using four 10 m x 10 m quadrats set up by Woodman Environmental in 2004, with the installation of a further four quadrats (Figure 4)
- assessment of vegetation condition
- using GPS to map significant species and boundaries of differing vegetation types and condition
- determine the presence of any further threatened or priority listed flora species and/or ecological communities listed under the *Wildlife Conservation Act 1950* (WA) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

The following were recorded for each quadrat:

- location
- vegetation description
- aspect
- habitat
- soil type and colour
- inundation
- evidence of disturbance, including fire
- height of species
- species abundance
- percentage foliar cover of each species.

The flora and vegetation survey was carried out in accordance with *Guidance Statement 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (Environmental Protection Authority, 2004). Samples were collected or photographs taken of unfamiliar species to enable later identification.

3.3.1 Flora Species

Flora species were recorded on observation within each quadrat and when the remainder of the site was traversed, with the list of potential declared rare or priority flora species used to guide targeted searches for those species (Appendix 3). The species list includes native and introduced species.

3.3.2 Vegetation Type

The vegetation type was determined using the structural classes described in *Bush Forever Volume 2* (Government of Western Australia, 2000), and records dominant over storey, middle and understorey species. A description of the various structural classes is provided in Table 1.

Table 1: Vegetation structural classes

Life Form/Height Class	Canopy Percentage Cover			
	100 – 70%	70 – 30%	30 - 10%	10 – 2 %
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland
Trees 10 – 30 m	Closed forest	Open forest	Woodland	Open woodland
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland
Tree Mallee	Closed tree mallee	Tree mallee	Open tree mallee	Very open tree mallee
Shrub Mallee	Closed shrub mallee	Shrub mallee	Open shrub mallee	Very open shrub mallee
Shrubs over 2 m	Closed tall scrub	Tall open scrub	Tall shrubland	Tall open shrubland
Shrubs 1 – 2 m	Closed heath	Open heath	Shrubland	Open shrubland
Shrubs under 1 m	Closed low heath	Open low heath	Low shrubland	Low open shrubland
Grasses	Closed grassland	Grassland	Open grassland	Very open grassland
Herbs	Closed herbland	Herbland	Open herbland	Very open herbland
Sedges	Closed sedgeland	Sedgeland	Open sedgeland	Very open sedgeland

(Source: Government of Western Australia, 2000)

3.3.3 Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Bush Forever Volume 2* (Government of Western Australia, 2000). A Trimble GPS unit was used to differentiate the locations of the vegetation condition across the site and assist with mapping outcomes. Table 2 provides a description of the rating scale.

Table 2: Vegetation condition ratings

Category	Description
1 Pristine	Pristine or nearly so, no obvious signs of disturbance.
2 Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3 Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4 Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
5 Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
6 Completely Degraded	The structure of the 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.

(Source: Government of Western Australia, 2000)

3.4 Limitations

While the surveys were carried out at the optimum time to enable identification of the majority of species present, a number of limitations associated with both desktop and on-site flora surveys remain. These include:

- database searches only provide an indication of what flora species may be present, with on ground surveys required to confirm those actually present
- the differing databases are reliant on information submitted via various reporting mechanisms, so all records of a particular flora species or ecological community in a specified area may not be complete
- on-ground surveys indicate species present at the time of the assessment, with species flowering at different times are not always able to be identified
- not all species flower every year
- variations in outcomes with other surveys include the judgements applied at the time of the assessment and natural variation at the time each survey was carried out.

Despite the various survey limitations, Natural Area estimates that 85 – 95% of species at the site were recorded.



Figure 4:
 Flora quadrat locations, Southern Link Road assessment site, Cannington

Client: City of Canning
 Project: Flora and Fauna Report, Southern Link Road
 Image Source: Nearmap, 2015
 Prepared by: Sharon Hynes
 Datum: GDA 94, Zone 50

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4.0 Flora Survey Results

4.1 Desktop Survey Results

4.1.1 Flora Species

NatureMap (DPaW, 2015c) indicates the potential for 106 dicotyledons (21 introduced species), 1 gymnosperm and 97 monocotyledons (23 introduced species) (Appendix 1).

4.1.2 Significant Flora

The Department of Parks and Wildlife threatened and priority flora and herbarium databases, NatureMap, and the Protected Matters Search Tool (Cwlth) (Appendix 2), identified the potential for 27 significant flora species in or near to the site of which 20 have a greater likelihood of being present based on the habitat types occurring at the site. Details of each are provided in Appendix 3, with a description of the conservation codes provided in Appendix 4. Four species that have been previously found within the site are listed in Table 3, including their conservation codes, flowering times and the years they were recorded. These species were targeted during on ground flora surveys.

Table 3: threatened and priority species previously found in Southern Link Road assessment site

Species Name	Conservation Code (WA)	Conservation Code (Cwlth)	Flowering times	Year recorded on site
<i>Aponogeton hexatepalus</i>	P4		July to October	2004
<i>Eremophila glabra subsp. chlorella</i>	T	CR	July to November	2007, 2011
<i>Ornduffia submersa</i>	P4		August to November	2004
<i>Schoenus natans</i>	P4		October	2004

4.2 Field Survey Results

4.2.1 Flora Composition

A total of 111 flora species were recorded from 43 families within the survey boundary, of which:

- 42 were monocotyledons (21 native species, 21 introduced species)
- 69 were dicotyledons (36 native species, 33 introduced species).

A list of all species observed is provided in Appendix 5, with quadrat data in Appendix 4. Examples of native species observed are provided in Figure 5.

Figure 5: Examples of native flora species



Scaevola lanceolata
 (Long-leaved Scaevola)



Amyema linophylla subsp.
Linophylla (Mistletoe)



Pimelea imbricata



Haemodorum simplex



Verticordia huegelii var. *huegelii*



Meeboldina coangustata



Viminaria juncea



Verticordia densiflora var.
densiflora



Melaleuca lateritia
 (Robin Redbreast Bush)

4.2.2 Significant Flora

The threatened species *Eremophila glabra* subsp. *chlorella*, and the Priority 4 species *Ornduffia submersa* were observed during the site survey activities (Figure 6). The proximity of these species in relation to the proposed road layout is shown in Figure 8.

Figure 6: Significant species observe in Southern Link Road assessment site



Ornduffia submersa (P4)



Eremophila glabra subsp. *chlorella* (T)

4.2.3 Introduced Flora

Of the 111 species recorded, 54 (48.6%) were introduced plants. Of these, Bridal Creeper (*Asparagus asparagoides*) is listed as a weed of national significance (WoNS) requiring control at a national level (Weeds Australia, 2015). Bridal Creeper (*Asparagus asparagoides*) and Arum Lily (*Zantedeschia aethiopica*) are listed on the Western Australian Organism List (WAOL) as C3 declared pests under the *Biosecurity and Agriculture Management Act 2007* (WA) requiring management to alleviate the harmful impact, reduce the numbers and/or distribution of the organism (Department of Agriculture and Food WA, 2015).

Seven species are listed as having a medium or high control priority on the Department of Parks and Wildlife's Weed Prioritisation Process for the Swan Coastal Plain (2015):

- *Acacia iteaphylla* (H) – Flinders Range Wattle
- *Euphorbia terracina* (M) – Geraldton Carnation Weed
- *Gladiolus undulata* (M) – Wavy Gladiolus
- *Hyparrhenia hirta* (M) – Tambookie Grass
- *Lupinus cosentinii* (H) – Sandplain Lupin
- *Ricinus communis* (M) – Castor Oil Plant
- *Zantedeschia aethiopica* (M) – Arum Lily

Examples of introduced flora species are shown in Figure 7.

Figure 7: Examples of introduced flora species



Tambookie Grass
(*Hyparrhenia hirta*)



Common Vetch
(*Vicia sativa*)



Pimpernel
(*Lysimachia arvensis*)



Giant Reed
(*Arundo donax*)



Castor Oil Plant
(*Ricinus communis*)



Poplar Tree
(*Populus* sp.)



Cape Lilac
(*Melia azedarach*)



Orange Trumpet Vine
(*Campsis radicans*)



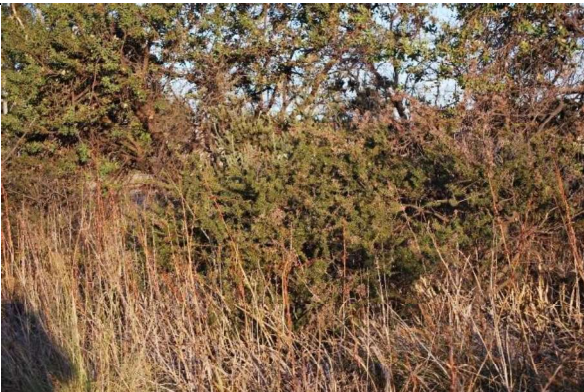






Bridal Creeper
(*Asparagus avarsagoides*)



4.2.4 Vegetation Types

Nine vegetation types were identified within the site, with *Melaleuca lateritia* Heathland covering the majority of the site. Vegetation types are described in Table 4 with locations of each shown in Figure 9.

Table 4: Vegetation types within the Southern Link Road assessment site

Vegetation Type	Description	Photograph
Open <i>Casuarina obesa</i> Woodland	<i>Casuarina obesa</i> Woodland over a <i>Meeboldina cana</i> , <i>M. coangustata</i> and <i>Chorizandra enodis</i> sedgeland	
Viminaria juncea and Melaleuca lateritia Shrubland	<i>Viminaria juncea</i> and <i>Melaleuca lateritia</i> Shrubland over scattered mixed shrubs and a * <i>Watsonia meriana</i> var. <i>bulbillifera</i> sedgeland	
Open <i>Hakea prostrata</i> Shrubland	Open <i>Hakea prostrata</i> Shrubland over sparse <i>Adenanthos cygnorum</i> and <i>Hakea varia</i> shrubs and a dense * <i>Watsonia meriana</i> var. <i>bulbillifera</i> sedgeland	

Vegetation Type	Description	Photograph
<i>Melaleuca lateritia</i> Heathland	Heathland of <i>Melaleuca lateritia</i> shrubs over mixed shrubs including <i>Eutaxia virgata</i> , <i>Cassythia racemosa</i> and <i>Astartea affinis</i> and an understorey of <i>Chorizandra enodis</i> , <i>Meeboldina cana</i> and <i>Goodenia pulchella</i> subsp. Coastal Plain B	
<i>Meeboldina</i> Sedgeland	<i>Meeboldina cana</i> and <i>M. coangustata</i> Sedgeland with sparse <i>Hakea sulcata</i> shrubs and <i>Melaleuca raphiophylla</i> trees, and an understorey of weedy herbs and grasses	
<i>Baumea juncea</i> Sedgeland	Sedgeland of <i>Baumea juncea</i> with sparse weedy herbs and grasses	
Open <i>Bolboschoenus caldwellii</i> Sedgeland	Open Sedgeland of <i>Bolboschoenus caldwellii</i> over * <i>Cynodon dactylon</i> grassland, with scattered <i>Meeboldina coangustata</i> sedges	

Vegetation Type	Description	Photograph
<i>Verticordia densiflora</i> var. <i>densiflora</i> Heathland	<i>Verticordia densiflora</i> var. <i>densiflora</i> Heathland with mixed shrubs including <i>Pimelea imbricata</i> and <i>Verticordia huegelii</i> var. <i>huegelii</i> , and a sedgeland of <i>Patersonia occidentalis</i> and <i>Lepidosperma longitudinale</i>	
<i>Melaleuca raphiophylla</i> Woodland	<i>Melaleuca raphiophylla</i> Woodland over mixed species including <i>Cassutha racemosa</i> , <i>Meeboldina cana</i> and weedy herbs and grasses	

4.2.5 Vegetation Condition

Vegetation condition was assessed at the same time the spring survey was carried out, and ranged from Completely Degraded to Very Good, with the majority of the site (51.2%) recorded as Completely Degraded (Table 5, Figure 10). The condition of the area where the 22 November 2015 fire occurred is now considered to be Degraded, however this will be temporary until regeneration is complete (Table 4; Figure 12).

Table 5: Vegetation condition

Vegetation Condition	Excellent	Very Good	Good	Degraded	Completely Degraded	Totals
Pre fire area (ha)	0.2	2.3	2.3	1.1	6.2	12.1
Pre fire area (%)	1.7	19	19	9.1	51.2	100
Post fire area (ha)	0.2	2	1.7	2	6.2	12.1
Post fire area (%)	1.7	16.5	14.1	16.5	51.2	100

4.2.6 Ecological Communities

As indicated in Section 2.7 and Figure 3, that portion of the site containing native vegetation with a good or better condition rating has been identified as the threatened ecological community Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain (Department of Parks and Wildlife, 2015b). Flora species recorded during the surveys were also compared with floristic community types 7 (Herb Rich Saline Shrublands in Clay Pans), 8 (Herb Rich Shrublands in Clay Pans), 9 (Dense Shrublands on Clay Flats) and 10a (Shrublands on Dry Clay Flats) (Gibson *et al*, 1994). While a number of species from each of these community

types were recorded during the survey, the numbers were low and all were located within the vegetated area associated with the Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain threatened ecological community. This suggests that the likelihood of community types 7, 8, 9, and/or 10a occurring within the remainder of the site is very low due to its degraded nature.

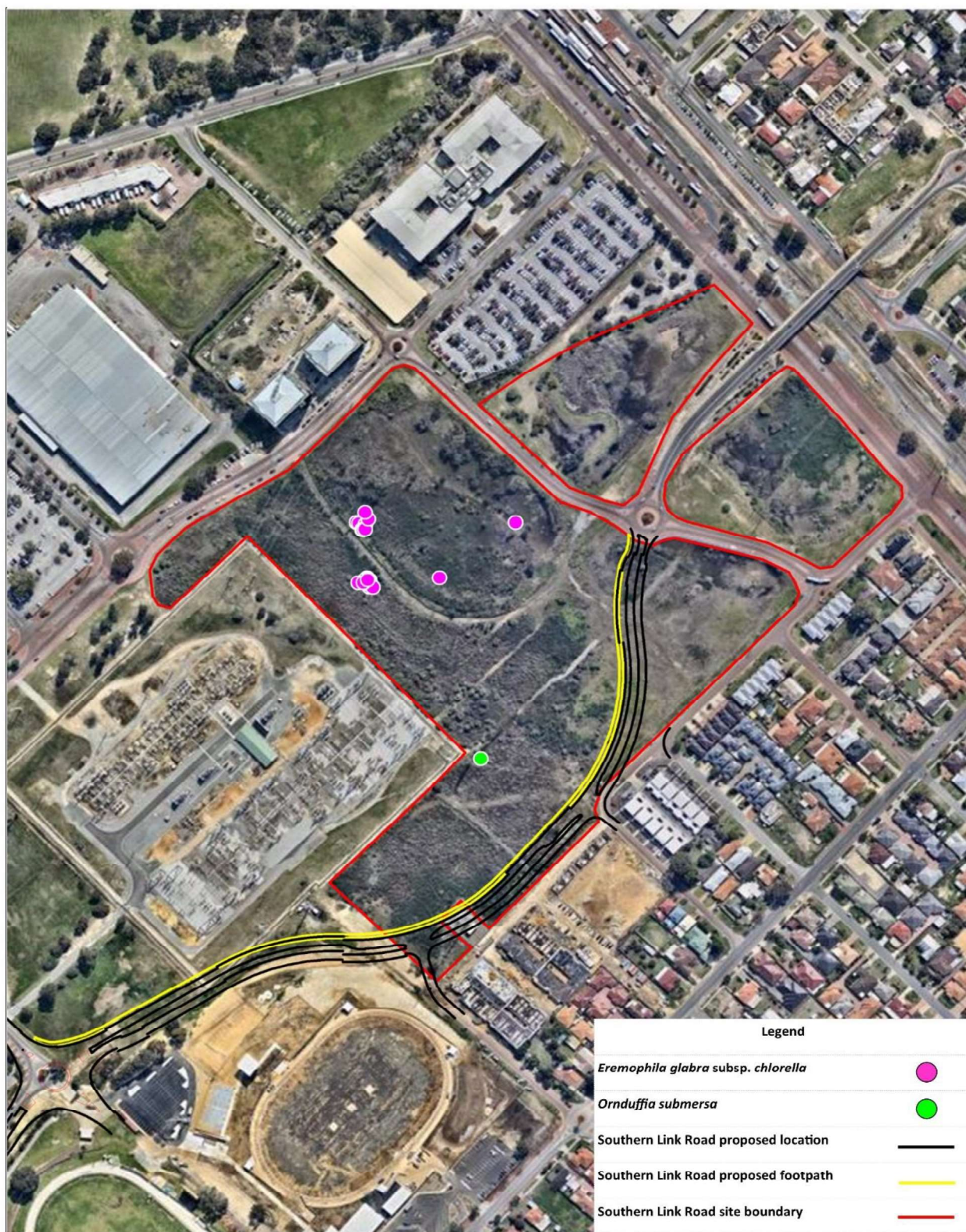
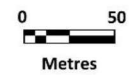


Figure 8:
 Significant flora locations and proposed road boundary, Southern Link Road assessment site, Cannington



Client: City of Canning
 Project: Flora and Fauna Report, Southern Link Road
 Image Source: Nearmap, 2015
 Prepared by: Sharon Hynes
 Datum: GDA 94, Zone 50



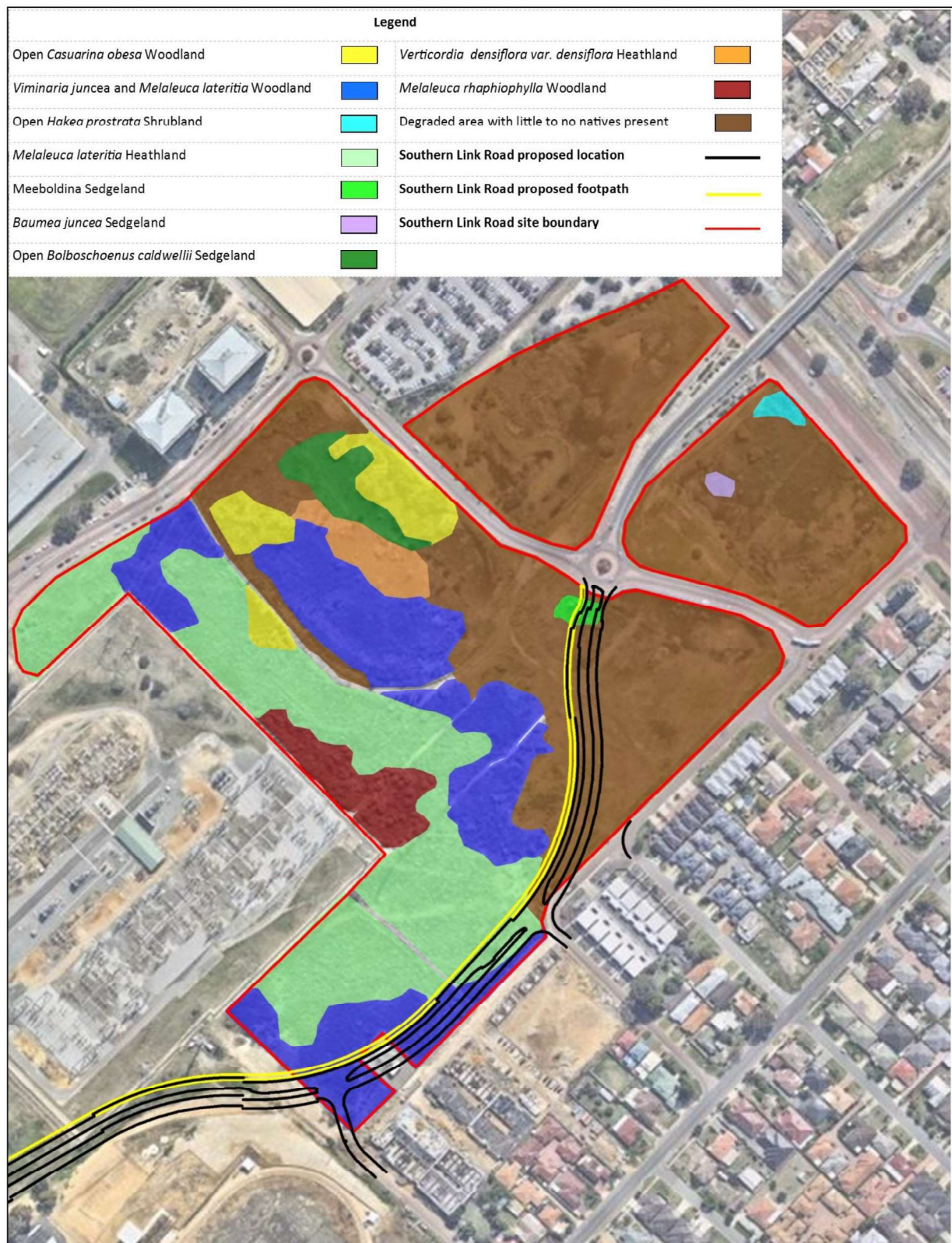


Figure 9:
Vegetation types and proposed road location,
Southern Link Road assessment site,
Cannington



Client: City of Canning
Project: Flora and Fauna Report,
Southern Link Road
Image Source: Nearmap, 2015
Prepared by: Sharon Hynes
Datum: GDA 94, Zone 50

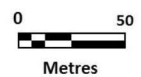




Figure 10:
 Vegetation condition, Southern Link Road
 assessment site, Cannington



Client: City of Canning
 Project: Flora and Fauna Report,
 Southern Link Road
 Image Source: Nearthmap, 2015
 Prepared by: Sharon Hynes
 Datum: GDA 94, Zone 50



4.3 Fire

A fire occurred within the site on Sunday the 22 November 2015 whilst fauna trapping activities were ongoing. No fauna trap lines, traps or trail cameras were affected by the fire. The burnt areas (Figure 11 and 12) are now in Degraded condition, although this will be temporary as the area will be able to naturally regenerate.



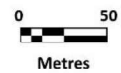
Figure 11: Burnt areas within Southern Link Road assessment site (23 November 2015)



Figure 12:
 Fire November 2015, Southern Link Road
 assessment site, Cannington



Client: City of Canning
 Project: Flora and Fauna Report,
 Southern Link Road
 Image Source: Nearmap, 2015
 Prepared by: Sharon Hynes
 Datum: GDA 94, Zone 50



5.0 Fauna Survey Methodology

5.1 Desktop Survey

The desktop fauna survey activities included:

- Obtaining the required Regulation 17 licence from the DPaW to take fauna for scientific purposes (Licence number: SF010506)
- requesting searches for the Department of Parks and Wildlife’s fauna databases to determine if priority or threatened fauna species have been previously recorded within or nearby the site
- undertaking a review of NatureMap (DPaW, 2015e) online database to indicate the fauna species (native and introduced) that could potentially occur within a 2 km buffer of the site
- undertaking a review of the Protected Matters Search Tool (Department of the Environment, 2015b) database to determine if any matters of national environmental significance were likely to occur within or close to the assessment site

5.2 Fauna Trapping and Observations

Fauna survey activities were undertaken throughout the Southern Link Road assessment site, in accordance with Guidance statement 56 – Terrestrial Fauna Surveys for Environmental Impact in Western Australia (Environmental Protection Authority, 2004b). Traps were placed in locations where there was more native vegetation cover to provide protection from the weather, and so they were not so easily visible or accessible by members of the public, therefore they were not placed in the two northern portions of the site that lacked native vegetation cover and were more easily accessed. The level 2 fauna survey undertaken from 17 – 26 November 2015 included the following:

- walking the site to determine the most appropriate locations for trap and trap line set up, as well as record opportunistic sightings of fauna species such as tracks, scats, dens and diggings
- setting out funnel and pitfall traps along a series of six trap lines; vegetation was placed in pitfalls and over funnel traps to provide protection from the elements (Figures 13 and 14)
- setting out six Elliot traps in close proximity to trap lines, which were set up under vegetation and with shredded newspaper inside (Figure 14)
- setting out two motion activated trail cameras (Figure 14)
- all trap, trail camera and trap line locations were recorded using a hand held GPS and marked with flagging tape
- traps were baited with universal bait (peanut butter and oats)
- checking all traps and trap lines within three hours of sunrise, recording and releasing species present on site
- where possible, animals were photographed
- a dusk survey was carried out on 17 December 2015 to target nocturnal species, by traversing the site on foot and recording fauna observations including tracks, scats, diggings, signs of foraging and calls
- recording the outcomes of trapping and observational activities.

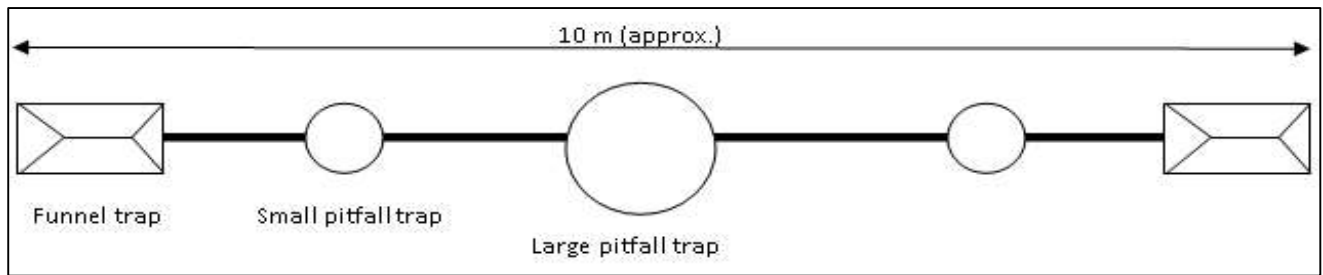
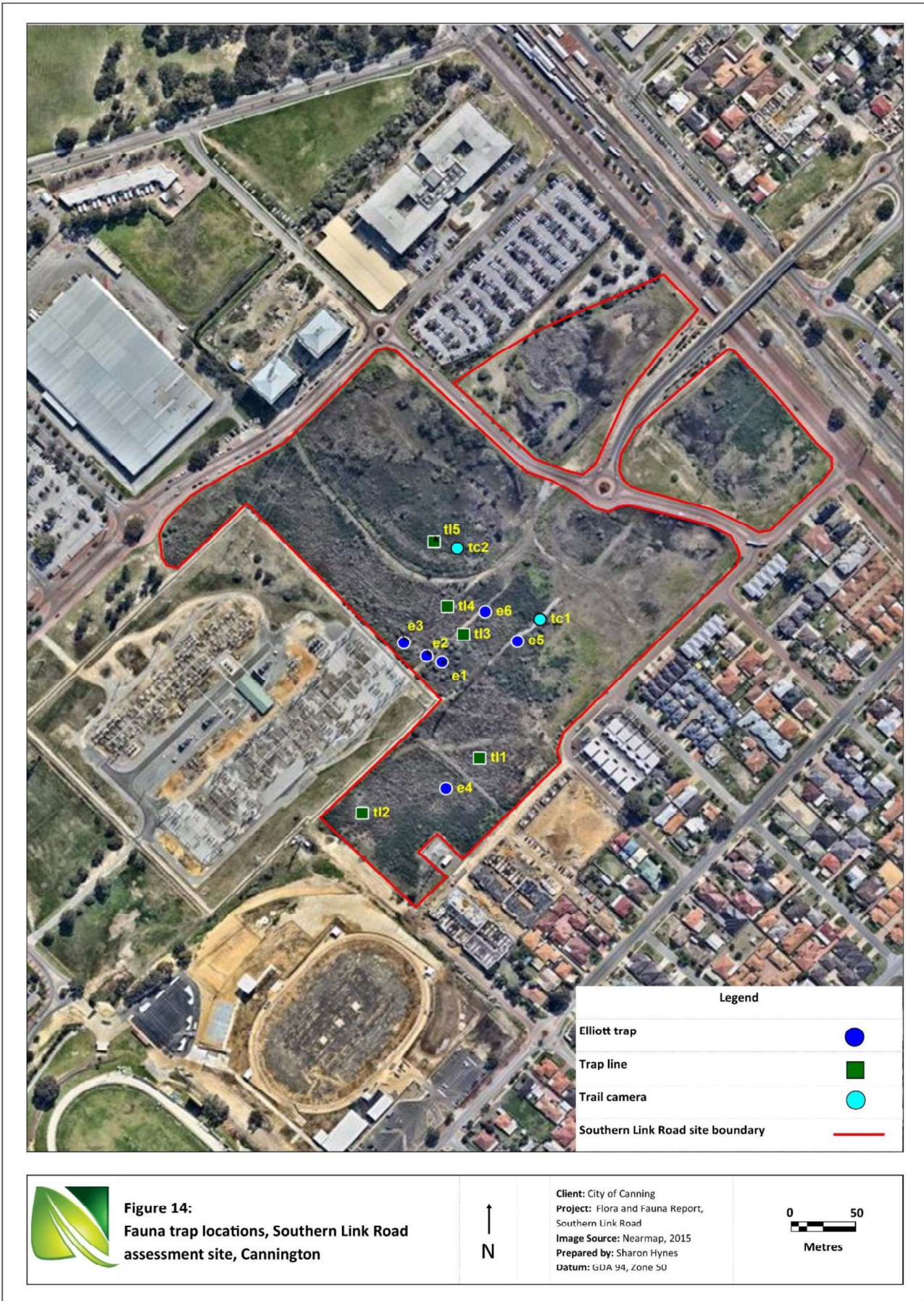


Figure 13: Trap line layout

5.3 Weather Conditions During Survey

Local weather conditions can affect fauna activity, with wind and rain likely to reduce capture rates; weather data recorded during the survey period is provided in Appendix 7 (Perth Airport). The majority of the survey period had fair weather with low levels of precipitation; temperatures ranged from 8.8 °C to 36.2 °C. Rainfall of 0.8 mm and 0.6 mm was recorded on the 18th and 19th of November 2015 respectively.



6.0 Fauna Survey Outcomes

6.1 Desktop Information

6.1.1 NatureMap Report

A review of the NatureMap report identified the potential for the following fauna within or near to the proposed Southern Link Road survey site:

- two amphibians
- 102 birds, of which five are introduced
- 15 invertebrates
- seven mammals, of which one is introduced
- 14 reptiles.

6.1.2 Significant Fauna Species

A review of the DPaW Threatened and Priority Fauna Database, NatureMap and the Protected Matters Search Tool (PMST) reports identified the potential for 18 conservation significant species listed under the *Wildlife Protection Act 1950* (WA) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). These are summarised in Table 6 along with their conservation codes, noting that marine birds (e.g.: swift, sea-eagle) listed on the PMST report have not been included. A copy of the State and Commonwealth conservation codes can be found in Appendix 4.

Table 6: Potential conservation significant fauna within or near the survey site

Scientific Name	Common Name	Cons Code	NatureMap	DPaW	PMST
Birds					
<i>Ardea modesta</i>	Eastern Great Egret	IA	x	x	
<i>Botaurus poiciloptilus</i>	Australian Bittern	En			x
<i>Calyptorhynchus banksia naso</i>	Forest Red-tailed Black Cockatoo	Vu			x
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo	T, En	x	x	x
<i>Falco peregrinus</i>	Peregrine Falcon	S	x	x	
<i>Leipoa ocellata</i>	Malleefowl	Vu			x
<i>Merops ornatus</i>	Rainbow Bee-eater	IA	x	x	x
<i>Oxyura australis</i>	Blue-billed Duck	P4	x	x	
<i>Rostratula australis</i>	Australian Painted Snipe	En			x
Invertebrates					
<i>Leioproctus douglasiellus</i>	A short-tongued bee	T, CE	x	x	x
<i>Neopasiphae simplicior</i>	Bee	T	x	x	
<i>Westralunio carteri</i>	Carter's Freshwater Mussel	T	x		

Scientific Name	Common Name	Cons Code	NatureMap	DPaW	PMST
Mammals					
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	T, Vu	x	x	x
<i>Isoodon obesulus fusciventer</i>	Southern Brown Bandicoot	P5	X	x	
<i>Phascogale tapoatafa tapoatafa</i>	Southern Brush-tailed phascogale	T	x	x	
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	Vu			x
<i>Setonix brachyurus</i>	Quokka	Vu			x
Reptiles					
<i>Lerista lineata</i>	Perth Slider, Lined Skink	P3	x	x	
<i>Pseudonaja affinis exilis</i>	Rottnest Dugite	T	x		

Of the species listed in Table 6, only the *Leioproctus douglasiellus* is listed by the Department of Parks and Wildlife (DPaW) as having been recorded within the survey boundary. According to the Threatened Species Scientific Committee (2013), the bee is closely associated with the presence of flora species *Goodenia filiformis* (Thread-leaved Goodenia) and *Anthotium junciforme*, neither of which were recorded at the site during the current surveys.

6.2 Field Sightings

6.2.1 Mammals

Three mammal species were recorded during fauna survey activities on the basis of observations of animals, track, scats and/or diggings. (Table 7). The introduced European Red Fox (*Vulpes vulpes*) (Figure 15) and Domestic Dog (*Canis lupus familiaris*) were the only mammal species observed during fauna activities. Signs of the introduced European Rabbit (*Oryctolagus cuniculus*) that is listed as category C3 declared pests under the *Biosecurity and Agriculture Management Act 2007* (WA) were also observed throughout the site.

Table 7: Mammal species within Southern Link Road assessment site

Family	Species Name	Common Name	Observed	Signs	Comment
Canidae	* <i>Canis lupus familiaris</i>	Domestic Dog	✓	✓	
Canidae	* <i>Vulpes vulpes</i>	Red fox	✓	✓	Declared pest (C3)
Leporidae	* <i>Oryctolagus cuniculus</i>	European Rabbit		✓	Declared pest (C3)

*Denotes introduced species



Figure 15: *European Red Fox (*Vulpes vulpes*) within Southern Link Road assessment site

6.2.2 Birds

Fifteen bird species were observed during the survey, of these three were introduced species (Table 8; Figure 16). Birds were identified using *Birds of Western Australia Field Guide* (Nevill, 2013).

Table 8: Bird species within Southern Link Road assessment site

Family	Species Name	Common Name
Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Herron
Cacatuidae	<i>Cacatua roseicapilla</i>	Galah
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
Columbidae	* <i>Streptopelia chinensis</i>	Spotted Turtle-dove
Columbidae	* <i>Streptopelia senegalensis</i>	Laughing Dove
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel
Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattle Bird
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater
Meliphagidae	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie Lark
Psittacidae	* <i>Trichoglossus haematodus</i>	Rainbow Lorikeet
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie wagtail
Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis

*Denotes introduced species



Magpie Lark (*Grallina cyanoleuca*) Nankeen Kestrel (*Falco cenchroides*) *Laughing Dove (*Streptopelia senegalensis*)

Figure 16: Birds within Southern Link Road assessment site

6.2.3 Reptiles

Five reptile species were recorded during the fauna survey (Table 9, Figure 17). Reptiles were identified using *A Complete Guide to Reptiles of Australia* (Wilson and Swan, 2013).

Table 9: Reptiles within Southern Link Road assessment site

Family	Species Name	Common name
Scincidae	<i>Acritoscincus trilineatum</i>	South-west Cool Skink
Scincidae	<i>Tiliqua rugosa rugosa</i>	Bobtail
Scincidae	<i>Menetia greyii</i>	Common Dwarf Skink
Scincidae	<i>Hemiergus quadrilineata</i>	Two-toed earless skink
Scincidae	<i>Morethia obscura</i>	Southern Pale-flecked Morethia



Bobtail (*Tiliqua rugosa rugosa*) Two-toed Earless Skink (*Hemiergus quadrilineata*) South-west Cool Skink (*Acritoscincus trilineatum*)

Figure 17: Reptiles within Southern Link Road assessment site

6.2.4 Amphibians

Four species of frog were captured during the fauna survey (Table 10: Figure 18); frogs were identified using the *Field Guide to Frogs of Western Australia, Fourth edition* (Tyler and Doughty, 2009).

Table 10: Amphibians within Southern Link Road assessment site

Family	Species Name	Common name
Myobatrachidae	<i>Heleioporus eyrei</i>	Moaning Frog
Myobatrachidae	<i>Limnodynastes dorsalis</i>	Western Banjo Frog
Myobatrachidae	<i>Crinia glauerti</i>	Rattling or Clicking Froglet
Myobatrachidae	<i>Crinia insignifera</i>	Squelching Froglet



Western Banjo Frog
(*Limnodynastes dorsalis*)

Moaning Frog
(*Heleioporus eyrei*)

Squelching Froglet
(*Crinia insignifera*)

Figure 18: Frogs within Southern Link Road assessment site

6.2.5 Invertebrates

In addition to mammals, reptiles, amphibians and birds recorded during the survey, 42 invertebrate species were observed (Table 11; Figure 19). These were identified using *A Field Guide to Insects in Australia* (Zborowski and Storey, 2010), the *Invertebrates* chapter in *Guide to the Wildlife of Perth and the South West* (Knowles and Whyte, 2014), and *Macroinvertebrate Herpetofauna of the Canning Catchment* (Knowles, 2012). Species were identified to family level, and where possible, to genus and species.

Table 11: Invertebrate species within Southern Link Road assessment site

Family	Species Name	Common Name
Acrididae	<i>Goniaea sp.</i>	Dead Gumleaf Grasshopper
Acrididae		Acrididae 1
Anisolabididae	<i>Dermaptera anisolabididae</i>	Earwig
Apidae	* <i>Apis mellifera</i>	European Honey Bee
Arenaidae	<i>Agriopae trifasciata</i>	Banded Orb Weaver
Arenaidae	<i>Eriophora transmarina</i>	Garden Orb Weaver
Blattidae	<i>Cutilla nigra</i>	Bush Cockroach

Family	Species Name	Common Name
Braconidae		Small black wasp
Buthidae	<i>Lychas marmoreus</i>	Marbled Scorpion
Carabidae	<i>Calosoma schayeri</i>	Green Carabid Beetle
Carabidae		Carab beetle 1
Carabidae		Carab beetle 2
Curculionidae	<i>Catasarcus impressipenis</i>	Red-legged Weevil
Evaniidae		Hatchet Wasp
Formicidae	<i>Camponotus minimus</i>	Small Black ant
Formicidae	<i>Iridomyrmex purpureus</i>	Meat Ant
Formicidae	<i>Myrmecia vindex</i>	Bull Ant
Formicidae	<i>Rhytidoponera metallica</i>	Common Metallic Ant
Grillidae	<i>Lepidogryllus sp.</i>	
Gryllotalpidae	<i>Gryotalpa sp.</i>	Common Mole Cricket
Libellulidae	<i>Diplacodes bipunctata</i>	Yellow Dragon Fly
Lycaenidae	<i>Zizina labradus</i>	Common Grass-blue Butterfly
Lycosidae	<i>Lycosa sp.</i>	Wolf Spider 1
Lycosidae	<i>Lycosa sp.</i>	Wolf Spider 2
Mantidae	<i>Tenodera sp.</i>	Mantis
Muscidae		Bush Fly
Mutillidae	<i>Ethmostigmus sp.</i>	Centipede 2
Nymphalidae	<i>Vanessa kershawii</i>	Australian Painted Lady
Pentatomidae	<i>Nezara viridula</i>	Green Vegetable Bug
Pieridae	<i>Pieris rapae</i>	Cabbage Butterfly
Pyrgomorphidae		Grasshopper 1
Reduviidae	<i>Peirates sp.</i>	Assassin Bug
Scarabaeidae	<i>Colpochila sp.</i>	
Scarabidae		Scarabidae 1
Scolopendridae	<i>Ethmostigmus sp.</i>	Centipede 1
Tabanidae	<i>Dasybasis sp.</i>	March Fly
Tenebrionidae	<i>Adelium sp.</i>	
Tenebrionidae	<i>Pterohelaeus sp.</i>	Pie-dish Beetle
Tettigoniidae	<i>Tympanophora andreae</i>	Andrea's Balloon-winged Katydid

* Denotes introduced species



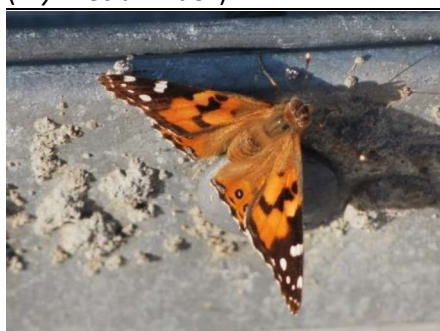
Bull Ant
(*Myrmecia vindex*)



Flower Wasp
(*Ephutomorpha* sp.)



Garden Orb Weaver
(*Eriophora transmarina*)



Australian Painted Lady
(*Vanessa kershawii*)



Andrea's Balloon-winged Katydid
(*Tymanophora andreae*)



Yellow Dragonfly
(*Diplacodes bipunctata*)

Figure 19: Invertebrates within Southern Link Road assessment site

7.0 Conclusions

A total of 111 flora species from 45 families were recorded during the survey, including 57 native and 54 weed species. One threatened species, *Eremophila glabra* subsp. *chlorella*, and one Priority 4 species *Ornduffia submersa* was found in the south-east of the site. The threatened ecological community *Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain* covers 5.8 ha of the 12.4 ha assessment site, and is listed as a matter of national environmental significance by the Department of the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (Department of the Environment, 2015c).

Nine vegetation types were described, with the most dominant being *Melaleuca lateritia* Heathland. The majority of the site had little to no native vegetation and was considered Completely Degraded. The areas that had remaining native vegetation vary in vegetation condition from Degraded to Excellent, with the majority in Good and Very Good condition.

The fire that occurred within the site on the 22 November 2015 has reduced vegetation cover and condition in the affected area; however, this is temporary with regeneration expected within a few years as Australian vegetation has developed adaptations to respond to fire.

A high diversity of weeds (48.6%) were recorded, with the majority being Poaceae (grass), Asteraceae (daisy) and Iridaceae (iris) species. One Weed of National Significance (WoNS) Bridal Creeper (*Asparagus asparagoides*) was recorded (Weeds Australia, 2014). Bridal Creeper and Arum Lily (*Zantedeschia aethiopica*) are listed as a category C3 declared pest under the *Biosecurity and Agricultural Management Act 2007* (Department of Agriculture and Food, 2014). These classifications require management by the landowners to reduce the impact of the species and prevent its spread.

The fauna survey confirmed the presence of three mammals, 15 birds, five reptiles, four amphibians and 42 invertebrates within the site. The number of birds and mammals compared to those listed on NatureMap are both low. The low numbers of birds, mammals and reptiles could be explained by:

- the wet nature of the site, as the majority is inundated for most of the winter months and the start of spring
- the small size of the site,
- its isolation from other vegetated areas,
- the degraded nature of the area and human disturbances.

The European Red Fox (*Vulpes Vulpes*) and the European Rabbit (*Oryctolagus cuniculus*) were recorded, which are listed as C3 declared pests on the Western Australian Organism List (WAOL) under the *Biosecurity Agriculture Management Act 2007* (WA). No threatened or priority listed fauna was found during fauna survey activities.

The proposed Southern Link Road will go through part of the site, which will have direct and indirect effects on the fauna and flora present. Impacts include:

- damage to vegetation and fauna habitat through clearing of vegetation
- decrease in habitat size

- potential hydrological changes, such as altered hydrological patterns with water flowing off the road into the site, altered drainage and rain shadow effects from the road and other infrastructure, which is of particular concern in the 0.44 ha of conservation category wetland that will be affected by the proposed road layout
- changes to vegetation within wetland areas due to altered hydrology and/or rain shadow effect of the road.

As the flora, vegetation and fauna surveys were carried out during spring in a degraded site they are considered to be sufficient for environmental assessment purposes with no further surveys recommended.

The Southern Link Road assessment site contains good quality fauna habitat where the threatened ecological community is present, with thick heath and understory vegetation present for invertebrates and many flowering shrubs for birds such as Honeyeaters, and wetland habitat suitable for amphibians. The wetter areas are unlikely to be affected by the proposed road as it will not extend into those portions of the site.

The proposed road layout primarily goes through Completely Degraded areas devoid of native vegetation, apart from a small portion of the threatened ecological community (5.8 ha) in the south-east corner of the site. The proposed road will go through 0.04 ha (0.7%) of Very Good, 0.05 ha (0.9%) of Good and 0.7 ha (1.2%) Degraded condition vegetation within the threatened ecological community boundary (Figure 10); however, since November 2015 when the fire went through the south-east corner of the site, vegetation condition has been reduced to Degraded in burnt areas. No threatened or priority flora species will be affected by the proposed development.

Overall, 0.37 ha of native vegetation will be cleared if the proposed road construction proceeds, this equates to 3% of the total areas of the site (Figure 9), of which 0.16 ha (1.3% total area) is within the threatened ecological community. The degraded nature of the site provides opportunity for an offset or revegetation to occur within other areas of low vegetation condition.

The majority of the site is classified as conservation category wetland (6.71 ha), which means that it is environmentally significant and there are restricted land uses in the area.

Referral to the Commonwealth Department of the Environment is required where significant impacts to matters of national environmental significance, such as the presence of endangered species and ecological communities. Due to the limited area of the threatened ecological community affected by the proposed development and the degraded nature of the site, the impacts of the proposed development is not considered to be significant; therefore, a referral to the Department of the environment is not warranted. However, a pre-referral meeting with the Perth Office of the Department can be undertaken to confirm there is no requirement for referral.

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Appendix 1: NatureMap Report

NatureMap Species Report

Created By Guest user on 10/09/2015

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115°56' 38" E,32°01' 04" S
Buffer 2km
Group By Species Group

Species Group	Species	Records
Amphibian	2	2
Bird	102	9140
Dicotyledon	106	162
Fish	1	1
Gymnosperm	1	2
Invertebrate	15	21
Mammal	7	12
Monocotyledon	97	130
Reptile	14	53
Slime Mould	1	1
TOTAL	346	9524

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Amphibian				
1.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
2.	25420 <i>Myobatrachus gouldii</i> (Turtle Frog)			
Bird				
3.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
4.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
5.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
6.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
7.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
8.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
9.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
10.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
11.	24312 <i>Anas gracilis</i> (Grey Teal)			
12.	24313 <i>Anas platyrhynchos</i> (Mallard)			
13.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
14.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
15.	25553 <i>Anhinga melanogaster</i> (Darter)			
16.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
17.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
18.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
19.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
20.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
21.	24318 <i>Aythya australis</i> (Hardhead)			
22.	24319 <i>Biziura lobata</i> (Musk Duck)			
23.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
24.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
25.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
26.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
27.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
28.	24373 <i>Charadrius melanops</i> (Black-fronted Dotterel)			
29.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
30.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
31.	24833 <i>Cincloramphus cruralis</i> (Brown Songlark)			
32.	24288 <i>Circus approximans</i> (Swamp Harrier)			
33.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
34.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
35.	25592 <i>Corvus coronoides</i> (Australian Raven)			
36.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
37.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
38.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
39.	24322 <i>Cygnus atratus</i> (Black Swan)			
40.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
41.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
42.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
43.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
44.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
45.	25621 <i>Falco berigora</i> (Brown Falcon)			
46.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
47.	25623 <i>Falco longipennis</i> (Australian Hobby)			
48.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
49.	25727 <i>Fulica atra</i> (Eurasian Coot)			
50.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
51.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
52.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
53.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
54.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
55.	24735 <i>Glossopsitta porphyrocephala</i> (Purple-crowned Lorikeet)			
56.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
57.	24295 <i>Haliastur spheonurus</i> (Whistling Kite)			
58.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
59.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
60.	24492 <i>Hirundo nigricans</i> subsp. <i>nigricans</i> (Tree Martin)			
61.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
62.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
63.	24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
64.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
65.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
66.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
67.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
68.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
69.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
70.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
71.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
72.	24623 <i>Pachycephala pectoralis</i> subsp. <i>fuliginosa</i> (Golden Whistler)			
73.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
74.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
75.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
76.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
77.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
78.	24660 <i>Petroica multicolor</i> subsp. <i>campbelli</i> (Scarlet Robin)			
79.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
80.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
81.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
82.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
83.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
84.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
85.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
86.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
87.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
88.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
89.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
90.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
91.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
92.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
93.	30948 <i>Smicromis brevirostris</i> (Weebill)			
94.	24525 <i>Sterna fuscata</i> subsp. <i>nubilosa</i> (Sooty Tern)			
95.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
96.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
97.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
98.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
99.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
100.	24844 <i>Threskiornis molucca</i> (Australian White Ibis)			
101.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
102.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
103.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
104.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silveryeye)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Dicotyledon				
105.	15466 <i>Acacia applanata</i>			
106.	11926 <i>Acacia drewiana</i> subsp. <i>drewiana</i>			
107.	3374 <i>Acacia huegelii</i>			
108.	15481 <i>Acacia pulchella</i> var. <i>glaberrima</i>			
109.	30033 <i>Acacia saligna</i> subsp. <i>lindleyi</i>			
110.	30032 <i>Acacia saligna</i> subsp. <i>saligna</i>			
111.	3541 <i>Acacia sessilis</i>			
112.	3557 <i>Acacia stenoptera</i> (Narrow Winged Wattle)			
113.	13267 <i>Amyema linophylla</i> subsp. <i>linophylla</i>			
114.	3688 <i>Aotus gracillima</i>			
115.	20350 <i>Astartea affinis</i>			
116.	20283 <i>Astartea scoparia</i>			
117.	3178 <i>Byblis gigantea</i> (Rainbow Plant)		P3	
118.	4717 <i>Callitriche stagnalis</i> (Common Starwort)	Y		
119.	5415 <i>Calothamnus lateralis</i>			
120.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
121.	7917 <i>Centaurea solstitialis</i> (St Barnaby's Thistle)	Y		
122.	6543 <i>Cicendia filiformis</i> (Slender Cicendia)	Y		
123.	7945 <i>Cotula coronopifolia</i> (Waterbuttons)	Y		
124.	15706 <i>Crassula natans</i> var. <i>minus</i>	Y		
125.	11021 <i>Cuscuta planiflora</i>	Y		
126.	7462 <i>Dampiera pedunculata</i>			
127.	16585 <i>Daviesia nudiflora</i> subsp. <i>nudiflora</i>			
128.	3832 <i>Daviesia physodes</i>			
129.	13217 <i>Drosera erythrorhiza</i> subsp. <i>erythrorhiza</i>			
130.	15453 <i>Drosera gigantea</i> subsp. <i>gigantea</i>			
131.	3098 <i>Drosera glanduligera</i> (Pimpernel Sundew)			
132.	13195 <i>Drosera helodes</i>			
133.	3101 <i>Drosera heterophylla</i> (Swamp Rainbow)			
134.	3106 <i>Drosera macrantha</i> (Bridal Rainbow)			
135.	14298 <i>Drosera macrantha</i> subsp. <i>macrantha</i>			
136.	3109 <i>Drosera menziesii</i> (Pink Rainbow)			
137.	11853 <i>Drosera menziesii</i> subsp. <i>menziesii</i>			
138.	13216 <i>Drosera menziesii</i> subsp. <i>penicillaris</i>			
139.	11768 <i>Drosera neesii</i> subsp. <i>neesii</i>			
140.	13191 <i>Drosera occidentalis</i> subsp. <i>occidentalis</i>		P4	
141.	3117 <i>Drosera paleacea</i> (Dwarf Sundew)			
142.	29178 <i>Drosera porrecta</i>			
143.	3128 <i>Drosera ramellosa</i> (Branched Sundew)			
144.	13205 <i>Drosera tubaestylis</i>			
145.	3135 <i>Drosera zonaria</i> (Painted Sundew)			
146.	8450 <i>Eclipta prostrata</i>	Y		
147.	5187 <i>Elatine gratioloides</i> (Waterwort)			
148.	17150 <i>Eremophila glabra</i> subsp. <i>chlorella</i>		T	
149.	18299 <i>Erythrina x sykesii</i>	Y		
150.	3872 <i>Euchilopsis linearis</i> (Swamp Pea)			
151.	4648 <i>Euphorbia terracina</i> (Geraldton Carnation Weed)	Y		
152.	3880 <i>Eutaxia virgata</i>			
153.	8365 <i>Fumaria bastardii</i>	Y		
154.	13439 <i>Grevillea thelemanniana</i> subsp. <i>thelemanniana</i> (Spider Net Grevillea)		P2	
155.	2136 <i>Hakea candolleana</i>			
156.	2137 <i>Hakea ceratophylla</i> (Horned Leaf Hakea)			
157.	2166 <i>Hakea incrassata</i> (Marble Hakea)			
158.	2212 <i>Hakea sulcata</i> (Furrowed Hakea)			
159.	2216 <i>Hakea varia</i> (Variable-leaved Hakea)			
160.	3016 <i>Heliophila pusilla</i>	Y		
161.	16934 <i>Hemiandra glabra</i> subsp. <i>glabra</i>			
162.	6238 <i>Hydrocotyle ranunculoides</i>	Y		
163.	5817 <i>Hypocalymma angustifolium</i> (White Myrtle, Kudjid)			
164.	8086 <i>Hypochoeris glabra</i> (Smooth Catsear)	Y		
165.	4012 <i>Jacksonia furcellata</i> (Grey Stinkwood)			
166.	4044 <i>Kennedia prostrata</i> (Scarlet Runner)			
167.	4052 <i>Latrobea tenella</i>			
168.	4959 <i>Lawrencia squamata</i>			
169.	40803 <i>Leucopogon squarrosus</i> subsp. <i>squarrosus</i>			
170.	9289 <i>Lobelia anceps</i> (Angled Lobelia)			
171.	5281 <i>Lythrum hyssopifolia</i> (Lesser Loosestrife)	Y		
172.	5926 <i>Melaleuca lateritia</i> (Robin Redbreast Bush)			
173.	5964 <i>Melaleuca seriata</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
174.	5987 <i>Melaleuca viminea</i> (Mohan)			
175.	13280 <i>Melaleuca viminea</i> subsp. <i>viminea</i>			
176.	37440 <i>Monopsis debilis</i> var. <i>depressa</i>	Y		
177.	6189 <i>Myriophyllum crispatum</i>			
178.	2401 <i>Nuytsia floribunda</i> (Christmas Tree, Mudja)			
179.	2923 <i>Nymphaea odorata</i> (Fragrant Waterlily)	Y		
180.	16390 <i>Oenothera drummondii</i> subsp. <i>drummondii</i>	Y		
181.	6142 <i>Oenothera stricta</i> (Common Evening Primrose)	Y		
182.	36177 <i>Ornduffia albiflora</i>			
183.	7090 <i>Parentucellia viscosa</i> (Sticky Bartsia)	Y		
184.	16478 <i>Pericalymma ellipticum</i> var. <i>floridum</i>			
185.	13911 <i>Persicaria decipiens</i>			
186.	11404 <i>Pimelea imbricata</i> var. <i>major</i>			
187.	4181 <i>Pultenaea reticulata</i>			
188.	13312 <i>Rhodanthe pyrethrum</i>			
189.	2433 <i>Rumex crispus</i> (Curled Dock)	Y		
190.	2593 <i>Sarcocornia quinqueflora</i> (Beaded Samphire)			
191.	7619 <i>Scaevola lanceolata</i>			
192.	8224 <i>Siloxerus filifolius</i>			
193.	2316 <i>Stirlingia latifolia</i> (Blueboy)			
194.	7717 <i>Stylidium divaricatum</i> (Daddy-long-legs)			
195.	7719 <i>Stylidium ecome</i> (Foot Triggerplant)			
196.	7734 <i>Stylidium guttatum</i> (Dotted Triggerplant)			
197.	7768 <i>Stylidium obtusatum</i> (Pinafore Triggerplant)			
198.	7772 <i>Stylidium perpusillum</i> (Tiny Triggerplant)			
199.	7773 <i>Stylidium petiolare</i> (Horn Triggerplant)			
200.	7782 <i>Stylidium pulchellum</i> (Thumbelina Triggerplant)			
201.	7806 <i>Stylidium utricularioides</i> (Pink Fan Triggerplant)			
202.	6476 <i>Styphelia tenuiflora</i> (Common Pinheath)			
203.	2321 <i>Synaphea acutiloba</i> (Granite Synaphea)			
204.	1139 <i>Trithuria bibracteata</i>			
205.	1141 <i>Trithuria submersa</i>			
206.	7148 <i>Utricularia multifida</i>			
207.	15433 <i>Verticordia huegellii</i> var. <i>huegellii</i>			
208.	14714 <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>		P4	
209.	4322 <i>Vicia sativa</i> (Common Vetch)	Y		
210.	4325 <i>Viminaria juncea</i> (Swishbush, Koweda)			
Fish				
211.	<i>Afurcagobius suppositus</i>			
Gymnosperm				
212.	36600 <i>Callitris pyramidalis</i> (Swamp Cypress)			
Invertebrate				
213.	<i>Austracantha minax</i>			
214.	<i>Cormocephalus novaehollandiae</i>			
215.	<i>Eurytion incisunguis</i>			Y
216.	<i>Hogna crispipes</i>			
217.	<i>Idiommata blackwalli</i>			
218.	<i>Idiosoma sigillatum</i>			
219.	<i>Isopeda leishmanni</i>			
220.	<i>Kangarosa properipes</i>			
221.	<i>Latrodectus hasseltii</i>			
222.	33983 <i>Leioproctus douglasiellus</i> (bee)		T	
223.	<i>Missulena occatoria</i>			
224.	33984 <i>Neopasiphae simplicior</i> (bee)		T	
225.	<i>Tasmanicosa leuckartii</i>			
226.	<i>Venator immansueta</i>			
227.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
Mammal				
228.	24251 <i>Bos taurus</i> (European Cattle)	Y		
229.	24187 <i>Chalinolobus morio</i> (Chocolate Wattleed Bat)			
230.	24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		T	
231.	24153 <i>Isoodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)		P5	
232.	24099 <i>Phascogale tapoatafa</i> subsp. <i>tapoatafa</i> (Southern Brush-tailed Phascogale, Wambenger)		T	
233.	<i>Sminthopsis murina</i>			
234.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
Monocotyledon				
235.	1205 <i>Acanthocarpus canaliculatus</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
236.	13380 <i>Amphibromus nervosus</i>			
237.	1058 <i>Anarthria gracilis</i>			
238.	141 <i>Aponogeton hexatepalus</i> (Stalked Water Ribbons)		P4	
239.	1201 <i>Asparagus officinalis</i> (Asparagus)	Y		
240.	233 <i>Avena barbata</i> (Bearded Oat)	Y		
241.	749 <i>Bolboschoenus caldwellii</i> (Marsh Club-rush)			
242.	1272 <i>Borya scirpoidea</i>			
243.	12770 <i>Burchardia congesta</i>			
244.	1385 <i>Burchardia multiflora</i> (Dwarf Burchardia)			
245.	1276 <i>Caesia micrantha</i> (Pale Grass Lily)			
246.	1586 <i>Caladenia discoidea</i> (Dancing Orchid)			
247.	1596 <i>Caladenia huegelii</i> (Grand Spider Orchid)		T	
248.	754 <i>Carex divisa</i> (Divided Sedge)	Y		
249.	1121 <i>Centrolepis aristata</i> (Pointed Centrolepis)			
250.	17685 <i>Chaetanthus aristatus</i>			
251.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
252.	11299 <i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>			
253.	763 <i>Chorizandra enodis</i> (Black Bristlerush)			
254.	32999 <i>Colocasia esculenta</i> var. <i>esculenta</i>	Y		
255.	15114 <i>Cyanicula gemmata</i>			
256.	40661 <i>Cycnogeton lineare</i>			
257.	806 <i>Cyperus polystachyos</i> (Bunchy Sedge)	Y		
258.	815 <i>Cyperus tenellus</i> (Tiny Flatsedge)	Y		
259.	17691 <i>Desmocladus fasciculatus</i>			
260.	1637 <i>Diuris purdiei</i> (Purdie's Donkey Orchid)		T	
261.	329 <i>Echinochloa crus-gavonis</i> (South American Barnyard Grass)	Y		
262.	337 <i>Echinochloa pyramidalis</i> (Antelope Grass)	Y		
263.	1643 <i>Elythranthera brunonis</i> (Purple Enamel Orchid)			
264.	1518 <i>Gladiolus angustus</i> (Long Tubed Painted Lady)	Y		
265.	17043 <i>Glyceria declinata</i>	Y		
266.	1464 <i>Haemodorum brevisepalum</i>			
267.	1468 <i>Haemodorum laxum</i>			
268.	1472 <i>Haemodorum simplex</i>			
269.	1475 <i>Haemodorum spicatum</i> (Mardja)			
270.	1068 <i>Harperia lateriflora</i>			
271.	1526 <i>Hesperantha falcata</i>	Y		
272.	452 <i>Hyparrhenia hirta</i> (Tambookie Grass)	Y		
273.	1070 <i>Hypolaena exsulca</i>			
274.	20200 <i>Isolepis cernua</i> var. <i>setiformis</i>			
275.	912 <i>Isolepis cyperoides</i>			
276.	19632 <i>Johnsonia pubescens</i> subsp. <i>pubescens</i>			
277.	1180 <i>Juncus capitatus</i> (Capitate Rush)	Y		
278.	1196 <i>Juncus usitatus</i> (Common Rush)	Y		
279.	28342 <i>Landoltia punctata</i> (Thin Duckweed)			
280.	1309 <i>Laxmannia squarrosa</i>			
281.	937 <i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
282.	118 <i>Lepilaena australis</i> (Austral Water Mat)			
283.	11384 <i>Lolium temulentum</i> forma <i>temulentum</i>	Y		
284.	11073 <i>Lolium x hybridum</i>	Y		
285.	1246 <i>Lomandra suaveolens</i>			
286.	1097 <i>Lyginia barbata</i>			
287.	18049 <i>Lyginia imberbis</i>			
288.	17683 <i>Meeboldina cana</i>			
289.	17679 <i>Meeboldina coangustata</i>			
290.	20639 <i>Megathyrus maximus</i> var. <i>maximus</i>	Y		
291.	957 <i>Mesomelaena tetragona</i> (Semaphore Sedge)			
292.	15419 <i>Microtis media</i> subsp. <i>media</i>			
293.	19179 <i>Moraea flaccida</i> (One-leaf Cape Tulip)	Y		
294.	492 <i>Neurachne alopecuroidea</i> (Foftail Mulga Grass)			
295.	168 <i>Ottelia ovalifolia</i> (Swamp Lily)			
296.	14531 <i>Ottelia ovalifolia</i> subsp. <i>ovalifolia</i>			
297.	527 <i>Paspalum dilatatum</i>	Y		
298.	30472 <i>Patersonia occidentalis</i> var. <i>occidentalis</i>			
299.	43760 <i>Pauridia occidentalis</i>			
300.	551 <i>Phalaris minor</i> (Lesser Canary Grass)	Y		
301.	1172 <i>Philydrella drummondii</i>			
302.	14306 <i>Philydrella pygmaea</i> subsp. <i>pygmaea</i>			
303.	1478 <i>Phlebocarya ciliata</i>			
304.	582 <i>Polypogon monspeliensis</i> (Annual Beardgrass)	Y		
305.	109 <i>Potamogeton crispus</i> (Curly Pondweed)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
306.	19709 <i>Pterostylis</i> sp. <i>Helena River (G. Brockman GBB 340)</i>			
307.	16367 <i>Pyrorchis nigricans</i> (<i>Red beaks, Elephants ears</i>)			
308.	114 <i>Ruppia maritima</i> (<i>Sea Tassel</i>)			
309.	971 <i>Schoenus andrewsii</i>			
310.	973 <i>Schoenus asperocarpus</i> (<i>Poison Sedge</i>)			
311.	974 <i>Schoenus benthamii</i>		P3	
312.	975 <i>Schoenus bifidus</i>			
313.	979 <i>Schoenus caespititius</i>			
314.	1003 <i>Schoenus natans</i> (<i>Floating Bog-rush</i>)		P4	
315.	1008 <i>Schoenus pennisetis</i>		P3	
316.	17614 <i>Schoenus plumosus</i>			
317.	611 <i>Setaria sphacelata</i> (<i>South African Pigeon Grass</i>)	Y		
318.	1558 <i>Sparaxis bulbifera</i>	Y		
319.	1033 <i>Tetragia australiensis</i>		T	
320.	20731 <i>Thelymitra vulgaris</i>			
321.	1319 <i>Thysanotus arenarius</i>			
322.	1343 <i>Thysanotus patersonii</i>			
323.	1354 <i>Thysanotus tenellus</i>			
324.	17684 <i>Tremulina tremula</i>			
325.	1481 <i>Tribonanthes australis</i>			
326.	147 <i>Triglochin mucronata</i>			
327.	148 <i>Triglochin muelleri</i>			
328.	98 <i>Typha domingensis</i> (<i>Bulrush, Djandjidi</i>)			
329.	99 <i>Typha orientalis</i> (<i>Bulrush, Cumbungi</i>)	Y		
330.	1394 <i>Wurmbea dioica</i> (<i>Early Nancy</i>)			
331.	12072 <i>Wurmbea dioica</i> subsp. <i>alba</i>			

Reptile

332.	42381 <i>Brachyuropis semifasciatus</i> (<i>Southern Shovel-nosed Snake</i>)			
333.	24999 <i>Delma grayii</i>			
334.	25296 <i>Demansia psammophis</i> subsp. <i>reticulata</i> (<i>Yellow-faced Whipsnake</i>)			
335.	25133 <i>Lerista elegans</i>			
336.	25147 <i>Lerista lineata</i> (<i>Perth Slider, Lined Skink</i>)		P3	
337.	25005 <i>Lialis burtonis</i>			
338.	25184 <i>Menetia greyii</i>			
339.	25192 <i>Morethia obscura</i>			
340.	25248 <i>Neelaps bimaculatus</i> (<i>Black-naped Snake</i>)			
341.	25252 <i>Notechis scutatus</i> (<i>Tiger Snake</i>)			
342.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (<i>Dugite</i>)			
343.	25258 <i>Pseudonaja affinis</i> subsp. <i>exilis</i> (<i>Rottnest Dugite</i>)		T	
344.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
345.	25526 <i>Varanus tristis</i> (<i>Racehorse Monitor</i>)			

Slime Mould

346.	39033 <i>Fuligo septica</i>			
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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 wholly 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 2: Protected Matters Search Tool Report



EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 10/09/15 15:21:22

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 2.0Km



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:	None
Listed Threatened Species:	27
Listed Migratory Species:	5

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:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	7
Whales and Other Cetaceans:	None
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:	3
Regional Forest Agreements:	None
Invasive Species:	42
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus baudinii Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Insects		
Leioproctus douglasiellus a short-tongued bee [66756]	Critically Endangered	Species or species habitat known to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir [25911]	Vulnerable	Species or species habitat may occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat may occur within area
Plants		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
Calytrix breviseta subsp. breviseta Swamp Starflower [23879]	Endangered	Species or species habitat likely to occur within area
Centrolepis caespitosa [6393]	Endangered	Species or species habitat likely to occur within area
Conospermum undulatum Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat likely to occur within area
Darwinia foetida Mucheia Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leaved Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus balanites Cadda Road Mallee, Cadda Mallee [24264]	Endangered	Species or species habitat may occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat likely to occur within area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to 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
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Migratory Marine Birds

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat likely to occur within area

Migratory Terrestrial Species

Name	Threatened	Type of Presence
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

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

Name
Commonwealth Land - Defence - AIRTC CANNINGTON

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		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Unnamed WA28740	WA
Unnamed WA47244	WA
Unnamed WA49363	WA

Invasive Species [\[Resource Information \]](#)

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

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

Name	Status	Type of Presence
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
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 aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		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 plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur

Name	Status	Type of Presence
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		within area Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

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

-32.0184 115.94293

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals



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

Please feel free to provide feedback via the [Contact Us](#) page.



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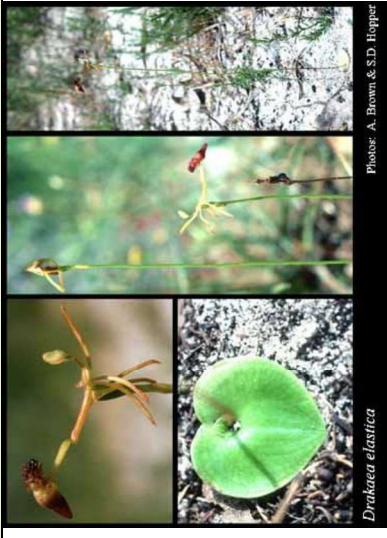
Appendix 3: Potential Priority and Threatened Flora

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
	Slender Andersonia	Slender erect or open straggly shrub, 0.1 – 0.5 m high. White pink purple.	September to November	Winter – wet areas, near swamps. White/grey sand, sandy clay, gravelly loam.	T	Y	Previously recorded in Canning; soil type is suitable.
	Stalked Water Ribbons	Rhizomatous or cormous, aquatic perennial, herb, leaves floating. Green-white flowers.	Jul to Oct	Mud. Freshwater: ponds, rivers, claypans.	P4	Y	Species known to occur in Canning

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Banksia minima</i></p>	Summer Honeyeater	Prostrate, lignotuberous shrub, 0.15-0.4 m high. Fl. yellow-brown	Dec or Jan to Feb	White or grey sand over laterite, sandy loam	T, En	N	Soils probably not suitable, not recorded in Canning, but has been recorded in Gosnells and Kalamunda
 <p><i>Byblis gigantea</i></p>	Rainbow Plant	Small, branched perennial herb to 0.45m high. Pink – purple/white flowers.	September to December or January	Sandy-peat swamps. Seasonally wet areas.	P3	Y	Previously recorded in Canning



Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
  <small>Photos: J. & M. Greve & J.L. Robson</small>	Grand Spider Orchid	Tuberous, perennial herb, 0.25 – 0.6m high. Green, cream and red flowers.	September to October.	Grey or brown sand, clay loam.	T, En	Y	Species is known to occur in Canning. Soils are suitable for the species
   <small>Photos: A.P. Brown, D. Coates & F. Hollans</small>	<i>Calytrix breviflora</i> subsp. <i>breviflora</i>	Shrub 0.4 – 1m high. Blue- purple flowers.	October to November	Sandy clay, Swampy flats.	T	Y	Recorded in Gosnells and Swan only; soil types are suitable.
<i>Centrolepis caespitosa</i>		Tufted annual, herb (forming a rounded cushion up to 25 mm across).	Oct to Dec	White sand, clay. Salt flats, wet areas	En, P4	Y	Generally found south of Perth; recorded in Gosnells

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Conospermum undulatum</i> Photos: A.D. Crawford & K.R. Thiel</p>		Erect, compact shrub 0.6 – 2m high. White-other flowers.	May to October	Grey or yellow-orange clayey sand.	T, Vu	N	Soils unlikely to be suitable, has been recorded in Canning
<i>Darwinia foetida</i>							
Muceba Bell							
T, Cr							
 <p><i>Diuris micrantha</i> Photos: A.P. Brown, J. & M. Greeve & B. Jackson</p>	Dwarf Bee-orchid	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown	Sep to Oct	Brown loamy clay. Winter-wet swamps, in shallow water	Vu	Y	Not recorded north of Kwinana. Soils are suitable for the species
Not recorded south of City of Swan, no information available about habitat							

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Diuris purdiei</i></p> <p>Photos: I. & M. Greeve & S.D. Hopper</p>	Purdie's Donkey Orchid	Tuberous, perennial, herb, 0.15-0.35 m high. Fl. yellow	Sep to Oct	Grey-black sand, moist. Winter-wet swamps.	T	Y	Species known to occur in Canning. Soils are suitable.
 <p><i>Diakaea elastica</i></p> <p>Photos: A. Brown & S.D. Hopper</p>	Glossy-leaved Hammer Orchid	Tuberous, perennial, herb, 0.12-0.3 m high. Fl. red & green & yellow	Oct to Nov	White or grey sand. Low-lying situations adjoining winter-wet swamps	T, En	N	Not known in Canning, known from Rockingham and further south. Suitable soils present on site

City of Canning



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Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Drakaea micrantha</i> Photos: S.D. Hopper, A.P. Brown & I. & M. Greaves</p>	Dwarf Hammer Orchid	Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow	Sep to Oct	White-grey sand	T, Vu	Y	Soil types suitable, recorded in Canning
 <p><i>Drosera occidentalis subsp. occidentalis</i></p>		Fibrous-rooted, rosette perennial, herb to 0.01 high. Pink/white flowers.	November to December.	Sandy and clayey soils. Swamps and wet depressions.	P4	Y	Species known to occur in Canning. Soil types are suitable

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Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Eleocharis keigheryi</i> Photo: G.J. Keighery</p>		Rhizomatous, clumped perennial, grass-like or herb (sedge) to 0.4 m high. Green flowers.	August to November.	Clay, sandy loam. Emergent in freshwater creeks and claypans.	T	Y	Species known to occur in Gosnells and further east, south and north. soil types and habitat is suitable
 <p><i>Eremophila glabra</i> subsp. <i>chlorella</i> Photos: A.P. Brown</p>		Prostrate & spreading or sprawling shrub, 0.2-1 m high. Green-yellow flowers.	July to November	Sandy clay. Winter-wet depressions	T	Y	Species recorded in Canning, soil types are suitable

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Eucalyptus balanites</i> Photos: R. Cranfield, L. Sweedman & S.D. Hopper</p>	<p>Caddee Road Mallee</p>	<p>Mallee, to 5 m high, bark rough, flaky. Fl. white</p>	<p>Oct to Dec or Jan to Feb</p>	<p>Sandy soils with lateritic gravel</p>	<p>T, En</p>	<p>N</p>	<p>Soils not lateritic, recorded in Armadale and Dandaragan</p>
 <p><i>Grevillea curviloba</i> subsp. <i>incurva</i> Photos: A.D. Crawford</p>	<p>Narrow Curved-leaf Grevillia</p>	<p>Prostrate to erect shrub, 0.1-2.5 m high. Fl. white-cream</p>	<p>Aug to Sep</p>	<p>Sand, sandy loam. Winter-wet heath</p>	<p>T, En</p>	<p>N</p>	<p>Habitat unlikely to be suitable – recorded in Chittering, Gingin and Swan</p>

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
	Spider Net Grevillea				P2	Y	Recorded in Canning
<p><i>Gevillea thelemanniana</i> subsp. <i>thelemanniana</i></p>							
<p><i>Lepidosperma rostratum</i></p>							
	Beaked Lepidosperma	Rhizomatous, tufted perennial, grass-like or herb (sedge), 0.5 m high. Fl. brown		Peaty sand, clay.	T, En	Y	Species is known to occur in Gosnells, soil type are suitable

Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Macarthuria keigheryi</i> Photos: G.J. Keighery</p>		Erect or spreading perennial, herb or shrub 0.2 – 0.4m high. 0.3 – 0.6 wide.	September to December or February to March.	White or grey sand.	T	Y	Species is known to occur in Canning, soil types are suitable.
<i>Schoenus benthamii</i>							
 <p><i>Schoenus benthamii</i> Photos: G.J. Keighery & J.L. Robson</p>		Tufted perennial, grass-like or herb (sedge), 0.15-0.45 m high. Fl. Brown	Oct to Nov.	White, grey sand, sandy clay. Winter-wet flats, swamps clay	P3	Y	Species is known to occur in Canning. Soil types are suitable.
<i>Schoenus natanus</i>							
 <p><i>Schoenus natanus</i> Photos: G.J. Keighery & J.L. Robson</p>	Floating Bog-rush	Aquatic annual, grass-like herb (sedge), 0.3m high. Brown flowers.	October	Winter-wet depressions.	P4	Y	Species is known to occur in Canning

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Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Schoenus pennisetis</i></p>		Tufted annual, grass-like or herb (sedge), 0.05-0.15 m high. Fl. purple-black	Aug to Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions	P3	Y	Species is known to occur in Canning, soil types are suitable
	Selena's Synaphea	Dense, clumped shrub to 0.3m high and 0.4 wide. Yellow flowers.	October	Sandy with lateritic pebbles. Near winter-wet flats in low woodland with weedy grasses.	T	N	Species is known to occur in Canning. Habitat and soil types are unsuitable.

Synaphea sp., Fairbridge Farm (D. Papenfuss 6/96) Photos: R. Baucher

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Picture	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)	Comment
 <p><i>Tetragia australiensis</i> Photos: G.J. Keighery</p>		Rhizomatous, tufted perennial, grass-like or herb (sedge), to 1 m high. Fl. Brown.	Nov to Dec.		T	Y	Species known to occur in Canning. Habitat requirements unknown.
 <p><i>Verticordia lindleyi</i> subsp. <i>lindleyi</i> Photos: G. Coe/terran</p>		Erect shrub, 0.2 – 0.75m high. Pink flowers.	May or November to December or January.	Winter-wet depressions. Sand, sandy clay.	P4	Y	Species known to occur in Canning. Soil types and habitat are suitable.

Appendix 4: Conservation Codes

Western Australia

Conservation Code	Name	Description
T	Threatened	Flora or fauna that is rare or likely to become extinct (Schedule 1 of the <i>Wildlife Conservation Act 1950</i>)
X	Presumed Extinct	Flora or fauna that is presumed to be extinct in the wild (Schedule 2 of the <i>Wildlife Conservation Act 1950</i>)
IA	International Agreement	Birds protected under international agreement (Schedule 3 of the <i>Wildlife Conservation Act 1950</i>)
S	Specially Protected	Other specially protected fauna (Schedule 4 of the <i>Wildlife Conservation Act 1950</i>)
<i>Schedule 1 species are ranked by DPaW according to their level of threat using IUCN Red List criteria</i>		
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild
EN	Endangered	Species considered to be facing a very high risk of extinction within the wild
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild
<i>Species that have not been adequately surveyed for listing under Schedule 1 or 2 of the Wildlife Protection Act</i>		
1	Priority One	Poorly known species – known from one or a few collections or sight records (generally <5), on all lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
2	Priority Two	Poorly known species – known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
3	Priority Three	Poorly known species – known collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.
4	Priority Four	Rare or near threatened and other species in need of monitoring.
5	Priority Five	Conservation dependent species that are not threatened but are subject to a specific conservation program, the cessation of which would result in them becoming threatened within five years.

(Source: Department of Parks and Wildlife, 2015d)

Commonwealth

Category	Description
Critically Endangered	Species facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Species facing a very high risk of extinction in the wild in the near future
Vulnerable	Species facing a high risk of extinction in the wild in the medium term

(Source: Department of the Environment, 2015b)

Appendix 5: Flora Species List

Legend:

* = Introduced species

Sorted by Family Name

Family	Species Name	Common Name
Liliopsida (Monocotyledons)		
Alliaceae	* <i>Nothoscordum gracile</i>	
Araceae	* <i>Zantedeschia aethiopica</i>	Arum Lily
Asparagaceae	<i>Acanthocarpus canaliculatus</i>	
	* <i>Asparagus asparagoides</i>	Bridal Creeper
	* <i>Asparagus officinalis</i>	Asparagus
	<i>Lomandra hermaphrodita</i>	
	<i>Lomandra suaveolens</i>	
	<i>Thysanotus manglesianus</i>	Fringed Lily
	<i>Thysanotus tenellus</i>	
Colchicaceae	<i>Burchardia multiflora</i>	Dwarf Burchardia
Cyperaceae	<i>Baumea articulata</i>	Jointed Rush
	<i>Baumea juncea</i>	Bare Twigrush
	<i>Bolboschoenus caldwellii</i>	Marsh Club-rush
	<i>Chorizandra enodis</i>	Black Bristlerush
	<i>Eleocharis acuta</i>	Common Spikerush
	<i>Gahnia trifida</i>	Coast Saw-sedge
	<i>Lepidosperma longitudinale</i>	Pithy Sword-sedge
	<i>Mesomelaena tetragona</i>	Semaphore Sedge
Haemodoraceae	<i>Haemodorum simplex</i>	
Iridaceae	* <i>Gladiolus undulatus</i>	Wild Gladiolus
	<i>Patersonia occidentalis</i>	Purple Flag
	* <i>Romulea rosea</i>	Guildford Grass
	* <i>Sparaxis bulbifera</i>	
	* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia
Juncaceae	* <i>Juncus articulatus</i>	Jointed Rush
	* <i>Juncus capitatus</i>	Capitate Rush
Juncaginaceae	<i>Triglochin mucronata</i>	

Family	Species Name	Common Name
Poaceae	* <i>Arundo donax</i>	Giant Reed
	* <i>Avena barbata</i>	Bearded Oat
	* <i>Briza minor</i>	Shivery Grass
	* <i>Bromus diandrus</i>	Great Brome
	* <i>Cynodon dactylon</i>	Couch Grass
	* <i>Ehrharta calycina</i>	Perennial Veldt Grass
	* <i>Eragrostis curvula</i>	African Lovegrass
	* <i>Hyparrhenia hirta</i>	Tambookie Grass
	<i>Lachnagrostis filiformis</i>	
	* <i>Lolium x hybridum</i>	
Restionaceae	<i>Meeboldina cana</i>	
	<i>Meeboldina coangustata</i>	
Typhaceae	* <i>Typha orientalis</i>	Bulrush
Xanthorrhoeaceae	<i>Xanthorrhoea brunonis</i>	Grass Tree
Magnoliopsida (Dicotyledons)		
Apocynaceae	* <i>Chamelaucium uncinatum</i>	Geraldton Wax
Asteraceae	* <i>Conyza</i> sp.	Fleabane
	<i>Hyalosperma cotula</i>	
	* <i>Hypochaeris radicata</i>	Flat Weed
	* <i>Leontodon rhagadioloides</i>	Cretan Weed
	* <i>Senecio vulgaris</i>	Common Groundsel
	<i>Siloxerus filifolius</i>	
	* <i>Sonchus oleraceus</i>	Common Sowthistle
	* <i>Symphyotrichum squamatum</i>	Bushy Starwort
Bignoniaceae	* <i>Campsis radicans</i>	Orange Trumpet Vine
Boraginaceae	* <i>Echium plantagineum</i>	Paterson's Curse
Campanulaceae	* <i>Monopsis debilis</i>	
Casuarinaceae	<i>Casuarina obesa</i>	Swamp Sheoak
Droseraceae	<i>Drosera glanduligera</i>	Pimpernel Sundew
	<i>Drosera menziesii</i>	Pink Rainbow

Family	Species Name	Common Name
Euphorbiaceae	* <i>Euphorbia peplus</i>	Petty Spurge
	* <i>Euphorbia terracina</i>	Geraldton Carnation Weed
	* <i>Ricinus communis</i>	Castor Oil Plant
Fabaceae	<i>Acacia saligna</i>	Orange Wattle
	* <i>Acacia iteaphylla</i>	Flinder's Range Wattle
	<i>Eutaxia virgata</i>	
	* <i>Lotus angustissimus</i>	Narrowleaf Trefoil
	<i>Lotus subbiflorus</i>	
	* <i>Lupinus cosentinii</i>	Blue Lupin
	* <i>Trifolium angustifolium</i>	Narrowleaf Clover
	* <i>Vicia sativa</i>	Common Vetch
	<i>Viminaria juncea</i>	Swishbush
Gentianaceae	* <i>Centaurium erythraea</i>	Common Centaury
	* <i>Cicendia filiformis</i>	Slender Cicendia
Geraniaceae	* <i>Pelargonium capitatum</i>	Rose Pelargonium
Goodeniaceae	<i>Goodenia pulchella</i> subsp. Coastal Plain B	
	<i>Scaevola lanceolata</i>	Long-leaved Scaevola
	<i>Scaevola repens</i>	
Lauraceae	<i>Cassytha flava</i>	Dodder Laurel
	<i>Cassytha racemosa</i>	Dodder Laurel
Lentibulariaceae	<i>Utricularia multifida</i>	
	<i>Utricularia violacea</i>	Violet Bladderwort
Loranthaceae	<i>Amyema linophylla</i> subsp. <i>linophylla</i>	Mistletoe
Lythraceae	* <i>Lythrum hyssopifolia</i>	Lesser Loosestrife
Meliaceae	* <i>Melia azedarach</i>	White Cedar, Cape Lilac
Menyanthaceae	<i>Ornduffia submersa</i> (P4)	
Myrtaceae	<i>Astartea affinis</i>	
	<i>Melaleuca lateritia</i>	Robin Redbreast Bush
	<i>Melaleuca raphiophylla</i>	Swamp Paperbark
	<i>Melaleuca viminea</i> subsp. <i>viminea</i>	
	* <i>Melaleuca viridiflora</i>	Broad-leaved Paperbark

Family	Species Name	Common Name
	<i>Pericalymma ellipticum</i>	Swamp Teatree
	<i>Verticordia densiflora</i> var. <i>densiflora</i>	
	<i>Verticordia huegelii</i> var. <i>huegelii</i>	
Oleaceae	* <i>Olea europaea</i>	Olive Tree
Onagraceae	* <i>Oenothera</i> sp.	Primrose
Orobanchaceae	* <i>Parentucellia latifolia</i>	Common Bartsia
	* <i>Parentucellia viscosa</i>	Sticky Bartsia
Oxalidaceae	* <i>Oxalis pes-caprae</i>	Soursob
Papaveraceae	* <i>Fumaria capreolata</i>	Whiteflower Fumitory
Primulaceae	* <i>Lysimachia arvensis</i>	Pimpernel
	<i>Samolus junceus</i>	
Proteaceae	<i>Adenanthos cygnorum</i>	Common Woolybush
	<i>Hakea prostrata</i>	Harsh Hakea
	<i>Hakea sulcata</i>	Furrowed Hakea
	<i>Hakea varia</i>	Variable-leaved Hakea
	<i>Isopogon dubius</i>	Pincushion Coneflower
Rubiaceae	<i>Opercularia vaginata</i>	Dog Weed
Scrophulariaceae	* <i>Dischisma capitatum</i>	Wooly-headed Dischisma
	<i>Eremophila glabra</i> subsp. <i>chlorella</i> (T)	
Stylidiaceae	<i>Stylidium divaricatum</i>	Daddy-long-legs
	<i>Stylidium roseoalatum</i>	Pink-wing Triggerplant
Thymelaeaceae	<i>Pimelea imbricata</i>	

(Source: Department of Parks and Wildlife, 2015a)

Appendix 6: Quadrat Data Southern Link Road

Quadrat No.: 1
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS E: 400290.51
 Coordinates: N: 6457216.74

 Location: Southern Link Road
 Aspect: NW
 Soil: clay
 Leaf Litter: 0%
 Condition: good
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Casuarina obesa</i>	7.0	<10	* <i>Avena barbata</i>	3.0	1
<i>Chorizandra enodis</i>	6.0	1.0	* <i>Cynodon dactylon</i>	5.0	<0.5
<i>Eleocharis acuta</i>	4.0	<0.5	* <i>Euphorbia peplus</i>	0.5	<0.5
<i>Meeboldina cana</i>	50.0	1.0	* <i>Hypochaeris radicata</i>	0.1	<0.5
Asteraceae sp.	3.0	<0.5	* <i>Lolium rigidum</i>	2.0	0.5
<i>Triglochin mucronata</i>	0.5	<0.5	* <i>Senecio vulgaris</i>	0.1	<0.5
<i>Utricularia multifida</i>	0.1	<0.5			

Quadrat No.: 2
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400258.8
 N: 6457194.06
 Location: Southern Link Road
 Aspect: none
 Soil: Clay, loamy clay
 Leaf Litter: 0%
 Condition: Excellent
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Burchardia multiflora</i>	0.1	0.5	* <i>Briza minor</i>	0.1	<0.5
<i>Chorizandra enodis</i>	15	0.5	* <i>Dischisma capitatum</i>	0.1	<0.5
<i>Drosera menziesii</i>	3	<0.5	* <i>Lotus subbiflorus</i>	0.5	<0.5
<i>Haemodorum simplex</i>	0.1	0.5	* <i>Romulea rosea</i>	0.1	<0.5
			* <i>Watsonia meriana</i> var.		
<i>Hyalosperma cotula</i>	0.1	<0.5	<i>bulbillifera</i>	7.5	1
<i>Lepidosperma longitudinale</i>	15	1.0			
<i>Opercularia vaginata</i>	4	0.5			
<i>Patersonia occidentalis</i>	6	0.5			
<i>Pimelea imbricata</i>	5	1.0			
<i>Thysanotus tenellus</i>	0.1	0.5			
<i>Verticordia densiflora</i>	50	1			
<i>Verticordia huegelii</i> var. <i>huegelii</i>	3.5	1			

Quadrat No.: 3
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400216.65
 N: 6457106.63
 Location: Southern Link Road
 Aspect: NE
 Soil: Clay
 Leaf Litter: 0%
 Condition: excellent
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Astartea affinis</i>	3	2	* <i>Lolium rigidum</i>	1	1
<i>Cassutha flava</i>	6	1.5	* <i>Lysimachia arvensis</i>	0.1	<0.5
<i>Chorizandra enodis</i>	3	1	* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	2	1.5
<i>Drosera menziesii</i>	0.1	<0.5			
<i>Eutaxia virgata</i>	4	1			
<i>Lepidosperma longitudinale</i>	5	0.5			
<i>Lotus subbiflorus</i>	0.5	<0.5			
<i>Meeboldina cana</i>	20	1			
<i>Melaleuca lateritia</i>	7	15			
<i>Drosera glanduligera</i>	0.1	<0.5			
<i>Stylidium divaricatum</i>	0.5	<0.5			
<i>Thysanotus manglesianus</i>	0.1	1.5			
<i>Utricularia multifida</i>	0.1	<0.5			

Quadrat No.: 4
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400295.92
 N: 6456920.77
 Location: Southern Link Road.
 Aspect: S
 Soil: Clay
 Leaf Litter: 0%
 Condition: Very good
 Notes:



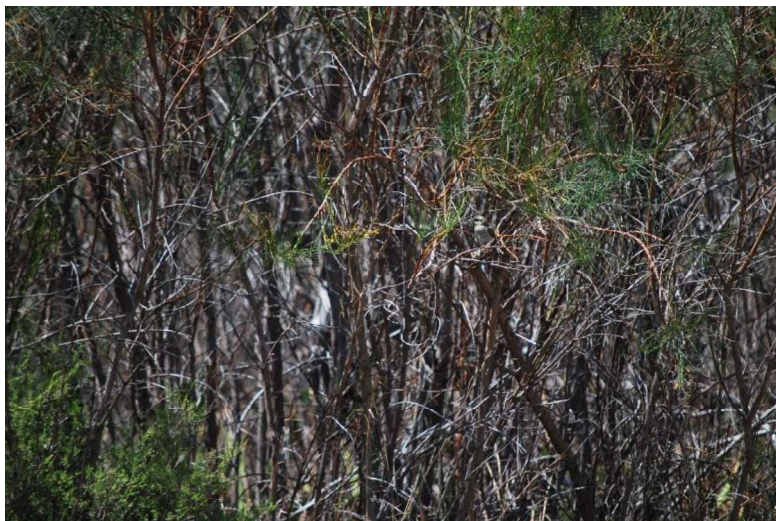
Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Astartea affinis</i>	1	1.5	* <i>Cicendia filiformis</i>	0.1	<0.5
<i>Cassytha flava</i>	10	1.5	* <i>Sonchus oleraceus</i>	0.1	<0.5
<i>Chorizandra enodis</i>	7	1	* <i>Sparaxis bulbifera</i>	0.1	<0.5
<i>Drosera glanduligera</i>	0.1	<0.5	* <i>Watsonia meriana</i> var.	5	1.5
<i>Eutaxia virgata</i>	6.5	1	<i>bulbillifera</i>		
<i>Goodenia pulchella</i> subsp.					
Coastal Plain B	3	<0.5			
<i>Meeboldina cana</i>	1	1			
<i>Melaleuca lateritia</i>	80	1.5			
<i>Stylidium divaricatum</i>	3	<0.5			
Cyperaceae sp.	3	0.5			
<i>Watsonia suaveolens</i>	0.1	<0.5			

Quadrat No.: 5
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400256.44
 N: 6457241.7
 Location: Southern Link Road.
 Aspect:
 Soil: clay
 Leaf Litter: 1% (0.1 cm)
 Condition: degraded
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Bolboschoenus caldwellii</i>	50	0.5	* <i>Cynodon dactylon</i>	40	0.5
<i>Chorizandra enodis</i>	0.1	1	* <i>Euphorbia peplus</i>	0.1	<0.5
<i>Eleocharis acuta</i>	0.5	<0.5	* <i>Lolium rigidum</i>	1	1
<i>Meeboldina coangustata</i>	4	1	* <i>Lotus subbiflorus</i>	4	<0.5
<i>Triglochin mucronata</i>	0.1	<0.5	* <i>Senecio vulgaris</i>	0.1	<0.5

Quadrat No.: 6
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400358.38
 N: 6457004.71
 Location: Southern Link Road
 Aspect: NW
 Soil: Clay
 Leaf Litter: 0%
 Condition: degraded
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Cassutha flava</i>	3	1	* <i>Cicendia filiformis</i>	0.1	<0.5
<i>Goodenia pulchella</i> subsp.	1	<0.5	* <i>Cynodon dactylon</i>	6	<0.5
Coastal Plain B					
<i>Melaleuca lateritia</i>	8	1.5	* <i>Lotus subbiflorus</i>	0.1	<0.5
<i>Sparaxis bulbifera</i>	0.5	<0.5	* <i>Paspalum dilatatum</i>	3	<0.5
<i>Viminaria juncea</i>	95	4	* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	70	1.5

Quadrat No.: 7
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400500.78
 N: 6457237.63
 Location: Southern Link Road
 Aspect: SE
 Soil: clay
 Leaf Litter: 0%
 Condition: Very good
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Baumea juncea</i>	90	1	* <i>Briza minor</i>	0.1	<0.5
<i>Euphorbia peplus</i>	0.5	<0.5	* <i>Cynodon dactylon</i>	10	<0.5
<i>Triglochin</i> sp.	2	<0.5	* <i>Lolium rigidum</i>	0.5	<0.5
<i>Utricularia multifida</i>	0.1	<0.5	* <i>Lotus subbiflorus</i>	1	<0.5
			* <i>Senecio vulgaris</i>	0.1	<0.5
			* <i>Typha orientalis</i>	1	1
			* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	3	2

Quadrat No.: 8
 Survey Date: 29/9/2015
 Personnel: Sharon Hynes, Taryn
 Brebner
 GPS Coordinates: E: 400232.24
 N: 6457074.25
 Location: Southern Link Road
 Aspect: NW
 Soil: clay
 Leaf Litter: 0%
 Condition: Good
 Notes:



Native Species	%	Height (m)	Invasive Species	%	Height (m)
<i>Cassutha racemosa</i>	15	3	* <i>Cynodon dactylon</i>	3	<0.5
<i>Lotus subbiflorus</i>	0.1	<0.1	* <i>Euphorbia peplus</i>	0.1	<0.1
<i>Meeboldina cana</i>	10	1	* <i>Euphorbia terracina</i>	1	0.3
<i>Meeboldina coangustata</i>	5	1	* <i>Lolium x hybridum</i>	3	0.5
<i>Melaleuca raphiophylla</i>	30	<10			
<i>Restionaceae</i> sp.	10	1			
<i>Triglochin mucronata</i>	1	0.1			

Appendix 7: Weather Data

Weather data from Perth Airport (Station ID: 009021) prior to and during survey activities, highlighted areas denotes survey dates.

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Evaporation (mm)	Sunshine (hours)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
01-11-15	11.1	26.1	0	7	6.9	W	31
02-11-15	13.9	23.4	14.8	5.6	10.3	W	39
03-11-15	14.8	26.2	0	5.8	12.6	W	35
04-11-15	13	25.6	0	7.2	12.2	W	33
05-11-15	10	24.5	0	7	9	WSW	37
06-11-15	15	26.6	0	6	8.3	SSW	44
07-11-15	17.3	24.1	1.2	7.4	4	S	39
08-11-15	13.6	26.2	0	4.2	12.7	SW	44
09-11-15	14.7	30.4	0	7	12.4	E	52
10-11-15	17.1	32.1	0	8.6	12.8	ENE	54
11-11-15	11.5	30.5	0	8.6	12.6	WSW	35
12-11-15	14.8	34.8	0	8.6	11.9	W	39
13-11-15	19.7	36.1	0	10.8	12.6	E	69
14-11-15	21.9	39.2	0	8	12.6	E	56
15-11-15	18.7	32.5	0	13.2	12.2	WSW	37
16-11-15	12.9	32.5	0	10.8	13.1	ENE	30
17-11-15	14	26.2	0	10.8	9	W	52
18-11-15	16.3	21.8	0.8	7.2	8.5	WSW	50
19-11-15	8.8	22.8	0.6	6.2	12.7	WSW	48
20-11-15	12.9	30.1	0	7.6	13.1	E	56
21-11-15	15.4	34.8	0	11	12.9	E	76
22-11-15	21.8	36.2	0	12.2	11.9	E	61
23-11-15	15.3	28.6	0	10	11.5	NNW	35
24-11-15	16.6	27.1	0	7.8	12.5	WSW	48
25-11-15	14.7	26.5	0	10.4	13.2	SE	48
26-11-15	14.3	31	0	9.8	12	E	50
27-11-15	16.9	31.5	0	9	13	ESE	33
28-11-15	16.3	28.7	0	9.8	12.6	W	37
29-11-15	13.7	27.1	0	8.6	13	SW	50
30-11-15	12.1	25.7	0	9.8	13.2	SSE	41