



Public Transport Authority

Thornlie-Cockburn Link Project Flora and fauna survey

October 2018

Executive summary

The Public Transport Authority (PTA) is in the planning stage for the extension of the passenger railway between Thornlie and Cockburn, the Thornlie-Cockburn Link Project (the project). The survey area follows the proposed alignment, extending from Beckenham Junction to Thornlie Station and through to Cockburn Central Station, a distance of approximately 18 kilometres (km) and 157.90 ha (hectares) in size.

The PTA commissioned GHD to undertake the following assessments for the survey area:

- Detailed flora and vegetation survey – conducted 6-8 September 2017, 6 October 2017, 14 February 2018, 1 March 2018 and 11 October 2018
- Targeted flora survey and targeted *Caladenia huegelii* survey, listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Threatened under the *Wildlife Conservation Act 1950* (WC Act) – conducted 6 October 2017 and between 19 September – 11 October 2018
- Dampland vegetation assessment of Geomorphic Wetlands of the Swan Coastal Plain (SWA) – conducted 14 February 2018
- Level 1 fauna survey – conducted 6-8 September 2017 and 14 February 2018
- Targeted Black Cockatoo assessment – conducted 6-8 September 2017 and 14 February 2018.

The results of the assessment will be used to assess the ecological impact of the project and inform the environmental approvals process.

Information gained from the survey and the review of previous reports of the area was extrapolated across those sections of the survey area not accessed on foot during the field survey. This was used to assist with determining the vegetation and habitat types for the entire survey area.

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

Key findings

Vegetation

Regional vegetation mapped by Heddle *et al.* (1980) at a broad scale indicates there are four vegetation complexes within the survey area: Southern River Complex, Bassendean Complex-Central and South, Guildford Complex and Swan Complex. All vegetation complexes have less than 30 percent (%) of their pre-European extents remaining within the SWA Interim Biogeographic Region of Australia (IBRA) bioregion:

- Southern River Complex – 18.42 %
- Bassendean Complex – Central and South – 26.90 %
- Guildford complex – 5.00 %
- Swan Complex – 13.53 %.

Where only 10 percent or less of the pre-European extent of an ecological community remains that community is considered threatened. Within the following LGAs less than 10 % of the pre-European extent remains:

- City of Gosnells – Guildford Complex – 8.37 %
- City of Canning – Bassendean Complex – Central and South – 5.45 %
- City of Melville – Bassendean Complex – Central and South – 7.82 %.

The survey area intersects the Canning River and 18 geomorphic wetlands of varying categories; seven Conservation Category Wetlands, six Resource Enhancement Wetlands and five Multiple Use Wetlands. Of the 18 wetlands located within the survey area, as mapped in the geomorphic wetlands of the SWA dataset, seven supported native dampland vegetation. The remaining 11 wetlands within the survey area have either been cleared or landscaped.

One Department of Biodiversity, Conservation and Attractions (DBCA)-managed conservation area that forms part of the Swan and Canning Rivers managed conservation area (R 48327), five Environmentally Sensitive Areas and four Bush Forever sites (246, 456, 245 and 253) intersect the survey area.

Eleven vegetation types were defined within the survey area. Seven types represent remnant native vegetation communities; two dryland (VT01 & VT08) and five dampland (VT02, VT02a, VT02b, VT05 & VT09). The remaining four communities vary between drylands and damplands and are in a varied state of degradation due to previous modifications to the landscape. The vegetation condition within the survey area was rated as Excellent to Degraded – Completely Degraded in condition. Cleared areas associated with roads, rail and infrastructure made up nearly half (48 %) of the survey area. The majority of the remaining vegetated areas of the survey area are in Degraded to Completely Degraded condition (70 %). A small diverse patch of Banksia woodland (VT01) was in Excellent condition (1.25 ha).

Field observations and statistical analysis determined the presence of two conservation significant ecological communities within the survey area:

- Banksia Woodlands of the Swan Coastal Plain TEC – listed as Endangered under the EPBC Act (12.47 ha)
- Low lying *Banksia attenuata* woodlands or shrublands (FCT 21c) PEC – listed as Priority 3 by DBCA (14.56 ha, which includes the above mentioned 12.47 ha of TEC).

These two communities' aligned with GHD vegetation types VT01 and VT02a.

Flora

One hundred and eighty seven (187) flora taxa representing 52 families and 140 genera were recorded from the survey area during the field survey. This total comprised 119 native taxa and 68 introduced flora taxa.

Other than *Caladenia huegelii*, no EPBC Act or WC Act listed flora were recorded within the survey area during the GHD survey. *Caladenia huegelii* listed as Endangered under the EPBC Act and Threatened under the WC Act was previously recorded in the 'Caladenia Grove Wetland Reserve'. Due to the existence of this species in the reserve it has been fenced off and was unable to be accessed for the detailed surveys. However access was allowed for the targeted flora survey completed during September and October 2018, with a number of *Caladenia huegelii* plants recorded (GHD 2018). Outside the survey area there have been a number of locations recorded of this species within remnant vegetation, the closest of these locations is <10 m north of the survey boundary in the area between Karel Ave and Ken Hurst Park. These records were confirmed as part of the targeted flora survey, reported by GHD (2018).

Caladenia huegelii is an ephemeral generally found in deep sandy soils of *Banksia* spp. – *Eucalyptus marginata* woodlands and favours areas of dense undergrowth. Suitable habitat within the project footprint included:

- *Banksia menziesii* and *B. attenuata* woodland (VT01)
- *Banksia* spp. isolated trees *Regelia inops* *Hypocalymma angustifolium* (VT02a).

The above vegetation types were intensively searched, however no individuals were recorded during any of the surveys.

Dodonaea hackettiana listed as a Priority 4 by DBCA was previously recorded by GHD (2013) near the Ranford Road Waste Transfer Station. This species was not recorded during the 2017 and 2018 surveys.

A likelihood of occurrence assessment conducted post-field surveys concluded that two taxa are known to occur, *Caladenia huegelii* and *Dodonaea hackettiana*. A further one species may possibly occur within survey area and the remaining taxa are considered unlikely to occur within the survey area. The one species that may possibly occur is *Tetraria australiensis* (listed as Vulnerable under the EPBC Act and Threatened under the WC Act). Whilst limited suitable habitat is present within the survey area (a small patch of open Marri woodland is present at Tom Bateman Reserve), this species can be cryptic and the reported flowering period is November to December.

Of the introduced taxa, six are listed as Declared Pests under the *Biosecurity and Management Act 2007* and/or as a WONS:

- **Zantedeschia aethiopica* (Arum Lilly) – Declared Pest
- **Moraea flaccida* (One-leaf Cape Tulip) – Declared Pest
- **Echium plantagineum* (Paterson's Curse) – Declared Pest
- **Rubus laudatus* (Blackberry) – Declared Pest
- **Lantana camara* (Lantana) – Declared Pest and WONS
- **Asparagus asparagoides* (Bridal Creeper) – Declared Pest and WONS.

Fauna

Eight broad fauna habitats were recorded within the survey area including:

- *Banksia* woodland
- *Melaleuca* woodland
- Ephemeral low shrubland
- Open *Banksia* woodland over low shrubland
- Mixed tall woodland/clumped trees
- Water bodies either seasonally inundated areas or Canning River
- Scattered isolated shrublands (scattered islands or scattered clumps)
- Mixed grasslands in paddocks.

Four of these habitat types provide high value habitat for fauna. These four habitat types cover approximately 28% of the total survey area. The remainder of the survey area consists of medium to low value fauna habitat or areas already cleared or developed for road, rail or infrastructure. All of the habitat types are represented at a local and regional scale in reserves, regional parks and conservation parks. Overall the survey area retains moderate local and regional connectivity to remnant vegetation in the region, in what is otherwise a fragmented environment.

The fauna survey recorded 66 species (native and introduced) comprising 45 birds, 11 reptiles, seven mammals and three frogs. Three species of conservation significance were recorded during the survey, Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) listed as Endangered under EPBC Act and WC Act, Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under EPBC Act and WC Act and Southern Brown Bandicoot (*Isoodon obesulus subsp. fusciventer*) listed as Priority 4 under the WC Act.

A further possible six conservation significant species were considered likely to occur within the survey area, including:

- Peregrine Falcon (*Falco peregrinus*) – Listed as other specially protected fauna by DBCA
- Perth Slider (*Lerista lineata*) – Listed as Priority 3 by DBCA
- Jewelled South West Ctenotus (*Ctenotus gemmula*) – Listed as Priority 3 by DBCA
- Black Striped Snake (*Neelaps calonotos*) – Listed as Priority 3 by DBCA
- Graceful Sunmoth (*Synemon gratiosa*) – Listed as Priority 4 by DBCA
- *Throscodectes xiphos* (a cricket) – Listed as Priority 1 by DBCA.

A Black Cockatoo assessment identified 46.83 ha of suitable foraging habitat and 176 potential breeding trees were recorded. Of these, none had evidence of being previously used for nesting and none had suitable hollows for current breeding. The 176 potential breeding trees had a diameter at breast height of >500 mm which means they may develop hollows in the future and therefore potentially become of value for Black Cockatoo breeding.

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1. Introduction

1.1 Project background

The Public Transport Authority (PTA) is in the planning stage for the extension of the passenger railway between Thornlie and Cockburn, the Thornlie-Cockburn Link Project (the project). The proposed alignment extends from Beckenham Station to Thornlie Station and through to Cockburn Central Station, a distance of approximately 18 kilometres (km). The project also includes two new stations, park and ride facilities at Ranford Road and Nicholson Road in Canning Vale, the duplication of the existing rail bridge over the Canning River, and drainage infrastructure areas outside of the rail reserve.

A reconnaissance flora, vegetation and fauna survey was completed by GHD Pty Ltd (GHD) in 2013 (GHD 2013). This survey assessed the proposed railway corridor, but not the current footprint for the stations or drainage infrastructure areas. Refinement of the project footprint and the subsequent listing of the 'Banksia woodlands of the Swan Coastal Plain' Threatened Ecological Community (TEC) has resulted in the need for further assessment of the project footprint.

1.2 Purpose of the report

The PTA commissioned GHD to undertake a biological assessment of the survey area. The purpose of the assessment was to confirm the flora, vegetation and fauna values of the survey area to inform planning works. The outcomes of the assessment will be used in the environmental assessment and approvals process.

1.3 Project location

1.3.1 Survey area

The survey area is located between Beckenham and Cockburn, extending from south of Beckenham Station to Thornlie Station, and through to Cockburn Central Station. The survey area is approximately 18 km long and 50 metres (m) wide increasing in width at station locations and other areas as required. The survey area covers 157.90 hectares (ha) (Figure 1, Appendix A).

1.3.2 Study area

A study area was defined for the desktop based searches of the assessment and includes a 5 km buffer of the survey area.

1.4 Scope of works

The scope of works for the biological assessment included:

- A desktop review of publically available information and relevant reports commissioned by the PTA was completed to determine the potential environmental values of the study area
- A biological assessment of the survey area to identify:
 - The presence or potential presence of Threatened or Priority flora
 - Vegetation community types present, including the presence of any TECs or Priority Ecological Communities (PECs).
 - Vegetation condition, including the location of any Weeds of National Significance (WONS) or Declared Weeds

- Flora species present including introduced species
- Vegetation growing in association with wetlands or watercourses
- Dampland vegetation assessment of Geomorphic Wetlands of the Swan Coastal Plain (SWA¹)
- The presence or potential presence of any Threatened or Priority fauna
- Fauna habitat types, including a targeted Black Cockatoo habitat survey
- Fauna species present, including introduced species
- A targeted search of *Caladenia huegelii* within the survey area to identify its presence or potential presence.
- Preparation of a biological survey report (this document) that:
 - Documents the results of the desktop assessment and field survey, including mapping
 - Identifies and discusses potentially occurring significant flora, vegetation and fauna species and their habitat (including identifying potential breeding or feeding habitat for Black Cockatoos)
 - Assesses the project clearing against the 10 Clearing Principles, as outlined in Schedule 5 of the *Environmental Protection Act 1986* (EP Act)
- Provision of spatial files in GIS format.

1.5 Relevant legislation, conservation codes and background information

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

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

1.6 Limitations and assumptions

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

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

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

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

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

GHD has prepared this report on the basis of information provided by PTA and others who provided information to GHD (including Government authorities), which GHD has not

¹ Also referred to as SCP

independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

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

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

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

This report has assessed the flora and fauna values within the survey area, as shown in Figure 1, Appendix A. Should the survey area change or be refined, further assessment may be required.

2. Methodology

2.1 Desktop assessment

Prior to the commencement of the field survey, a desktop assessment was undertaken to identify relevant environmental information pertaining to the study area and to assist in survey design. The desktop assessment involved a review of:

- Previous reports relevant to the study area including:
 - GHD (2013)
 - 360 Environmental (2012)
 - Natural Area Consulting (2013, 2016)
 - Astron (2015)
- The Department of the Environment and Energy (DEE) Protected Matters Search Tool (PMST) to identify communities and species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within the study area (DEE 2017a) (Appendix C)
- The Department of Biodiversity, Conservation and Attractions (DBCA) TEC and PEC database to determine the potential for significant ecological communities to be present within the study area
- The DBCA *NatureMap* database for flora and fauna species previously recorded within the study area (DBCA 2007–) (Appendix C)
- The DBCA Threatened (Declared Rare) and Priority Flora database (TPFL) and the WA Herbarium database (WAHERB) for Threatened and Priority flora species listed under the *Wildlife Conservation Act 1950* (WC Act) and listed as priority by DBCA, previously recorded within the study area
- Existing datasets including previous vegetation mapping of the survey area (Beard 1979, Heddle *et al.* 1980), aerial photography, geology/soils and hydrology information to provide background information on the variability of the environment, likely vegetation units and fauna habitats and to identify areas with potential to contain TECs, PECs, and Threatened and Priority listed flora and fauna species.

The environmental constraints identified in the desktop assessment are mapped in Figures 2 to 4, Appendix A.

2.2 Field survey

2.2.1 Vegetation and flora

GHD botanist Angela Benkovic (flora license no. SL012111) and Anna Napier (flora licence no. SL012292) completed a detailed vegetation and flora assessment, a targeted *Caladenia huegelii* search and dampland vegetation assessment of the Geomorphic Wetlands of the SWA within the survey area. Additional targeted flora surveys using traverses at 5 m spacing have completed across the survey area; the results of these surveys are reported in GHD 2018. The timing and survey efforts are shown in Table 1.

Table 1 Flora and vegetation survey timing and effort

Date	Survey effort	Area
6-8 September 2017	Detailed survey	Survey area (excluding pedestrian bridge)
6 October 2017	Detailed survey	Pedestrian bridge
	Targeted survey	Survey area
14 February 2018	Detailed survey and dampland vegetation assessment of Geomorphic Wetlands of SWA	Extension to survey area including Sevenoaks Street, Kwinana Freeway and Tom Bateman Reserve (in part) and revisiting Geomorphic Wetland of SWA areas
1 March 2018	Detailed survey	Additional sections including the northern extent of McCowan Street and approximately 5.15 ha of vacant land located between Karel Avenue (south) and the rail corridor (north)
19 September – 11 October 2018	Targeted flora survey	Targeted flora survey area (which includes the entire survey area). Results reported in GHD (2018)
11 October 2018	Detailed survey	Ranford Road area

The field survey was undertaken to verify the results of the desktop assessment, identify and describe the dominant vegetation units, assess vegetation condition, and identify and record vascular flora taxa present at the time of survey. Searches for conservation significant or other significant ecological communities and flora taxa were undertaken during the detailed survey and targeted survey.

The survey methodology employed by GHD was undertaken with reference to the Environmental Protection Authority (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a).

Data collection

Field survey methods involved a combination of sampling quadrats and relevés located in identified vegetation units and traversing the survey area by foot. Twelve non-permanent quadrats and nine relevés were described throughout the survey area.

Quadrats (measuring 10 m x 10 m – area of 100 m²) were located within each identified vegetation unit. A minimum of two quadrats were located within each identified vegetation unit, where possible. Field data at each quadrat was recorded on a pro-forma data sheet and included the parameters detailed in Table 2.

Table 2 Data collected during the field survey

Aspect	Measurement
Collection attributes	Personnel/recorder; date, quadrat dimensions, photograph of the quadrat.
Physical features	Aspect, soil attributes, ground surface cover, leaf and wood litter.
Location	Coordinates recorded in GDA94 datum using a hand-held Global Positioning System (GPS) tool to accuracy approximately ± 5 m.
Vegetation condition	Vegetation condition was assessed using the condition rating scale adapted by EPA (2016a) for the South West Botanical Province.
Disturbance	Level and nature of disturbances (e.g. weed presence, fire and time since last fire, impacts from grazing, exploration activities).
Flora	List of dominant flora from each structural layer. List of all species within the quadrat including average height and cover (using National Vegetation Information System (NVIS))

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

GHD Vegetation units

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

GHD vegetation units were described based on structure, dominant taxa and cover characteristics as defined by quadrat data and field observations. GHD vegetation unit descriptions follow NVIS and are consistent with NVIS Level V (Association). At Level V up to three taxa per stratum are used to describe the association (ESCAVI 2003).

360 Environmental Vegetation units and condition

Access to Ken Hurst Park, an area known to be affected by dieback was not permitted by the City of Melville due to the potential threat of spreading the pathogen further. The survey area follows the rail corridor along the boundary of Ken Hurst Park for approximately 1 km, north of the rail corridor the survey area extends into Ken Hurst Park by approximately 5 m.

The vegetation units from the Flora and Vegetation report of Ken Hurst Park (360 Environmental 2012) were compared to the vegetation units identified by GHD during the field survey and merged with synonymous GHD vegetation units. The vegetation condition reported by 360 Environmental (2012) within the relevant section of Ken Hurst Park was adopted for this report.

Comparison of vegetation units with regional datasets

The SWA dataset (accessed through *NatureMap*) is derived from a database that has been compiled and maintained over many years, combining the results of a number of floristic studies (conducted between 1990 and 1996) on plant communities of the SCP Bioregion, south of the Moore River. The SWA dataset includes sampling site details, the flora collected at these sampling sites and the floristic community type (FCT) assigned to these sampling sites. The taxonomy of the flora in the SWA dataset is current as of 23 June 2005 when the dataset was compiled (DBCA 2007–).

Statistical analysis

PRIMER v6 (Clarke and Gorley 2006) was used to compare the GHD quadrats to existing data (where available) for FCTs described on the SWA. PRIMER is limited in use for this purpose as analysis is based on all species recorded in quadrats, includes introduced species and does not take into account dominance of species. Further interpretation of statistical results, coupled with multiple field surveys and desktop information is needed to determine whether the vegetation units are representative of a certain FCT.

SWA site locations within a 5 km buffer of the survey area were located and the FCTs represented by these sites were identified. All site locations for these FCTs from the SWA dataset were extracted, along with those FCTs identified in the desktop searches (e.g. TEC and PEC searches). Representative quadrats from each FCT selected for the analysis are shown in Table 3. A second dataset was also established using FCTs identified in the desktop searches (e.g. TEC and PEC searches) (Table 3).

Three FCTs identified in the desktop searches were removed from the analysis, these included the Muehea Limestone TEC, Coastal Saltmarsh PEC and Wooded wetlands that support colonial waterbird nesting areas PEC. There were no limestone outcroppings, saltmarshes or wooded wetlands present within the survey area.

Table 3 List of SWA dataset quadrats used in PRIMER analysis

Floristic Community Type Name	FCT	Status	Quadrats
Southern wet shrublands, Swan Coastal Plain (SCP02)	2	TEC	AMBR-2, AMBR-5, AMBR-7, FISH-5, m5304, SF1201, YOON-2
<i>Eucalyptus calophylla</i> - <i>Kingia australis</i> woodlands on heavy soils, Swan Coastal Plain (SCP3a)	3a	TEC	brick1, brick3, brick5, brick6, brick7, brick8, BRIX-2, BRIX-5, lamb1, lamb2, m5305
<i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain (SCP3b)	3b	TEC	card12, card13, elbr01, Rush03, serp01, serp02, serp03, serp04, waro 01, waro 02
<i>Melaleuca preissiana</i> damplands	4		cas01, cas04, dian02, FL-1, FL-9, gosn01, gosn03, gosn07, gosn09, Light03, MODO-1, MODO-6, perth10
Mixed shrub damplands	5		AUSTB-4, AUSTB-6, BULL-5, BULL-7, GUTHR-2, GUTHR-4, Hamp02, HARRY-3, jand06, low08, PAGA-1, PAGA-3, perth02
Herb rich saline shrublands in clay pans (SCP07)	7	TEC^	AUSTB-1, BAMBUN-1, BULL-6, BULL-8, FISH-1, FISH-2, gosn10, mrnp01, mrnp03, perth05, Swamp02, YOON-3, YULE-5
Herb rich shrublands in clay pans (SCP08)	8	TEC^	airf01, airf02, BRIX-1, BRIX-3, BRIX-4, C58-3, FL-3, FL-7, gosn08, Hay01, waro 03, waro 04, xpearce01, xpearce02
Shrublands on dry clay flats (SCP10a)	10a	TEC^	C58-4, FISH-3, FISH-4, FL-2, gosn11, KOOLJ-6, KOOLJ-7, pinj10, Plant01, Punr03, waro 05, YULE-4
Wet forests and woodlands	11		AUSTB-3, beel03, BULL-12, C71-1, CARAB-3, HARRY-6, hymus01, hymus05, low10b, MODO-3, rowe01, TWIN-11, Yuri04
<i>Banksia attenuata</i> woodlands over species rich dense shrublands (SCP20a)	20a	TEC*	activ01, activ02, activ03, APBF-1, APBF-2, Bushm01, hart01, M53, m5302, m5303, maida01, maida02, perth07
Shrublands and woodlands of the eastern side of the Swan Coastal Plain (SCP20c)	20c	TEC	Bushm02, talb10, talb11, talb2, talb3, talb5, talb6, talb7, talb8, talb9
Low lying <i>Banksia attenuata</i> woodlands or shrublands (SCP21c)	21c	PEC*	5C07, BULLER-3, dillo01, FL-5, FL-6, hymus03, hymus04, jand05, KEME-3, MODO-2, PLINE-7, YULE-3
<i>Banksia ilicifolia</i> woodlands, southern Swan Coastal Plain (SCP22)	22	PEC*	5F01, BANK-1, DEJONG01, jand03, MELA-10, MELA-5, MPK02, MR11, pinj12, PLINE-6, raven05, white07, zBEER 01
Central <i>Banksia attenuata</i> – <i>Banksia menziesii</i> woodlands (SCP23a)	23a	Not listed*	beel02, bibra01, Cresw01, gosn02, gosn04, gosn12, gosn13, hart04, hurst01, hurst02, hurst03, hurst04, jand01, jand02, jand04, jand07, jand08, perth04, perth06, perth08
Northern Spearwood shrublands and woodlands (SCP24)	24	PEC**	bold07, bold09, bold12, bold13, bold14, bold23, BOLD-1, BOLD-2, buck01, CHIDPT-1, MTB-1, PTWALT-1, THOM-2

Floristic Community Type Name	FCT	Status	Quadrats
Spearwood <i>Banksia attenuata</i> or <i>B. attenuata</i> – <i>Eucalyptus</i> woodlands	28	Not listed*	4M03, beel01, HARRY-1, HARRY-2, KING-1, KING-2, leda02, NEER-2, NEER-3, sams01, sand01, SHENT-1, wire01, wire02
<i>Astartea</i> aff. <i>fascicularis</i> / <i>Melaleuca</i> species dense shrublands	S01		Caves07, Della01, gosn06, pinj15, raven04, Swamp03, yang03
Northern <i>Pericalymma ellipticum</i> dense low shrublands	S02		BNR04, Cavs09, ELE05, ELE06, ELE26, ELE30, ELE31, ELE34, hart02, hart03, MP02, MP11, MR08
Wet sedgelands on sandy clays	S03		ELE19, ELE20, gnan01, gosn05, pinj01, pinj02, pinj03, pinj04, pinj11, zBEER 02

* A component of the Endangered Banksia woodlands of the SWA EPBC Act listed TEC

** Can be a component of the Endangered Banksia woodlands of the SWA EPBC Act listed TEC

^ A component of the Critically Endangered Clay Pans of the Swan Coastal Plain EPBC Act listed TEC.

Multiple site analysis

The GHD and SWA dataset quadrat data was combined and presence/absence matrix created of all taxa (including perennials and annuals). The dissimilarity between quadrats was determined using the Bray-Curtis measure and the Resemblance function in PRIMER. A Cluster analysis (using Agglomerative Hierarchical Clustering technique) based on group average was undertaken using the Bray-Curtis similarity matrix and results presented as a dendrogram. In addition, a nonmetric multi-dimensional scaling analysis (MDS) was undertaken using the Bray-Curtis similarity matrix and results presented as a two dimensional scatter plot. A factor was added to the output to define sample groups by FCT. The outputs of the PRIMER analysis were used to inform decisions on vegetation units.

Single site insertion analysis

A single site insertion (SSI) analysis was conducted on all GHD quadrats. The SSI analysis involved analysing GHD quadrats individually against the SWA dataset. This type of analyses is considered a more powerful method of grouping each quadrat with the SWA data and therefore enables a more robust result.

Dampland vegetation assessment

Geomorphic Wetlands of SWA located within or that intersect the survey area, were assessed for the presence of dampland/ riparian vegetation and current condition. Rapid Assessment points were located within the geomorphic wetland boundary and the following data recorded:

- Wetland Unique Feature Identifier (UFI)
- Management Category, as evaluated by DBCA
- Vegetation type
- Condition
- Soil
- Photographs looking North, South, East and West of photo point, where applicable
- Extent of dampland vegetation, when applicable.

Vegetation condition

The vegetation condition was assessed and mapped in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces of Western Australia (devised by Keighery (1994) and adapted by EPA (2016a). The scale recognises the intactness of vegetation and consists of six rating levels. The vegetation condition rating scale is located in Appendix B.

The vegetation condition of Ken Hurst Park was assessed and mapped using (Keighery 1994). As this is the same scale used by EPA (2016a) the condition ratings from this survey (current report) and the Ken Hurst Park survey (360 Environmental 2012) are considered synonymous.

Flora identification and nomenclature

Species well known to the survey botanist were identified in the field; all other species were collected and assigned a unique collection number to facilitate tracking. All specimens collected during the field assessment were dried and processed in accordance with the requirements of the WA Herbarium. Species were identified by the use of taxonomic literature, electronic keys and online electronic databases.

The conservation status of all recorded flora was compared against the current lists available on *FloraBase* (WA Herbarium 1998–) and the EPBC Act Threatened species database provided by DEE (2017b).

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

Surveys for conservation significant flora

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

Targeted searches for conservation significant flora were undertaken during October 2017, September 2018 and October 2018. Sampling methods in September and October 2018 included traverses spaced 5 m apart across all areas of the survey area (and beyond) with native vegetation in Degraded or better condition. The results of these surveys are presented in a separate technical memorandum (GHD 2018).

2.2.2 Fauna

GHD zoologists Glen Gaikhorst and Melissa Jensen undertook a Level 1 fauna survey (reconnaissance survey) and Black Cockatoo habitat assessment of the survey area from 6-8 September 2017 and 14 February 2018. The majority of the survey area was traversed on foot and by vehicle over the course of the survey to identify and describe the dominant fauna habitat types present and their condition, assess habitat connectivity, and identify and record fauna species within the survey area. An assessment of the likelihood of conservation significant fauna and their habitats occurring within the survey area was also undertaken.

The survey methodology employed by GHD was undertaken with reference to the EPA *Technical Guidance – Terrestrial Fauna Surveys* (EPA 2016b).

Habitat assessment

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

- Habitat structure (e.g. vegetation type, presence/absence of structural layers such as ground cover and mid storey)
- Presence/absence of refuge including: density of ground covers, fallen timber (coarse woody debris), hollow-bearing trees and stags and rocks/boulder piles, and the type and extent of each refuge
- Presence/absence of waterways including type, extent and habitat quality within waterway
- Location of the habitat within the survey area in comparison to the habitat within the surrounding landscape
- Habitat connectivity and identification of wildlife corridors within and immediately adjacent to the survey area
- Current land use and disturbance history
- Evaluation of key habitat features and types identified during the desktop assessment relevant to fauna of conservation significance

- Evaluation of the likelihood of occurrence of conservation significant fauna within the habitat (based on presence of suitable habitat)
- A representative photograph of each habitat type.

Opportunistic fauna searches

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

- Searching the survey area for tracks, scats, bones, diggings and feeding areas for both native and feral species
- Searching through microhabitats including turning over logs or rocks, turning over leaf litter and examining tree hollows and hollow logs
- Visual and aural surveys, which accounted for many bird species potentially utilising the survey area
- Recording GPS locations of any conservation significant fauna species observed.

Black Cockatoo habitat assessment

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

- The identification and recording (via GPS) of the locations of potential and actual breeding habitat within the survey area (relevant tree species with a diameter at breast height (DBH) of >500 mm for Jarrah, Marri and Tuart
- Identifying, describing and recording the size of existing tree hollows and any evidence of use by Black Cockatoos within the survey area
- Identifying, describing and recording the DBH of trees with existing hollows within the survey area
- Identifying, recording and describing the locations of potential night roosting habitat
- Identifying, recording and describing the locations of potential foraging habitat
- The survey distinguished between actual and potential breeding habitat as per the following:
 - Actual nest trees: Evidenced as currently being used or have been used in the past
 - Potential habitat: Trees with available hollows that do not show evidence of use now or in the past; trees with hollows that do not show evidence of use now or in the past where the hollow is not available (e.g. hollows are occupied by bees or galahs); and those trees without hollows but which have the potential to develop hollows in the future, and which have DBH >500 mm.

Fauna species identification

Identification of fauna species was made in the field using available field guides and electronic guides (e.g. Morcombe 2004). Where identification in the field was not possible, photographs of specimens were collected to be later identified.

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

2.3 Limitations

2.3.1 Desktop limitations

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

2.3.2 Field survey limitations

The EPA (2016a) Technical Guide states flora and fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 4. Based on this assessment, the present survey effort has not been subject to any constraints which affect the thoroughness of the assessment and the conclusions which have been formed.

Table 4 Field survey limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information.	Nil	Adequate information is available for the survey area, this includes: <ul style="list-style-type: none"> • Broad scale (1:250,000) mapping by Beard (1979) and digitised by Shepherd <i>et al.</i> (2002) • Regional biogeography (Heddle <i>et al.</i> 1980).
Scope (what life forms were sampled etc.)	Nil	Vascular flora and terrestrial vertebrate fauna were sampled during the survey. Non-vascular flora, invertebrate and aquatic fauna were not surveyed.
Proportion of flora collected and identified (based on sampling, timing and intensity) Proportion of fauna identified, recorded and/or collected	Minor	<p>The detailed vegetation and flora surveys and targeted flora searches were undertaken in spring 2017 and 2018. The dampland vegetation assessment and detailed survey associated with Sevenoaks Street, Kwinana Freeway and Tom Bateman Reserve (in part) was completed in summer 2018.</p> <p>The flora recorded from the field survey is detailed in 4.1.3 and a full flora species list is provided in Appendix D. The portion of flora collected and identified was considered high, although it is possible the survey under-recorded some grass species (Poaceae), and annuals due to poor flowering material during the field assessments. Several grasses and annuals were observed during the spring assessment, however due to a lack of flowering and/or fruiting bodies were not identifiable, and as such, are likely to be underrepresented in the flora collected. As with any biological survey, ephemeral species such as orchids are not always present in each year/season or at the particular time a single botanical survey is conducted.</p> <p>The fauna survey was undertaken in spring 2017, and was a reconnaissance survey. An additional fauna survey was completed in summer 2018 for additional areas added to the survey area, including Sevenoaks Street, Kwinana Freeway and Tom Bateman Reserve (in part). The fauna assessment sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings, etc. Many cryptic species would not have been identified during a reconnaissance survey and seasonal variation within species often requires targeted surveys at a particular time of the year. Of the fauna species recorded during the survey, all species were identified to species level.</p> <p>The fauna assessment was aimed at identifying habitat types and terrestrial vertebrate fauna utilising the survey area. No sampling for invertebrates or aquatic species occurred. The information available on the identification, distribution and conservation status of invertebrates is generally less extensive than that of vertebrate species.</p>
Flora determination	Minor	<p>Flora determination was undertaken by the GHD botanist in the field and at the WA Herbarium.</p> <p>Two taxa could only be identified to family level only and eight taxa could be identified to genus level and one taxon tentatively identified to species level due to lack of flowering and/or fruiting material required for identification. Some species, particularly grasses and annuals may have been overlooked due to lack of material.</p> <p>The taxonomy and conservation status of the WA flora is dynamic. This report was prepared with reliance on taxonomy and conservation status current at the time report development, but it should be noted this may change in response to ongoing research and review of International Union for Conservation Nature criteria.</p>

Aspect	Constraint	Comment
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Minor	A number of areas were inaccessible during the survey area (see Access restrictions below). These areas were assessed from adjacent areas and/or information gained from the survey and the review of previous reports of the area was extrapolated across those sections of the survey area not accessed on foot during the field survey to assist with determining the vegetation and habitat types for the entire survey area.
Mapping reliability	Minor	The vegetation was mapped using high-resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1979) and field data. Data was recorded in the field using hand-held GPS tools (e.g. Nomad Juno and Garmin GPS). Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units used for this survey are accurate to within ± 5 metres on average. Therefore the data points consisting of coordinates recorded from the GPS may contain inaccuracies.
Timing/weather/season/cycle	Minor	<p>The detailed flora and vegetation field survey and the level 1 fauna survey were conducted during spring (6 – 8 September 2017) and summer (14 February 2018). The dampland vegetation assessment was also conducted during the summer survey. The targeted search for <i>Caladenia huegelii</i> was performed on 6 October 2017. The additional targeted conservation significant flora survey and detailed flora and vegetation field survey was conducted during spring (19 September -11 October 2018).</p> <p>In the three months prior to the September 2017 survey (June - August), Gosnells City weather recording station (No. 009106, Bureau of Meteorology (BoM) 2017) (located approximately 2.3 km from the survey area) recorded a total of 410.2 mm of rainfall. This total is approximately 10% lower than the long-term average for the same period (June - August; 453.2 mm) (BoM 2017).</p> <p>The weather conditions during the September field survey included:</p> <ul style="list-style-type: none"> • Daily maximum temperature ranging from 25.9 to 26.5 °C • Daily minimum temperature ranging from 10.0 to 16.0 °C • Daily rainfall 0 mm. <p>In the three months prior to the <i>Caladenia huegelii</i> targeted search (July - September), the Gosnells City weather recording station (No. 009106, BoM 2017) recorded a total of 419.1 mm of rainfall. This total is significantly lower than the average for this period, which is 669.3 mm (BoM 2017).</p> <p>The weather conditions during the autumn field survey included:</p> <ul style="list-style-type: none"> • Daily maximum temperature 23.0 °C • Daily minimum temperature 10.0 °C • Daily rainfall 0 mm. <p>In the three months prior to the February / March 2018 survey (November - January), the Gosnells City weather recording station (No. 009106, BoM 2018) recorded a total of 31.6 mm of rainfall. This total is less than the average for this period, which is 52.1 mm (BoM 2018).</p> <p>The weather conditions during the February field survey included:</p> <ul style="list-style-type: none"> • Daily maximum temperature 27.7 °C (recorded for 13 February, data for 14 February is unavailable)

Aspect	Constraint	Comment
		<ul style="list-style-type: none"> • Daily minimum temperature 18.2 °C • Daily rainfall 0 mm. <p>The weather conditions during the March field survey included:</p> <ul style="list-style-type: none"> • Daily maximum temperature 33.2 °C (recorded for 2 March, data for 1 March is unavailable) • Daily minimum temperature 15.2 °C (recorded for 3 March, data for 1 & 2 March are unavailable) • Daily rainfall 0 mm. <p>In the three months prior to the September/October 2018 survey (June - August), the Gosnells City weather recording station (No. 009106, BoM 2018) recorded a total of 330.1 mm of rainfall. This total is less than the average for this period, which is 451.1 mm (BoM 2018).</p> <p>The weather conditions during the September/October 2018 field survey included:</p> <ul style="list-style-type: none"> • Daily maximum temperature 20.7 to 26.7 °C • Daily minimum temperature 6.7 to 16.1 °C • Daily rainfall 0 to 10.2 mm (total over three days 28-30 September). <p>The weather conditions recorded during the survey periods are considered unlikely to have impacted upon the flora and fauna survey.</p> <p>The survey timings were considered appropriate for the flora and fauna field survey.</p>
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	Much of the survey area has been subjected to historical disturbance events (e.g. clearing, dumping); however, these disturbances did not impact the survey.
Intensity (in retrospect, was the intensity adequate)	Nil	The vascular flora of the survey area was sampled based on EPA (2016a); where possible a minimum of two quadrats per vegetation type were established along with relevés to supplement the data. This was done due to the linear and degraded nature of the survey area, making it difficult to establish three quadrats per vegetation type. The terrestrial fauna was sampled in accordance to EPA (2016b). The survey area was sufficiently covered by the GHD zoologist and botanist during the survey.
Resources	Nil	Adequate resources were employed during the field survey. Nine person days were spent undertaking the survey using a zoologist and botanist.
Access restrictions	Minor	Where possible the survey area was accessed on foot and traversed by vehicle. The following areas inaccessible during the field survey: The rail corridor: access was restricted due to safety, however the corridor was assessed from adjacent areas. Caladenia Grove Wetland Reserve: this is a fenced off area managed by the City of Canning (inaccessible area: 4.88 ha) Ken Hurst Park: access was not permitted by the City of Melville due to the threat of spreading dieback (inaccessible area: 0.73 ha).

Aspect	Constraint	Comment
Experience levels	Nil	The botanist and zoologist who executed the survey are practitioners suitably qualified and experienced in their respective fields. Botanist Angela Benkovic has over 10 years' experience undertaking flora surveys within WA. Glen Gaikhorst (senior zoologist) has over 22 years' experience undertaking fauna surveys within WA. Melissa Jensen has nine years' experience undertaking fauna surveys throughout Australia.

3. Desktop assessment

3.1 Climate

The study area is located in the South West Province of WA and experiences a temperate climate with distinctly dry, hot summers and cool, wet winters.

The BoM Gosnells City station (site number 009106) is the nearest weather station to the survey area (2.3 km from the survey area). Climatic data from this site indicates the mean maximum temperature of the area ranges from 18.7 °C in July to 33.1 °C in January and the mean minimum temperature ranges from 8.8 °C in July to 18.8 °C in February. The mean annual rainfall is 820.3 mm with an average of 86.8 rain days per year (BoM 2017). Climate statistics for the area are summarised in Plate 1 (source: Weatherzone 2017).

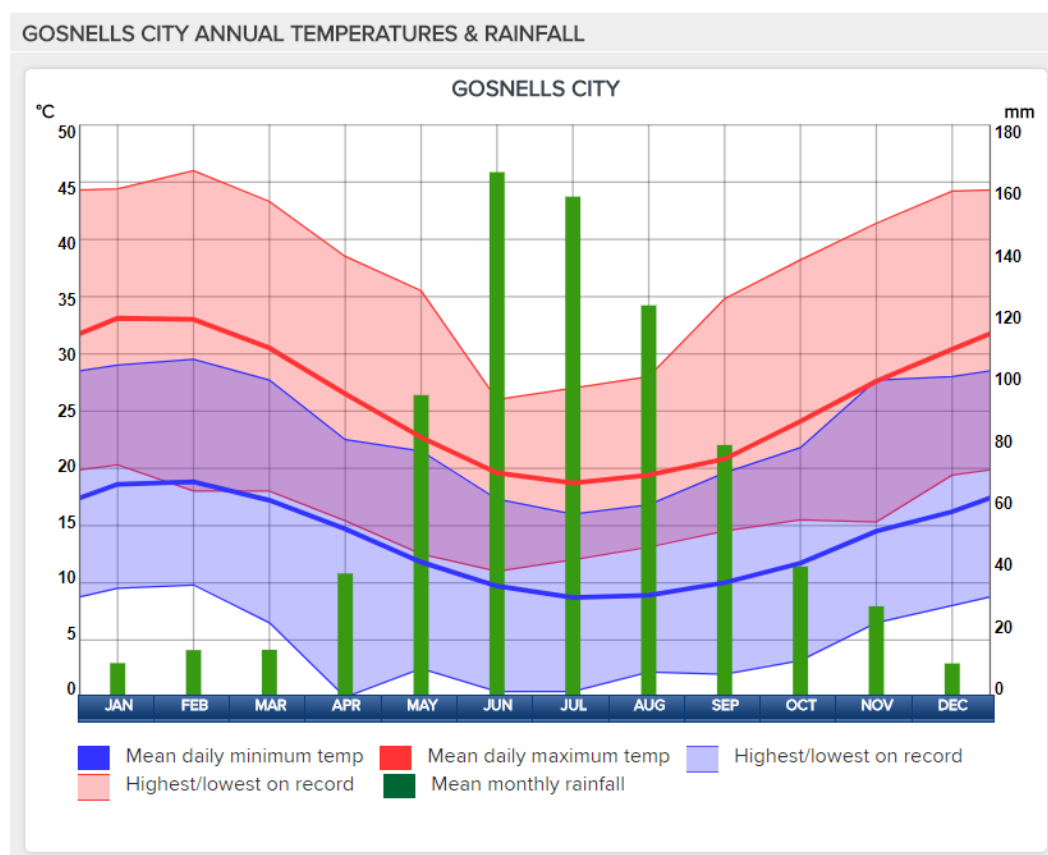


Plate 1 Mean climate statistics for Gosnells City (Weatherzone 2017)

3.2 Regional biogeography

The survey area is situated in the South West Botanical Province of WA (Beard 1990) within the SWA bioregion and the Perth (SWA2) subregion as described by the Interim Biogeographic Region of Australia (IBRA) (DEE 2017c).

The SWA bioregion is a low lying coastal plain, mainly covered with woodlands. The Perth subregion is composed of colluvial and aeolian sands, alluvial river flats and coastal limestone. Heath and/or Tuart woodlands occur on limestone, *Banksia* and Jarrah-*Banksia* woodlands on Quaternary marine dunes of various ages and Marri on colluvial and alluvial soils. The subregion also includes a complex series of seasonal wetlands (Mitchell *et al.* 2002).

3.3 Landform and soils

Soil-landscape mapping of the South West of WA (DAFWA 2007) indicates the survey area stretches east to west from the Pinjarra Zone, Bassendean Zone and just into the Spearwood Dunes of the Perth Coastal Zone.

The Pinjarra Zone is a flat, poorly drained alluvial plain with a variety of soils including grey deep sandy duplex soils, brown shallow loamy duplex soils and cracking clays. The Bassendean Zone consists of low dunes, sandplains and wetland depressions with pale, deep, well draining and highly leached sands. The yellow 'Spearwood sands are of varying depths over limestone (Tamala Limestone) (Tille *et al.* 1998). The DAFWA (2007) soil mapping indicates there are 10 different soil types within the survey area:

- Pinjarra Zone
 - CLAYEY SANDY SILT - pale brown, angular to rounded sand, low cohesion, of alluvial origin (213PjSWMsc1)
 - SANDY CLAY - white-grey to brown, fine to coarse-grained, subangular to rounded sand, clay of moderate plasticity gravel and silt layers near scarp (213Pj_Cs)
 - SAND - as S8 as relatively thin veneer over sandy clay to clayey sand. Of eolian origin (213Pj_S10)
 - PEATY SAND - grey to black, fine to medium-grained, moderately sorted quartz sand, slightly peaty, of lacustrine origin (213Pj_Sp1)
 - CLAYEY SAND - silty in part, pale grey to brown, medium to coarse-grained, poorly sorted, subangular to rounded, frequent heavy minerals, rare feldspar, of alluvial origin (213Pj_Sc).
- Bassendean Zone
 - Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m (212Bs_B1)
 - Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m (212Bs_B2)
 - Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam (212Bs_B3)
 - Deep grey siliceous sands or bleached sands, underlain at depths generally greater than 1.5 m by clay or less frequently a strong iron-organic hardpan (212Bs_B4)
 - SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin (212Bs_S8).
- Spearwood Dunes of the Perth Coastal Zone
 - Dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15% (211Sp_S1c).

3.4 Hydrology

Groundwater in WA is protected under the *Rights in Water and Irrigation Act 1914* (RIWI Act). A search of the GoWA Open Data (GoWA 2018a) database for areas within the survey area affected by the RIWI Act is provided in Table 5 and shown in Figure 4.

Table 5 Department of Water and Environmental Regulation groundwater queries for the survey area

Aspect	Details	Result	Location within the survey area
Groundwater area	Groundwater areas proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act).	Jandakot and Perth groundwater areas	Jandakot groundwater area intersects the project footprint south west of Leeming Road. North east of Leeming Road the groundwater area changes to Perth
Groundwater subareas	Groundwater subareas proclaimed under the RIWI Act.	South Lakes, Airport, City of Canning, City of Melville, City of Cockburn, City of Gosnells and	Groundwater subareas intersect the whole of the survey area
Surface water areas	Surface water areas proclaimed under the RIWI Act.	None present	
Irrigation district	Irrigation Districts proclaimed under the RIWI Act.	None present	
Rivers	Rivers proclaimed under the RIWI Act.	Canning River and Tributaries	Crosses the survey area west of the Kenwick Link
Public Drinking Water Source Areas (PDWSA)	PDWSAs is a collective term used for the description of Water Reserves, Catchment Areas and Underground Pollution Control Areas declared (gazetted) under the provisions of the <i>Metropolitan Water Supply, Sewage and Drainage Act 1909</i> or the <i>Country Area Water Supply Act 1947</i> .	Jandakot Underground Water Pollution Control Area, Protection Area Priority 1, 2 and 3	Extends from the western extent of the survey area to ~200 m east of Karel Ave
Waterway Management Areas	Areas proclaimed under the <i>Waterway Conservation Act 1976</i> .	None present	

3.4.1 Watercourses

The survey area intersects the Canning River. A number of smaller drainage lines occur within the study area, including the Swan River (Figure 4, Appendix A)

3.4.2 Wetlands

The EPBC Act PMST identified one Australian Government-listed Wetland of International Importance (Ramsar wetland) within the study area, Forrestdale and Thomsons Lakes (site number 35). Forrestdale and Thomsons Lakes are the best remaining examples of brackish, seasonal lakes with extensive fringing sedgeland, typical of the Swan Coastal Plain. The lakes provide important habitat for waterbirds on the SWA with 72 species of waterbird occurring at the two lakes and 21 of them breeding (DEE 2017d). Twenty-one species of migratory birds protected by international migratory bird conservation agreements have been recorded at the lakes. Thomsons Lake is one of the

last remaining Swan Coastal Plain refuges for the Australasian Bittern, and the only remaining wetland within the Perth metropolitan area where the Marsh Harrier still breeds (DEE 2017d). The sediments of Thomsons Lake are between 30,000 and 40,000 years old, which are the oldest lake sediments discovered in WA to date (DEE 2017d). The survey area is 4.9 km away from the Forrestdale and Thomsons Lakes at its closest point.

The Geomorphic Wetlands SWA dataset (Hill *et al.* 1996) identified 18 wetlands that intersect the survey area; seven Conservation Category Wetlands (CCW), six Resource Enhancement Wetlands (REW) and five Multiple Use Wetlands (MUW) (Table 6). An additional 43 Geomorphic Wetlands SWA are within 1 km of the survey area (Table 7). These included 10 CCW, 11 REW and 22 MUW (Figure 4, Appendix A).

Table 6 Geomorphic wetlands within or intersecting the survey area

Name	Unique feature identifier	Category
Unknown	6912	CCW
Unknown	6911	CCW
Unknown	6910	CCW
Unknown	13332	CCW
Unknown	7446	CCW
Canning River Palusplain	14900	CCW
Canning River Palusplain	15925	CCW
Unknown	15299	REW
Unknown	6776	REW
Unknown	7499	REW
Hester Park Canning River	7447	REW
Unknown	13537	REW
Canning River Palusplain	15926	REW
Unknown	7155	MUW
Unknown	13621	MUW
Canning River Palusplain	14899	MUW
Canning River Palusplain	14450	MUW
Unknown	6655	MUW

Table 7 Geomorphic wetlands within 1 km of the survey area

Name	Unique feature identifier	Category
Brixton Street Swamp	13365	CCW
Brixton Street Swamp	7748	CCW
Brixton Street Swamp	13129	CCW
Unknown	7653	CCW
Unknown	15255	CCW
Canning River Palusplain	14456	CCW
Canning River Palusplain	14901	CCW
Canning River Palusplain	7734	CCW
Canning River Palusplain	15404	CCW
Unknown	7444	CCW
Unknown	7353	REW
Unknown	7156	REW
Unknown	7733	REW
Unknown	7737	REW
Unknown	13336	REW
Unknown	6650	REW

Name	Unique feature identifier	Category
Unknown	6777	REW
Canning River Palusplain	14455	REW
Unknown	13620	REW
Unknown	7742	REW
Unknown	7741	REW
Canning Vale Dampland	7066	MUW
Unknown	7065	MUW
Unknown	7160	MUW
Unknown	15293	MUW
Unknown	7157	MUW
Unknown	7207	MUW
Unknown	15300	MUW
Unknown	7457	MUW
Unknown	13538	MUW
Unknown	13533	MUW
Canning River Palusplain	15949	MUW
Canning River Palusplain	14452	MUW
Unknown	7744	MUW
Brixton Street Swamp	7746	MUW
Unknown	15254	MUW
Unknown	7740	MUW
Unknown	6654	MUW
Unknown	15716	MUW
Unknown	6528	MUW
Unknown	6523	MUW
Unknown	6524	MUW
Unknown	7348	MUW

3.5 Land use

3.5.1 DBCA managed lands

Approximately 700 m west of the Kenwick Link the survey area crosses one DBCA-managed land categorised as the Swan River Trust River Reserve (R 48327). The Kenwick Wetlands Nature Reserve (R 49200, Class A) is the next closest DBCA managed land, approximately 160 m east of the survey area boundary (Figure 3, Appendix A).

3.5.2 Environmentally Sensitive Areas

The survey area intersects five Environmentally Sensitive Areas (ESAs), four of which are associated with Bush Forever sites (Figure 3, Appendix A);

1. Canning and Southern Rivers, Beckenham to Martin/Kelmscott (site 246)
2. Nicholson Road Bushland, Langford/ Thornlie (site 456)
3. Ken Hurst Park, Leeming (site 245) and Jandakot Airport, Jandakot (site 388)
4. Buffer zone of Greater Brixton Street Wetlands, Kenwick (site 387)

The remaining ESA is associated with Caladenia Grove Wetland Reserve (Figure 3, Appendix A), which is also a CCW and known habitat of *Caladenia huegelii*. This reserve is managed by the City of Canning (R48617). The reserve is approximately five hectares and includes *Melaleuca preissiana* Low Open Woodland (covering the wetland portion of the reserve).

3.6 Vegetation and flora

3.6.1 Broad vegetation mapping and extents

Broad scale (1:250,000) pre-European vegetation mapping of the area has been completed by Beard (1979) at an association level. The mapping indicates that two vegetation associations intersect the survey area:

- Medium woodland; jarrah, marri & wandoo (association 968)
- Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina (association 1001).

The pre-European mapping has been adapted and digitised by Shepherd *et al.* (2002). The extent of the vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA (latest update December 2017 – GoWA 2018b). As shown in (Table 8), the current extent of vegetation association 968 is less than 30 % of its pre-European extent at the IBRA bioregion, IBRA subregion and Local Government Authority (LGA) levels, and the current extent of vegetation association 1001 is less than 30 % of its pre-European extents at all levels (State, IBRA bioregion, IBRA subregion and LGA).

Regional vegetation mapped by Heddle *et al.* (1980) based on major geomorphic units on the SWA indicates two vegetation complexes on Aeolian deposits of the SWA and two vegetation complexes of fluvial deposits of the SWA are present within the survey area:

- Southern River Complex: Open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus marginata* (Jarrah) - *Banksia* species with fringing woodland of *E. rudis* (Flooded Gum) - *Melaleuca raphiophylla* (Swamp Paperbark) along creek beds (system6 42 on Aeolian deposits)
- Bassendean Complex-Central and South: Vegetation ranges from woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of *E. marginata* (Jarrah) to *E. todtiana* (Pricklybark) in the vicinity of Perth (system6 44 on Aeolian deposits)
- Guildford Complex: A mixture of open forest to tall open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) – *E. marginata* (Jarrah) and woodland of *E. wandoo* (Wandoo) (with rare occurrences of *E. lane-poolei* (Salmon White Gum)). Minor components include *E. rudis* (Flooded Gum) - *Melaleuca raphiophylla* (Swamp Paperbark) (system6 32 on fluvial deposits)
- Swan Complex: Fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca raphiophylla* (Swamp Paperbark) with localised occurrence of low open forest of *Casuarina obesa* (Swamp Sheoak) and *M. cuticularis* (Saltwater Paperbark) (system6 33 fluvial deposits).

GoWA (2018c) has assessed the vegetation complexes mapped by Heddle *et al.* (1980) against presumed pre-European extents within the SWA IBRA bioregion (Table 9) and the Cities of Canning, Cockburn, Gosnells and Melville (Table 10) respectively. All vegetation complexes have less than 30 % of their pre-European extents remaining within the SWA IBRA bioregion and in their respective LGA. Where only 10 per cent or less of the pre-European extent of an ecological community remains that community is considered threatened. Within the SWA IBRA bioregion the Guildford complex has 5.00 % remaining. The following LGAs have less than 10 % of the pre-European extent:

- City of Gosnells – Guildford Complex – 8.37 %

- City of Canning – Bassendean Complex – Central and South – 5.45 %
- City of Melville – Bassendean Complex – Central and South – 7.82 %.

3.6.2 Conservation significant ecological communities

A search of the EPBC Act PMST identified five EPBC Act-listed TECs potentially occurring within the study area. These TECs were also identified in a search of the DBCA TEC/PEC database. Details for these communities are provided in Table 11. There are multiple occurrences of TECs and PECs within the study area (Figure 2, Appendix A). The TECs and PEC that intersect the survey area are:

- *Eucalyptus [Corymbia] calophylla – Kingia australis* woodlands on heave soils of the Swan Coastal Plain (SCP 3a) TEC – five occurrences
- Herb rich shrublands in clay pans (SCP 08) TEC – two occurrences
- *Banksia* woodlands of the Swan Coastal Plain (TEC)/ *Banksia* dominated woodlands of the Swan Coastal Plain IBRA region (PEC) – 100 occurrences.

The majority of the south-western section of the survey area overlays occurrences of the *Banksia* woodlands of the Swan Coastal Plain TEC. The north-eastern section of the survey area intersects one occurrence of Herb rich shrublands in clay pans (SCP08) TEC and four occurrences of the *Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain (SCP3a) TEC.

3.6.3 Flora diversity

The *NatureMap* database search identified 1,286 plant taxa, representing 124 families recorded within the study area. This total comprises 992 native flora taxa and 294 introduced flora taxa. Dominant families recorded within the study area include Fabaceae (110 taxa), Myrtaceae (88 taxa) and Orchidaceae (86 taxa). The *NatureMap* database search is provided in Appendix C.

3.6.4 Conservation significant flora

Desktop searches of the EPBC Act PMST database, *NatureMap* database, DBCA TPFL and WAHERB databases identified the presence/potential presence of 85 conservation significant flora taxa within the study area. The desktop searches recorded:

- 27 taxa listed under the EPBC Act and/or as Threatened under the WC Act
- Six Priority 1 taxa
- Nine Priority 2 taxa
- 27 Priority 3 taxa
- 16 Priority 4 taxa.

The locations of conservation significant flora registered on the DBCA databases are mapped in Figure 2, Appendix A.

3.6.5 Previous survey GHD (2013)

One hundred and ninety two (192) flora taxa were recorded during the GHD survey in 2013. One Priority 4 taxon was recorded; *Dodonaea hackettiana*. This taxon was located near the Ranford Road Waste Transfer Station.

Table 8 Extents of vegetation associations mapped within the survey area (GoWA 2018b)

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DBCA managed lands
SWA IBRA bioregion		1,501,221.93	578,432.17	38.53	37.85
Perth IBRA sub-region		1,117,757.03	464,855.95	41.59	38.68
968	State: WA	296,715.07	94,970.94	31.99	57.68
	IBRA bioregion: SWA (SWA)	136,188.20	8,938.45	6.56	21.78
	IBRA sub-region: Perth (SWA2)	136,188.20	8,938.45	6.56	21.78
	LGA: City of Gosnells	3,643.74	342.52	9.40	25.97
1001	State: WA	57,410.23	12,704.45	22.13	13.82
	IBRA bioregion: SWA (SWA)	57,410.23	12,704.45	22.13	13.82
	IBRA sub-region: Perth (SWA2)	57,410.23	12,704.45	22.13	13.82
	LGA: City of Canning	5,025.14	330.33	6.57	5.53
	LGA: City of Cockburn	7,328.39	2,038.06	27.81	14.66
	LGA: City of Gosnells	5,173.51	598.25	11.56	0.78
	LGA: City of Melville	1,503.38	150.43	10.01	-

Table 9 Extents of vegetation complexes on the SWA mapped within the survey area (GoWA 2018c)

Vegetation complex	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DBCA managed lands
Southern River Complex	58,781.48	10,828.04	18.42	1.59
Bassendean Complex-Central and South	87,476.25	23,533.09	26.90	4.99
Guildford Complex	90,513.13	4,522.01	5.00	0.30
Swan Complex	15,194.13	2,055.56	13.53	0.92

Table 10 Extents of vegetation complexes in the LGA mapped within the survey area (GoWA 2018c)

LGA	Vegetation complex	Pre-European extent (ha)	Current extent (ha)	% of pre-European extent	Proportion of the vegetation complex within the LGA %
City of Gosnells	Southern River Complex	4,835.91	558.54	11.55	8.23
	Guildford Complex	1,966.15	164.61	8.37	2.17
	Swan Complex	925.20	144.22	15.59	6.09
City of Canning	Bassendean Complex-Central and South	3,814.26	207.76	5.45	4.36
City of Cockburn	Bassendean Complex-Central and South	6,809.99	1,766.14	25.93	7.78
City of Melville	Bassendean Complex-Central and South	2,235.87	174.89	7.82	2.56

Table 11 Threatened and Priority Ecological Communities identified in the desktop searches

Community type	EPBC Act	DBCA	Description (DEE 2017b)	Location
Shrublands on dry clay flats – SCP10a (TEC)	Critically Endangered	Endangered	This is the most rapidly drying of the clay flats vegetation community types. The microtopography is generally shallower and they have thin skeletal soils. This vegetation community type has a high species richness and includes the aquatic annuals and geophytes typical of other clay pan and clay flat vegetation community types (e.g. <i>Schoenus natans</i> , <i>Crassula natans</i> , <i>Eryngium pinnatifidum</i> subsp. <i>palustre</i> ms, <i>Wurmbea dioica</i> subsp. <i>alba</i> and <i>Amphibromus nervosus</i>). There are many species of herbs in this vegetation community type in spring. The shrub layer is dominated by species of <i>Hakea</i> (<i>H. varia</i> and <i>H. sulcata</i>) which, along with <i>Pericalymma ellipticum</i> , is indicative of a short inundation period.	Populations have been recorded approximately 100 m north west of the survey boundary and another population's buffer zone overlays the survey area at the north eastern extent.
Claypans with mid dense shrublands of <i>Melaleuca lateritia</i> over herbs (PEC)		Priority 1	These clay pans are usually dominated by a shrubland of <i>Melaleuca lateritia</i> with dense herbs. This community is known from the Swan Coastal Plain and Jarrah Forest IBRA regions. The clay pans are characterised by taxa that are adapted to presence of surface water such as <i>Hydrocotyle lemnooides</i> or to a combination of terrestrial and wet phases such as <i>Glossostigma diandrum</i> , <i>Villarsia capitata</i> , and <i>Eleocharis keigheryi</i> (DBCA 2015).	One occurrence of this community occurs 3.5 km south

Community type	EPBC Act	DBCAs	Description (DEE 2017b)	Location
Herb rich shrublands in clay pans – SCP08 (TEC)	Critically Endangered	Vulnerable	This vegetation community type occurs in low lying flats with a clay impeding layer allowing seasonal inundation. While aquatic annuals are common, the pools are probably not inundated to the same depth or for the same length of time as in the Herb rich saline shrublands in clay pans TEC (SCP07). This vegetation community type is dominated by one or more of the shrubs: <i>Viminaria juncea</i> , <i>Melaleuca viminea</i> , <i>M. lateritia</i> (robin redbreast bush), broom bush, <i>Kunzea micrantha</i> or <i>K. recurva</i> with occasional emergent of <i>Eucalyptus wandoo</i> . Species such as <i>Hypocalymma angustifolium</i> , <i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant (G. J. Keighery 5026) and <i>Verticordia huegelii</i> occur at moderate frequencies. This vegetation community type has a high percentage of weeds and appears to be the clay pan vegetation community type that has the greatest disturbance.	Fifteen communities have been recorded, locations include; approximately 100 m north west of the survey boundary and <2 km east of the survey area. The buffer zone of one community overlays the survey area at the north eastern extent.
Herb rich saline shrublands in clay pans - SCP07 (TEC)	Critically Endangered	Vulnerable	This vegetation community type occurs on heavy clay soils that are generally inundated from winter to mid summer. In early spring many of the sites in this vegetation community are covered by free water up to 30 cm deep. Aquatic species are common in this vegetation community early in the growing season. <i>Cotula coronopifolia</i> can form yellow floating mats in some pools while others are dominated by <i>Ornduffia submersa</i> . As the wetland dries a succession of species such as <i>Centrolepis</i> spp. and annual <i>Stylidium</i> spp. (trigger plants) successively germinate, grow and flower, resulting in an extended flowering period of over three months. Structurally this vegetation community type is quite variable ranging from woodlands to herblands, the most common overstorey taxa being <i>Melaleuca viminea</i> , <i>M. uncinata</i> , <i>M. cuticularis</i> or <i>Casuarina obesa</i> . The species saltwater paperbark and swamp sheoak may indicate some saline influence for at least some part of the year. Typical species in the understorey include the common herbs <i>Brachyscome bellidioides</i> , <i>Centrolepis polygyna</i> , <i>Pogonolepis stricta</i> and water buttons. In addition, species such as <i>Angianthus</i> aff. <i>drummondii</i> , <i>Eryngium pinnatifidum</i> subsp. <i>palustre</i> ms, and <i>Blennospora drummondii</i> occur in low frequency (<50%) and are absent from the other four vegetation community types (SCP08, SCP09, SCP10a and 117).	Four populations occur ~800 m north east of the eastern tip of the survey area

Community type	EPBC Act	DBCA	Description (DEE 2017b)	Location
Shrublands and woodlands of the eastern side of the Swan Coastal Plain – SCP20c (TEC)	Endangered	Critically Endangered	The community occurs mainly on the transitional soils of the Ridge Hill Shelf, on the Swan Coastal Plain adjacent to the Darling Scarp, but also extends marginally onto the alluvial clays deposited on the eastern fringe of the Swan Coastal Plain. The community occurs as a shrubland, or a woodland of <i>Banksia attenuata</i> and <i>Banksia menziesii</i> , sometimes with <i>Allocasuarina fraseriana</i> , over a shrub layer that can include the species <i>Adenanthos cygnorum</i> , <i>Hibbertia huegelii</i> , <i>Scaevola repens</i> var. <i>repens</i> , <i>Allocasuarina humilis</i> , <i>Bossiaea eriocarpa</i> , <i>Hibbertia hypericoides</i> and <i>Stirlingia latifolia</i> . A suite of herbs including <i>Conostylis aurea</i> , <i>Trachymene pilosa</i> , <i>Lomandra hermaphrodita</i> , <i>Burchardia umbellata</i> and <i>Patersonia occidentalis</i> ; and the sedges <i>Mesomelaena pseudostygia</i> and <i>Lyginia barbata</i> usually occur in the community. The weeds <i>Gladiolus caryophyllaceus</i> and <i>Ursinia anthemoides</i> are also common.	~3 km east of the survey area
<i>Eucalyptus [Corymbia] calophylla - Kingia australis</i> woodlands on heavy soils, Swan Coastal Plain – SCP3a (TEC)	Endangered	Critically Endangered	The <i>Corymbia calophylla - Kingia australis</i> woodlands on heavy soils of the Swan Coastal Plain ecological community is a woodland community located on heavy soils of the eastern side of the Swan Coastal Plain between Ruabon and Guildford. Typical and common native plant taxa in the community are: <i>Corymbia calophylla</i> ; the shrubs <i>Banksia dallanneyi</i> , <i>Philotheca spicata</i> , <i>Kingia australis</i> and <i>Xanthorrhoea preissii</i> ; herbs, rushes and sedges, <i>Cyathochaeta avenacea</i> , <i>Dampiera linearis</i> , <i>Haemodorum laxum</i> , <i>Desmocladius fasciculatus</i> , <i>Mesomelaena tetragona</i> and <i>Tetaria octandra</i> . The introduced grass <i>Briza maxima</i> is also common in the community, although weed cover in most occurrences is currently quite low	Eleven communities have been recorded adjacent to the north eastern extent of the survey area. Five of these communities buffer zones overlay the survey area

Community type	EPBC Act	DBCAs	Description (DEE 2017b)	Location
Shrublands and woodlands on Muchea Limestone (TEC)	Endangered	Endangered	The Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain ecological community occurs on the heavy soils of the eastern side of the Swan Coastal Plain. It is defined on the basis of rare limestone-influenced substrates. Where the best developed limestone occurs, near Gingin, the plant community is located on shallow black clay or sandy clay soils on limestone. Typical and common native species in areas of best developed limestone are the tree <i>Casuarina obesa</i> , the mallees <i>Eucalyptus decipiens</i> and <i>E. foecunda</i> and the shrubs <i>Melaleuca huegelii</i> , <i>Alyogyne huegelii</i> var. <i>huegelii</i> , <i>Grevillea curviloba</i> ssp. <i>incurva</i> , <i>Grevillea curviloba</i> ssp. <i>curviloba</i> , <i>Grevillea evanescens</i> , <i>Melaleuca acerosa</i> , and the herb <i>Thysanotus arenarius</i> . Where the limestone substrate is less well developed and limestone may occur as nodules or chunks, the flora assemblages can be influenced by other characteristics of the substrate, such as clay content, with the presence of calcicoles such as <i>Alyogyne</i> sp. Rockingham, <i>A. hakeifolia</i> , <i>Carex theca</i> , <i>Hibbertia spicata</i> subsp. <i>spicata</i> , <i>Lechenaultia linarioides</i> , <i>Thysanotus arenarius</i> , <i>Gahnia trifida</i> , <i>Eremophila glabra</i> and <i>Melaleuca brevifolia</i> providing evidence of the limestone influence.	Ten communities have been recorded north and south of the survey area. the closest occurrence is ~1.3 km east
<i>Banksia attenuata</i> woodland over species rich dense shrublands - SCP20a (TEC)*	Endangered TEC (part)	Endangered	Occurs on sands at the base of the Darling Scarp in the Forrestfield area and north of Perth in the Koondoola and Chittering areas. This community is very species rich (80 spp./100m2) and is dominated by <i>Banksia attenuata</i> (occasionally with <i>Eucalyptus marginata</i>) with <i>Bossiaea eriocarpa</i> , <i>Conostephium pendulum</i> , <i>Hibbertia huegelii</i> , <i>H. hypericoides</i> , <i>Petrophile linearis</i> , <i>Scaevola repens</i> , <i>Stirlingia latifolia</i> , <i>Mesomelaena pseudostygia</i> and <i>Alexgeorgea nitens</i> common understorey species. This community is very restricted and the richest of any <i>Banksia</i> community found on the coastal plain.	Seven communities have been recorded north east of the survey area; the closest occurrence is ~3 km east
<i>Banksia</i> woodlands of the Swan Coastal Plain (TEC) <i>Banksia</i> dominated woodlands of the Swan Coastal Plain IBRA region (PEC)	Endangered	Priority 3	The ecological community is a woodland associated with the Swan Coastal Plain of southwest Western Australia. A key diagnostic feature is a prominent tree layer of <i>Banksia</i> , with scattered eucalypts and other tree species often present among or emerging above the <i>Banksia</i> canopy. The understorey is a species rich mix of sclerophyllous shrubs, graminoids and forbs. The ecological community is characterised by a high endemism and considerable localised variation in species composition across its range.	989 occurrences of this community occur within and around the survey area.

Community type	EPBC Act	DBCAs	Description (DEE 2017b)	Location
Subtropical and Temperate Coastal Saltmarsh (TEC)	Vulnerable	Priority 3	<p>The Subtropical and Temperate Coastal Saltmarsh consists of an assemblage of plants, animals and micro-organisms associated with saltmarsh in coastal regions of sub-tropical and temperate Australia (south of 23 °S latitude). The habitat is coastal areas under tidal influence. In southern latitudes saltmarsh are the dominant habitat in the intertidal zone and often occur in association with estuaries. It is typically restricted to the upper intertidal environment, generally between the elevation of the mean high tide, and the mean spring tide. The community consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, reeds, sedges and shrubs. Succulent herbs and grasses generally dominate and vegetation is generally <0.5 m tall with the exception of some reeds and sedges. Many species of nonvascular plants are also found in saltmarsh, including epiphytic algae, diatoms and cyanobacterial mats. Saltmarsh consists of many vascular plant species but is dominated by relatively few families. There is also typically a high degree of endemism at the species level. The two most widely represented coastal saltmarsh plant families are the Chenopodiaceae and Poaceae. Four structural saltmarsh forms are currently recognised based on dominance of a particular vegetation type:</p> <ul style="list-style-type: none"> • dominance by succulent shrubs (e.g. <i>Tecticornia</i>) • dominance by grasses (e.g. <i>Sporobolus virginicus</i>) • dominance by sedges and grasses (e.g. <i>Juncus kraussii</i>, <i>Gahnia trifida</i>) • dominance by herbs (e.g. low-growing creeping plants such as <i>Wilsonia backhousei</i>, <i>Samolus repens</i>, <i>Schoenus nitens</i>). 	Eight communities have been recorded north of the survey area; the closest occurrence is ~3 km
Southern wet shrublands, Swan Coastal Plain – SCP02 (TEC)		Endangered	<p>This community type consists of shrublands or open low woodlands usually restricted to small remnant areas south of Busselton. They are characterised by seasonally inundated sandy clay soils. Shrub rich, occurrences of <i>Kingia australis</i>, <i>Eutaxia virgata</i> and <i>Calothamnus lateralis</i> are common for this community (Gibson <i>et al.</i> 1994)</p>	Two communities have been recorded north of the survey area; the closest occurrence is ~5 km.

Community type	EPBC Act	DBCAs	Description (DEE 2017b)	Location
<i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain – SCP3b (TEC)		Vulnerable	This community is generally dominated by <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> in the upper stratum and <i>Bossiaea eriocarpa</i> and <i>Conostylis juncea</i> in the lower stratum on heavy soils.	One community recorded 3.2 km east
Wooded wetlands which support colonial waterbird nesting areas (PEC)		Priority 2	Chandala, Booragoon Lake, unnamed wetland near Pinjarra, McCarleys Swamp. This type differs from the listed 'Perched wetlands of the Wheatbelt region with extensive stands of <i>Casuarina obesa</i> and <i>Melaleuca strobophylla</i> ' ('Toolibin-type' wetlands) in that the Wheatbelt type is <i>Casuarina</i> , rather than <i>Melaleuca</i> dominated. Also, Toolobin Lake type is now brackish-saline (formerly fresh-brackish), whereas this type are currently fresh-brackish.	One community recorded 3.0 km north
<i>Banksia ilicifolia</i> woodlands –SCP22 (PEC)*	Endangered TEC (part)	Priority 2	Low lying sites generally consisting of <i>Banksia ilicifolia</i> – <i>B. attenuata</i> woodlands, but <i>Melaleuca preissiana</i> woodlands and scrubs are also recorded. Occurs on Bassendean and Spearwood systems in the central Swan Coastal Plain north of Rockingham. Typically has very open understorey, and sites are likely to be seasonally waterlogged.	Four occurrences of this community; the closest is 700 m south
Northern Spearwood shrublands and woodlands – SCP24 (PEC)*	Endangered TEC (part)	Priority 3	Heaths with scattered <i>Eucalyptus gomphocephala</i> occurring on deeper soils north from Woodman Point. Most sites occur on the Cottesloe unit of the Spearwood system. The heathlands in this group typically include <i>Dryandra sessilis</i> , <i>Calothamnus quadrifidus</i> and <i>Schoenus grandiflorus</i> .	One occurrence; 4.7 km south
Low lying <i>Banksia attenuata</i> woodlands or shrublands – SCP21c (PEC)*	Endangered TEC (part)	Priority 3	This type occurs sporadically between Gingin and Bunbury, and is largely restricted to the Bassendean system. The type tends to occupy lower lying wetter sites and is variously dominated by <i>Melaleuca preissiana</i> , <i>Banksia attenuata</i> , <i>B. menziesii</i> , <i>Regelia ciliata</i> , <i>Eucalyptus marginata</i> or <i>Corymbia calophylla</i> . Structurally, this community type may be either a woodland or occasionally shrubland.	Four occurrences of this community; the closest is 800 m south

* A component of the Endangered *Banksia* woodlands of the SCP EPBC listed TEC

3.7 Fauna

3.7.1 Fauna diversity

The *NatureMap* database search identified 557 fauna species previously recorded within the study area including: 228 birds, 63 reptiles, 10 amphibians and 26 mammals. The remainder of species are marine fish and invertebrates and were not considered as part of this survey.

3.7.2 Conservation significant fauna

The EPBC Act PMST and *NatureMap* database identified the presence, or potential presence of 45 conservation significant fauna species, excluding those species that are exclusively marine or migratory/marine as no marine habitat was present within the survey area. In addition to the 45 species identified by the database searches, 34 additional species were considered for this assessment as a result of a review of the species listed under Schedules 1-4 of the WC Act (revised January 2017).

3.7.3 Previous survey GHD (2013)

The GHD (2013) survey recoded 72 species (native and introduced) comprising 57 birds, six reptiles, five mammals and four frogs. Two conservation significant fauna were recorded during the survey including Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Baudin's Black Cockatoo (*Calyptorhynchus baudinii*). The Baudin's Black Cockatoo record is considered rare and would be associated with opportunistic use as it is not typical to see this species of Cockatoo on the Swan Coastal Plain.

4. Field survey results

4.1 Vegetation and flora

4.1.1 Vegetation types

The survey area occurs on a mostly altered landscape of flat plains with seasonally wet areas. Small areas of remnant bushland are found scattered along the survey area, however the majority of the survey area has been cleared and modified by infrastructure and weed invasion. The surveys identified 11 vegetation types within the survey area (Table 12 and Figure 5, Appendix A). Seven types represent remnant bushland communities; two dryland and five dampland. The remaining four vegetation types vary between drylands and damplands, which are in a varied state of degradation due to previous modifications to the landscape and so are not considered remnant bushland.

Of the remnant native vegetation communities, *Banksia menziesii* and *B attenuata* woodland (VT01) was the dominant vegetation type within the survey area (11.61 ha). However, not all this community type could be surveyed in the field due to access constraints. Remnant bushland within *Caladenia Grove Wetland Reserve* (4.88 ha) was observed to be synonymous with *Banksia menziesii* and *B attenuata* woodland (VT01). Signage around the area identified the bushland as known habitat for EPBC Act and WC Act listed Threatened Grand Spider Orchid (*Caladenia huegelii*).

Remnant bushland west of Ranford Road included areas of *Banksia menziesii* and *B attenuata* woodland (VT01) with *Regelia inops Hypocalymma angustifolium* shrubland (VT02). Isolated clumps of *Banksia* spp. were recorded in upland areas of the shrubland (described as VT02a), whilst *Melaleuca* dominated the overstorey in low-lying shrubland areas (described at VT02b). The GHD vegetation types and mapping in this area aligns with that completed for the City of Canning by Natural Area (2012).

A previous flora and vegetation survey of Ken Hurst Park (360 Environmental 2012), was used to map the small section that intersected the survey area. The 360 Environmental vegetation types that overlay the survey area are B, EBA and WetShrub; B and EBA are considered synonymous to GHD vegetation unit *Banksia menziesii* and *B attenuata* woodland (VT01), whilst WetShrub aligns with GHD vegetation type *Regelia inops Hypocalymma angustifolium* shrubland (VT02).

With the exception of the rail corridor and the above noted areas, the remainder of the survey area was easily accessible. The most dominant vegetation type within the survey area was isolated stands of native/planted trees and/or shrubs (VT06). The most restricted vegetation type within the survey area was *Melaleuca raphiophylla* woodland (VT09); this vegetation type occurred within the north eastern extent of the Tom Bateman Reserve.

A floristic analysis was used to compare the GHD quadrats (Q01 – Q12) to existing data (where available) from FCTs occurring within a 5 km buffer of the survey area (shown in Table 3). The cluster analysis and resulting dendrogram showed general clustering of most FCTs, however outlier sites for FCTs 7, 22, 23a, 28 and S03 were also present. GHD quadrats Q01 and Q03 clustered together, aligning with a clade represented by FCTs 21c and 23a. GHD quadrats Q04, Q08 and Q11 were clustered and were on a clade with GHD quadrats Q02, Q05, Q09, Q10 and Q12; these quadrats showed no clear alignment to any FCTs. GHD Q06 showed no similarities to any FCTs, and GHD Q07 showed low similarity with FCTs 11 and S03 (Appendix D). This preliminary analysis

indicates that, statistically, the vegetation recorded in the GHD quadrats Q01 and Q03 have affinities to FCT 21c.

A two dimensional MDS scatter plot was also produced and largely reflected the dendrogram (Appendix D). A floristic analysis was rerun including only FCTs representative of TECs and PECs. This cluster analysis and resulting dendrogram, and two dimensional MDS scatter plot showed similar results with more discrete grouping of FCTs 02, 3a, 3b, 7, 8, 10a and 22. GHD quadrats Q01 and Q03 also show clearer separation and alignment with FCT 21c compared with 23a.

Whilst not shown in the statistical results, based on dominant (and typical) species present and landforms, it is likely that VT02b aligns with *Melaleuca preissiana* damplands (FCT 4).




The statistical outputs indicate partial statistical alignment between the GHD vegetation types and the previously described Gibson *et al.* (1994) FCTs based on taxa presence or absence. However, limitations with the data analysis include no consideration of dominant taxa within each vegetation type.



4.1.2 Vegetation condition




The vegetation condition within the survey area was rated from Excellent to Degraded - Completely Degraded in condition. The extents of the vegetation condition ratings mapped within the survey area are detailed in Table 13 and mapped in Figure 6, Appendix A.




Cleared areas associated with roads, rail and infrastructure make up nearly half (48 %) of the survey area. The majority of the remaining vegetated areas of the survey area are in Degraded to Completely Degraded condition. This condition rating is due to historical clearing and/ or the presence of WoNS, Declared Pests and/ or other aggressive bushland weeds that now dominate these areas. A small diverse patch of *Banksia* woodland (VT01) was in Excellent condition (1.25 ha); the vegetation structure in the community was largely intact with common herbaceous and grassy bushland weeds present but not dominant. The majority of vegetation in the Ranford Road Bushland was rated Good to Very Good; this area has been grazed by kangaroos, but limited weed incursion was observed.


Table 12 Recorded vegetation types

Vegetation type	Vegetation type description	Landform and substrate	Extent (ha)	Sample locations and notes	Representative photograph
<i>Banksia menziesii</i> and <i>B attenuata</i> woodland (VT01)	<i>Eucalyptus todtiana</i> , <i>Nuytsia floribunda</i> , <i>Banksia illicifolia</i> isolated trees over <i>B. menziesii</i> , <i>B attenuata</i> woodland over <i>Xanthorrhoea preissii</i> , <i>Hibbertia</i> spp. sparse shrubland over diverse heathland	Plain with grey sandy soils.	9.68 ha (surveyed) *4.88 ha (not surveyed) 14.56 ha total	Quadrats: 1, 3, 4, 8, 11 Relevé: 2 Likely to align with FCT 21c, and possibly with FCT 23a	
<i>Regelia inops</i> <i>Hypocalymma angustifolium</i> shrubland (VT02)	<i>Melaleuca preissiana</i> / <i>Banksia illicifolia</i> / <i>B. littoralis</i> isolated trees over <i>Regelia inops</i> , <i>Hypocalymma angustifolium</i> shrubland over <i>Phlebocarya ciliatum</i> , <i>Dasyopogon bromeliifolius</i> closed herbland	Plain with grey sandy soils.	6.44 ha	Quadrats: 2, 10 No clear alignment with any FCTs	
<i>Banksia</i> spp. isolated trees <i>Regelia inops</i> <i>Hypocalymma angustifolium</i> shrubland (VT02a)	<i>B. attenuata</i> / <i>B. illicifolia</i> isolated clumps of trees over <i>Regelia inops</i> , <i>Hypocalymma angustifolium</i> shrubland over <i>Phlebocarya ciliatum</i> , <i>Dasyopogon bromeliifolius</i> closed herbland	Plain with grey sandy soils.	0.49 ha	Quadrat: 5 May align with FCTs 23a, 21c	

Vegetation type	Vegetation type description	Landform and substrate	Extent (ha)	Sample locations and notes	Representative photograph
<i>Melaleuca preissiana</i> open woodland (VT02b)	<i>Melaleuca preissiana</i> open woodland over <i>Regelia inops</i> , <i>Hypocalymma angustifolium</i> , <i>Astartea fascicularis</i> shrubland with <i>Lepidosperma longitudinale</i> , <i>Lyginia imberbis</i> , <i>Hypolaena exsulca</i> sparse sedgeland over <i>Phlebocarya ciliatum</i> , <i>Dasypogon bromeliifolius</i> herbland	Plain, depressions with grey sandy soils	1.92 ha	Quadrats: 9, 12 Likely to align with FCT 4	
<i>Melaleuca preissiana</i> M. <i>rhapsiophylla</i> open woodland (VT03)	<i>Melaleuca preissiana</i> , <i>M. rhapsiophylla</i> open woodland over <i>Juncus pallidus</i> isolated clumps of sedges over * <i>Cynodon dactylon</i> , * <i>Cenchrus clandestinus</i> closed grassland	Seasonally wet plain with black clay/loamy soils	2.94 ha	Relevé: 3 No alignment with any FCTs	

Vegetation type	Vegetation type description	Landform and substrate	Extent (ha)	Sample locations and notes	Representative photograph
<i>Adenanthos cygnorum</i> shrubland (VT04)	<i>Corymbia calophylla</i> , <i>Eucalyptus todtiana</i> isolated clumps of trees over <i>Adenanthos cygnorum</i> sparse shrubland over * <i>Cenchrus setaceus</i> sparse grassland	Modified terrain with yellow sandy soils.	3.95 ha	Relevé: 1 No alignment with any FCTs	 
<i>Eucalyptus rudis</i> <i>Melaleuca raphiophylla</i> open forest (VT05)	<i>Eucalyptus rudis</i> , <i>Melaleuca raphiophylla</i> open forest over introduced herbland/ grassland	Black clay/loamy soils	1.06 ha	No alignment with any FCTs	

Vegetation type	Vegetation type description	Landform and substrate	Extent (ha)	Sample locations and notes	Representative photograph
Scattered natives amongst weeds (VT06)	<i>Corymbia calophylla</i> / <i>Eucalyptus rudis</i> / <i>E. todtiana</i> / <i>E. gomphocephala</i> / * <i>Eucalyptus</i> spp. isolated trees over introduced herbland/ grassland	Plain with grey sandy soils.	26.69 ha	Relevé: 4, 5, 6, 7 8 & 9 No alignment with any FCTs	
Grassland/ Herbland (VT07)	Weedy closed grassland/ herbland with occasional natives	Plains with black clay/ loamy soils. Occasional pools of water in places	23.21 ha	No alignment with any FCTs	
<i>Corymbia calophylla</i> open woodland (VT08)	<i>Corymbia calophylla</i> open woodland over <i>Jacksonia furcellata</i> , <i>Acacia pulchella</i> sparse mid shrubland over <i>Phlebocarya ciliatum</i> <i>Dasyogon bromeliifolius</i> herbland	Plain with grey sandy soils.	1.14 ha	Quadrat: 6 No clear alignment with any FCTs	

Vegetation type	Vegetation type description	Landform and substrate	Extent (ha)	Sample locations and notes	Representative photograph
<i>Melaleuca raphiophylla</i> woodland (VT09)	<i>Melaleuca raphiophylla</i> , <i>Eucalyptus rudis</i> woodland over <i>Lepidosperma longitudinale</i> , <i>Juncus pallidus</i> open sedgeland over <i>Centella asiatica</i> closed herbland	Plain with black clay	0.40 ha	Quadrat: 7 May align with FCT S03	
Road, rail and/ or infrastructure	Cleared of vegetation		75.10 ha	No alignment with any FCTs	

* Area not surveyed due to restricted access, however areas were observed to be synonymous to VT01

Table 13 Extent of vegetation condition ratings mapped within the survey area

Vegetation Condition	Extent in survey area (ha)
Excellent	1.98
Very Good	7.00
Good	7.38
Good - Degraded	3.68
Degraded	3.93
Degraded - Completely Degraded	53.96
Cleared	75.10
Not surveyed	4.88
Total	157.90

4.1.3 Conservation significant ecological communities

By assessing the vegetation types described at a broad level, based on dominant species, landform features and field observations two conservation significant ecological communities were identified to occur within the survey area. These two conservation significant ecological communities are:

- *Banksia* Woodlands of the SWA TEC
- Low lying *Banksia attenuata* woodlands or shrublands (FCT21c) PEC².

Field observations and statistical analysis aligned the quadrats of GHD VT01 to FCT 21c. For these areas to be classified as the *Banksia* Woodlands of the SWA TEC key diagnostics characteristics, condition thresholds and minimum patch sizes must be met. An explanation of these conditions and a description of each conservation significant ecological community within the survey area is described below.

All FCTs representative of clay pan communities (e.g. 7, 8, 10a) occurred on a separate clade to all other FCTs. This result was also reflected in the two dimensional MDS scatter plot (Appendix D). This result indicates none of the vegetation units identified and described by GHD align (either through inference or statistics) with the Clay Pans of the SWA TEC.

Banksia Woodlands of the SWA TEC

The *Banksia* Woodlands of the SWA TEC is restricted to the SWA IBRA bioregion and immediately adjacent areas, including the Dandaragan Plateau, from Jurien Bay in the north, to Dunsborough in the south, and northwest on the Whicher and Darling escarpments (DEE 2016). The ecological community typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands (DEE 2016).

During the field survey two vegetation types were assessed as meeting the key diagnostic characteristics for the *Banksia* Woodlands of the SWA TEC, as outlined in DEE (2016). Specifically:

- The survey area occurs in the SWA IBRA bioregion
- The survey area occurs on sandplain landform, notably Bassendean sands
- The vegetation types have a low woodland structure and the upper sclerophyllous layer dominated or co-dominated by *Banksia attenuata* and/or *B. menziesii*. The understorey

² Community is also recognised as part of the *Banksia* Woodlands of the Swan Coastal Plain TEC, which is listed as Endangered under the EPBC Act.

consists of a mid-ground sclerophyllous shrub layer and/or a herbaceous ground layer of cord rushes, sedges and perennial and ephemeral forbs that sometimes includes grasses.

Further assessment of these vegetation types identified four patches within the survey area that meet the minimum condition criteria outlined in DEE (2016). A breakdown of the mapped TEC patches (by vegetation type, condition and extent) is detailed in Table 14 with the TEC extent mapped in Figure 7, Appendix A. There is 12.47 ha of vegetation in the survey area representative of the Banksia Woodlands of the SWA TEC.

Table 14 Extent of Banksia Woodlands of the SWA TEC within the survey area

Patch ID	Vegetation type	Vegetation condition and extent (ha)	Comments
Patch 1	VT01	Excellent: 1.25 Very Good: 0.03 Good: 0.39 Good – Degraded: 0.25 Degraded: 0.08 <u>Total area: 2.00</u>	Areas mapped as TEC are part of a larger patch that extends outside of the survey area (either side of Karel Ave). This patch contains a small area of Good – Degraded vegetation associated with an access track. It is noted by DEE (2016) that a patch may include small scale variation in structure and condition and/or gaps such as tracks and disturbances (<30 m wide), as long as overall functionality of the community is not significantly altered. Aerial imagery indicates there is approximately 3 ha of <i>Banksia</i> vegetation in varying condition that is likely representative of the TEC adjacent to the survey area, and south of Karel Ave. It is estimated that approximately 40% of the patch occurs within the survey area.
Patch 2	VT01	Excellent: 0.73 Very Good: 0.24 Good: 0.08 <u>Total area: 1.05</u>	Areas mapped as TEC are on the Southern boundary of Ken Hurst Park and are part of a larger patch that extends outside of the survey area (to the north). Vegetation mapping by 360 Environmental (2012) indicates there is approximately 28 ha of <i>Banksia</i> woodland in Good to Very Good condition within Ken Hurst Park. Additional <i>Banksia</i> communities also extend west of Ken Hurst Park (on the northern side of the railway line) covering approximately 4 ha. Based on this mapping it is estimated less than 5% of the patch occurs within the survey area.

Patch ID	Vegetation type	Vegetation condition and extent (ha)	Comments
Patch 3	VT01	Good: 4.54 <u>Total area: 4.54</u>	Areas mapped as TEC are part of a larger patch that extends outside of the survey area (to the south-west, part of the Ranford Road Bushland). This patch contains small scale gaps, however, the vegetation structure across the patch is representative of <i>Banksia</i> woodland. Vegetation mapping by Natural Area Consulting (2016) indicates there is approximately 13 ha of <i>Banksia</i> Woodland in Excellent to Good condition in the Ranford Road Bushland. Based on this mapping, it is estimated that approximately 50% of the patch occurs within the survey area.
Patch 4	VT01	Not surveyed: 4.88 <u>Total area: 4.88</u>	Area mapped as TEC is part of Caladenia Grove Wetland Reserve. This patch is wholly contained within the survey area.

Low lying *Banksia attenuata* woodlands or shrublands PEC

The field assessment also confirmed the presence of the Low lying *Banksia attenuata* woodlands or shrublands (SCP21c) PEC, listed as Priority 3 by DBCA. This PEC differs from the TEC in that it has no minimum condition or patch size thresholds. There is 14.56 ha of the PEC present within the survey area (this total includes 12.47 ha which also aligns with the *Banksia* Woodlands of the SWA TEC). A breakdown of the PEC is detailed Table 15 with the TEC extent mapped in Figure 7, Appendix A.

Table 15 Extent of Low lying *Banksia attenuata* woodlands or shrublands PEC within the survey area

Vegetation type	Vegetation condition	Extent (ha)
VT01	Excellent	1.98 ha
	Very Good	0.27 ha
	Good	5.15 ha
	Good - Degraded	1.98 ha
	Degraded	0.09 ha
	Degraded – Completely Degraded	0.21 ha
Not surveyed		4.88 ha
Total		14.56 ha

4.1.1 Geomorphic Wetlands SWA dampland vegetation assessment

Of the 18 Geomorphic Wetlands SWA located within the survey area (Table 6), seven supported native dampland vegetation (Table 16). The remaining 10 wetlands within the survey area have either been cleared or landscaped.

Table 16 Geomorphic Wetlands SWA with dampland vegetation

UFI	Management Category	Wetland extent in the survey area (ha)	Location	Dampland vegetation extent (ha)
13332	REW	5.40	Rapid Assessment 3	4.95
13621	MUW	15.28	Rapid Assessment 9, 10, 11, 14 & 22	2.88
15926	REW	0.86	Rapid Assessment 17	0.68
6910*	CCW	0.88	Caladenia Grove Wetland Reserve	0.88
6912	CCW	0.63	Rapid Assessment 2	0.57
7446	CCW	1.97	Q06	0.38
7447	REW	4.09	Rapid Assessment 16	0.10

The vegetation of CCW (UFI 6912) and REW (UFI 13332) located south of the Canning Landfill and Recycling Facility was mapped as VT02 and VT02a. Despite their location the two above mentioned wetlands supported a diverse suite of dampland flora. Both have been degraded to a varying degree by weed invasion and kangaroos; a significant population of kangaroos inhabit the area. The area is fenced, which inhibits the kangaroos from leaving but also deters the public from entering. As a result both wetlands are representative of their management categories and boundaries.

The CCW (UFI 7446) located within the Tom Bateman Reserve supported a combination of dampland and dryland vegetation. One vegetation type was mapped for the area, *Melaleuca raphiophylla* woodland (VT09).

REW (UFI 7447) is represented by the Canning River and supports a combination of riparian vegetation, aggressive weeds and Declared Pests along the river bank. This REW along with REW (UFI 15926) – located ~100 m north of the Canning River were both mapped as VT05, with UFI 7447 also supporting a small amount of VT07.

MUW (UFI 13621) intersects 15.28 ha of the survey area. The majority of this MUW has been historically cleared and has been mapped as *Melaleuca preissiana M. raphiophylla* open woodland (VT03) and grassland/ herbland (VT07). The dampland vegetation that exists is degraded in condition due to the presence of aggressive weeds, Declared Pests and WONS.

Additional information on all the Geomorphic Wetlands of SWA that intersect the survey area is provided in Appendix D. Figure 8, Appendix A illustrates the extent of dampland vegetation recorded within the wetlands listed in Table 16 and the rapid assessment point locations from the dampland vegetation assessment.

4.1.2 Other significant vegetation

Mature trees were scattered throughout the survey area. Of these, 48 trees were considered large enough (>500 mm DBH) to be potentially used by Black Cockatoos for roosting and nesting in the future. These trees may also be utilised by Black Cockatoo for foraging. Section 4.2.5 explains in further detail the importance of these trees to the survival of Black Cockatoos.

4.1.3 Flora diversity

One hundred and eighty seven (187) flora taxa (including subspecies and varieties) representing 52 families and 140 genera were recorded from the survey area during the field survey. This total comprised of 119 native taxa, 68 introduced flora taxa.

* Unable to be surveyed due to access restrictions. Presence of dampland vegetation is inferred based on previous vegetation mapping (360 Environmental 2012 and City of Canning 2017)

Dominant families recorded from the survey area included:

- Myrtaceae (28 taxa)
- Fabaceae (25 taxa)
- Poaceae (16 taxa).

The uplands centred on the Bassendean Dunes and Dandaragan Plateau are known for species rich understoreys, with the number of flora taxa typically recorded in 100 m² within this area ranges from 30-59 taxa (GoWA 2000). Based on described quadrats, species diversity ranged from 8 to 39 taxa (average 20) per 100 m². The highest floristic diversity was recorded in Q1 (VT01) with 39 taxa. The survey area's diversity is considered to be low to moderate, with a lower floristic diversity compared to historic records for the area. The lower diversity is attributed to disturbance through clearing and weed invasion.

4.1.4 Conservation significant flora

Other than *Caladenia huegelii*, no EPBC Act or WC Act listed flora were recorded within the survey area during the 2017 and 2018 GHD surveys. *Caladenia huegelii* has been previously recorded in the survey area within the Caladenia Grove Wetland Reserve. Access to the fenced area was permitted to inform the targeted flora survey completed during September and October 2018, with a number of *Caladenia huegelii* plants recorded (GHD 2018). Outside the survey area there have been a number of locations where *Caladenia huegelii* has been recorded, the closest of these locations is <10 m north of the survey boundary in the area between Karel Ave and Ken Hurst Park. These records were confirmed as part of the targeted flora survey, reported by GHD (2018). *Caladenia huegelii* is generally found in deep sandy soils of *Banksia* spp. – *Eucalyptus marginata* woodlands and favours areas of dense undergrowth (DEC 2009). Within the survey area vegetation types *Banksia menziesii* and *B. attenuata* woodland (VT01) and *Banksia* spp. isolated trees *Regelia inops* *Hypocalymma angustifolium* (VT02a) meet the habitat requirements of *C. huegelii*. These areas have been extensively searched with no additional *C. huegelii* individuals located.

No DBCA Priority-listed flora species were recorded within the survey area during the field survey. *Dodonaea hackettiana* P4 was previously recorded by GHD (2013) and Natural Area Consulting (2016) near the Waste Transfer Station on Ranford Road. This location was revisited during the field survey, but no individuals were observed at the time of survey.

Likelihood of occurrence

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

The likelihood of occurrence assessment post-field surveys concluded that two taxa are known to occur within the survey area:

- *Caladenia huegelii* (Grand Spider Orchid), listed as Endangered by the EPBC Act and Threatened under the WC Act
- *Dodonaea hackettiana* listed as Priority 4 by DBCA.

One additional species may occur within the survey area, *Tetraria australiensis* (listed as Vulnerable under the EPBC Act and Threatened under the WC Act). Whilst limited suitable habitat is present within the survey area (a small patch of open Marri woodland is present at Tom Bateman Reserve), this species can be cryptic and the reported flowering period is November to December.

The remaining taxa are considered unlikely to occur within the survey area. The desktop searches identified a significant number of conservation significant species occurring within 1 km of the survey area which is largely a result of its proximity to the Brixton Street Wetlands. The Brixton Street Wetlands is the most floristically diverse Bush Forever site on the SCP and contains a number of rare and restricted plant species and vegetation communities (DEE 2018a). A large proportion of the significant flora found within this reserve are considered unlikely to be present within the survey area due to the cleared and degraded nature of the survey area and lack of suitable habitat.

4.1.5 Introduced flora

Sixty eight (68) introduced flora taxa were recorded in the survey area. The majority of the survey area has been impacted to some degree and has resulted in the introduction of a number of introduced species. The most commonly recorded weed species in the survey area include; **Hypochaeris glabra*, **Ursinia anthemoides*, **Solanum nigrum*, **Pelargonium capitatum*, **Gladiolus caryophyllaceus*, **Ehrharta calycina*, **Sonchus oleraceus*, **Arctotheca calendula*, **Briza minor* and **Cenchrus setaceus*.

Weeds of National Significance and Declared Pests

Of the introduced taxa, six are listed as Declared Pests under the *Biosecurity and Agriculture Management Act 2007* and/or as a WONS (DEE 2013):

- **Zantedeschia aethiopica* (Arum Lilly) – Declared Pest
- **Moraea flaccida* (One-leaf Cape Tulip) – Declared Pest
- **Echium plantagineum* (Paterson’s Curse) - Declared Pest
- **Rubus laudatus* (Blackberry) – Declared Pest
- **Asparagus asparagoides* (Bridal Creeper) – Declared Pest and WONS
- **Lantana camara* (Lantana) – Declared Pest and WONS.

The locations of the Declared Pests and WONS within the survey area are mapped in Figure 6, Appendix A.

4.2 Fauna

4.2.1 Fauna habitats

The survey identified eight fauna habitat types, as well as cleared areas within the survey area. These habitat types are closely aligned to the vegetation types described in Section 4.1.1 and are presented below in Table 17. They consist of:

- *Banksia* woodland
- *Melaleuca* woodland
- Ephemeral low shrubland
- Open *Banksia* woodland over low shrubland
- Mixed tall woodland/clumped trees
- Water bodies either seasonally inundated areas or man-made pools
- Scattered isolated shrublands (scattered islands or scattered clumps)
- Mixed grasslands in paddocks.

4.2.2 Fauna habitat connectivity and quality


Habitat quality for fauna varied greatly within the survey area. The rail corridor had previously been cleared and consisted of mostly weeds and open ground of low quality. However small patches of shrub regrowth (particularly in the western portion) had areas of medium to high quality, including vegetation utilised by Black Cockatoo (e.g. *Banksia* species and Marri, via feeding evidence).

Areas identified outside of the rail corridor had patches of vegetation in good to excellent condition for fauna and in particular Black Cockatoos. In most areas feeding evidence was recorded on both *Banksia* species and Marri. Areas of this quality were along Karel Ave, South Street and just off Nicholson Road. These areas also recorded the presence of Southern Brown Bandicoot via diggings.

Areas of relatively intact native vegetation within the survey area were found to support a good diversity of birds, reptiles and mammals. The remnant vegetation demonstrate good diversity for the metropolitan area, particularly for bush birds, reptile and mammals. Species such as Yellow-rumped Thornbill, Black-faced Woodswallow, Splendid Fairy-wren, Mistletoe bird and Cuckoo species are not common on the SWA.

The survey area, in general, has poor habitat connectivity as the remaining vegetation is fragmented by infrastructure and/or residential developments. The existing rail corridor is a significant barrier for ground dwelling fauna to move through the landscape and therefore the proposed project will not necessarily alter the current movement patterns for ground dwelling species.

Table 17 Fauna habitat types within survey area

Habitat Type	Indicative Picture
<p><i>Banksia</i> woodland 14.56 ha</p> <p>This habitat incorporates vegetation type VT01.</p> <p>This habitat type is dominated by <i>Banksia</i> species including <i>B. attenuata</i> and <i>B. menziesii</i> with some areas of <i>B. ilicifolia</i>. Shrub layers of <i>Allocasuarina</i>, <i>Acacia</i>, <i>Hakea</i>, <i>Xanthorrhoea</i>, <i>Zamia</i> and scattered Jarrah. This habitat was often very dense and had excellent litter cover and woody debris. Few large logs were present due to the lack of large tree species, however large skirts from <i>Xanthorrhoea</i> and <i>Zamia</i> palms would provide excellent cover for terrestrial fauna species. Soils were predominantly deep sands with no recent fire scarring evident.</p> <p>Numerous reptiles and bush birds were recorded in this habitat type due to the vegetation type and dense cover available.</p> <p><u>Conservation significant species:</u></p> <p>Two conservation significant species were recorded in this habitat type, Carnaby’s Black Cockatoo and Southern Brown Bandicoot. The Carnaby’s Black Cockatoo was recorded via feeding evidence in the habitat type throughout the survey area. The Southern Brown Bandicoot (resident, foraging) was recorded via digs and scats. Species likely to occur in this habitat type include Peregrine Falcon (foraging), Jewelled Skink (resident), Perth Slider (resident), Black Striped snake (resident) and Graceful Sunmoth (resident). The ground cricket <i>Throscodectes xiphos</i> may also reside in this habitat based of habitat types in the Jandakot region (where the species has only been recorded).</p> <p>Habitat Value – High</p>	

Habitat Type

Melaleuca woodland 3.34 ha

This habitat incorporates vegetation types: VT03, VT09

This habitat type was primarily within low lying areas and consisted of individual plants or dense groupings of *Melaleuca raphiophylla*. This habitat was within areas that had received historical disturbance or clearing including that of the Canning River (which had squatter's disturbance evident). This habitat was also dominated by a ground layer or understorey of introduced grasses and weeds. Some common wetland birds were recorded in these areas including White Ibis, Black Duck and Swampen. Very little litter was present and woody debris varied from absent to abundant with fallen logs and debris present, this looked to be dependent on previous impacts and fire.

Conservation significant species:

One species of conservation significance was recorded in this habitat type, Southern Brown Bandicoot. This species was recorded via digs present in areas that were dry with good vegetation cover. This species would not utilise areas that are seasonally inundated however would utilise habitat on the margins that was dense and accessible. The likely species to occur in this habitat include the Peregrine Falcon (foraging).

Habitat Value – Low to medium depending on condition

Ephemeral low shrubland 8.36 ha


This habitat incorporates vegetation type VT02, VT02b

An ephemeral low lying area consisting low shrubs of *Regelia inops* and *Hypocalymma angustifolium* with *Phlebocarya ciliata* and *Dasypogon bromeliifolius* herbs. In some area, patches of *Melaleuca preissiana* open woodland were present; these occurred in the lower lying depressions. Some weed incursion was observed and appeared to be associated with historical disturbances. The habitat was mostly open with little litter or woody debris and no logs present, however where herbs had died and created matted vegetation provided good cover for small reptiles. The soils were sands with no evidence of recent fire. Few fauna species were recorded in this habitat type however species that preferred open areas like small skinks were numerous. Lots of dropping from Western Grey Kangaroo were present and the area likely utilised at night time for grazing.

Conservation significant species:

Indicative Picture



Habitat Type	Indicative Picture
<p>No species of conservation significance were recorded in this habitat type. The Southern Brown Bandicoot (foraging) may opportunistically use this habitat. Two reptile species the Jewelled Skink and Black Striped snake may also utilise/reside in this habitat.</p> <p>Habitat Value - Medium</p>	
<p>Open <i>Banksia</i> woodland over low shrubland 0.49 ha</p> <p>This habitat incorporates vegetation type VT02a</p> <p>This habitat type is dominated by <i>Banksia ilicifolia</i> with sparse <i>Allocasuarina</i>, <i>Melaleuca</i>, <i>Nuytsia</i> and <i>Xanthorrhoea</i> species over a low native shrubs of <i>Regelia</i> and <i>Hypocalymma</i> with <i>Phlebocarya</i> <i>Dasypogon</i> herbland understory. The vegetation varies slightly in species composition throughout the survey area but is dominated by <i>Banksia ilicifolia</i>. This habitat had grey sandy soils with good litter cover and scattered woody debris. No large logs were present due to the lack of large trees. This habitat provides excellent cover for small bush birds with numerous honeyeaters (flowering <i>B. ilicifolia</i>) and aerial bird species recorded. This area also had a Western Grey Kangaroo population persisting and appeared to move between the remanent patches of bush present in the area.</p> <p><u>Conservation significant species:</u></p> <p>One species of conservation significance was recorded in this habitat type, evidence of Carnaby's Black Cockatoo. The Carnaby's Black Cockatoo was recorded via feeding evidence on <i>Banksia</i> cones in the habitat type. The Southern Brown Bandicoot (resident), Peregrine Falcon (foraging), Jewelled Skink (resident), Perth Slider (resident), Black Striped snake (resident) and Graceful Sunmoth (resident) are all likely utilising or residing in this habitat type. The ground cricket <i>Throscodectes xiphos</i> may also reside in this habitat based of habitat types in the Jandakot region (where the species has only been recorded).</p> <p>Habitat Value - High</p>	

Habitat Type

Mixed tall woodland/clumped trees 27.83 ha

This habitat incorporates vegetation types: VT06, VT08

This habitat type is dominated by Tuart (*Eucalyptus gomphocephala*), Marri (*Corymbia calophylla*) or Flooded Gum (*E. rudis*) with a mixed under story of weeds. The vegetation varies slightly in species composition and density throughout the survey area depending on the amount of disturbance but is always dominated by large Eucalypts. This habitat had areas of deep sandy soils or clay lateritic composition. Depending on disturbance, impacted the amount of litter and woody debris cover. Some of the woody debris areas were very thick and able to provide refuge areas for ground dwelling mammals and reptiles. Few large logs were present in this habitat which is likely an artefact off historical fire activity, although little fire activity was recorded during the survey.

Conservation significant species:

Two species of conservation significance was recorded in this habitat type, Forest Red-tailed Black Cockatoo and Carnaby's Black Cockatoo. The Forest Red-tailed Black Cockatoos were recorded resting in trees in the western portion of the survey area and a large group was recorded feeding in Marri trees in the eastern portion. The Carnaby's Black Cockatoos were sighted flying over the survey area. The Peregrine Falcon (foraging) is likely to use this habitat area opportunistically.

Habitat Value - High

Water bodies/Canning River/or man-made pools 1.06 ha

This habitat incorporates vegetation types: VT05

Portions of the survey area include low lying areas with surface water present and a small area of the Canning River. All of the water bodies present show historical disturbances of which most are completely modified. This includes areas dug out to form pools/ponds or surface water amongst grassy paddocks. Some native vegetation was present including sedges, reeds, *Melaleuca raphiophylla* and *E. rudis*. At one paddock pool (between Wilfed Road and the rail corridor) several Forest Red-tailed Black Cockatoo were recorded utilising the water source after feeding in nearby Marri. Additionally numerous common wetland birds were recorded in these areas including White Ibis, Black Duck and Swampphen.

The Canning River portion of the survey area has two existing rail crossings present with trimmed/modified vegetation. A thin strip of riparian vegetation remains along the river however within the survey

Indicative Picture



Habitat Type

area only a small amount is present. The understorey in mostly weeds with evidence of squatter's dwellings. Very few fauna species were recorded due to human activity in the area.

Conservation significant species:

One species of conservation significance was recorded in this habitat type, Forest Red-tailed Black Cockatoo. This species would only utilise areas that are seasonally inundated and accessible for use as a water source. The likely species to occur in this habitat type include the Peregrine Falcon (foraging).

Habitat Value - Medium

Indicative Picture



Scattered isolated shrublands (scattered islands or scattered clumps) 3.95 ha

This habitat incorporates vegetation types: VT04


This habitat type was dominated by shrubs including *Adenanthos*, *Acacia*, *Banksia*, *Xanthorrhoea*, *Melaleuca* and *Nuytsia* species were most common. This habitat was often only scattered shrubs but areas of dense clumps were present. Litter cover was present and small fine woody debris was scattered. Few large logs were present due to the lack of large tree species, however, the density of the vegetation would provide excellent cover for terrestrial fauna species. Soils were predominantly deep sands. No recent fire scars were evident. Some sections particularly in the western portion has a considerable amount of dumped rubbish. Numerous birds were recorded in this habitat type due to the flowering plants present.

Conservation significant species:

Two species of conservation significance was recorded in this habitat type, Carnaby's Black Cockatoo (feeding evidence only) and Southern Brown Bandicoot (digs). The Carnaby's Black Cockatoo were recorded via feeding evidence in the habitat type throughout the survey area. The Peregrine Falcon (foraging) may all opportunistically use this habitat. Two reptile species the Jewelled Skink, Perth Slider and Black Striped snake are also known to utilise/reside in this habitat.

Habitat Value – Medium to High depending on composition



Habitat Type	Indicative Picture
<p>Mixed grasslands in paddocks 23.21 ha</p> <p>This habitat incorporates vegetation types: VT07</p> <p>This habitat type is mostly paddocks or cleared areas with weedy regrowth. This habitat had very little composition and few fauna species were present during the field survey.</p> <p>Habitat Value - Low</p>	 A photograph showing a wide, green grassy field with a dirt path or track leading from the foreground into the distance. The sky is overcast with grey clouds. In the background, there are some trees and a fence line.

4.2.3 Fauna diversity

Sixty six (66) fauna species were recorded in the survey area. This level of fauna diversity is considered good considering much of the area is within a suburban modified setting. The small patches of bush provide refuge for the species persisting in the region or as hopping stones for species moving through (primarily birds). The species diversity of the survey area comprised:

- 45 birds
- 11 reptiles
- Seven mammals
- Three frogs.

4.2.4 Introduced fauna

Eleven introduced species were recorded in the survey area, which included: the Eastern Long-billed Corella, Turtle Dove, Laughing Dove, Feral Pigeon, Laughing Kookaburra, Rainbow Lorikeet, Fox, Dog (most probably pets being walked), Cat, House Mouse and Rabbit.

4.2.5 Conservation significant fauna

Three conservation significant fauna were recorded (or evidence of occurrence) during the survey including:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – listed as Vulnerable under both the EPBC Act and WC Act
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – listed as Endangered under both EPBC Act and WC Act
- Southern Brown Bandicoot (*Isodon obesulus fusciventer*) – listed as Priority 4 by DBCA

Black Cockatoo assessment

Two species of Black Cockatoo were recorded utilising the survey area, the Forest Red-tailed Black Cockatoo and Carnaby's Black Cockatoo. A summary of the Black Cockatoo assessment are presented in Table 18.

Foraging habitat

The survey area is located within the modelled feeding and breeding distribution for the Forest Red-tailed Black Cockatoo and feeding habitat for Carnaby's Black Cockatoo (Swan Coastal Plain) (DSEWPac 2012). There are numerous records of both species occurring within and around the survey area. *Banksia* Woodlands, Open *Banksia* Woodland, scattered isolated shrublands and mixed tall Woodland/forest provide high foraging habitat value for Forest Red-tailed Black Cockatoo and Carnaby's Black Cockatoo. Approximately 46.83 ha of foraging habitat for Black Cockatoos was recorded within the survey area (Figure 9, Appendix A). Table 18 provides a summary of the vegetation types deemed suitable foraging habitat for the species within the survey area. The extent and type of foraging habitat was confirmed by the presence of foraging evidence (e.g. *Banksia* cones and Marri nuts, see Plate 2, Plate 3, and Plate 4) and a comparison of the flora species recorded with a list of known foraging species (Groom 2011).

Breeding habitat

No evidence of breeding by any of the three Black Cockatoo species within the survey area was recorded by GHD during the 2017 and 2018 field surveys. The field surveys identified 176 significant trees of suitable DBH within the survey area (Figure 9, Appendix A). Trees of this

size are considered to have nesting potential now, or may develop hollows within 100 years, however none had hollows that would currently support a Black Cockatoo breeding.

Breeding success is dependent on both the nesting and foraging areas being relatively close together and sufficient to support the population (DSEWPaC 2012). The trees identified in the survey area were scattered throughout the survey area and have the potential to be utilised by Black Cockatoos in the future.

Roosting habitat

No evidence of roosting by any of the three Black Cockatoo species within the survey area was recorded by GHD during any of the fauna surveys. There is limited suitable roosting habitat within the survey area.

Table 18 Black Cockatoo habitat within survey area

Habitat type	Survey area
Foraging habitat	62 feeding events were recorded by Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo in the survey area on Pine, <i>Banksia</i> species, Marri and Cape Lilac (<i>Melia azedarach</i>). One drinking event was also recorded for Forest Red-tailed Black Cockatoo. There is 46.83 ha of foraging habitat within the survey area consisting of the following: <ul style="list-style-type: none"> • <i>Banksia</i> Woodland – 14.56 ha • Open <i>Banksia</i> Woodland – 0.49 ha • Scattered isolated shrublands – 3.95 ha • Mixed tall woodland/clumped trees – 27.83 ha.
Actual breeding habitat	No evidence of breeding was recorded within the survey area of any species of Black Cockatoo during the 2017 and 2018 surveys.
Potential breeding habitat	176 trees with a DBH of >500 mm were recorded. These consist of 7 Jarrah, 20 Tuart, 99 Marri, 49 Flooded Gum and one Stag. Of the 176 trees two had large hollows suitable for Black Cockatoo breeding, however one is currently occupied by bees.
Roosting habitat	No roosting sites were recorded as being used by Black Cockatoos within the survey area. Limited suitable roosting habitat occurs within the survey area.



Plate 2 Flock of Forest Red-tailed Black Cockatoo feeding in Marri



Plate 3 Feeding Evidence on a discarded *Banksia attenuata* cone



Plate 4 Feeding evidence on *Corymbia calophylla*



Plate 5 Feeding evidence on *Melia azedarach*

Southern Brown Bandicoot/Quenda

The Southern Brown Bandicoot or Quenda is listed as Priority 4 by DBCA. The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it

also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Van Dyck and Strahan 2008).

The Quenda was recorded during the field assessment via digs, scats and a sighting (Plate 5 and Plate 6), and the species is likely to utilise habitats of remnant vegetation present within the survey area.



Plate 6 Southern Brown Bandicoot digs in the survey area



Plate 7 Southern Brown Bandicoot scats next to digs in the survey area

Fauna Likelihood of Occurrence

Seventy eight (78) conservation significant fauna species were identified during desktop assessment as potentially occurring in the region and within the survey area. Of these, 68 were deemed unlikely or highly unlikely to be present or have significant habitat in the survey area. Six species are considered likely to occur and three are known/present within the survey area. One invertebrate species has an unknown likelihood of occurrence due to the limited data available. The likely, known/present and unknown species are summarised below in Table 19.

Table 19 Conservation significant fauna Present or likely to occur in the survey area

Species Name	Status		Desktop Search			Likelihood
	EPBC Act Status	WA Status	NM	PMST	DBCA – SWA	
<i>Calyptorhynchus banksii subsp. naso</i> (Forest Red-tailed Black Cockatoo)	Vu	Vu	X	X	X	Present, species was recorded within survey area via observation and feeding evidence
<i>Calyptorhynchus latirostris</i> (Carnaby's Black Cockatoo)	En	En	X	X	X	Present, species was recorded within survey area via observation and feeding evidence
<i>Isoodon obesulus subsp. fusciventer</i> (Southern Brown Bandicoot)		P4			X	Present, digs and scats recorded, habitat within the survey area is suitable for this species. There are records present within the survey area.
<i>Falco peregrinus</i> (Peregrine Falcon)		OS	X		X	Likely, the species is known from the area with records from Jandakot and Gosnells. Some habitat is present but would primarily be for foraging.
<i>Ctenotus gemmula</i> (SWA subpop.) (Jewelled south-west Ctenotus)		P3			X	Likely, the habitat within the survey area is suitable for this species. There are no records from the survey area however this is likely due to lack of data for this species and records in the region.
<i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3			X	Likely, habitat is present and the species is known from the study area. Recently recorded at the Roe Highway/ Kwinana Freeway intersection during Roe8 project.
<i>Neelaps calonotos</i> (Black-striped Snake)		P3			X	Likely, the habitat within the survey area is suitable for this species. There are multiple records within 5 km.

Species Name	Status		Desktop Search			Likelihood
	EPBC Act Status	WA Status	NM	PMST	DBCA – SWA	
<i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	X		X	Likely, habitat is present for the species and the species has been recorded in the Jandakot area approximately 2 km south of the survey area.
<i>Throscodectes xiphos</i> (a cricket)		P1	X		X	Unknown but likely, no data can be found on this species including habitat. The records are from Jandakot area and consists of Banksia woodland.
<i>Westralunio carteri</i> (Carter's Freshwater Mussel)	Vu	Vu	X			Likely, there are a number of records of this species along the Canning River. Four records (from 2010 and 2012) are located approximately 1 km north (downstream) of the survey area where it crosses the Canning River. However, it is anticipated that the impact area in the vicinity of Canning River is minimal and is unlikely to have a significant impact on this species.

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Appendices

Appendix A – Figures

Figure 1 Project location

Figure 2 Biological constraints

Figure 3 Land use constraints

Figure 4 Hydrology constraints

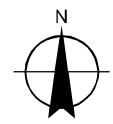
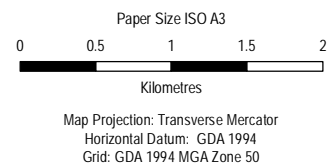
Figure 5 Vegetation type and survey sites

Figure 6 Vegetation condition and significant weeds

Figure 7 Conservation significant communities

Figure 8 Geomorphic wetland assessment

Figure 9 Conservation significant fauna and habitats

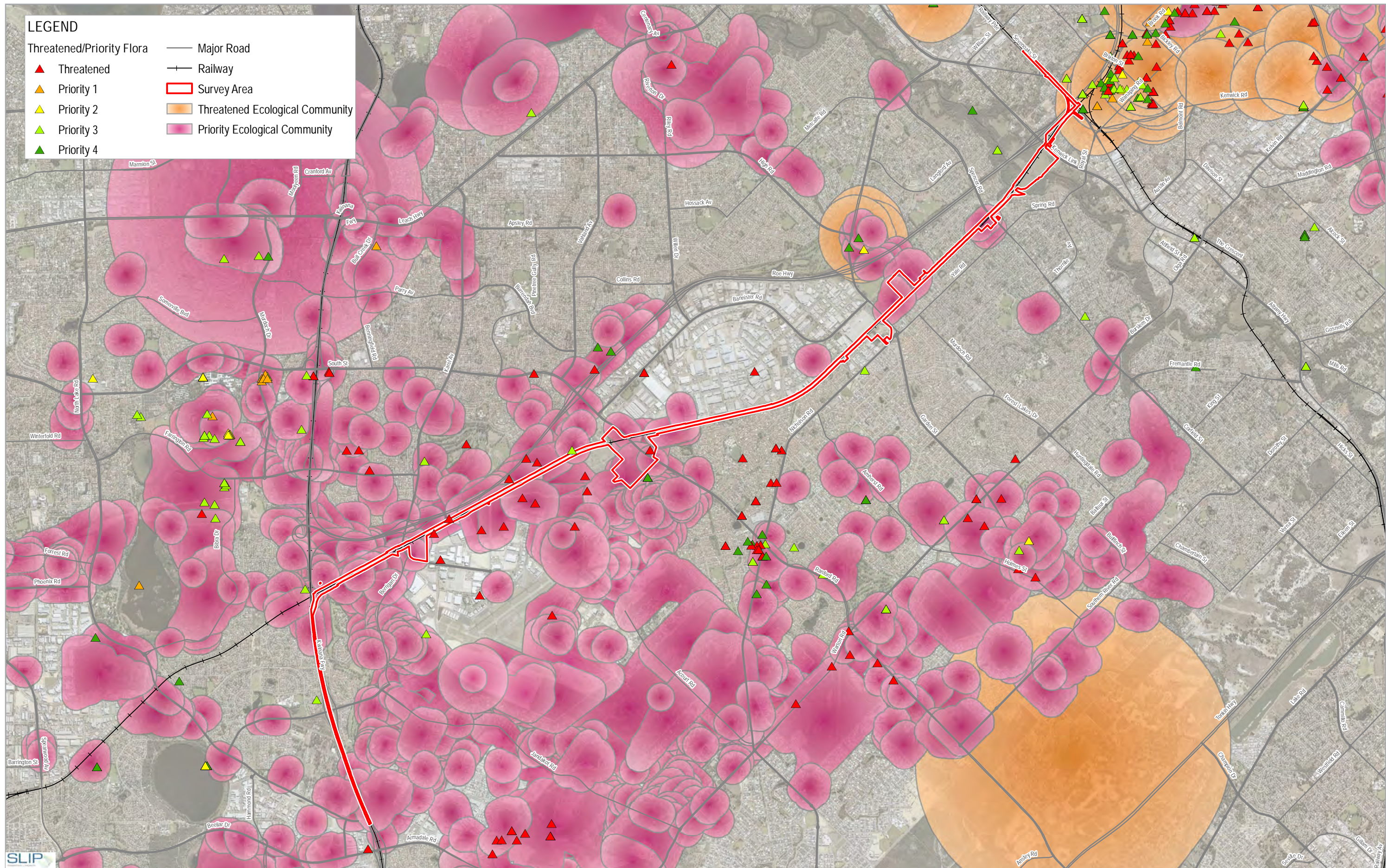


Public Transport Authority
Thornlie Cockburn Link Project

Project Location

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 1



LEGEND

Threatened/Priority Flora	— Major Road
▲ Threatened	—+— Railway
▲ Priority 1	▭ Survey Area
▲ Priority 2	▭ Threatened Ecological Community
▲ Priority 3	▭ Priority Ecological Community
▲ Priority 4	

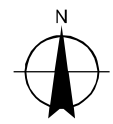


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Kilometres

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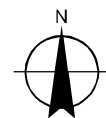
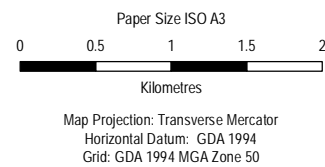
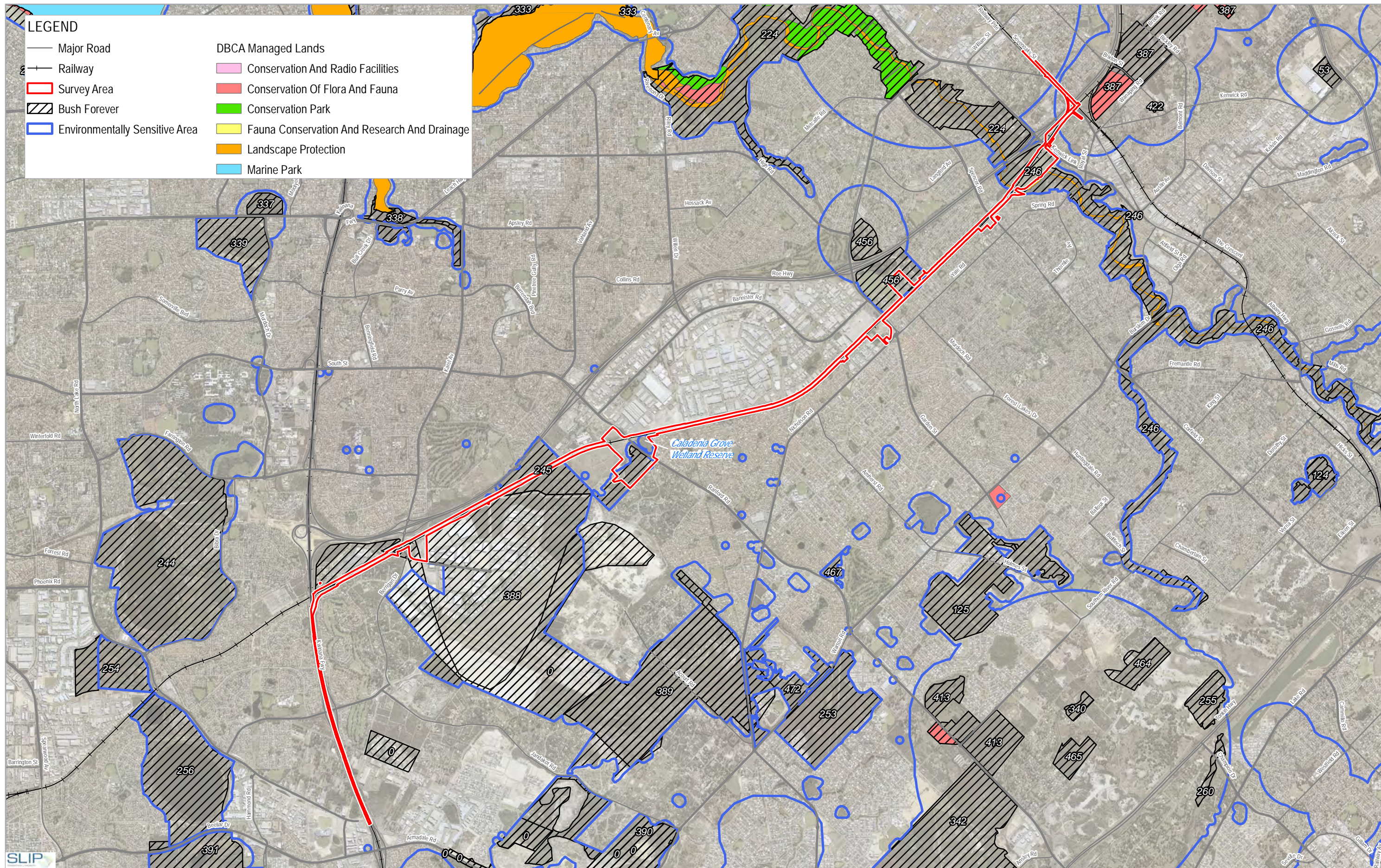
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Thornlie Cockburn Link Project

Biological Constraints

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 2

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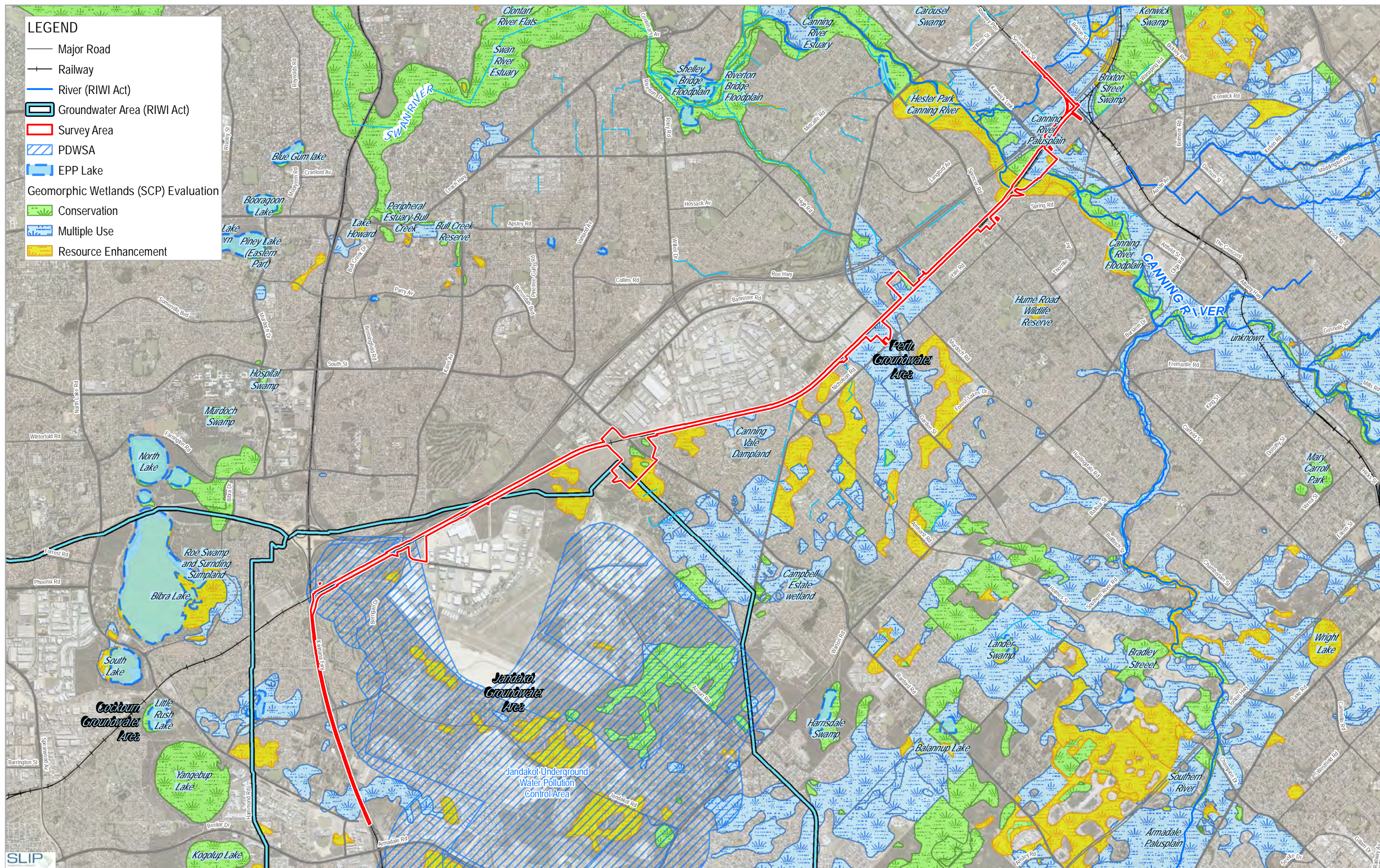
Public Transport Authority
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Land Use Constraints

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

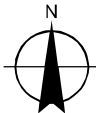
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- LEGEND**
- Major Road
 - Railway
 - River (RIWI Act)
 - ▭ Groundwater Area (RIWI Act)
 - ▭ Survey Area
 - ▨ PDWSA
 - ▭ EPP Lake
 - Geomorphic Wetlands (SCP) Evaluation
 - ▭ Conservation
 - ▭ Multiple Use
 - ▭ Resource Enhancement

Paper Size ISO A3
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 Kilometres
 Map Projection: Transverse Mercator
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Public Transport Authority
 Thornlie Cockburn Link Project

Hydrology Constraints

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

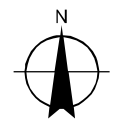
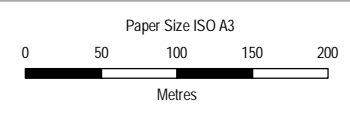
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LEGEND

- Quadrat
- Relevé
- Survey Area
- Vegetation Type**
- VT06 - Scattered natives amongst weeds
- Cleared - Road, rail, infrastructure



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Thornlie Cockburn Link Project

**Vegetation Type and
Survey Sites**

Project No. 61-36327
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Date 22 Oct 2018

FIGURE 5a

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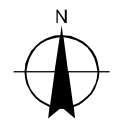
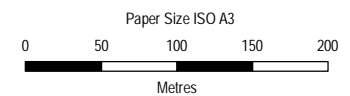


LEGEND

- Quadrat
- Relevé
- Survey Area

Vegetation Type

- VT06 - Scattered natives amongst weeds
- Cleared - Road, rail, infrastructure



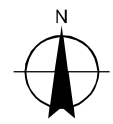
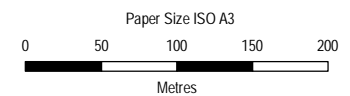
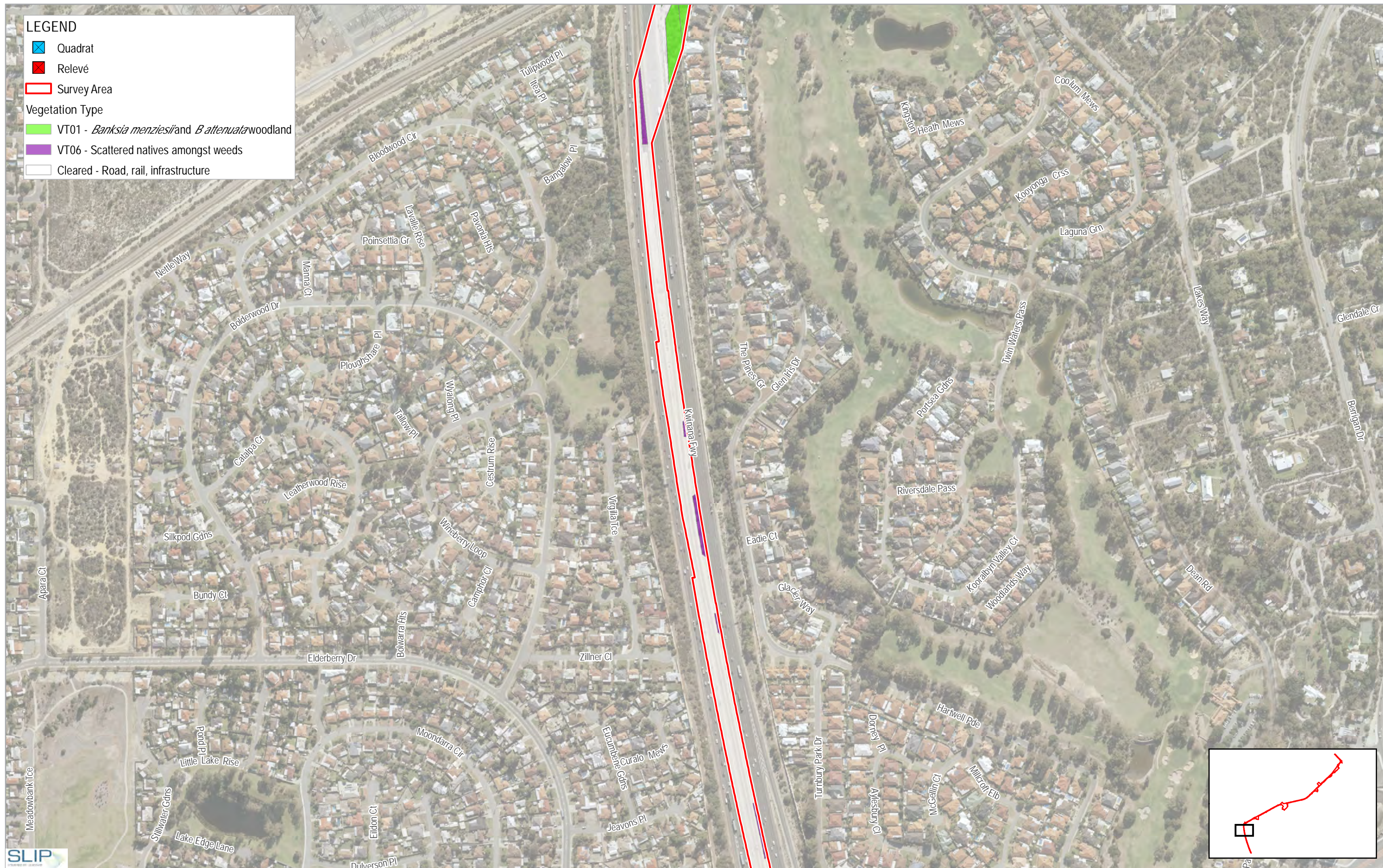
Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 50

Public Transport Authority
 Thornlie Cockburn Link Project

**Vegetation Type and
 Survey Sites**

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 5b



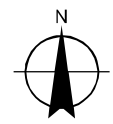
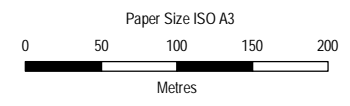
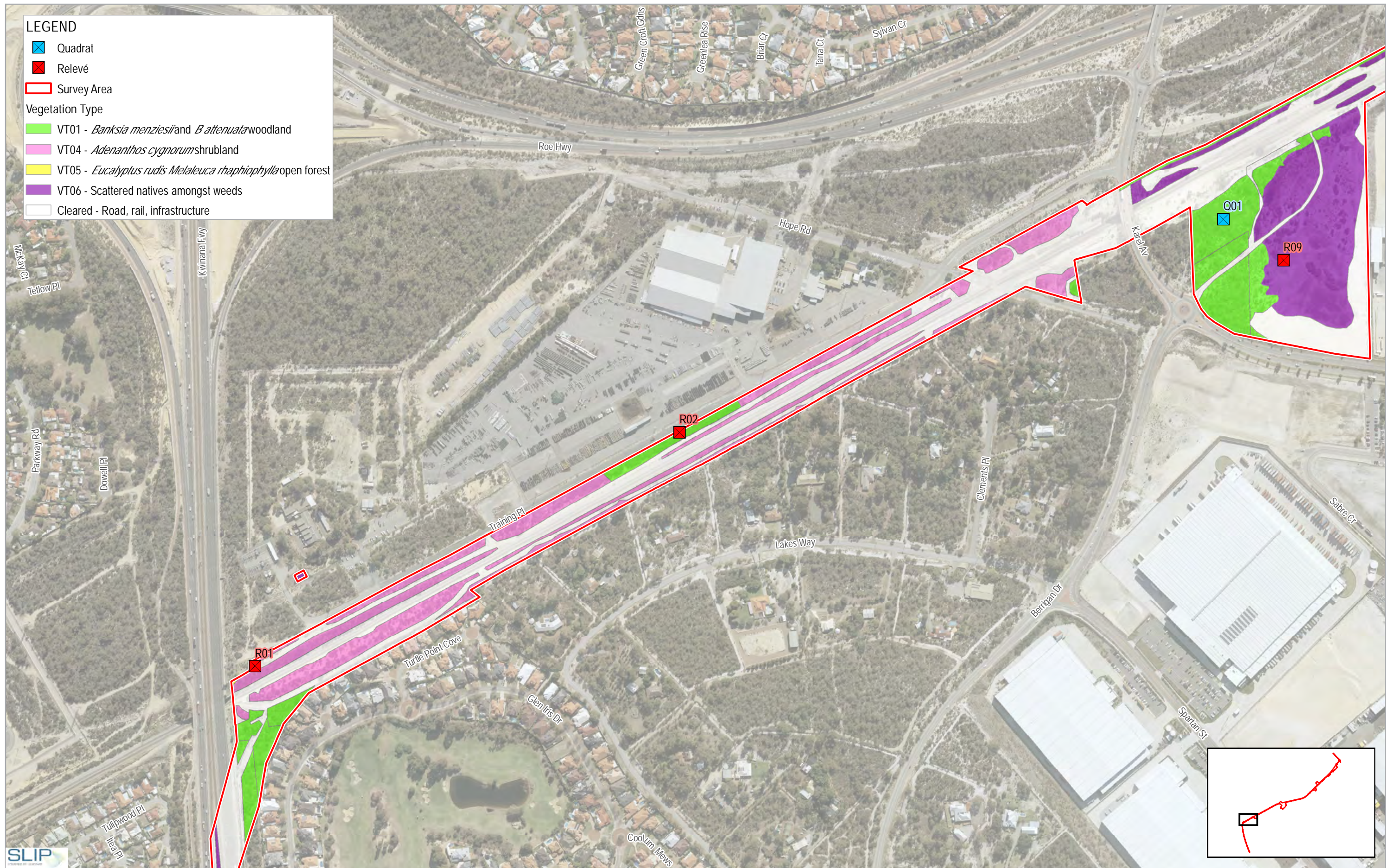
Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 50

Public Transport Authority
 Thornlie Cockburn Link Project

Vegetation Type and
 Survey Sites

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 5C



Public Transport Authority
Thornlie Cockburn Link Project

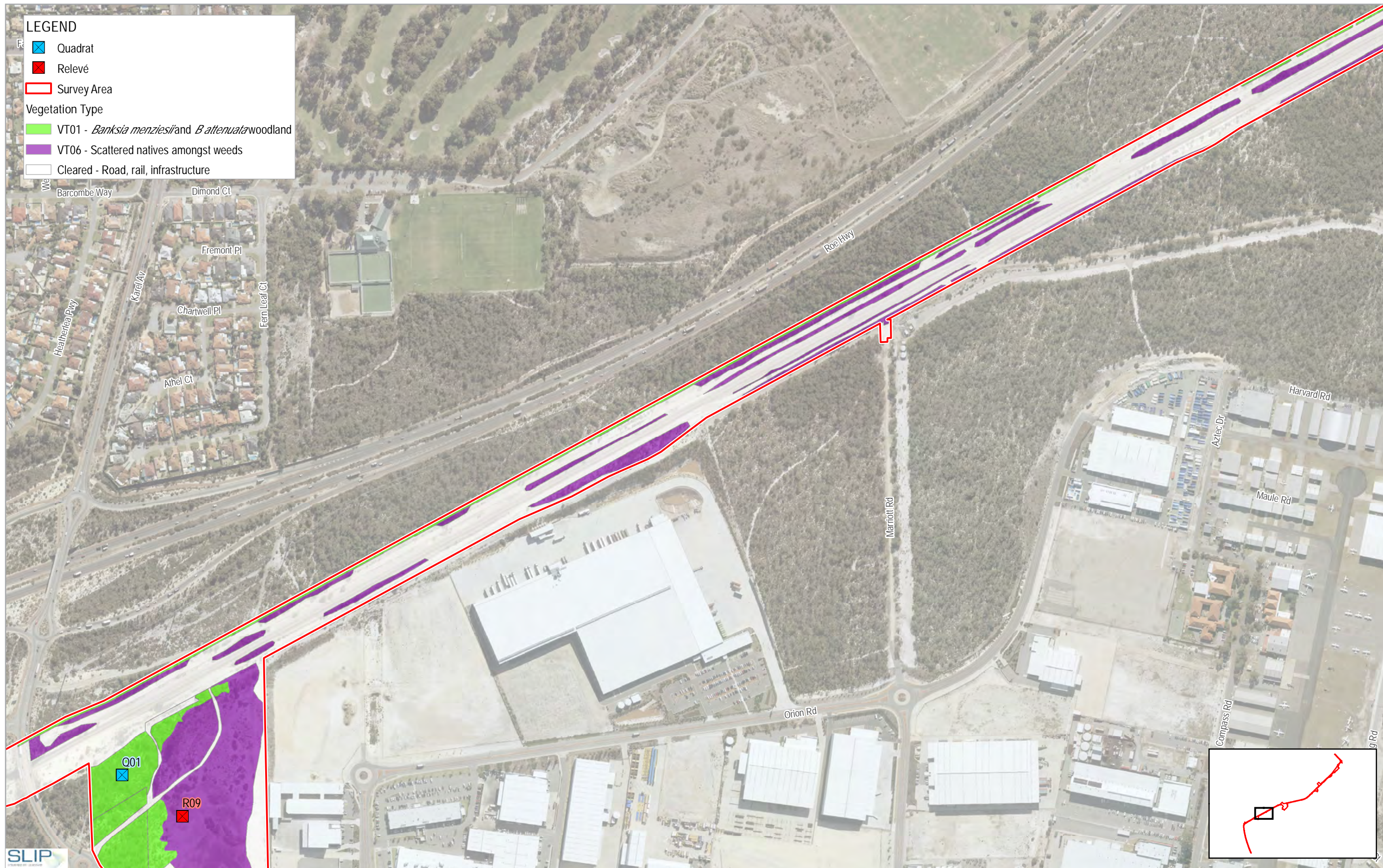
Vegetation Type and
Survey Sites

Project No. 61-36327
Revision No. 2
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FIGURE 5d

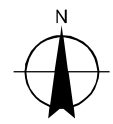
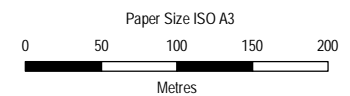
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Print date: 22 Oct 2018 - 13:08

Data source: GHD: Vegetation Types, Quadrats, Relevés, Survey Area - 20181019; Landgate: Imagery; Roads: Created by artemul



LEGEND

- Quadrat
- Relevé
- Survey Area
- Vegetation Type**
- VT01 - *Banksia menziesii* and *B attenuata* woodland
- VT06 - Scattered natives amongst weeds
- Cleared - Road, rail, infrastructure



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

Public Transport Authority
 Thornlie Cockburn Link Project

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FIGURE 5e

LEGEND

▣ Quadrat

▣ Relevé

▭ Survey Area

Vegetation Type

VT01 - *Banksia menziesii* and *B. attenuata* woodland

VT02 - *Regelia inops* *Hypocalymma angustifolia* shrubland

VT02a - *Banksia* spp. isolated trees *Regelia inops* *Hypocalymma angustifolium* shrubland

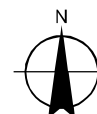
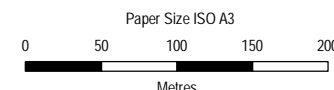
VT02b - *Melaleuca preissiana* open woodland

VT06 - Scattered natives amongst weeds

VT07 - Grassland/ Herbland

▨ NS - Not surveyed

▭ Cleared - Road, rail, infrastructure

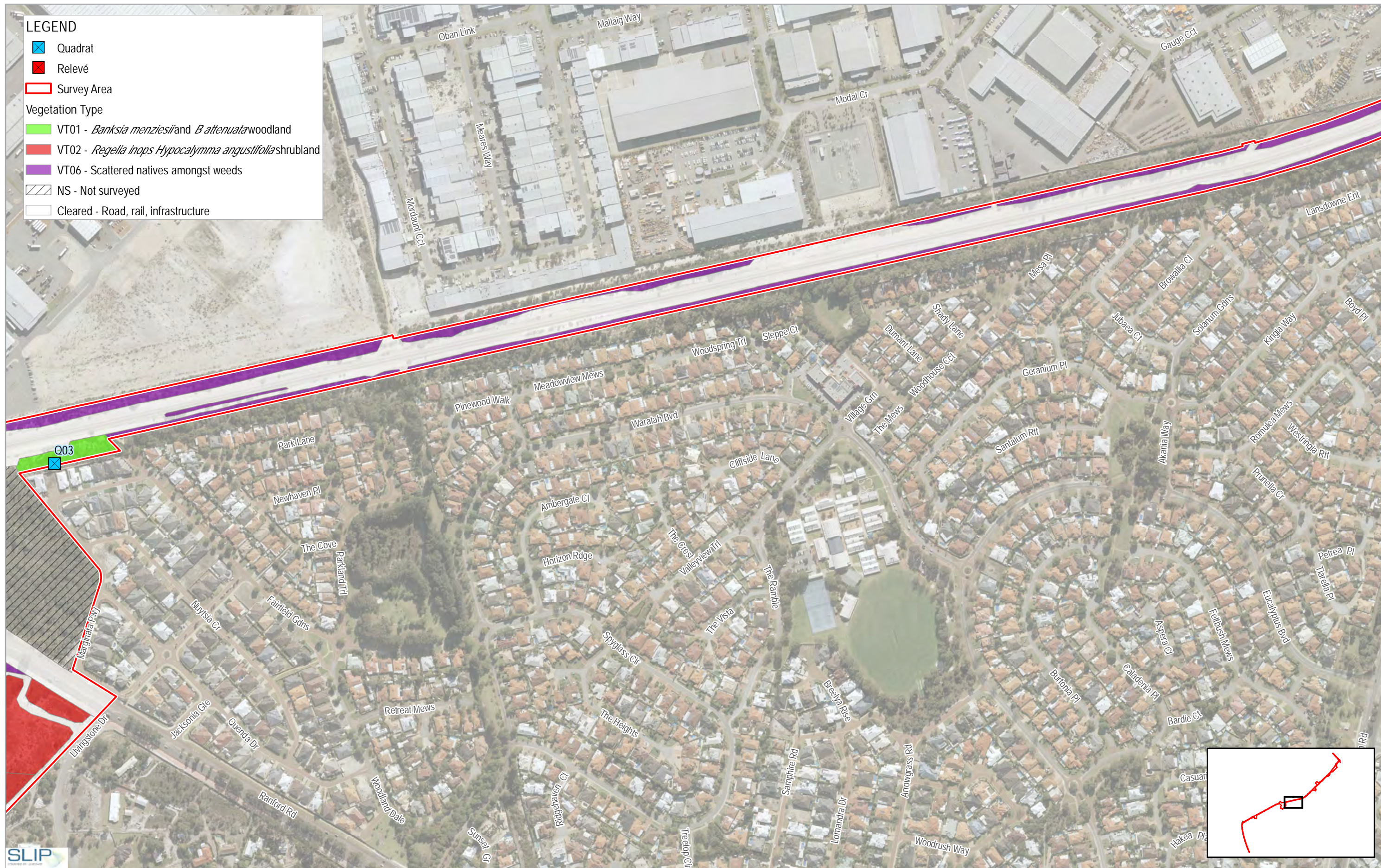


Public Transport Authority
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Survey Sites**

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FIGURE 5f

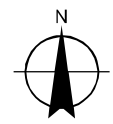
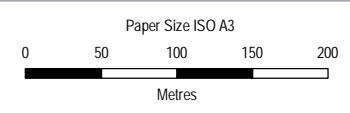


LEGEND

- Quadrat
- Relevé
- Survey Area

Vegetation Type

- VT01 - *Banksia menziesii* and *B. attenuata* woodland
- VT02 - *Regelia inops* *Hypocalymma angustifolia* shrubland
- VT06 - Scattered natives amongst weeds
- NS - Not surveyed
- Cleared - Road, rail, infrastructure



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

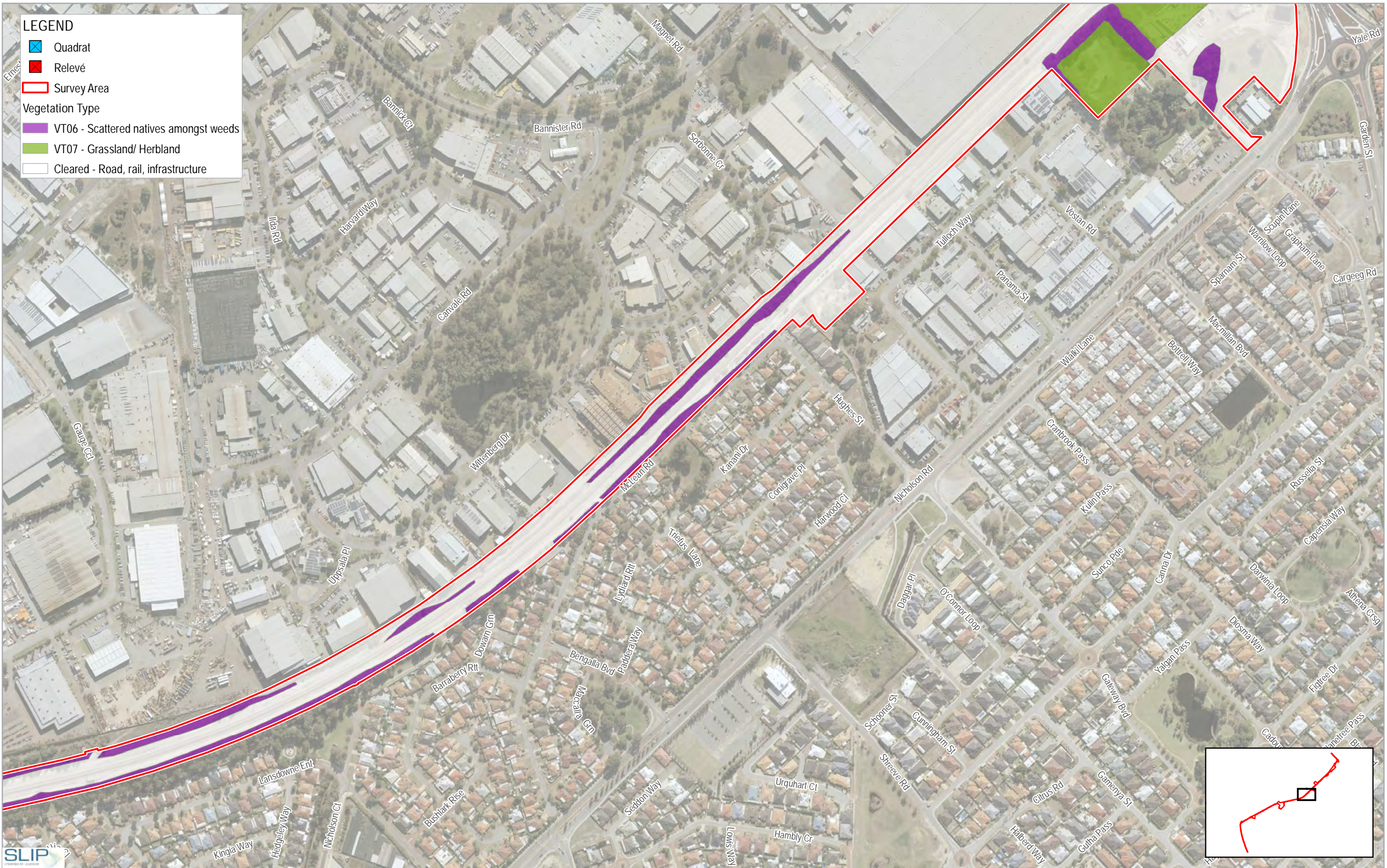
Public Transport Authority
 Thornlie Cockburn Link Project

**Vegetation Type and
 Survey Sites**

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 5g

G:\6136327\GIS\Maps\Working\Rev 2\6136327_005_Fig5gVegTypeMapbook_Rev2.mxd
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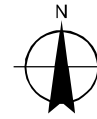


LEGEND

- Quadrat
- Relevé
- Survey Area
- Vegetation Type**
 - VT06 - Scattered natives amongst weeds
 - VT07 - Grassland/ Herbland
 - Cleared - Road, rail, infrastructure



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



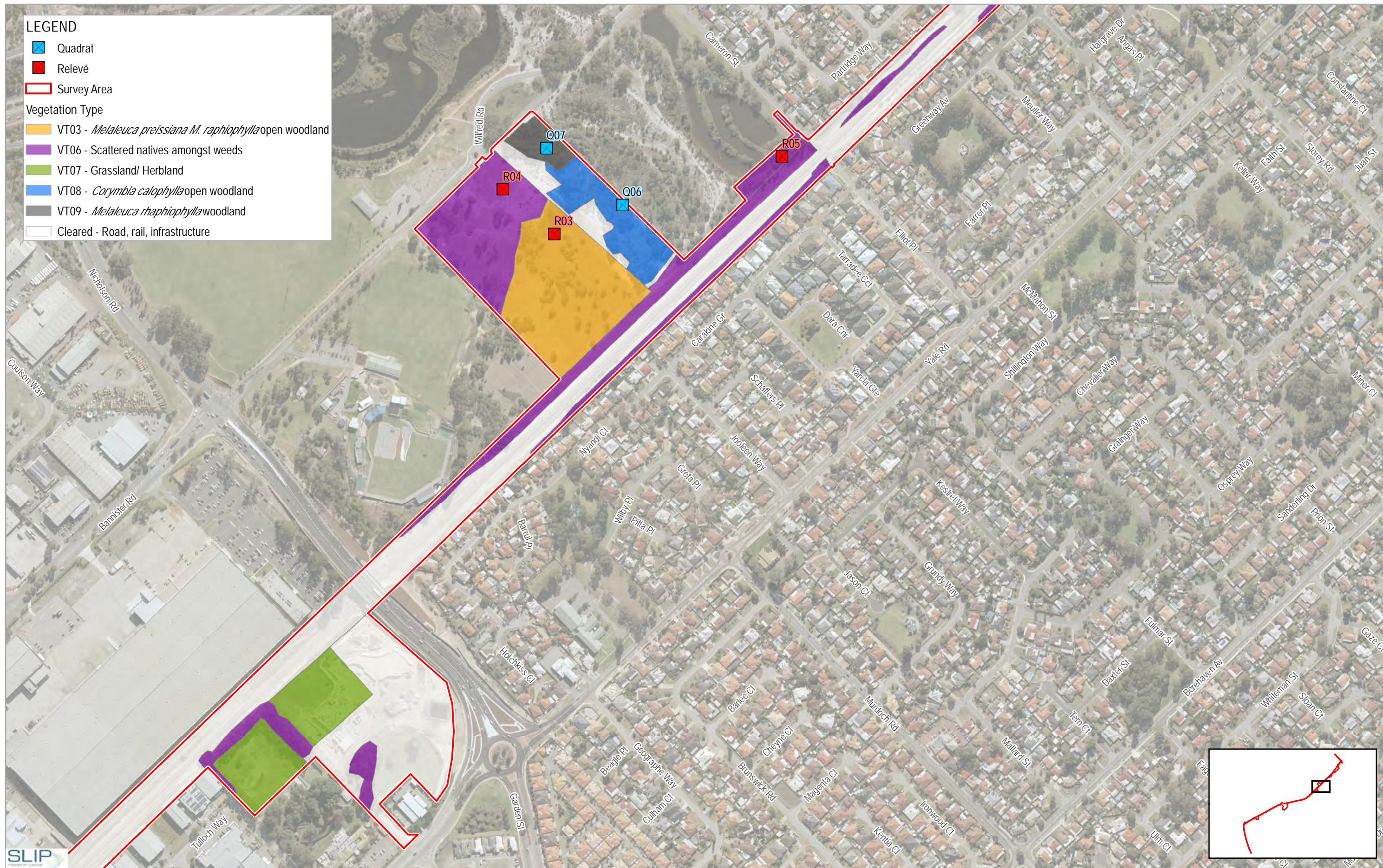
Public Transport Authority
Thornlie Cockburn Link Project

**Vegetation Type and
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Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 5h

G:\6136327\GIS\Maps\Working\Rev 2\6136327_005_Fig5h\vegTypeMapbook_Rev2.mxd
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Data source: GHD: Vegetation Types, Quadrats, Relevés, Survey Area - 20181019; Landgate: Imagery, Roads. Created by: artemul

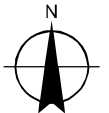


LEGEND

- Quadrat
- Relevé
- Survey Area

Vegetation Type

- VT03 - *Melaleuca preissiana* *M. raphiophylla* open woodland
- VT06 - Scattered natives amongst weeds
- VT07 - Grassland/ Herbland
- VT08 - *Corymbia calophylla* open woodland
- VT09 - *Melaleuca raphiophylla* woodland
- Cleared - Road, rail, infrastructure



Public Transport Authority
Thornlie Cockburn Link Project

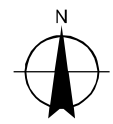
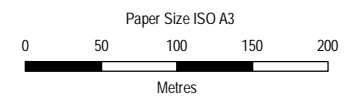
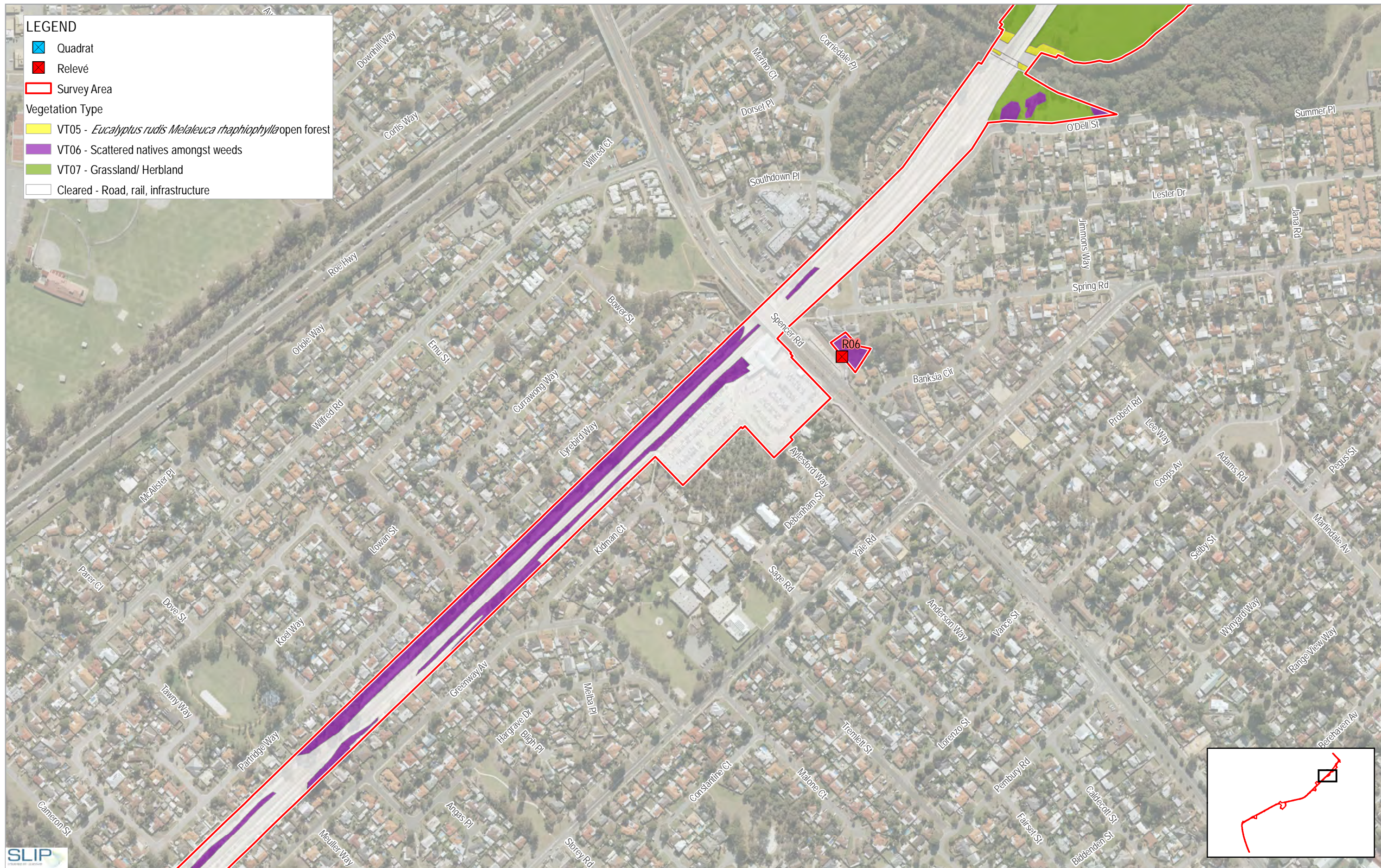
**Vegetation Type and
Survey Sites**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 5I

G:\6136327\GIS\Maps\Working\Rev 2\6136327_005_Fig5VegTypeMapbook_Rev2.mxd
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Data source: GHD: Vegetation Types, Quadrats, Relevés, Survey Area - 20181019; Landgate: Imagery; Roads: Created by artemul



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

Public Transport Authority
Thornlie Cockburn Link Project

**Vegetation Type and
Survey Sites**

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Revision No. 2
Date 22 Oct 2018

FIGURE 5j

G:\6136327\GIS\Maps\Working\Rev 2\6136327_005_Fig5jVegTypeMapbook_Rev2.mxd
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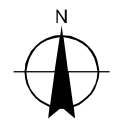
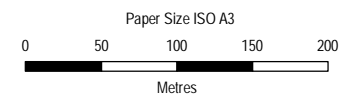
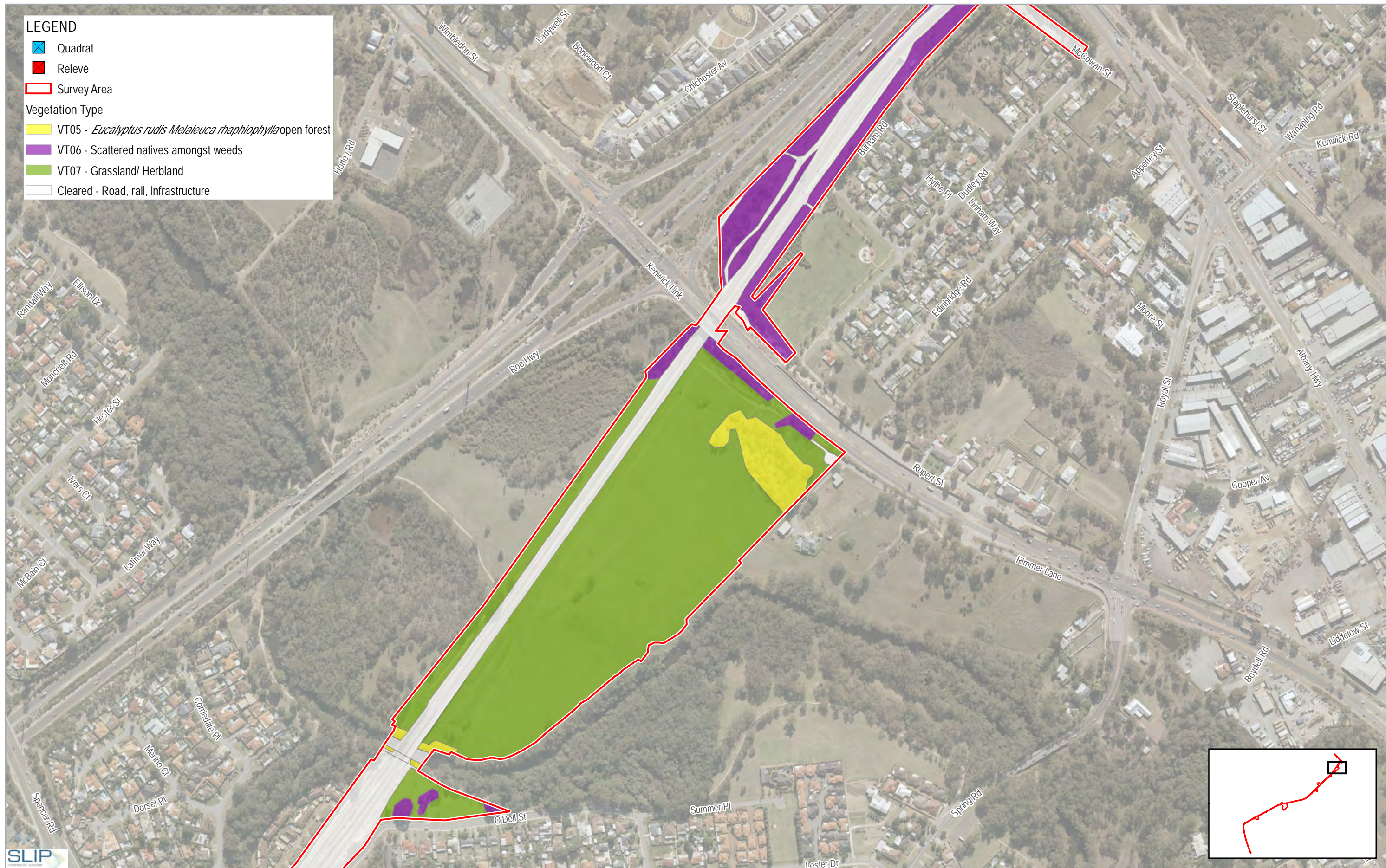
Data source: GHD: Vegetation Types, Quadrats, Relevés, Survey Area - 20181019; Landgate: Imagery, Roads. Created by: artemulo

LEGEND

- Quadrat
- Relevé
- Survey Area

Vegetation Type

- VT05 - *Eucalyptus rudis* *Melaleuca raphiophylla* open forest
- VT06 - Scattered natives amongst weeds
- VT07 - Grassland/ Herbland
- Cleared - Road, rail, infrastructure



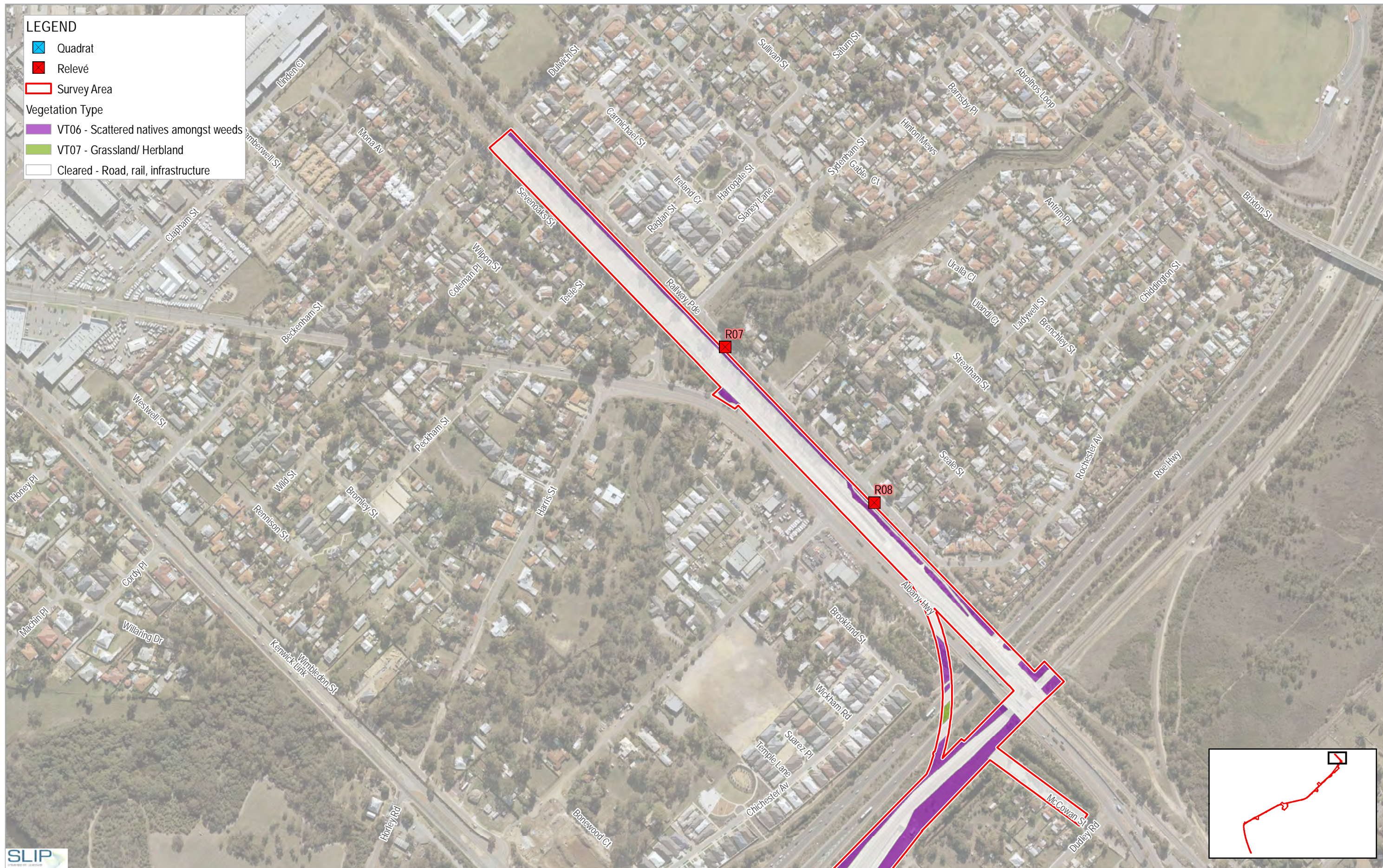
Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 50

Public Transport Authority
 Thornlie Cockburn Link Project

**Vegetation Type and
 Survey Sites**

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 5K

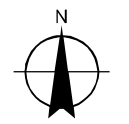
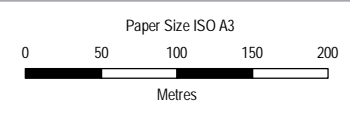


LEGEND

- Quadrat
- Relevé
- Survey Area

Vegetation Type

- VT06 - Scattered natives amongst weeds
- VT07 - Grassland/ Herbland
- Cleared - Road, rail, infrastructure



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

Public Transport Authority
 Thornlie Cockburn Link Project

**Vegetation Type and
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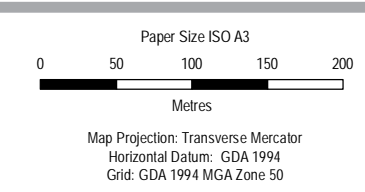
Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 5I

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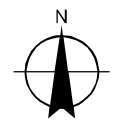
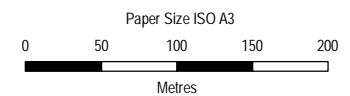
Public Transport Authority
Thornlie Cockburn Link Project

**Vegetation Condition And
Significant Weeds**

Project No. 61-36327
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FIGURE 6a

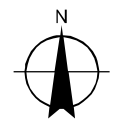
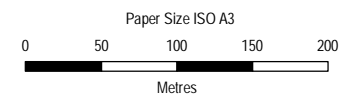
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Print date: 22 Oct 2018 - 10:10
Data source: GHD: Vegetation Condition, Survey Area - 20181019; Significant Weeds - 20180307; Landgate: Imagery, Roads. Created by: artemulo



Public Transport Authority
Thornlie Cockburn Link Project
**Vegetation Condition And
Significant Weeds**

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FIGURE 6b

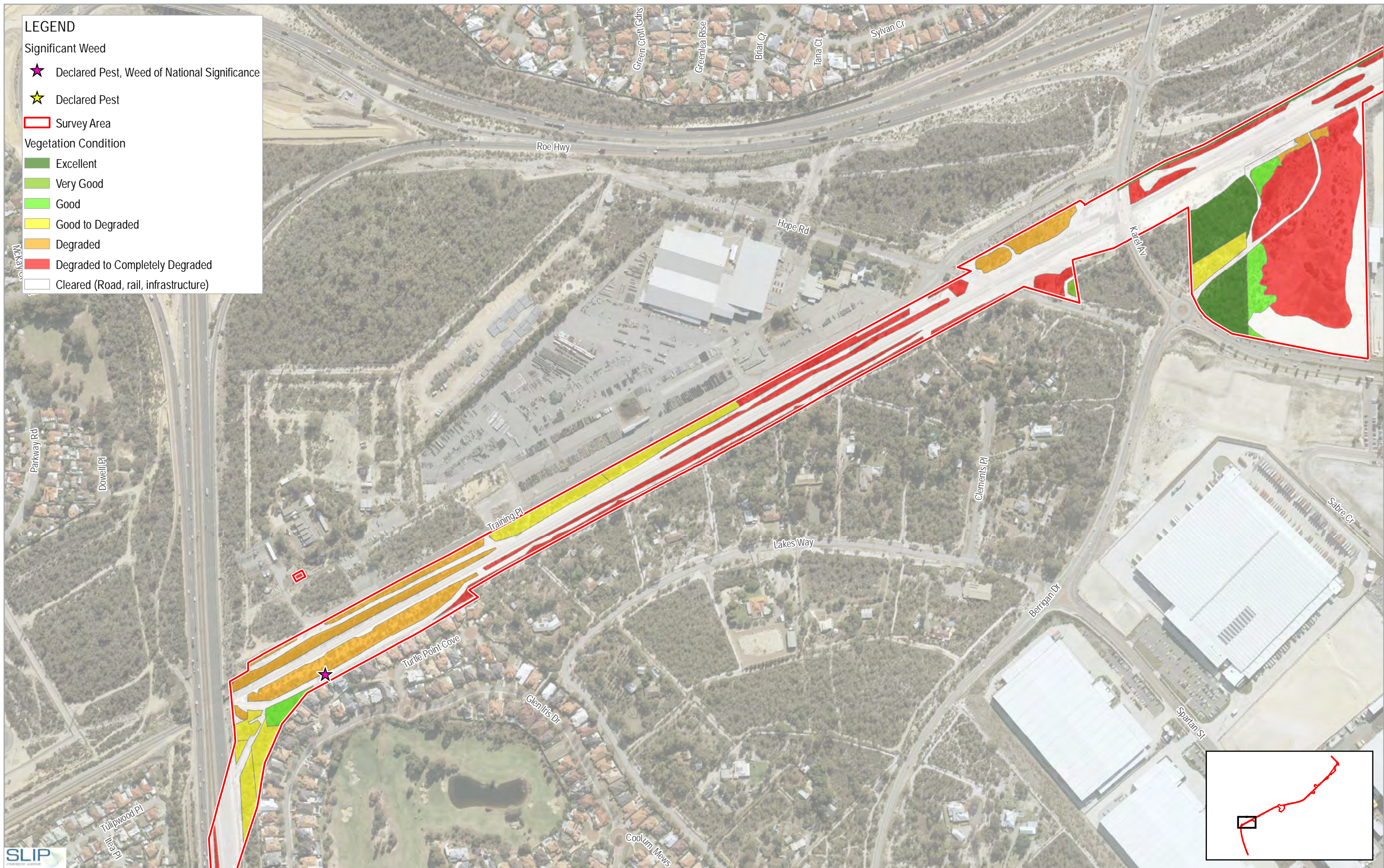


Public Transport Authority
Thornlie Cockburn Link Project
**Vegetation Condition And
Significant Weeds**

Project No. 61-36327
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FIGURE 6C

G:\6136327\GIS\Maps\Working\Rev 2\6136327_006_Fig6VegConditionMapbook_Rev2.mxd
Print date: 22 Oct 2018 - 10:10
Data source: GHD: Vegetation Condition, Survey Area - 20181019, Significant Weeds - 20180307; Landgate: Imagery, Roads. Created by: artemulo



LEGEND

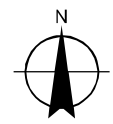
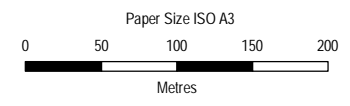
Significant Weed

- ★ Declared Pest, Weed of National Significance
- ★ Declared Pest

Survey Area

Vegetation Condition

- Excellent
- Very Good
- Good
- Good to Degraded
- Degraded
- Degraded to Completely Degraded
- Cleared (Road, rail, infrastructure)



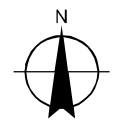
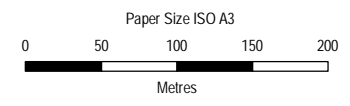
Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 50

Public Transport Authority
 Thornlie Cockburn Link Project

**Vegetation Condition And
 Significant Weeds**

Project No. 61-36327
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FIGURE 6d

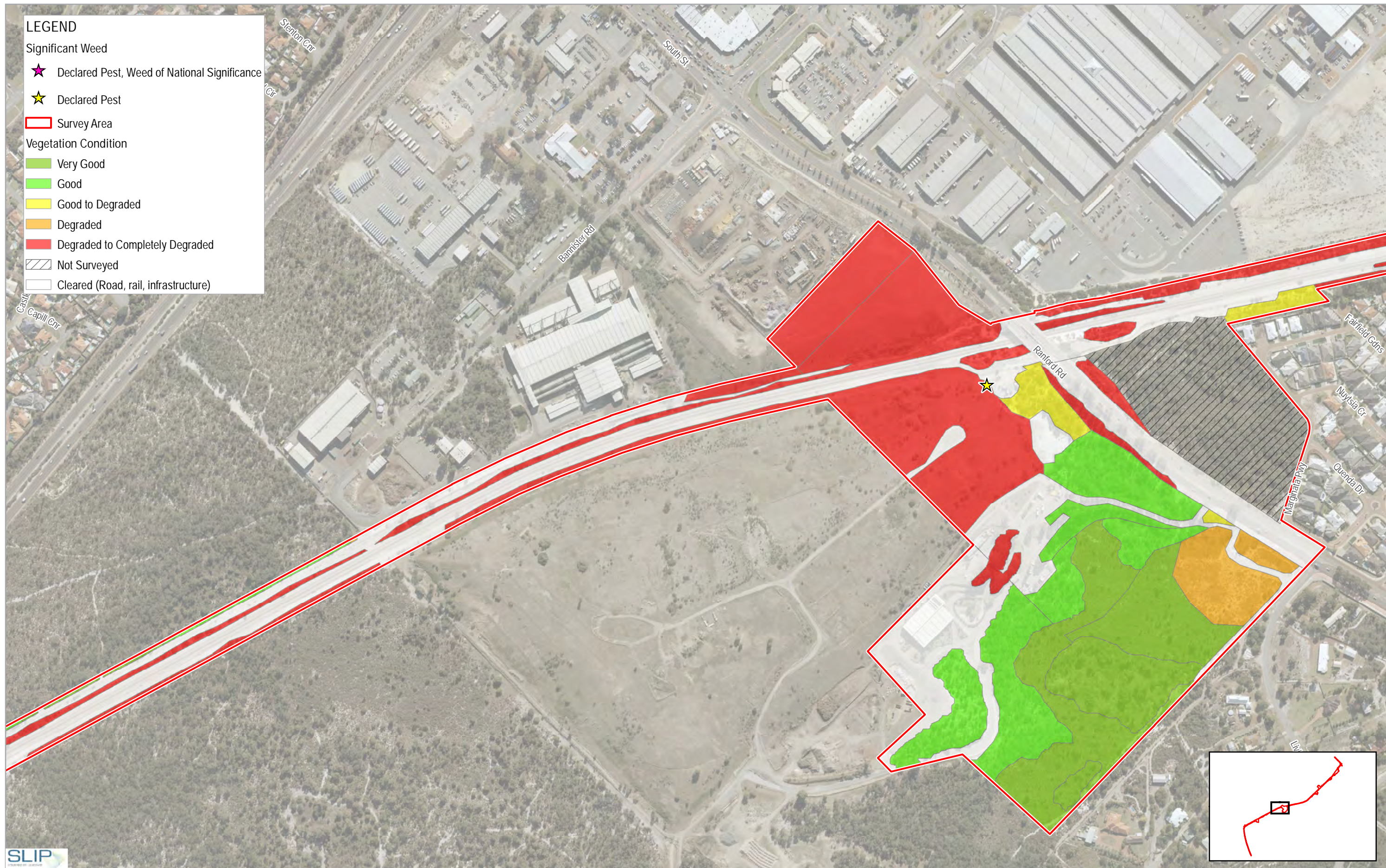


Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

Public Transport Authority
Thornlie Cockburn Link Project
**Vegetation Condition And
Significant Weeds**

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FIGURE 6e



LEGEND

Significant Weed

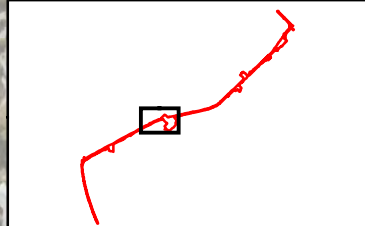
- ★ Declared Pest, Weed of National Significance
- ★ Declared Pest

Survey Area

- ▭ Survey Area

Vegetation Condition

- Very Good
- Good
- Good to Degraded
- Degraded
- Degraded to Completely Degraded
- ▨ Not Surveyed
- ▭ Cleared (Road, rail, infrastructure)

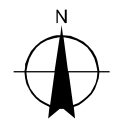


Paper Size ISO A3

0 50 100 150 200

Metres

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



Public Transport Authority
Thornlie Cockburn Link Project

**Vegetation Condition And
Significant Weeds**

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FIGURE 6f



LEGEND

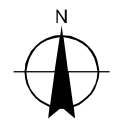
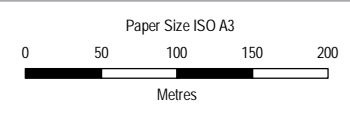
Significant Weed

- ★ Declared Pest, Weed of National Significance
- ★ Declared Pest

Survey Area

Vegetation Condition

- Very Good
- Good to Degraded
- Degraded
- Degraded to Completely Degraded
- Not Surveyed
- Cleared (Road, rail, infrastructure)

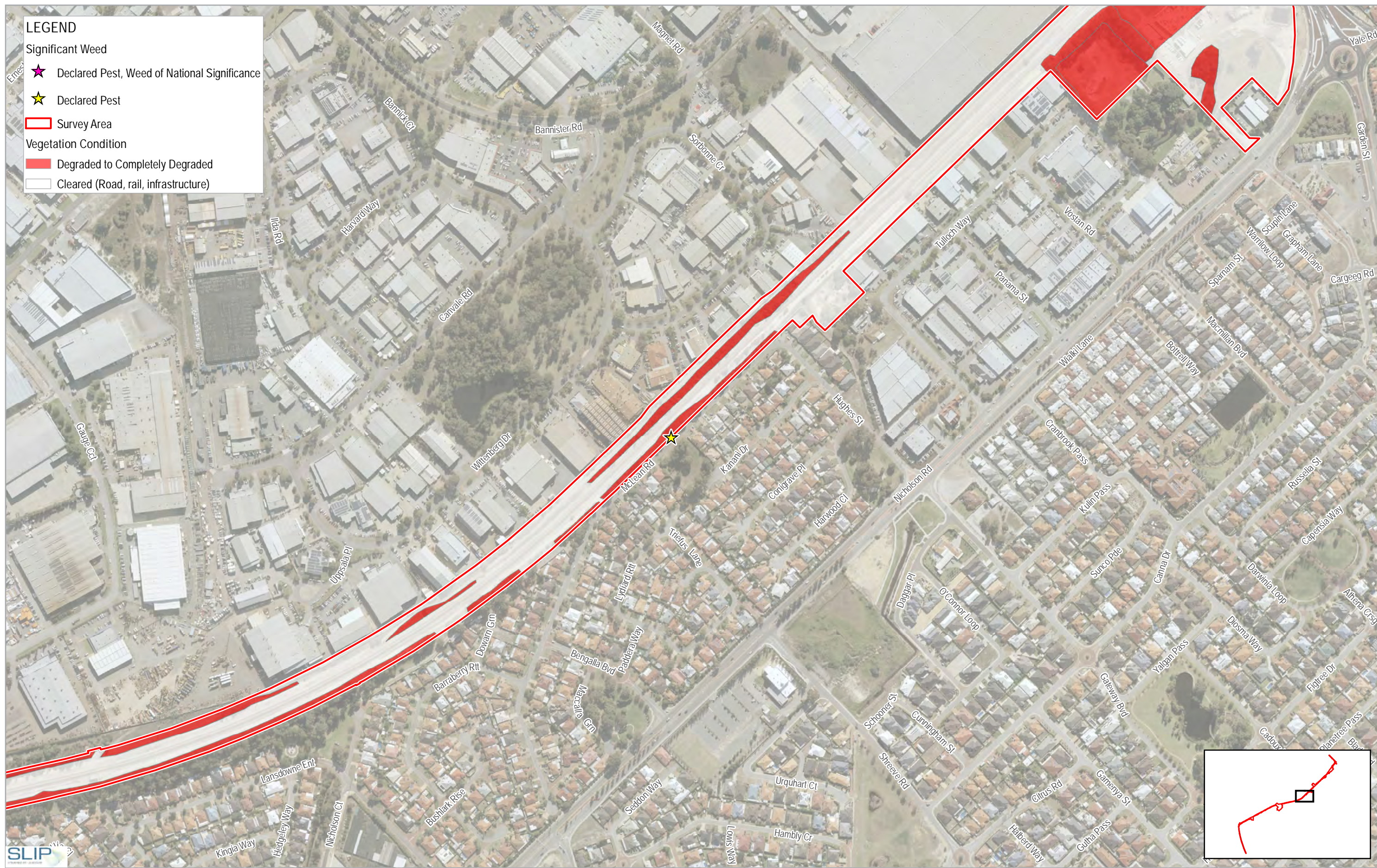


Public Transport Authority
Thornlie Cockburn Link Project

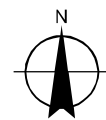
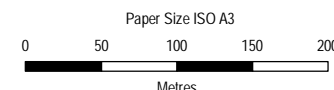
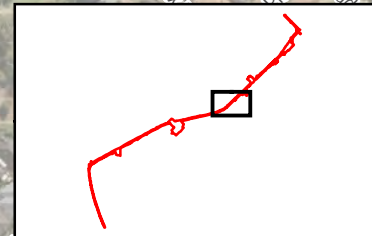
**Vegetation Condition And
Significant Weeds**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 6g



SLIP

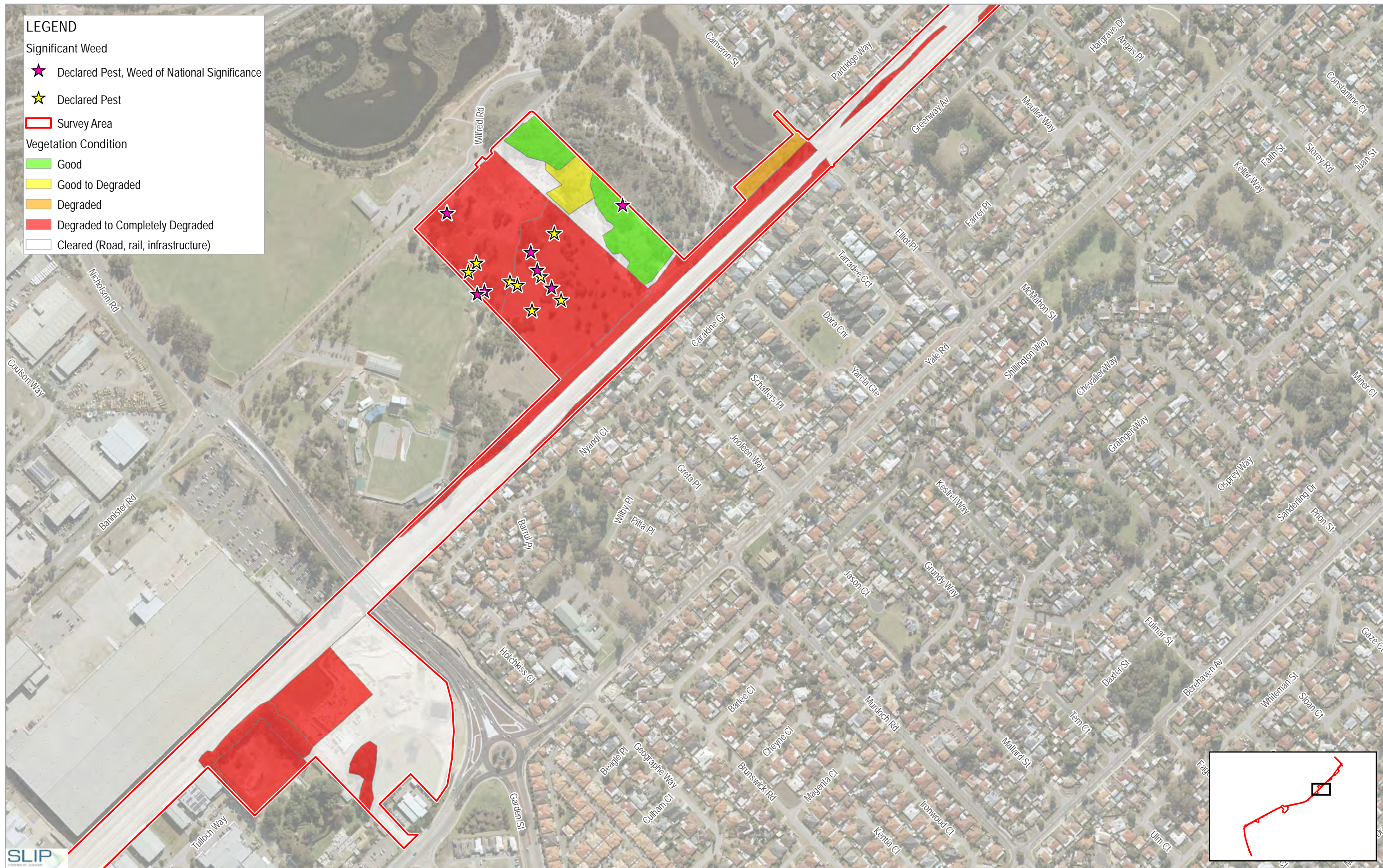


Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

Public Transport Authority
Thornlie Cockburn Link Project
Vegetation Condition And
Significant Weeds

Project No. 61-36327
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Date 22 Oct 2018

FIGURE 6h



LEGEND

Significant Weed

- ★ Declared Pest, Weed of National Significance
- ★ Declared Pest

Survey Area

Vegetation Condition

- Good
- Good to Degraded
- Degraded
- Degraded to Completely Degraded
- Cleared (Road, rail, infrastructure)

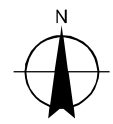


Paper Size ISO A3

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Metres

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

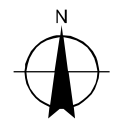
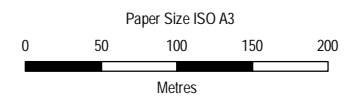


Public Transport Authority
Thornlie Cockburn Link Project

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Significant Weeds**

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FIGURE 6I



Public Transport Authority
Thornlie Cockburn Link Project
**Vegetation Condition And
Significant Weeds**

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Date 22 Oct 2018

FIGURE 6j

LEGEND

Significant Weed

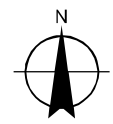
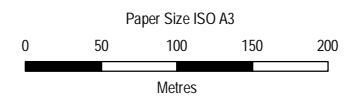
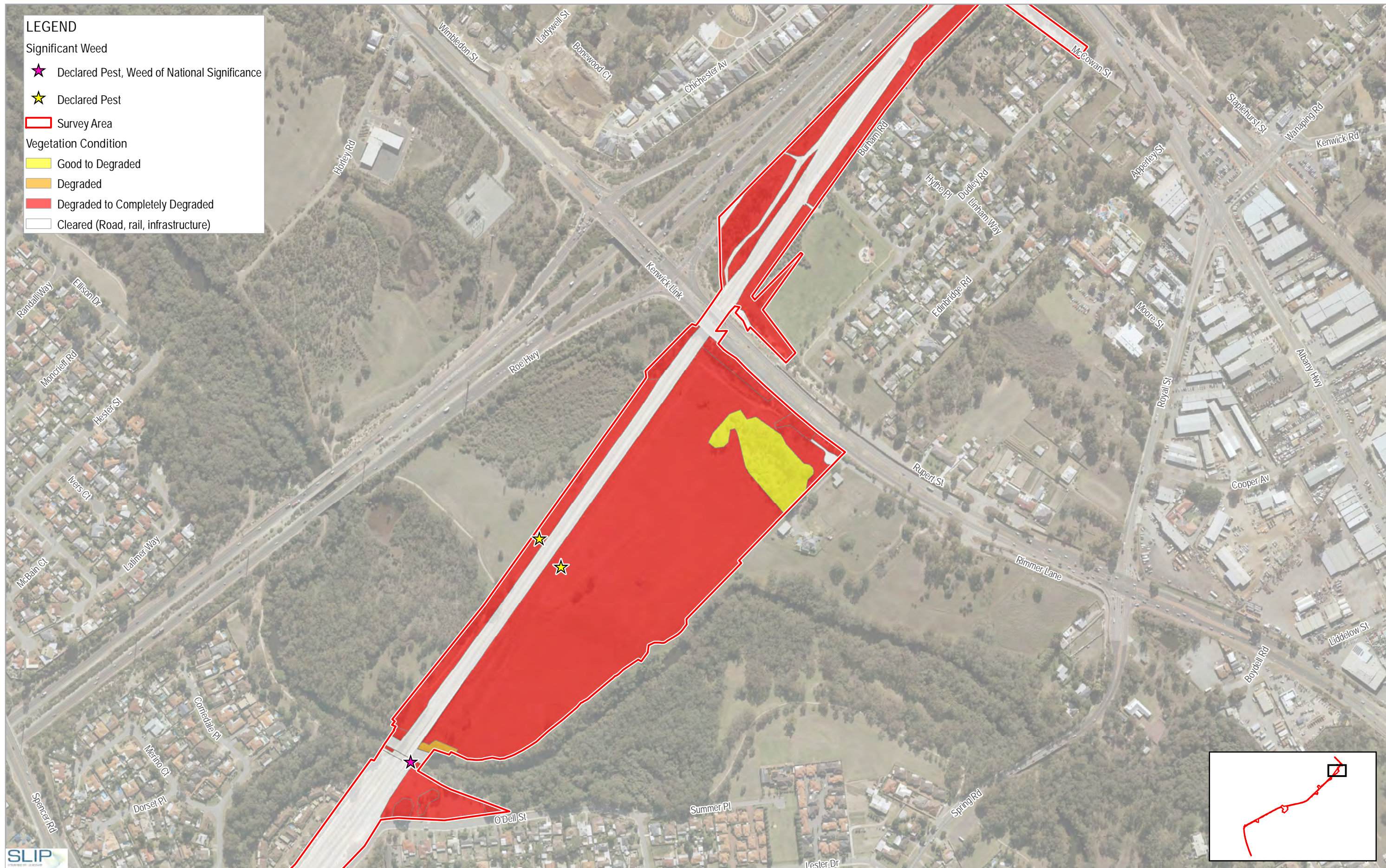
- ★ Declared Pest, Weed of National Significance
- ☆ Declared Pest

Survey Area

- Red outline

Vegetation Condition

- Yellow: Good to Degraded
- Orange: Degraded
- Red: Degraded to Completely Degraded
- White: Cleared (Road, rail, infrastructure)

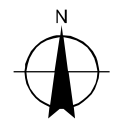
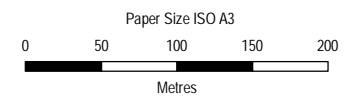


Public Transport Authority
Thornlie Cockburn Link Project

**Vegetation Condition And
Significant Weeds**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 6K



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

Public Transport Authority
Thornlie Cockburn Link Project
**Vegetation Condition And
Significant Weeds**

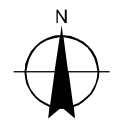
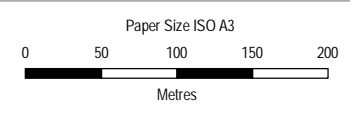
Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 61

G:\6136327\GIS\Maps\Working\Rev 2\6136327_006_Fig6VegetationConditionMapbook_Rev2.mxd
Print date: 22 Oct 2018 - 10:11
Data source: GHD: Vegetation Condition, Survey Area - 20181019; Significant Weeds - 20180307; Landgate: Imagery; Roads: Created by: artemulo

LEGEND

- Survey Area
- PEC - Likely to represent Low lying Banksia attenuata woodlands or shrublands - SCP21c
- TEC - Likely to represent Banksia Woodlands of the Swan Coastal Plain TEC



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

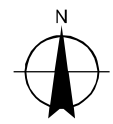
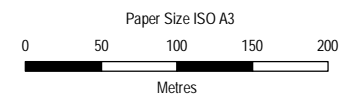
Public Transport Authority
Thornlie Cockburn Link Project
**Conservation Significant
Communities**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 7a

G:\6136327\GIS\Maps\Working\Rev
26136327_007_Fig7\ConservationSignificantCommunities_Rev2.mxd
Print date: 22 Oct 2018 - 10:11

Data source: GHD: Conservation Significant Communities, Survey Area - 20181019; Landgate: Imagery; Roads: Created by artermulo



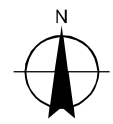
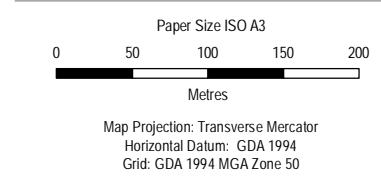
Public Transport Authority
 Thornlie Cockburn Link Project
 Conservation Significant
 Communities

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 7b

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 26136327_007_Fig7_ConservationSignificantCommunities_Rev2.mxd
 Print date: 22 Oct 2018 - 10:11

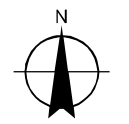
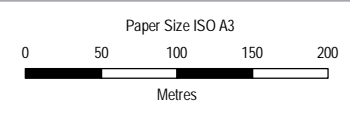
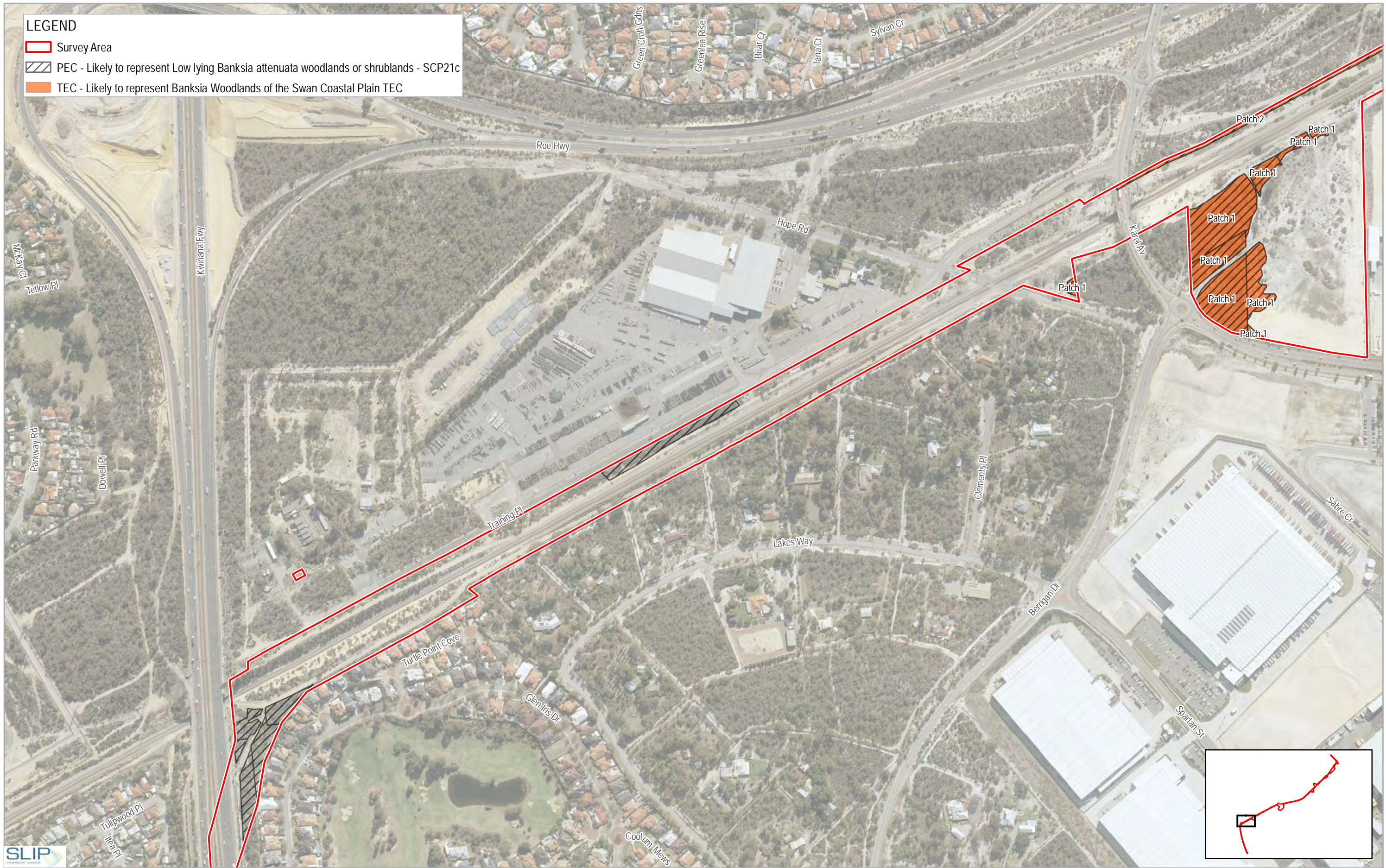
Data source: GHD: Conservation Significant Communities, Survey Area - 20181019; Landgate: Imagery; Roads: Created by artermulo



Public Transport Authority
 Thornlie Cockburn Link Project
 Conservation Significant
 Communities

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 7c



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

Public Transport Authority
Thornlie Cockburn Link Project

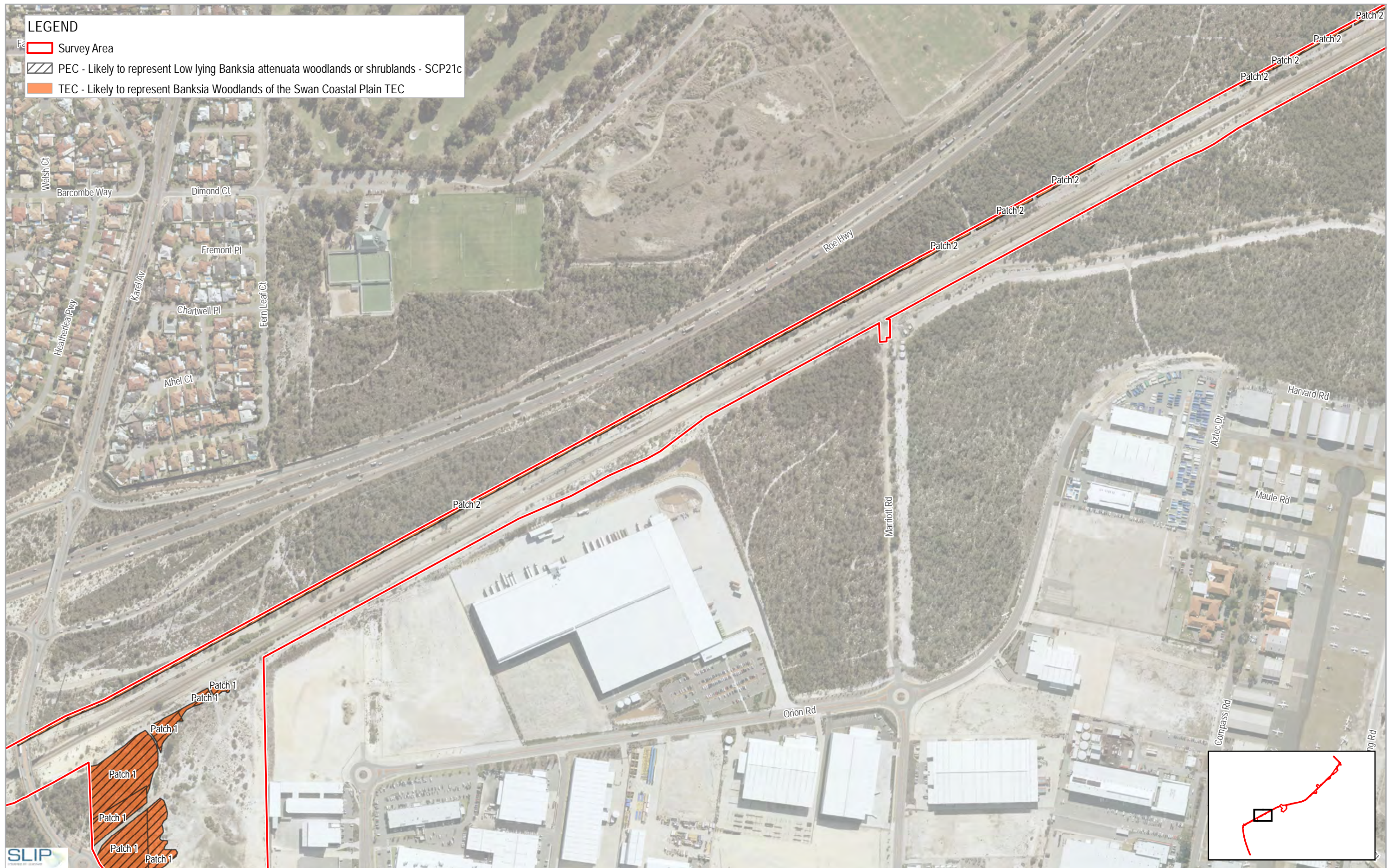
Conservation Significant
Communities

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 7d

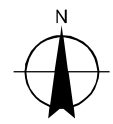
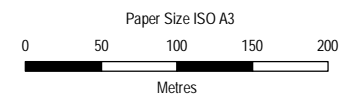
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Print date: 22 Oct 2018 - 10:11

Data source: GHD: Conservation Significant Communities, Survey Area - 20181019; Landgate: Imagery, Roads: Created by artermulo



LEGEND

- Survey Area
- PEC - Likely to represent Low lying *Banksia attenuata* woodlands or shrublands - SCP21c
- TEC - Likely to represent *Banksia* Woodlands of the Swan Coastal Plain TEC



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

Public Transport Authority
 Thornlie Cockburn Link Project

**Conservation Significant
 Communities**

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

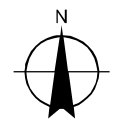
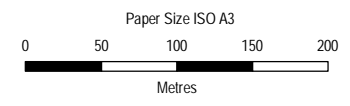
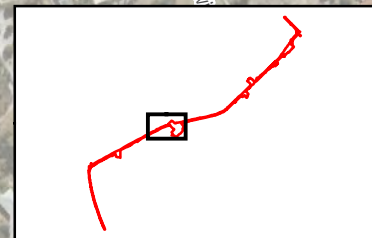
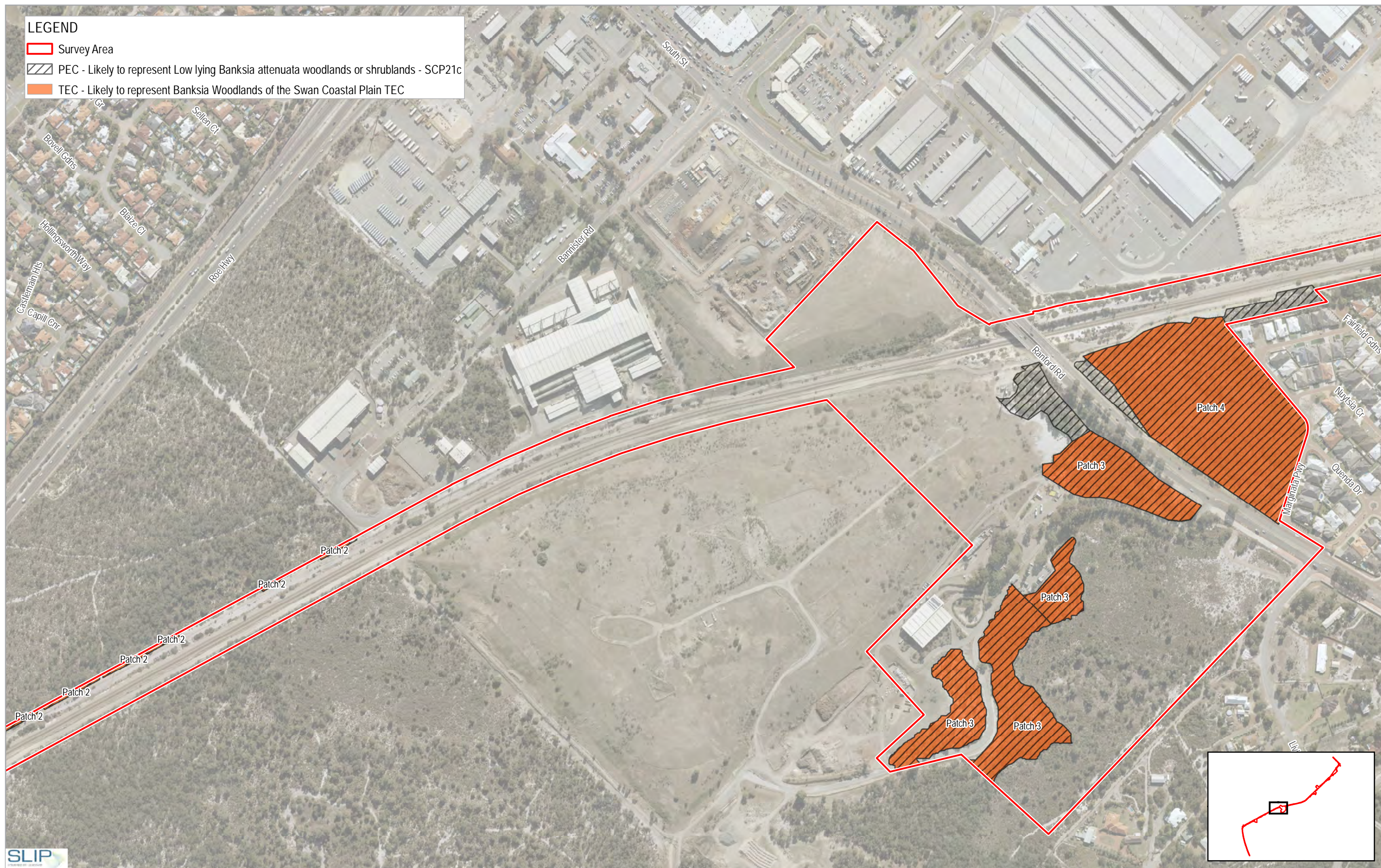
FIGURE 7e

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 26136327_007_Fig7\ConservationSignificantCommunities_Rev2.mxd
 Print date: 22 Oct 2018 - 10:11

Data source: GHD; Conservation Significant Communities, Survey Area - 20181019; Landgate; Imagery; Roads. Created by: artermulo

LEGEND

- Survey Area
- PEC - Likely to represent Low lying Banksia attenuata woodlands or shrublands - SCP21c
- TEC - Likely to represent Banksia Woodlands of the Swan Coastal Plain TEC



Public Transport Authority
 Thornlie Cockburn Link Project
**Conservation Significant
 Communities**

Project No. 61-36327
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FIGURE 7f

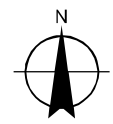
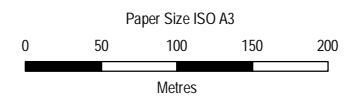
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 Print date: 22 Oct 2018 - 10:12

Data source: GHD; Conservation Significant Communities, Survey Area - 20181019; Landgate; Imagery; Roads. Created by: artemulo



LEGEND

- Survey Area
- PEC - Likely to represent Low lying Banksia attenuata woodlands or shrublands - SCP21c
- TEC - Likely to represent Banksia Woodlands of the Swan Coastal Plain TEC



Public Transport Authority
Thornlie Cockburn Link Project

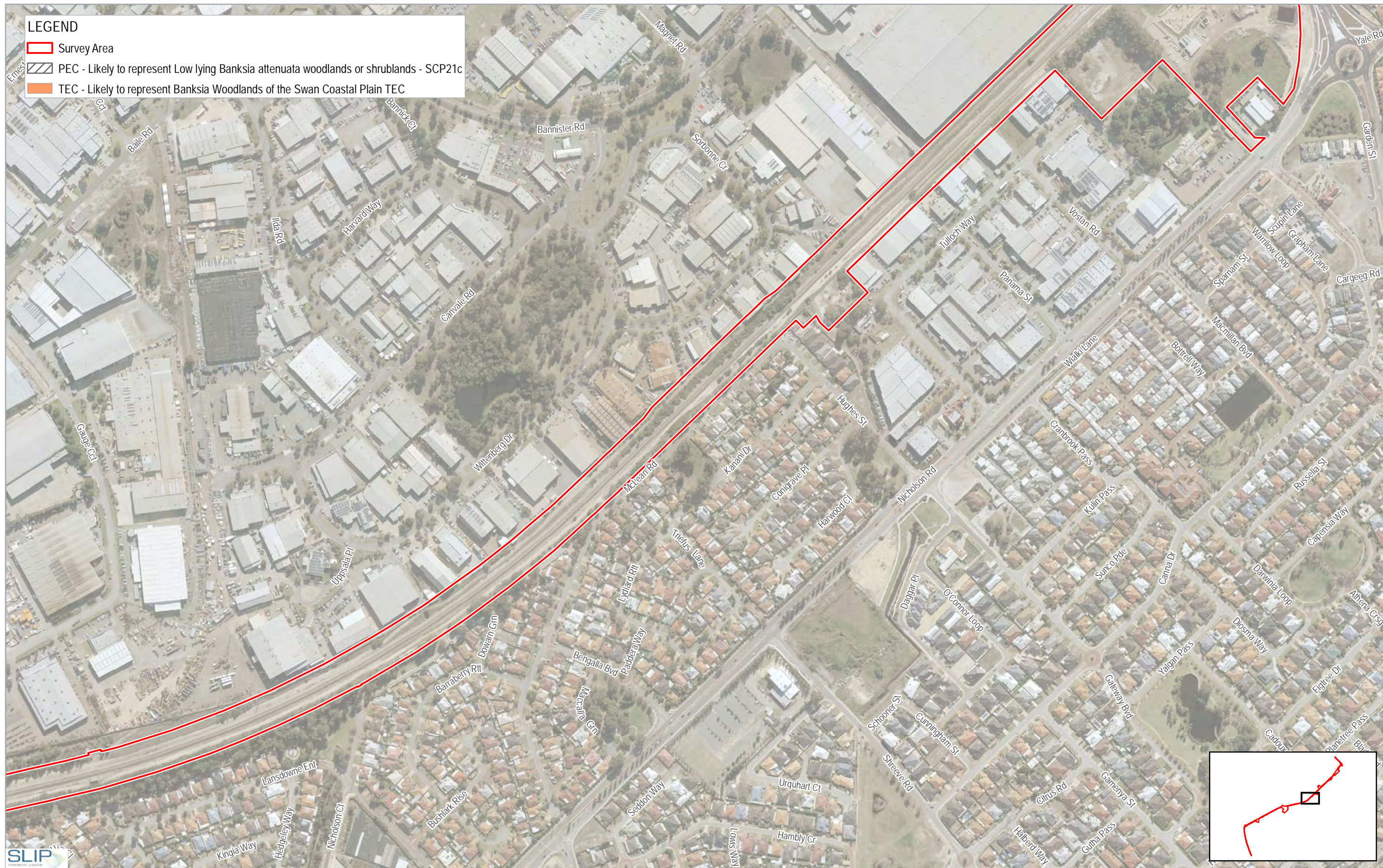
**Conservation Significant
Communities**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 7g

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Data source: GHD; Conservation Significant Communities; Survey Area - 20181019; Landgate; Imagery; Roads. Created by: artemul






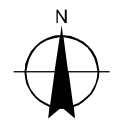
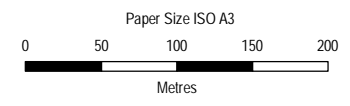
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 Print date: 22 Oct 2018 - 10:12

Data source: GHD: Conservation Significant Communities, Survey Area - 20181019; Landgate: Imagery, Roads: Created by artermulo

LEGEND

-  Survey Area
-  PEC - Likely to represent Low lying Banksia attenuata woodlands or shrublands - SCP21c
-  TEC - Likely to represent Banksia Woodlands of the Swan Coastal Plain TEC



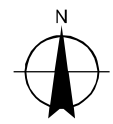
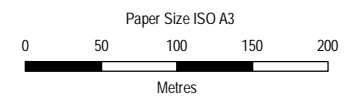
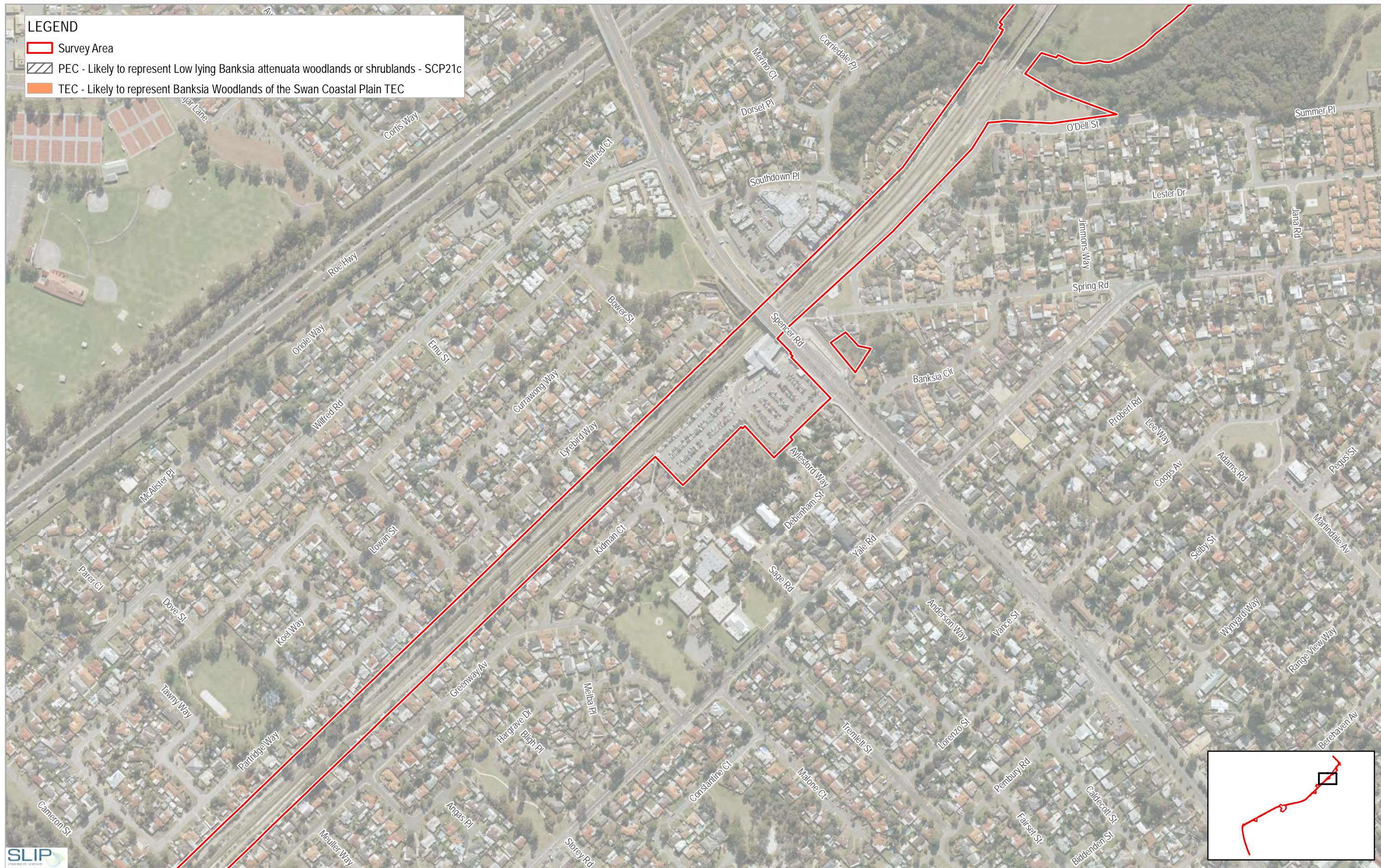
Public Transport Authority
Thornlie Cockburn Link Project
**Conservation Significant
Communities**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 7I

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Print date: 22 Oct 2018 - 10:12

Data source: GHD: Conservation Significant Communities, Survey Area - 20181019; Landgate: Imagery; Roads: Created by artermulo



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Project No. 61-36327
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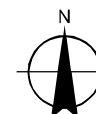
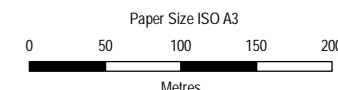
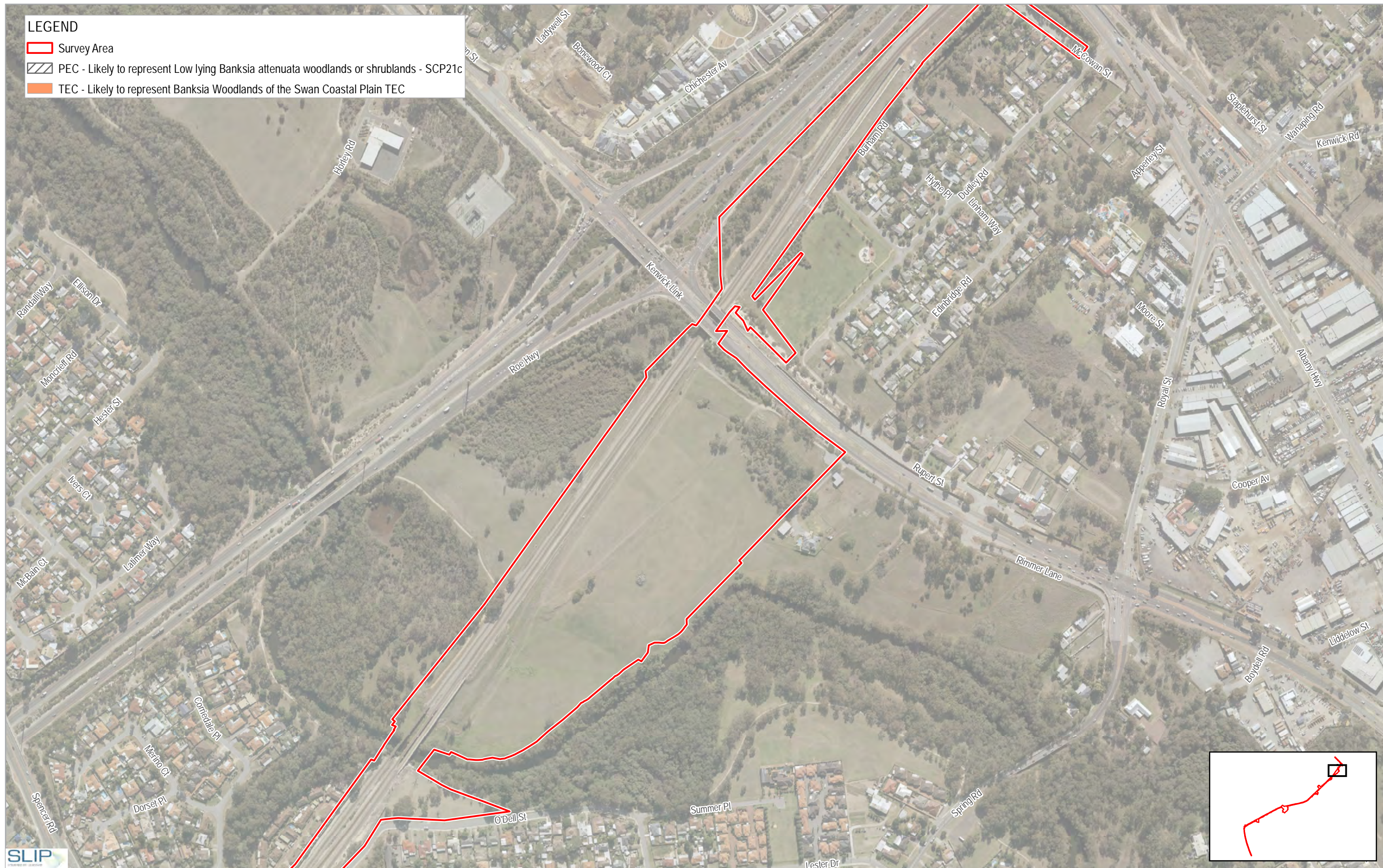
FIGURE 7j

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 26136327_007_Fig7j\ConservationSignificantCommunities_Rev2.mxd
 Print date: 22 Oct 2018 - 10:12

Data source: GHD: Conservation Significant Communities, Survey Area - 20181019; Landgate: Imagery, Roads: Created by artermulo

LEGEND

- Survey Area
- PEC - Likely to represent Low lying Banksia attenuata woodlands or shrublands - SCP21c
- TEC - Likely to represent Banksia Woodlands of the Swan Coastal Plain TEC



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

Public Transport Authority
 Thornlie Cockburn Link Project
 Conservation Significant
 Communities

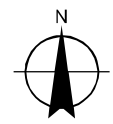
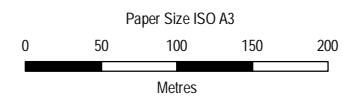
Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 7k



LEGEND

- Survey Area
- PEC - Likely to represent Low lying Banksia attenuata woodlands or shrublands - SCP21c
- TEC - Likely to represent Banksia Woodlands of the Swan Coastal Plain TEC



Public Transport Authority
 Thornlie Cockburn Link Project

**Conservation Significant
 Communities**

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

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

FIGURE 71

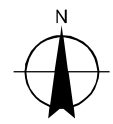
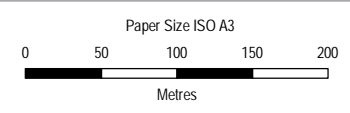
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 Print date: 22 Oct 2018 - 10:12

Data source: GHD; Conservation Significant Communities, Survey Area - 20181019; Landgate; Imagery; Roads; Created by: artemul



LEGEND

- Survey Area
- Geomorphic Wetlands (DBCA Evaluation)
- Multiple Use



Public Transport Authority
Thornlie Cockburn Link Project

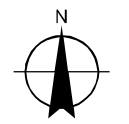
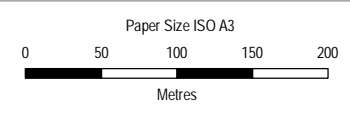
Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

Geomorphic Wetland Assessment

FIGURE 8a

G:\6136327\GIS\Maps\Working\Rev
26136327_008_FigGeomorphicWetlandAssessment_Rev2.mxd
Print date: 22 Oct 2018 - 13:27

Data source: GHD; Survey Area - 20181019; Rapid Assessment Points; Geomorphic Wetland Assessment - 20180307; DBCA; Geomorphic Wetlands - 20170124; Landgate; Imagery; Roads.
Created by: artemulo



Public Transport Authority
Thornlie Cockburn Link Project


Geomorphic Wetland Assessment

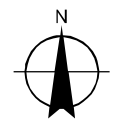
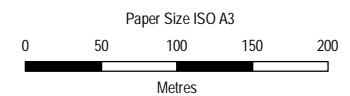
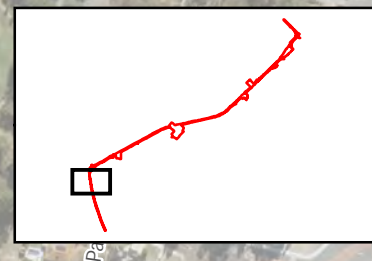
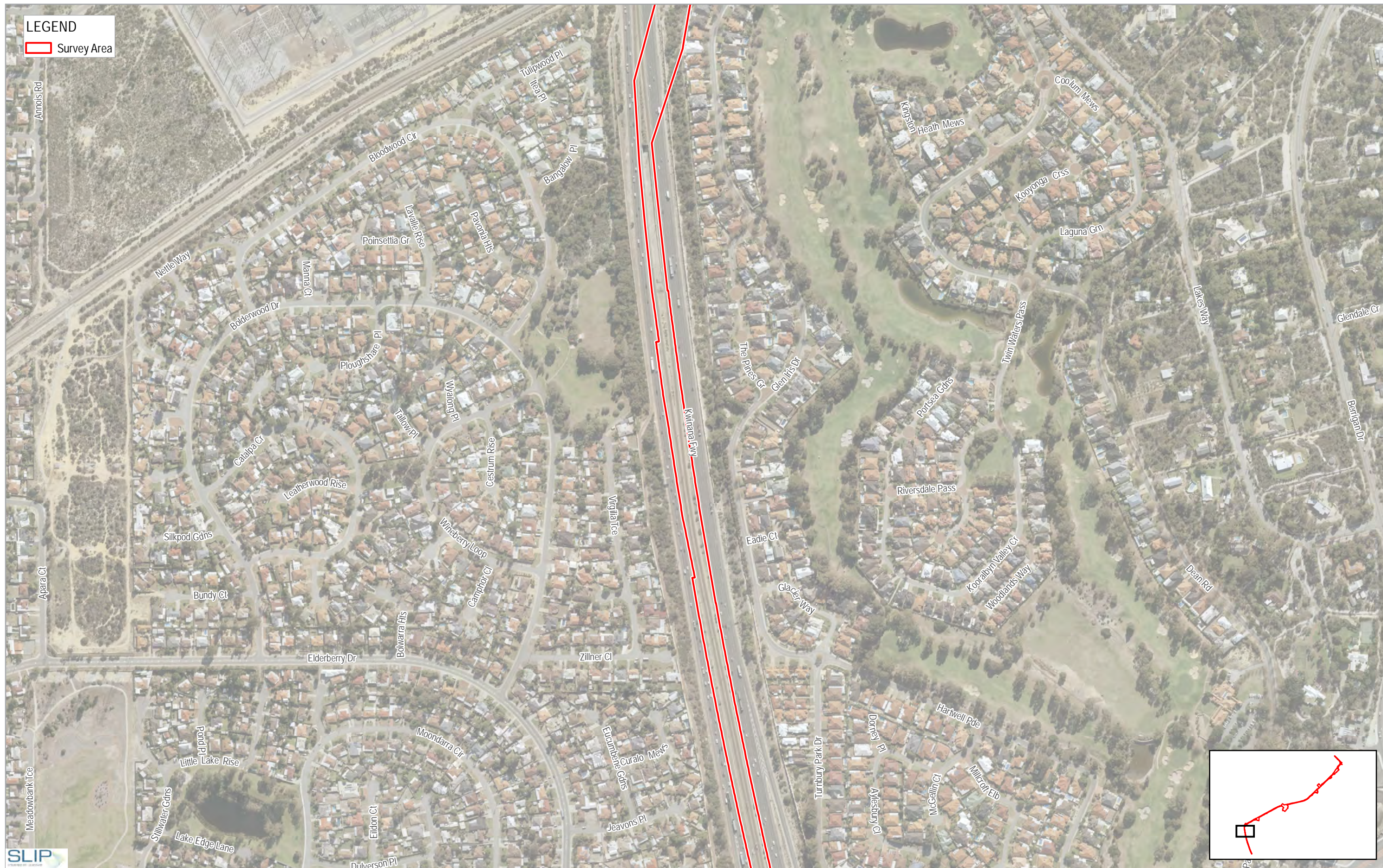
Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 8b

G:\6136327\GIS\Maps\Working\Rev
26136327_008_FigGeomorphicWetlandAssessment_Rev2.mxd
Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA: Geomorphic Wetlands - 20170124; Landgate: Imagery, Roads.
Created by: artemulo

LEGEND
 Survey Area



Public Transport Authority
 Thornlie Cockburn Link Project

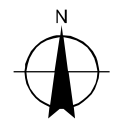
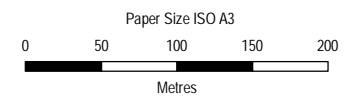
Geomorphic Wetland Assessment

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 8C

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 Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA: Geomorphic Wetlands - 20170124; Landgate: Imagery, Roads. Created by: artemulo



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 Thornlie Cockburn Link Project

Geomorphic Wetland Assessment

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

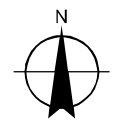
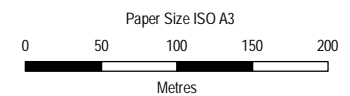
FIGURE 8d

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 Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA: Geomorphic Wetlands - 20170124; Landgate: Imagery, Roads.
 Created by: artemulo



LEGEND
 Survey Area



Public Transport Authority
 Thornlie Cockburn Link Project

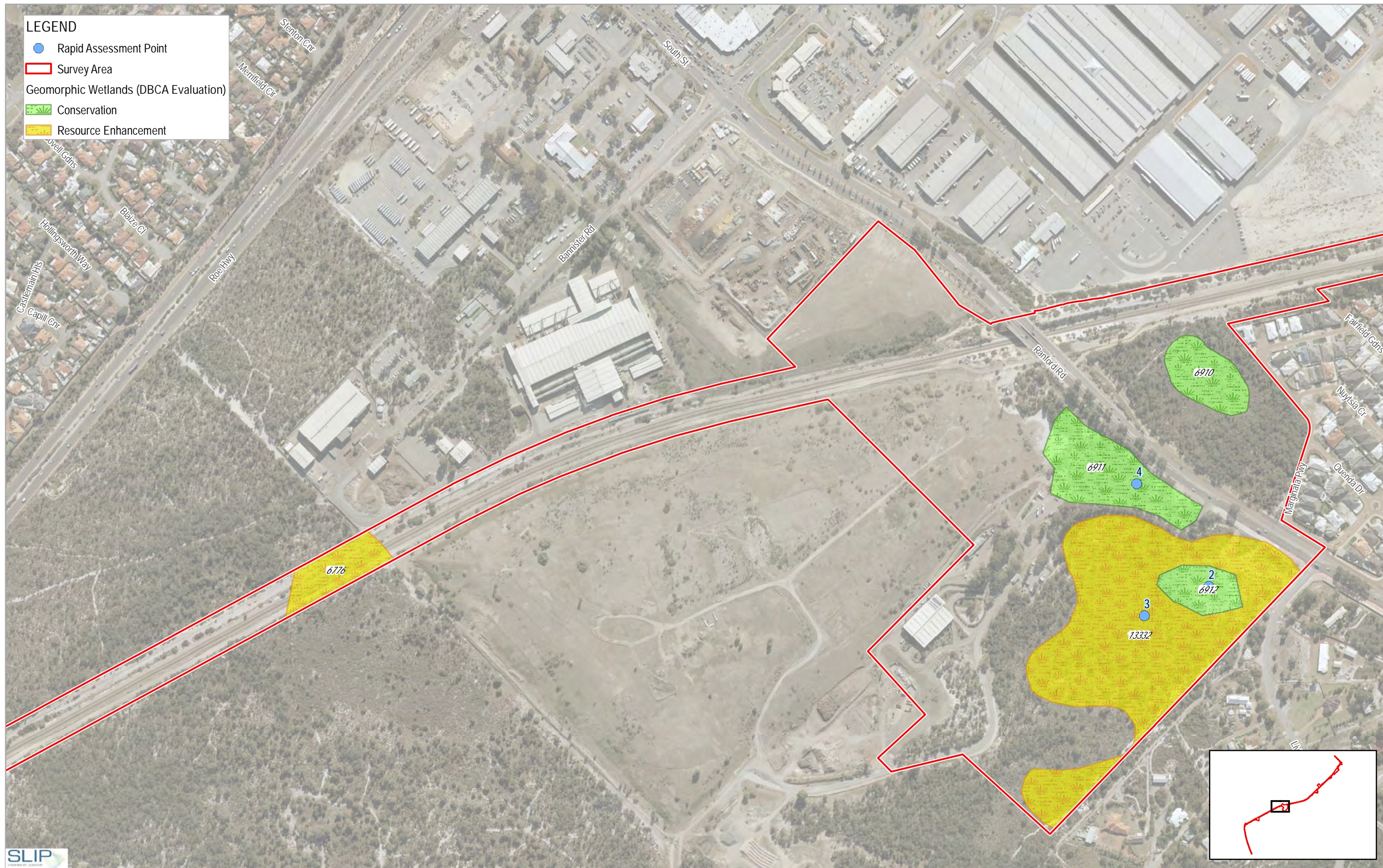
Geomorphic Wetland Assessment

Project No. 61-36327
 Revision No. 2
 Date 22 Oct 2018

FIGURE 8e

G:\6136327\GIS\Maps\Working\Rev
 26136327_008_Fig8e\GeomorphicWetlandAssessment_Rev2.mxd
 Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA: Geomorphic Wetlands - 20170124; Landgate: Imagery, Roads.
 Created by: artemulo

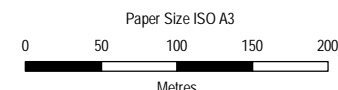


LEGEND

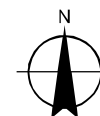
- Rapid Assessment Point
- Survey Area

Geomorphic Wetlands (DBCA Evaluation)

- Conservation
- Resource Enhancement



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



Public Transport Authority
 Thornlie Cockburn Link Project

Geomorphic Wetland Assessment

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 Revision No. 2
 Date 22 Oct 2018

FIGURE 8f

G:\6136327\GIS\Maps\Working\Rev
 26136327_008_Fig8f\GeomorphicWetlandAssessment_Rev2.mxd
 Print date: 22 Oct 2018 - 13:26

Data source: GHD; Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA; Geomorphic Wetlands - 20170124; Landgate; Imagery, Roads.
 Created by: artemulo

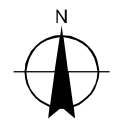
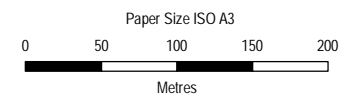


LEGEND

- Rapid Assessment Point
- Survey Area

Geomorphic Wetlands (DBCA Evaluation)

- Conservation
- Multiple Use
- Resource Enhancement



Public Transport Authority
Thornlie Cockburn Link Project

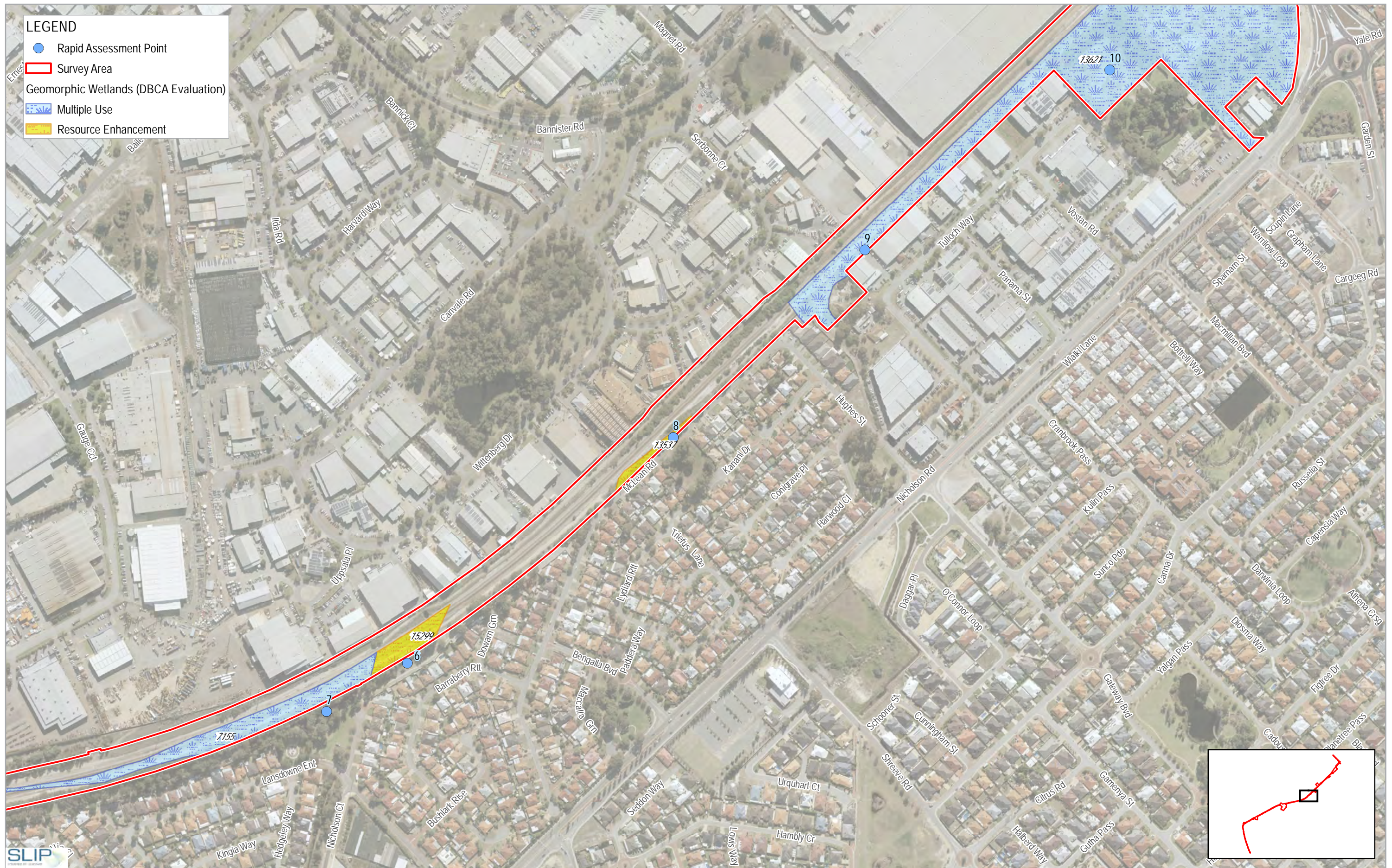
Geomorphic Wetland Assessment

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 8g

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26136327_008_FigGeomorphicWetlandAssessment_Rev2.mxd
Print date: 22 Oct 2018 - 13:28

Data source: GHD; Survey Area - 20181019; Rapid Assessment Points; Geomorphic Wetland Assessment - 20180307; DBCA; Geomorphic Wetlands - 20170124; Landgate; Imagery; Roads.
Created by: artemulo



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



Public Transport Authority
Thornlie Cockburn Link Project

Geomorphic Wetland Assessment

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 8h

G:\6136327\GIS\Maps\Working\Rev
26136327_008_FigGeomorphicWetlandAssessment_Rev2.mxd
Print date: 22 Oct 2018 - 13:28

Data source: GHD; Survey Area - 20181019; Rapid Assessment Points; Geomorphic Wetland Assessment - 20180307; DBCA; Geomorphic Wetlands - 20170124; Landgate; Imagery; Roads.
Created by: artemulo

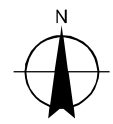
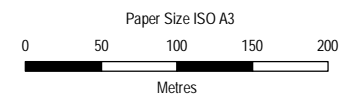


LEGEND

- Rapid Assessment Point
- Survey Area

Geomorphic Wetlands (DBCA Evaluation)

- Conservation
- Multiple Use



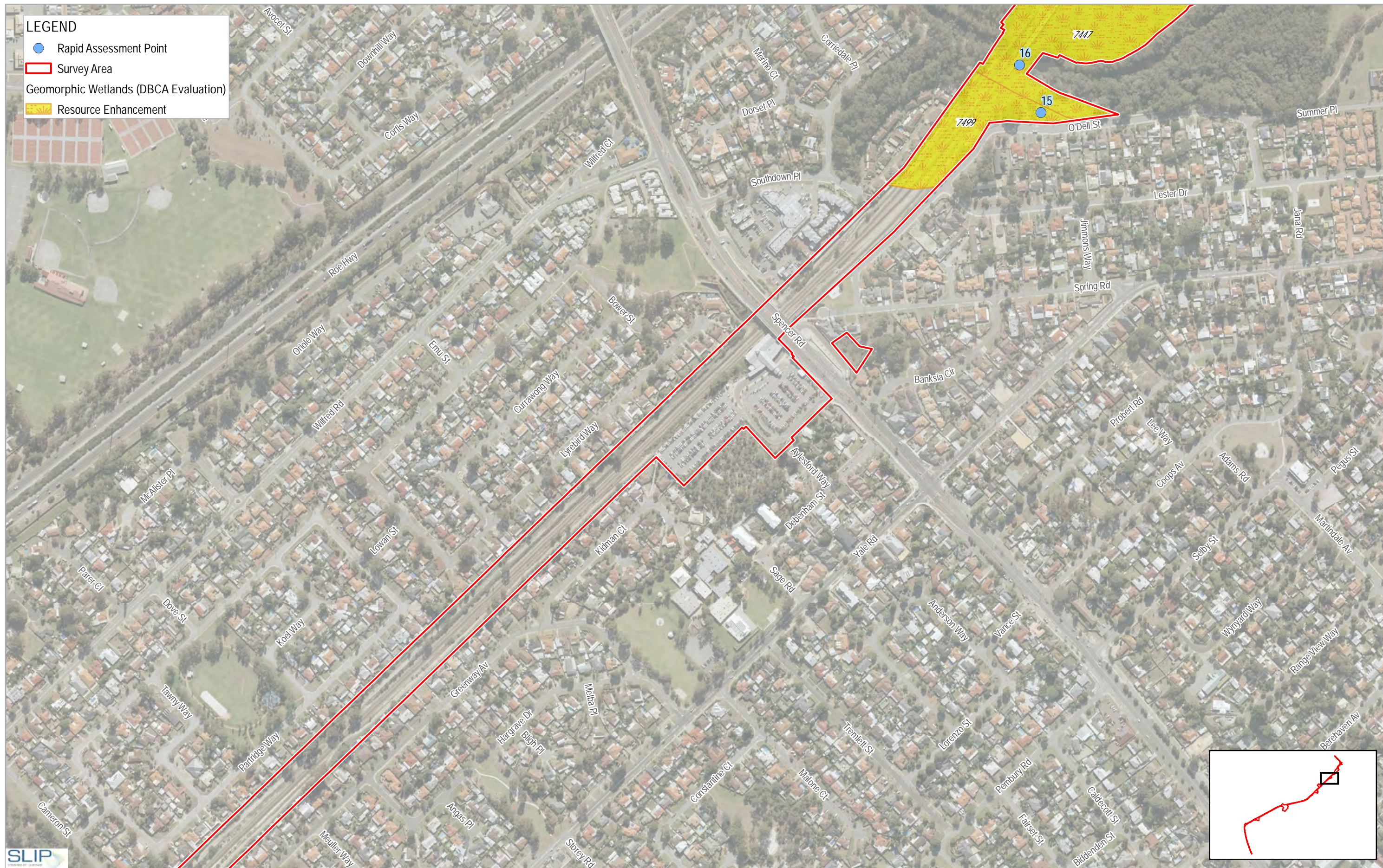
Public Transport Authority Thornlie Cockburn Link Project	Project No. 61-36327 Revision No. 2 Date 22 Oct 2018
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Geomorphic Wetland Assessment

FIGURE 8I

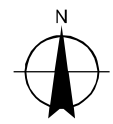
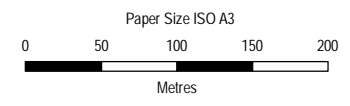
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Print date: 22 Oct 2018 - 13:28

Data source: GHD; Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA; Geomorphic Wetlands - 20170124; Landgate; Imagery, Roads
Created by: artemulo



LEGEND

- Rapid Assessment Point
- Survey Area
- Geomorphic Wetlands (DBCA Evaluation)
- Resource Enhancement



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



Public Transport Authority
 Thornlie Cockburn Link Project

Geomorphic Wetland Assessment

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 Date 22 Oct 2018

FIGURE 8j

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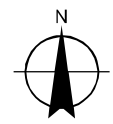
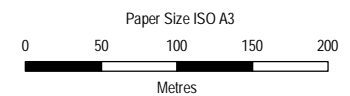
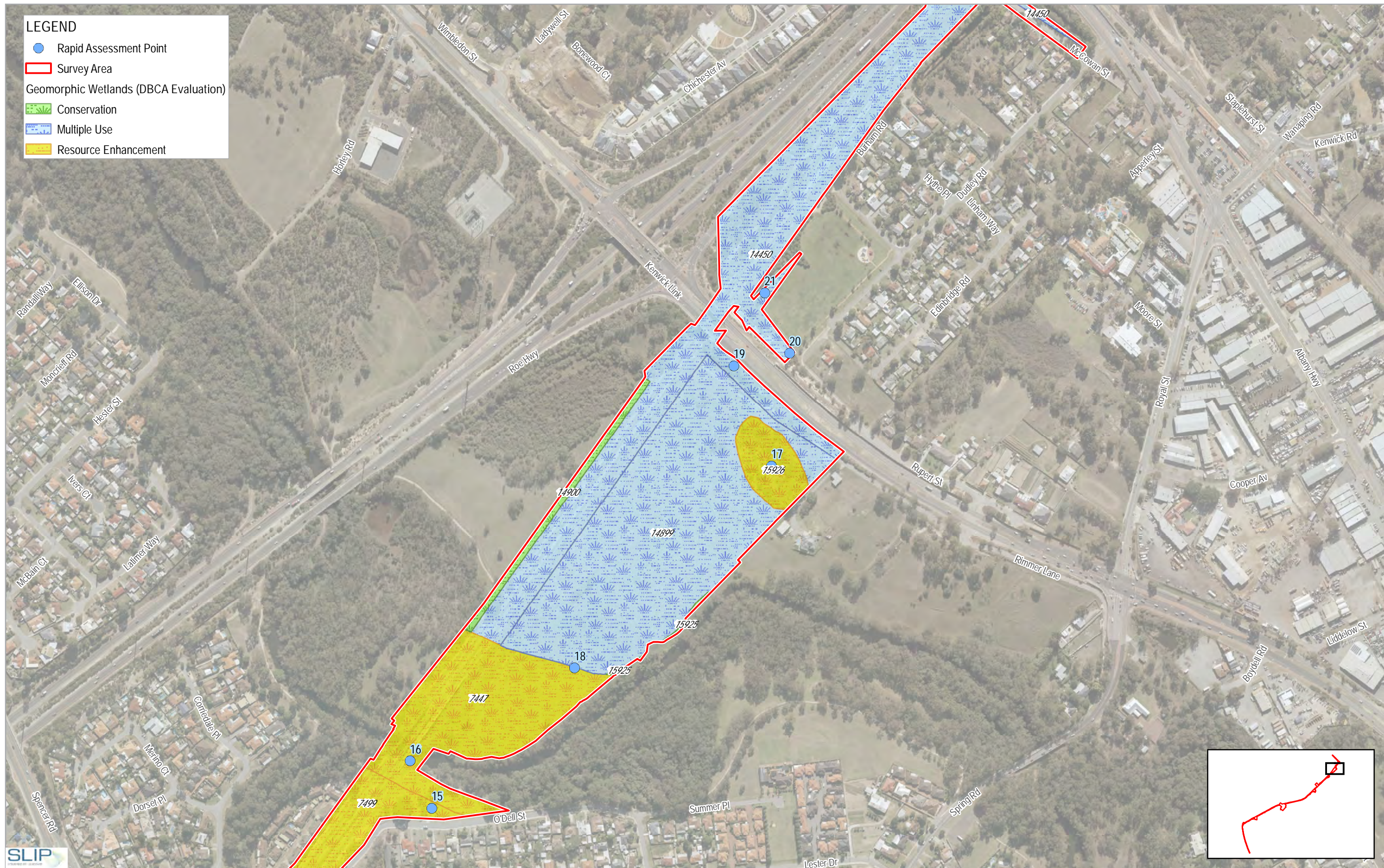
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 Created by: artemulo

LEGEND

- Rapid Assessment Point
- Survey Area

Geomorphic Wetlands (DBCA Evaluation)

- Conservation
- Multiple Use
- Resource Enhancement



Public Transport Authority
Thornlie Cockburn Link Project

Geomorphic Wetland Assessment

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

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

FIGURE 8K

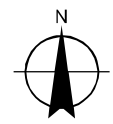
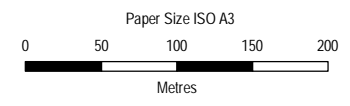
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Print date: 22 Oct 2018 - 13:28

Data source: GHD; Survey Area - 20181019; Rapid Assessment Points; Geomorphic Wetland Assessment - 20180307; DBCA; Geomorphic Wetlands - 20170124; Landgate; Imagery; Roads
Created by: artemulo



LEGEND

- Survey Area
- Geomorphic Wetlands (DBCA Evaluation)
- Multiple Use



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

Public Transport Authority
 Thornlie Cockburn Link Project

Geomorphic Wetland Assessment

Project No. 61-36327
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 Date 22 Oct 2018

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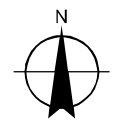
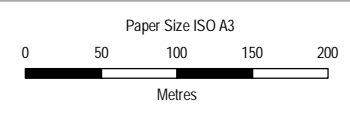
Data source: GHD: Survey Area - 20181019; Rapid Assessment Points, Geomorphic Wetland Assessment - 20180307; DBCA: Geomorphic Wetlands - 20170124; Landgate: Imagery, Roads
 Created by: artemulo

FIGURE 8I



LEGEND

- Survey Area
- Black Cockatoo Foraging Habitat
- Fauna Habitat**
- Mixed tall woodland/clumped trees
- Cleared



Public Transport Authority
Thornlie Cockburn Link Project

Conservation Significant Fauna and Habitats

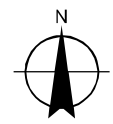
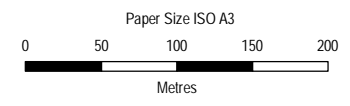
Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

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

FIGURE 9a

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Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo



Public Transport Authority
Thornlie Cockburn Link Project

**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
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Date 22 Oct 2018

FIGURE 9b

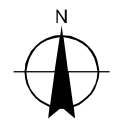
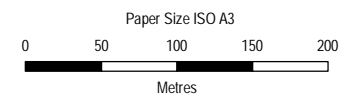
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Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo



LEGEND

- Survey Area
- Black Cockatoo Foraging Habitat
- Fauna Habitat**
- Banksia Woodland
- Mixed tall woodland/clumped trees
- Cleared



Public Transport Authority
Thornlie Cockburn Link Project

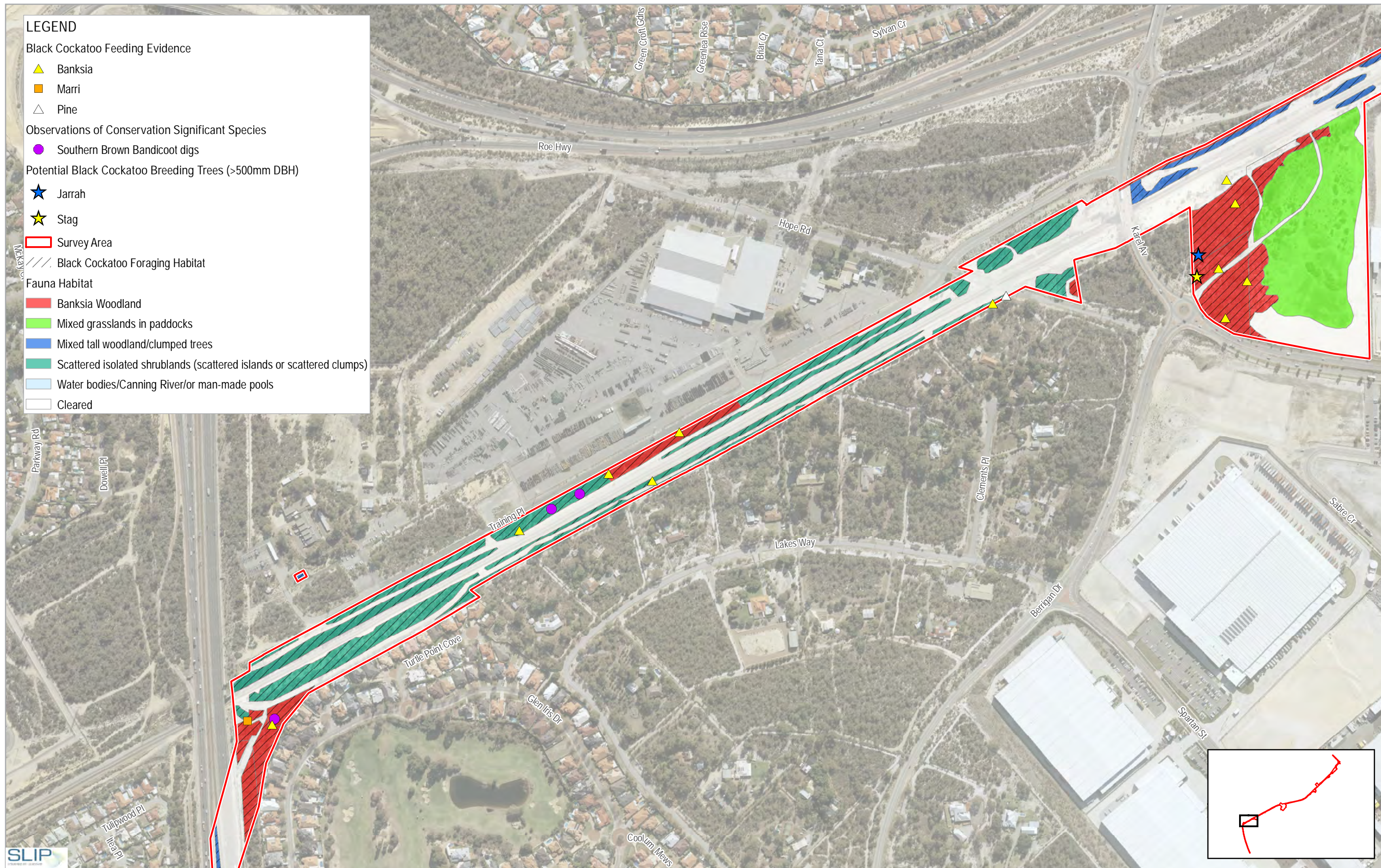
**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 9C

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Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo



LEGEND

Black Cockatoo Feeding Evidence

- ▲ Banksia
- Marri
- △ Pine

Observations of Conservation Significant Species

- Southern Brown Bandicoot digs

Potential Black Cockatoo Breeding Trees (>500mm DBH)

- ★ Jarrah
- ★ Stag

Survey Area

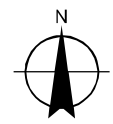
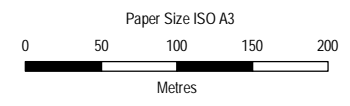
▭ Survey Area

Black Cockatoo Foraging Habitat

/// Black Cockatoo Foraging Habitat

Fauna Habitat

- Banksia Woodland
- Mixed grasslands in paddocks
- Mixed tall woodland/clumped trees
- Scattered isolated shrublands (scattered islands or scattered clumps)
- Water bodies/Canning River/or man-made pools
- Cleared



Public Transport Authority
Thornlie Cockburn Link Project

**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
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Date 22 Oct 2018

FIGURE 9d

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Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery, Roads. Created by: artemul



LEGEND

Black Cockatoo Feeding Evidence

- ▲ Banksia

Potential Black Cockatoo Breeding Trees (>500mm DBH)

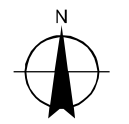
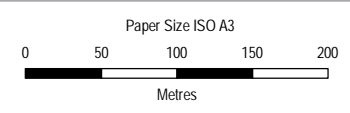
- ★ Jarrah
- ★ Stag

Survey Area

Black Cockatoo Foraging Habitat

Fauna Habitat

- Banksia Woodland
- Mixed grasslands in paddocks
- Mixed tall woodland/clumped trees
- Cleared



Public Transport Authority
Thornlie Cockburn Link Project

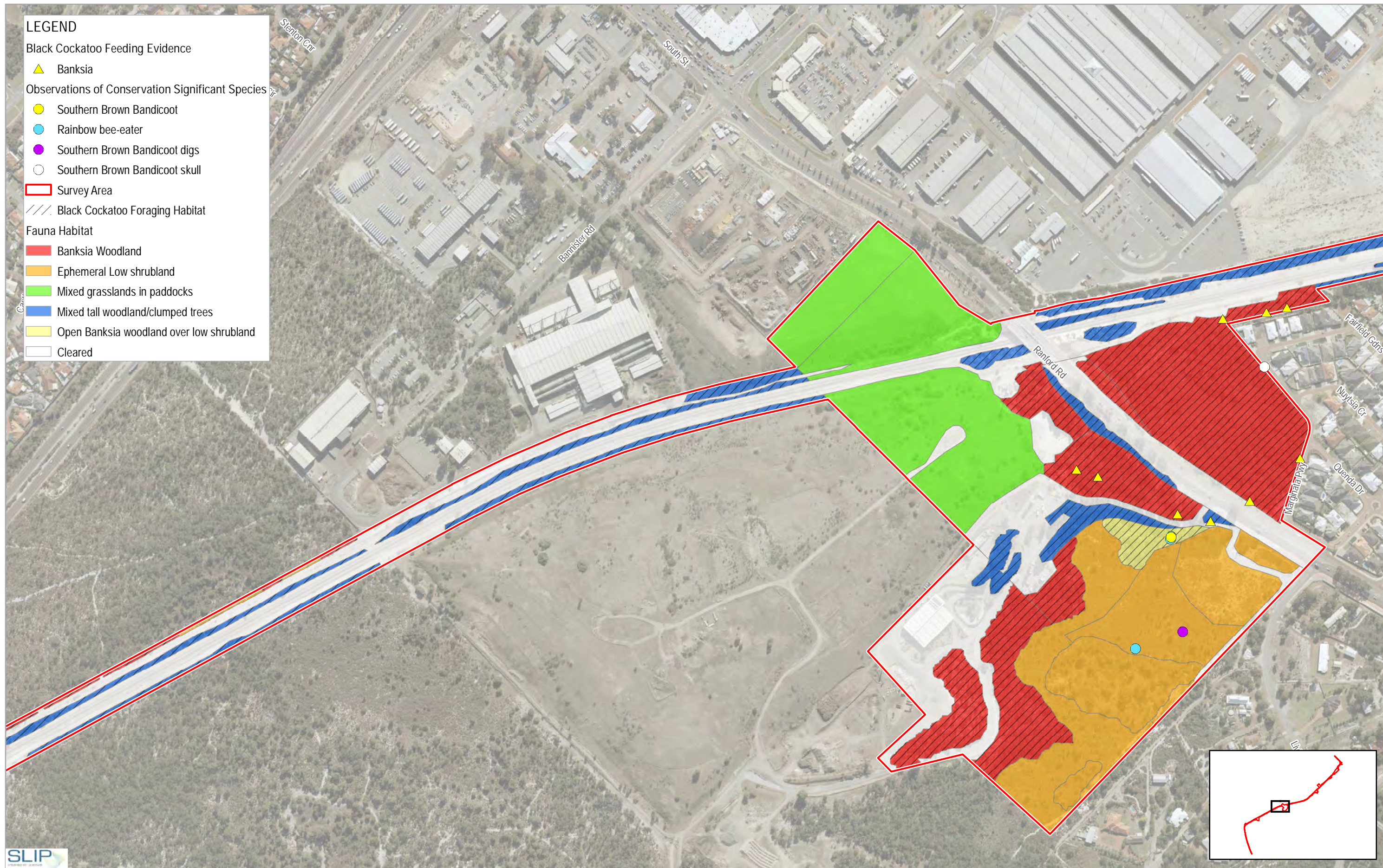
**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 9e

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Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery, Roads. Created by: artermulo



LEGEND

Black Cockatoo Feeding Evidence

- ▲ Banksia

Observations of Conservation Significant Species

- Southern Brown Bandicoot
- Rainbow bee-eater
- Southern Brown Bandicoot digs
- Southern Brown Bandicoot skull

Survey Area

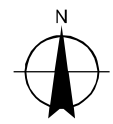
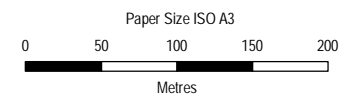
- ▭ Survey Area

Black Cockatoo Foraging Habitat

- ▨ Black Cockatoo Foraging Habitat

Fauna Habitat

- Banksia Woodland
- Ephemeral Low shrubland
- Mixed grasslands in paddocks
- Mixed tall woodland/clumped trees
- Open Banksia woodland over low shrubland
- Cleared



Public Transport Authority
Thornlie Cockburn Link Project

**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 9f

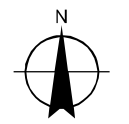
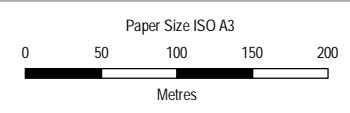
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Print date: 22 Oct 2018 - 13:27

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery, Roads. Created by: artemulo



LEGEND

- Black Cockatoo Feeding Evidence
 - ▲ Banksia
- Observations of Conservation Significant Species
 - Southern Brown Bandicoot skull
- Survey Area
- Black Cockatoo Foraging Habitat
- Fauna Habitat
 - Banksia Woodland
 - Ephemeral Low shrubland
 - Mixed tall woodland/clumped trees
 - Cleared



Public Transport Authority
Thornlie Cockburn Link Project

**Conservation Significant Fauna
and Habitats**

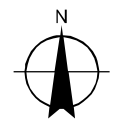
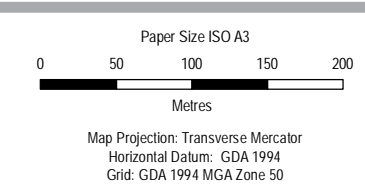
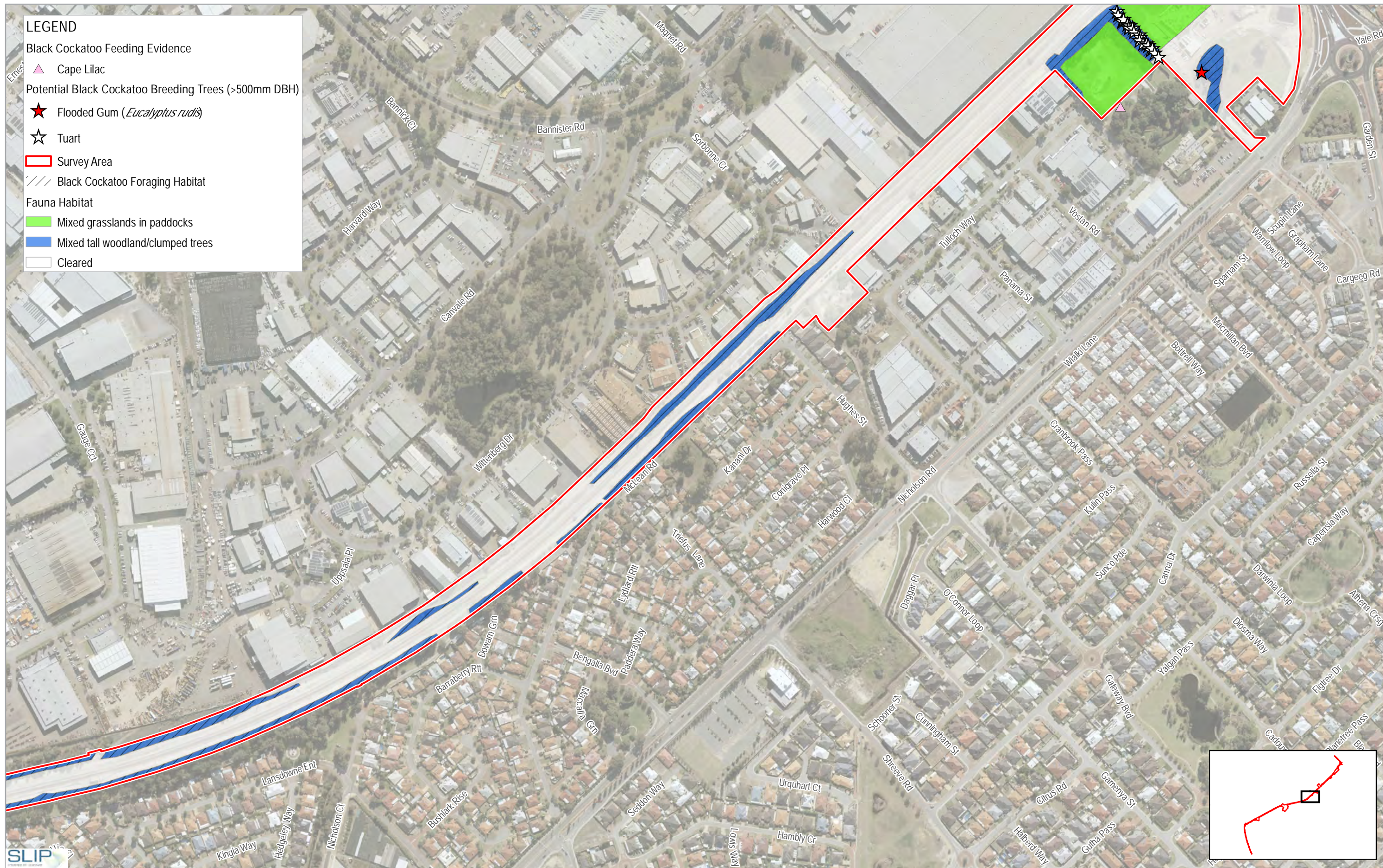
Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 9g



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26136327_009_Fig9ConservationSignificantFaunaAndHabitats_Rev2.mxd
Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery, Roads. Created by: artemul



Public Transport Authority
Thornlie Cockburn Link Project

**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
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Date 22 Oct 2018

FIGURE 9h

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Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery, Roads. Created by: artemul



LEGEND

Black Cockatoo Feeding Evidence

- △ Cape Lilac
- ◇ Drinking evidence
- Marri

Observations of Conservation Significant Species

- Forest Red-tailed Black Cockatoo
- Southern Brown Bandicoot digs

Potential Black Cockatoo Breeding Trees (>500mm DBH)

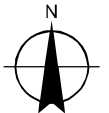
- ★ Marri
- ★ Flooded Gum (*Eucalyptus rudis*)
- ★ Tuart

Survey Area

▭ Black Cockatoo Foraging Habitat

Fauna Habitat

- Melaleuca woodland
- Mixed grasslands in paddocks
- Mixed tall woodland/clumped trees
- Cleared



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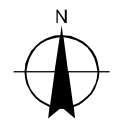
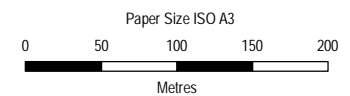
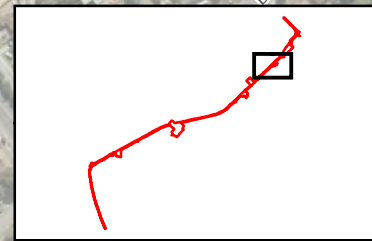
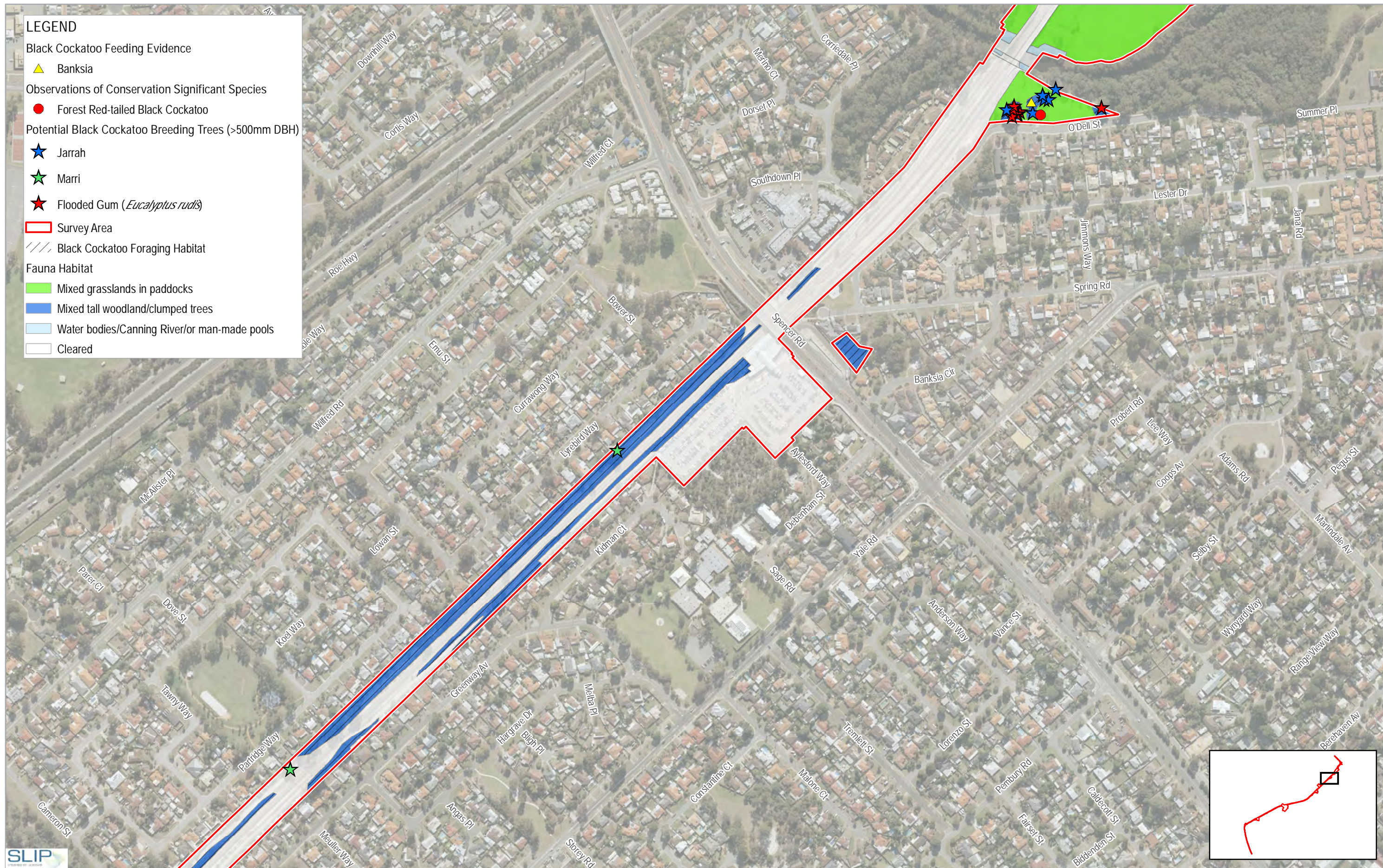
**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

FIGURE 9I

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Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo



Public Transport Authority
Thornlie Cockburn Link Project

**Conservation Significant Fauna
and Habitats**

Project No. 61-36327
Revision No. 2
Date 22 Oct 2018

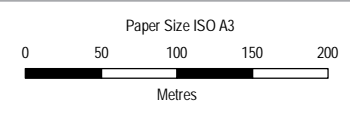
FIGURE 9j

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Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo



- LEGEND**
- Black Cockatoo Feeding Evidence**
- △ Cape Lilac
 - ▲ Banksia
 - Marri
- Observations of Conservation Significant Species**
- Carnaby's Black Cockatoo
 - Forest Red-tailed Black Cockatoo
- Potential Black Cockatoo Breeding Trees (>500mm DBH)**
- ★ Jarrah
 - ★ Marri
 - ★ Flooded Gum (*Eucalyptus rudis*)
- Survey Area**
- ▭ Black Cockatoo Foraging Habitat
- Fauna Habitat**
- Mixed grasslands in paddocks
 - Mixed tall woodland/clumped trees
 - Water bodies/Canning River/or man-made pools
 - Cleared



Public Transport Authority
Thornlie Cockburn Link Project

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Date 22 Oct 2018

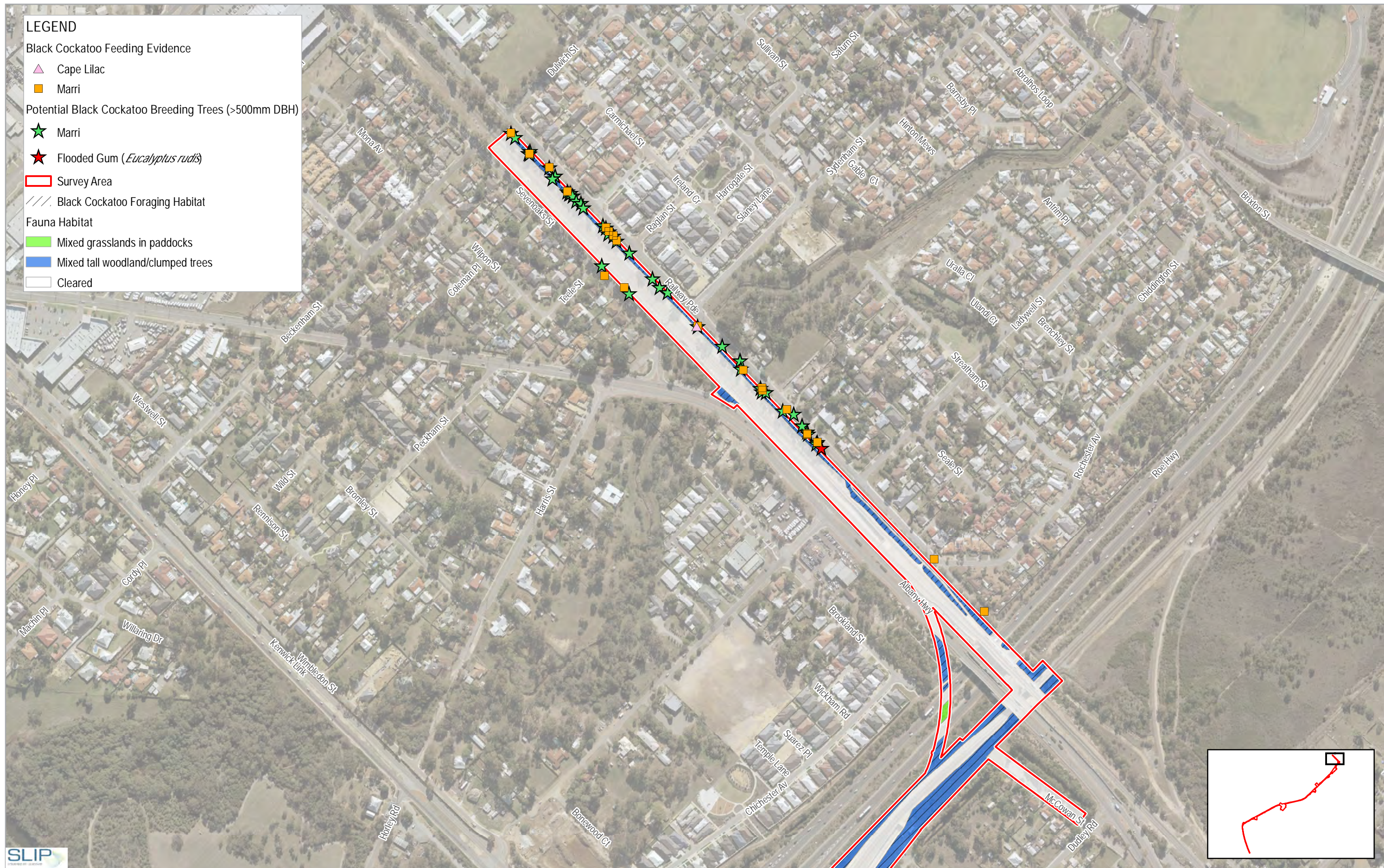
Conservation Significant Fauna and Habitats

FIGURE 9K

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Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo





LEGEND

Black Cockatoo Feeding Evidence

- △ Cape Lilac
- Marri

Potential Black Cockatoo Breeding Trees (>500mm DBH)

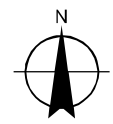
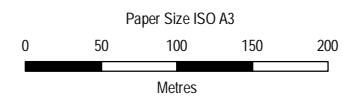
- ★ Marri
- ★ Flooded Gum (*Eucalyptus rudis*)

Survey Area

Black Cockatoo Foraging Habitat

Fauna Habitat

- Mixed grasslands in paddocks
- Mixed tall woodland/clumped trees
- Cleared



Public Transport Authority
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Project No. 61-36327
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Date 22 Oct 2018

Conservation Significant Fauna and Habitats

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

FIGURE 9I

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Print date: 22 Oct 2018 - 13:28

Data source: GHD: Survey Area, Con Sig Fauna, Breeding Trees, Fauna Habitat, Foraging Habitat - 20181019; Landgate: Imagery; Roads: Created by artermulo

Appendix B – Relevant legislation, conservation codes and background information

Relevant legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

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

The biological aspects listed as MNES include:

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

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

The EPBC Act is administered by the Department of the Environment and Energy (DoEE).

State *Environmental Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DoWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DoWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

- a) Native vegetation should not be cleared if it comprises a high level of biodiversity.
- b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.
- c) Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
- d) Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
- e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
- f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- g) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
- h) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

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

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State Biodiversity and Conservation Act 2016

The Biodiversity Conservation Bill 2015 was introduced to State Parliament in November 2015, and passed in September 2016. The Bill became the *Biodiversity Conservation Act 2016* (BC Act) upon receiving Assent on 21 September 2016. The BC Act will eventually fully replace both the *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act).

Several parts of the BC Act were proclaimed by the State Governor in the Government Gazette and came into effect on 3 December 2016. However, provisions that replace those existing under the WC Act and Sandalwood Act (including threatened species listings and controls over the taking and keeping of native species) and their associated Regulations cannot be brought into effect until the necessary Biodiversity Conservation Regulations have been made. It is hoped the new Regulations will be completed and ready to commence by late 2017.

State Wildlife Conservation Act 1950

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

State Biosecurity and Agriculture Management Act 2007

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976*. The main purposes of the BAM Act and its regulations are to:

- Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA
- Manage the impact and spread of those pests already present in the state
- Safely manage the use of agricultural and veterinary chemicals
- Increased control over the sale of agricultural products that contain violative chemical residues

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

DPIRD Categories for Declared Pests under the BAM Act

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

Background information

Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Minister for Environment under Section 51B of the EP Act. The Table below outlines the aspects of areas declared as ESA in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005.

Aspects of ESAs

Aspects of Environmentally Sensitive Areas
A declared World Heritage property as defined in Section 13 of the EPBC Act.
An area that is included on the Register of the National Estate (RNE), because of its natural values, under the <i>Australian Heritage Commission Act 1975</i> of the Commonwealth (the RNE was closed in 2007 and is no longer a statutory list – all references to the RNE were removed from the EPBC Act on 19 February 2012).
A defined wetland and the area within 50 m of the wetland. Defined wetlands include Ramsar wetlands, conservation category wetlands and nationally important wetlands.
The area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located.
The area covered by a Threatened Ecological Community.
A Bush Forever Site listed in “Bush Forever” Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission.
The areas covered by the <i>Environmental Protection (Gnangara Mound Crown Land) Policy 1992</i> .
The areas covered by the <i>Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002</i> .
The areas covered by the lakes to which the <i>Environmental Protection (Swan Coastal Plain Lakes) Policy 1992</i> (EPP Lakes) applies.
Protected wetlands as defined in the <i>Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998</i> .

Reserves and conservation areas

Bush Forever

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

Department of Biodiversity, Conservation and Attractions managed lands and waters

DBCA manages lands and waters throughout Western Australia to conserve ecosystems and species, and to provide for recreation and appreciation of the natural environment. DBCA managed lands and waters include national parks, conservation parks and reserves, marine parks and reserves, regional parks, nature reserves, State forest and timber reserves. DBCA managed conservation estate, is

vested with the Conservation Commission of Western Australia. Access to, or through, some areas of DBCA managed lands may require a permit or could be restricted due to management activities. Proposed land use changes and development proposals that abut DBCA managed lands will generally be referred to DBCA throughout the assessment process.

Wetlands

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

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

Ramsar Listed Wetlands

The Convention of Wetlands of International Importance was signed in 1971 at the Iranian town of Ramsar. The Convention has since been referred to as the Ramsar Convention. Ramsar Listed wetlands are “sites containing representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity ... because of their ecological, botanical, zoological, limnological or hydrological importance” (DoEE 2017b). Once a Ramsar Listed Wetland is designated, the country agrees to manage its conservation and ensure its wise use. Under the Convention, wise use is broadly defined as “maintaining the ecological character of a wetland” (DoEE 2017b).

Nationally important wetlands

Wetlands of national significance are listed under the Directory of Important Wetlands in Australia. Nationally important wetlands are wetlands which meet at least one of the following criteria (DoEE 2017a):

- It is a good example of a wetland type occurring within a biogeographic region in Australia
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail
- The wetland supports one percent or more of the national populations of any native plant or animal taxa
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level
- The wetland is of outstanding historical or cultural significance

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

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

Geomorphic wetlands

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

Wetlands are classified as those wetlands with few attributes that still provide important wetland functions. Multiple Use wetlands have few important ecological attributes and functions remaining.

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

Vegetation extent and status

The National Objectives and Targets for Biodiversity Conservation 2001–2005 (Commonwealth of Australia 2001) recognise that the retention of 30 percent or more of the pre-clearing extent of each ecological community is necessary if Australia’s biological diversity is to be protected. This is the threshold level below which species loss appears to accelerate exponentially and loss below this level should not be permitted. This level of recognition is in keeping with the targets recommended in the review of the National Strategy for the Conservation of Australia’s Biological Diversity (ANZECC 2000).

The extent of remnant native vegetation in WA has been assessed by Shepherd *et al.* (2002) and the GoWA (2016), based on broadscale vegetation association mapping by Beard (various publications). The GoWA produces Statewide Vegetation Statistics Reports that are used for a number of purposes including conservation planning, land use planning and when assessing development applications. The reports are updated at least every two years.

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

Vegetation condition

The vegetation condition can be assessed in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces (EPA 2016A). The scale recognises the intactness of vegetation and consists of six rating levels as outlined below.

Vegetation condition rating scale for the South West and Interzone Botanical Provinces

Condition	South West and Interzone Botanical Provinces description
Pristine	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

Condition	South West and Interzone Botanical Provinces description
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	The structure of vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Conservation codes

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

Ecological communities

Conservation significant communities

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

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

Conservation codes and definitions for TECs listed under the EPBC Act or endorsed by the WA Minister for the Environment

Categories	Definition
Federal Government Conservation Categories (EPBC Act)	
Critically Endangered (CR)	An ecological community if, at that time, is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000)
Endangered (EN)	An ecological community if, at that time: A) is not critically endangered; and B) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000)
Vulnerable (VU)	An ecological community if, at that time: A) is not critically endangered or endangered; and B) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000)
Western Australia Conservation Categories	
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Categories	Definition
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Conservation categories and definitions for PECS as listed by the DBCA

Category	Description
Priority 1	<p>Poorly known ecological communities.</p> <p>Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.</p>
Priority 2	<p>Poorly known ecological communities.</p> <p>Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.</p>
Priority 3	<p>Poorly known ecological communities.</p> <p>(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:</p> <p>(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;</p> <p>(iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.</p> <p>Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.</p>

Category	Description
Priority 4	<p>Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.</p> <p>(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.</p> <p>(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</p> <p>(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.</p>
Priority 5	<p>Conservation Dependent ecological communities.</p> <p>Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.</p>

Other significant vegetation

Vegetation may be significant for a range of reasons other than a statutory listing. The EPA (2016b) states that significant vegetation may include vegetation that includes the following:

- Restricted distribution
- Degree of historical impact from threatening processes
- Local endemism in restricted habitats
- Novel combinations of taxa
- A role as a refuge
- A role as a key habitat for Threatened species or large population representing a significant proportion of the local to regional total population of a species
- Being representative of a vegetation unit in 'pristine' condition in a highly cleared landscape, recently discovered range extensions, or isolated outliers of the main range)
- Being poorly reserved

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

Flora and fauna

Conservation significant flora and fauna

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

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

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

- Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
- Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
- Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of Threatened flora and fauna has been published as Specially Protected under the WC Act, and listed under Schedules 1 to 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2015 for Threatened Fauna and under Schedules 1 to 4 of the Wildlife Conservation (Rare Flora) Notice 2015 for Threatened (Declared Rare) Flora. The schedules align with the categories of the EPBC Act Threatened Fauna and Threatened Flora Lists. Threatened species are those species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such.

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

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

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

Conservation categories and definitions for EPBC Act listed flora and fauna species

Conservation category	Definition
Extinct	There is no reasonable doubt that the last member of the species has died.
Extinct in the Wild	A) A species known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or B) A species that has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered	A species facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000).
Endangered	A) A species not critically endangered; and B) A species facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

Conservation category	Definition
Vulnerable	A) A species not critically endangered or endangered; and B) A species facing a high risk of extinction in the wild in the medium-term, as determined in accordance with the prescribed criteria.
Conservation Dependent	A) The species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or B) The following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that Section 180 provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Conservation codes and descriptions for WC Act listed flora and fauna species

Conservation category	Schedule and definition
Threatened species (T)	Published as Specially Protected under the WC Act, and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora. Threatened fauna is that subset of ‘Specially Protected Fauna’ declared to be ‘likely to become extinct’ pursuant to section 14(4) of the WC Act. Threatened flora is flora that has been declared to be ‘likely to become extinct or is rare, or otherwise in need of special protection’, pursuant to section 23F(2) of the WC Act.
Critically Endangered (CR)	Schedule 1: Threatened species considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	Schedule 2: Threatened species considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	Schedule 3: Threatened species considered to be facing a high risk of extinction in the wild.
Presumed Extinct (EX)	Schedule 4: Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
International Agreement (IA)	Schedule 5: Migratory birds protected under an international agreement
Conservation Dependent (CD)	Schedule 6: Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Other Specially Protected (OS)	Schedule 7: Fauna otherwise in need of special protection to ensure their conservation.

Conservation codes for DBCA listed Priority flora and fauna

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

Other significant flora

Flora species, subspecies, varieties, hybrids and ecotypes may be significant for a range of reasons, other than a statutory listing. The EPA (2016b) states that significant flora may include taxa that have:

- A keystone role in a particular habitat for threatened or Priority flora or fauna species, or large populations representing a considerable proportion of the local or regional total population of a species
- Relictual status, being representation of taxonomic or physiognomic groups that no longer occur widely in the broader landscape
- Anomalous features that indicate a potential new discovery
- Being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)

- The presence of restricted subspecies, varieties, or naturally occurring hybrids
- Local endemism (a restricted distribution) or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)
- Being poorly reserved

Other significant fauna

Fauna species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed (EPA 2010).

Introduced plants (weeds)

Declared Pests

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

Weeds of National Significance

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

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

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

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Appendix C – Database searches

EPBC Act PMST Report

NatureMap Flora Report

NatureMap Fauna 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: 05/09/17 13:49:33

[Summary](#)

[Details](#)

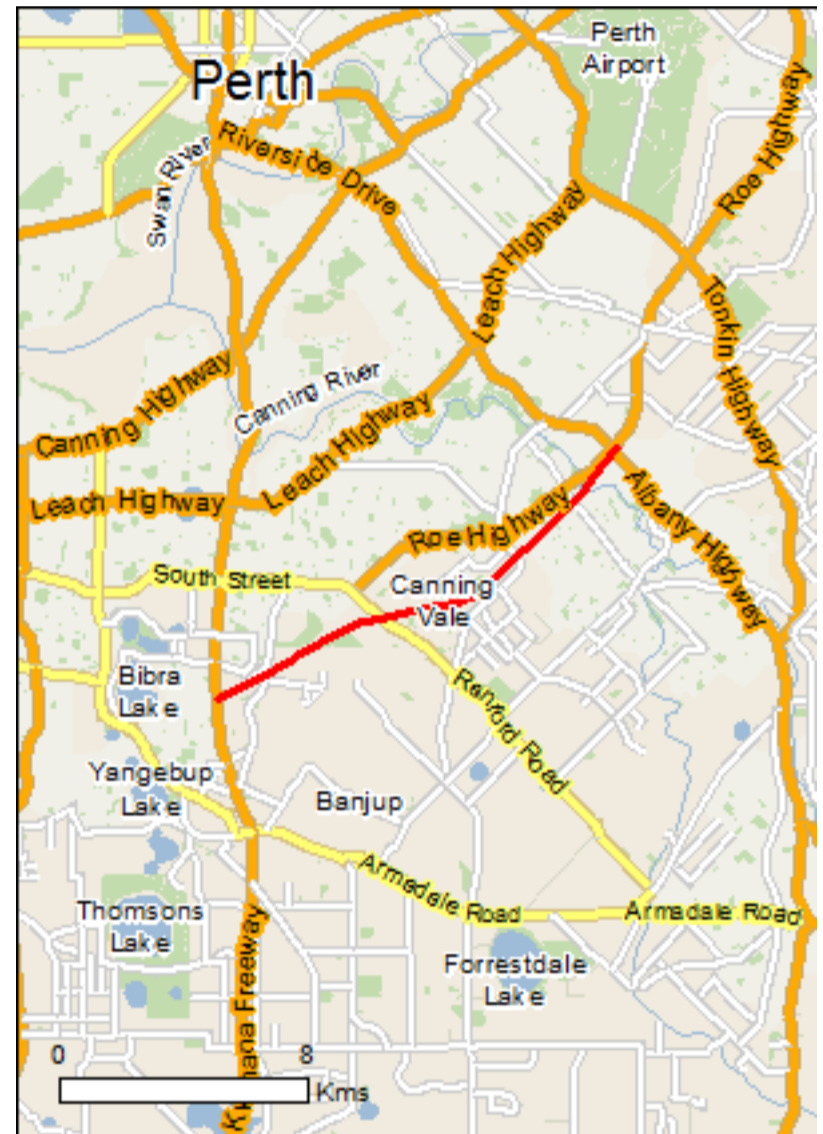
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

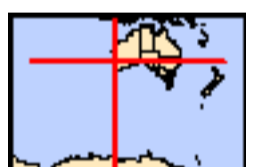
[Acknowledgements](#)



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[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	52
Listed Migratory Species:	32

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:	43
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:	7
Regional Forest Agreements:	None
Invasive Species:	45
Nationally Important Wetlands:	4
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Forrestdale and thomsons lakes	Within Ramsar site

Listed Threatened Ecological Communities

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	Endangered	Community known to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species

Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Roosting known to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Insects		
Leioproctus douglasiellus a short-tongued bee [66756]	Critically Endangered	Species or species habitat known to occur within area
Mammals		
Bettongia penicillata Brush-tailed Bettong, Woylie [213]	Endangered	Species or species habitat may occur within area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat likely to occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat may occur within area
Plants		
Acacia anomala Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species

Name	Status	Type of Presence
Andersonia gracilis Slender Andersonia [14470]	Endangered	habitat may occur within area Species or species habitat known to occur within area
Banksia mimica Summer Honey-pot [82765]	Endangered	Species or species habitat likely to occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat known to occur within area
Calytrix breviseta subsp. breviseta Swamp Starflower [23879]	Endangered	Species or species habitat known to occur within area
Chamelaucium sp. Gingin (N.G.Marchant 6) Gingin Wax [88881]	Endangered	Species or species habitat may occur within area
Conospermum undulatum Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat likely to occur within area
Darwinia apiculata Scarp Darwinia [8763]	Endangered	Species or species habitat may 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 known to occur within area
Drakaea elastica Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to 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
Ptilotus pyramidatus Pyramid Mulla-mulla [18216]	Critically Endangered	Species or species habitat known to occur within area
Synaphea sp. Fairbridge Farm (D. Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat known to occur

Name	Status	Type of Presence within area
Synaphea stenoloba Dwellingup Synaphea [66311]	Endangered	Species or species habitat may occur within area
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat known to occur within area

Reptiles

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known 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
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area

Migratory Marine Species

Name	Threatened	Type of Presence
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

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

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

Name
Commonwealth Land - 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		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		habitat known to occur within area Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
Pandion haliaetus Osprey [952]		within area Breeding known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Extra Information

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

Name	State
Kenwick Wetlands	WA
Thomsons Lake	WA
Unnamed WA28740	WA
Unnamed WA47244	WA
Unnamed WA49299	WA
Unnamed WA49362	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
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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

Name	Status	Type of Presence
<i>Sturnus vulgaris</i> Common Starling [389]		Species or species habitat likely to occur within area
<i>Turdus merula</i> Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
<i>Bos taurus</i> Domestic Cattle [16]		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Capra hircus</i> Goat [2]		Species or species habitat likely to occur within area
<i>Felis catus</i> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<i>Funambulus pennantii</i> Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
<i>Mus musculus</i> House Mouse [120]		Species or species habitat likely to occur within area
<i>Oryctolagus cuniculus</i> Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
<i>Rattus norvegicus</i> Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
<i>Rattus rattus</i> Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
<i>Sus scrofa</i> Pig [6]		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
<i>Anredera cordifolia</i> 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
<i>Asparagus aethiopicus</i> Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
<i>Asparagus plumosus</i> Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
<i>Brachiaria mutica</i> Para Grass [5879]		Species or species habitat may occur within

Name	Status	Type of Presence area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		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

Name	Status	Type of Presence
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		habitat likely to occur within area Species or species habitat likely to occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Booragoon Swamp	WA
Brixton Street Swamps	WA
Gibbs Road Swamp System	WA
Swan-Canning Estuary	WA

Caveat

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

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

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

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-32.094896 115.849805,-32.089369 115.862079,-32.085661 115.870404,-32.084134 115.873752,-32.078897 115.885339,-32.076861 115.890059,-32.076279 115.891862,-32.075407 115.896754,-32.07417 115.903363,-32.072061 115.914779,-32.071188 115.919328,-32.070752 115.921044,-32.070097 115.922761,-32.068643 115.925593,-32.06646 115.928426,-32.050966 115.947652,-32.044419 115.955686,-32.041218 115.958089,-32.035543 115.963067,-32.033505 115.96547,-32.033505 115.96547,-32.034888 115.963762,-32.034888 115.963762

Acknowledgements

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- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
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- [-Reef Life Survey Australia](#)
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- [-Other groups and individuals](#)

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NatureMap Flora Report (5 km buffer)

Created By Guest user on 05/09/2017

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Line'
Vertices 32° 05' 42" S,115° 50' 58" E 32° 05' 21" S,115° 51' 47" E 32° 04' 57" S,115° 52' 40" E 32° 04' 33" S,115° 53' 11" E 32° 04' 38" S,115° 53' 20" E 32° 04' 35" S,115° 53' 29" E 32° 04' 33" S,115° 53' 40" E 32° 04' 17" S,115° 55' 07" E 32° 04' 14" S,115° 55' 19" E 32° 04' 11" S,115° 55' 26" E 32° 04' 05" S,115° 55' 35" E 32° 03' 28" S,115° 56' 21" E 32° 02' 42" S,115° 57' 18" E 32° 02' 28" S,115° 57' 30" E 32° 02' 11" S,115° 57' 45" E 32° 01' 59" S,115° 57' 56" E
Group By Family

Family	Species	Records
Aizoaceae	3	10
Alismataceae	1	6
Alliaceae	1	1
Amaranthaceae	14	39
Anacardiaceae	1	2
Anarthriaceae	5	50
Apiaceae	12	109
Apocynaceae	2	3
Aponogetonaceae	1	14
Araceae	4	8
Araliaceae	9	77
Asparagaceae	43	399
Asphodelaceae	2	5
Asteraceae	74	339
Basellaceae	1	1
Boryaceae	2	12
Brassicaceae	6	8
Bryaceae	4	5
Byblidaceae	1	14
Cactaceae	1	1
Calceolariaceae	1	1
Campanulaceae	14	63
Caprifoliaceae	1	1
Caryophyllaceae	11	32
Casuarinaceae	4	27
Celastraceae	4	22
Centrolepidaceae	9	44
Chenopodiaceae	7	11
Colchicaceae	5	62
Commelinaceae	2	3
Convolvulaceae	5	8
Crassulaceae	6	19
Cucurbitaceae	3	3
Cupressaceae	2	18
Cyatheaceae	1	2
Cyperaceae	84	433
Dasyogonaceae	5	46
Dicranaceae	2	4
Dilleniaceae	16	104
Dioscoreaceae	1	1
Droseraceae	30	179
Elaeocarpaceae	3	14
Elatinaceae	1	2
Ericaceae	32	230
Euphorbiaceae	8	13
Fabaceae	110	592
Fissidentaceae	1	1
Gentianaceae	3	11
Geraniaceae	3	9
Goodeniaceae	20	105
Haemodoraceae	39	263
Haloragaceae	11	39
Hemerocallidaceae	15	115
Hydatellaceae	2	16
Hydrocharitaceae	3	7
Hypoxidaceae	2	3
Iridaceae	29	171
Isoetaceae	1	2
Juncaceae	10	37
Juncaginaceae	9	31
Lamiaceae	9	31
Lauraceae	6	17
Lentibulariaceae	5	40
Linaceae	1	1
Loganiaceae	2	4
Lophocoleaceae	1	1
Loranthaceae	4	21
Lycopodiaceae	1	5
Lythraceae	1	5
Malvaceae	10	30

Marchantiaceae	1	1
Marsileaceae	1	1
Meliaceae	1	2
Menyanthaceae	4	16
Molluginaceae	3	14
Moraceae	1	1
Musaceae	1	2
Myrtaceae	88	539
Nymphaeaceae	1	3
Olaceae	1	3
Onagraceae	13	25
Orchidaceae	86	401
Orobanchaceae	4	9
Oxalidaceae	4	10
Papaveraceae	4	8
Philydraceae	3	19
Phyllanthaceae	3	21
Phytolaccaceae	1	4
Pittosporaceae	2	3
Plantaginaceae	7	13
Poaceae	85	410
Polygalaceae	6	15
Polygonaceae	9	24
Portulacaceae	5	8
Potamogetonaceae	3	5
Pottiaceae	2	3
Primulaceae	5	29
Proteaceae	70	452
Pteridaceae	1	1
Ranunculaceae	2	3
Restionaceae	22	175
Rhamnaceae	8	14
Rosaceae	2	5
Rubiaceae	3	14
Ruppiaceae	1	1
Rutaceae	9	49
Salviniaceae	3	7
Santalaceae	4	9
Sapindaceae	3	13
Scrophulariaceae	2	17
Selaginellaceae	1	4
Sematophyllaceae	1	1
Solanaceae	4	10
Splachnaceae	1	2
Stylidiaceae	40	223
Thymelaeaceae	10	33
Typhaceae	2	8
Udoteaceae	1	1
Verbenaceae	1	2
Violaceae	1	4
Vitaceae	1	1
Xanthorrhoeaceae	4	32
Zamiaceae	2	22
Zygophyllaceae	1	4
TOTAL	1286	6698

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Aizoaceae				
1.	2794 <i>Carpobrotus aequilaterus</i> (Angular Pigface)	Y		
2.	2795 <i>Carpobrotus edulis</i> (Hottentot Fig)	Y		
3.	11571 <i>Galenia pubescens</i> var. <i>pubescens</i>	Y		
Alismataceae				
4.	17591 <i>Sagittaria platyphylla</i>	Y		
Alliaceae				
5.	1381 <i>Nothoscordum gracile</i>	Y		
Amaranthaceae				
6.	2648 <i>Alternanthera denticulata</i> (Lesser Joyweed)			
7.	2652 <i>Alternanthera nodiflora</i> (Common Joyweed)			
8.	2655 <i>Amaranthus albus</i> (Tumbleweed)	Y		
9.	2656 <i>Amaranthus caudatus</i> (Love Lies Bleeding)	Y		
10.	2671 <i>Amaranthus viridis</i> (Green Amaranth)	Y		
11.	2716 <i>Ptilotus declinatus</i> (Curved Mulla Mulla)			
12.	2718 <i>Ptilotus drummondii</i> (Narrowleaf Mulla Mulla)			
13.	11260 <i>Ptilotus drummondii</i> var. <i>drummondii</i> (Pussytail)			
14.	2720 <i>Ptilotus esquamatus</i>			
15.	2742 <i>Ptilotus manglesii</i> (Pom Poms, Mulamula)			
16.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
17.	2753 <i>Ptilotus pyramidatus</i>		T	Y
18.	11615 <i>Ptilotus sericostachyus</i> subsp. <i>roseus</i>		P1	
19.	40841 <i>Ptilotus stirlingii</i> subsp. <i>stirlingii</i>			
Anacardiaceae				
20.	11027 <i>Schinus terebinthifolius</i>	Y		
Anarthriaceae				
21.	1058 <i>Anarthria gracilis</i>			
22.	1060 <i>Anarthria laevis</i>			
23.	1097 <i>Lyginia barbata</i>			
24.	<i>Lyginia barbata/imberbis</i>			
25.	18049 <i>Lyginia imberbis</i>			
Apiaceae				
26.	6205 <i>Actinotus leucocephalus</i> (Flannel Flower)			
27.	12040 <i>Apium prostratum</i> var. <i>prostratum</i> (Sea Celery)			
28.	6214 <i>Centella asiatica</i>			
29.	6218 <i>Daucus glochidiatus</i> (Australian Carrot)			
30.	6219 <i>Eryngium pinnatifidum</i> (Blue Devils)			
31.	41801 <i>Eryngium pinnatifidum</i> subsp. <i>Palustre</i> (G.J. Keighery 13459)		P3	
32.	41810 <i>Eryngium</i> sp. <i>Subdecumbens</i> (G.J. Keighery 5390)		P3	
33.	6222 <i>Homalosciadium homalocarpum</i>			
34.	6249 <i>Platysace compressa</i> (Tapeworm Plant)			
35.	6253 <i>Platysace filliformis</i>			
36.	6263 <i>Schoenolaena juncea</i>			
37.	6289 <i>Xanthosia huegelii</i>			
Apocynaceae				
38.	17355 <i>Araujia sericifera</i>	Y		
39.	6587 <i>Gomphocarpus fruticosus</i> (Narrowleaf Cottonbush)	Y		
Aponogetonaceae				
40.	141 <i>Aponogeton hexatepalus</i> (Stalked Water Ribbons)		P4	
Araceae				
41.	32999 <i>Colocasia esculenta</i> var. <i>esculenta</i>	Y		
42.	28342 <i>Landoltia punctata</i> (Thin Duckweed)			
43.	1051 <i>Lemna disperma</i> (Duckweed)			
44.	1049 <i>Zantedeschia aethiopica</i> (Arum Lily)	Y		
Araliaceae				
45.	6223 <i>Hydrocotyle alata</i>			
46.	6226 <i>Hydrocotyle callicarpa</i> (Small Pennywort)			
47.	6229 <i>Hydrocotyle diantha</i>			
48.	6233 <i>Hydrocotyle lemnoides</i> (Aquatic Pennywort)		P4	
49.	6238 <i>Hydrocotyle ranunculoides</i>	Y		
50.	6240 <i>Hydrocotyle scutellifera</i>			
51.	11074 <i>Hydrocotyle striata</i>		P1	

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
52.	19041 <i>Trachymene coerulea</i> subsp. <i>coerulea</i>			
53.	6280 <i>Trachymene pilosa</i> (Native Parsnip)			
Asparagaceae				
54.	1205 <i>Acanthocarpus canaliculatus</i>			
55.	20752 <i>Asparagus aethiopicus</i>	Y		
56.	1201 <i>Asparagus officinalis</i> (Asparagus)	Y		
57.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
58.	11299 <i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>			
59.	19338 <i>Chamaescilla gibsonii</i>		P3	
60.	1287 <i>Dichopogon capillipes</i>			
61.	1289 <i>Dichopogon preissii</i>			
62.	13562 <i>Lachenalia aloides</i>	Y		
63.	1370 <i>Lachenalia reflexa</i>	Y		
64.	1307 <i>Laxmannia ramosa</i> (Branching Lily)			
65.	11911 <i>Laxmannia ramosa</i> subsp. <i>ramosa</i>			
66.	11464 <i>Laxmannia sessiliflora</i> subsp. <i>australis</i>			
67.	1309 <i>Laxmannia squarrosa</i>			
68.	<i>Lomandra ?caespitosa</i>			
69.	<i>Lomandra ?preissii</i>			
70.	1223 <i>Lomandra caespitosa</i> (Tufted Mat Rush)			
71.	1228 <i>Lomandra hermaphrodita</i>			
72.	1229 <i>Lomandra integra</i>			
73.	1232 <i>Lomandra micrantha</i> (Small-flower Mat-rush)			
74.	14542 <i>Lomandra micrantha</i> subsp. <i>micrantha</i>			
75.	1234 <i>Lomandra nigricans</i>			
76.	1236 <i>Lomandra odora</i> (Tiered Matrush)			
77.	1239 <i>Lomandra preissii</i>			
78.	1243 <i>Lomandra sericea</i> (Silky Mat Rush)			
79.	<i>Lomandra</i> sp.			
80.	1246 <i>Lomandra suaveolens</i>			
81.	1312 <i>Sowerbaea laxiflora</i> (Purple Tassels)			
82.	<i>Thysanotus ?tenellus</i>			
83.	1317 <i>Thysanotus anceps</i>		P3	
84.	1318 <i>Thysanotus arbuscula</i>			
85.	1319 <i>Thysanotus arenarius</i>			
86.	1320 <i>Thysanotus asper</i> (Hairy Fringe Lily)			
87.	1338 <i>Thysanotus manglesianus</i> (Fringed Lily)			
88.	<i>Thysanotus manglesianus/patersonii</i> complex			
89.	1339 <i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
90.	1343 <i>Thysanotus patersonii</i>			
91.	13783 <i>Thysanotus</i> sp. <i>Badgingarra</i> (E.A. Griffin 2511)		P2	
92.	46055 <i>Thysanotus</i> sp. <i>Coastal plain</i> (N.H. Brittan 66/63)			
93.	1351 <i>Thysanotus sparteus</i>			
94.	1354 <i>Thysanotus tenellus</i>			
95.	1357 <i>Thysanotus thyrsoides</i>			
96.	1358 <i>Thysanotus triandrus</i>			
Asphodelaceae				
97.	1364 <i>Asphodelus fistulosus</i> (Onion Weed)	Y		
98.	1366 <i>Bulbine semibarbata</i> (Leek Lily)			
Asteraceae				
99.	7811 <i>Acanthospermum hispidum</i> (Starburr)	Y		
100.	7820 <i>Ambrosia artemisiifolia</i> (Annual Ragweed, Bitterweed, Hay-feverweed, Hog-weed)	Y		
101.	7821 <i>Ambrosia psilostachya</i> (Perennial Ragweed)	Y		
102.	7833 <i>Angianthus preissianus</i>			
103.	7838 <i>Arctotheca calendula</i> (Cape Weed, African Marigold)	Y		
104.	7851 <i>Asteridea pulverulenta</i> (Common Bristle Daisy)			
105.	7855 <i>Bidens pilosa</i> (Cobbler's Pegs)	Y		
106.	7867 <i>Brachyscome bellidioides</i>			
107.	7878 <i>Brachyscome iberidifolia</i>			
108.	7916 <i>Centaurea melitensis</i> (Maltese Cockspur, Malta Thistle)	Y		
109.	7917 <i>Centaurea solstitialis</i> (St Barnaby's Thistle, Yellow Star Thistle)	Y		
110.	7918 <i>Centipeda cunninghamii</i> (Common Sneezewood, Gukwonderuk, Old Man Weed)			
111.	7925 <i>Chondrilla juncea</i> (Skeleton Weed)	Y		
112.	7933 <i>Chthonocephalus pseudevax</i> (Woolly Groundheads)			
113.	7937 <i>Cirsium vulgare</i> (Spear Thistle, Scotch Thistle)	Y		
114.	7939 <i>Conyza bonariensis</i> (Flaxleaf Fleabane)	Y		
115.	<i>Conyza</i> sp.			
116.	20074 <i>Conyza sumatrensis</i>	Y		
117.	7944 <i>Cotula bipinnata</i> (Ferny Cotula)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
		Y		
118.	7945 <i>Cotula coronopifolia</i> (Waterbuttons)	Y		
119.	7946 <i>Cotula cotuloides</i> (Smooth Cotula)			
120.	7947 <i>Cotula turbinata</i> (Funnel Weed)	Y		
121.	29054 <i>Crepis foetida</i> subsp. <i>foetida</i> (Stinking Hawksbeard)	Y		
122.	7961 <i>Dittrichia graveolens</i> (Stinkwort)	Y		
123.	8450 <i>Eclipta prostrata</i>	Y		
124.	7976 <i>Galinsoga parviflora</i> (Potato Weed)	Y		
125.	16311 <i>Gazania linearis</i>	Y		
126.	7991 <i>Gnephosis drummondii</i>			
127.	8002 <i>Gnephosis tenuissima</i>			
128.	8010 <i>Helianthus tuberosus</i> (Jerusalem Artichoke)	Y		
129.	12741 <i>Hyalosperma cotula</i>			
130.	8086 <i>Hypochoeris glabra</i> (Smooth Catsear)	Y		
131.	9352 <i>Hypochoeris radicata</i> (Flat Weed, Cats-ear)	Y		
132.	8092 <i>Ixiolaena viscosa</i> (Sticky Ixiolaena)			
133.	8096 <i>Lactuca serriola</i> (Prickly Lettuce)	Y		
134.	29046 <i>Lactuca serriola</i> forma <i>serriola</i>	Y		
135.	18585 <i>Lagenophora huegelii</i>			
136.	44490 <i>Leontodon rhagadioloides</i>	Y		
137.	8099 <i>Leontodon saxatilis</i> (Hairy Hawkbit)	Y		
138.	8106 <i>Millotia tenuifolia</i> (Soft Millotia)			
139.	29418 <i>Monoculus monstrosus</i>	Y		
140.	14187 <i>Myriocephalus occidentalis</i>			
141.	8127 <i>Olearia axillaris</i> (Coastal Daisybush)			
142.	8143 <i>Olearia paucidentata</i> (Autumn Scrub Daisy)			
143.	17756 <i>Osteospermum ecklonis</i>	Y		
144.	42281 <i>Pithocarpa cordata</i>			
145.	8165 <i>Pithocarpa pulchella</i> (Beautiful Pithocarpa)			
146.	18353 <i>Pithocarpa pulchella</i> var. <i>pulchella</i>			
147.	8173 <i>Podolepis capillaris</i> (Wiry Podolepis)			
148.	8175 <i>Podolepis gracilis</i> (Slender Podolepis)			
149.	8179 <i>Podolepis nutans</i> (Nodding Podolepis)			
150.	8182 <i>Podotheca angustifolia</i> (Sticky Longheads)			
151.	8183 <i>Podotheca chrysantha</i> (Yellow Podotheca)			
152.	8184 <i>Podotheca gnaphalioides</i> (Golden Long-heads)			
153.	8188 <i>Pogonolepis stricta</i>			
154.	8189 <i>Pseudognaphalium luteoalbum</i> (Jersey Cudweed)			
155.	8195 <i>Quinetia urvillei</i>			
156.	13300 <i>Rhodanthe citrina</i>			
157.	13312 <i>Rhodanthe pyrethrum</i>			
158.	45434 <i>Roldana petasitis</i>	Y		
159.	25878 <i>Senecio condylus</i>			
160.	8203 <i>Senecio diaschides</i>			
161.	20663 <i>Senecio multicaulis</i> subsp. <i>multicaulis</i>			
162.	8224 <i>Siloxerus filifolius</i>			
163.	8225 <i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
164.	45036 <i>Solidago chilensis</i>	Y		
165.	8231 <i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
166.	25902 <i>Symphotrichum squamatum</i> (Bushy Starwort)	Y		
167.	20024 <i>Tagetes erecta</i> (Marigold)	Y		
168.	8251 <i>Trichocline spathulata</i> (Native Gerbera)			
169.	8254 <i>Urospermum picroides</i> (False Hawkbit)	Y		
170.	8255 <i>Ursinia anthemoides</i> (Ursinia)	Y		
171.	38388 <i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
172.	8282 <i>Waitzia suaveolens</i> (Fragrant Waitzia)			
Basellaceae				
173.	17455 <i>Anredera cordifolia</i>	Y		
Boryaceae				
174.	1272 <i>Borya scirpoidea</i>			
175.	1273 <i>Borya sphaerocephala</i> (Pincushions)			
Brassicaceae				
176.	3000 <i>Brassica tournefortii</i> (Mediterranean Turnip)	Y		
177.	18555 <i>Cardamine</i> sp. <i>Jandakot</i> (P. Luff s.n. 4/7/1969)	Y		
178.	3016 <i>Heliophila pusilla</i>	Y		
179.	3061 <i>Raphanus raphanistrum</i> (Wild Radish)	Y		
180.	3066 <i>Rorippa nasturtium-aquaticum</i> (Watercress)	Y		
181.	19403 <i>Stenopetalum gracile</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Bryaceae				
182.	32330 <i>Bryum argenteum</i>			
183.	32376 <i>Gemmabryum dichotomum</i>			
184.	44608 <i>Rosulabryum billardieri</i>			
185.	32429 <i>Rosulabryum torquescens</i>			
Byblidaceae				
186.	3178 <i>Byblis gigantea</i> (Rainbow Plant)		P3	
Cactaceae				
187.	5227 <i>Opuntia stricta</i> (Common Prickly Pear)	Y		
Calceolariaceae				
188.	44722 <i>Calceolaria tripartita</i>	Y		Y
Campanulaceae				
189.	37500 <i>Grammatotheca bergiana</i> var. <i>bergiana</i>	Y		
190.	7396 <i>Isotoma hypocrateriformis</i> (Woodbridge Poison)			
191.	7398 <i>Isotoma pusilla</i> (Small Isotome)			
192.	7399 <i>Isotoma scapigera</i> (Long-scaped Isotome)			
193.	9289 <i>Lobelia anceps</i> (Angled Lobelia)			
194.	7402 <i>Lobelia gibbosa</i> (Tall Lobelia)			
195.	7406 <i>Lobelia rhombifolia</i> (Tufted Lobelia)			
196.	7407 <i>Lobelia rhytidosperma</i> (Wrinkled-seeded Lobelia)			
197.	7408 <i>Lobelia tenuior</i> (Slender Lobelia)			
198.	7410 <i>Monopsis debilis</i>	Y		
199.	37440 <i>Monopsis debilis</i> var. <i>depressa</i>	Y		
200.	7384 <i>Wahlenbergia capensis</i> (Cape Bluebell)	Y		
201.	7389 <i>Wahlenbergia preissii</i>			
202.	<i>Wahlenbergia</i> sp.			
Caprifoliaceae				
203.	7368 <i>Scabiosa atropurpurea</i> (Purple Pincushion)	Y		
Caryophyllaceae				
204.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
205.	2891 <i>Corrigiola litoralis</i> (Strapwort)	Y		
206.	16693 <i>Minuartia mediterranea</i>	Y		
207.	19825 <i>Petrohragia dubia</i>	Y		
208.	2905 <i>Polycarpon tetraphyllum</i> (Fourleaf Allseed)	Y		
209.	2906 <i>Sagina apetala</i> (Annual Pearlwort)	Y		
210.	2907 <i>Sagina procumbens</i> (Spreading Pearlwort)	Y		
211.	<i>Silene armeria</i>			Y
212.	2909 <i>Silene gallica</i> (French Catchfly)	Y		
213.	15972 <i>Silene gallica</i> var. <i>gallica</i>	Y		
214.	2912 <i>Spergula arvensis</i> (Corn Spurry)	Y		
Casuarinaceae				
215.	1728 <i>Allocasuarina fraseriana</i> (Sheoak, Kondil)			
216.	1732 <i>Allocasuarina humilis</i> (Dwarf Sheoak)			
217.	18321 <i>Casuarina glauca</i>	Y		
218.	1742 <i>Casuarina obesa</i> (Swamp Sheoak, Kuli)			
Celastraceae				
219.	9069 <i>Stackhousia huegelii</i>			
220.	9070 <i>Stackhousia pubescens</i> (Downy Stackhousia)			
221.	4737 <i>Tripterococcus brunonis</i> (Winged Stackhousia)			
222.	44444 <i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)		P4	
Centrolepidaceae				
223.	1117 <i>Aphelia cyperoides</i>			
224.	1118 <i>Aphelia drummondii</i>			
225.	43548 <i>Aphelia</i> sp. <i>Albany</i> (B.G. Briggs 596)			
226.	1121 <i>Centrolepis aristata</i> (Pointed Centrolepis)			
227.	1123 <i>Centrolepis caespitosa</i>		P4	
228.	1125 <i>Centrolepis drummondiana</i>			
229.	1129 <i>Centrolepis glabra</i> (Smooth Centrolepis)			
230.	1132 <i>Centrolepis mutica</i>			
231.	1134 <i>Centrolepis polygyna</i> (Wiry Centrolepis)			
Chenopodiaceae				
232.	2471 <i>Atriplex prostrata</i> (Hastate Orache)	Y		
233.	2483 <i>Chenopodium album</i> (Fat Hen)	Y		
234.	2491 <i>Chenopodium macrospermum</i>	Y		
235.	33500 <i>Dysphania ambrosioides</i> (Mexican Tea)	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
236.	2593 <i>Sarcocornia quinqueflora</i> (Beaded Samphire)			
237.	2639 <i>Suaeda australis</i> (Seablite)			
238.	31718 <i>Tecticornia lepidosperma</i>			
Colchicaceae				
239.	1383 <i>Burchardia bairdiae</i>			
240.	12770 <i>Burchardia congesta</i>			
241.	1385 <i>Burchardia multiflora</i> (Dwarf Burchardia)			
242.	1394 <i>Wurmbea dioica</i> (Early Nancy)			
243.	12072 <i>Wurmbea dioica</i> subsp. <i>alba</i>			
Commelinaceae				
244.	1162 <i>Cartonema philydroides</i>			
245.	31694 <i>Tradescantia fluminensis</i>	Y		Y
Convolvulaceae				
246.	6663 <i>Cuscuta epithymum</i> (Lesser Dodder, Greater Dodder)	Y		
247.	11021 <i>Cuscuta planiflora</i>	Y		
248.	6616 <i>Dichondra repens</i> (Kidney Weed)			
249.	6620 <i>Ipomoea cairica</i> (Coast Morning Glory)	Y		
250.	6658 <i>Wilsonia backhousei</i> (Narrow-leaf Wilsonia)			
Crassulaceae				
251.	3136 <i>Crassula alata</i>	Y		
252.	17701 <i>Crassula closiana</i>			
253.	3137 <i>Crassula colorata</i> (Dense Stonecrop)			
254.	3138 <i>Crassula decumbens</i> (Rufous Stonecrop)			
255.	3142 <i>Crassula natans</i>	Y		
256.	15706 <i>Crassula natans</i> var. <i>minus</i>	Y		
Cucurbitaceae				
257.	7370 <i>Citrullus lanatus</i> (Pie Melon)	Y		
258.	7374 <i>Ecballium elaterium</i> (Squirting Cucumber)	Y		
259.	7378 <i>Momordica balsamina</i> (Balsam Apple)	Y		
Cupressaceae				
260.	36520 <i>Callitris acuminata</i> (Dwarf Cypress)			
261.	36600 <i>Callitris pyramidalis</i> (Swamp Cypress)			
Cyatheaceae				
262.	51 <i>Cyathea cooperi</i>	Y		
Cyperaceae				
263.	740 <i>Baumea arthropphylla</i>			
264.	741 <i>Baumea articulata</i> (Jointed Rush)			
265.	743 <i>Baumea juncea</i> (Bare Twigrush)			
266.	744 <i>Baumea laxa</i>			
267.	745 <i>Baumea preissii</i>			
268.	748 <i>Baumea vaginalis</i> (Sheath Twigrush)			
269.	749 <i>Bolboschoenus caldwellii</i> (Marsh Club-rush)			
270.	754 <i>Carex divisa</i> (Divided Sedge)	Y		
271.	755 <i>Carex fascicularis</i> (Tassel Sedge)			
272.	759 <i>Carex tereticaulis</i>		P3	
273.	763 <i>Chorizandra enodis</i> (Black Bristlerush)			
274.	764 <i>Chorizandra multiarticulata</i>			
275.	768 <i>Cyathochaeta avenacea</i>			
276.	769 <i>Cyathochaeta clandestina</i>			
277.	16245 <i>Cyathochaeta teretifolia</i>		P3	
278.	783 <i>Cyperus congestus</i> (Dense Flat-sedge)	Y		
279.	18318 <i>Cyperus involucratus</i>	Y		
280.	18198 <i>Cyperus papyrus</i>	Y		
281.	806 <i>Cyperus polystachyos</i> (Bunchy Sedge)	Y		
282.	<i>Cyperus</i> sp.			
283.	815 <i>Cyperus tenellus</i> (Tiny Flatsedge)	Y		
284.	816 <i>Cyperus tenuiflorus</i> (Scaly Sedge)	Y		
285.	822 <i>Eleocharis acuta</i> (Common Spikerush)			
286.	17605 <i>Eleocharis keigheryi</i>		T	
287.	20216 <i>Ficinia nodosa</i> (Knotted Club Rush)			
288.	894 <i>Fimbristylis velata</i>			
289.	907 <i>Gahnia trifida</i> (Coast Saw-sedge)			
290.	910 <i>Isolepis cernua</i> (Nodding Club-rush)			
291.	20199 <i>Isolepis cernua</i> var. <i>cernua</i>			
292.	20200 <i>Isolepis cernua</i> var. <i>setiformis</i>			
293.	912 <i>Isolepis cyperoides</i>			

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294.	14540 <i>Isolepis hystrix</i>	Y		
295.	917 <i>Isolepis marginata</i> (Coarse Club-rush)			
296.	919 <i>Isolepis oldfieldiana</i>			
297.	921 <i>Isolepis producta</i>			
298.	10831 <i>Isolepis prolifera</i> (Budding Club-rush)	Y		
299.	924 <i>Isolepis stellata</i> (Star Club-rush)			
300.	925 <i>Lepidosperma angustatum</i>			
301.	937 <i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
302.	45753 <i>Lepidosperma oldhamii</i> (Oldham's Sword Sedge)			
303.	940 <i>Lepidosperma pubisquamum</i>			
304.	942 <i>Lepidosperma rostratum</i>		T	
305.	944 <i>Lepidosperma scabrum</i>			
306.	<i>Lepidosperma</i> sp.			
307.	29150 <i>Lepidosperma</i> sp. Margaret River (B.J. Lepschi 1841)			
308.	16284 <i>Lepidosperma</i> sp. P1 small head (M.D. Tindale 166A)			
309.	<i>Lepidosperma</i> sp. terete			
310.	945 <i>Lepidosperma squamatum</i>			
311.	955 <i>Mesomelaena pseudostygia</i>			
312.	957 <i>Mesomelaena tetragona</i> (Semaphore Sedge)			
313.	969 <i>Schoenoplectus validus</i> (Lake Club-rush)			
314.	971 <i>Schoenus andrewsii</i>			
315.	973 <i>Schoenus asperocarpus</i> (Poison Sedge)			
316.	974 <i>Schoenus benthamii</i>		P3	
317.	975 <i>Schoenus bifidus</i>			
318.	978 <i>Schoenus brevisetis</i>			
319.	979 <i>Schoenus caespititius</i>			
320.	980 <i>Schoenus capillifolius</i>		P3	
321.	982 <i>Schoenus clandestinus</i>			
322.	983 <i>Schoenus cruentus</i>			
323.	984 <i>Schoenus curvifolius</i>			
324.	985 <i>Schoenus discifer</i>			
325.	986 <i>Schoenus efoliatus</i>			
326.	987 <i>Schoenus elegans</i>			
327.	991 <i>Schoenus grammatophyllus</i>			
328.	992 <i>Schoenus grandiflorus</i> (Large Flowered Bogrush)			
329.	994 <i>Schoenus humilis</i>			
330.	996 <i>Schoenus laevigatus</i>			
331.	999 <i>Schoenus loliaceus</i>		P2	
332.	1003 <i>Schoenus natans</i> (Floating Bog-rush)		P4	
333.	1006 <i>Schoenus odontocarpus</i>			
334.	1007 <i>Schoenus pedicellatus</i>			
335.	1008 <i>Schoenus pennisetis</i>		P3	
336.	17614 <i>Schoenus plumosus</i>			
337.	1011 <i>Schoenus rigens</i>			
338.	1013 <i>Schoenus sculptus</i> (Gimlet Bog-rush)			
339.	16280 <i>Schoenus</i> sp. Beaufort (G.J. Keighery 6291)		P1	
340.	17731 <i>Schoenus</i> sp. Waroona (G.J. Keighery 12235)		P3	
341.	1017 <i>Schoenus subbulbosus</i>			
342.	1018 <i>Schoenus subfascicularis</i>			
343.	17409 <i>Schoenus variicellae</i>			
344.	1033 <i>Tetraria australiensis</i>		T	
345.	1036 <i>Tetraria octandra</i>			
346.	1038 <i>Tricostularia neesii</i>			
Dasypogonaceae				
347.	1213 <i>Calectasia cyanea</i> (Blue Tinsel Lily)		T	
348.	1214 <i>Calectasia grandiflora</i> (Blue Tinsel Lily)			
349.	19309 <i>Calectasia narragara</i>			
350.	1218 <i>Dasypogon bromeliifolius</i> (Pineapple Bush)			
351.	1221 <i>Kingia australis</i> (Kingia, Pulonok)			
Dicranaceae				
352.	32338 <i>Campylopus introflexus</i>	Y		
353.	32344 <i>Dicranoloma diaphanoneuron</i>			
Dilleniaceae				
354.	5112 <i>Hibbertia aurea</i>			
355.	5114 <i>Hibbertia commutata</i>			
356.	5117 <i>Hibbertia cuneiformis</i> (Cutleaf Hibbertia)			
357.	19778 <i>Hibbertia glomerata</i> subsp. <i>darlingensis</i>			
358.	5134 <i>Hibbertia huegelii</i>			
359.	<i>Hibbertia huegelii</i> complex			

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360.	5135 <i>Hibbertia hypericoides</i> (Yellow Buttercups)			
361.	45534 <i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			
362.	5146 <i>Hibbertia montana</i>		P4	
363.	5148 <i>Hibbertia mylnei</i>			
364.	5152 <i>Hibbertia ovata</i>			
365.	5162 <i>Hibbertia racemosa</i> (Stalked Guinea Flower)			
366.	5169 <i>Hibbertia serrata</i> (Serrate Leaved Guinea Flower)			
367.	5171 <i>Hibbertia spicata</i>			
368.	5172 <i>Hibbertia stellaris</i> (Orange Stars)			
369.	5173 <i>Hibbertia subvaginata</i>			
Dioscoreaceae				
370.	1509 <i>Dioscorea hastifolia</i> (Warrine, Waram)			
Droseraceae				
371.	3091 <i>Drosera bulbigena</i> (Midget Sundew)			
372.	3095 <i>Drosera erythrorhiza</i> (Red Ink Sundew)			
373.	13217 <i>Drosera erythrorhiza</i> subsp. <i>erythrorhiza</i>			
374.	3097 <i>Drosera gigantea</i> (Giant Sundew)			
375.	16244 <i>Drosera gigantea</i> subsp. <i>geniculata</i>			
376.	15453 <i>Drosera gigantea</i> subsp. <i>gigantea</i>			
377.	3098 <i>Drosera glanduligera</i> (Pimpernel Sundew)			
378.	13195 <i>Drosera helodes</i>			
379.	3101 <i>Drosera heterophylla</i> (Swamp Rainbow)			
380.	3105 <i>Drosera leucoblasta</i> (Wheel Sundew)			
381.	3106 <i>Drosera macrantha</i> (Bridal Rainbow)			
382.	14298 <i>Drosera macrantha</i> subsp. <i>macrantha</i>			
383.	3109 <i>Drosera menziesii</i> (Pink Rainbow)			
384.	11853 <i>Drosera menziesii</i> subsp. <i>menziesii</i>			
385.	13216 <i>Drosera menziesii</i> subsp. <i>penicillaris</i>			
386.	11768 <i>Drosera neesii</i> subsp. <i>neesii</i>			
387.	3114 <i>Drosera nitidula</i> (Shining Sundew)			
388.	3115 <i>Drosera occidentalis</i> (Western Sundew)			
389.	13191 <i>Drosera occidentalis</i> subsp. <i>occidentalis</i>		P4	
390.	3117 <i>Drosera paleacea</i> (Dwarf Sundew)			
391.	13188 <i>Drosera paleacea</i> subsp. <i>paleacea</i>			
392.	3118 <i>Drosera pallida</i> (Pale Rainbow)			
393.	29178 <i>Drosera porrecta</i>			
394.	3128 <i>Drosera ramellosa</i> (Branched Sundew)			
395.	8911 <i>Drosera rosulata</i>			
396.	<i>Drosera</i> sp. "climbing"			
397.	3131 <i>Drosera stolonifera</i> (Leafy Sundew)			
398.	3133 <i>Drosera subhirtella</i> (Sunny Rainbow)			
399.	13205 <i>Drosera tubaestylis</i>			
400.	3135 <i>Drosera zonaria</i> (Painted Sundew)			
Elaeocarpaceae				
401.	4524 <i>Platytheca galioides</i>			
402.	4535 <i>Tetratheca hirsuta</i> (Black Eyed Susan)			
403.	14333 <i>Tetratheca</i> sp. <i>Granite</i> (S. Patrick SP1224)		P3	
Elatinaceae				
404.	5187 <i>Elatine gratiolooides</i> (Waterwort)			
Ericaceae				
405.	6300 <i>Andersonia aristata</i> (Rice Flower)			
406.	6309 <i>Andersonia gracilis</i>		T	
407.	6312 <i>Andersonia involucrata</i>			
408.	6314 <i>Andersonia lehmanniana</i>			
409.	11471 <i>Andersonia lehmanniana</i> subsp. <i>lehmanniana</i>			
410.	6327 <i>Astroloma foliosum</i> (Candle Cranberry)			
411.	6334 <i>Astroloma pallidum</i> (Kick Bush)			
412.	6337 <i>Astroloma stomarrhena</i> (Red Swamp Cranberry)			
413.	6339 <i>Astroloma xerophyllum</i>			
414.	30131 <i>Brachyloma preissii</i> subsp. <i>lanceolatum</i>			
415.	30142 <i>Brachyloma preissii</i> subsp. <i>obtusifolium</i>			
416.	30136 <i>Brachyloma preissii</i> subsp. <i>preissii</i>			
417.	6348 <i>Conostephium pendulum</i> (Pearl Flower)			
418.	6349 <i>Conostephium preissii</i>			
419.	13527 <i>Croninia kingiana</i>			
420.	6374 <i>Leucopogon conostephioides</i>			
421.	6425 <i>Leucopogon oxycedrus</i>			
422.	6427 <i>Leucopogon parviflorus</i> (Coast Beard-heath)			

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423.	6434 <i>Leucopogon polymorphus</i>			
424.	6436 <i>Leucopogon propinquus</i>			
425.	6439 <i>Leucopogon pulchellus</i> (Beard-heath)			
426.	6440 <i>Leucopogon racemosus</i>			
427.	6445 <i>Leucopogon squarrosus</i>			
428.	40803 <i>Leucopogon squarrosus</i> subsp. <i>squarrosus</i>			
429.	6447 <i>Leucopogon strictus</i>			
430.	6451 <i>Leucopogon tenuis</i>			
431.	6456 <i>Lysinema ciliatum</i> (Curry Flower)			
432.	6458 <i>Lysinema elegans</i>			
433.	34736 <i>Lysinema pentapetalum</i>			
434.	6464 <i>Needhamiella pumilio</i>			
435.	48297 <i>Styphelia filifolia</i>		P3	
436.	6476 <i>Styphelia tenuiflora</i> (Common Pinheath)			

Euphorbiaceae

437.	16492 <i>Calycopeplus paucifolius</i>			
438.	4627 <i>Euphorbia helioscopia</i> (Sun Spurge)	Y		
439.	29940 <i>Euphorbia maculata</i>	Y		
440.	34757 <i>Euphorbia prostrata</i>	Y		
441.	4648 <i>Euphorbia terracina</i> (Geraldton Carnation Weed)	Y		
442.	9051 <i>Homalanthus novo-guineensis</i>			
443.	19585 <i>Monotaxis grandiflora</i> var. <i>grandiflora</i>			
444.	4666 <i>Monotaxis occidentalis</i>			

Fabaceae

445.	15466 <i>Acacia applanata</i>			
446.	3237 <i>Acacia benthamii</i>		P2	
447.	3294 <i>Acacia dentifera</i>			
448.	3307 <i>Acacia divergens</i>			
449.	11926 <i>Acacia drewiana</i> subsp. <i>drewiana</i>			
450.	3373 <i>Acacia horridula</i>		P3	
451.	3374 <i>Acacia huegelii</i>			
452.	3382 <i>Acacia incrassata</i>			
453.	3383 <i>Acacia incurva</i>			
454.	3409 <i>Acacia lasiocarpa</i> (Panjang)			
455.	14932 <i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant (G.J. Keighery 5026)		P1	
456.	11611 <i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i>			
457.	17861 <i>Acacia longifolia</i>	Y		
458.	17464 <i>Acacia longifolia</i> subsp. <i>longifolia</i>	Y		
459.	3464 <i>Acacia obovata</i>			
460.	14131 <i>Acacia oncinophylla</i> subsp. <i>patulifolia</i>		P4	
461.	17860 <i>Acacia podalyriifolia</i>	Y		
462.	3502 <i>Acacia pulchella</i> (Prickly Moses)			
463.	15481 <i>Acacia pulchella</i> var. <i>glaberrima</i>			
464.	15483 <i>Acacia pulchella</i> var. <i>pulchella</i>			
465.	3527 <i>Acacia saligna</i> (Orange Wattle, Kudjong)			
466.	30033 <i>Acacia saligna</i> subsp. <i>lindleyi</i>			
467.	30032 <i>Acacia saligna</i> subsp. <i>saligna</i>			
468.	3541 <i>Acacia sessilis</i>			
469.	3557 <i>Acacia stenoptera</i> (Narrow Winged Wattle)			
470.	3574 <i>Acacia teretifolia</i>			
471.	3602 <i>Acacia willdenowiana</i> (Grass Wattle)			
472.	3686 <i>Aotus cordifolia</i>			
473.	3688 <i>Aotus gracillima</i>			
474.	3692 <i>Aotus procumbens</i>			
475.	3710 <i>Bossiaea eriocarpa</i> (Common Brown Pea)			
476.	18156 <i>Chamaecytisus palmensis</i> (Tagasaste)	Y		
477.	8971 <i>Chorizema cordatum</i>			
478.	3753 <i>Chorizema dicksonii</i> (Yellow-eyed Flame Pea)			
479.	3793 <i>Daviesia angulata</i>			
480.	15656 <i>Daviesia brachyphylla</i>			
481.	3799 <i>Daviesia cordata</i> (Bookleaf)			
482.	19747 <i>Daviesia decurrens</i> subsp. <i>decurrens</i>			
483.	3807 <i>Daviesia divaricata</i> (Marno)			
484.	18560 <i>Daviesia divaricata</i> subsp. <i>divaricata</i>			
485.	3815 <i>Daviesia horrida</i> (Prickly Bitter-pea)			
486.	16585 <i>Daviesia nudiflora</i> subsp. <i>nudiflora</i>			
487.	3832 <i>Daviesia physodes</i>			
488.	3845 <i>Daviesia triflora</i>			
489.	3867 <i>Dipogon lignosus</i> (Dolichos Pea)	Y		

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490.	18299 <i>Erythrina x sykesii</i>	Y		
491.	3872 <i>Euchilopsis linearis</i> (Swamp Pea)			
492.	3880 <i>Eutaxia virgata</i>			
493.	3887 <i>Gastrolobium acutum</i>			
494.	20475 <i>Gastrolobium capitatum</i>			
495.	20473 <i>Gastrolobium ebracteolatum</i>			
496.	20483 <i>Gastrolobium linearifolium</i>			
497.	3923 <i>Gastrolobium spathulatum</i> (Poison Bush)			
498.	3945 <i>Gompholobium aristatum</i>			
499.	10909 <i>Gompholobium confertum</i>			
500.	3951 <i>Gompholobium marginatum</i>			
501.	3956 <i>Gompholobium shuttleworthii</i>			
502.	3957 <i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
503.	3961 <i>Hardenbergia comptoniana</i> (Native Wisteria)			
504.	3966 <i>Hovea pungens</i> (Devil's Pins, Puyenak)			
505.	3968 <i>Hovea trisperma</i> (Common Hovea)			
506.	12859 <i>Hovea trisperma</i> var. <i>trisperma</i>			
507.	3992 <i>Isotropis cuneifolia</i> (Granny Bonnets)			
508.	19700 <i>Isotropis cuneifolia</i> subsp. <i>cuneifolia</i>			
509.	16317 <i>Isotropis cuneifolia</i> subsp. <i>glabra</i>		P2	
510.	3998 <i>Jacksonia angulata</i>			
511.	4010 <i>Jacksonia floribunda</i> (Holly Pea)			
512.	4012 <i>Jacksonia furcellata</i> (Grey Stinkwood)			
513.	20462 <i>Jacksonia gracillima</i>		P3	
514.	4018 <i>Jacksonia lehmannii</i>			
515.	4027 <i>Jacksonia sericea</i> (Waldjumi)		P4	
516.	4029 <i>Jacksonia sternbergiana</i> (Stinkwood, Kapur)			
517.	4044 <i>Kennedia prostrata</i> (Scarlet Runner)			
518.	3669 <i>Labichea punctata</i> (Lance-leaved Cassia)			
519.	4052 <i>Latrobea tenella</i>			
520.	8564 <i>Lotus subbiflorus</i>	Y		
521.	4063 <i>Lotus uliginosus</i> (Greater Lotus)	Y		
522.	4066 <i>Lupinus cosentinii</i>	Y		
523.	4067 <i>Lupinus luteus</i> (Yellow Lupin)	Y		
524.	4077 <i>Medicago minima</i> (Small Burr Medic)	Y		
525.	4079 <i>Medicago polymorpha</i> (Burr Medic)	Y		
526.	4080 <i>Medicago sativa</i> (Alfalfa)	Y		
527.	4097 <i>Mirbelia ramulosa</i>			
528.	4100 <i>Mirbelia spinosa</i>			
529.	4113 <i>Ornithopus compressus</i> (Yellow Serradella)	Y		
530.	4141 <i>Phyllota gracilis</i>			
531.	4172 <i>Pultenaea ericifolia</i>			
532.	4177 <i>Pultenaea ochreatea</i>			
533.	4181 <i>Pultenaea reticulata</i>			
534.	17020 <i>Robinia pseudoacacia</i>	Y		
535.	20302 <i>Sphaerolobium hygrophilum</i>			
536.	4205 <i>Sphaerolobium linophyllum</i>			
537.	4206 <i>Sphaerolobium macranthum</i>			
538.	4211 <i>Sphaerolobium vimineum</i> (Leafless Globe Pea)			
539.	4251 <i>Templetonia drummondii</i>			
540.	4256 <i>Templetonia retusa</i> (Cockies Tongues)			
541.	4289 <i>Trifolium angustifolium</i> (Narrowleaf Clover)	Y		
542.	17145 <i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Y		
543.	4291 <i>Trifolium arvense</i> (Hare's Foot Clover)	Y		
544.	4292 <i>Trifolium campestre</i> (Hop Clover)	Y		
545.	17763 <i>Trifolium campestre</i> var. <i>campestre</i> (Hop Clover)	Y		
546.	4295 <i>Trifolium dubium</i> (Suckling Clover)	Y		
547.	4297 <i>Trifolium glomeratum</i> (Cluster Clover)	Y		
548.	4309 <i>Trifolium scabrum</i> (Rough Clover)	Y		
549.	4320 <i>Vicia hirsuta</i> (Hairy Vetch)	Y		
550.	4322 <i>Vicia sativa</i> (Common Vetch)	Y		
551.	11474 <i>Vicia sativa</i> subsp. <i>nigra</i>	Y		
552.	12070 <i>Vicia sativa</i> subsp. <i>sativa</i>	Y		
553.	29491 <i>Vicia tetrasperma</i>	Y		Y
554.	4325 <i>Viminaria juncea</i> (Swishbush, Koweda)			
Fissidentaceae				
555.	32368 <i>Fissidens taylorii</i>			
Gentianaceae				
556.	6539 <i>Centaureium erythraea</i> (Common Centaury)	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
557.	6542 <i>Centaurium tenuiflorum</i>	Y		
558.	6543 <i>Cicendia filiformis</i> (Slender Cicendia)	Y		
Geraniaceae				
559.	4339 <i>Geranium molle</i> (Dove's Foot Cranesbill)	Y		
560.	4343 <i>Pelargonium capitatum</i> (Rose Pelargonium)	Y		
561.	4346 <i>Pelargonium littorale</i>			
Goodeniaceae				
562.	12724 <i>Anthotium junciforme</i>			
563.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
564.	7462 <i>Dampiera pedunculata</i>			
565.	7484 <i>Dampiera trigona</i> (Angled-stem Dampiera)			
566.	7485 <i>Dampiera triloba</i>		P3	
567.	29362 <i>Goodenia coerulea</i>			
568.	12520 <i>Goodenia fasciculata</i>			
569.	7517 <i>Goodenia incana</i> (Hoary Goodenia)			
570.	12551 <i>Goodenia micrantha</i>			
571.	7538 <i>Goodenia pulchella</i>			
572.	19284 <i>Goodenia pulchella</i> subsp. Coastal Plain B (L.W. Sage 2336)			
573.	7568 <i>Lechenaultia biloba</i> (Blue Leschenaultia)			
574.	7572 <i>Lechenaultia expansa</i>			
575.	7574 <i>Lechenaultia floribunda</i> (Free-flowering Leschenaultia)			
576.	7603 <i>Scaevola canescens</i> (Grey Scaevola)			
577.	7613 <i>Scaevola glandulifera</i> (Viscid Hand-flower)			
578.	7619 <i>Scaevola lanceolata</i> (Long-leaved Scaevola)			
579.	12585 <i>Scaevola repens</i>			
580.	13182 <i>Scaevola repens</i> var. <i>repens</i>			
581.	7665 <i>Velleia trinervis</i>			
Haemodoraceae				
582.	11470 <i>Anigozanthos bicolor</i> subsp. <i>bicolor</i>			
583.	1409 <i>Anigozanthos humilis</i> (Catspaw)			
584.	11434 <i>Anigozanthos humilis</i> subsp. <i>humilis</i>			
585.	1411 <i>Anigozanthos manglesii</i> (Mangles Kangaroo Paw, Kurulbrang)			
586.	11261 <i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			
587.	1416 <i>Anigozanthos viridis</i> (Green Kangaroo Paw, Kurulbardang)			
588.	11566 <i>Anigozanthos viridis</i> subsp. <i>viridis</i>			
589.	1417 <i>Blancoa canescens</i> (Winter Bell)			
590.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
591.	11826 <i>Conostylis aculeata</i> subsp. <i>aculeata</i>			
592.	11513 <i>Conostylis aculeata</i> subsp. <i>cygnorum</i>			
593.	1420 <i>Conostylis androstemma</i> (Trumpets)			
594.	1423 <i>Conostylis aurea</i> (Golden Conostylis)			
595.	1427 <i>Conostylis candicans</i> (Grey Cottonhead)			
596.	11438 <i>Conostylis candicans</i> subsp. <i>candicans</i>			
597.	12035 <i>Conostylis caricina</i> subsp. <i>caricina</i>			
598.	11695 <i>Conostylis festuacea</i> subsp. <i>festuacea</i>			
599.	1436 <i>Conostylis juncea</i>			
600.	1437 <i>Conostylis latens</i>			
601.	11388 <i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>		P4	
602.	1453 <i>Conostylis serrulata</i>			
603.	1454 <i>Conostylis setigera</i> (Bristly Cottonhead)			
604.	11597 <i>Conostylis setigera</i> subsp. <i>setigera</i>			
605.	1455 <i>Conostylis setosa</i> (White Cottonhead)			
606.	1464 <i>Haemodorum brevisepalum</i>			
607.	1468 <i>Haemodorum laxum</i>			
608.	1469 <i>Haemodorum loratum</i>		P3	
609.	1470 <i>Haemodorum paniculatum</i> (Mardja)			
610.	1472 <i>Haemodorum simplex</i>			
611.	<i>Haemodorum</i> sp.			
612.	1474 <i>Haemodorum sparsiflorum</i>			
613.	1475 <i>Haemodorum spicatum</i> (Mardja)			
614.	1478 <i>Phlebocarya ciliata</i>			
615.	1479 <i>Phlebocarya filifolia</i>			
616.	11557 <i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>		P3	
617.	1481 <i>Tribonanthes australis</i>			
618.	1482 <i>Tribonanthes brachypetala</i>			
619.	1483 <i>Tribonanthes longipetala</i>			
620.	1485 <i>Tribonanthes violacea</i>			
Haloragaceae				

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621.	6143 <i>Glischrocaryon aureum</i> (Common Popflower)			
622.	6149 <i>Gonocarpus cordiger</i>			
623.	6159 <i>Gonocarpus nodulosus</i>			
624.	6160 <i>Gonocarpus paniculatus</i>			
625.	6161 <i>Gonocarpus pithyoides</i>			
626.	6178 <i>Haloragis scoparia</i>		P1	
627.	34676 <i>Meionectes brownii</i> (Swamp Raspwort)			
628.	33638 <i>Meionectes tenuifolia</i>		P3	
629.	6189 <i>Myriophyllum crispatum</i>			
630.	6193 <i>Myriophyllum echinatum</i>		P3	
631.	6199 <i>Myriophyllum tillaeoides</i>			
Hemerocallidaceae				
632.	23474 <i>Agrostocrinum hirsutum</i>			
633.	1261 <i>Agrostocrinum scabrum</i> (Blue Grass Lily)			
634.	23501 <i>Agrostocrinum scabrum</i> subsp. <i>scabrum</i>			
635.	1264 <i>Arnocrinum preissii</i>			
636.	1276 <i>Caesia micrantha</i> (Pale Grass Lily)			
637.	1277 <i>Caesia occidentalis</i>			
638.	1259 <i>Dianella revoluta</i> (Blueberry Lily)			
639.	11636 <i>Dianella revoluta</i> var. <i>divaricata</i>			
640.	1293 <i>Hensmania turbinata</i>			
641.	1298 <i>Johnsonia pubescens</i> (Pipe Lily)			
642.	19632 <i>Johnsonia pubescens</i> subsp. <i>pubescens</i>			
643.	1260 <i>Stypantra glauca</i> (Blind Grass)			
644.	1361 <i>Tricoryne elatior</i> (Yellow Autumn Lily)			
645.	1362 <i>Tricoryne humilis</i>			
646.	1363 <i>Tricoryne tenella</i>			
Hydatellaceae				
647.	1139 <i>Trithuria bibracteata</i>			
648.	1141 <i>Trithuria submersa</i>			
Hydrocharitaceae				
649.	166 <i>Hydrilla verticillata</i> (Water Thyme)			
650.	168 <i>Ottelia ovalifolia</i> (Swamp Lily)			
651.	14531 <i>Ottelia ovalifolia</i> subsp. <i>ovalifolia</i>			
Hypoxidaceae				
652.	43760 <i>Pauridia occidentalis</i>			
653.	43761 <i>Pauridia occidentalis</i> var. <i>occidentalis</i>			
Iridaceae				
654.	18279 <i>Babiana angustifolia</i>	Y		
655.	1513 <i>Chasmanthe floribunda</i> (African Cornflag)	Y		
656.	18392 <i>Freesia alba</i> x <i>leichtlinii</i>	Y		
657.	1518 <i>Gladiolus angustus</i> (Long Tubed Painted Lady)	Y		
658.	1520 <i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
659.	1526 <i>Hesperantha falcata</i>	Y		
660.	1533 <i>Ixia paniculata</i>	Y		
661.	19179 <i>Moraea flaccida</i> (One-leaf Cape Tulip)	Y		
662.	19178 <i>Moraea lewisiae</i>	Y		
663.	19438 <i>Moraea ochroleuca</i>	Y		
664.	1536 <i>Moraea vegeta</i>	Y		
665.	11749 <i>Orthrosanthus laxus</i> var. <i>laxus</i> (Morning Iris)			
666.	1550 <i>Patersonia occidentalis</i> (Purple Flag, Koma)			
667.	30471 <i>Patersonia occidentalis</i> var. <i>angustifolia</i>			
668.	30472 <i>Patersonia occidentalis</i> var. <i>occidentalis</i>			
669.	1554 <i>Romulea flava</i>	Y		
670.	1556 <i>Romulea rosea</i> (Guildford Grass)	Y		
671.	11544 <i>Romulea rosea</i> var. <i>australis</i> (Guildford Grass)	Y		
672.	14924 <i>Romulea rosea</i> var. <i>communis</i>	Y		
673.	1557 <i>Sisyrinchium exile</i>	Y		
674.	1558 <i>Sparaxis bulbifera</i>	Y		
675.	1560 <i>Sparaxis pillansii</i> (Harlequin Flower)	Y		
676.	38401 <i>Tritonia gladiolaris</i> (Lined Tritonia)	Y		
677.	13103 <i>Watsonia borbonica</i>	Y		
678.	1566 <i>Watsonia marginata</i>	Y		
679.	1567 <i>Watsonia meriana</i> (Bulbil Watsonia)	Y		
680.	18108 <i>Watsonia meriana</i> var. <i>bulbillifera</i>	Y		
681.	18118 <i>Watsonia meriana</i> var. <i>meriana</i>	Y		
682.	1569 <i>Watsonia versfeldii</i>	Y		

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Isoetaceae				
683.	11 <i>Isoetes drummondii</i> (Quillwort)			
Juncaceae				
684.	20454 <i>Juncus acutus</i> subsp. <i>acutus</i>	Y		
685.	1177 <i>Juncus articulatus</i> (Jointed Rush)	Y		
686.	1178 <i>Juncus bufonius</i> (Toad Rush)	Y		
687.	1180 <i>Juncus capitatus</i> (Capitate Rush)	Y		
688.	11922 <i>Juncus kraussii</i> subsp. <i>australiensis</i>			
689.	1186 <i>Juncus microcephalus</i>	Y		
690.	1188 <i>Juncus pallidus</i> (Pale Rush)			
691.	1189 <i>Juncus pauciflorus</i> (Loose Flower Rush)			
692.	1196 <i>Juncus usitatus</i> (Common Rush)	Y		
693.	1198 <i>Luzula meridionalis</i> (Field Woodrush)			
Juncaginaceae				
694.	40660 <i>Cycnogeton huegelii</i>			
695.	40661 <i>Cycnogeton lineare</i>			
696.	33676 <i>Triglochin calcitrapa</i>			
697.	146 <i>Triglochin minutissima</i>			
698.	147 <i>Triglochin mucronata</i>			
699.	148 <i>Triglochin muelleri</i>			
700.	18587 <i>Triglochin nana</i>			
701.	150 <i>Triglochin stowardii</i>			
702.	151 <i>Triglochin striata</i>			
Lamiaceae				
703.	16933 <i>Hemiandra glabra</i>			
704.	6838 <i>Hemiandra linearis</i> (Speckled Snakebush)			
705.	6839 <i>Hemiandra pungens</i> (Snakebush)			
706.	38320 <i>Hemiandra</i> sp. <i>Jurien</i> (B.J. Conn & M.E. Tozer BJC 3885)			
707.	6856 <i>Hemigenia incana</i> (Silky Hemigenia)			
708.	41020 <i>Hemiphora bartlingii</i> (Woolly Dragon)			
709.	41042 <i>Hemiphora uncinata</i>			
710.	6884 <i>Mentha spicata</i> (Spearmint)	Y		
711.	6930 <i>Stachys arvensis</i> (Staggerweed)	Y		
Lauraceae				
712.	11351 <i>Cassytha aurea</i> var. <i>hirta</i>			
713.	2951 <i>Cassytha flava</i> (Dodder Laurel)			
714.	2952 <i>Cassytha glabella</i> (Tangled Dodder Laurel)			
715.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
716.	11799 <i>Cassytha racemosa</i> forma <i>racemosa</i>			
717.	18303 <i>Cinnamomum camphora</i>	Y		
Lentibulariaceae				
718.	7138 <i>Utricularia inaequalis</i>			
719.	7145 <i>Utricularia menziesii</i> (Redcoats)			
720.	7148 <i>Utricularia multifida</i>			
721.	7153 <i>Utricularia tenella</i>			
722.	7157 <i>Utricularia violacea</i> (Violet Bladderwort)			
Linaceae				
723.	4363 <i>Linum trigynum</i> (French Flax)	Y		
Loganiaceae				
724.	16825 <i>Phyllangium divergens</i>			
725.	16177 <i>Phyllangium paradoxum</i>			
Lophocoleaceae				
726.	<i>Chiloscyphus semiteres</i> var. <i>semiteres</i>			
Loranthaceae				
727.	13267 <i>Amyema linophylla</i> subsp. <i>linophylla</i>			
728.	2383 <i>Amyema preissii</i> (Wireleaf Mistletoe)			
729.	2396 <i>Lysiana casuarinae</i>			
730.	2401 <i>Nuytsia floribunda</i> (Christmas Tree, Mudja)			
Lycopodiaceae				
731.	4 <i>Phylloglossum drummondii</i> (Pigmy Clubmoss)			
Lythraceae				
732.	5281 <i>Lythrum hyssopifolia</i> (Lesser Loosestrife)	Y		
Malvaceae				
733.	19708 <i>Abutilon grandifolium</i>	Y		

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734.	40864 <i>Commersonia cygnorum</i>			
735.	14646 <i>Lagunaria patersonia</i>	Y		
736.	5025 <i>Lasiopetalum bracteatum</i> (Helena Velvet Bush)		P4	
737.	45081 <i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>		P3	
738.	4959 <i>Lawrenzia squamata</i>			
739.	4963 <i>Modiola caroliniana</i>	Y		
740.	4980 <i>Sida hookeriana</i>			
741.	5084 <i>Thomasia grandiflora</i> (Large Flowered Thomasia)			
742.	5087 <i>Thomasia macrocarpa</i> (Large Fruited Thomasia)			
Marchantiaceae				
743.	<i>Marchantia berteriana</i>			
Marsileaceae				
744.	78 <i>Piularia novae-hollandiae</i> (Austral Pillwort)			
Meliaceae				
745.	4516 <i>Melia azedarach</i> (White Cedar)			
Menyanthaceae				
746.	36160 <i>Liparophyllum capitatum</i>			
747.	36179 <i>Liparophyllum violifolium</i>			
748.	36177 <i>Ornduffia albiflora</i>			
749.	36200 <i>Ornduffia submersa</i>		P4	
Molluginaceae				
750.	2838 <i>Macarthuria apetala</i>			
751.	2839 <i>Macarthuria australis</i>			
752.	17106 <i>Macarthuria keigheryi</i>		T	
Moraceae				
753.	1747 <i>Ficus carica</i> (Common Fig)	Y		
Musaceae				
754.	20774 <i>Musa acuminata</i>	Y		
Myrtaceae				
755.	20350 <i>Astartea affinis</i> (West-coast Astartea)			
756.	20249 <i>Astartea leptophylla</i> (River-bank Astartea)			
757.	20283 <i>Astartea scoparia</i> (Common Astartea)			
758.	36441 <i>Babingtonia camphorosmae</i> (Camphor Myrtle)			
759.	45403 <i>Babingtonia pelloeae</i> (Pelloe's Babingtonia)			
760.	45402 <i>Babingtonia urbana</i> (Coastal Plain Babingtonia)		P3	
761.	5382 <i>Beaufortia elegans</i> (Elegant Beaufortia)			
762.	5387 <i>Beaufortia macrostemon</i> (Darling Range Beaufortia)			
763.	5390 <i>Beaufortia purpurea</i> (Purple Beaufortia)		P3	
764.	5393 <i>Beaufortia squarrosa</i> (Sand Beaufortia, Sand Bottlebrush, Puno)			
765.	5411 <i>Calothamnus hirsutus</i>			
766.	5415 <i>Calothamnus lateralis</i>			
767.	35816 <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
768.	5428 <i>Calothamnus rupestris</i> (Mouse Ears)			
769.	5429 <i>Calothamnus sanguineus</i> (Silky-leaved Blood flower, Pindak)			
770.	5431 <i>Calothamnus torulosus</i>			
771.	5433 <i>Calothamnus validus</i> (Barrens Clawflower)			
772.	5439 <i>Calytrix angulata</i> (Yellow Starflower)			
773.	5441 <i>Calytrix aurea</i>			
774.	13653 <i>Calytrix breviseta</i> subsp. <i>breviseta</i>		T	
775.	5458 <i>Calytrix flavescens</i> (Summer Starflower)			
776.	5460 <i>Calytrix fraseri</i> (Pink Summer Calytrix)			
777.	5461 <i>Calytrix glutinosa</i>			
778.	5485 <i>Calytrix variabilis</i>			
779.	5502 <i>Conothamnus trinervis</i>			
780.	17104 <i>Corymbia calophylla</i> (Marri)			
781.	5508 <i>Darwinia citriodora</i> (Lemon-scented Darwinia)			
782.	13950 <i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i>			
783.	14097 <i>Eremaea asterocarpa</i> subsp. <i>brachyclada</i>			Y
784.	5540 <i>Eremaea fimbriata</i>			
785.	5541 <i>Eremaea pauciflora</i>			
786.	14103 <i>Eremaea pauciflora</i> var. <i>calyptra</i>			
787.	14104 <i>Eremaea pauciflora</i> var. <i>pauciflora</i>			
788.	5580 <i>Eucalyptus camaldulensis</i> (River Gum, Yabalyinba)			
789.	5708 <i>Eucalyptus marginata</i> (Jarrah, Djara)			
790.	13547 <i>Eucalyptus marginata</i> subsp. <i>marginata</i> (Jarrah)			
791.	5739 <i>Eucalyptus patens</i> (Swan River Blackbutt, Dwuda)			

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792.	5763 <i>Eucalyptus rudis</i> (Flooded Gum, Kulurda)			
793.	13511 <i>Eucalyptus rudis</i> subsp. <i>rudis</i>			
794.	5790 <i>Eucalyptus todtiana</i> (Coastal Blackbutt)			
795.	5817 <i>Hypocalymma angustifolium</i> (White Myrtle, Kudjid)			
796.	35070 <i>Hypocalymma angustifolium</i> subsp. <i>Swan Coastal Plain</i> (G.J. Keighery 16777)			
797.	5825 <i>Hypocalymma robustum</i> (Swan River Myrtle)			
798.	5832 <i>Kunzea ericifolia</i> (Spearwood, Pondil)			
799.	15498 <i>Kunzea glabrescens</i> (Spearwood)			
800.	5835 <i>Kunzea micrantha</i>			
801.	17461 <i>Kunzea micrantha</i> subsp. <i>micrantha</i>			
802.	5847 <i>Leptospermum erubescens</i> (Roadside Teatree)			
803.	5850 <i>Leptospermum laevigatum</i> (Coast Teatree)	Y		
804.	37580 <i>Melaleuca acutifolia</i>			
805.	5881 <i>Melaleuca brevifolia</i>			
806.	5900 <i>Melaleuca cuticularis</i> (Saltwater Paperbark)			
807.	13273 <i>Melaleuca incana</i> subsp. <i>incana</i>			
808.	5926 <i>Melaleuca lateritia</i> (Robin Redbreast Bush)			
809.	5932 <i>Melaleuca leucadendra</i>			
810.	20297 <i>Melaleuca osullivanii</i>			
811.	18394 <i>Melaleuca parviceps</i>			
812.	5952 <i>Melaleuca preissiana</i> (Moonah)			
813.	5958 <i>Melaleuca radula</i> (Graceful Honeymyrtle)			
814.	5959 <i>Melaleuca rhapsiophylla</i> (Swamp Paperbark)			
815.	5964 <i>Melaleuca seriata</i>			
816.	5978 <i>Melaleuca teretifolia</i> (Banbar)			
817.	5980 <i>Melaleuca thymoides</i>			
818.	5983 <i>Melaleuca trichophylla</i>			
819.	5987 <i>Melaleuca viminea</i> (Mohan)			
820.	13280 <i>Melaleuca viminea</i> subsp. <i>viminea</i>			
821.	20101 <i>Paragonis grandiflora</i>			
822.	6006 <i>Pericalymma ellipticum</i> (Swamp Teatree)			
823.	16477 <i>Pericalymma ellipticum</i> var. <i>ellipticum</i>			
824.	16478 <i>Pericalymma ellipticum</i> var. <i>floridum</i>			
825.	6012 <i>Regelia ciliata</i>			
826.	6014 <i>Regelia inops</i>			
827.	6033 <i>Scholtzia involucrata</i> (Spiked Scholtzia)			
828.	20135 <i>Taxandria linearifolia</i>			
829.	6070 <i>Verticordia acerosa</i>			
830.	15431 <i>Verticordia acerosa</i> var. <i>acerosa</i>			
831.	12388 <i>Verticordia acerosa</i> var. <i>preissii</i>			
832.	6076 <i>Verticordia densiflora</i> (Compacted Featherflower)			
833.	15432 <i>Verticordia densiflora</i> var. <i>densiflora</i>			
834.	6077 <i>Verticordia drummondii</i> (Drummond's Featherflower)			
835.	6088 <i>Verticordia huegelii</i> (Variegated Featherflower)			
836.	15433 <i>Verticordia huegelii</i> var. <i>huegelii</i>			
837.	15434 <i>Verticordia insignis</i> subsp. <i>insignis</i>			
838.	14714 <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>		P4	
839.	6107 <i>Verticordia pennigera</i>			
840.	6110 <i>Verticordia plumosa</i> (Plumed Featherflower)			
841.	12449 <i>Verticordia plumosa</i> var. <i>brachyphylla</i>			
842.	15618 <i>Verticordia plumosa</i> var. <i>plumosa</i>			

Nymphaeaceae

843.	2923 <i>Nymphaea odorata</i> (Fragrant Waterlily)	Y		
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Olacaceae

844.	2367 <i>Olax scalariformis</i>			
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Onagraceae

845.	6132 <i>Epilobium ciliatum</i>	Y		
846.	6133 <i>Epilobium hirtigerum</i> (Hairy Willow Herb)			
847.	14289 <i>Epilobium tetragonum</i> subsp. <i>tetragonum</i>	Y		
848.	6138 <i>Oenothera drummondii</i> (Beach Evening Primrose)	Y		
849.	16390 <i>Oenothera drummondii</i> subsp. <i>drummondii</i>	Y		
850.	6139 <i>Oenothera glazioviana</i> (Evening Primrose)	Y		
851.	14293 <i>Oenothera indecora</i> subsp. <i>bonariensis</i>	Y		
852.	20052 <i>Oenothera jamesii</i>	Y		
853.	16347 <i>Oenothera laciniata</i>	Y		
854.	6140 <i>Oenothera mollissima</i>	Y		
855.	6141 <i>Oenothera speciosa</i> (White Evening Primrose)	Y		
856.	6142 <i>Oenothera stricta</i> (Common Evening Primrose)	Y		
857.	14292 <i>Oenothera stricta</i> subsp. <i>stricta</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
		Y		
Orchidaceae				
858.	15330 <i>Caladenia arenicola</i>			
859.	1586 <i>Caladenia discoidea</i> (Dancing Orchid)			
860.	1590 <i>Caladenia ferruginea</i> (Rusty Spider Orchid)			
861.	1592 <i>Caladenia flava</i> (Cowslip Orchid)			
862.	15348 <i>Caladenia flava</i> subsp. <i>flava</i>			
863.	15502 <i>Caladenia footeana</i>			
864.	1596 <i>Caladenia huegelii</i> (Grand Spider Orchid)		T	
865.	1599 <i>Caladenia latifolia</i> (Pink Fairy Orchid)			
866.	15361 <i>Caladenia longicauda</i> subsp. <i>calcigena</i>			
867.	15365 <i>Caladenia longicauda</i> subsp. <i>longicauda</i>			
868.	1605 <i>Caladenia marginata</i> (White Fairy Orchid)			
869.	15371 <i>Caladenia nana</i> subsp. <i>nana</i>			
870.	17760 <i>Caladenia nobilis</i>			
871.	17589 <i>Caladenia occidentalis</i>			
872.	15503 <i>Caladenia paludosa</i>			
873.	15377 <i>Caladenia reptans</i> subsp. <i>reptans</i>			
874.	<i>Caladenia</i> sp.			
875.	18019 <i>Caladenia vulgata</i>			
876.	15398 <i>Caladenia xantha</i>			
877.	1627 <i>Cryptostylis ovata</i> (Slipper Orchid)			
878.	15114 <i>Cyanicula gemmata</i>			
879.	15404 <i>Cyanicula sericea</i>			
880.	10942 <i>Cyrtostylis tenuissima</i>			
881.	19649 <i>Disa bracteata</i>	Y		
882.	11049 <i>Diuris corymbosa</i>			
883.	<i>Diuris corymbosa/magnifica</i>			
884.	1634 <i>Diuris laxiflora</i> (Bee Orchid)			
885.	1637 <i>Diuris purdiei</i> (Purdie's Donkey Orchid)		T	
886.	1639 <i>Drakaea elastica</i> (Glossy-leaved Hammer Orchid)		T	
887.	1640 <i>Drakaea glyptodon</i> (King-in-his-carriage)			
888.	15406 <i>Drakaea gracilis</i>			
889.	13635 <i>Drakaea micrantha</i>		T	
890.	1643 <i>Elythranthera brunonis</i> (Purple Enamel Orchid)			
891.	1644 <i>Elythranthera emarginata</i> (Pink Enamel Orchid)			
892.	15410 <i>Eriochilus dilatatus</i> subsp. <i>dilatatus</i>			
893.	15412 <i>Eriochilus dilatatus</i> subsp. <i>multiflorus</i>			
894.	15414 <i>Eriochilus helonomos</i>			
895.	13866 <i>Eriochilus pulchellus</i>			
896.	15415 <i>Eriochilus scaber</i> subsp. <i>scaber</i>			
897.	10802 <i>Eriochilus tenuis</i>			
898.	1653 <i>Leporella fimbriata</i> (Hare Orchid)			
899.	15418 <i>Leptoceras menziesii</i>			
900.	1658 <i>Microtis atrata</i> (Swamp Mignonette Orchid)			
901.	8814 <i>Microtis brownii</i>			
902.	31713 <i>Microtis cupularis</i>			
903.	10954 <i>Microtis media</i> (Tall Mignonette Orchid)			
904.	15419 <i>Microtis media</i> subsp. <i>media</i>			
905.	33742 <i>Microtis quadrata</i>		P4	
906.	<i>Orchidaceae</i> sp.			Y
907.	23500 <i>Paracaleana hortiorum</i>			
908.	20460 <i>Pheladenia deformis</i>			
909.	1670 <i>Prasophyllum drummondii</i> (Swamp Leek Orchid)			
910.	1671 <i>Prasophyllum elatum</i> (Tall Leek Orchid)			
911.	1672 <i>Prasophyllum fimbria</i> (Fringed Leek Orchid)			
912.	1673 <i>Prasophyllum gibbosum</i> (Humped Leek Orchid)			
913.	1674 <i>Prasophyllum giganteum</i> (Bronze Leek Orchid)			
914.	16688 <i>Prasophyllum gracile</i>			
915.	1676 <i>Prasophyllum hians</i> (Yawning Leek Orchid)			
916.	1677 <i>Prasophyllum macrostachyum</i> (Laughing Leek Orchid)			
917.	1680 <i>Prasophyllum parvifolium</i> (Autumn Leek Orchid)			
918.	10853 <i>Prasophyllum plumiforme</i>			
919.	1681 <i>Prasophyllum regium</i> (King Leek Orchid)			
920.	<i>Pterostylis</i> aff. <i>nana</i>			
921.	15426 <i>Pterostylis aspera</i>			
922.	1687 <i>Pterostylis dilatata</i>			
923.	<i>Pterostylis nana</i> "short sepal"			Y
924.	1693 <i>Pterostylis recurva</i> (Jug Orchid)			
925.	12217 <i>Pterostylis sanguinea</i>			

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926.	19709 <i>Pterostylis</i> sp. <i>Helena River (G. Brockman GBB 340)</i>			
927.	18655 <i>Pterostylis</i> sp. <i>crinkled leaf (G.J. Keighery 13426)</i>			
928.	1698 <i>Pterostylis vittata</i> (<i>Banded Greenhood</i>)			
929.	16367 <i>Pyrorchis nigricans</i> (<i>Red beaks, Elephants ears</i>)			
930.	1701 <i>Thelymitra antennifera</i> (<i>Vanilla Orchid</i>)			
931.	10856 <i>Thelymitra benthamiana</i> (<i>Leopard Orchid</i>)			
932.	1702 <i>Thelymitra campanulata</i> (<i>Shirt Orchid</i>)			
933.	1705 <i>Thelymitra crinita</i> (<i>Blue Lady Orchid</i>)			
934.	1707 <i>Thelymitra flexuosa</i> (<i>Twisted Sun Orchid</i>)			
935.	11143 <i>Thelymitra graminea</i>			
936.	11053 <i>Thelymitra macrophylla</i>			
937.	1710 <i>Thelymitra mucida</i> (<i>Plum Orchid</i>)			
938.	<i>Thelymitra</i> sp.			
939.	1715 <i>Thelymitra spiralis</i> (<i>Curlylocks</i>)			
940.	1716 <i>Thelymitra tigrina</i> (<i>Tiger Orchid</i>)			
941.	1717 <i>Thelymitra variegata</i> (<i>Queen of Sheba</i>)		P2	
942.	1718 <i>Thelymitra villosa</i> (<i>Custard Orchid</i>)			
943.	20731 <i>Thelymitra vulgaris</i>			
Orobanchaceae				
944.	15037 <i>Bartsia trixago</i>	Y		
945.	7122 <i>Orobanche minor</i> (<i>Lesser Broomrape</i>)	Y		
946.	7089 <i>Parentucellia latifolia</i> (<i>Common Bartsia</i>)	Y		
947.	7090 <i>Parentucellia viscosa</i> (<i>Sticky Bartsia</i>)	Y		
Oxalidaceae				
948.	4349 <i>Oxalis corniculata</i> (<i>Yellow Wood Sorrel</i>)	Y		
949.	4352 <i>Oxalis glabra</i>	Y		
950.	4356 <i>Oxalis pes-caprae</i> (<i>Soursob</i>)	Y		
951.	4358 <i>Oxalis purpurea</i> (<i>Largeflower Wood Sorrel</i>)	Y		
Papaveraceae				
952.	8365 <i>Fumaria bastardii</i>	Y		
953.	2969 <i>Fumaria capreolata</i> (<i>Whiteflower Fumitory</i>)	Y		
954.	31532 <i>Fumaria muralis</i> subsp. <i>muralis</i>	Y		
955.	<i>Fumaria</i> sp.			
Philydraceae				
956.	1172 <i>Philydrella drummondii</i>			
957.	1173 <i>Philydrella pygmaea</i> (<i>Butterfly Flowers</i>)			
958.	14306 <i>Philydrella pygmaea</i> subsp. <i>pygmaea</i>			
Phyllanthaceae				
959.	4675 <i>Phyllanthus calycinus</i> (<i>False Boronia</i>)			
960.	4691 <i>Poranthera microphylla</i> (<i>Small Poranthera</i>)			
961.	<i>Poranthera microphylla/moorokatta</i>			
Phytolaccaceae				
962.	2793 <i>Phytolacca octandra</i> (<i>Red Ink Plant</i>)	Y		
Pittosporaceae				
963.	25788 <i>Billardiera fraseri</i> (<i>Elegant Pronaya</i>)			
964.	3169 <i>Cheiranthra preissiana</i>			
Plantaginaceae				
965.	4717 <i>Callitriche stagnalis</i> (<i>Common Starwort</i>)	Y		
966.	14282 <i>Gratiola pubescens</i>			
967.	12008 <i>Kickxia elatine</i> subsp. <i>crinita</i>	Y		
968.	7068 <i>Kickxia spuria</i> (<i>Roundleaf Toadflax</i>)	Y		
969.	7303 <i>Plantago lanceolata</i> (<i>Ribwort Plantain</i>)	Y		
970.	7304 <i>Plantago major</i> (<i>Greater Plantain</i>)	Y		
971.	7108 <i>Veronica arvensis</i> (<i>Wall Speedwell</i>)	Y		
Poaceae				
972.	184 <i>Aira caryophyllea</i> (<i>Silvery Hairgrass</i>)	Y		
973.	<i>Aira caryophyllea/cupaniana</i> group			
974.	185 <i>Aira cupaniana</i> (<i>Silvery Hairgrass</i>)	Y		
975.	187 <i>Aira praecox</i> (<i>Early Hairgrass</i>)	Y		
976.	13380 <i>Amphibromus nervosus</i>			
977.	197 <i>Amphipogon debilis</i>			
978.	199 <i>Amphipogon strictus</i> (<i>Greybeard Grass</i>)			
979.	200 <i>Amphipogon turbinatus</i>			
980.	38480 <i>Austrostipa bronwenae</i>		T	
981.	17234 <i>Austrostipa compressa</i>			
982.	17240 <i>Austrostipa flavescens</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
983.	17254 <i>Austrostipa tenuifolia</i>			
984.	17257 <i>Austrostipa variabilis</i>			
985.	233 <i>Avena barbata</i> (Bearded Oat)	Y		
986.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
987.	245 <i>Briza minor</i> (Shivery Grass)	Y		
988.	248 <i>Bromus catharticus</i> (Prairie Grass)	Y		
989.	249 <i>Bromus diandrus</i> (Great Brome)	Y		
990.	41564 <i>Cenchrus clandestinus</i> (Kikuyu Grass)	Y		
991.	259 <i>Cenchrus echinatus</i> (Burrgrass)	Y		
992.	41566 <i>Cenchrus longisetus</i> (Feathertop)	Y		
993.	41567 <i>Cenchrus macrourus</i> (African Feather Grass)	Y		
994.	41563 <i>Cenchrus purpureus</i> (Elephant Grass)	Y		
995.	267 <i>Chloris gayana</i> (Rhodes Grass)	Y		
996.	48259 <i>Cortaderia selloana</i> subsp. <i>selloana</i>	Y		
997.	283 <i>Cynodon dactylon</i> (Couch)	Y		
998.	299 <i>Deyeuxia quadriseta</i> (Reed Bentgrass)			
999.	328 <i>Echinochloa colona</i> (Awnless Barnyard Grass)	Y		
1000.	11105 <i>Echinochloa crus-galli</i>	Y		
1001.	329 <i>Echinochloa crus-pavonis</i> (South American Barnyard Grass)	Y		
1002.	337 <i>Echinochloa pyramidalis</i> (Antelope Grass)	Y		
1003.	347 <i>Ehrharta calycina</i> (Perennial Veldt Grass)	Y		
1004.	349 <i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
1005.	<i>Ehrharta</i> sp.			
1006.	352 <i>Eleusine coracana</i> (Indian Millet)	Y		
1007.	353 <i>Eleusine indica</i> (Crowsfoot Grass)	Y		
1008.	376 <i>Eragrostis curvula</i> (African Lovegrass)	Y		
1009.	379 <i>Eragrostis elongata</i> (Clustered Lovegrass)			
1010.	430 <i>Festuca arundinacea</i> (Tall Fescue)	Y		
1011.	17043 <i>Glyceria declinata</i>	Y		
1012.	444 <i>Holcus lanatus</i> (Yorkshire Fog)	Y		
1013.	448 <i>Hordeum glaucum</i> (Northern Barley Grass)	Y		
1014.	449 <i>Hordeum leporinum</i> (Barley Grass)	Y		
1015.	450 <i>Hordeum marinum</i>	Y		
1016.	452 <i>Hyparrhenia hirta</i> (Tambookie Grass)	Y		
1017.	20019 <i>Lachnagrostis filiformis</i>			
1018.	19955 <i>Lachnagrostis plebeia</i>			
1019.	467 <i>Lagurus ovatus</i> (Hare's Tail Grass)	Y		
1020.	475 <i>Lolium multiflorum</i> (Italian Ryegrass)	Y		
1021.	10957 <i>Lolium perenne</i> x <i>rigidum</i>	Y		
1022.	478 <i>Lolium rigidum</i> (Wimmera Ryegrass)	Y		
1023.	<i>Lolium</i> sp. (annual)			
1024.	11384 <i>Lolium temulentum</i> forma <i>temulentum</i>	Y		
1025.	11073 <i>Lolium</i> x <i>hybridum</i>	Y		
1026.	20639 <i>Megathyrus maximus</i> var. <i>maximus</i>	Y		
1027.	14985 <i>Melinis repens</i>	Y		
1028.	485 <i>Microlaena stipoides</i> (Weeping Grass)			
1029.	492 <i>Neurachne alopecuroidea</i> (Foxtail Mulga Grass)			
1030.	507 <i>Panicum miliaceum</i> (Millet Panic)	Y		
1031.	527 <i>Paspalum dilatatum</i>	Y		
1032.	528 <i>Paspalum distichum</i> (Water Couch)	Y		
1033.	532 <i>Paspalum urvillei</i> (Vasey Grass)	Y		
1034.	40423 <i>Pentameris airoides</i> (False Hairgrass)	Y		
1035.	40424 <i>Pentameris airoides</i> subsp. <i>airoides</i>	Y		
1036.	40422 <i>Pentameris pallida</i>	Y		
1037.	551 <i>Phalaris minor</i> (Lesser Canary Grass)	Y		
1038.	571 <i>Poa annua</i> (Winter Grass)	Y		
1039.	578 <i>Poa porphyroclados</i>			
1040.	<i>Poaceae</i> sp.			
1041.	582 <i>Polypogon monspeliensis</i> (Annual Beardgrass)	Y		
1042.	583 <i>Polypogon tenellus</i>			
1043.	11151 <i>Rostraria pumila</i>	Y		
1044.	40431 <i>Rytidosperma acerosum</i>			
1045.	40425 <i>Rytidosperma caespitosum</i>			
1046.	40426 <i>Rytidosperma occidentale</i>			
1047.	609 <i>Setaria palmifolia</i> (Palm Grass)	Y		
1048.	19453 <i>Setaria parviflora</i>	Y		
1049.	611 <i>Setaria sphacelata</i> (South African Pigeon Grass)	Y		
1050.	616 <i>Sorghum bicolor</i> (Grain Sorghum)	Y		
1051.	635 <i>Sporobolus virginicus</i> (Marine Couch)			
1052.	11112 <i>Tribolium uniolae</i>	Y		

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1053.	722 <i>Vulpia bromoides</i> (Squirrel Tail Fescue)	Y		
1054.	724 <i>Vulpia myuros</i> (Rat's Tail Fescue)	Y		
1055.	12052 <i>Vulpia myuros forma megalura</i>	Y		
1056.	<i>Vulpia</i> sp.			
Polygalaceae				
1057.	4550 <i>Comesperma calymega</i> (Blue-spike Milkwort)			
1058.	4551 <i>Comesperma ciliatum</i>			
1059.	14663 <i>Comesperma griffinii</i>		P2	
1060.	4559 <i>Comesperma polygaloides</i> (Small Milkwort)			
1061.	4560 <i>Comesperma rhadinocarpum</i> (Slender-fruited Comesperma)		P2	
1062.	4564 <i>Comesperma virgatum</i> (Milkwort)			
Polygonaceae				
1063.	2412 <i>Muehlenbeckia adpressa</i> (Climbing Lignum)			
1064.	13911 <i>Persicaria decipiens</i>			
1065.	11020 <i>Persicaria hydropiper</i>			
1066.	16983 <i>Persicaria maculosa</i>	Y		
1067.	2416 <i>Polygonum arenastrum</i> (Sand Wireweed)	Y		
1068.	2419 <i>Polygonum aviculare</i> (Wireweed)	Y		
1069.	2429 <i>Rumex acetosella</i> (Sorrel)	Y		
1070.	2432 <i>Rumex conglomeratus</i> (Clustered Dock)	Y		
1071.	2433 <i>Rumex crispus</i> (Curled Dock)	Y		
Portulacaceae				
1072.	2848 <i>Calandrinia corrigioloides</i> (Strap Purslane)			
1073.	2854 <i>Calandrinia granulifera</i> (Pygmy Purslane)			
1074.	2856 <i>Calandrinia liniflora</i> (Parakeelya)			
1075.	20096 <i>Calandrinia</i> sp. <i>Piawaning</i> (A.C. Beauglehole 12257)		P1	
1076.	2884 <i>Portulaca oleracea</i> (Purslane, Wakati)			
Potamogetonaceae				
1077.	118 <i>Lepilaena australis</i> (Austral Water Mat)			
1078.	109 <i>Potamogeton crispus</i> (Curly Pondweed)			
1079.	44492 <i>Stuckenia pectinata</i>			
Pottiaceae				
1080.	32315 <i>Barbula calycina</i>			
1081.	32345 <i>Didymodon australasiae</i>			
Primulaceae				
1082.	36375 <i>Lysimachia arvensis</i> (Pimpernel)	Y		
1083.	36373 <i>Lysimachia minima</i>	Y		
1084.	6483 <i>Samolus junceus</i>			
1085.	6484 <i>Samolus repens</i> (Creeping Brookweed)			
1086.	11647 <i>Samolus repens</i> var. <i>repens</i>			
Proteaceae				
1087.	14970 <i>Adenanthos barbiger</i>			
1088.	1775 <i>Adenanthos cygnorum</i> (Common Woollybush)			
1089.	11837 <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> (Common Woollybush)			
1090.	1791 <i>Adenanthos obovatus</i> (Basket Flower)			
1091.	32682 <i>Banksia armata</i> var. <i>armata</i>			
1092.	1800 <i>Banksia attenuata</i> (Slender Banksia, Piara)			
1093.	32576 <i>Banksia dallanneyi</i> (Couch Honeypot)			
1094.	32580 <i>Banksia dallanneyi</i> var. <i>dallanneyi</i>			
1095.	32577 <i>Banksia dallanneyi</i> var. <i>mellicula</i>			
1096.	1819 <i>Banksia grandis</i> (Bull Banksia, Pulgarla)			
1097.	1822 <i>Banksia ilicifolia</i> (Holly-leaved Banksia)			
1098.	1823 <i>Banksia incana</i>			
1099.	1830 <i>Banksia littoralis</i> (Swamp Banksia, Pungura)			
1100.	1834 <i>Banksia menziesii</i> (Firewood Banksia)			
1101.	32211 <i>Banksia mimica</i> (Summer Honeypot)		T	
1102.	32138 <i>Banksia pteridifolia</i> subsp. <i>vernalis</i>		P3	
1103.	32080 <i>Banksia sessilis</i> var. <i>sessilis</i>			
1104.	1852 <i>Banksia telmatiaea</i> (Swamp Fox Banksia)			
1105.	1855 <i>Banksia victoriae</i> (Woolly Orange Banksia)			
1106.	15041 <i>Conospermum canaliculatum</i>			
1107.	15516 <i>Conospermum canaliculatum</i> subsp. <i>canaliculatum</i>			
1108.	16853 <i>Conospermum capitatum</i> subsp. <i>glabratum</i>			
1109.	1875 <i>Conospermum huegelii</i> (Slender Smokebush)			
1110.	1882 <i>Conospermum stoechadis</i> (Common Smokebush)			
1111.	1885 <i>Conospermum triplinervium</i> (Tree Smokebush)			
1112.	13999 <i>Conospermum undulatum</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1113.	1964 <i>Grevillea bipinnatifida</i> (<i>Fuchsia Grevillea</i>)			T
1114.	19628 <i>Grevillea bipinnatifida</i> subsp. <i>bipinnatifida</i>			
1115.	1997 <i>Grevillea endlicheriana</i> (<i>Spindly Grevillea</i>)			
1116.	2066 <i>Grevillea pilulifera</i> (<i>Woolly-flowered Grevillea</i>)			
1117.	15839 <i>Grevillea preissii</i> subsp. <i>preissii</i>			
1118.	2107 <i>Grevillea thelemanniana</i> (<i>Spider Net Grevillea</i>)			
1119.	13439 <i>Grevillea thelemanniana</i> subsp. <i>thelemanniana</i> (<i>Spider Net Grevillea</i>)		T	
1120.	2128 <i>Hakea amplexicaulis</i> (<i>Prickly Hakea</i>)			
1121.	2136 <i>Hakea candolleana</i>			
1122.	2137 <i>Hakea ceratophylla</i> (<i>Horned Leaf Hakea</i>)			
1123.	2158 <i>Hakea erinacea</i> (<i>Hedge-hog Hakea</i>)			
1124.	2166 <i>Hakea incrassata</i> (<i>Marble Hakea</i>)			
1125.	2175 <i>Hakea lissocarpha</i> (<i>Honey Bush</i>)			
1126.	2185 <i>Hakea myrtoidea</i> (<i>Myrtle Hakea</i>)			
1127.	2197 <i>Hakea prostrata</i> (<i>Harsh Hakea</i>)			
1128.	2203 <i>Hakea ruscifolia</i> (<i>Candle Hakea</i>)			
1129.	31793 <i>Hakea</i> sp. <i>Eastern coastal plain</i> (G.J. Keighery 8014)			
1130.	2212 <i>Hakea sulcata</i> (<i>Furrowed Hakea</i>)			
1131.	2214 <i>Hakea trifurcata</i> (<i>Two-leaf Hakea</i>)			
1132.	2215 <i>Hakea undulata</i> (<i>Wavy-leaved Hakea</i>)			
1133.	2216 <i>Hakea varia</i> (<i>Variable-leaved Hakea</i>)			
1134.	2221 <i>Isopogon asper</i>			
1135.	29775 <i>Isopogon drummondii</i>		P3	
1136.	2229 <i>Isopogon dubius</i> (<i>Pincushion Coneflower</i>)			
1137.	2237 <i>Isopogon sphaerocephalus</i> (<i>Drumstick Isopogon</i>)			
1138.	2249 <i>Lambertia multiflora</i> (<i>Many-flowered Honeysuckle</i>)			
1139.	14083 <i>Lambertia multiflora</i> var. <i>darlingensis</i>			
1140.	2255 <i>Persoonia angustiflora</i>			
1141.	2262 <i>Persoonia elliptica</i> (<i>Spreading Snottygobble</i>)			
1142.	2273 <i>Persoonia saccata</i> (<i>Snottygobble</i>)			
1143.	2284 <i>Petrophile biloba</i> (<i>Granite Petrophile</i>)			
1144.	20391 <i>Petrophile juncifolia</i>			
1145.	2299 <i>Petrophile linearis</i> (<i>Pixie Mops</i>)			
1146.	2312 <i>Petrophile striata</i>			
1147.	2316 <i>Stirlingia latifolia</i> (<i>Blueboy</i>)			
1148.	2317 <i>Stirlingia simplex</i>			
1149.	2321 <i>Synaphea acutiloba</i> (<i>Granite Synaphea</i>)			
1150.	2323 <i>Synaphea gracillima</i>			
1151.	2324 <i>Synaphea petiolaris</i> (<i>Synaphea</i>)			
1152.	16864 <i>Synaphea petiolaris</i> subsp. <i>petiolaris</i>			
1153.	18590 <i>Synaphea</i> sp. <i>Fairbridge Farm</i> (D. Papenfus 696)		T	
1154.	2329 <i>Synaphea spinulosa</i>			
1155.	15532 <i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>			
1156.	2331 <i>Xylomelum occidentale</i> (<i>Woody Pear, Djandin</i>)			

Pteridaceae

1157. 31 *Cheilanthes austrotenuifolia*

Ranunculaceae

1158. 2933 *Ranunculus muricatus* (*Sharp Buttercup*)

Y

1159. 11927 *Ranunculus sessiliflorus* var. *sessiliflorus*

Restionaceae

1160. 1056 *Alexgeorgea nitens*

1161. 17685 *Chaetanthus aristatus*

1162. 17706 *Chordiflex sinuosus*

1163. 17692 *Cytogonidium leptocarpoides*

1164. 17691 *Desmocladius fasciculatus*

1165. 16595 *Desmocladius flexuosus*

1166. 46362 *Desmocladius lateriflorus*

1167. 17838 *Dielsia stenostachya*

1168. 1070 *Hypolaena exsulca*

1169. 17841 *Hypolaena pubescens*

1170. 1077 *Leptocarpus canus* (*Hoary Twine-rush*)

1171. 1078 *Leptocarpus coangustatus*

1172. 46375 *Leptocarpus decipiens*

1173. 46380 *Leptocarpus kraussii*

1174. 46382 *Leptocarpus roycei*

1175. 1080 *Leptocarpus scariosus*

1176. 46383 *Leptocarpus tephrius*

1177. 19241 *Lepyrodia curvescens*

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
			P2	
1178.	1085 <i>Lepyrodia glauca</i>			
1179.	1088 <i>Lepyrodia macra</i> (Large Scale Rush)			
1180.	1090 <i>Lepyrodia muirii</i>			
1181.	17684 <i>Tremulina tremula</i>			
Rhamnaceae				
1182.	13470 <i>Cryptandra arbutiflora</i> var. <i>arbutiflora</i>			
1183.	4809 <i>Cryptandra pungens</i>			
1184.	4810 <i>Cryptandra scoparia</i>			
1185.	4822 <i>Rhamnus alaternus</i> (Buckthorn)	Y		
1186.	4828 <i>Spyridium globulosum</i> (Basket Bush)			
1187.	13475 <i>Stenanthemum humile</i>			
1188.	19704 <i>Stenanthemum sublineare</i>		P2	
1189.	33418 <i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>			
Rosaceae				
1190.	18301 <i>Eriobotrya japonica</i>	Y		
1191.	20496 <i>Rubus laudatus</i>	Y		
Rubiaceae				
1192.	7323 <i>Galium murale</i> (Small Goosegrass)	Y		
1193.	18254 <i>Opercularia apiciflora</i>			
1194.	18255 <i>Opercularia vaginata</i> (Dog Weed)			
Ruppiaceae				
1195.	114 <i>Ruppia maritima</i> (Sea Tassel)			
Rutaceae				
1196.	4413 <i>Boronia crenulata</i> (Aniseed Boronia)			
1197.	16636 <i>Boronia crenulata</i> subsp. <i>viminea</i>			
1198.	11503 <i>Boronia crenulata</i> var. <i>crenulata</i>			
1199.	4414 <i>Boronia cymosa</i> (Granite Boronia)			
1200.	4417 <i>Boronia dichotoma</i>			
1201.	4420 <i>Boronia fastigiata</i> (Bushy Boronia)			
1202.	4438 <i>Boronia ramosa</i>			
1203.	11381 <i>Boronia ramosa</i> subsp. <i>anethifolia</i>			
1204.	18529 <i>Philothea spicata</i> (Pepper and Salt)			
Salviniaceae				
1205.	17737 <i>Azolla pinnata</i>			
1206.	42902 <i>Azolla rubra</i>			
1207.	79 <i>Salvinia molesta</i> (Salvinia)	Y		
Santalaceae				
1208.	10765 <i>Exocarpos sparteus</i> (Broom Ballart, Djuk)			
1209.	2342 <i>Leptomeria cunninghamii</i>			
1210.	2344 <i>Leptomeria empetriformis</i>			
1211.	2350 <i>Leptomeria pauciflora</i> (Sparse-flowered Currant Bush)			
Sapindaceae				
1212.	17318 <i>Cardiospermum grandiflorum</i>	Y		
1213.	18589 <i>Diplopeltis huegellii</i> subsp. <i>lehmannii</i>			
1214.	4763 <i>Dodonaea hackettiana</i> (Hackett's Hopbush)		P4	
Scrophulariaceae				
1215.	17150 <i>Eremophila glabra</i> subsp. <i>chlorella</i>		T	
1216.	7291 <i>Myoporum insulare</i> (Blueberry Tree, boobialla)			
Selaginellaceae				
1217.	6 <i>Selaginella gracillima</i> (Tiny Clubmoss)			
Sematophyllaceae				
1218.	32433 <i>Sematophyllum homomallum</i>			
Solanaceae				
1219.	6978 <i>Nicotiana rotundifolia</i> (Round-leaved Tobacco)			
1220.	7022 <i>Solanum nigrum</i> (Black Berry Nightshade)	Y		
1221.	9259 <i>Solanum nodiflorum</i> (Glossy Nightshade)	Y		
1222.	7037 <i>Solanum symonii</i>			
Splachnaceae				
1223.	32440 <i>Tayloria octoblepharum</i>			
Stylidiaceae				
1224.	7674 <i>Levenhookia preissii</i> (Preiss's Stylewort)			
1225.	7676 <i>Levenhookia pusilla</i> (Midget Stylewort)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1226.	<i>Levenhookia pusilla/stipitata</i>			
1227.	7677 <i>Levenhookia stipitata</i> (Common Stylewort)			
1228.	18564 <i>Stylidium aceratum</i>		P3	
1229.	7681 <i>Stylidium affine</i> (Queen Triggerplant)			
1230.	7684 <i>Stylidium amoenum</i> (Lovely Triggerplant)			
1231.	30278 <i>Stylidium androsaceum</i>			
1232.	25831 <i>Stylidium araeophyllum</i> (Stilt Walker)			
1233.	<i>Stylidium araeophyllum/neurophyllum</i>			
1234.	7693 <i>Stylidium brunonianum</i> (Pink Fountain Triggerplant)			
1235.	7696 <i>Stylidium calcaratum</i> (Book Triggerplant)			
1236.	7712 <i>Stylidium despectum</i> (Dwarf Triggerplant)			
1237.	7713 <i>Stylidium dichotomum</i> (Pins-and-needles)			
1238.	7716 <i>Stylidium diuroides</i> (Donkey Triggerplant)			
1239.	11808 <i>Stylidium diuroides</i> subsp. <i>diuroides</i>			
1240.	7717 <i>Stylidium divaricatum</i> (Daddy-long-legs)			
1241.	7721 <i>Stylidium emarginatum</i> (Biddy-four-legs)			
1242.	7734 <i>Stylidium guttatum</i> (Dotted Triggerplant)			
1243.	7742 <i>Stylidium inundatum</i> (Hundreds and Thousands)			
1244.	7756 <i>Stylidium longitubum</i> (Jumping Jacks)		P4	
1245.	7768 <i>Stylidium obtusatum</i> (Pinafore Triggerplant)			
1246.	25800 <i>Stylidium paludicola</i>		P3	
1247.	7771 <i>Stylidium periscelanthum</i> (Pantaloon Triggerplant)		P3	
1248.	7772 <i>Stylidium perpusillum</i> (Tiny Triggerplant)			
1249.	7773 <i>Stylidium petiolare</i> (Horn Triggerplant)			
1250.	7774 <i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
1251.	7777 <i>Stylidium preissii</i> (Lizard Triggerplant)			
1252.	7781 <i>Stylidium pubigerum</i> (Yellow Butterfly Triggerplant)			
1253.	7782 <i>Stylidium pulchellum</i> (Thumbelina Triggerplant)			
1254.	33106 <i>Stylidium recurvum</i>			
1255.	7785 <i>Stylidium repens</i> (Matted Triggerplant)			
1256.	20521 <i>Stylidium rigidulum</i>			
1257.	7790 <i>Stylidium roseoalatum</i> (Pink-wing Triggerplant)			
1258.	25806 <i>Stylidium scariosum</i>			
1259.	7798 <i>Stylidium schoenoides</i> (Cow Kicks)			
1260.	<i>Stylidium</i> sp.			
1261.	45594 <i>Stylidium tenue</i> subsp. <i>majusculum</i> (Showy Fountain Triggerplant)			
1262.	23511 <i>Stylidium thesioides</i> (Delicate Triggerplant)			
1263.	7806 <i>Stylidium utricularioides</i> (Pink Fan Triggerplant)			

Thymelaeaceae

1264.	5231 <i>Pimelea angustifolia</i> (Narrow-leaved Pimelea)			
1265.	11928 <i>Pimelea ciliata</i> subsp. <i>ciliata</i>			
1266.	5243 <i>Pimelea ferruginea</i>			
1267.	11404 <i>Pimelea imbricata</i> var. <i>major</i>			
1268.	11402 <i>Pimelea imbricata</i> var. <i>piligera</i>			
1269.	5252 <i>Pimelea lanata</i>			
1270.	5254 <i>Pimelea leucantha</i>			
1271.	18117 <i>Pimelea rosea</i> subsp. <i>rosea</i>			
1272.	12041 <i>Pimelea suaveolens</i> subsp. <i>suaveolens</i>			
1273.	5268 <i>Pimelea sulphurea</i> (Yellow Banjine)			

Typhaceae

1274.	98 <i>Typha domingensis</i> (Bulrush, Djandjidd)			
1275.	99 <i>Typha orientalis</i> (Bulrush, Cumbungi)			

Udoteaceae

1276.	27121 <i>Penicillus nodulosus</i>			
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Verbenaceae

1277.	6733 <i>Lantana camara</i> (Common Lantana)	Y		
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Violaceae

1278.	5216 <i>Hybanthus calycinus</i> (Wild Violet)			
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Vitaceae

1279.	34481 <i>Parthenocissus quinquefolia</i>	Y		
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Xanthorrhoeaceae

1280.	1251 <i>Xanthorrhoea brunonis</i>			
1281.	14544 <i>Xanthorrhoea brunonis</i> subsp. <i>brunonis</i>			
1282.	1256 <i>Xanthorrhoea preissii</i> (Grass tree, Palga)			
1283.	<i>Xanthorrhoea</i> sp.			

Zamiaceae

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1284.	18119 <i>Macrozamia fraseri</i>			
1285.	85 <i>Macrozamia riedlei</i> (<i>Zamia, Djiridji</i>)			
Zygophyllaceae				
1286.	4383 <i>Tribulus terrestris</i> (<i>Caltrop</i>)	Y		

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

¹ For NatureMap's purposes, species flagged as endemic are those whose records are 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.

NatureMap Fauna Report (5 km buffer)

Created By Guest user on 05/09/2017

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Line'
Vertices 32° 05' 42" S,115° 50' 56" E 32° 05' 20" S,115° 51' 48" E 32° 05' 01" S,115° 52' 28" E 32° 04' 51" S,115° 52' 49" E 32° 04' 42" S,115° 53' 11" E 32° 04' 38" S,115° 53' 19" E 32° 04' 34" S,115° 53' 32" E 32° 04' 27" S,115° 54' 11" E 32° 04' 17" S,115° 55' 04" E 32° 04' 13" S,115° 55' 21" E 32° 04' 04" S,115° 55' 35" E 32° 03' 38" S,115° 56' 05" E 32° 02' 39" S,115° 57' 21" E 32° 02' 12" S,115° 57' 41" E 32° 01' 58" S,115° 57' 55" E
Group By Species Group

Species Group	Species	Records
Amphibian	10	742
Bird	228	47009
Fish	15	20
Invertebrate	215	679
Mammal	26	1277
Reptile	63	1319
TOTAL	557	51046

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Amphibian				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
4.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
5.	25412 <i>Heleioporus psammophilus</i> (Sand Frog)			
6.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
7.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
8.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
9.	25420 <i>Myobatrachus gouldii</i> (Turtle Frog)			
10.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
Bird				
11.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
12.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
13.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
14.	24265 <i>Acanthiza uropygialis</i> (Chestnut-rumped Thornbill)			
15.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
16.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
17.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
18.	24283 <i>Accipiter fasciatus</i> subsp. <i>didimus</i> (Brown Goshawk)			
19.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
20.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
21.	24831 <i>Acrocephalus australis</i> subsp. <i>gouldi</i> (Australian Reed Warbler)			
22.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
23.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
24.	24310 <i>Anas castanea</i> (Chestnut Teal)			
25.	24312 <i>Anas gracilis</i> (Grey Teal)			
26.	24313 <i>Anas platyrhynchos</i> (Mallard)			
27.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
28.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
29.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
30.	<i>Anser anser</i>			
31.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
32.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
33.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
34.	25558 <i>Ardea ibis</i> (Cattle Egret)		IA	
35.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
36.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
37.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
38.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
39.	24352 <i>Artamus cinereus</i> subsp. <i>melanops</i> (Black-faced Woodswallow)			
40.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
41.	24318 <i>Aythya australis</i> (Hardhead)			
42.	<i>Barnardius zonarius</i>			
43.	24319 <i>Biziura lobata</i> (Musk Duck)			
44.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
45.	25715 <i>Cacatua roseicapilla</i> (Galah)			
46.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
47.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
48.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
49.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
50.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
51.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
52.	24786 <i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
53.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
54.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
55.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
56.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)		T	
57.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)		T	
58.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
59.	25574 <i>Charadrius dubius</i> (Little Ringed Plover)		IA	
60.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
61.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
62.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
63.	41332 <i>Chlidonias leucopterus</i> (White-winged Black Tern)		IA	
64.	<i>Chroicocephalus novaehollandiae</i>			
65.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
66.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
67.	24288 <i>Circus approximans</i> (Swamp Harrier)			
68.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
69.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
70.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
71.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
72.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
73.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
74.	24362 <i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i> (Black-faced Cuckoo-shrike)			
75.	24363 <i>Coracina novaehollandiae</i> subsp. <i>subpallida</i> (Black-faced Cuckoo-shrike)			
76.	24416 <i>Corvus bennetti</i> (Little Crow)			
77.	25592 <i>Corvus coronoides</i> (Australian Raven)			
78.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
79.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
80.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
81.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
82.	24423 <i>Cracticus tibicen</i> subsp. <i>tibicen</i> (Black-backed Magpie)			
83.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
84.	24424 <i>Cracticus torquatus</i> subsp. <i>torquatus</i> (Grey Butcherbird)			
85.	24322 <i>Cygnus atratus</i> (Black Swan)			
86.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
87.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
88.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
89.	<i>Egretta garzetta</i>			
90.	<i>Egretta novaehollandiae</i>			
91.	<i>Elanus axillaris</i>			
92.	25540 <i>Elanus caeruleus</i> (Black-shouldered Kite)			
93.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
94.	47937 <i>Eiseyornis melanops</i> (Black-fronted Dotterel)			
95.	<i>Eolophus roseicapillus</i>			
96.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
97.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
98.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
99.	24379 <i>Erythronyctes cinctus</i> (Red-kneed Dotterel)			
100.	25621 <i>Falco berigora</i> (Brown Falcon)			
101.	24471 <i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon)			
102.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
103.	24472 <i>Falco cenchroides</i> subsp. <i>cenchrus</i> (Australian Kestrel, Nankeen Kestrel)			

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104.	25623 <i>Falco longipennis</i> (Australian Hobby)			
105.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
106.	24475 <i>Falco peregrinus</i> subsp. <i>macropus</i> (Australian Peregrine Falcon)		S	
107.	25727 <i>Fulica atra</i> (Eurasian Coot)			
108.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
109.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
110.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
111.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
112.	24765 <i>Gallirallus philippensis</i> subsp. <i>mellori</i> (Buff-banded Rail)			
113.	<i>Gallus gallus</i>			
114.	42314 <i>Gavicalis virescens</i> (Singing Honeyeater)			
115.	47954 <i>Gelochelidon nilotica</i> (Gull-billed Tern)		IA	
116.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
117.	24271 <i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone)			
118.	47962 <i>Glyciphila melanops</i> (Tawny-crowned Honeyeater)			
119.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
120.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
121.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
122.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
123.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
124.	24775 <i>Himantopus himantopus</i> subsp. <i>leucocephalus</i> (Black-winged Stilt)			
125.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
126.	<i>Hydroprogne caspia</i>			
127.	47975 <i>Ixobrychus dubius</i> (Australian Little Bittern)		P4	
128.	25637 <i>Larus novaehollandiae</i> (Silver Gull)			
129.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
130.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
131.	24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
132.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
133.	25683 <i>Lonchura castaneothorax</i> (Chestnut-breasted Mannikin)			
134.	<i>Lophoictinia isura</i>			
135.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
136.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
137.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
138.	24551 <i>Malurus pulcherrimus</i> (Blue-breasted Fairy-wren)			
139.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
140.	24552 <i>Malurus splendens</i> subsp. <i>splendens</i> (Splendid Fairy-wren)			
141.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
142.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
143.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
144.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
145.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
146.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
147.	<i>Microcarbo melanoleucos</i>			
148.	25693 <i>Microeca fascinans</i> (Jacky Winter)			
149.	25542 <i>Milvus migrans</i> (Black Kite)			
150.	25686 <i>Neochmia temporalis</i> (Red-browed Finch)	Y		
151.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
152.	24739 <i>Neophema petrophila</i> (Rock Parrot)			
153.	25747 <i>Ninox connivens</i> (Barking Owl)			
154.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
155.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
156.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
157.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
158.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
159.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
160.	<i>Pandion cristatus</i>			
161.	24299 <i>Pandion haliaetus</i> subsp. <i>cristatus</i> (Osprey)		IA	
162.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
163.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
164.	24628 <i>Pardalotus striatus</i> subsp. <i>murchisoni</i> (Striated Pardalote)			
165.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
166.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
167.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
168.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
169.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
170.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
171.	24665 <i>Phalacrocorax fuscescens</i> (Black-faced Cormorant)			
172.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
173.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			

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174.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
175.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
176.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
177.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
178.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
179.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
180.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
181.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
182.	24745 <i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
183.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
184.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
185.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
186.	24751 <i>Platycercus zonarius</i> subsp. <i>zonarius</i> (Port Lincoln Parrot)			
187.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
188.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
189.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
190.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
191.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
192.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
193.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
194.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
195.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
196.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
197.	24769 <i>Porzana fluminea</i> (Australian Spotted Crane)			
198.	25732 <i>Porzana pusilla</i> (Baillon's Crane)			
199.	24770 <i>Porzana pusilla</i> subsp. <i>palustris</i> (Baillon's Crane)			
200.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
201.	24702 <i>Pterodroma brevirostris</i> (Kerguelen Petrel)			
202.	25710 <i>Pterodroma macroptera</i> (Great-winged Petrel)			
203.	24711 <i>Puffinus assimilis</i> subsp. <i>assimilis</i> (Little Shearwater)			
204.	<i>Purpureicephalus spurius</i>			
205.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
206.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
207.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
208.	24454 <i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			
209.	48237 <i>Rostratula australis</i> (Australian Painted Snipe)			
210.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
211.	30948 <i>Sericornis brevirostris</i> (Weebill)			
212.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
213.	24525 <i>Sterna fuscata</i> subsp. <i>nubilosa</i> (Sooty Tern)			
214.	24528 <i>Sterna hybrida</i> subsp. <i>javanica</i> (Whiskered Tern)			
215.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
216.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
217.	24426 <i>Strepera versicolor</i> subsp. <i>plumbea</i> (Grey Currawong)			
218.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
219.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
220.	30950 <i>Streptopelia senegalensis</i> subsp. <i>senegalensis</i> (Laughing Turtle-Dove)	Y		
221.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
222.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
223.	25552 <i>Tadorna radjah</i> (Radjah Shelduck)			
224.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
225.	<i>Thalasseus bergii</i>			
226.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
227.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
228.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
229.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
230.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
231.	24755 <i>Trichoglossus haematodus</i> subsp. <i>moluccanus</i> (Rainbow Lorikeet)	Y		
232.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
233.	24808 <i>Tringa nebularia</i> (Common Greenshank)		IA	
234.	24809 <i>Tringa stagnatilis</i> (Marsh Sandpiper)		IA	
235.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
236.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
237.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
238.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			
Fish				
239.	<i>Acentrogobius bifrenatus</i>			
240.	<i>Afurcagobius suppositus</i>			
241.	<i>Aldrichetta forsteri</i>			

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242.	<i>Apogon rueppellii</i>			
243.	<i>Atherinomorus vaigiensis</i>			
244.	<i>Atherinosoma wallacei</i>			
245.	<i>Carassius auratus</i>			
246.	<i>Cnidoglanis macrocephalus</i>			
247.	<i>Craterocephalus mugiloides</i>			
248.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
249.	<i>Nannoperca vittata</i>			
250.	<i>Pelates sexlineatus</i>			
251.	<i>Sillago burrus</i>			
252.	<i>Torquigener pleurogramma</i>			
253.	<i>Urocampus carinirostris</i>			

Invertebrate

254.	<i>Acercella falcipes</i>			
255.	<i>Agraptocorixa parvipunctata</i>			
256.	<i>Ainudrilus nharna</i>			
257.	<i>Akamptogonus novarae</i>			
258.	<i>Alboa worooa</i>			
259.	<i>Allodessus bistrigatus</i>			
260.	<i>Allothereua maculata</i>			
261.	<i>Alona affinis</i>			
262.	<i>Alona cf. guttata</i>			
263.	<i>Alona rigidicaudis</i>			
264.	<i>Alona setigera</i>			
265.	<i>Alonella clathratula</i>			
266.	<i>Aname mainae</i>			
267.	<i>Aname tepperi</i>			
268.	<i>Ancylidae sp.</i>			
269.	<i>Anisops thienemanni</i>			
270.	<i>Anopheles annulipes s.l.</i>			
271.	<i>Apsectrotanypus nr maculosa</i>			
272.	<i>Arachnura higginsi</i>			
273.	<i>Araneus cyphoxis</i>			
274.	<i>Araneus eburneiventris</i>			
275.	<i>Araneus senicaudatus</i>			
276.	<i>Arkys walckenaeri</i>			
277.	<i>Arrenurus (Micruracarus) sp. 1 (SAP)</i>			
278.	<i>Artoria flavimana</i>			
279.	<i>Artoria linnaei</i>			
280.	<i>Artoria taeniifera</i>			
281.	<i>Austracantha minax</i>			
282.	<i>Austrolestes analis</i>			
283.	<i>Austrolestes io</i>			
284.	<i>Backobourkia heroine</i>			
285.	<i>Badumna insignis</i>			
286.	<i>Ballarra longipalpus</i>			
287.	<i>Bennelongia sp.</i>			
288.	<i>Berosus approximans</i>			
289.	<i>Berosus australiae</i>			
290.	<i>Bezzia sp.</i>			
291.	<i>Bezzia sp. 2 (SAP)</i>			
292.	<i>Boeckella bispinosa</i>			
293.	<i>Brachionus quadridentatus</i>			
294.	<i>Caenidae sp.</i>			
295.	<i>Candonocypris novaezelandiae</i>			
296.	<i>Ceinidae sp.</i>			
297.	<i>Cephalodella gibba</i>			
298.	<i>Ceratopogonidae sp.</i>			
299.	<i>Ceriodaphnia sp.</i>			
300.	<i>Ceryerda cursitans</i>			
301.	<i>Chaoboridae sp.</i>			
302.	33939 <i>Cherax cainii</i> (Marron)			
303.	<i>Cherax destructor</i>			
304.	<i>Cherax preissii</i>			
305.	<i>Cherax quinquecarinatus</i>			
306.	<i>Cherax sp.</i>			
307.	<i>Chironominae sp.</i>			
308.	<i>Chydorus sp.</i>			
309.	<i>Coenagrionidae sp.</i>			
310.	<i>Corixidae sp.</i>			

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311.	<i>Cormocephalus aurantipes</i>			
312.	<i>Cormocephalus novaehollandiae</i>			
313.	<i>Cormocephalus rubriceps</i>			
314.	<i>Cormocephalus strigosus</i>			
315.	<i>Corynoneura</i> sp. (V49) (SAP)			
316.	<i>Cricotopus 'brevicornis'</i>			
317.	<i>Cryptochironomus griseidorsum</i>			
318.	<i>Cryptoerithus quobba</i>			
319.	<i>Culex (Culex) annulirostris</i>			
320.	<i>Culicoides</i> sp.			
321.	<i>Cyclosa trilobata</i>			
322.	<i>Cypretta</i> sp.			
323.	<i>Cyprinotus cingalensis</i>			
324.	<i>Cyrtophora parnasia</i>			
325.	<i>Delena cancerides</i>			
326.	<i>Diaphanosoma</i> sp.			
327.	<i>Dingosa serrata</i>			
328.	<i>Dinocambala ingens</i>			
329.	<i>Diptera</i> sp.			
330.	<i>Dolichopodidae</i> sp.			
331.	<i>Dunhevedia crassa</i>			
332.	<i>Dytiscidae</i> sp.			
333.	<i>Eodelena convexa</i>			
334.	<i>Eodelena lapidicola</i>			
335.	<i>Ephydriidae</i> sp.			
336.	<i>Eriophora biapicata</i>			
337.	<i>Erythracarus decoris</i>			
338.	<i>Ethmostigmus rubripes</i>			
339.	<i>Euchlanis</i> sp.			
340.	<i>Eupograptus kottae</i>			
341.	<i>Eurytion incisunguis</i>			Y
342.	<i>Eylais</i> sp.			
343.	<i>Gea theridioides</i>			
344.	<i>Glacidorbidae</i> sp.			Y
345.	<i>Glyptophysa</i> sp.			
346.	<i>Gripopterygidae</i> sp.			
347.	<i>Gyrinidae</i> sp.			
348.	<i>Haliphus gibbus</i>			
349.	<i>Hebridae</i> sp.			
350.	<i>Hemianax papuensis</i>			
351.	<i>Hemicordulia tau</i>			
352.	<i>Hemicordulidae</i> sp.			
353.	<i>Henicops dentatus</i>			
354.	<i>Hogna crispipes</i>			
355.	<i>Hydrophilidae</i> sp.			
356.	<i>Hydropsychidae</i> sp.			
357.	<i>Hydroptilidae</i> sp.			
358.	<i>Idiommatia blackwalli</i>			
359.	<i>Ilyocryptus</i> sp.			
360.	<i>Ilyodromus</i> sp.			
361.	<i>Isidorella</i> sp.			
362.	<i>Isopeda leishmani</i>			
363.	<i>Ixodes australiensis</i>			
364.	<i>Kangarosa ludwigi</i>			
365.	<i>Kangarosa properipes</i>			
366.	<i>Karaops ellenae</i>			
367.	<i>Lacrimicypris "drummondi" n.sp.</i> (SAP)			
368.	<i>Lampona cylindrata</i>			
369.	<i>Latonopsis brehmi</i>			
370.	<i>Latrodectus hasseltii</i>			
371.	<i>Leberis aenigmata</i>			
372.	33981 <i>Leioproctus bilobatus</i> (bee)		P2	
373.	33982 <i>Leioproctus contrarius</i> (bee)		P3	
374.	33983 <i>Leioproctus douglasiellus</i> (bee)		T	
375.	<i>Leptoceridae</i> sp.			
376.	<i>Leucauge dromedaria</i>			Y
377.	<i>Libellulidae</i> sp.			
378.	<i>Limbodessus shuckhardi</i>			
379.	<i>Limnadia</i> sp.			
380.	<i>Limnochares australica</i>			

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381.	<i>Limnophyes vestitus</i> (V41)			
382.	<i>Longepi woodman</i>			
383.	<i>Lycidas michaelseni</i>			
384.	<i>Lycosa gilberta</i>			
385.	<i>Lynceus</i> sp.			
386.	<i>Macrothrix</i> sp.			
387.	<i>Maratus pavonis</i>			
388.	<i>Maraura macracantha</i> (formerly <i>Alona macracantha</i>)			
389.	<i>Megaporus</i> sp.			
390.	<i>Mesocyclops brooksi</i>			
391.	<i>Microcyclops varicans</i>			
392.	<i>Microvelia</i> sp.			
393.	<i>Missulena granulosa</i>			
394.	<i>Missulena occatoria</i>			
395.	<i>Mituliodon tarantulinus</i>			
396.	<i>Mitzoruga insularis</i>			
397.	<i>Monohelea</i> sp. 1 (SAP)			
398.	<i>Monohelea</i> sp. 2 (SAP)			
399.	<i>Nematoda</i> sp.			
400.	33984 <i>Neopasiphae simplicior</i> (bee)		T	
401.	<i>Nephila edulis</i>			
402.	<i>Nicodamus mainae</i>			
403.	<i>Notiasemus glauerti</i>			
404.	<i>Notonectidae</i> sp.			
405.	<i>Oligochaeta</i> sp.			
406.	<i>Onychohydus</i> sp.			
407.	<i>Oribatida</i> sp.			
408.	<i>Orthoclaadiinae</i> sp.			
409.	<i>Orthoclaadiinae</i> sp. C = V44 <i>Gymnometriocnemus</i> (SAP)			
410.	<i>Palaemonidae</i> sp.			
411.	<i>Paralamyctes cammoensis</i>			Y
412.	<i>Paramerina levidensis</i>			
413.	<i>Paramphisopus palustris</i>			
414.	<i>Parastacidae</i> sp.			
415.	<i>Pediana occidentalis</i>			
416.	<i>Phenasteron longiconductor</i>			
417.	<i>Phreatoicidae</i> sp.			
418.	<i>Phryganoporus candidus</i>			
419.	<i>Phryganoporus gausapatus</i> subsp. <i>occidentalis</i>			Y
420.	<i>Physidae</i> sp.			
421.	<i>Pinkfloydia harveii</i>			
422.	<i>Piona cumberlandensis</i>			
423.	<i>Planicirculus alticarinatus</i>			
424.	<i>Planorbidae</i> sp.			
425.	<i>Podykipus collinus</i>			
426.	<i>Poltys laciniosus</i>			
427.	<i>Polygonarea repanda</i>			Y
428.	<i>Prionosternum scutatatum</i>			
429.	<i>Procladius paludicola</i>			
430.	<i>Procladius</i> sp. (normal claws)			
431.	<i>Raveniella cirrata</i>			
432.	<i>Raveniella peckorum</i>			
433.	<i>Rhantus suturalis</i>			
434.	<i>Scolopendra laeta</i>			
435.	<i>Servaea melaina</i>			
436.	<i>Simaetha tenuior</i>			
437.	<i>Simocephalus elizabethae</i>			
438.	<i>Simuliidae</i> sp.			
439.	<i>Smeringopus natalensis</i>			
440.	<i>Solaenodolichopus pruvoti</i>			
441.	<i>Spencerhydus</i> sp.			Y
442.	<i>Steatoda capensis</i>			
443.	<i>Sternopriscus</i> sp.			
444.	<i>Supunna funerea</i>			
445.	33992 <i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	
446.	<i>Synothele michaelseni</i>			
447.	<i>Synothele rastelloides</i>			
448.	<i>Tabanidae</i> sp.			
449.	<i>Tamopsis darlingtoniana</i>			
450.	<i>Tamopsis perthensis</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
451.	<i>Tanypodinae sp.</i>			
452.	<i>Tanytarsus fuscithorax</i>			
453.	<i>Tasmanicosa leuckartii</i>			
454.	<i>Testudinella patina</i>			
455.	<i>Tetragnatha demissa</i>			
456.	<i>Tetragnatha nitens</i>			
457.	33994 <i>Throscodectes xiphos (cricket)</i>		P1	Y
458.	<i>Tinytrema yarra</i>			
459.	<i>Tipulidae sp.</i>			
460.	<i>Trichocerca similis</i>			
461.	<i>Triplectides australis</i>			
462.	<i>Turbellaria sp.</i>			
463.	<i>Urodacus novaehollandiae</i>			
464.	<i>Urodacus planimanus</i>			
465.	<i>Venator immansueta</i>			
466.	<i>Venatrix pullastra</i>			
467.	34113 <i>Westralunio carteri (Carter's Freshwater Mussel)</i>		T	
468.	<i>Zachria flavicoma</i>			
Mammal				
469.	24251 <i>Bos taurus (European Cattle)</i>	Y		
470.	30883 <i>Canis lupus subsp. familiaris (Dog)</i>	Y		
471.	24186 <i>Chalinolobus gouldii (Gould's Wattle Bat)</i>			
472.	24187 <i>Chalinolobus morio (Chocolate Wattle Bat)</i>			
473.	24092 <i>Dasyurus geoffroyi (Chuditch, Western Quoll)</i>		T	
474.	24041 <i>Felis catus (Cat)</i>	Y		
475.	30916 <i>Funambulus pennanti (Indian Palm Squirrel)</i>	Y		
476.	24215 <i>Hydromys chrysogaster (Water-rat, Rakali)</i>		P4	
477.	25478 <i>Isoodon obesulus (Southern Brown Bandicoot)</i>		P4	
478.	24153 <i>Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)</i>		P4	
479.	24132 <i>Macropus fuliginosus (Western Grey Kangaroo)</i>			
480.	24133 <i>Macropus irma (Western Brush Wallaby)</i>		P4	
481.	24223 <i>Mus musculus (House Mouse)</i>	Y		
482.	24146 <i>Myrmecobius fasciatus (Numbat, Walpurti)</i>		T	
483.	24194 <i>Nyctophilus geoffroyi (Lesser Long-eared Bat)</i>			
484.	24085 <i>Oryctolagus cuniculus (Rabbit)</i>	Y		
485.	24173 <i>Pteropus scapulatus (Little Red Flying-fox)</i>			
486.	24243 <i>Rattus fuscipes (Western Bush Rat)</i>			
487.	24244 <i>Rattus norvegicus (Brown Rat)</i>	Y		
488.	24245 <i>Rattus rattus (Black Rat)</i>	Y		
489.	24145 <i>Setonix brachyurus (Quokka)</i>		T	
490.	<i>Sminthopsis murina</i>			
491.	24167 <i>Tarsipes rostratus (Honey Possum, Noolbenger)</i>			
492.	25521 <i>Trichosurus vulpecula (Common Brushtail Possum)</i>			
493.	24206 <i>Vespadelus regulus (Southern Forest Bat)</i>			
494.	24040 <i>Vulpes vulpes (Red Fox)</i>	Y		
Reptile				
495.	25242 <i>Acanthophis antarcticus (Southern Death Adder)</i>		P3	
496.	42368 <i>Acritoscincus trilineatus (Western Three-lined Skink)</i>			
497.	44629 <i>Anilius australis</i>			
498.	24990 <i>Aprasia pulchella (Granite Worm-lizard)</i>			
499.	24991 <i>Aprasia repens (Sand-plain Worm-lizard)</i>			
500.	42380 <i>Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)</i>			
501.	42381 <i>Brachyurophis semifasciatus (Southern Shovel-nosed Snake)</i>			
502.	43380 <i>Chelodina colliei (South-western Snake-necked Turtle)</i>			
503.	24980 <i>Christinus marmoratus (Marbled Gecko)</i>			
504.	30893 <i>Cryptoblepharus buchananii</i>			
505.	25020 <i>Cryptoblepharus plagioccephalus</i>			
506.	30899 <i>Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)</i>			
507.	24883 <i>Ctenophorus ornatus (Ornate Crevice-Dragon)</i>			
508.	25027 <i>Ctenotus australis</i>			
509.	25035 <i>Ctenotus delli (Dell's Ctenotus, Darling Range Heath Ctenotus)</i>		P4	
510.	25039 <i>Ctenotus fallens</i>			
511.	25040 <i>Ctenotus gemmula (Jewelled South-west Ctenotus (Swan Coastal Plain pop P3), skink)</i>			
512.	25047 <i>Ctenotus impar</i>			
513.	25049 <i>Ctenotus labillardieri</i>			
514.	41641 <i>Ctenotus ora (Coastal Plains Skink)</i>		P3	
515.	25766 <i>Delma fraseri (Fraser's Legless Lizard)</i>			
516.	24999 <i>Delma grayii</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
517.	25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
518.	25296 <i>Demansia psammophis</i> subsp. <i>reticulata</i> (Yellow-faced Whipsnake)			
519.	25325 <i>Dendrelaphis punctulata</i> (Green Tree Snake)			
520.	24939 <i>Diplodactylus polyophthalmus</i>			
521.	25100 <i>Egernia napoleonis</i>			
522.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
523.	25115 <i>Hemiergis initialis</i> subsp. <i>initialis</i>			
524.	25119 <i>Hemiergis quadrilineata</i>			
525.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
526.	25131 <i>Lerista distinguenda</i>			
527.	25133 <i>Lerista elegans</i>			
528.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
529.	25005 <i>Lialis burtonis</i>			
530.	25184 <i>Menetia greyii</i>			
531.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
532.	25191 <i>Morethia lineocellata</i>			
533.	25192 <i>Morethia obscura</i>			
534.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
535.	25249 <i>Neelaps calonotos</i> (Black-striped Snake)		P3	
536.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
537.	25253 <i>Parasuta gouldii</i>			
538.	25255 <i>Parasuta nigriceps</i>			
539.	25509 <i>Pletholax gracilis</i> (Keeled Legless Lizard)			
540.	25007 <i>Pletholax gracilis</i> subsp. <i>gracilis</i> (Keeled Legless Lizard)			
541.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
542.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
543.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
544.	25511 <i>Pseudonaja affinis</i> (Dugite)			
545.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
546.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
547.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
548.	24943 <i>Strophurus spinigerus</i> subsp. <i>inornatus</i>			
549.	24942 <i>Strophurus spinigerus</i> subsp. <i>spinigerus</i>			
550.	25203 <i>Tiliqua occipitalis</i> (Western Bluetongue)			
551.	25519 <i>Tiliqua rugosa</i>			
552.	25204 <i>Tiliqua rugosa</i> subsp. <i>aspera</i>			
553.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
554.	24983 <i>Underwoodisaurus milii</i> (Barking Gecko)			
555.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
556.	25225 <i>Varanus rosenbergi</i> (Heath Monitor)			
557.	25526 <i>Varanus tristis</i> (Racehorse Monitor)			

Conservation Codes

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

¹ For NatureMap's purposes, species flagged as endemic are those whose records are 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 D – Flora data

Floristic analysis results (dendrogram and cluster) – All FCTs

Floristic analysis (dendrogram and cluster) – TECs & PECs only

Flora species x vegetation type matrix

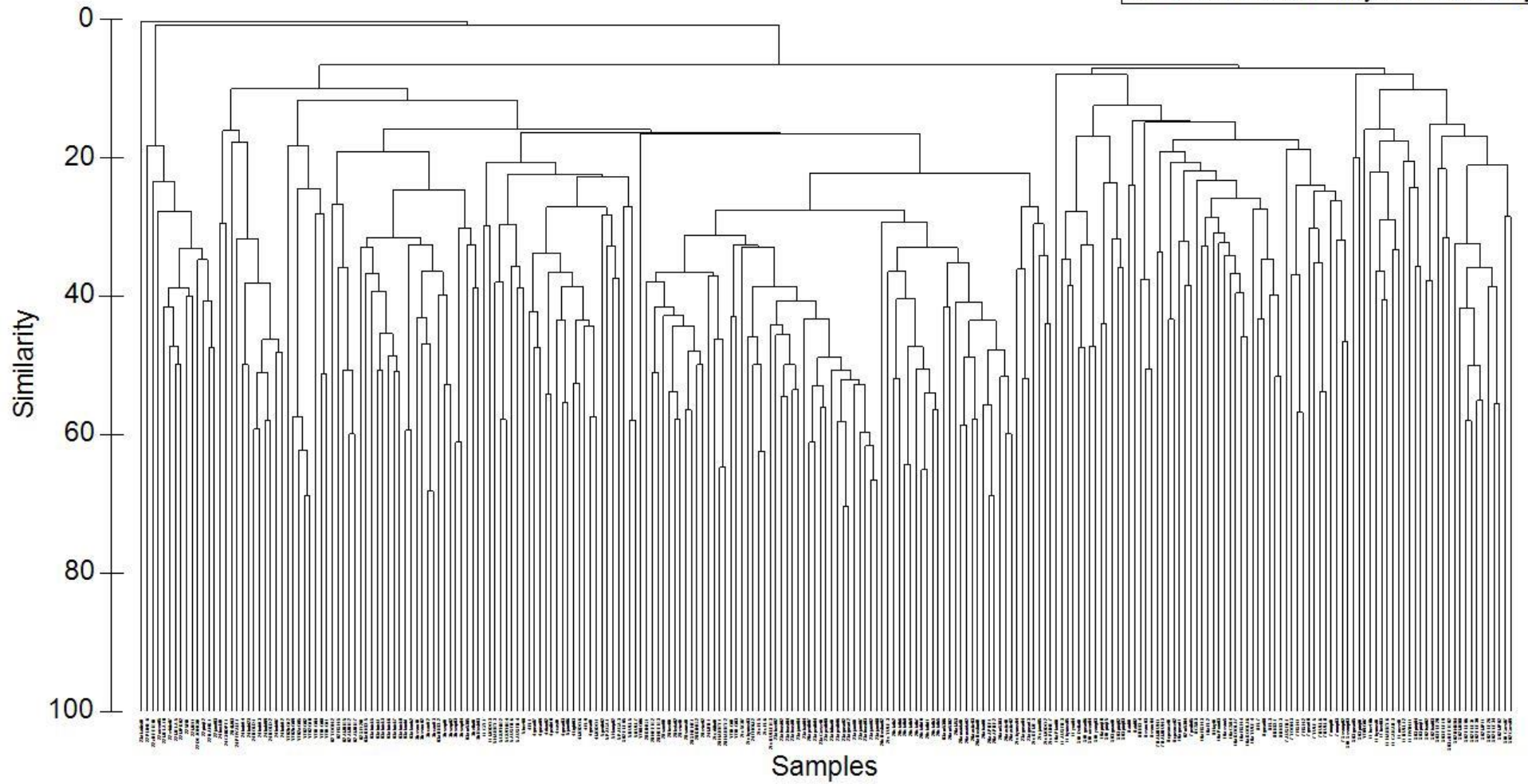
Flora species x site matrix

Flora likelihood of occurrence assessment guidelines

Flora likelihood of occurrence assessment

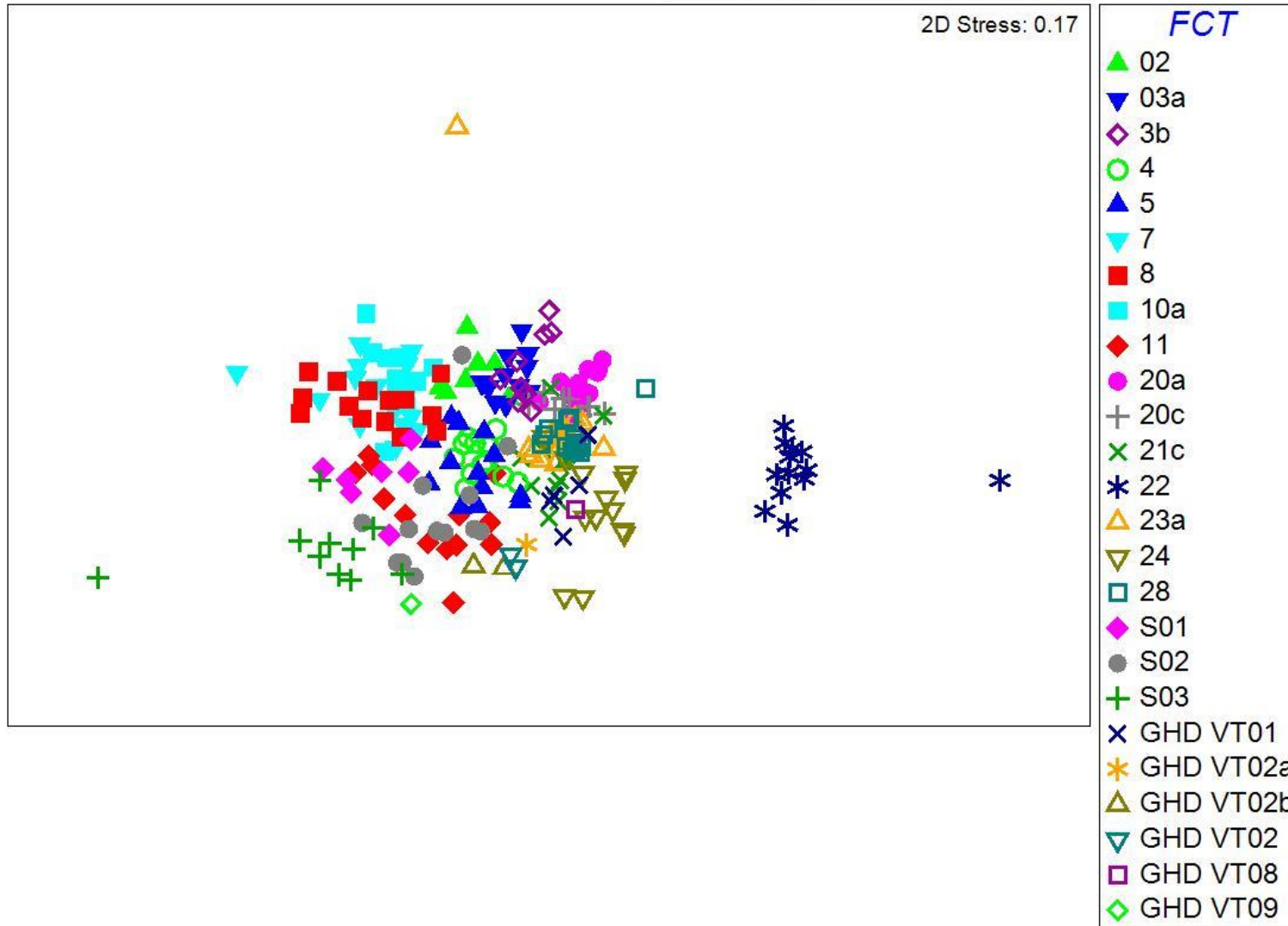
Group average

Resemblance: S17 Bray Curtis similarity



Resemblance: S17 Bray Curtis similarity

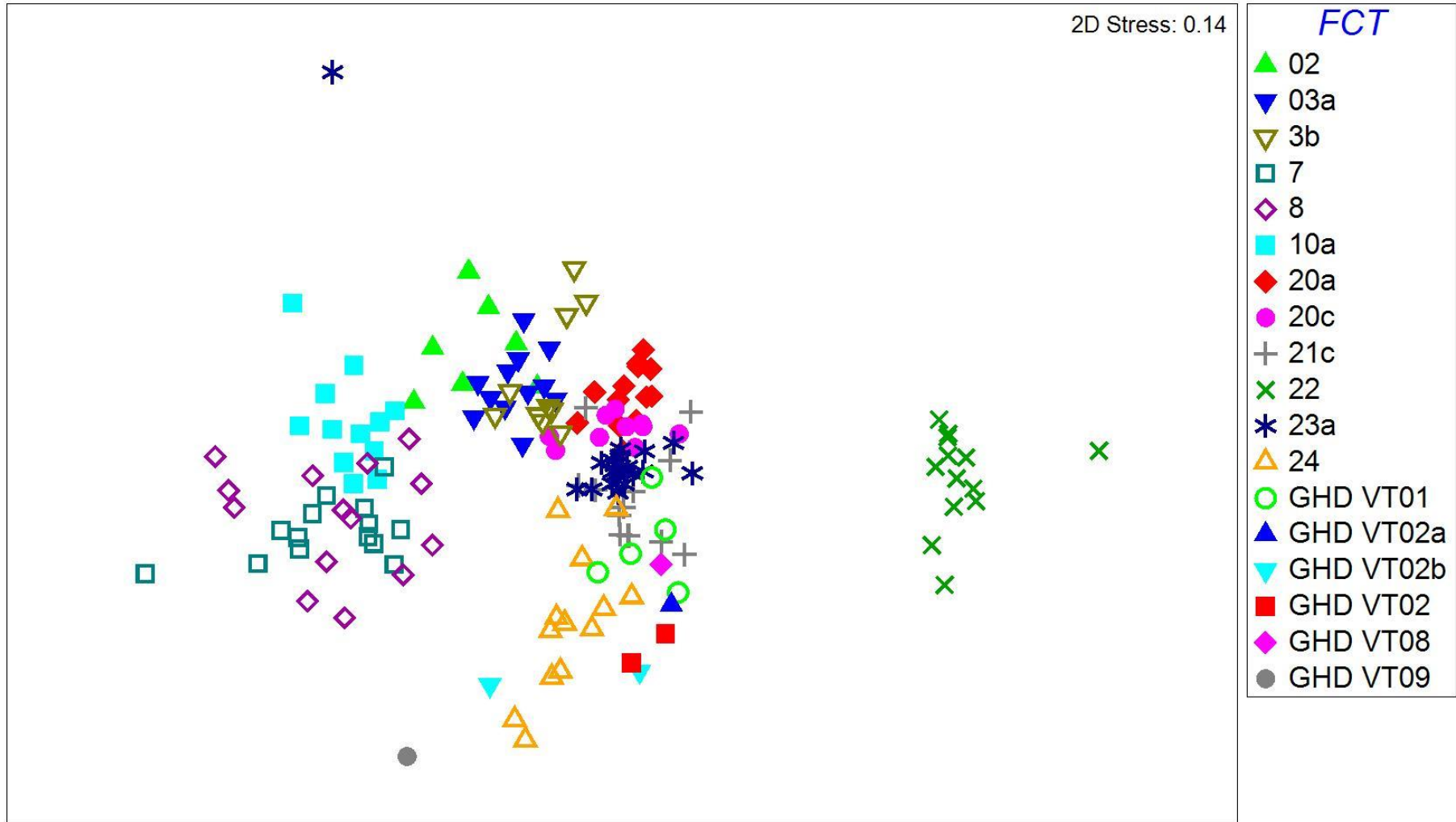
2D Stress: 0.17



Multiple Site Floristic Analysis – All FCTs

Resemblance: S17 Bray Curtis similarity

2D Stress: 0.14



Multiple Site Floristic Analysis – TECs and PECs only

Flora Species List – Species by vegetation type

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Aizoaceae	<i>Carpobrotus edulis</i>	*						X	X			
Anacardiaceae	<i>Schinus terebinthifolius</i>	*							X			
Anarthriaceae	<i>Lyginia barbata</i>		X		X							
Anarthriaceae	<i>Lyginia imberbis</i>		X	X		X		X				
Apiaceae	<i>Apium prostratum</i>		X									
Apiaceae	<i>Centella asiatica</i>								X			X
Apiaceae	<i>Daucus glochidiatus</i>		X	X		X						
Araceae	<i>Zantedeschia aethiopica</i>	*DP					X					
Asparagaceae	<i>Agave americana</i>	*							X			
Asparagaceae	<i>Asparagus asparagoides</i>	*DP & WoNS					X		X		X	
Asparagaceae	<i>Chamaescilla corymbosa</i>		X									
Asparagaceae	<i>Laxmannia ramosa</i>							X				
Asparagaceae	<i>Lomandra caespitosa</i>		X									
Asparagaceae	<i>Lomandra hermaphrodita</i>		X									
Asparagaceae	<i>Lomandra preissii</i>										X	
Asparagaceae	<i>Thysanotus patersonii/ manglesianus</i>		X									
Asphodelaceae	<i>Asphodelus fistulosus</i>	*	X									
Asteraceae	<i>Arctotheca calendula</i>	*		X		X		X	X			
Asteraceae	<i>Conyza bonariensis</i>	*	X						X			
Asteraceae	<i>Dimorphotheca ecklonis</i>	*							X			
Asteraceae	<i>Hyalosperma cotula</i>			X		X						
Asteraceae	<i>Hypochaeris glabra</i>	*	X	X	X	X			X			
Asteraceae	<i>Lagenophora huegelii</i>		X									
Asteraceae	<i>Osteospermum ecklonis</i>	*		X								

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Asteraceae	<i>Podotheca gnaphalioides</i>					X						
Asteraceae	<i>Rhodanthe citrina</i>					X						
Asteraceae	<i>Senecio condylus</i>				X							
Asteraceae	<i>Sonchus oleraceus</i>	*	X					X				
Asteraceae	<i>Ursinia anthemoides</i>	*	X	X	X	X			X			
Boraginaceae	<i>Echium plantagineum</i>	*DP								X		
Brassicaceae	<i>Brassica tournefortii</i>	*	X					X				
Campanulaceae	<i>Wahlenbergia capensis</i>	*	X									
Caryophyllaceae	<i>Petrorhagia dubia</i>	*				X						
Caryophyllaceae	<i>Silene gallica</i>	*				X						
Casuarinaceae	<i>Allocasuarina fraseriana</i>		X									
Casuarinaceae	<i>Allocasuarina humilis</i>		X					X				
Casuarinaceae	<i>Casuarina glauca</i>	*							X			
Casuarinaceae	<i>Casuarina sp.</i>	*							X			
Colchicaceae	<i>Burchardia congesta</i>		X								X	
Cupressaceae	<i>Callitris preissii</i>		X									
Cyperaceae	<i>Cyperaceae sp.</i>					X						
Cyperaceae	<i>Lepidosperma longitudinale</i>					X	X					X
Cyperaceae	<i>Lepidosperma sp.</i>		X								X	
Cyperaceae	<i>Mesomelaena pseudostygia</i>							X				
Cyperaceae	<i>Schoenus curvifolius</i>			X	X							
Cyperaceae	<i>Schoenus sp.</i>			X								
Dasypogonaceae	<i>Dasypogon bromeliifolius</i>		X	X	X	X					X	
Dilleniaceae	<i>Hibbertia huegelii</i>		X					X				
Dilleniaceae	<i>Hibbertia hypericoides</i>		X					X				
Dilleniaceae	<i>Hibbertia subvaginata</i>		X	X	X							
Droseraceae	<i>Drosera gigantea</i>						X					

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Droseraceae	<i>Drosera leucablasta</i>		X									
Droseraceae	<i>Drosera menziesii</i>		X	X								
Ericaceae	<i>Astroloma</i> sp.			X								
Ericaceae	<i>Brachyloma preissii</i> subsp. <i>obtusifolium</i>		X									
Ericaceae	<i>Conostephium pendulum</i>		X					X				
Ericaceae	<i>Leucopogon conostephioides</i>		X									
Ericaceae	<i>Leucopogon polymorphus</i>		X									
Euphorbiaceae	<i>Euphorbia peplus</i>	*	X									
Euphorbiaceae	<i>Euphorbia terracina</i>	*						X	X			
Euphorbiaceae	<i>Ricinus communis</i>	*								X		
Fabaceae	<i>Acacia lasiocarpa</i>							X				
Fabaceae	<i>Acacia longifolia</i>	*							X			
Fabaceae	<i>Acacia pulchella</i>		X				X				X	
Fabaceae	<i>Acacia rostellifera</i>								X			
Fabaceae	<i>Acacia saligna</i>			X					X			
Fabaceae	<i>Acacia willdenowiana</i>		X									
Fabaceae	<i>Bossiaea eriocarpa</i>		X					X				
Fabaceae	<i>Caesalpinia gilliesii</i>		X									
Fabaceae	<i>Chamaecytisus palmensis</i>	*		X					X			
Fabaceae	<i>Daviesia physodes</i>		X					X				
Fabaceae	<i>Euchilopsis linearis</i>			X	X	X	X					
Fabaceae	Fabaceae sp.							X				
Fabaceae	<i>Gastrolobium linearifolium</i>		X									
Fabaceae	<i>Gompholobium tomentosum</i>		X					X			X	
Fabaceae	<i>Hardenbergia comptoniana</i>			X								
Fabaceae	<i>Hovea trisperma</i>		X									

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Fabaceae	<i>Jacksonia furcellata</i>		X	X					X		X	
Fabaceae	<i>Jacksonia sternbergiana</i>							X				
Fabaceae	<i>Kennedia prostrata</i>							X	X			
Fabaceae	<i>Lupinus angustifolius</i>	*							X			
Fabaceae	<i>Lupinus cosentinii</i>			X								
Fabaceae	<i>Medicago polymorpha</i>	*							X			
Fabaceae	<i>Retama raetam</i>	*	X	X								
Fabaceae	<i>Trifolium arvense</i>	*	X									
Fabaceae	<i>Vicia sativa</i>	*					X					
Geraniaceae	<i>Geranium molle</i>	*	X									
Geraniaceae	<i>Pelargonium capitatum</i>	*	X				X	X	X			
Goodeniaceae	<i>Dampiera linearis</i>		X	X				X				
Haemodoraceae	<i>Anigozanthos humilis</i>							X				
Haemodoraceae	<i>Anigozanthos manglesii</i>							X			X	
Haemodoraceae	<i>Conostylis aculeata</i>							X				
Haemodoraceae	<i>Conostylis juncea</i>		X									
Haemodoraceae	<i>Conostylis setigera</i>		X									
Haemodoraceae	<i>Phlebocarya ciliata</i>		X	X	X	X		X			X	
Hemerocallidaceae	<i>Tricoryne elatior</i>										X	
Iridaceae	<i>Freesia alba x leichtlinii</i>	*		X					X			
Iridaceae	<i>Gladiolus caryophyllaceus</i>	*	X					X			X	
Iridaceae	<i>Moraea flaccida</i>	*DP					X					
Iridaceae	<i>Patersonia occidentalis</i>		X								X	
Iridaceae	<i>Romulea rosea</i>	*	X						X		X	
Iridaceae	<i>Watsonia meriana</i> var. <i>bulbillifera</i>	*						X				
Iridaceae	<i>Watsonia meriana</i> var. <i>meriana</i>	*					X		X			
Juncaceae	<i>Juncus pallidus</i>						X		X			X

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Lamiaceae	<i>Lavandula dentata</i>	*							X			
Lauraceae	<i>Cassytha glabella</i>				X		X					
Loranthaceae	<i>Nuytsia floribunda</i>		X									
Malvaceae	<i>Abutilon grandifolium</i>	*							X			
Myrtaceae	<i>Astartea fascicularis</i>					X						
Myrtaceae	<i>Callistemon</i> sp.								X			
Myrtaceae	<i>Calothamnus sanguineus</i>		X						X			
Myrtaceae	<i>Calytrix</i> sp.		X									
Myrtaceae	<i>Chamelaucium uncinatum</i>			X								
Myrtaceae	<i>Corymbia calophylla</i>							X	X		X	
Myrtaceae	<i>Eucalyptus ?patens</i>								X			
Myrtaceae	<i>Eucalyptus maculata</i>								X			
Myrtaceae	<i>Eucalyptus marginata</i>								X			
Myrtaceae	<i>Eucalyptus rudis</i>								X			X
Myrtaceae	<i>Eucalyptus</i> sp.	*	X						X			
Myrtaceae	<i>Eucalyptus totiana</i>		X	X				X	X			
Myrtaceae	<i>Hypocalymma angustifolium</i>			X	X	X						
Myrtaceae	<i>Hypocalymma robustum</i>		X									
Myrtaceae	<i>Kunzea ?glabrescens</i>								X			
Myrtaceae	<i>Kunzea glabrescens</i>		X				X					
Myrtaceae	<i>Leptospermum laevigatum</i>	*						X	X			
Myrtaceae	<i>Melaleuca lateritia</i>						X		X			X
Myrtaceae	<i>Melaleuca nesophila</i>								X			
Myrtaceae	<i>Melaleuca preissiana</i>			X		X	X					
Myrtaceae	<i>Melaleuca quinquenervia</i>	*							X			
Myrtaceae	<i>Melaleuca raphiophylla</i>						X		X			X
Myrtaceae	<i>Melaleuca thymoides</i>		X	X								

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Myrtaceae	Myrtaceae sp.		X	X								
Myrtaceae	<i>Pericalymma ellipticum</i>						X					
Myrtaceae	<i>Regelia inops</i>		X	X	X	X						
Myrtaceae	<i>Scholtzia involucrate</i>		X	X								
Myrtaceae	<i>Verticordia drummondii</i>			X								
Orchidaceae	<i>Caladenia flava</i>		X	X	X							
Orchidaceae	<i>Diuris corymbosa</i>		X									
Orchidaceae	<i>Prasophyllum parvifolium</i>		X									
Oxalidaceae	<i>Oxalis pes-caprae</i>	*							X			
Papaveraceae	<i>Fumaria capreolata</i>	*	X			X						
Pinaceae	<i>Pinus pinaster</i>	*	X						X			
Poaceae	<i>Amphipogon strictus</i>		X									
Poaceae	<i>Avena barbata</i>	*	X	X		X		X	X			
Poaceae	<i>Briza maxima</i>	*	X			X			X		X	X
Poaceae	<i>Briza minor</i>	*	X				X	X	X			
Poaceae	<i>Bromus diandrus</i>	*				X			X			
Poaceae	<i>Cenchrus clandestinus</i>	*					X		X			
Poaceae	<i>Cenchrus setaceus</i>	*	X	X				X				
Poaceae	<i>Cynodon dactylon</i>	*					X		X			
Poaceae	<i>Ehrharta calycina</i>	*	X	X					X		X	
Poaceae	<i>Ehrharta longiflora</i>	*							X			
Poaceae	<i>Eragrostis curvifolius</i>	*							X			
Poaceae	<i>Eragrostis curvula</i>	*	X						X			
Poaceae	<i>Lagurus ovatus</i>	*	X									
Poaceae	<i>Lolium sp.</i>		X									
Poaceae	<i>Paspalum sp.</i>	*										X
Poaceae	<i>Vulpia bromoides</i>	*	X									

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Polygonaceae	<i>Rumex crispus</i>	*					X					
Primulaceae	<i>Lysimachia arvensis</i>	*	X					X				
Proteaceae	<i>Adenanthos cygnorum</i>		X					X				
Proteaceae	<i>Adenanthos obovatus</i>			X	X	X						
Proteaceae	<i>Banksia attenuata</i>		8						X			
Proteaceae	<i>Banksia ilicifolia</i>		X				X					
Proteaceae	<i>Banksia menziesii</i>		7	X					X			
Proteaceae	<i>Banksia sessilis</i>		X									
Proteaceae	<i>Hakea lissocarpha</i>		X									
Proteaceae	<i>Hakea prostrata</i>		X									
Proteaceae	<i>Petrophile linearis</i>		X									
Proteaceae	<i>Stirlingia latifolia</i>		X					X				
Restionaceae	<i>Desmocladius flexuosus</i>		X									
Restionaceae	<i>Ficinia nodosa</i>								X			
Restionaceae	<i>Hypolaena exsulca</i>					X						
Restionaceae	<i>Leptocarpus coangustus</i>			X	X							
Rhamnaceae	<i>Spyridium globulosum</i>			X								
Rhamnaceae	<i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>			X								
Rosaceae	<i>Prunus cerasifera</i>	*							X			
Rosaceae	<i>Rubus laudatus</i>	*DP							X			
Rutaceae	<i>Philothea spicata</i>		X					X				
Solanaceae	<i>Solanum nigrum</i>	*	X					X	X			
Thymelaeaceae	<i>Pimelea</i> sp.		X									
Typhaceae	<i>Typha ?orientalis</i>	*							X			
Verbenaceae	<i>Lantana camara</i>	*DP & WoNS							X			
Violaceae	<i>Hybanthus calycina</i>		X									

Family	Taxon	Status	VT01	VT02	VT02a	VT02b	VT03	VT04	VT06	VT07	VT08	VT09
Xanthorrhoeaceae	<i>Arctotheca calendula</i>		X									
Xanthorrhoeaceae	<i>Xanthorrhoea gracilis</i>						X				X	
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>		X	X			X	X				
Zamiaceae	<i>Macrozamia riedlei</i>		X	X								

* denotes an introduced species, DP – Declared Pest, WONS Weed of National Significance

Flora species list – species x site

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Abutilon grandifolium</i>	*																	X					
<i>Acacia lasiocarpa</i>															X								
<i>Acacia longifolia</i>	*																				X		
<i>Acacia pulchella</i>			X					X								X	X						
<i>Acacia rostelifera</i>		X																					
<i>Acacia saligna</i>		X																	X				
<i>Acacia willdenowiana</i>													X										
<i>Adenanthos cygnorum</i>		X													X	X							
<i>Adenanthos obovatus</i>				X			X				X	X											
<i>Agave americana</i>	*																				X		
<i>Allocasuarina fraseriana</i>										X													
<i>Allocasuarina humilis</i>		X	X												X	X							
<i>Amphipogon strictus</i>			X																				
<i>Anigozanthos humilis</i>															X								
<i>Anigozanthos manglesii</i>								X							X								
<i>Apium prostratum</i>			X			X																	
<i>Arctotheca calendula</i>	*			X								X		X	X				X				
<i>Arctotheca calendula</i>						X																	
<i>Asparagus asparagoides</i>	*DP & WoNS							X									X	X					
<i>Asphodelus fistulosus</i>	*	X																					
<i>Astartea fascicularis</i>											X			X									
<i>Astroloma sp.</i>												X											
<i>Avena barbata</i>	*	X									X		X		X				X				
<i>Banksia attenuata</i>		X	X		X	X				X			X			X		X					

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Banksia ilicifolia</i>		X				X										X							
<i>Banksia menziesii</i>		X			X	X				X			X			X							
<i>Banksia sessilis</i>		X																					
<i>Bossiaea eriocarpa</i>			X												X	X							
<i>Brachyloma preissii</i> subsp. <i>obtusifolium</i>			X																				
<i>Brassica tournefortii</i>	*									X					X								
<i>Briza maxima</i>	*							X	X	X			X	X						X			
<i>Briza minor</i>	*									X					X	X	X			X			
<i>Bromus diandrus</i>	*													X						X			
<i>Burchardia congesta</i>			X		X			X															
<i>Caesalpinia gilliesii</i>						X																	
<i>Caladenia flava</i>		X		X	X	X	X						X										
<i>Callistemon</i> sp.																					X		
<i>Callitris preissii</i>		X																					
<i>Calothamnus sanguineus</i>		X																			X		
<i>Calytrix</i> sp.			X		X																		
<i>Carpobrotus edulis</i>	*														X								X
<i>Cassutha glabella</i>		X					X																
<i>Casuarina glauca</i>	*																				X		
<i>Casuarina</i> sp.	*	X																					
<i>Cenchrus clandestinus</i>	*																X	X					
<i>Cenchrus setaceus</i>	*														X	X							
<i>Centella asiatica</i>									X												X		
<i>Chamaecytisus palmensis</i>	*	X																		X			
<i>Chamaescilla corymbosa</i>			X			X																	

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Chamelaucium uncinatum</i>		X																					
<i>Conostephium pendulum</i>			X		X										X								
<i>Conostylis aculeata</i>															X								
<i>Conostylis juncea</i>					X																		
<i>Conostylis setigera</i>			X																				
<i>Conyza bonariensis</i>	*	X																	X				
<i>Corymbia calophylla</i>								X							X			X	X		X		
<i>Cynodon dactylon</i>	*																X	X	X				
Cyperaceae sp.														X									
<i>Dampiera linearis</i>		X			X										X								
<i>Dasypogon bromeliifolius</i>			X	X		X	X	X		X	X	X	X										
<i>Daucus glochidiatus</i>											X		X										
<i>Daviesia physodes</i>			X												X	X							
<i>Desmocladus flexuosus</i>			X							X			X			X							
<i>Dimorphotheca ecklonis</i>	*	X																					
<i>Diuris corymbosa</i>					X																		
<i>Drosera gigantea</i>																	X						
<i>Drosera leucablata</i>			X																				
<i>Drosera menziesii</i>		X	X		X																		
<i>Echium plantagineum</i>	*DP	X																					
<i>Ehrharta calycina</i>	*	X			X		X	X		X								X		X			X
<i>Ehrharta longiflora</i>	*																		X				
<i>Eragrostis curvifolius</i>	*																		X	X			
<i>Eragrostis curvula</i>	*															X		X					
<i>Eucalyptus ?patens</i>		X																					
<i>Eucalyptus maculata</i>	planted	X																					

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Eucalyptus marginata</i>		X																					
<i>Eucalyptus rudis</i>		X							X										X			X	
<i>Eucalyptus</i> sp.	*																	X	X		X		
<i>Eucalyptus todtiana</i>		X													X			X					
<i>Euchilopsis linearis</i>		X					X				X	X											
<i>Euphorbia peplus</i>	*					X																	
<i>Euphorbia terracina</i>	*														X			X	X				
Fabaceae sp.															X								
<i>Ficinia nodosa</i>																			X				
<i>Freesia alba x leichtlinii</i>	*	X																X					
<i>Fumaria capreolata</i>	*									X	X												
<i>Gastrolobium linearifolium</i>			X		X																		
<i>Geranium molle</i>	*					X																	
<i>Gladiolus caryophyllaceus</i>	*		X		X			X							X								
<i>Gompholobium tomentosum</i>			X		X			X							X	X							
<i>Hakea lissocarpha</i>		X																					
<i>Hakea prostrata</i>		X																					
<i>Hardenbergia comptoniana</i>																							
<i>Hibbertia huegelii</i>			X												X	X							
<i>Hibbertia hypericoides</i>		X	X							X			X		X								
<i>Hibbertia subvaginata</i>			X	X	X	X	X					X				X							
<i>Hovea trisperma</i>					X											X							
<i>Hyalosperma cotula</i>												X		X									
<i>Hybanthus calycina</i>		X																					
<i>Hypocalymma angustifolium</i>				X			X				X	X											

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Hypocalymma robustum</i>			X																				
<i>Hypochaeris glabra</i>	*		X	X	X	X	X			X	X	X	X	X					X				
<i>Hypolaena exsulca</i>														X									
<i>Jacksonia furcellata</i>		X			X			X					X		X		X						
<i>Jacksonia sternbergiana</i>														X									
<i>Juncus pallidus</i>									X								X		X				
<i>Kennedia prostrata</i>														X			X						
<i>Kunzea ?glabrescens</i>																						X	
<i>Kunzea glabrescens</i>		X											X		X								
<i>Lagenophora huegelii</i>						X																	
<i>Lagurus ovatus</i>	*															X							
<i>Lantana camara</i>	*DP & WoNS	X																					
<i>Lavandula dentata</i>	*																		X				
<i>Laxmannia ramosa</i>															X								
<i>Lepidosperma longitudinale</i>									X					X			X						
<i>Lepidosperma sp.</i>						X		X															
<i>Leptocarpus coangusttas</i>		X					X																
<i>Leptospermum laevigatum</i>	*	X													X								
<i>Leucopogon conostephioides</i>					X																		
<i>Leucopogon polymorphus</i>					X																		
<i>Lolium sp.</i>		X																					
<i>Lomandra caespitosa</i>			X																				
<i>Lomandra hermaphrodita</i>			X																				
<i>Lomandra preissii</i>								X															
<i>Lupinus angustifolius</i>	*																	X	X				

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Lupinus cosentinii</i>		X																					
<i>Lyginia barbata</i>			X		X	X	X																
<i>Lyginia imberbis</i>						X				X	X	X	X		X								
<i>Lysimachia arvensis</i>	*					X									X								
<i>Macrozamia riedlei</i>		X											X										
<i>Medicago polymorpha</i>	*																			X			
<i>Melaleuca lateritia</i>									X								X		X				
<i>Melaleuca nesophila</i>		X																					
<i>Melaleuca preissiana</i>				X							X			X			X						
<i>Melaleuca quinquenervia</i>	*	X																					
<i>Melaleuca raphiophylla</i>									X								X		X	X			
<i>Melaleuca thymoides</i>		X											X										
<i>Mesomelaena pseudostygia</i>															X								
<i>Moraea flaccida</i>	*DP																X						
<i>Myrtaceae sp.</i>			X	X																			
<i>Nuytsia floribunda</i>													X			X							
<i>Osteospermum ecklonis</i>	*	X																					
<i>Oxalis pes-caprae</i>	*																	X					
<i>Paspalum sp.</i>	*								X														
<i>Patersonia occidentalis</i>			X					X		X			X										
<i>Pelargonium capitatum</i>	*														X	X	X		X				
<i>Pericalymma ellipticum</i>		X																					
<i>Petrophile linearis</i>			X		X																		
<i>Petrorhagia dubia</i>	*													X									
<i>Philothea spicata</i>			X												X								

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Phlebocarya ciliata</i>			X	X	X		X	X			X	X			X								
<i>Pimelea</i> sp.			X																				
<i>Pinus pinaster</i>	*	X																				X	
<i>Podotheca gnaphalioides</i>														X									
<i>Prasophyllum parvifolium</i>			X																				
<i>Prunus cerasifera</i>	*																	X					
<i>Regelia inops</i>				X	X		X				X	X		X									
<i>Retama raetam</i>	*	X														X							
<i>Rhodanthe citrina</i>														X									
<i>Ricinus communis</i>	*	X																					
<i>Romulea rosea</i>	*					X		X												X			
<i>Rubus laudatus</i>	*DP	X																					
<i>Rumex crispus</i>	*																X						
<i>Schinus terebinthifolius</i>	*																	X		X			
<i>Schoenus curvifolius</i>				X			X																
<i>Schoenus</i> sp.				X								X											
<i>Scholtzia involucrate</i>										X		X											
<i>Senecio condylus</i>							X																
<i>Silene gallica</i>	*													X									
<i>Solanum nigrum</i>	*					X									X			X					
<i>Sonchus oleraceus</i>	*					X									X								
<i>Spyridium globulosum</i>		X																					
<i>Stirlingia latifolia</i>			X												X	X							
<i>Thysanotus patersonii/manglesianus</i>			X																				
<i>Tricoryne elatior</i>								X															

Taxon	Status	OPP	Q 01	Q 02	Q 03	Q 04	Q 05	Q 06	Q 07	Q 08	Q 09	Q 10	Q 11	Q 12	R 01	R 02	R 03	R 04	R 05	R 06	R 07	R 08	R 09
<i>Trifolium arvense</i>	*									X													
<i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>		X																					
<i>Typha ?orientalis</i>	*	X																					
<i>Ursinia anthemoides</i>	*		X	X	X		X			X	X	X	X						X				
<i>Verticordia drummondii</i>		X																					
<i>Vicia sativa</i>	*																X						
<i>Vulpia bromoides</i>	*									X													
<i>Wahlenbergia capensis</i>	*									X													
<i>Watsonia meriana</i> var. <i>bulbillifera</i>	*														X								
<i>Watsonia meriana</i> var. <i>meriana</i>	*																X	X					
<i>Xanthorrhoea gracilis</i>								X									X						
<i>Xanthorrhoea preissii</i>		X			X	X							X		X	X							
<i>Zantedeschia aethiopica</i>	*DP																X						

* denotes an introduced species, DP – Declared Pest, WONS Weed of National Significance

Flora likelihood of occurrence assessment guidelines

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

Source information - desktop searches

NM – DBCA *NatureMap* (accessed September 2017)

DBCA – DBCA (2007–) records of threatened flora, database search within the study area (accessed September 2017)

PMST – DEE Protected Matters Search Tool (PMST) to identify flora listed under the EPBC Act potentially occurring within the study area (accessed September 2017)

Definitions

Term	Description
study area	a 5 km buffer around the survey area
survey area	the area subject to the current survey
T	Threatened
Cr	Critically Endangered
En	Endangered
Vu	Vulnerable
P1 – P4	Priority 1 – Priority 4

Flora likelihood of occurrence assessment for conservation significant flora

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
Amaranthaceae	<i>Ptilotus pyramidatus</i>	T	Cr	<p>Small herb up to 5 cm tall. The erect stem is tufted, unbranched, finely striated, hairy and greyish in colour. Flowers are a greenish-yellow colour and arranged in dense, pyramid-shaped spikes about 2.5 cm long (DEE 2018). Flowering occurs in early October. Sandy clay. Floodplains.</p> <p>Previous records have been found on floodplains growing under <i>Melaleuca acutifolia</i> and <i>Verticordia</i> sp. shrubland in grey sandy loam/clay.</p>	<p>There are only four records of this species from the one location – the Brixton St Wetland (bush forever site 387) (records from 2010, 2013, 2018) (DBCA 2007–). The Brixton St wetlands are located immediately east of the study area. The population is extremely localised and its total area of occupancy is less than 0.2 ha (Davis and Tauss 2011). The Greater Brixton Street Wetlands and about 400 ha of the adjoining rural lands have been searched in several intensive, multi-season surveys (e.g. Tauss & Weston 2010 cited in Davis & Tauss 2011) and no other occurrences of the Pyramid Mulla-mulla have been found. It is unlikely that other populations will be located in the Swan Coastal Plain as the</p>	<p>Unlikely – although the survey was not undertaken in the optimal flowering period for this species there is no suitable habitat within the study area which matches its known habitat requirements. This species is known to have specific habitat requirements which is scarce on the Swan Coastal Plain and have previously been thoroughly surveyed (DEE 2018).</p>	<p>EPBC, NM, DBCA</p>

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
					habitat of this species is scarce and has been thoroughly explored due to its high conservation values (Davis & Tausse 2011).		
Amaranthaceae	<i>Ptilotus sericostachyus</i> subsp. <i>roseus</i>	P1		Prostrate to ascending perennial, herb. Fl. pink-white, Sep to Dec.	There are two records just within 5 km of the survey area.	Unlikely – no habitat description is available for this species. This species is not cryptic and the survey was undertaken during the reported flowering period.	NM, DBCA
Apiaceae	<i>Eryngium pinnatifidum</i> subsp. <i>palustre</i>	P3		Tuberous perennial herb (20 cm). White-pale blue flowers, Sep to Nov. Grey sand. Winter wet depressions	There are records less than 1 km of the survey area from Brixton Road.	Unlikely – limited suitable habitat was found within the survey area. However, this species is not cryptic and the survey was undertaken during the reported flowering period.	NM, DBCA
Apiaceae	<i>Eryngium sp. subdecumbens</i>	P3		Caespitose perennial herb. Flowers greenish, Sep to Nov. Winter wet depressions	There are two records less than 1 km of the survey area from Brixton Road.	Unlikely – limited suitable habitat was found within the survey area. However, this species is not cryptic and the survey was undertaken during the reported flowering period.	NM, DBCA
Aponogetonaceae	<i>Aponogeton hexatepalus</i>	P4		Rhizomatous or cormous, aquatic perennial, herb, leaves floating. Fl. green-white, Jul to Oct. Mud. Freshwater: ponds, rivers, claypans.	There is a record less than 600 m from the survey area, located within the Brixton St Wetlands.	Unlikely – areas with open water within the survey area were associated with drainage and were highly degraded. Therefore no suitable habitat is present. There is suitable habitat in	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						areas immediately adjacent to the survey area.	
Araliaceae	<i>Hydrocotyle lemnoides</i>	P4		Aquatic, floating annual, herb. Fl. purple, Aug to Oct. Swamps.	There are records less than 1 km of the survey area, including within the Brixton St Wetlands.	Unlikely – areas with open water within the survey area were associated with drainage and were highly degraded. Therefore no suitable habitat is present. There is suitable habitat in areas immediately adjacent to the survey area.	NM, DBCA
Araliaceae	<i>Hydrocotyle striata</i>	P1		Herb. Clay. Springs. Winter wet creek	There is one record within 5 km of the survey area.	Unlikely – no suitable habitat present within the survey area.	NM, DBCA
Asparagaceae	<i>Chamaescilla gibsonii</i>	P3		Clumped tuberous, herb. Fl. blue, Sep. Clay to sandy clay. Winter-wet flats, shallow water-filled claypans.	There is a record less than 500 m of the survey area, located within the Brixton St Wetlands.	Unlikely – very limited suitable habitat present within the survey area. This species can be cryptic and the survey was undertaken during the reported flowering period.	NM, DBCA
Asparagaceae	<i>Thysanotus anceps</i>	P3		Rhizomatous, leafless perennial, herb, to 0.4 m high. Fl. purple, Oct to Dec. White or grey sand, lateritic gravel, laterite. Also some granite outcrops.	There are two records just within 5 km of the survey area (in Forrestfield). To note, the location description on FloraBase for these records identifies them as occurring within the Kalamunda area and does not match with the	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
					location shown on NatureMap.		
Asparagaceae	<i>Thysanotus</i> sp. Badgingarra (E.A. Griffin 2511)	P2		Perennial, herb (with tuberous roots), ca 0.35 m high. Fl. blue, Dec. Grey sand with lateritic gravel.	There is a record less than 600 m west of the survey area, located within Bush Forever site 456 (Nicholson Rd Reserve).	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Byblidaceae	<i>Byblis gigantea</i>	P3		Small, branched perennial, herb (or sub-shrub), to 0.45 m high. Fl. pink-purple/white, Sep to Dec or Jan. Sandy-peat swamps. Seasonally wet areas.	There is one record within 1 km of the survey area in Canning Vale.	Unlikely – limited suitable habitat was found within the survey area which is predominantly in degraded condition. Species previously recorded <5 km away. The survey was undertaken during the reported flowering period.	NM, DBCA
Celastraceae	<i>Tripterococcus</i> sp. Brachylobus (A.S. George 14234).	P4		Erect perennial herb 80 cm high and 15 cm wide. Flowers green to yellow, Nov to Dec. Grey sand.	There is one record within 1 km of the survey area located in remnant bushland in Canning Vale.	Unlikely - suitable habitat was found within the survey area (VT01, VT02, VT02a and VT08); however if present, was expected to be recorded based on extensive survey effort.	NM, DBCA
Centrolepidaceae	<i>Centrolepis caespitosa</i>	P4		Tufted annual, herb (forming a rounded cushion up to 25 mm across). Fl. Oct to Dec. White sand, clay. Salt flats, wet areas.	Records are greater than 5 km from the survey area.	Unlikely – limited suitable habitat was found within the survey area. The survey was undertaken during the reported flowering time.	NM, DBCA
Cyperaceae	<i>Carex tereticaulis</i>	P3		Monoecious, rhizomatous, tufted perennial, grass-like or herb (sedge), 0.7 m high. Fl.	There is one record located less than 500 m of the survey area,	Unlikely – some suitable habitat was found within the survey area however	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				brown, Sep to Oct. Black peaty sand.	located along the bank of the Canning River.	it is predominately in degraded condition. This species can be cryptic however the survey was undertaken during the reported flowering period.	
Cyperaceae	<i>Cyathochaeta teretifolia</i>	P3		Rhizomatous, clumped, robust perennial, grass-like or herb (sedge), to 2 m high, to 1.0 m wide. Fl. brown. Grey sand, sandy clay. Swamps, creek edges.	There is one record within 5 km of the survey area, recorded at Emma Treeby reserve, Banjup.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Cyperaceae	<i>Eleocharis keigheryi</i>	T	Vu	Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high. Fl. green, Aug to Nov. Clay, sandy loam. Emergent in freshwater: creeks, claypans.	There is a record less than 500 m of the survey area, located within the Brixton St Wetlands.	Unlikely – no suitable habitat was found within the survey area. This species can be cryptic however the survey was undertaken during the reported flowering period. There is suitable habitat immediately adjacent to the survey area.	EPBC, NM, DBCA
Cyperaceae	<i>Lepidosperma rostratum</i>	T	En	Rhizomatous, tufted perennial, grass-like or herb (sedge), 0.5 m high. Flowers brown. The species grows in peaty sand and clay amongst low heath, in winter-wet swamps (DEE 2018). Flowering May to June and the distinctive fruits are beaked toward the base of the style, and generally appear between late June and August.	There are records less than 500 m from the survey area, including the Brixton St Wetlands.	Unlikely – limited suitable habitat was found within the survey area. This species is not cryptic and the survey was undertaken during the reported flowering period.	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
Cyperaceae	<i>Schoenus benthamii</i>	P3		Tufted perennial, grass-like or herb (sedge), 0.15-0.45 m high. Fl. brown, Oct to Nov. White, grey sand, sandy clay. Winter-wet flats, swamps.	There are records less than 500 m of the survey area, including within the Brixton St Wetlands.	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT02, VT02a, VT09. This species can be cryptic, but targeted surveys were undertaken during the reported flowering period.	NM, DBCA
Cyperaceae	<i>Schoenus capillifolius</i>	P3		Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 m high. Fl. green, Oct to Nov. Brown mud. Claypans.	There are records less than 1 km of the survey area, including within the Brixton St Wetlands.	Unlikely – no suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT09. This species can be cryptic, but the survey was undertaken during the reported flowering period.	NM, DBCA
Cyperaceae	<i>Schoenus loliaceus</i>	P2		Annual, grass-like or herb (sedge), 0.03-0.06 m high. Fl. Aug to Nov. Sandy soils. Winter-wet depressions.	There is a record less than 500 m from the survey area, located within the Brixton St Wetlands.	Unlikely – limited suitable habitat was found within the survey area. This species can be cryptic, but the survey was undertaken during the reported flowering period.	NM, DBCA
Cyperaceae	<i>Schoenus natans</i>	P4		Aquatic annual, grass-like or herb (sedge), 0.3 m high. Fl. brown, Oct. Winter-wet depressions.	There is a record less than 500 m of the survey area, located within the Brixton St Wetlands.	Unlikely – very limited suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT09. Extensive targeted survey	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						effort was undertaken during spring.	
Cyperaceae	<i>Schoenus pennisetis</i>	P3		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.	There are records less than 1 km of the survey area. The closest record is less than 200 m away, however this record no longer exists as it is now housing.	Unlikely – some suitable habitat was found within the survey area. This species can be cryptic, but the survey was undertaken during the reported flowering period.	NM, DBCA
Cyperaceae	<i>Schoenus</i> sp. Beaufort (G.J. Keighery 6291)	P1		Annual, grass-like or herb (sedge), ca 0.05 m high. Fl. green. Sep – Oct. Mud. Winter-wet claypans.	There are records less than 500 m of the survey area, located within the Brixton St Wetlands.	Unlikely – very limited suitable habitat was found within the survey area. This species can be cryptic, but the survey was undertaken during the reported flowering period.	NM, DBCA
Cyperaceae	<i>Schoenus</i> sp. Waroona (G.J. Keighery 12235)	P3		Tufted annual, grass-like or herb (sedge), 0.02-0.06 m high. Fl. brown-red-green, Oct to Nov. Clay or sandy clay. Winter-wet flats.	There is a record within 1 km of the survey area on Brixton Street.	Unlikely – very limited suitable habitat is available within the survey area. Suitable vegetation types within the survey area may include VT09. This species can be cryptic, but the survey was undertaken during the reported flowering period.	NM, DBCA
Cyperaceae	<i>Tetraria australiensis</i>	T	Vu	Rhizomatous, tufted perennial, grass-like or herb (sedge), to 1 m high. Fl. brown, Nov to Dec. Has been recorded on yellow and grey sand, moist grey sandy loam/light clay in open	Species has been recorded within 5 km of the survey area.	Possible – suitable habitat was found within the survey area. This species can be cryptic and the survey was not undertaken during the reported flowering period.	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				sedgelands amongst open marri/jarrah woodlands.		Suitable vegetation types within the survey area may include VT04, VT08 and VT09.	
Dasygogonaceae	<i>Calectasia cyanea</i>	T	Cr	Rhizomatous, clump forming, woody perennial, herb, 0.1-0.6 m high, to 0.3 m wide. Flowers blue/purple, June to October. White, grey or yellow sand, gravel.	There is one record of this species occurring within 1 km of the survey area, within the Brixton St Wetlands.	Unlikely – very limited suitable habitat was found within the survey area. However, this species is not cryptic and the survey was undertaken during the reported flowering period.	NM
Dilleniaceae	<i>Hibbertia montana</i>	P4		Erect, straggling or sprawling shrub, 0.1-0.7 m high. Fl. yellow, Jul to Oct. Loam over granite, lateritic soils, gravel. Granite rocks, lateritic ridges & boulders, hills.	The closest record is approximately 5 km north-east of the survey area.	Unlikely –No suitable habitat found within the survey area	NM, DBCA
Ericaceae	<i>Andersonia gracilis</i>	T	En	Slender erect or open straggly shrub, 0.1-0.5 m high. Flowers white-pink-purple from September to November. White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	There is a record less than 500 m from the survey area.	Unlikely – limited suitable habitat was found within the survey area. This species is not cryptic and the survey was undertaken during the reported flowering period	EPBC, NM, DBCA
Ericaceae	<i>Styphelia filifolia</i>	P3		Shrub, ca 50 cm. Flowers white February-March. Brown-grey sand. Associated with <i>Banksia</i> woodland.	There are four records less than 1 km of the survey area, including within Ken Hurst Park and remnant bushland just west of the Kwinana Freeway.	Unlikely – suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT01, VT02, VT02a. Surveys were undertaken outside the flowering period for this	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						species, however this species is not cryptic.	
Fabaceae	<i>Acacia anomala</i>	T	Vu	Slender, rush-like shrub, 0.2-0.5 m high. Fl. yellow, Aug to Sep. Lateritic soils. Slopes.	Species previously recorded over 5 km from the survey area.	Unlikely – no suitable habitat found within the survey area.	EPBC
Fabaceae	<i>Acacia benthamii</i>	P2		Shrub, ca 1 m high. Fl. yellow, Aug to Sep. Sand. Typically on limestone breakaways.	There is one record within 5 km of the survey area.	Unlikely – no suitable habitat found within the survey area.	NM, DBCA
Fabaceae	<i>Acacia horridula</i>	P3		Harsh, slender, single-stemmed shrub, 0.3-0.6(-1) m high. Fl. yellow, May to Aug. Gravelly soils over granite, sand. Rocky hillsides.	There is one record within 5 km of the survey area.	Unlikely – no suitable habitat found within the survey area.	NM, DBCA
Fabaceae	<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant (G.J. Keighery 5026)	P1		Shrub, 0.4-1.5 m high. Fl. yellow, May or Aug. Grey or black sand over clay. Swampy areas, winter wet lowlands.	There are a number of records located within 5 km of the survey area, including the Brixton St Wetlands.	Unlikely – limited suitable habitat was found within the survey area, however these areas are predominantly cleared/highly disturbed. This species is not cryptic.	NM, DBCA
Fabaceae	<i>Acacia oncinophylla</i> subsp. <i>patulifolia</i>	P4		Shrub, 0.5-2.5(-3) m high, 'minni-ritchi' bark, phyllodes 4-9 cm long, 3-6 mm wide. Fl. yellow, Aug to Nov or Nov to Dec. Granitic soils, occasionally on laterite.	The closest records are over 5 km from the survey area, located along the Darling Scarp.	Unlikely –no suitable habitat found within the survey area.	NM, DBCA
Fabaceae	<i>Isotropis cuneifolia</i> subsp. <i>glabra</i>	P2		Prostrate to ascending, spreading perennial, herb or shrub, 0.05-0.15 m high. Fl. yellow/orange & red, Sep. Sand, clay loam. Winter-wet flats.	There is a record less than 700 m from the survey area, located within the Brixton St Wetlands.	Unlikely – limited suitable habitat is present within the survey area. This species can be cryptic, however the survey was undertaken during the reported flowering period.	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
Fabaceae	<i>Jacksonia gracillima</i>	P3		Perennial tufted herb with narrow leaves 10-40 cm long, with rose pink flowers, Oct-Nov. Grey sand, winter wet.	There are three records of this species within 5 km of the survey area, in Bodallin Crescent Reserve, Tom Bateman Reserve and east of Roe Swamp in Beelier Regional Park.	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT02, VT02a. Targeted searches for this species were undertaken during the reported flowering period. This species has been recorded adjacent to the survey area near Cameron Street.	NM, DBCA
Fabaceae	<i>Jacksonia sericea</i>	P4		Low spreading shrub, to 0.6 m high. Fl. orange, usually Dec or Jan to Feb. Calcareous & sandy soils.	The closest records are approximately 5 km north and west of the survey area.	Unlikely - no suitable habitat found within the survey area.	NM, DBCA
Goodeniaceae	<i>Dampiera triloba</i>	P3		Erect perennial, herb or shrub, to 0.5 m high. Fl. blue, Aug to Dec. Loamy sand	There are records within 5 km of the survey area, located around Bibra Lake.	Unlikely - some suitable habitat was found within the survey area. This species is not cryptic and the survey was undertaken during the reported flowering period.	NM, DBCA
Haemodoraceae	<i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>	P4		Rhizomatous, stoloniferous perennial, grass-like or herb, 0.06-0.18 m high. Fl. yellow, Aug to Oct. White, grey or yellow sand. Consolidated dunes.	Closest record is over 50 km from the survey area.	Unlikely – Records of this species are confined to the coastline north of Wanneroo.	NM
Haemodoraceae	<i>Haemodorum loratum</i>	P3		Bulbaceous, perennial, herb, 0.45-1.2(-2) m high. Fl.	There is one record within 1 km of the survey area, located	Unlikely – some suitable habitat was found within the survey area. Suitable	NM

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				black/brown-black/green, Nov. Grey or yellow sand, gravel.	within the Brixton St Wetlands.	vegetation types within the survey area may include VT01, VT02, VT02a and VT08. Extensive targeted survey effort was undertaken during spring.	
Haemodoraceae	<i>Haloragis scoparia</i>	P1		Perennial, herb, 0.3-0.6 m high. Clay over Limestone	There are two records within 5 km of the survey area.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Haemodoraceae	<i>Meionectes tenuifolia</i>	P3		Annual semi aquatic herb. Flowers in Oct – Nov. Moist sandy clay.	There is one record within 5 km of the survey area in the Maddington area.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Haemodoraceae	<i>Myriophyllum echinatum</i>	P3		Erect annual, herb, 0.02-0.03 m high. Fl. red, Nov. Clay. Winter-wet flats.	There are two records of this species occurring within 5 km of the survey area, within the Brixton St Wetlands.	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT09. Extensive targeted survey effort was undertaken during spring.	NM, DBCA
Haemodoraceae	<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3		Shortly rhizomatous, compactly tufted perennial, grass-like or herb, 0.15-0.4 m high. Fl. cream-white, Aug to Oct. White or grey sand, lateritic gravel. Associated with <i>Banksia</i> woodland.	There is one historic record located less than 200 m west of the survey area, on Prinsep Road, Jandakot.	Unlikely – some suitable habitat was found within the survey area. However, this species is not cryptic and the survey was undertaken during the reported flowering period.	NM, DBCA
Macarthuriaceae	<i>Macarthuria keigheryi</i>	T	En	Erect or spreading perennial, herb or shrub, 0.2-0.4 m high, 0.3-0.6 m wide. Flowers September to December or February to March. White or grey sand.	The closest records occur over 3 km north of the study area.	Unlikely – no suitable habitat was found within the survey area. The survey was undertaken during the reported flowering period, however	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				Five of the six known populations occur within a 5 km radius of Welshpool and Kewdale area. These populations are found in low-lying winter-wet damp, grey/white sands and grows in open patches with low tree canopy cover among heathland, jarrah (<i>Eucalyptus marginata</i>) and <i>Allocasuarina/Banksia</i> woodland at Welshpool and Kewdale.		this species can be cryptic.	
Malvaceae	<i>Lasiopetalum bracteatum</i>	P4		Erect, open shrub, 0.4-1.5 m high. Fl. pink-purple, Aug to Nov. Sandy clay, clay, lateritic gravel. Along drainage lines, creeks, gullies, granite outcrops.	The closest record is over 5 km from the survey area.	Unlikely – some suitable habitat was found within the survey area, however the survey was undertaken during the reported flowering period and would have been identified if present.	NM, DBCA
Malvaceae	<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>	P3		Branched shrub, 1 m high. Fl pink, Sep to Dec. Brown clayey sand over granite	There are records just within 5 km of the survey area, north-east of the Brixton St Wetlands.	Unlikely – no suitable habitat was found within the survey area. The survey was undertaken during the reported flowering period.	NM, DBCA
Menyanthaceae	<i>Ornduffia submersa</i>	P4		Aquatic annual, 0.3 cm high. Fl white, Oct to Nov. Wetland	There are records less than 1 km from the survey area, including the Brixton St Wetlands.	Unlikely – areas with open water within the survey area were associated with drainage and were highly degraded. Therefore no suitable habitat is present. There is suitable habitat in	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						areas immediately adjacent to the survey area.	
Myrtaceae	<i>Babingtonia urbana</i>	P3		Spreading shrub to 1 m tall x 1.5 m wide. Flowers pink, Jan to Feb. Winter wet.	There is a record less than 500 m from the survey area in Kenwick.	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT09. The survey was undertaken outside the flowering period, but this species is not cryptic.	NM, DBCA
Myrtaceae	<i>Beaufortia purpurea</i>	P3		Erect or spreading shrub, 0.3-1.5 m high. Fl. red-purple, Oct to Dec or Jan to Feb. Lateritic or granitic soils. Rocky slopes.	There is one record just within 5 km of the survey area.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Myrtaceae	<i>Calytrix breviseta</i> subsp. <i>breviseta</i>	T	En	The swamp starflower is a free-standing shrub with widely-spaced, spreading-ascending leaves that can reach 40 cm in height (DEE 2018). Flowers purple-blue, from October to November. Occurs on sandy clay on swampy flats. The swamp starflower occurs in the Kenwick area of Perth. Historically, the species was also known from Gosnells and Bellevue, but it is now extinct in these areas. The species is restricted to winter-wet clay flats with low shrubs or jarrah forest. Germination is likely to be stimulated by fire or smoke, however, germination has also	The closest known records are situated 2-3 km north-east of the survey area, within the Brixton St wetlands.	Unlikely – some suitable habitat was found within the survey area associated with seasonally wet plains and sandy clay soils however majority of these areas were cleared or degraded. The survey was undertaken outside the flowering period. Mapping by DEE (DEE 2018) identifies the northern section of the survey area as being within where the 'species or species habitat is likely to occur'. However no suitable habitat for this	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				been observed in the absence of disturbance. In 2003 the species was recorded as having two populations, with the first divided into four sub-populations on the basis of land tenure. In 2007, a further 20 plants were discovered during a flora survey of the Greater Brixton St wetlands and were determined to be a new population (DEE 2018).		species was identified within this area as the majority has been cleared/highly disturbed.	
Myrtaceae	<i>Chamelaucium</i> sp. Gingin (N.G. Marchant 6)	T	En	Erect open branching shrub with white flowers. Height: to ca 1.8 m. Fl white, Sep - Dec. white/grey sand.	The closest known records are over 50 km north of the survey area, from the Gingin area.	Unlikely – there are no known records in close proximity to the survey area.	EPBC
Myrtaceae	<i>Darwinia apiculata</i>	T	En	Densely branched shrub, 0.4-0.5 m high. Fl. green & yellow/red, Oct. Lateritic soils.	The closest known records are located over 5 km from the survey area along the Darling Scarp.	Unlikely – no suitable habitat was found within the survey area.	EPBC
Myrtaceae	<i>Eucalyptus x balanites</i>	T	En	(Mallee), to 5 m high, bark rough, flaky. Fl. white, Oct to Dec or Jan to Feb. Sandy soils with lateritic gravel.	The closest known record is over 10 km south-east of the survey area.	Unlikely – no suitable habitat was found within the survey area.	EPBC
Myrtaceae	<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4		Erect shrub, 0.2-0.75 m high. Fl. pink, May or Nov to Dec or Jan. Sand, sandy clay. Winter-wet depressions.	There are a number of records less than 1 km from the survey area, including within the Brixton St Wetlands and Nicholson Road Reserve.	Unlikely – limited suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT02 and VT09. Extensive targeted survey effort was undertaken	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						during spring. This species is not cryptic.	
Orchidaceae	<i>Caladenia huegelii</i>	T	En	Tuberous, perennial, herb, 0.25-0.6 m high. Flowers green & cream & red, September to October. Grey or brown sand, clay loam. The King Spider-orchid grows in well-drained, deep sandy soils in low mixed woodlands of Coast Banksia (<i>Banksia attenuata</i>), Firewood Banksia (<i>B. menziesii</i>), Holly-leaved Banksia (<i>Banksia ilicifolia</i>), Western Sheoak (<i>Allocasuarina fraseriana</i>) and Jarrah (<i>Eucalyptus marginata</i>). It tends to favour areas of lush undergrowth (DEE 2018). The preferred soil conditions are variable and range from wet to moist to dry. The species is killed by fire when flowers or leaves are present and its growth is suppressed by weed invasion (DEE 2018). The King Spider-orchid flowers from September to October and is thought to fruit in the same season. The species dies back to underground tubers over summer. Plants may not flower each year. However, after disturbance to the canopy, or following summer fire, this	There are multiple records of this species within 1 km of the survey area, with the closest known record approximately 11 m from the survey area boundary. A number of these records no longer exist due to clearing for urban development.	Known – suitable habitat was found within the survey area. The area marked as 'Not Surveyed' in this report is a known location for this species. This species has also been recorded from Ken Hurst Park. Whilst this species can be cryptic, targeted surveys for this species were undertaken during the reported flowering period.	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				species can be found flowering profusely (DEE 2018).			
Orchidaceae	<i>Diuris micrantha</i>	T	Vu	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown, Sep to Oct. Brown loamy clay. Winter-wet swamps, in shallow water. This species is known from seven populations, from east of Kwinana and south towards the Frankland area, Western Australia. It is found in small populations, on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps. The bases of the flowering plants are often covered with shallow water (DEE 2018).	The closest known record is over 10 km south of the survey area.	Unlikely – There is limited suitable habitat for this species. Previous records are located over 10 km away.	EPBC
Orchidaceae	<i>Diuris purdiei</i>	T	En	Tuberous, perennial, herb, 0.15-0.35 m high. Flowers yellow, from late September to mid-October, but only after a summer or early autumn fire (Brown et al. 1998). It grows on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath with scattered emergent <i>Melaleuca preissiana</i> , <i>Eucalyptus calophylla</i> , <i>E. marginata</i> and <i>Nuytsia floribunda</i> (DEE 2018).	The closest known records are approximately 1.6 km south of the survey area	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area include VT02, VT03, VT08 and VT09. Targeted searches for this species were undertaken throughout the survey area during the reported flowering period.	EPBC, NM, DBCA
Orchidaceae	<i>Drakaea elastica</i>	T	En	Tuberous, perennial, herb, 0.12-0.3 m high. Flowers red and green and yellow. Flowers are	There are two records less than 1 km south of the survey area. One of	Unlikely – some suitable habitat was found within the survey area. Suitable	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				<p>first seen in late September and continue flowering until late October or more rarely early November. Individual plants may not flower every year. The plant dies back to a dormant underground tuber over summer. The best time to look for the plant is in July and August when the leaves are relatively conspicuous (DEE 2018).</p> <p>Occurs on bare patches of white or grey sand in low-lying situations adjoining winter-wet swamps. This hammer-orchid species occurs in south-west Western Australia and grows at only 42 locations with a total population size of around 230 plants. To survive, the orchid relies on a specific fungus which assists germination and provides nutrients. It is also dependent on a single species of wasp that pollinates its flowers (DEE 2018).</p>	these records no longer exists due to clearing for housing, the other is within the Jandakot airport.	vegetation types within the survey area include VT01, VT02 and VT08. Targeted searches for this species were undertaken during the reported flowering period.	
Orchidaceae	<i>Drakaea micrantha</i>	T	Vu	<p>Tuberous, perennial, herb, 0.15-0.3 m high. Flowers red & yellow, September to October. The Dwarf Hammer-orchid is known from 32 small, scattered populations from Perth to Albany, with secure populations in Frankland National Park. The</p>	There are three historical records within 3 km of the study area, with one less than 1 km. However this population no longer exists due to housing development.	Unlikely – suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT01, VT02 and VT02a. Targeted searches for this species	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				populations are often very difficult to locate from year-to-year, as they do not necessarily flower annually (Brown et al. 1998; Hoffman & Brown 1992; Robinson & Coates 1995). The Dwarf Hammer-orchid is usually found on cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed (Brown et al. 1998; Hearn et al. 2006). This suggests that the plants may need a disturbance event at some point, and that plants regenerate from soil stored seed after such an event (WA DEC 2007). The Dwarf Hammer-orchid occurs in infertile grey sands, in Jarrah (<i>Eucalyptus marginata</i>) and Common Sheoak (<i>Allocasuarina fraseriana</i>) woodland or forest associated with <i>Banksia</i> species (DEE 2018).		were undertaken throughout the survey area during the reported flowering period.	
Orchidaceae	<i>Microtis quadrata</i>	P4		Erect herb 40 cm, green/cream flowers, Oct to Dec. Swamps. Known to occur in black peaty soil of Lake Jandakot.	The closest record is approximately 3 km south-west of the survey area (Lake Jandakot).	Unlikely – limited suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT03 and VT09. Extensive targeted survey effort was undertaken during spring.	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
Orchidaceae	<i>Thelymitra dedmaniarum</i>	T	En	Tuberous, perennial, herb, to 0.8 m high. Fl. yellow, Nov to Dec or Jan. Granite.	Previously recorded over 20 km from the survey area.	Unlikely – no suitable habitat was found within the survey area.	EPBC
Orchidaceae	<i>Thelymitra stellata</i>	T	En	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow & brown, Oct to Nov. Sand, gravel, lateritic loam.	Previously recorded over 5 km from the survey area.	Unlikely – no suitable habitat was found within the survey area.	EPBC
Orchidaceae	<i>Thelymitra variegata</i>	P2		Tuberous, perennial, herb, 0.1-0.35 m high. Fl. orange & red & purple & pink, Jun to Sep. Sandy clay, sand, laterite. Has been recorded in yellow sand associated with <i>Banksia attenuata</i> , <i>Allocasuarina fraseri</i> and <i>Hibbertia hypericoides</i> in the Jandakot area.	The closest known record is from Yangebup Lake, approximately 2 km west of the survey area.	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT01. The survey and targeted searches for this species were undertaken during the reported flowering period.	NM, DBCA
Poaceae	<i>Austrostipa bronwenae</i>	T	Cr	Robust grass 60 cm high, Flowers green, in September. Sandy loam.	Previously recorded less than 5 km from the survey area.	Unlikely – some suitable habitat was found within the survey area. However, the survey was undertaken during the optimal flowering period and has been thoroughly surveyed.	NM, DBCA
Polygalaceae	<i>Comesperma griffinii</i>	P2		Annual or perennial, herb, to 0.15 m high. Fl. white, Oct. Yellow or grey sand. Plains.	There are records less than 1 km from the survey area, located within the Brixton St Wetlands.	Unlikely – suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT01, VT02, VT02a and VT08. Targeted surveys for this species were undertaken	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						during the reported flowering period.	
Polygalaceae	<i>Comesperma rhadinocarpum</i>	P2		Perennial, herb. Fl. blue, Oct to Nov. White sandy soils.	There is one record within 1 km of the survey area located in a nature reserve in Kenwick.	Unlikely – suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT01, VT02, VT02a and VT08. Targeted surveys for this species were undertaken during the reported flowering period.	NM, DBCA
Portulacaceae	<i>Calandrinia</i> sp. Piawaning (A.C. Beaglehole 12257)	P1		Decumbent to erect annual, herb, to 0.08 m high. Fl. pink, Oct. Brown/gey silty sandy loam over granite. Near pools, small rise within large saline valley flats, disturbed shrubland.	There are a number of records located within 5 km of the survey area, within the Brixton St Wetlands.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Proteaceae	<i>Banksia mimica</i>	T	En	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.	Species previously recorded <5 km away	Unlikely – no suitable habitat was found within the survey area.	EPBC, NM, DBCA
Proteaceae	<i>Banksia pteridifolia</i> subsp. <i>vernalis</i>	P3		Prostrate, lignotuberous shrub, to 0.4 m high. Fl. cream-white/yellow, Sep to Oct. White/grey sand over laterite.	There is one record within 5 km of the survey area.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Proteaceae	<i>Conospermum undulatum</i>	T	Vu	Erect, compact shrub, 0.6-2 m high. Fl. white-other, May to Oct. Grey or yellow-orange clayey sand.	Previously recorded within 5 km of the survey area.	Unlikely – some suitable habitat was found within the survey area. The survey was undertaken during the optimal flowering period and this species is not cryptic.	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
Proteaceae	<i>Grevillea curviloba</i> subsp. <i>incurva</i>	T	En	Prostrate to erect shrub, 0.1-2.5 m high. Fl. white-cream, Aug to Sep. Sand, sandy loam. Winter-wet heath.	The closest known record is over 10 km north of the survey area.	Unlikely – suitable habitat was found within the survey area however previous records of this species have been found over 10 km north of the survey area.	EPBC
Proteaceae	<i>Grevillea thelemanniana</i> subsp. <i>thelemanniana</i>	T	Cr	Spreading, lignotuberous shrub, 0.3-1.5 m high. Flowers pink-red, May to November. Sand, sandy clay. Winter-wet low-lying flats	There are a number of records less than 1 km from the survey area, with the closest known record approximately 150 m away. A number of the records are from Brixton St Wetlands.	Unlikely – some suitable habitat was found within the survey area. However, this species is not cryptic and the survey was undertaken during the reported flowering period	DBCA
Proteaceae	<i>Isopogon drummondii</i>	P3		Shrub, multi-stemmed 40 cm high. Fl yellow, Apr-Jun. Yellow / grey sands. Associated with Eucalyptus/Banksia woodlands.	There are records of this species within 5 km of the survey area.	Unlikely – suitable habitat was found within the survey area however this species is distinct and would have been detected up during the surveys.	NM, DBCA
Proteaceae	<i>Synaphea</i> sp. Fairbridge Farm (D. Papenfus 696)	T	Cr	Dense, clumped shrub 25-65 cm tall, to 20-80 cm wide. Flowers yellow, flowering between September to November. Occurs on grey, clayey sand with lateritic pebbles in low woodland areas near winter-wetflats (DEE 2018). Selena's <i>Synaphea</i> is distinguished from other <i>Synaphea</i> species by its flattened, nearly symmetrically divided tripartite, leaf lobes with short petioles relative to the leaf	This species is known from five subpopulations south of Perth from Serpentine to Dardanup. It occurs on road verges, rail reserves, private property and a nature reserve (DEE 2018). There is one record (2004) less than 1 km from the survey area within the Canning Vale Business Park. There	Unlikely – some suitable habitat was found within the survey area associated with seasonally wet plains and clay/loamy soils however these areas had been historically cleared or degraded (VT08, VT09). Targeted surveys for this species was undertaken during the reported flowering period.	EPBC, NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
				blade, short peduncles and straight flowering spikes. Flowers of <i>Selena's Synaphea</i> are larger than related species, hairy externally and held in a very upright position in the flowering spike and the stigma is shallowly emarginate with broad lateral lobes. Stems of this species are green, and the sheaths enclosing the bases of the spikes are usually pale coloured with appressed hairs (DEC 2007a).	are also two records (2017) from wetlands north of the Brixton St wetlands, approximately 1.6 km from the survey area (DBCA 2007-).		
Proteaceae	<i>Synaphea stenoloba</i>	T	En	Caespitose shrub, 0.3-0.45 m high. Fl. yellow, Aug to Oct. Sandy or sandy clay soils. Winter-wet flats, granite.	Previously recorded over 45 km from the survey area.	Unlikely – no suitable habitat was found within the survey area.	EPBC
Restionaceae	<i>Lepyrodia curvescens</i>	P2		Dioecious, shortly creeping, tufted rhizomatous, herb, 0.24-0.4 m high, rhizomes on surface or to 1 cm deep. Fl. Sep to Nov. Sand, laterite. Seasonally inundated swampland.	There are records less than 1 km from the survey area, located within the Brixton St Wetlands.	Unlikely – limited suitable habitat was found within the survey area. However, the survey was undertaken during the optimal flowering period and should have been found during the survey if present	NM, DBCA
Rhamnaceae	<i>Stenanthemum sublineare</i>	P2		Erect shrub, to 0.1 m high. Fl. green, Oct to Dec. Littered white sand. Coastal plain.	There is one record located within 5 km of the survey area.	Unlikely – no suitable habitat was found within the survey area.	NM, DBCA
Sapindaceae	<i>Dodonaea hackettiana</i>	P4		Erect shrub or tree, 1-5 m high. Fl. yellow-green/red, mainly Jul to Oct. Sand. Outcropping limestone.	<i>NatureMap</i> identifies numerous records within 5 km of the survey area west of the	Known –Previously recorded GHD (2013)	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
					Kwinana Freeway along the lake systems.		
Scrophulariaceae	<i>Eremophila glabra</i> subsp. <i>chlorella</i>	T	En	Prostrate & spreading or sprawling shrub, 0.2-1 m high. Fl. green-yellow, Jul to Nov. Sandy clay. Winter-wet depressions.	There are records less than 1 km of the survey area.	Unlikely – limited suitable habitat was found within the survey area. The survey was undertaken during the optimal flowering period and should have been found during the survey if present.	NM, DBCA
Stylidiaceae	<i>Stylidium aceratum</i>	P3		Fibrous rooted annual, herb, 0.05-0.09 m high, leaves spatulate. Fl. pink/white, Oct to Nov. Sandy soils. Swamp heathland.	There are records within 1 km of the survey area, with the closest record less than 500 m of the survey area, located within the Brixton St Wetlands.	Unlikely – some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT01, VT02, VT02a, VT08. Extensive targeted survey effort was undertaken during spring.	NM, DBCA
Stylidiaceae	<i>Stylidium longitubum</i>	P4		Erect annual (ephemeral), herb, 0.05-0.12 m high. Fl. pink, Oct to Dec. Sandy clay, clay. Seasonal wetlands.	There is one record located within 1 km of the survey area on Bickley Road, Cannington.	Unlikely – very limited suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT09. Extensive targeted survey effort was undertaken during spring.	NM, DBCA
Stylidiaceae	<i>Stylidium paludicola</i>	P3		Reed-like perennial, herb, 0.35-1 m high. Fl. pink, Oct to Dec. Peaty sand over clay. Winter wet habitats.	There is one record within 2 km of the survey area, located in Jandakot.	Unlikely – Some suitable habitat was found within the survey area. Suitable vegetation types within the survey area may include VT03 and VT09.	NM, DBCA

Family	Taxon	Status		Description and closest record information (if available) (WA Herbarium 1998–, DBCA 2017)	Nearest record	Likelihood of Occurrence	Source
		WC Act	EPBC Act				
						Extensive targeted survey effort was undertaken during spring.	
Stylidiaceae	<i>Stylidium periscelanthum</i>	P3		Bulb-forming perennial, herb, 0.07-0.15 m high. Fl. pink, Sep to Oct. Loamy clay, moist soils pockets. Wet flats, low granitic hills.	There is one record located less than 1 km of the survey area, within the Brixton St Wetlands.	Unlikely – Very limited suitable habitat was found within the survey area. This species can be cryptic, however the survey was undertaken during the reported flowering period.	NM

Wetland UFI 6912

Photo Point/ RA	2	Management Category	Conservation Category
Vegetation	VT02 - <i>Regelia inops</i> <i>Hypocalymma angustifolium</i> shrubland.		
Extent of dampland vegetation within the survey area	(0.57 ha)		
Condition	Ranged from Very Good to Degraded	Soil	Sandy grey



North



South



East



West

Wetland UFI 6910

Wetland UFI	6910	Management Category	Conservation Category
Vegetation	The wetland was unable to be assessed due to access restrictions. Remnant bushland within Caladenia Grove Wetland Reserve was observed to be synonymous with <i>Banksia menziesii</i> and <i>B attenuata</i> woodland (VT01)		
Extent of CCW within the survey area	(0.77 ha)		
Condition	unknown	Soil	unknown

Wetland UFI 7446

Photo point/ RA	12	Management Category	Conservation category
Vegetation	VT08 – <i>Corymbia calophylla</i> woodland		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Good - Degraded	Soil	Grey sand
Notes	Evidence of revegetation works		



North



South



East



West

Wetland UFI 7446

Photo point/ RA	13	Management Category	Conservation category
Vegetation	VT08 – <i>Corymbia calophylla</i> woodland		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Good	Soil	Grey sand
Notes	Evidence of revegetation works		



North



South



East



West

Wetland UFI 7446

Quadrat	Q06	Management Category	Conservation Category
Vegetation	VT09 – <i>Melaleuca raphiophylla</i> woodland		
Extent of dampland vegetation within the survey area	0.38 ha		
Condition	Good	Soil	Black clay
Notes			



North



South



East



West

Wetland UFI 13332

Photo point/ RA	3	Management Category	Resource Enhancement
Vegetation	VT02a – <i>Banksia</i> spp. isolated trees <i>Regelia inops</i> <i>Hypocalymma angustifolium</i> shrubland VT02 – <i>Regelia inops</i> <i>Hypocalymma angustifolium</i> shrubland		
Extent of dampland vegetation within the survey area	4.95 ha		
Condition	Ranged from Very Good to Degraded	Soil	Sandy grey



North



South



East



West

Wetland UFI 7447

Photo point/ RA	16	Management Category	Resource Enhancement
Vegetation	VT05 – <i>Eucalyptus rudis</i> <i>Melaleuca raphiophylla</i> open forest		
Extent of dampland vegetation within the survey area	0.10 ha		
Condition	Degraded	Soil	Black clay
Notes	Canning River bank		



North



South

Wetland UFI 15926

Photo point/ RA	17	Management Category	Resource Enhancement
Vegetation	VT05 – <i>Eucalyptus rudis</i> <i>Melaleuca raphiophylla</i> open forest		
Extent of dampland vegetation within the survey area	0.68 ha		
Condition	Good - Degraded	Soil	Black clay
Notes			



North



South



East



West

Wetland UFI 13621

Photo point/RA	9	Management Category	Multiple Use
Vegetation	Cleared areas for rail and infrastructure		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Cleared	Soil	Sand
Notes	Highly disturbed within the rail corridor.		



North



South



East



West

Wetland UFI 13621

Photo point/ RA	10	Management Category	Multiple Use
Vegetation	VT07 – Grassland/ Herbland		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded to Completely Degraded	Soil	Grey sand
Notes	Grassland surrounded by planted trees		



North



South



East



West

Wetland UFI 13621

Photo point/ RA	11	Management Category	Multiple Use
Vegetation	VT07 – Grassland/ Herbland		
Extent of dampland vegetation within the survey area	0.17 ha		
Condition	Degraded to Completely Degraded	Soil	Black clay
Notes	Highly disturbed depression; surface water surrounded by <i>Juncus pallidus</i> and weedy grasses		



North



South



East



West

Wetland UFI 13621

Photo point/ RA	14	Management Category	Multiple Use
Vegetation	VT03 – <i>Melaleuca preissiana</i> , <i>M. raphiophylla</i> open woodland		
Extent of dampland vegetation within the survey area	2.71 ha		
Condition	Degraded to Completely Degraded	Soil	Black clay
Notes	Multiple Declared Pest and WoNS locations (* <i>Zantedeschia aethiopica</i> & * <i>Asparagus asparagoides</i>)		



North



South



East



West

Wetland UFI 13621

Photo point / RA	22	Management Category	Multiple Use
Vegetation	VT06 – Scattered natives amongst weeds		
Extent of dampland vegetation within the survey area	0.28 ha		
Condition	Degraded – Completely Degraded	Soil	Black clay
Notes	Parkland		



North



South



East



West

Geomorphic wetlands within the survey area with no native dampland vegetation

Wetland UFI 6776

Wetland UFI	6776	Management Category	Resource Enhancement
Vegetation	The wetland was unable to be assessed due to access restrictions. 360 Environmental (2012) have previously surveyed the area and their vegetation units of this area considered synonymous to GHD vegetation types: VT01 - Banksia menziesii and B attenuata woodland VT02 - Regelia inops Hypocalymma angustifolium shrubland VT06 - Scattered natives amongst weeds		
Extent of dampland vegetation within the survey area (VT02)	(0.03ha)		
Condition	Ranged from Good to Degraded – Completely Degraded	Soil	unknown

Wetland UFI 6911

Photo point/ RA	4	Management Category	Conservation Category
Vegetation	VT01 - <i>Banksia menziesii</i> <i>B attenuata</i> woodland		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Good	Soil	Sandy grey
Notes	Not considered dampland vegetation, more transitional between dampland to dryland		



North



South



East



West

Wetland UFI 14900

	Management Category	Conservation Category
Vegetation	VT07 – grassland/ herbland	
Extent of dampland vegetation within the survey area	(0 ha)	
Condition	Degraded to Completely Degraded	Soil Brown clay
Notes	Dampland vegetation exists within this CCW, however not within the survey area	

Wetland UFI 15925

	Management Category	Conservation Category
Vegetation	VT07 – grassland/ herbland	
Extent of dampland vegetation within the survey area	(0 ha)	
Condition	Degraded to Completely Degraded	Soil Brown clay
Notes	Dampland vegetation exists within this CCW, however not within the survey area	

Wetland UFI 15299

Photo point/RA	6	Management Category	Resource Enhancement
Vegetation	VT06 – Scattered natives amongst weeds Cleared areas for rail and infrastructure		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded to Completely Degraded Cleared	Soil	Brown clay
Notes	Man-made drain, the native vegetation has been significantly altered and landscaped		



North



South



East



West

Wetland UFI 15299b

Photo point/ RA	7	Management Category	Multiple Use
Vegetation	VT06 – Scattered natives amongst weeds Cleared areas for rail and infrastructure		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded to Completely Degraded Cleared	Soil	Brown clay
Notes	Man-made drain, the native vegetation has been significantly altered. Dampland vegetation is landscaped.		



North



South



East



West

Wetland UFI 7499

Photo point/ RA	15	Management Category	Resource Enhancement
Vegetation	VT06 – Scattered natives amongst weeds		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded to Completely Degraded	Soil	sand
Notes	Cleared parkland		



North



South



East



West

Wetland UFI 13537

Photo point/ RA	8	Management Category	Resource Enhancement
Vegetation	VT06 – Scattered natives amongst weeds Cleared areas for rail and infrastructure		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded to Completely Degraded Cleared	Soil	Brown Loamy Sand
Notes	Highly disturbed with invasive weeds, adjacent to a road		



North



South



East



West

Wetland UFI 7155

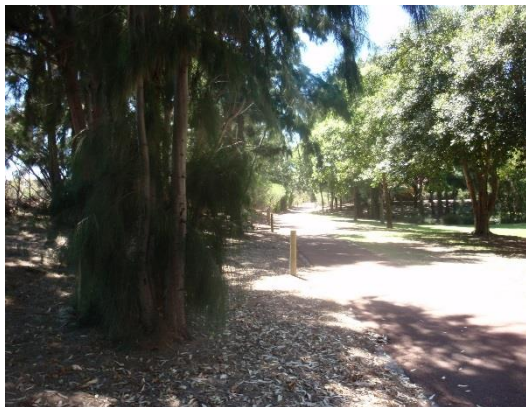
Photo point/ RA	5	Management Category	Multiple Use
Vegetation	VT06 – Scattered natives amongst weeds Cleared areas for rail and infrastructure		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded to Completely Degraded Cleared	Soil	Sandy grey



North



South



East



West

Wetland UFI 14899

Photo point/ RA	18	Management Category	Multiple Use
Vegetation	VT07 – Grassland/ Herbland		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded – Completely Degraded	Soil	Black clay
Notes			



North



South



East



West

Wetland UFI 14450

Photo point/ RA	19	Management Category	Multiple Use
Vegetation	VT06 – Scattered natives amongst weeds		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded – Completely Degraded	Soil	sand
Notes			



East

Wetland UFI 14450

Photo point/ RA	20	Management Category	Multiple Use
Vegetation	VT06 – Scattered natives amongst weeds		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded – Completely Degraded	Soil	Black clay
Notes			



North

Wetland UFI 14450

Photo point/ RA	21	Management Category	Multiple Use
Vegetation	VT06 – Scattered natives amongst weeds		
Extent of dampland vegetation within the survey area	0 ha		
Condition	Degraded – Completely Degraded	Soil	Black clay
Notes	Park		



North



South



East



West

Wetland UFI 6655

Photo point/ RA	1	Management Category	Multiple Use
Vegetation	Road, rail, infrastructure		
Extent of dampland vegetation within the survey area	(0 ha)		
Condition	Cleared	Soil	unknown



Looking east towards the rail corridor

Appendix E – Fauna data

Fauna species list

Fauna likelihood of occurrence guidelines

Fauna likelihood of occurrence assessment

Species recorded in the survey area in the current survey

Family	Scientific Name	Common Name	Listing	2017 survey count	2018 survey count
Acanthizidae	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill		4	
Acanthizidae	<i>Gerygone fusca</i>	Western Gerygone		2	
Accipitridae	<i>Accipiter fasciatus</i>	Brown Goshawk		1	
Anatidae	<i>Anas superciliosa</i>	Pacific Black Duck		4	
Anatidae	<i>Chenonetta jubata</i>	Australian Wood Duck		3	
Artamidae	<i>Cracticus tibicen</i>	Australian Magpie		4	5
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow		4	
Cacatuidae	<i>Cacatua tenuirostris</i>	Eastern long billed Corella	Intro	4	
Cacatuidae	<i>Calyptorhynchus banksii</i>	Red-tailed Black-Cockatoo	Vu, Vu	14	8
Cacatuidae	<i>Calyptorhynchus latirostris</i>	Carnaby's Black-Cockatoo	En, En	4	13
Cacatuidae	<i>Eolophus roseicapillus</i>	Galah		2	1
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike		3	
Columbidae	<i>Columba livia</i>	Feral pigeon	Intro	12	
Columbidae	<i>Streptopelia chinensis</i>	Spotted Turtle dove	Intro	2	
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing		1	
Columbidae	<i>Ocyphaps lophotes</i>	Crested Pigeon		2	
Columbidae	<i>Streptopelia senegalensis</i>	Laughing Dove	Intro	2	7
Corvidae	<i>Corvus coronoides</i>	Australian Raven		4	4
Cuculidae	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo		2	
Cuculidae	<i>Cacomantis pallidus</i>	Pallid Cuckoo		1	
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel		1	
Halcyonidae	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Intro	2	
Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow		6	
Hirundinidae	<i>Petrochelidon nigricans</i>	Tree Martin		12	
Maluridae	<i>Malurus splendens</i>	Splendid Fairy-wren		4	2

Family	Scientific Name	Common Name	Listing	2017 survey count	2018 survey count
Meliphagidae	<i>Acanthorhynchus superciliosus</i>	Western Spinebill		2	
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird		6	4
Meliphagidae	<i>Anthochaera lunulata</i>	Western Wattlebird		2	
Meliphagidae	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater		28	5
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater		2	
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater		16	
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark		2	4
Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird		4	
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler		3	2
Pardalotidae	<i>Pardalotus striatus</i>	Striated Pardalote		2	
Petroicidae	<i>Microeca fascinans</i>	Jacky Winter		1	
Psittacidae	<i>Barnardius zonarius</i>	Australian Ringneck		2	
Psittacidae	<i>Purpureicephalus spurius</i>	Red-capped Parrot		2	2
Psittacidae	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Intro	many	
Rallidae	<i>Fulica atra</i>	Eurasian Coot		2	
Rallidae	<i>Porphyrio porphyrio</i>	Purple Swamphen		2	
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail		1	10
Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis		6	7
Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater		1	3
Zosteropidae	<i>Zosterops lateralis</i>	Silvereye			10
Reptiles					
Agamidae	<i>Pogona minor</i>	Western Bearded Dragon		1	
Egerniidae	<i>Tiliqua rugosa</i>	Bobtail		3	
Elapidae	<i>Pseudonaja affinis</i>	Dugite		1	
Eugongylidae	<i>Acritoscincus trilineatus</i>	Western three-lined Skink		1	
Eugongylidae	<i>Cryptoblepharus plagiocephalus</i>	Fence Skink		16	

Family	Scientific Name	Common Name	Listing	2017 survey count	2018 survey count
Eugongylidae	<i>Menetia greyii</i>	Common Dwarf Skink		1	
Eugongylidae	<i>Morethia obscura</i>	Shrubland Morethia Skink		1	
Pygopodidae	<i>Delma fraseri</i>	Fraser's Delma		1	
Sphenomorphidae	<i>Hemiergis quadrilineata</i>	Two-toed Earless Skink		4	
Sphenomorphidae	<i>Lerista elegans</i>	Elegant Slider		3	
Varanidae	<i>Varanus gouldii</i>	Gould's Monitor		burrow	
Mammals					
Canidae	<i>Vulpes vulpes</i>	Fox	Intro	prints	
Canidae	<i>Canis lupus</i>	Domestic Dog	Intro	prints	
Felidae	<i>Felis catus</i>	Cat	Intro	prints	
Peramelidae	<i>Isoodon obesulus</i>	Southern Brown Bandicoot	P4	scats, digs	1
Macropodidae	<i>Macropus fuliginosus</i>	Western Grey Kangaroo		4	9
Muridae	<i>Mus musculus</i>	House Mouse	Intro	2	
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit	Intro	scats	
Amphibians					
Myobatrachidae	<i>Crinia glauerti</i>	Clicking Froglet		calling	
Limnodynastidae	<i>Heleioporus eyrei</i>	Moaning Frog		1	
Limnodynastidae	<i>Lymnodynasties dorsalis</i>	Pobblebink		calling	

En – Endangered listing under EPBC Act and WC Act

Vu – Vulnerable Listing under EPBC Act and WC Act

P4 – Priority listed Species under DBCA

IA – International Agreement under WC Act

Intro – Introduced species to WA.

Parameters of fauna likelihood of occurrence assessment

Assessment outcome	Description
Present	Species recorded during the field survey or from recent, reliable records from within or close proximity to the survey area.
Likely	Species are likely to occur in the survey area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the survey area. OR Species known distribution overlaps with the survey area and there is suitable habitat within the survey area.
Unlikely	Species assessed as unlikely include those species previously recorded within 10 km of the survey area however: <ul style="list-style-type: none"> • There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the survey area. • The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area. OR Those species that have a known distribution overlapping with the survey area however: <ul style="list-style-type: none"> • There is limited habitat in the survey area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). • The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.
Highly unlikely	Species that are considered highly unlikely to occur in the survey area include: <ul style="list-style-type: none"> • Those species that have no suitable habitat within the survey area. • Those species that have become locally extinct, or are not known to have ever been present in the region of the survey area.

Source information - desktop searches

NM – DBCA *NatureMap* (accessed September 2017)

DBCA – SWA – DBCA (2007–) records of threatened fauna, database search within the SWA study area (accessed September 2017)

PMST – DEE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the study area (accessed September 2017)

Definitions

Term	Description
study area	a 5 km buffer around the survey area
survey area	the area subject to the current survey
region	the area within an approximate 20 km radius of the survey area
Cr	Critically endangered listed under the EPBC Act or WC Act
En	Endangered listed under the EPBC Act or WC Act
Vu	Vulnerable listed under the EPBC Act or WC Act
Mi	Migratory listed under the EPBC Act
IA	International agreement under WC Act
CD	Conservation dependent under WC Act
OS	Other specially protected fauna under WC Act
P1 – P4	Priority 1 – Priority 4 under DBCA

Fauna likelihood of occurrence assessment

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
Birds								
<i>Actitis hypoleucos</i> (Common Sandpiper)	Mi	IA	X	X	X	Habitat for the Common Sandpiper is varied: coastal and interior wetlands – narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches. Avoids wide open mudflats. This species is widespread and scattered, common on the north and west coasts and uncommon in the south-east and interior (Morcombe 2004).	Unlikely , the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records are from Bibra and North Lakes, north along the Swan and Canning Rivers (but within the lower reaches).	No significant habitat present
<i>Apus pacificus</i> (Fork-tailed Swift)	Mi	IA		X		The fork-tailed Swift is a migratory species that follows large storm fronts and are almost exclusively areal species. In Western Australia, there are sparsely scattered records of the Fork-tailed Swift along the south coast, ranging from near the Eyre Bird Observatory and west to Denmark. They are widespread in coastal and subcoastal areas between Augusta and Carnarvon, including some on nearshore and offshore islands. Scattered records are present in the Perth region. Records are scattered throughout WA including the Pilbara, Kimberley, Wheatbelt, Gascoyne and Isolated records occur at Neale Junction in the Great Victoria Desert and on the Nullarbor Plain (Higgins 1999).	Unlikely , although this species may periodically occur in the region the species is exclusively areal in nature and not utilise terrestrial habitats.	No significant habitat present
<i>Ardea ibis</i> (Cattle Egret)		IA	X	X	X	The Cattle Egret is a common and widespread species, being recorded in several locations in the Greater South West. Typical habitat includes tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, paddocks, improved pastures and croplands and	Unlikely , the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records are from Bibra and Forrestdale Lakes, north	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCAs – SWA			
						roosts in trees, or amongst ground vegetation in or near lakes, swamps, wetlands, tidal mudflats, and drains (Morcombe 2004; Pizzey and Knight 2012). It has occasionally been seen in arid and semi-arid regions (DEE 2018). As the name implies it often accompanies livestock, but can also follow machinery and has thus been seen in rubbish tips (Nevill 2008).	long the Swan River in Guildford.	
<i>Arenaria interpres</i> (Ruddy Turnstone)	Mi	IA			X	The Ruddy Turnstone is found in most coastal regions with exposed rock coast lines or coral reefs, and also near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral, and in occasionally near river beds, and on inland lakes and adjacent farmland. It strongly prefers rocky shores or beaches with large deposits of rotting seaweed. In south-west Australia, it may occur on pebble-strewn shores of salt lakes near the coast. On Rottnest Island, it prefers shores with scattered fragments of limestone (DEE 2018). It is also common on all the larger islands south to Penguin Island, but is uncommon from Augusta to Cape Arid (Nevill 2013).	Highly unlikely , there is little suitable habitat within the survey area for this species. Most observations occur along the coast line areas.	No significant habitat present
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	En	En		X	X	The Australasian Bittern prefers densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands. In the southwest of WA, the Bittern is found in beds of tall rush mixed with or near short fine sedge or open pools. It also occurs around swamps, lakes, pools, rivers and channels fringed with <i>Lignum muehlenbeckia</i> , canegrass (<i>Eragrostis</i> spp.) or other dense vegetation. It occasionally ventures	Highly unlikely , there is little suitable habitat within the survey area for this species. Most observations occur within lakes and wetland where dense vegetation is present.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						into areas of open water or onto banks (DEE 2018).		
<i>Cacatua pastinator pastinator</i> (Muir's Corella)	Vu	CD			X	Muir's Corella is now confined to a small region from Boyup Brook, McAlinden and Qualeup, south to Lake Muir and the lower Perup River, and east to Frankland and Rocky Gully (DEC 2008). However, was once more widespread into the Perth Region. Muir's Corella occurs in eucalyptus woodlands that are dominated by Wandoo (<i>Eucalyptus wandoo</i>), Marri, (<i>Corymbia calophylla</i>), or Jarrah, (<i>E. marginata</i>). Most suitable woodland habitat for this species now consists of remnant patches. These patches occur in or adjacent to farmland, or along roadsides, paddock boundaries or watercourses, and sometimes as a few, isolated shade trees in otherwise cleared paddocks (Garnett and Crowley 2000).	Highly unlikely , this species is not known from the survey area. This species may be considered locally extinct	No significant habitat present
<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	Mi	IA	X	X	X	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. Sometimes they occur on rocky	Unlikely , the species has not been recorded in the survey area, with scattered records in the region. The closest records is at Bibra, North and Forrestdale Lakes, north long the Swan and Canning Rivers (lower reaches).	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						shores (DEE 2018). They are found throughout many wetlands on the Swan Coastal Plain, in Perth lakes with wet grassed margins and receding waters, Vasse and Harvey Estuaries, and the Busselton wetlands, but are less common on the south coast until the Esperance region (Nevill 2013).		
<i>Calidris alba</i> (Sanderling)	Mi	IA			X	In Australia, the Sanderling is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed. Sanderlings also occur on beaches that may contain wave-washed rocky outcrops. Less often the species occurs on more sheltered sandy shorelines of estuaries, inlets and harbours. Rarely, they are recorded in near-coastal wetlands. There are rare inland records from sandy shores of ephemeral brackish lakes and brackish river-pools (DEE 2018). They are moderately common, and can be found every year on Rottnest beaches and salt lakes (Nevill 2013).	Highly unlikely , there is little suitable habitat within the survey area for this species. Most observations occur along the coast line areas.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Calidris canutus</i> (Red Knot)	En, Mi	IA		X	X	In Australasia the Red Knot mainly inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (DEE 2018). They are found near mudflats and estuaries from Murchison to Bunbury but are then uncommon from Wilson Inlet to Esperance. In Perth region they are mainly seen in Alfred Cove and Peel Inlet (Nevill 2013).	Highly unlikely , there is little suitable habitat within the survey area for this species. Most observations occur along the coast line and lower reaches of Swan River areas.	No significant habitat present
<i>Calidris ferruginea</i> (Curlew Sandpiper)	Mi, Cr	Vu, IA	X	X	X	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (DEE 2018).	Unlikely , there is little suitable habitat within the survey area, the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records is at Bibra, North and Forrestdale Lakes, north along the Swan River.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Calidris melanotos</i> (Pectoral Sandpiper)	Mi	IA	X	X	X	In Australia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum (DEE 2018). The bird can be seen on the Swan Coastal Plain but is rare to scarce on Lake Thompson, and as well on any freshwater wetland in the southwest with shallow, well-grassed margins. They are seen at Lake Warden, Esperance, and at Lake McLarty (Nevill 2013).	Unlikely , there is little suitable habitat within the survey area, the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records is at Bibra and Forrestdale Lakes, north along the Swan River.	No significant habitat present
<i>Calidris minuta</i> (Little Stint)		IA			X	The Little Stint is a rare vagrant to Australasia. It can be found along the coast and on inland shorelines in the Swan Coastal Plain region (Nevill 2013; Simpson and Day 1996).	Highly unlikely , this species appears to have a coastal preference with no records in the region.	No significant habitat present
<i>Calidris ruficollis</i> (Red-Necked Stint)	Mi	IA	X	X	X	The Red-necked Stint can be found in fresh and saline water, but primarily in coastal regions (Nevill 2013). It is mostly found in areas including sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh;	Unlikely , there is little suitable habitat within the survey area, the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records are at Bibra, North and Forrestdale Lakes, north along the Swan and lower reaches of the Canning River.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation (DEE 2018). They are common in many parts of the south west, and can be found in the Murchison down to Busselton and Augusta to Cape Arid, and on islands, particularly Rottneest (Nevill 2013).		
<i>Calidris subminuta</i> (Long-toed Stint)	Mi	IA	X	X	X	In Australia, the Long-toed Stint occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also found in areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. It has been observed at open, less vegetated shores of larger lakes and ponds and is common on muddy fringes of drying ephemeral lakes and swamps, and frequents permanent wetlands such as reservoirs and artificial lakes. In WA the species is found mainly along the coast, with a few scattered inland records. On the south coast the Long-toed Stint is found from Esperance to Albany and inland to Lake Cassencarry and Dumblebung, on the coast from the Vasse River estuary, Guraga Lake and the Namming Nature Reserve, and on the Swan Coastal Plain (DEE 2017; Nevill 2013).	Unlikely , there is little suitable habitat within the survey area, the species has not been recorded in the survey area, with scattered records in the region. The closest records are at Bibra and Forrestdale Lakes, north along the lower reaches of the Canning River.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Calidris tenuirostris</i> (Great Knot)	Cr, Mi	Vu, IA			X	The Great Knot typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (DEE 2018). In the south west they can be found in the Murchison region and then further down the coast to Bunbury, in the Perth region, Alfred Cove, Woodman Point, and Peel Inlet. They are scarce on the coast past Busselton (Nevill 2013).	Highly unlikely , there is little suitable habitat within the survey area for this species. Most observations occur along the coast line and lower reaches of Swan River area.	No significant habitat present
<i>Calyptorhynchus banksii subsp. naso</i> (Forest Red-tailed Black Cockatoo)	Vu	Vu	X	X	X	Forest Red-tailed Black Cockatoo typically occurs in dense Jarrah (<i>Eucalyptus marginata</i>), Karri (<i>E. diversicolor</i>) and Marri (<i>Corymbia calophylla</i>) forests, however the species also occurs in a range of other forest and woodland types, including Blackbutt (<i>E. patens</i>), Wandoo (<i>E. wandoo</i>), Tuart (<i>E. gomphocephala</i>), Albany Blackbutt, Yate (<i>E. cornuta</i>), and Flooded Gum (<i>E. rudis</i>) Habitats also tend to have an understorey of <i>Banksia spp.</i> , <i>Persoonia spp.</i> , <i>Allocasuarina spp.</i> In recent years the species has been recorded utilising areas of the Swan Coastal Plain for resources (Johnstone et al 2017). The Forest Red-tailed Black Cockatoo generally nests in hollows in live or dead trees of Marri, Karri, Wandoo, Bullich, Blackbutt, Tuart and Jarrah (DSEWPaC 2012) in the Darling Range and recently on the Swan Coastal Plain.	Present , species was recorded within survey area via observation and feeding evidence	<i>Banksia</i> woodland (11.61 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Mixed tall woodland/clumped trees (24.02 ha) Water bodies/Canning River/or man-made pools (1.06 ha) Scattered isolated shrublands (scattered islands or clattered clumps) (3.91 ha)

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Calyptorhynchus baudinii</i> (Baudin's Black Cockatoo)	En	En	X	X	X	Baudin's Black Cockatoo occurs in high-rainfall areas, usually at sites that are heavily forested and dominated by Marri (<i>Corymbia calophylla</i>) and Eucalyptus species, especially Karri (<i>E. diversicolor</i>) and Jarrah (<i>E. marginata</i>). The species also occurs in woodlands of Wandoo (<i>E. wandoo</i>), Blackbutt (<i>E. patens</i>), Flooded Gum (<i>E. rudis</i>), and Yate (<i>E. cornuta</i>). Baudin's Black Cockatoo breeds in the Jarrah, Marri and Karri forests of the deep south-west in areas averaging more than 750 mm of rainfall annually. The range of the species extends from Albany to Gidgegannup and Mundaring (east of Perth), and inland to the Stirling Ranges and near Boyup Brook. Preferred roosts are in areas with a dense canopy close to permanent water sources that provide the birds with protection from weather conditions (DSEWPaC 2012).	Unlikely , the habitat within the survey area is not the preferred habitat for this species, however they may opportunistically enter the survey area to forage. This species was observed within the survey area during the 2013 GHD survey.	No significant habitat present
<i>Calyptorhynchus latirostris</i> (Carnaby's Black Cockatoo)	En	En	X	X	X	This species mainly occurs in uncleared or remnant native eucalypt woodlands and in shrubland or kwongan heathland dominated by <i>Hakea</i> , <i>Banksia</i> and <i>Grevillea</i> species. The species also occurs in forests containing Marri (<i>Corymbia calophylla</i>), Jarrah (<i>Eucalyptus marginata</i>) or Karri (<i>E. diversicolor</i>). Breeding usually occurs in the western Wheatbelt region of WA, with flocks moving to the higher rainfall coastal area to forage after the breeding season. Feeds on the seeds of a variety of native plants, including <i>Allocasuarina</i> , <i>Banksia</i> , <i>Eucalyptus</i> , <i>Grevillea</i> and <i>Hakea</i> , and some introduced plants (DSEWPaC 2012).	Present , species was recorded within survey area via observation and feeding evidence	<i>Banksia</i> woodland (11.61 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Mixed tall woodland/clumped trees (24.02 ha) Water bodies/Canning River/or man-made pools (1.06 ha) Scattered isolated shrublands (scattered islands or clattered clumps) (3.91 ha)

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Charadrius bicinctus</i> (Double-banded Plover)	Mi	IA			X	The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It is sometimes associated with coastal lagoons, inland saltlakes and saltworks, and is also found on seagrass (especially <i>Zostera</i>) and kelp beds. It is also found around sewage farms and saltworks, gravel roads and quarries (DEE 2018). Those birds that migrate to WA mainly come to the beaches on the Great Australian Bight, while few come to the deep south west and even fewer to the west coast. They can be seen on the beaches adjacent to Eyre Bird Observatory, occasionally off Perth coast, and at Lake McLarty near Mandurah (Nevill 2013).	Highly unlikely , this species appears to have a south coastal preference with no records in the region.	No significant habitat present
<i>Charadrius dubius</i> (Little Ringed Plover)	Mi	IA	X	X	X	The Little Ringed Plover winters in Asia but several will overshoot and land in Australia. They have a preference for stony shorelines around freshwater as well as brackish and coastal beaches. It is possible to find this species not only on beaches but also on freshwater lakes, marshes or perimeters of sewerage ponds (Nevill 2013; Simpson and Day 1996).	Highly unlikely , this species appears to have a coastal preference with the only inland records at Bibra and associated lakes.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Charadrius leschenaultii</i> (Greater Sand Plover)	IA	Vu, IA			X	In Australasia the Greater Sand Plover is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps. They seldom occur at shallow freshwater wetlands (DEE 2017). Some come down the coast from Geraldton as far as Busselton but numbers decrease from north to south. A few birds pass on down to the southern coast. They are locally common in the Peel Inlet, Oyster Harbour, and Alfred Cove (Nevill 2013).	Highly unlikely , this species appears to have a coastal preference with the only inland records at Forrestdale Lake and in the lower reaches of the Swan River.	No significant habitat present
<i>Charadrius mongolus</i> (Lesser Sand Plover)	En, Mi	En, IA			X	In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometimes occurs in short saltmarsh or among mangroves, in saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds. The species is seldom recorded away from the coast, at margins of lakes, soaks and swamps associated with artesian bores (DEE 2018). This species is scarce in the south west, but can be found near the coast from Albany to Esperance (Nevill 2013).	Highly unlikely , this species appears to have a coastal preference with the only inland records in the lower reaches of the Swan River.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Thinornis rubricollis</i> (Hooded Plover)		P4		X	X	The Hooded Plover can be found on inland and coastal salt lakes as well as coastal beaches, with a preference for wide sandy beaches with large amounts of seaweed and backed by extensive open dunes. After breeding, many migrate to larger salt lakes like Lake Clifton south of Mandurah, or Lake Gore and Warden in the Esperance region. Their distribution extends from Horrocks to Eyre on the Nullarbor, with their largest numbers on the Esperance lakes, as well as inland on some of the smaller ephemeral salt lakes, particularly in the Salmon Gum woodlands north of Esperance and those north west of Hyden and between Hyden and Norseman (Morcombe 2004; Nevill 2013).	Highly unlikely , this species appears to have a coastal and south coast inland preference with the only Perth region records near Thomsons Lake and the lower reaches of the Swan River.	No significant habitat present
<i>Falco peregrinus</i> (Peregrine Falcon)		OS	X		X	The Peregrine Falcon is seen occasionally anywhere in the south-west of WA. It is found everywhere from woodlands to open grasslands and coastal cliffs - though less frequently in desert regions. The species nests primarily on ledges of cliffs, shallow tree hollows, and ledges of building in cities. (Morcombe, 2004).	Likely , the species is known from the area with records from Jandakot and Gosnells. Known records in the area are generally confined to the lake systems west of Kwinana Freeway, Forestdale Lake and Canning River. The Peregrine Falcon is likely to use suitable habitat within the study area for foraging only. No breeding habitat is present therefore any use of habitat would be opportunistic.	<i>Banksia</i> woodland (11.61 ha) <i>Melaleuca</i> woodland (3.34 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Mixed tall woodland/clumped trees (24.02 ha) Waterbodies/Canning River/man-made pools (1.06 ha) Scattered isolated shrublands (3.91 ha)

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Gallinago hardwickii</i> (Latham's Snipe)	Mi	IA			X	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. The species is occasionally recorded at sites in WA, despite being located to the west of its core range (DEE 2018).	Highly unlikely , very little habitat present for this species. Few records available in the Perth region however the closest record is from North Lake.	No significant habitat present
<i>Gallinago stenura</i> (Pin-tailed Snipe)	Mi	IA			X	The distribution of the Pin-tailed Snipe within Australia is not well understood. There are confirmed records from NSW, south-west Western Australia, Pilbara and the Top End. During non-breeding period the Pin-tailed Snipe occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. It is also commonly seen at sewage ponds; not normally in saline or inter-tidal wetlands (DEE 2018).	Highly unlikely , very little habitat present for this species. Few records available in the Perth region.	No significant habitat present
<i>Gelochelidon nilotica</i> (Gull-billed Tern)	Mi	IA	X			The Gull-billed Tern can be found on beaches and mudflats in the southwest but has a preference for ephemeral freshwater or brackish lakes. It is highly nomadic and will also disperse to inland lakes. It is uncommon on the Swan Coastal Plain and scarce in the southern region (Nevill 2013).	Highly unlikely , there is no suitable habitat within the survey area, the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records are at Bibra and Forrestdale Lakes.	No significant habitat present

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	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Chlidonias leucopterus</i> (White-winged Black Tern)	Mi	IA	X		X	The White-winged Black Tern is a non-breeding migrant to Australia, where it is widespread and common along south-western, northern and central-eastern coasts, with only scattered records of small numbers along the coasts elsewhere in southern Australia. In Western Australia, the species is widespread on the southern west coast, mainly from Ballingup and the estuary of Vasse River north to Mongers Lake, and also on coasts of the Pilbara region and Kimberley Division, with occasional records farther inland, along major rivers, such as the Ord. (DEE 2018).	Highly unlikely , there is no suitable habitat within the survey area, the species has not been recorded in the survey area, with two locations (coastal lakes) utilised in the region.	No significant habitat present
<i>Ixobrychus dubius</i> (Australian Little Bittern)		P4	X		X	The Australian Little Bittern is uncommon in WA but can be found in lakes around Perth as it requires less extensive reed beds as the Australasian Bittern (<i>Botaurus poiciloptilus</i>). There have been sightings in Jandabup, Joondalup, Herdsman Lake, smaller lakes in the southwest (Nevill 2013).	Highly unlikely , there is no suitable habitat within the survey area, the species has not been recorded in the survey area, with records from Bibra (area) and Forrestdale Lakes.	No significant habitat present
<i>Ixobrychus flavicollis australis</i> (Black Bittern, southwestern subpop.)		P1			X	The Black Bittern tends to be found on smaller bodies of water, particularly along creek lines with shadowy, leafy waterside trees (callistemons, casuarinas, paperbarks, eucalypts, mangroves, and willows), in sheltered mudflats, and oyster-slats. In the south west they are found on the quieter river systems, often where there are large paperbarks. They can be found in the coastal south west from Perth, through Margaret River, to Northcliffe (Nevill 2013; Pizzey and Knight 2012).	Highly unlikely , very little habitat present for this species. Few records available in the Perth region.	No significant habitat present
<i>Leipoa ocellata</i> (Malleefowl)	Vu	Vu		X	X	The Malleefowl generally occurs in semi-arid areas of WA, from Carnarvon to south east of	Highly unlikely , the nearest record is located over 40 km	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						the Eyre Bird Observatory (south-east WA). It occupies shrublands and low woodlands that are dominated by mallee vegetation, as well as native pine (<i>Callitris spp.</i>) woodlands, Acacia shrublands, Broombush (<i>Melaleuca uncinata</i>) vegetation or coastal heathlands. The nest is a large mound of sand or soil and organic matter (Jones & Goth 2008; Morcombe, 2004). Few records are present on the SWA and are historical observations.	away and was recorded in 1972. This species is considered locally extinct.	
<i>Limosa lapponica</i> (Bar-tailed Godwit)	Mi	IA			X	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh (Morcombe 2004). They usually forage near the edge of water or in shallow water, mainly in tidal estuaries and harbours and roost on sandy beaches, sandbars, spits and also in near-coastal saltmarshes (Marchant and Higgins 1993).	Highly unlikely , No habitat present. This species appears to have a coastal preference with the only inland records in the lower reaches of the Swan River.	No significant habitat present
<i>Limosa limosa</i> (Black-tailed Godwit)	Mi	IA	X	X	X	In Australia the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. It is also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains. There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and	Highly unlikely , No habitat present. This species appears to have a coastal and coastal lakes preference with North and Forrestdale Lakes and lower reaches of the Swan River the closest recorded.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
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						bore-overflows. They also use lagoons in sewage farms and saltworks. (DEE 2018).		
<i>Motacilla cinerea</i> (Grey Wagtail)	Mi	IA		X		The non-breeding habitat only of the Grey Wagtail has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes (DEE 2018). It is a rare visitor to WA. It can be found mainly in banks and rocks in fast-running freshwater habitats: rivers, creeks, streams, and around waterfalls, in forest and open country; but can occur anywhere during migration (Johnstone and Storr 2004).	Unlikely , some habitat is present for this species however they are migratory and rarely found on the Swan Coastal Plain. Use maybe periodic and opportunistic.	No significant habitat present
<i>Ninox connivens connivens</i> (Barking Owl Southern subsp.)		P2			X	The southwest subspecies of the Barking Owl is found in the deep south-west region and is very scarce (Nevill 2013). They reside in open forests, woodlands, dense scrubs, and foothills, with red river gums, paperbarks, and other large trees near watercourses that penetrate otherwise open country (Pizzey and Knight 2012). It can be seen in the Busselton, Augusta and Esperance regions, in from Katanning to Cranbrook (Nevill 2013).	Unlikely , there is no suitable habitat within the survey area. The nearest record is located approximately 40 km east of the survey area.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Numenius madagascariensis</i> (Eastern Curlew)	Mi, Cr	Vu, IA		X	X	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (Marchant and Higgins 1993).	Highly unlikely , No habitat present. This species appears to have a coastal and coastal lakes preference. The lower reaches of the Swan River is the closest recorded.	No significant habitat present
<i>Numenius minutus</i> (Little Curlew)	Mi	IA			X	The Little Curlew is most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated. Open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads and airstrips are also used. Little Curlews generally spend the non-breeding season in northern Australia from Port Hedland to the Queensland coast. There are more scattered records of the species from inland Australia and in the southwest (DEE 2018).	Highly unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest records are along the coast.	No significant habitat present
<i>Numenius phaeopus</i> (Whimbrel)	Mi	IA			X	The Whimbrel is often found on the intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It also used saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields. There are few inland records from saline lakes and canegrass swamps. The Whimbrel is	Highly unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest records are along the coast or associated to the Swan River.	No significant habitat present

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	EPBC Act	WA	NM	PMST	DBCA – SWA			
						common and widespread from Carnarvon to the north-east Kimberley Division. It is occasionally seen on the south coast and has occasionally been recorded in the south-west (DEE 2018).		
<i>Oxyura australis</i> (Blue-billed Duck)		P4	X		X	The blue-billed Duck is a small Australian almost entirely aquatic duck, with both the male and female growing to a length of 40 cm. The male has a slate-blue bill which changes to bright-blue during the breeding season. The Blue-billed Duck is endemic to Australia's temperate regions, ranging from the south west of WA, extending to southern Queensland, through New South Wales and Victoria, to Tasmania. The species is readily seen on freshwater lakes and billabongs where deep fresh water is present (Morcombe 2004).	Unlikely , there is no suitable habitat within the survey area however it has been recorded in nearby lakes and wetlands.	No significant habitat present
<i>Pandion haliaetus</i> (Osprey)	Mi	IA	X	X	X	Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range but may also occur on low sandy, muddy or rocky shores and over coral cays. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from (DEE 2018).	Highly unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest records are along the coast or associated to the Swan River and lower reaches of the Canning River.	No significant habitat present

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	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Phalaropus lobatus</i> (Red-necked Phalarope)	Mi	IA			X	The Red-necked Phalarope mainly winters at sea around the tropics, but are occasionally seen on coastal and inland wetlands. In Western Australia the species has been seen on Rottnest Island, Pelican Point, the Swan River, the Port Hedlands Saltworks, the Eyre Bird Observatory and Hinds Lake Nature Reserve (DEE 2018).	Highly unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest records are along the coast.	No significant habitat present
<i>Philomachus pugnax</i> (Ruff)	Mi	IA		X	X	In Australia the Ruff is found on generally fresh or saline wetlands with exposed mudflats at the edges. It is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands. They are occasionally seen on sheltered coasts, in harbours, estuaries, seashores and are known to visit sewage farms and saltworks. They are sometimes found on wetlands surrounded by dense vegetation including grass, sedges, saltmarsh and reeds. They have been observed on sand spits and other sandy habitats including shingles. In WA the species has been recorded at the lower King River and it is mostly found in the south-west region of the state. It has been sighted at the Vasse River estuary, north to Namming Lake and Lake McLarty (DEE 2018).	Highly unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest record is along the coast.	No significant habitat present

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	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Plegadis falcinellus</i> (Glossy Ibis)	Mi	IA	X		X	The Glossy Ibis' preferred habitat for foraging and breeding are shallow, grassy, fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons, and in wooded swamps, artificial wetlands (such as irrigated fields), and in mangroves. It may retreat to permanent wetlands and/or coastal areas (including tidal wetlands) during drought (DEE 2018). It can be seen at Herdsman Lake regularly, and at Joondalup, McClarty, Thompson and Forrestdale Lakes when winter wet (Nevill 2013).	Unlikely , the species has not been recorded in the survey area, with scattered but clumped areas utilised in the region. The closest records is at Bibra, North and Forrestdale Lakes, north long the Swan and Canning Rivers (lower reaches).	No significant habitat present
<i>Pluvialis fulva</i> (Pacific Golden Plover)	Mi	IA	X		X	In Australia this species usually inhabits coastal habitats, on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as <i>Sarcocornia</i> , or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in saltworks. It is sometimes recorded on islands, sand and coral cays and exposed reefs and rocks. They are less often recorded in terrestrial habitats, but can be seen in habitats with short grass in paddocks, crops or airstrips, or ploughed or recently burnt areas. In WA, the species is seldom recorded along the southern or south-western coasts (DEE 2018). They can be seen to the Vasse Inlet, on the south coast to Oyster Harbour, the Kalgan River, and occasionally in inland lakes close to the coast (Nevill 2013).	Unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest record is at Bibra Lake, long the coast, Forrestdale Lake and the Swan River.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Pluvialis squatarola</i> (Grey Plover)	Mi	IA	X		X	Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. The species is also very occasionally recorded further inland, where they occur around wetlands or salt-lakes (DEE 2018).	Unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest record is at Bibra Lake, long the coast, Forrestdale Lake and the Swan River.	No significant habitat present
<i>Rostratula australis</i> (Australian Painted Snipe)	En	En		X	X	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Australian Painted Snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. The species rarely occurs in the south-western of Western Australia (Marchant and Higgins 1993; Garnett and Crowley 2000).	Unlikely , the species has not been recorded in the survey area, with few recorded in the region. The closest record is at Lake Kogolup.	No significant habitat present
<i>Sterna nereis nereis</i> (Fairy Tern)	Vu, Mi	Vu, IA			X	The Fairy Tern occurs along the coast of WA as far north as the Dampier Archipelago near Karratha, but mostly in the southern part of Australia including most of the coastline in the south west. It nests on sheltered sandy beaches, coastal inlets, spits and banks above the high tide line and below vegetation. It has been found in embayments of habitats including offshore, estuarine or lake islands, wetlands, and mainland coastline (DEE 2018; Nevill 2013 and Pizzey and Knight 2012).	Unlikely , there is no suitable habitat within the survey area. There are no records of the species within the survey area, all are on the coast line.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Tringa brevipes</i> (Grey-tailed Tattler)	Mi	P4, IA			X	Within Australia, the Grey-tailed Tattler has a primarily northern coastal distribution and is found in most coastal regions. It is found in the south-west between Augusta and Cervantes (DEE 2018).	Unlikely , there is no suitable habitat within the survey area. There are no records within the survey area, all are on the coast or Swan River.	No significant habitat present
<i>Tringa cinerea</i> (Terek Sandpiper)	Mi	IA			X	In Australia, the Terek Sandpiper has a primarily coastal distribution, with occasional records inland. In Western Australia, the Terek Sandpiper is rarely seen on the south coast: occasionally around Eyre and several records around Albany. Near Perth, it has been recorded between Bunbury and the mouth of the Moore River (DEE 2018).	Highly unlikely , the species has not been recorded in this region	No significant habitat present
<i>Tringa glareola</i> (Wood Sandpiper)	Mi	IA	X	X	X	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums <i>E. camaldulensis</i> . They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding. They can occasionally be found at drying or stony small wetlands, but rarely use brackish wetlands, or dry stunted saltmarsh. They can also use artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains (DEE 2017). In WA, they can be found in many of Perth's wetlands including drainage channels, in Wheatbelt inland ephemeral lakes if they are not too saline, but are uncommon on the south coast (Nevill 2013).	Unlikely , there is little suitable habitat within the survey area. There are no records of the species within the survey area nearest records are from Bibra and North Lake in the west and lower reaches of Canning River to the north.	No significant habitat present

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	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Tringa nebularia</i> (Common Greenshank)	Mi	IA	X	X	X	The Common Greenshank does not breed in Australia; however, the species occurs in all types of wetland and has the widest distribution of any shorebird in Australia. The Common Greenshank is generally absent from the Western Deserts although there are a few records from the Great Sandy Desert and the Nullarbor Plain. It occurs around the coast from Cape Arid in the south to Carnarvon in the north-west. (DEE 2018).	Unlikely , there is little suitable habitat within the survey area. There are no records and the nearest records are from Bibra and North Lake in the west and lower reaches of Canning River to the north.	No significant habitat present
<i>Tringa stagnatilis</i> (Marsh Sandpiper)	Mi	IA	X	X	X	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In WA they prefer freshwater to marine environments (DEE 2018), but are uncommon throughout most of the south west, with the exception of a few freshwater lakes, including Bibra, Kogolup, North, Thompson, Herdsman, and McLarty Lakes (Nevill 2013).	Unlikely , there is little suitable habitat within the survey area. There are no records of the species within the survey area nearest records are from Bibra and North Lake in the west.	No significant habitat present
<i>Tringa totanus</i> (Common Redshank)	Mi	IA			X	The Common Redshank is found at sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand). They are also found at saltlakes, fresh water lagoons, artificial wetlands, saltworks and sewage farms (DEE 2018).	Highly unlikely , the species has not been recorded in this region	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Tyto novaehollandiae subsp. novaehollandiae</i> (Masked Owl southern subsp.)		P3			X	The Masked Owl is found across a range of habitats from wet sclerophyll forest, dry sclerophyll forest, non-eucalypt dominated forest, scrub and cleared land with remnant old growth trees. There are however several aspects of habitat preference which appear to be common: the Masked Owl requires large hollows in old growth eucalypts for nesting; it often favours areas with dense understorey or ecotones comprising dense and sparse ground cover, they are often recorded foraging within 100-300 m of the boundary of two vegetation types (Bell and Mooney 2002).	Unlikely , the habitat within the survey area is not the preferred habitat for this species. The nearest record is in the Yanchep National Park.	No significant habitat present
Mammals								
<i>Bettongia penicillata subsp. ogilbyi</i> (Woylie, Brush-tailed Bettong)	En	Cr		X	X	Preferred habitat for the Woylie includes dense undergrowth, logs and rock-cavities and occasionally in burrows (Burbidge 2004). Scattered Woylie populations may be found throughout the Jarrah forest in the south-west corner of WA. Extant naturally occurring populations of the species are restricted to three small wheatbelt reserves in WA – Dryandra Woodland, Tutanning Nature Reserve and Perup Forest. All are characterised by the presence of thickets of the plant <i>Gastrolobium</i> (Van Dyck and Strahan 2008). The species historically occurred in a wide variety of habits, however is now restricted to areas where predation has been controlled (or excluded).	Highly unlikely , the species is no longer known from the area. There are records within 10 km of the survey area however the specimens collected were bones and likely represent historic occurrence in the area. The species is likely extinct in the region.	No significant habitat present
<i>Dasyurus geoffroii</i> (Western Quoll, Chuditch)	Vu	Vu		X	X	The Chuditch inhabits eucalypt forest (especially Jarrah, <i>Eucalyptus marginata</i>), dry woodland and mallee shrublands. In Jarrah forest, Chuditch populations occur in both moist,	Unlikely , this species requires large areas of connected habitat to persist, the habitat is the survey area would not be	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						densely vegetated, steeply sloping forest and drier, open, gently sloping forest. Most diurnal resting sites in sclerophyll forest consist of hollow logs or earth burrows (Van Dyck and Strahan, 2008). The species can travel large distances, has a large home range and is sparsely populated through a large portion of its range.	suitable for this species. An individual record from 2016 was recorded in the City of Melville. This is a suburban environment and the specimen was likely transported to the region by vehicle. This is not typical for this species in this region and the species is unlikely to persist in such environments.	
<i>Falsistrellus mackenziei</i> (Western False Pipistrelle)		P4			X	The Western False Pipistrelle occurs in wet sclerophyll forest dominated by Karri (<i>Eucalyptus diversicolor</i>), and in the high rainfall zones of the Jarrah (<i>E. marginata</i>) and Tuart (<i>E. gomphocephala</i>) forests. The species is restricted to areas in or adjacent to stands of old growth forest. It has also been recorded in mixed Tuart-Jarrah tall woodlands on the adjacent coastal plain. Marri (<i>E. calophylla</i>), Sheoak (<i>Casuarina heugeliana</i>) and Peppermint (<i>Agonis flexuosa</i>) trees are often co-dominant at its collection localities (Churchill 2008).	Unlikely , very little habitat is present for this species and the nearest record is located over 20 km away to the south east.	No significant habitat present
<i>Hydromys chrysogaster</i> (Water Rat)		P4			X	Water-rats live primarily in a wide variety of freshwater habitats, from sub-alpine streams and other inland waterways to lakes, swamps, farm dams and irrigation channels and are thought to be one of the few native species to have at least partially benefited from human encroachment (Gardner and Serena 1995).	Unlikely , there is suitable habitat (Canning River) within the survey area and the species has been recorded previously. However the records for the species are historical and approximately 50 years old. It is unlikely the species is present in this section of river.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Isoodon obesulus subsp. fusciventer</i> (Quenda, Southern Brown Bandicoot)		P4			X	The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland close to dense cover (Van Dyck and Strahan 2008).	Present , there is suitable habitat within the survey area. The species was recorded within survey area via observation, digs and scats. There are records present within the survey area.	<i>Banksia</i> woodland (11.61 ha) <i>Melaleuca</i> woodland (3.34 ha) Ephemeral low shrubland (4.43 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Scattered isolated shrublands (3.91 ha)
<i>Macropus eugenii derbianus</i> (Tammar Wallaby)		P4			X	The Tammar Wallaby inhabits dense, low vegetation for daytime shelter and open grassy areas for feeding. Inhabits coastal scrub, heath, dry sclerophyll (leafy) forest and thickets in mallee and woodland The tammar wallaby is currently known to inhabit three islands in the Houtman Abrolhos group, Garden Island near Perth, Middle and North Twin Peak Islands in the Archipelago of the Recherche, and at least nine sites on the mainland including, Dryandra, Boyagin, Tutanning, Batalling (reintroduced) Perup, private property near Pingelly, Jaloran Road timber reserve near Wagin, Hopetown, Stirling Range National Park, and Fitzgerald River National Park (Van Dyck and Strahan 2008).	Highly unlikely , the habitat within the survey area is suitable for this species however they have not been recorded on the Swan Coastal Plain for many years and are heavily impacted by predation from foxes and therefore unlikely to be present in the survey area.	No significant habitat present
<i>Macropus irma</i> (Western Brush Wallaby)		P4			X	The Western Brush Wallaby is a grazer found primarily in open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland, and is uncommon in karri forest. This species was once very common in the south-west of WA	Unlikely , the habitat within the survey area is suitable for this species however they are heavily impacted by predation from foxes and therefore unlikely to be present in the survey area.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						but has undergone a reduction in range and a significant decline in abundance in its current habitat. (Van Dyck and Strahan 2008).		
<i>Myrmecobius fasciatus</i> (Numbat)	Vu	En			X	The numbat's distribution once encompassed a number of habitat types, including eucalypt forest, eucalypt woodland, Acacia woodland and Triodia grasslands. Current populations occupy several different habitat types: upland Jarrah forest, open eucalypt woodland, banksia woodland and tall closed shrubland. There are currently two remnant native populations at Dryandra and Perup, WA and several reintroduced populations including Boyagin, Tutanning, Batalling and Karroun Hill Nature Reserves. Habitats usually have an abundance of termites in the soil, hollow logs and branches for shelter (Friend 2008).	Highly unlikely , the species is locally extinct.	No significant habitat present
<i>Petrogale lateralis subsp. lateralis</i> (Black-footed Rock-wallaby)	Vu	En			X	The Black-flanked Rock-wallaby has undergone a large range restriction, formerly being known from suitable habitat across central and southern WA. The current known populations remain restricted to suitable habitat in the Little Sandy Desert, Cape Range, Wheatbelt, Barrow and Salisbury Islands. In the south-west, colonies are largely confined to large scattered granite outcrops in remnants vegetation surrounded by cleared agricultural land. The habitat of Black-flanked Rock-wallaby varies between colonies but always involves grassland feeding habitat for feeding in close proximity to cliff, rock-pile, talus or escarpment refuge habitat. Rock cliffs or other steep substrates with adequate shelter and refuge are essential for breeding. (Van Dyck and Strahan 2008).	Highly unlikely , there is no suitable habitat within the survey area and the species is susceptible to predation by foxes. The nearest record is located in the Darling Range.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Pseudocheirus occidentalis</i> (Western Ringtail Possum)	Vu	En		X	X	The Western Ringtail Possum occurs in and near coastal Peppermint Tree (<i>Agonis flexuosa</i>) forest and Tuart (<i>Eucalyptus gomphocephala</i>) dominated forest with a Peppermint Tree understorey from Bunbury to Albany. Also occurs in Jarrah (<i>Eucalyptus marginata</i>) forest and Jarrah-Marri (<i>Corymbia calophylla</i>) forest associated with Peppermint Tree (Van Dyck and Strahan 2008).	Highly unlikely , there is no suitable habitat within the survey area and the species is not known from the Swan Coastal Plain north of Mandurah.	No significant habitat present
<i>Setonix brachyurus</i> (Quokka)	Vu	Vu		X	X	The Quokka prefer dense forests and thickets, streamside vegetation, heaths and shrublands of <i>Agonis linearifolia</i> -dominated swamps in the Jarrah (<i>Eucalyptus marginata</i>) forest. The northern extent of the current distribution on the mainland is in the Jarrah forest in the Perth hills, to southward through the southern Jarrah, Marri and Karri forests to the south coast, but largely confined to areas receiving an annual rainfall of 1,000 mm or more (Van Dyck and Strahan 2008).	Highly unlikely , the species is locally extinct.	No significant habitat present
Reptiles								
<i>Acanthophis antarcticus</i> (Southern Death Adder)		P3			X	Locally restricted to the Darling Range between Mount Helena and Jarrahdale, preferring woodlands adjacent to granite outcrops and densely vegetated creeks (Bush <i>et al.</i> 2010; Wilson and Swan 2013).	Highly unlikely , the species is not known from the survey area and is restricted to the Darling Range.	No significant habitat present
<i>Ctenotus delli</i> (Dell's Skink)		P4			X	Dell's Skink is associated with Jarrah-Marri woodland that has a shrub-dominated understorey, on laterite, sandy or clay soils. It is found in the north Darling Range and inhabits dry sclerophyll forest on granite outcrops, stony hills and ranges. It is absent from the Swan	Highly unlikely , the species is not known from the survey area and is restricted to the Darling Range.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						Coastal Plain (Cogger 2014; Wilson and Swan 2013).		
<i>Ctenotus gemmula</i> (SWA subpop.) (Jewelled south-west Ctenotus)		P3			X	The Jewelled South-West Ctenotus occurs on pale sandplains supporting heaths in association with <i>Banksia</i> or mallee woodlands (Wilson and Swan 2013, Kay and Keogh 2012). This species occurs in two isolated subpopulations in Western Australia; one along the lower west coastal plain from Cataby south to Perth, the second along the south coast and adjacent interior, from Rocky Gully east to the beginning of the Great Australian Bight, and inland to Lake Magenta (G. Shea pers. comm. 2008). A third subpopulation, from Perth south of the Swan River to Canningvale, was lost historically following urbanisation (G. Gaikhorst pers. comm. 2017).	Likely , the habitat within the survey area is suitable for this species. There is one record approximately 1 km east of the southern-most section of the alignment from 1973 and one record approximately 4 km west of the northern-most section of the alignment from 1972. This species is uncommon despite extensive areas of suitable habitat within its range. It is likely they are confined to larger intact areas of native vegetation that remain unburnt (G. Gaikhorst pers. comm. 2017) however very little is currently known about this species.	<i>Banksia</i> woodland (11.61 ha) Ephemeral low shrubland (4.43 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Scattered isolated shrublands (3.91 ha)
<i>Ctenotus ora</i> (Coastal Plains Skink)		P4			X	The Coastal Plains Skink is locally restricted the sandy regions of the southern portion of the Swan Coastal Plain. It inhabits open eucalypt woodland over <i>Banksia</i> , as well as sandy coastal plain and coastal dunes between Pinjarra and Yallingup Brook (Wilson and Swan 2013).	Highly unlikely , the species is not known from the Swan Coastal Plain north of Mandurah.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3			X	The Perth Slider is locally restricted to the Swan Coastal Plain south of the Swan River, including Rottnest and Garden Islands, where it inhabits coastal dunes, Banksia/eucalypt woodlands and suburban gardens. There are also isolated populations on the mid-west coast at Woodleigh Station and in Busselton (Wilson and Swan 2013).	Likely , habitat is present and the species is known from the study area. There a number of recent records (between 2009 to 2016) of this species within 5 km of the study area, including Ken Hurst Park, around Jandakot airport and near Aubin Park. Recently recorded at the Roe Highway/ Kwinana Freeway intersection during the Roe8 project. Although this species seems to survive well in small patches of remnant vegetation ongoing development is eliminating much of the remaining suitable habitat. Given that much of the project area is already highly fragmented and in degraded condition, the project is unlikely to have a significant impact on this species.	<i>Banksia</i> woodland (11.61 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Scattered isolated shrublands (3.91 ha)
<i>Neelaps calonotos</i> (Black-striped Snake)		P3			X	This Black-striped Snake is restricted to the sandy coastal strip near Perth, between Mandurah and Lancelin. It occurs on dunes and sand-plains vegetated with heaths and eucalypt/banksia woodlands. This species is seriously threatened by increasing development within its restricted distribution (Wilson and Swan 2013). This species is thought to prefer mature <i>Banksia</i> woodlands and hence frequent fires may become a threat (Valentine <i>et al.</i> 2012); this is supported by the observation that,	Likely , the habitat within the survey area is suitable for this species. There are a number of historical records within 5 km of the survey area (multiple records at Thomsons Lake). There is one record from 2011 which appears to occur within or immediately adjacent to the study area in bushland at the corner of Ranford Rd and	<i>Banksia</i> woodland (11.61 ha) Ephemeral low shrubland (4.43 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha) Scattered isolated shrublands (3.91 ha)

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						<p>in nine reserves on the Swan Coastal Plain where it was historically recorded, it appears to persist only in the larger ones (and so those most resistant to fire) based on the results of repeated surveys (How and Dell 2000). This suggests it may be at significant risk from fire only as a secondary pressure in areas already under pressure from habitat fragmentation (M. Craig pers. comm. 2017 in IUCN 2018).</p>	<p>Livingston Drive (near Ken Hurst Park). The larger patches of remnant vegetation comprising of <i>Banksia</i> woodlands provide the most suitable habitat for this species, in particular the area adjacent to Ranford Road just south of the Canning Vale Business Park. The project will result in some habitat loss for this species. The project may also impede the movement of this species between remaining remnants of native vegetation in adjacent areas. The project is likely to impact this species on a local scale, however given that much of the study area is already highly fragmented and in degraded condition, it is not considered to contain significant habitat for this species.</p>	
Invertebrates								
<i>Leioproctus bilobatus</i> (a bee)		P2	X		X	<p>Very little information is available on this species. This species is only known from two locations near Kenwick on the Swan Coastal Plain and just north of Albany. These two localities consist of clay plans dominated by shrubs and herbs that may seasonally inundate. There are few remaining communities remaining of this habitat type are now listed as threatened Ecological communities.</p>	<p>Unlikely, there is no habitat present in the survey area and no records are present in the survey area. Records are present in the Brixton Street Wetlands approximately 1.5 km east of the survey area.</p>	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
<i>Leioproctus contrarius</i> (a bee)		P3	X		X	Very little information is available on this species. This species (like the above) is only known from few locations near Murdoch, Forrestdale Lake on the Swan Coastal Plain and just north of Wanneroo. These localities consist of clay plans dominated by shrubs and herbs that may seasonally inundate. There are few remaining communities remaining of this habitat type are now listed as threatened Ecological communities.	Unlikely , there is no habitat present in the survey area and no records are present in the survey area. Records are present in the Forrestdale Lake associated wetlands approximately 10 km south of the survey area.	No significant habitat present
<i>Leioproctus douglasiellus</i> (a Short-Tongued Bee)	Cr	En	X	X	X	Very little information is available on this species. This species is only known from three locations near Kenwick, Cannington and Forrestdale Lake associated wetlands on the Swan Coastal Plain. These localities consist of clay plans dominated by shrubs and herbs that may seasonally inundate. There are few remaining communities remaining of this habitat type are now listed as threatened Ecological communities.	Unlikely , there is no suitable habitat present in the survey area and no records present. However one record is within 0.5 km of the survey area within the Kenwick Wetlands Nature Reserve. Records are also present in Cannington (old) and the Forrestdale Lake associated wetlands approximately 10 km south of the survey area. This species has not been recorded in habitat identified within the survey area.	No significant habitat present
<i>Neopasiphae simplicior</i> (a bee)	Cr	En	X		X	<i>Neopasiphae simplicior</i> is restricted in range, and is thought to only occur in a single location within the bushland of the Forrestdale Lake Nature Reserve adjacent to Forrestdale Lake and the Armadale Golf Course, with a previous population known from Cannington (Perth's southern suburbs). The Forrestdale Lake Nature Reserve lies on the Bassendean dunes of the Swan Coastal Plain, vegetated largely by banksia woodlands and low closed forests of	Unlikely , there is no habitat present in the survey area and no records are present in the survey area. Records are present in Cannington (no longer present) and the Forrestdale Lake associated wetlands approximately 10 km south of the survey area.	No significant habitat present

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
						swamp paperbarks. <i>Neopasiphae simplicior</i> has been collected at flowers of Thread-leaved Goodenia (<i>Goodenia filiformis</i>), Slender Lobelia (<i>Lobelia tenuior</i>), <i>Angianthus preissianus</i> , and <i>Velleia</i> sp. Males roost overnight in flowers of Asteraceae, of which the flowers are low-growing ephemerals (DEE 2018).		
<i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	X		X	The Graceful Sunmoth occurs within the Swan, South West and Midwest WA DBCA regions. The range of the Graceful Sunmoth is from Namburg National Park (near Dandaragan) in the north to Mandurah in the south. The Graceful Sun Moth is associated with two habitat types: (1) Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the preferred host plant <i>Lomandra maritima</i> . (2) <i>Banksia</i> woodland on Spearwood and Bassendean dunes, where the second known host plant <i>L. hermaphrodita</i> is widespread (DEE 2018).	Likely , habitat is present for the species. There are three recent records (2011) approximately 2-3 km south and east of the study area in Jandakot and one record from 1969 at Yangebup Lake (approximately 2 km west). The larger intact areas of <i>Banksia</i> woodland in good or better condition provide the most suitable habitat for the Graceful sunmoth. However given the linear nature of the study area and degraded condition of much of the remaining vegetation, the project is unlikely to have a significant impact on this species.	<i>Banksia</i> woodland (11.61 ha) Open <i>Banksia</i> woodland over low shrubland (1.42 ha)
<i>Throscodectes xiphos</i> (a cricket)		P1	X		X	No data can be found on this species including habitat preference. The collection records for the museum specimens are from heathland (<i>Banksia</i> woodlands) in the Jandakot area.	Unknown , there are only four known records of this species, all of which are in the Jandakot area, less than 1 km from the study area (recorded 1975, 1981, 1983 and 1999). Given the lack of information available on this species it is difficult to identify significant	Unknown, potentially the <i>Banksia</i> woodlands.

Species Name	Status		Desktop Search			Description and habitat requirements	Likelihood	Suitable habitat in the survey area (for species present, likely and possibly present)
	EPBC Act	WA	NM	PMST	DBCA – SWA			
							habitat within the project as well as potential impacts to the species.	
Crustacean								
<i>Westralunio carteri</i> (Carter's Freshwater Mussel)	VU	VU	X			The Carter's Freshwater Mussel is restricted to south-western Western Australia, and occurs in 13 of 18 river basins in the South West Coast Drainage Division. It was formerly found from Moore River in the north to King George Sound in the south and inland to the Avon River (McMichael and Hiscock 1958; WA Museum Records; Kendrick 1976). Currently distributed in freshwater streams, rivers, reservoirs and lakes within 50-100 km of the coast, from Gingin Brook southward to the Kent River, Doodga River and Waychinicup River (Klunzinger et al. 2012c, 2014). It patchily distributes itself in sandy/muddy sediments of freshwater lakes, rivers and streams with greatest densities associated with exposed submerged tree roots (<i>Eucalyptus rudis</i> , <i>Melaleuca</i> spp. and others), woody debris and overhanging riparian vegetation near stream banks and edges of lakes/dams (DEE 2018).	Likely , there are a number of records of this species along the Canning River. Four records (from 2010 and 2012) are located approximately 1 km north (downstream) of the study area where it crosses the Canning River.	Canning River

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Appendix F – Ten clearing principles assessment

Principle	Assessment	Outcome	Data sources
<p>a) – Native vegetation should not be cleared if it comprises a high level of biological diversity.</p>	<p>The survey area is situated in the South West Botanical Province of WA, within the SWA IBRA bioregion and Perth IBRA subregion. The flora of the Perth sub-region is diverse with 3,255 native vascular flora taxa recorded.</p> <p>The majority of the survey area is a rail corridor with isolated stands of trees and shrubs scattered along its length. Adjacent to the corridor are patches of remnant bushland and/or cleared areas that have been modified by infrastructure and weed invasion. Eleven vegetation types were identified from the survey area. The vegetation types included six that represent remnant native vegetation communities; two dryland (VT01 & VT08) and five dampland (VT02, VT02a, VT02b, VT05 & VT09). The remaining four communities vary between drylands and damplands and are in a varied state of degradation due to previous modifications to the landscape.</p> <p>There is 28.85 ha of native vegetation, 53.96 ha of highly modified vegetation (scattered natives or cleared grassland) and 75.10 ha of cleared areas within the survey area (total: 157.90 ha). Vegetation that was rated as Degraded, Degraded - Completely Degraded and Cleared accounted for 129.06 ha (82 %) of the overall survey area. Remnant <i>Banksia</i> woodland (1.25 ha) in Excellent condition was recorded in part of VT01.</p> <p>The survey area is linear and is surrounded by residential housing, infrastructure and remnant patches of bushland in varying condition. Within the survey area is the <i>Caladenia Grove Wetland Reserve</i> (4.88 ha). This area is identified as an; ESA, CCW, representative of the Banksia woodland of the Swan Coastal Plain TEC and known habitat for the EPBC Act and WC Act listed Threatened species <i>Caladenia huegelii</i> (Grand Spider Orchid).</p> <p>The survey area does contain areas of native vegetation that are in better condition, and offer a higher floristic value than the surrounding environment. The majority of the survey area and the surrounding environment has been highly modified by clearing, infrastructure and aggressive weeds. The small areas of remnant bushland left in the survey area that are in Good or better condition are rare in the area and do support a high level of diversity when compared to their surrounds.</p> <p>Desktop searches identified eleven TECs, and three PECs within 5 km of the survey area, three of the PECs are also part of a TEC. The vegetation within the survey area aligned with one TEC and one PEC.</p> <ul style="list-style-type: none"> • <i>Banksia</i> Woodlands of the SWA TEC, which is listed as Endangered under the EPBC Act 	<p>Likely to be at variance to this Principle</p>	<p>Beard (1990) Beard (1979) DEE (2017c) DBCA (2007–) DBCA TEC and PEC databases DBCA TPFL and WAHERB WA Herbarium (1998–)</p>

Principle	Assessment	Outcome	Data sources
	<ul style="list-style-type: none"> • Low lying <i>Banksia attenuata</i> woodlands or shrublands (21c) PEC, listed as a Priority 3 by DBCA <p>There is 12.47 ha of the <i>Banksia</i> Woodlands of the SWA TEC within the survey area. There is 14.56 ha of Low lying <i>Banksia attenuata</i> woodlands or shrublands (21c) PEC present within the survey area (this total includes 12.47 ha which also aligns with the <i>Banksia</i> Woodlands of the SWA TEC).</p> <p>Nine hundred and ninety two native flora taxa have been previously recorded within 5 km of the survey area (DBCA 2007–). One hundred and sixty five (165) flora taxa representing 49 families and 125 genera were recorded from the survey area during the field survey. This total comprised of 103 native taxa, 62 introduced flora taxa. The survey area is considered to have low to moderate floral diversity.</p> <p>Desktop searches identified the presence/potential presence of 85 conservation significant flora taxa within 5 km of the survey area. Other than <i>Caladenia huegelii</i>, no EPBC Act or WC Act listed flora taxa were recorded within the survey area during the GHD surveys. <i>Caladenia huegelii</i> has previously been recorded with the <i>Caladenia Grove Wetland Reserve</i>, with the targeted flora survey completed during September and October 2018 confirming a number of plant recorded (GHD 2018). Additionally DBCA records show the occurrence of <i>C. huegelii</i> occurring <10 m from the survey area boundary between Karel Ave and Ken Hurst park. These records were confirmed as part of the targeted flora survey, reported by GHD (2018). A likelihood of occurrence assessment conducted post-field survey concluded that two taxa are known to occur within the survey area (<i>Caladenia huegelii</i> and <i>Dodonaea hackettiana</i>, one may occur (<i>Tetraria australiensis</i>) and the remaining taxa identified in desktop searches are considered unlikely to occur in the survey area.</p> <p>Eight broad fauna habitat types were recorded from the survey area including highly disturbed areas. Four of these habitat types provide high value habitat for fauna. A search of the <i>NatureMap</i> database (DBCA 2007–) identified 557 fauna species that have been previously recorded within 10 km of the study area. This total included 228 birds, 63 reptiles, 10 amphibians and 26 mammals. The remainder of species are marine fish and invertebrates. The fauna surveys recorded 66 vertebrate fauna species, including 45 birds, 11 reptiles, seven mammals and 3 frogs. This included three conservation significant species:</p> <ul style="list-style-type: none"> • Carnaby's Black Cockatoo (<i>Calyptorhynchus latirostris</i>) – listed as Endangered under EPBC Act and WC Act 		

Principle	Assessment	Outcome	Data sources
	<ul style="list-style-type: none"> • Forest Red-tailed Black Cockatoo (<i>Calyptorhynchus banksii naso</i>) – listed as Vulnerable under EPBC Act and WC Act • Southern Brown Bandicoot (<i>Isoodon obesulus subsp. Fusciventer</i>) – Listed as P4 by DBCA <p>The survey area contains a number of vegetation and habitat types including conservation significant vegetation and supports a range of flora and fauna species, including conservation significant species. Whilst the survey area does contains patchy areas of native vegetation it offers a higher floristic value than the surrounding environment, it supports approximately 16 ha of native vegetation in Good or better condition in a largely cleared/degraded landscape.</p>		
<p>b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA</p>	<p>Eight broad fauna habitats were recorded within the survey area, including:</p> <ul style="list-style-type: none"> • <i>Banksia</i> woodland • <i>Melaleuca</i> woodland • Ephemeral low shrubland • Open <i>Banksia</i> woodland over low shrubland • Mixed tall woodland/clumped trees • Water bodies either seasonally inundated areas or man-made pools • Scattered isolated shrublands (scattered islands or scattered clumps) • Mixed grasslands in paddocks. <p>Four of these habitat types provide high value habitat for fauna. These four habitat types cover approximately 30% of the total survey area demonstrating the overall high value of the area. The remainder of the survey area consists of medium to low value habitat for fauna. All of the habitat types are moderately represented at a local and regional scale, and overall the survey area retains moderate local and regional connectivity to remnant vegetation in the region.</p> <p>Five hundred and fifty seven native fauna species have been previously recorded within 5 km of the survey area (DBCA 2007–). This total included 228 birds, 63 reptiles, 10 amphibians and 26 mammals. The remainder of species are marine fish and invertebrates. The field surveys recorded 66 vertebrate fauna species, including 45 birds, 11 reptiles, seven mammals and three frogs.</p> <p>During the field survey, three conservation significant fauna species were recorded:</p> <ul style="list-style-type: none"> • Carnaby’s Black Cockatoo – listed as Endangered under EPBC Act and WC Act • Forest Red-tailed Black Cockatoo – listed as Vulnerable under EPBC Act and WC Act • Southern Brown Bandicoot - listed as Priority 4 by DBCA 	<p>Likely to be at variance to this Principle</p>	<p>DEE (2016b) DBCA (2007–) Beard (1979)</p>

Principle	Assessment	Outcome	Data sources
	<p>A further six conservation significant species were assessed as likely to occur within the survey area, including:</p> <ul style="list-style-type: none"> • Peregrine Falcon (<i>Falco peregrinus</i>) – Listed as other specially protected fauna by DBCA • Jewelled South West Ctenotus (<i>Ctenotus gemmula</i>) – Listed as Priority 3 by DBCA • Black Striped Snake (<i>Neelaps calonotos</i>) – Listed as Priority 3 by DBCA. • Perth Slider (<i>Lerista lineata</i>) – listed as Priority 4 by DBCA • Graceful Sunmoth (<i>Synemon gratiosa</i>) - listed as Priority 4 by DBCA • A Cricket (<i>Throscodectes xiphos</i>) - listed as Priority 1 by DBCA <p>Forest Red-tailed Black Cockatoo were observed in several small groups foraging, drinking and flying over the survey area. Carnaby's Black Cockatoo were recorded via feeding evidence on Marri and pine cones and flying over the survey area. There is 46.83 ha of suitable foraging habitat and 176 potential breeding trees (only two had large hollows, with one of these occupied by bees) for the species within the survey area. It is likely that these species utilises the survey area for foraging and resources. The native vegetation within the survey area comprises significant habitat for Carnaby's and Forest Red-tailed Black Cockatoo.</p>		
(c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	<p>Desktop searches identified the presence/potential presence of 27 EPBC Act and/or WC Act listed flora taxa within 5 km of the survey area. A likelihood of occurrence assessment, which takes into account the habitats present, known species distribution and previous records and intensity of field surveys and season, was completed for the Threatened flora taxa identified in desktop searches. This assessment determined that one Threatened taxa (<i>Caladenia huegelii</i>) is known to occur, <i>Tetraria australiensis</i> may possibly occur and the remaining taxa are considered unlikely to occur within the survey area. The known occurrence of <i>Caladenia huegelii</i> is in the Caladenia Grove Wetland Reserve and <10 m from the survey area boundary between Karel Ave and Ken Hurst park. These are shown in the DBCA records and recorded by GHD (2018).</p>	Likely to be at variance to this Principle.	DEE (2017b) DBCA (2007–) DBCA TPFL and WAHERB WA Herbarium (1998–)
d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	<p>Desktop searches identified the presence/potential presence of 11 TECs within 5 km of the survey area, including:</p> <ul style="list-style-type: none"> • <i>Banksia</i> woodlands of the Swan Coastal Plain (TEC) • Subtropical and Temperate Coastal Saltmarsh (TEC) • Shrublands and woodlands on Muchea Limestone (TEC) • Southern wet shrublands, Swan Coastal Plain – SCP02 (TEC) • <i>Corymbia calophylla</i> - <i>Kingia australis</i> woodlands on heavy soils, Swan Coastal Plain – SCP3a (TEC) • <i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain – SCP3b (TEC) 	Likely to be at variance to this Principle.	DotE (2017b) DBCA TEC and PEC databases

Principle	Assessment	Outcome	Data sources
	<ul style="list-style-type: none"> • Herb rich saline shrublands in clay pans – SCP07 (TEC) • Herb rich shrublands in clay pans – SCP08 (TEC) • Shrubbylands on dry clay flats – SCP10a (TEC) • <i>Banksia attenuata</i> woodland over species rich dense shrublands – SCP20a (TEC) • Shrubbylands and woodlands of the eastern side of the Swan Coastal Plain – SCP20c (TEC) <p>An assessment of the vegetation types described within the survey area, based on dominant species and general field observations determined that only one vegetation type (VT01) within the survey area aligned with one TEC:</p> <ul style="list-style-type: none"> • <i>Banksia</i> Woodlands of the SWA TEC, which is listed as Endangered under the EPBC Act <p>There is 12.47 ha of the <i>Banksia</i> Woodlands of the SWA TEC within the survey area.</p>		
(e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	<p>The survey area is located within the SWA IBRA Bioregion, which has approximately 38.5% of its pre-European extent remaining.</p> <p>Regional vegetation mapping has been undertaken by Heddle <i>et al.</i> (1980). This mapping identified four vegetation complexes within the survey area: Southern River Complex, Bassendean Complex – Central and South, Guildford Complex and Swan Complex</p> <p>The vegetation complexes described and mapped by Heddle <i>et al.</i> (1980) have been assessed against presumed pre-European extents within the SWA IBRA bioregion and the Cities of Canning, Cockburn, Gosnells and Melville (GoWA 2018c). All vegetation complexes have less than 30 % of their pre-European extents remaining within the SWA IBRA bioregion and in their respective LGA.</p> <p>Where only 10 per cent or less of the pre-European extent of an ecological community remains that community is considered threatened. Within the following LGA's less than 10 % of the pre-European extent remains:</p> <ul style="list-style-type: none"> • City of Gosnells – Guildford Complex – 8.37 % • City of Canning – Bassendean Complex – Central and South – 5.45 % • City of Melville – Bassendean Complex – Central and South – 7.82 % 	Likely to be at variance to this Principle.	Heddle <i>et al.</i> (1980) GoWA (2018b) GoWA (2018c)
(f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment	<p>Desktop searches identified seven Conservation Category Wetland's, six Resource Enhancement Wetlands and five Multiple Use Wetlands occurring within the survey area.</p> <p>The survey area extends to either side of the Canning River embankment. The riparian vegetation located on the banks of the river was mapped as <i>Eucalyptus rudis Melaleuca rhapsiophylla</i> open forest (VT05). The surrounding vegetation has been highly modified and is</p>	Likely to be at variance to this Principle.	DoEE (2017d) GoWA (2018a)

Principle	Assessment	Outcome	Data sources
associated with a watercourse or wetland.	represented by grassland/ herbland (VT07). The condition of this area is Degraded to Degraded - Completely Degraded. The vegetation in this area supports vegetation that grows in association with the Canning River.		
(g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	<p>The survey area stretches east to west from the Pinjarra Zone, Bassendean Zone and just into the Spearwood Dunes of the Perth Coastal Zone. The Pinjarra Zone is a flat, poorly drained alluvial plain with a variety of soils including grey deep sandy duplex soils, brown shallow loamy duplex soils and cracking clays. The Bassendean Zone consists of low dunes, sandplains and wetland depressions with pale, deep, well drained and highly leached sands. The yellow 'Spearwood sands are of varying depths over limestone (Tamala Limestone).</p> <p>A review of Acid Sulphate Soils (ASS) risk mapping provided by DER indicates that the majority of the survey area is mapped as having 'moderate to low' risk of ASS occurring within 3 m of natural soil surface, the area associated with Canning River is mapped as 'high to moderate'.</p> <p>Any clearing of native vegetation within the survey area has the potential to cause water and wind erosion in areas with lighter-texture soils (e.g. sandy soils). The high sand content of the soils and ease with which these materials can be transported by the wind means there is a high risk of wind erosion in this area. However, given these soils are porous and well-drained and the survey area is linear in nature, the risk of water erosion is low.</p> <p>Overall, due to the long and linear nature of the native vegetation to be cleared, clearing for the Project is unlikely to cause substantial land degradation.</p>	Unlikely to be at variance to this Principle.	DAFWA (2007) DER ASS risk mapping Natural Resource Management SLIP (GoWA 2018a)
(h) – Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	<p>The survey area intersects one DBCA-managed conservation area that forms part of the Swan and Canning Rivers managed conservation area (R 48327). The survey area is also located 160 m from Kenwick Wetlands Nature Reserve (R 49200, Class A)</p> <p>The survey area intersects five Environmentally Sensitive Areas (ESAs), four of which are associated with Bush Forever sites;</p> <ul style="list-style-type: none"> • Canning and Southern Rivers, Beckenham to Martin/Kelmscott (site 246) • Nicholson Road Bushland, Langford/ Thornlie (site 456) • Ken Hurst Park, Leeming (site 245) and Jandakot Airport, Jandakot (site 253) • Buffer zone of Greater Brixton Street Wetlands, Kenwick (site 387) <p>The remaining ESA is associated with Caladenia Grove Wetland Reserve which is a CCW and known habitat of <i>Caladenia huegellii</i>.</p>	Likely to be at variance to this Principle.	DBCA Estate spatial dataset

Principle	Assessment	Outcome	Data sources
	<p>The survey area is surrounded by TECs and PECs. However, the actually survey area is located in an area that is surrounded by residential development and so has been has been historically cleared or otherwise highly modified (e.g. by roads, tracks, housing). The pockets of native vegetation within and surrounding the survey area that remain do have significant environmental values due to their rarity in the landscape and the presence of Threatened taxa.</p>		
<p>(i) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</p>	<p>The western extent of the survey area is located in the RIWI Act listed Jandakot and Perth Groundwater Areas and the Airport, Jandakot Confined, City of Melville and Perth South Confined subareas. Public Drinking Water Source Areas – Jandakot Underground Water Pollution Control Area, which is within a Priority 1, 2 and 3 Protection Zone.</p> <ul style="list-style-type: none"> • Priority 1 areas are defined and managed to endure there is no degradation of the drinking water source areas. • Priority 2 areas are defined and managed to maintain or improve the quality of the drinking water source • Priority 3 areas are declared over land where water supply sources need to coexist with other land uses such as residential, commercial and light industrial developments. <p>The vegetation within the western extent of the survey area is Degraded; clearing for the project is considered unlikely to impact upon groundwater quality.</p> <p>The edges of the Canning River and Tributaries listed under the RIWI Act were identified within the survey area (DWER 2016). Additionally, desktop searches identified five Conservation Category Wetland's, three Resource Enhancement Wetlands and four Multiple Use Wetlands occurring within the survey area (GoWA 2017). It is unlikely that the proposed works will disturb or interrupt any natural drainage and surface run-off patterns due to the deep sandy soils present in the area.</p> <p>There are no Environmental Protection Policy (EPP) lakes protected under the <i>Environmental Protection (Swan Coastal Plain Lakes) Policy 1992</i> within or in immediate proximity to the survey area. The nearest EPP lake is located approximately 2.4 km north of the survey area, and therefore no direct impacts are expected to occur to any EPP lakes as a result of the proposed project.</p>	<p>Unlikely to be at variance to this Principle.</p>	<p>DWER (2016) (GoWA 2018a)</p>
<p>(j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or</p>	<p>The soils of the survey area are generally sandy and porous and the area is generally well-drained. There were areas of more clayey type soils scattered within the survey area. These areas did exhibit pooling of water and were attached to the MUW (UFI 13621). Vegetation associated with this area included:</p> <ul style="list-style-type: none"> • VT03 <i>Melaleuca preissiana</i> <i>M. raphiophylla</i> open woodland (R3) • VT07 Grassland/Herbland 	<p>Unlikely to be at variance to this Principle.</p>	<p>(GoWA 2018a)</p>

Principle	Assessment	Outcome	Data sources
exacerbate, the incidence of flooding	The vegetation within these areas is already highly modified and mostly cleared. It is unlikely that the removal of vegetation proposed for this project would cause or exacerbate the incidence or intensity of flooding in the local area.		

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