360 environmental

Orange Grove Quarry

Native Vegetation Clearing Permit: Supporting Documentation

Prepared for

Boral Resources (WA) (Quarries)

December 2019

people planet professional

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1 Introduction

1.1 Background

360 Environmental Pty Ltd (360 Environmental) was commissioned by Boral Resources (WA) Quarries (the Proponent) to prepare a Native Vegetation Clearing Permit (NVCP) application to facilitate the construction of an access route within the existing Orange Grove Hard Rock Quarry (the quarry), Orange Grove (the Proposal) (Figure 1). The quarry is located within Lots 453, 457, 465, 466, 467, 50, 10, 113, and 181 Stephen Street, Orange Grove (the site), which is approximately 18.5 km south east of Perth within the City of Gosnells (CoG). It is proposed to clear approximately 0.96 ha of remnant vegetation to create safer and more efficient access to the quarry pit area within Lots 453 and 457 (clearing permit area). (Figures 1 and 2).

Operations on site commenced in the early 1960s, with Boral Resources purchasing the site and operations in the late 1980s. To accommodate the existing facilities and proposed future activities, part of the quarry operation was formally assessed in 1990 at the level of 'Public Environmental Review' (PER) and approved by the Minister for the Environment subject to a number of Ministerial Conditions and Proponent Commitments, as outlined in Ministerial Statement No. 170 (Appendix A).

The site operates under an Extractive Industry Licence which expires in June 2025 (Appendix B).

The site is currently reserved for 'Parks and Recreation' under the Metropolitan Region Scheme (MRS). This reservation is also reflected in the CoG Town Planning Scheme (TPS) No. 6 with the area shown as a 'Metropolitan Region Scheme Reserve - Parks and Recreation'.

1.2 Purpose of Clearing Permit Application

The purpose of this Native Vegetation Clearing Permit (NVCP) supporting document is to present the results of an assessment of the clearing aspects of this Proposal against the Ten Clearing Principles as outlined in the (then) Department of Environment Regulation (DER)'s A guide to the assessment of applications to clear native vegetation (2014a) under Part V Division 2 of the *Environmental Protection Act 1986* (EP Act). This report identifies the potential environmental impacts associated with the proposal based on the best available data. This document and accompanying NVCP (Area Permit) application will be submitted to the Department of Water and Environmental Regulation (DWER) for assessment.

1.3 Responsible Applicant

Boral Resources (WA) Quarries is responsible for implementation of the clearing described within this document. Correspondence relating to this NVCP application should be addressed to:

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2 Site Overview

2.1 Climate

The nearest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Gosnells City (9106), located approximately 3.8 km southwest of the Survey Area. The long-term mean minimum temperature for Gosnells City ranges from 8.8˚C (July) to 18.7˚C (February) (1991 to 2019) and the long-term mean maximum temperature ranges from 18.4˚C (June) to 36.0˚C (January) (1961 to 2019) (Plate 1) (Bureau of Meteorology, 2019). The long-term annual average rainfall is 811.0 millimetres (mm) (1961 to 2019) (Plate 1) (Bureau of Meteorology, 2019).

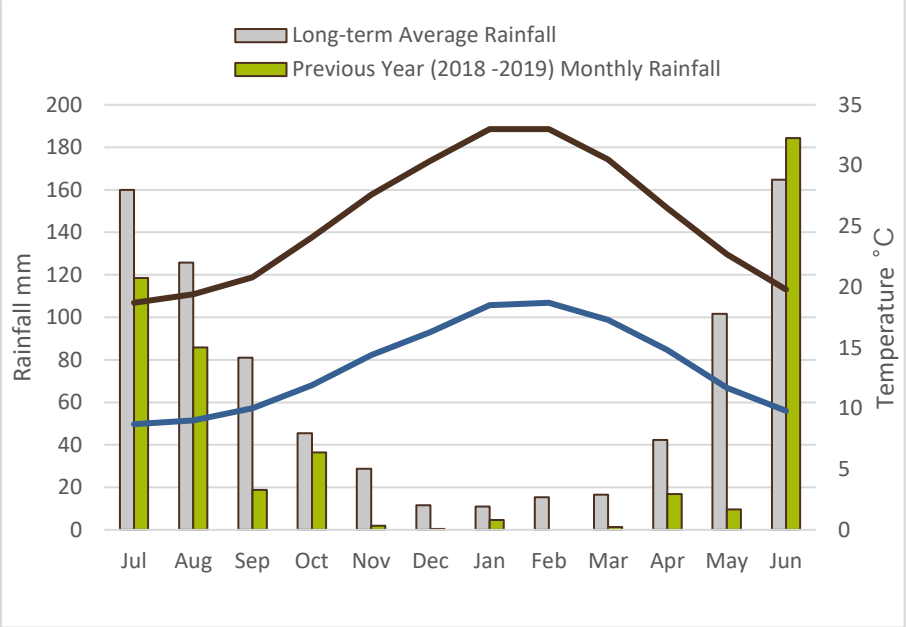

Plate 1: Long Term and Monthly total Rainfall, Maximum and Minimum Temperatures for Gosnells City (9106)

2.2 Topography and Soils

Regional topography contours indicate the range within the clearing permit area is between approximately 59 mAHD to 100 mAHD (Figure 3).

Soil-landscape system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales. The clearing permit area is within the Murray Valleys System which is described as the Western Darling Range from Avon Valley to Harvey. It is characterised as deeply incised valleys with red loamy earths, shallow duplexes and rock outcrop and Jarrah-marri-wandoo forest and woodland with mixed shrubland (Department of Agriculture and Food WA, 2012).

Regional Environmental Geology Mapping indicates that while the site consists of several geological units the clearing permit area is within the Granite (GR) which is characterised by mesocratic, fine to coarse-grained, ranges in composition from granodiorite to granite, adamellite being commonest variety (Figure 3).

2.3 Broad Vegetation Associations

Mapping of the vegetation of the Perth of WA was completed on a broad scale (1:250,000) by Beard (1981). These vegetation units were re-assessed by Shepherd et al. (2001) to account for clearing in the intensive land use zone, dividing some larger vegetation units into smaller units.

One broad vegetation type is mapped over the site. The vegetation type is described below and its representation across the state, bioregion and local government authority is shown in Table 1.

- **West Darling 4**: The vegetation type is described as a medium woodland comprising of marri and wandoo (Department of Primary Industries and Regional Development, 2018).

Table 1: Broad Vegetation Type and it's State and Regional Representation (Department of Biodiversity Conservation and Attractions, 2019a)

Vegetation Type	Pre-European Extent (HA)	Current Extent (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%)
Vegetation Type in Western Australia				
West Darling 4	1,054,279.89	284,102.41	26.95	23.85
Vegetation Type in Northern Jarrah Forest IBRA sub-region				
West Darling 4	614,200.82	197,903.81	32.22	30.56
Vegetation in City of Gosnells				
West Darling 4	1608.10	1,317.22	81.91	10.96

2.4 Hydrology

A review of GIS datasets has identified two minor, perennial streams (FID 8028 and 7712) occurring within the property boundary (Department of Water and Environmental Regulation, 2016), however, these do not occur within the clearing permit area and will not be affected by the proposed clearing. The clearing permit area is not within a Public Drinking Water Source Area (PDWSA) (Department of Water and Environmental Regulation, 2019a).

No geomorphic wetlands are mapped within the site (Department of Biodiversity Conservation and Attractions, 2017a). The closest wetland identified is a Multiple-Use Wetland (ID: 15768) located approximately 580 m west of the site.

According to the 1990 EPA referral, surface water occurs in seasonal streamlines in valleys surrounding the site. The initial site and proposed 1990 study area were bounded to the north and south by two streamlines which flowed freely during winter. The northern streamline was intercepted by the initial quarry, its flow maintained by roadside drains, which directed it into silt-traps then into the main storage dam, or the old quarry reservoir (Environmental Protection Authority, 1990).

There are two artificial water bodies within the property boundary, which are part of the quarry operations.

2.5 Conservation Features

Environmentally Sensitive Areas (ESAs) are identified and protected under the Environmental Protection (Environmentally Sensitive Areas) Notice 2005. Under the Notice, it is an offence to kill or destroy vegetation within an ESA. Exemptions contained in the *Environmental Protection (Clearing of Native vegetation) Regulations 2004* for low impact land clearing do not apply in ESAs and a clearing permit is required.

Mapping undertaken by DWER indicates there are no ESAs identified across the clearing permit area. The closest ESA is located approximately 1.2 km to the south of the clearing permit area. (Department of Water and Environmental Regulation, 2018).

The clearing permit area is not mapped within any Regional Parks or DBCA Managed Lands, however, the vegetated land located to the north, east and south of the quarry boundary is identified as the Banyowla Regional Park (Department of Biodiversity Conservation and Attractions, 2017b). The Banyowla Regional Park contains several parcels of land which are managed by the DBCA.

The clearing permit area is not mapped within any Bush Forever Areas (Government of Western Australia, 2000). The closest Bush Forever Site No. 51 is mapped 1.7 km north, north-west from the clearing permit area.

The clearing permit area is not mapped with the Perth Regional Ecological Linkage, however, Linkage ‘34’ occurs on the eastern boundary of the Quarry, approximately 950 m to the east of the site (Western Australian Local Government Authority, 2018).

3 Assessment Methodology

3.1 Flora and Vegetation Survey

Boral Resources commissioned 360 Environmental to conduct a Reconnaissance Flora and Vegetation Assessment at the Boral Quarries site in Orange Grove. The survey area included part of Lots 50 & 457 Stephen Street as well as Lot 453 Grant Street, Orange Grove.

3.1.1 Desktop Assessment

An initial desktop assessment was undertaken which included a review of current and relevant tenure and land ownership details, literature sources, database and GIS information to determine:

- Possible environmental survey and approvals requirements; and
- The location of areas with minimal environmental sensitivities/constraints and any highly constrained areas.

The desktop study provided background information on the flora and vegetation of the site. Database searches of the Department of the Environment and Energy (DEE)'s Protected Matters Search Tool (PMST) and the Department of Biodiversity Conservation and Attractions (DBCA)'s NatureMap Search Tool were undertaken to compile a list of Threatened or Priority species and Threatened and Priority Ecological Communities (TECs and PECs) that may occur in the area.

The database search identified 103 conservation significant flora species as potentially occurring within a 5 km radius of the survey area. This included 33 Threatened Species and 70 Priority Species, all which maintain the same status in 2019.

The PMST identified the potential of presence of two Threatened Ecological Communities (TEC) and two Priority Ecological Communities (PEC) within a 5 km radius of the site. These included:

- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 [DBCA], Endangered [EPBC])
- Clay Pans of the Swan Coastal Plain, (Vulnerable [DBCA], Critically Endangered [EPBC])
- *Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain (Critically Endangered [DBCA], Endangered [EPBC])
- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community (Priority 3 [DBCA], Critically Endangered [EPBC]).

For the full likelihood of occurrence assessment refer to Appendix C.

3.1.2 Reconnaissance Site Survey

A reconnaissance site survey was conducted over three visits by 360 Environmental. The first visit on 29 July 2019 was by 360's Senior Botanist Shenaye Hummerston (Flora licence number FB62000125), and the second visit on 28 October 2019 by Tyler Hudson (Flora licence number FB62000172). The survey was comprised of two areas (section A and section B).

The Proponent increased the survey area of section A after the first site visit and before the second visit. The original survey area covered 0.44 ha in section A, and 0.52 ha in section B. The

revised survey area for section A increased to 1.02 ha. The full Flora and Vegetation Assessment is provided in Appendix C.

A total of 39 flora species (including species, subspecies, varieties and forms) from 18 families and 34 genera were recorded in the clearing permit area. The most commonly occurring families were Myrtaceae (eight taxa) and Proteaceae (five taxa). Refer to Appendix C for more information.

Seven species could not be confidently identified to species level due to lack of identifying features such as flowering or fruiting parts and are not thought to represent significant species.

3.1.2.1 Flora of Conservation Significance

No Threatened or priority species pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and/or gazetted as Declared Rare Flora pursuant to the *Biodiversity Conservation Act 2016* were recorded within the survey area during any site visit.

3.1.2.2 Vegetation Associations

Two vegetation types were recorded during the site survey. None of the vegetation types recorded during the survey are considered representative of any TECs or PECs pursuant to the EPBC Act or the *Biodiversity Conservation Regulations 2018*. Section B of the survey area did not contain any native vegetation and so is excluded from this NVCP application.

The vegetation associations in the area are described in Table 2 and mapped in Figure 4 (360 Environmental Pty Ltd, 2019).

Table 2: Vegetation Types Recorded within the Clearing Permit Area

Vegetation Association Code and Description	Sites	Total Area (ha)	Total Area (%)	Representative Site Photograph
Cr: Closed shrubland of *Calothamnus rupestris* over an open grassland of *Poaceae* sp.	OG01 OG03 OG04	0.44	42.17	

Vegetation Association Code and Description	Sites	Total Area (ha)	Total Area (%)	Representative Site Photograph
CcBs: Open Woodland of *Corymbia calophylla* over shrubland of *Banksia sessilis*	OG02	0.25	24.68	
Cleared	N/A	0.34	33.14	N/A
Total		1.02	100	

3.1.2.3 Vegetation Condition

Only section A of the survey area contained remnant vegetation and the entire area of section B has been historically cleared, forming part of the current operational footprint for the Orange Grove Quarry.

The vegetation condition ranged from 'Very Good' to 'Completely Degraded' based on the Keighery (1994) condition scale. The areas considered to be 'Completely Degraded' have been cleared, and now consist of bare tracks and small areas of scattered individual native plants with a high density of weed species.

Refer to Table 3 for a summary of the vegetation condition extent, and Figure 5 for vegetation condition mapping (360 Environmental Pty Ltd, 2019).

Table 3: Vegetation Condition Recorded within the Clearing Permit Area

Condition	Extent in Survey Area (HA)	Proportion in Survey Area (%)
Very Good	0.09	9.53
Good	0.16	16.14
Degraded	0.38	37.82
Completely Degraded	0.37	36.55
Total	**1.02**	**100.0**

3.1.2.4 Introduced Flora

A total of 12 introduced species were recorded during the survey, representing approximately 28% of the total taxa. Of these introduced species, 2 introduced grasses could not be identified due to a lack of flowering, three species are listed as Declared Pest species under the Biosecurity and *Agriculture Management Act 2007* (BAM Act). Of these declared pests, both Bridal Creeper (**Asparagus asparagoides*) and Prickly Pear (**Opuntia stricta*) are listed as a Weed of National Significance (WONS) (Department of the Environment and Energy, 2018).

3.1.2.5 Threatened/ Priority Ecological Communities

None of the vegetation types recorded during the survey are considered representative of any TECs or PECs pursuant to the EPBC Act or the Biodiversity Conservation Regulations 2018.

3.2 Fauna and Habitats

3.2.1 Desktop Assessment

The NatureMap and the PMST databases identified 25 conservation significant fauna species as potentially occurring within a 5 km radius of the site.

While there are open quarry pits containing water bodies used for dust suppression and quarry operations within the site, there are no water bodies/wetlands within the clearing permit area. Due to this lack of water and the granite geology, the migratory avian fauna, marine species and wetland species have been omitted from further discussion.

Likelihood was determined based on the presence or absence of suitable fauna. The likelihood of conservation significant fauna species occurring within the Survey Area is provided in Table 4.

Table 4: Assessment of the Likelihood of Occurrence of Significant Fauna in the Survey Area

Species	Conservation Status		Habitat	Likelihood of Presence within the Survey Area *Surveyed Area is larger than the Clearing Permit Area
	EPBC Act (CTH)	BC Act (WA)		
Bettongia penicillata ogilbyi (Brush-tailed Bettong, Woylie)	EN	CR	Restricted to three small wheatbelt reserves, all characterised by the presence thickets of the plant genus *Gastrolobium*	Unlikely. Locally extinct.
Calyptorhynchus banksii naso (Forest Red-tailed Black-Cockatoo)	T	T	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests receiving more than 600 mm of annual average rainfall.	Likely. The site is within the modelled species distribution range (Department of Environment and Energy, 2017). 5 Wandoo trees were identified in the survey area which could potentially be utilized as breeding trees if appropriate hollows were present. One tree has hollows of sufficient size (as judged from the ground) to enable entry.

Species	Conservation Status		Habitat	Likelihood of Presence within the Survey Area *Surveyed Area is larger than the Clearing Permit Area
	EPBC Act (CTH)	BC Act (WA)		
Calyptorhynchus latirostris (Carnaby's Cockatoo)	E	T	Typically occurs in woodlands and scrubs of semiarid interior of Western Australia, in non- breeding season wandering in flocks to coastal areas, especially pine plantations and *Banksia* woodlands. Food includes the flowers, nectar and seeds of *Banksia*, *Dryandra*, *Hakea*, *Eucalyptus*, *Corymbia*, *Grevillea*, also seeds of Pinus	Likely. The survey area is within the modelled species distribution range (Department of Environment and Energy, 2017). Potential foraging habitat (Vegetation type CcBS) on site. Potential Roosting Habitat (Wandoo) is also present on site). 5 Wandoo trees were identified in the survey area which could potentially be utilized as breeding trees if appropriate hollows were present. One tree has hollows of sufficient size (as judged from the ground) to enable entry. This tree is located outside of the clearing permit area.
Calyptorhynchus baundinii Baudin's Cockatoo	EN	EN	Forests, farm trees, feed primarily on seed from large woody capsules of marri, a common SW eucalypt; also strips bark from dead trees in search of wood-boring insects	Likely. The survey area is within the modelled species distribution range (Department of Environment and Energy, 2017). Potential foraging habitat is present on site (e.g. Marri). Habitat on site is not preferred roosting habitat. 5 Wandoo trees were identified in the survey area which could potentially be utilized as breeding trees if appropriate hollows were present. One tree has hollows of sufficient size (as judged from the ground) to enable entry. This tree is located outside of the clearing permit area. Note that the site does not lie within a known breeding area.
Acanthophis antarcticus Southern Death Adder		P3	Habitats range from rainforest to shrublands and heath	Possible. Suitable shrubland habitat is present (*Banksia sessilis and Calothamnus rupestris).* However, as the surrounding area has been quarried over several decades, we do not consider that it would be present in high numbers, nor reliant on the on-site habitat for local persistence, if present.

Species	Conservation Status		Habitat	Likelihood of Presence within the Survey Area *Surveyed Area is larger than the Clearing Permit Area
	EPBC Act (CTH)	BC Act (WA)		
Setonix brachyurus Quokka	VU	VU	Requires dense wet ground cover in forest or swampy flats	Unlikely. Lack of suitable habitat within the clearing permit area. No wetlands present on the site.
Pseudocheirus occidentalis Western Ringtail Possum	CR	CR	Agonis forest and woodland, and Tuart forest with an *Agonis* midstorey	Unlikely. The known current distribution of the western ringtail possum is located south of Perth, predominately in pockets between Mandurah- Albany. The site is not located within the known current distribution area.
Leipoa ocellata Malleefowl	VU	VU	Unburned mallee and woodland with abundant litter and low scrub	Unlikely. No unburned mallee located on site. Lack of suitable habitat in the area.
Dasyurus geoffroii fortis (Western Quoll, Chuditch)	VU	VU	Areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland[4]	Unlikely. Suitable Habitat not located within the clearing permit area.
Kawaniphila pachomai southwest cricket		P1	The known from only two records, one of which is 5 km to the east of Holcim Gosnells Quarry from 1981, with the only other record from near Augusta (Bamford et al. 2017)	Unknown
Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)		P3	Sandy soil, arranges fallen twigs from the sheoak tree around the rim of its burrow entrance	Unlikely. *Allocasuarina* sp. Not recorded during the survey, preferred soil type is not present.
Isoodon fusciventer (Quenda, southwestern brown bandicoot)		P4	Quenda have a patchy distribution through the Jarrah and Karri forest, the Swan Coastal Plain. Scrubby, often swampy, vegetation with dense cover up to 1 m high, often feeds in adjacent forest and woodland and in areas of pasture and cropland lying close to dense cover.	Likely. Potential Quenda Habitat has been regionally mapped as occurring within the site (Western Australian Local Government Authority, 2018)
Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)		P3	Lives in *Banksia* woodlands and sandy areas of the Perth region.	Unlikely. Substrate on site is not preferred by this species.

3.2.2 Black Cockatoo Habitat Assessment

360 Environmental completed a third site survey to undertake a Black Cockatoo habitat survey on 8 November 2019 by Botanist Shenaye Hummerston. Note that the survey covered a slightly larger area than is proposed to be cleared. The survey identified five Wandoo (*Eucalyptus wandoo)* trees, with a Diameter at Breast Height (DBH) of greater than 300 mm in the survey area, three are within the clearing boundary. Only one of these trees contained hollows with an entrance of < 12 cm; this tree is outside of the proposed clearing area.

No evidence of Black Cockatoo roosting, breeding or foraging was observed during the survey (360 Environmental Pty Ltd, 2019).

4 Environmental Management Measures

In accordance with Ministerial Statement 170, Boral Resources has an approved Environmental Management Plan (EMP) for the management of the site including noise, dust emission and fire control. Boral Resources submits an annual compliance report to the Environmental Protection Authority (EPA) assessed against their ministerial statement.

To minimise the risk of impact from the activities associated with the Proposal, the following environmental management measures will be implemented:

- Induction of all contractors and/or internal personal undertaking the clearing in accordance with Boral's internal procedures. GPS coordinates of clearing permit area to be supplied to contractor
- Prior to clearing and earthworks commencing within the clearing permit area, the area will be clearly outlined (by barrier tape or star pickets) to ensure that no over clearing occurs beyond the permitted area
- Prior to clearing activities, areas of native vegetation to be retained will be clearly demarcated by star pickets, coloured tape or bunting and all personnel should be made aware of the requirement to protect native vegetation in these areas
- Cleared native vegetation will be mulched and reused on site for rehabilitation activities.

5 Assessment Against the Ten Clearing Principles

The proposed clearing of 0.96 ha has been assessed against the ten clearing principles as defined in DER's Guide to Assessment: Clearing of Native Vegetation under the EP Act, taking into account the current extent and condition of the native vegetation on the site. This assessment is presented in Table 5.

Table 5: Assessment Against the Ten Clearing Principles

Principle	Assessment	Outcome
Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity	The application is to clear 0.96 ha of vegetation to facilitate the construction of an access route within the existing Orange Grove Hard Rock Quarry (the quarry). The quarry is located within Lots 453, 457, 465, 466, 467, 50, 10, 113, and 181 Stephen Street, Orange Grove (the site). A database search with a 5 km buffer from the centre of the site and subsequent likelihood assessment was undertaken and identified 103 conservation significant flora species as potentially occurring in the vicinity of the site. Of these species, 20 were considered to have a High Likelihood of occurrence. Of these, five were classed as Threatened; *Acacia aphylla, Anthocercis gracilis, Darwinia apiculata, Goodenia arthrotricha, Thelymitra stellata.* One as Priority 1; *Thelymitra magnifica,* six as Priority 3; *Asteridea gracilis, Banksia kippistiana* var. *paenepeccata, Beaufortia purpurea, Halgania corymbosa, Pithocarpa corymbulosa, Thysanotus anceps* and Eight as Priority 4; *Acacia oncinophylla* subsp. *Patulifolia, Boronia tenuis, Calothamnus graniticus* subsp. *leptophyllus, Cyanicula ixioides* subsp. *ixioides, Hibbertia montana, Pimelea rara, Senecio leucoglossus and Stylidium striatum.* The PMST identified the potential of presence of two Threatened Ecological Communities (TEC) and two Priority Ecological Communities (PEC) potentially occurring within a 5 km radius of the site. These included: • Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 [DBCA], Endangered [EPBC]) • Clay Pans of the Swan Coastal Plain, (Vulnerable [DBCA], Critically Endangered [EPBC]) • *Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain (Critically Endangered [DBCA], Endangered [EPBC]) • Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community (Priority 3 [DBCA], Critically Endangered [EPBC]).	The Proposal is unlikely to be at variance with this Principle.

Principle	Assessment	Outcome
	Boral Quarries commissioned 360 Environmental to undertake a Reconnaissance Flora and Vegetation survey at the site in July and October 2019. The survey identified a total of 39 flora taxa from 34 genera and 18 families within the site. No Threatened flora species listed under the EPBC Act or gazetted a T/DRF pursuant to the Biodiversity Conservation Regulations 2018 were recorded during the survey. No Priority species, as listed by DBCA were recorded during the survey. Two vegetation types were recorded in the survey area; Cr (0.44 ha) and CcBs (0.25 ha) of which approximately 74% is in 'Degraded' to 'Completely Degraded' condition (Table 3). None of the vegetation types recorded during the survey are considered representative of any TECs or PECs pursuant to the EPBC Act or the Biodiversity Conservation Regulations 2018. 360 Environmental completed a Black Cockatoo habitat survey on 8 November 2019. Note that the survey covered a slightly larger area than is proposed to be cleared. The survey identified five Wandoo (*Eucalyptus wandoo*) trees, with a Diameter at Breast Height (DBH) of greater than 300 mm in the survey area, three are within the clearing boundary. Only one of the trees contained hollows with an entrance of < 12 cm; this tree is outside of the proposed clearing area. The site is also adjacent to Banyowla Regional Park which includes Korung National Park that is managed and protected by the DBCA for conservation purposes. The proposed clearing area therefore contains low diversity relative to the surrounding area. Based on the above, the proposed clearing area does not comprise a high level of biological diversity.	
Principle (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 Western Australia	One native tree species known to be used for breeding by Black Cockatoos was recorded in the survey area, Wandoo (*Eucalyptus wandoo*). 360 Environmental completed a Black Cockatoo habitat survey on 8 November 2019. Note that the survey covered a slightly larger area than is proposed to be cleared. The survey identified five Wandoo (Eucalyptus wandoo) trees, with a Diameter at Breast Height (DBH) of greater than 300 mm in the survey area, three are within the clearing boundary. Only one of the trees contained hollows with an entrance of < 12 cm; this tree is outside of the proposed clearing area and will not be impacted by clearing.	The proposal to clear 1.09 ha of vegetation within the site is unlikely to have a significant impact on significant habitat for fauna species indigenous to Western Australia due to nearby large areas of

Principle	Assessment	Outcome
	The majority of the proposed clearing area is not high-quality vegetation, is located within an existing quarry and is adjacent to large areas of better-quality vegetation areas. The vegetation is unlikely to represent significant foraging habitat, and no evidence of Black Cockatoo foraging, breeding or roosting was observed during the survey. The vegetation in the Survey Area does very little in contributing to the linkage of bushland areas in the region due to its isolation and size. In addition to this, the various current land uses within the boundaries of the Survey Area limit the sustainability of the vegetation due to the stresses of firebreak maintenance and weed infestations on an already very small pocket of vegetation. The site is not considered necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia and therefore the proposed clearing is not likely to be at variance to this principle.	remnant vegetation that may provide more suitable habitat. The proposal is unlikely to be at variance with this Principle.
Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of rare flora.	The review of the database searches identified 103 Threatened and Priority flora species as potentially occurring in the vicinity of the Survey Area. Of these potential Threatened species, 20 were considered to have a High Likelihood of occurrence, based on the habitat type present and known distribution. However, following the Reconnaissance Flora and Vegetation assessment completed by 360 Environmental, it was determined that the clearing permit area is unlikely to support significant flora due to the conditions of the site. The proposed clearing area forms part of an existing quarry area and is not of high quality (360 Environmental 2019). Additionally, the quarry abuts the Banyowla Regional Park, and Korung National Park which are part of the same IBRA Subregion – Northern Jarrah Forest as the proposed clearing area. The national park is managed by the DBCA for conservation purposes, with part comprising the same Vegetation Association as the proposed clearing area (West Darling 4). Much of the Banyowla Regional Park is also West Darling 4 (with a large area of West Darling 3). The national park also contains better quality vegetation than the proposed clearing area which is predominantly degraded. The site survey concluded that no Threatened Species listed under the EPBC Act and/or gazetted as Declared Rare Flora pursuant to the BC Act were recorded. Following the Reconnaissance Flora and Vegetation assessment completed by 360 Environmental, it was determined that the clearing permit area is unlikely to support rare flora due to the conditions of the site.	The Proposal is unlikely to be at variance with this Principle.

Principle	Assessment	Outcome
Principle (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 (TEC).	There are no Priority Ecological Communities (PEC) or Threatened Ecological Communities (TEC) within the proposed clearing area. However, there are two PECs and two TECs listed by the State within a five km radius of the proposed clearing area. These communities are also listed as TEC under the EPBC Act. These include; • Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 [DBCA], Endangered [EPBC]) • Clay Pans of the Swan Coastal Plain, (Vulnerable [DBCA], Critically Endangered [EPBC]) • *Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain (Critically Endangered [DBCA], Endangered [EPBC]) • Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community (Priority 3 [DBCA], Critically Endangered [EPBC]) Neither of the vegetation types (Cr and CcBs) identified in the proposed clearing area are considered to represent the TECs identified in the desktop assessment. This is due to the absence of the typical dominant species of any of the communities and/or soil type.	The Proposal is unlikely to be at variance with this Principle.
Principle (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	The site is within one vegetation unit mapped by Shepherd et al. (2001) and Beard (1981), West Darling 4. Table 1 outlines the total remaining extent of this vegetation unit within the State, Bioregion and Subregion. Of the pre-European extent, approximately 26% of West Darling 4 association remains across the state, respectively. The National Objectives and Targets for Biodiversity Conservation 2001 – 2005 include a target to have clearing controls in place that prevent the clearance of ecological communities with a pre-European extent below 30% (Commonwealth of Australia 2001). In the Perth metropolitan area, the EPA has a modified objective to retain at least 10% of pre-clearing extents of a vegetation association for defined constrained areas (EPA 2008). The application area is within a constrained area given that it is within the Perth metropolitan area. At the State level, the current vegetation extent falls below the 30% threshold. However, vegetation association West Darling 4 remains above the 30% threshold at the Subregion and LGA level (City of Gosnells). In addition, the proposed clearing area is adjacent to Banyowla Regional Park which is part of the same IBRA Subregion (Northern Jarrah Forest) as the proposed clearing area, and the vegetation association (West Darling 4) is well represented within the local area.	The Proposal is unlikely to be at variance with this Principle.

Principle	Assessment	Outcome
	Given the above and the small size of the proposed clearing area and the condition of the vegetation, it is unlikely that the proposed clearing of 0.96 ha would be at variance with this principle.	
Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	The clearing footprint is not impinged by or in the vicinity of any watercourses, wetlands or other surface water features. Desktop mapping of DBCA's geomorphic wetlands dataset has identified no wetlands occurring within 500 m of the site. The clearing area is located near a quarry pit that holds water used for dust suppression. It has little, if any, ecological value.	The site does not contain any vegetation associated with watercourses or wetlands and is not located within the immediate vicinity of any surface water features. Therefore, the proposal is unlikely to be at variance with this Principle.
Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	The (then) Department of Environment Regulations (DER) defined land degradation as including the following (DER 2014): • The clearing of vegetation; • Decline in vegetation condition (including spread of weeds); • Soil erosion and soil acidity (caused by wind and water erosion due to vegetation clearing) • Salinity; or • Waterlogging/flooding. The proposal includes a minimal amount of vegetation to be cleared (0.96 ha). The vegetation condition ranges from Very Good to Completely Degraded. As the proposed clearing is not significant, is within an existing quarry and is isolated vegetation, it is not likely that this clearing would cause appreciable land degradation.	The proposal is unlikely to be at variance with this Principle as the works are unlikely to cause additional land degradation.
Principle (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	The site abuts the Banyowla Regional Park, within which is the Korung National Park, managed by DBCA for conservation purposes. The nearest ESA is over 1 km from the proposed clearing area. The site, including the proposed clearing permit area, has historically been cleared in sections to enable quarrying. As such, the proposed clearing of 0.96 ha is unlikely to impact the adjacent Regional and National Park, and other areas of conservation value.	The proposal is unlikely to be at variance with this Principle.

Principle	Assessment	Outcome
	The activities associated with the proposal is likely to only impact the vegetation within the clearing footprint. It is not likely that the clearing would have an impact on the conservation value of nearby conservation areas through the spread of weeds or dieback. However, Best Practice Management will be implemented to ensure the risk of spread of weeds or dieback is reduced during clearing works.	
Principle (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	The site (including the clearing permit area) is not mapped within a PDWSA, with the nearest drinking water supply (the Victoria Reservoir Catchment Area), located approximately 2.7 km south east. The quarry operations will not intercept with groundwater. Given the relatively small and mostly degraded clearing area (0.96 ha), lack of surface water features and the considerable distance from nearby surface water features and wetlands, it is not likely the clearing would cause deterioration in the quality of surface or underground water.	The proposed action is unlikely to be at variance with this Principle
Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	Hydrography and wetland mapping suggests there are no known watercourses or surface water features within the proposed clearing area, however there is a perennial lake within the larger site boundary (Department of Biodiversity Conservation and Attractions, 2019b; Department of Water and Environmental Regulation, 2019b). The 100 Year ARI floodplain and flood fringe mapping did not identify the site as being within a flood risk area (Department of Water, 2015). Stormwater runoff is captured on site and stored within pit areas in accordance with the sites EMP. It is therefore considered unlikely that the small scale of the proposed clearing of 0.96 ha will cause a change in runoff volumes or patterns or exacerbate incidences of flooding.	The proposal is unlikely to be at variance with this Principle.

6 Summary of Assessment

In summary, after desktop and field assessments of the environmental values of the proposed disturbance area, it is considered that the proposal to clear approximately 0.96 ha of native vegetation is not significant.

The Proposed clearing area is not in pristine condition; it contains vegetation that varies in condition and has been subject to clearing and degradation.

Overall, the potential impacts associated with the clearing of 0.96 ha of native vegetation within an existing quarry, are not considered to have a significant environmental impact. Furthermore, the environmental management measures proposed to be implemented will ensure the risk of impacts are mitigated and minimised.

7 Limitations

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

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

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

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

8 References

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Figures

Legend

- Site Boundary
- Lot Boundary
- Local Road

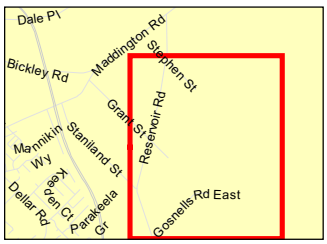
0 75 150 225 N

Meters

1:7,500 @ A4

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

LOCALITY MAP



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- LOCALITY MAP SOURCED FROM LANDGATE 2017
- OTHER DATA SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018

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f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
3421	27/11/2019

HORIZONTAL DATUM AND PROJECTION: GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
SL	SS	FJ	0

Boral Resources (WA) (Quarry)
Lot 453 Stephen Street, Orange Grove

NVCP: Area Permit Application

Figure 1 Site Location

K:\Projects\9.0 APP\3421 Orange Grove Approvals Advice\3421 Background Figures.mxd

Legend

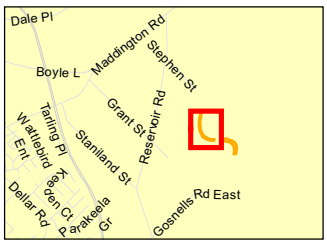
Clearing Permit Area (0.96 ha)

0 10 20 30
Meters
1:1,500 @ A4

N

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

LOCALITY MAP



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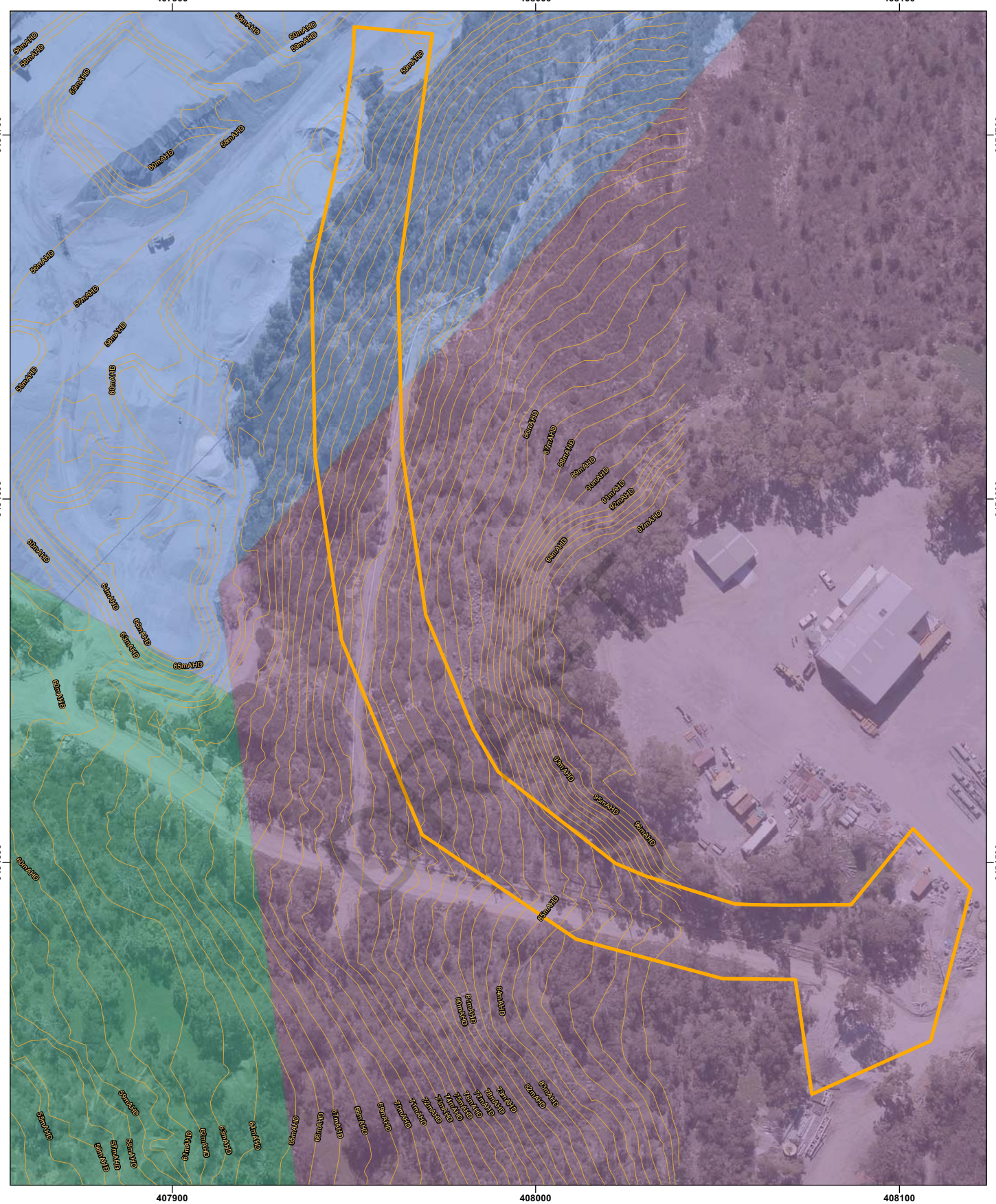
Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Area Permit Application

Figure 2
Clearing Permit Area

K:\Projects\9.0 APP\3421 Orange Grove Approvals Advice\3421 F2 Clearing Permit Area.mxd



Legend

- Contours 1m interval
- Lot Boundary
- Clearing Permit Area

Soils Subsystems

- Duplex and gradational soils.
- Red loamy earths, shallow duplexes and rock outcrop
- Variable duplex and gradational soils.

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- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
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Meters
1:1,428 @ A4

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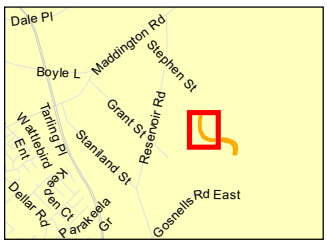
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Area Permit Application

Figure 3 Topography and Regional Environmental Geology

K:\Projects\9.0 APP\3421 Orange Grove Approvals Advice\3421 F3 Topography and Regional Environmental Geology.mxd

Legend

- Extended Survey Area
- Survey Area
- Lot Boundary

VegetationTypesSurvey2

- C, Historically cleared areas including tracks and existing extraction areas
- CcBs, Open woodland of Corymbia calophylla over shrubland of Banksia sessilis.
- Cr, Closed shrubland of Calothamnus rupestris over open grassland of Poacea spp.

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- OTHER DATA SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
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Meters
1:1,500 @ A4

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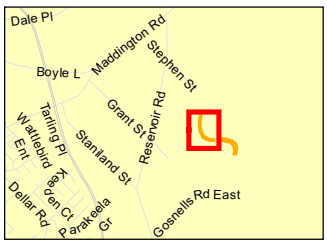
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Survey Area

Figure 4 Vegetation Types

K:\Projects\1.0 EBS\3215 Orange Grove flora and vegetation reconnaissance survey\3215 F4 Vegetation Types.mxd

Legend

- Extended Survey Area
- Survey Area
- Lot Boundary

VegetationConditionSurvey2

- Completely Degraded
- Degraded
- Good
- Very Good

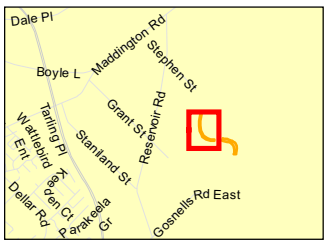
1:1,500 @ A4

Metres

N

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

LOCALITY MAP



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LF	SS	FJ	0

Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Survey Area

Figure 5 Vegetation Condition

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Appendices

Appendix A
Ministerial Statement 170

Ass #	307
Bull #	487
State #	170

WESTERN AUSTRALIA

MINISTER FOR THE ENVIRONMENT

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

LONG TERM DEVELOPMENT OF MADDINGTON QUARRY (307)

BORAL RESOURCES (WA) LIMITED

This proposal may be implemented subject to the following conditions:

1. In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Public Environmental Review. (A copy of the commitments is attached).

2. Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3. The proponent shall ensure that there are no unacceptable impacts from the operation on the streamline on the southern side and the easterly portion of the streamline on the northern side of the proposed expansion. Prior to commencement of the expansion development, the proponent shall prepare and subsequently implement an environmental management programme for the protection of these zones and their exclusion from the effects of quarrying, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and the City of Gosnells.

4. Within six months of the date of any environmental approval issued by the Minister for the Environment, the proponent shall submit and subsequently implement detailed on-going rehabilitation plans for the whole quarrying operation, to the satisfaction of the Environmental Protection Authority on advice of the City of Gosnells. These plans should be reviewed initially on an annual basis for the first year and thereafter at five yearly intervals.

5. The proponent shall be responsible for decommissioning and removal of the plant and installations and rehabilitating the site and its environs, to the satisfaction of the Environmental Protection Authority. At least twelve months prior to decommissioning, the proponent shall prepare and subsequently implement a decommissioning and rehabilitation plan, to the satisfaction of the Environmental Protection Authority, on advice of the City of Gosnells.

Published on

16 AUG 1991

18th FLOOR, ALLENDALE SQUARE, 77 ST GEORGE'S TERRACE, PERTH, W.A. 6000 TELEPHONE 325 9422 FAX. 325 5621

6. No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

7. If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority).

Bob Pearce, MLA
MINISTER FOR THE ENVIRONMENT

15 AUG 1991

PROPONENT'S COMMITMENTS

The proponent undertakes to operate the proposed Maddington quarry according to the conditions of the licence to quarry to be issued by the Pollution Control Division of the Environmental Protection Authority as required by the Environmental Protection Act 1986 (see Appendix C).

The proponent will minimise all foreseeable impacts by modification of standard quarrying methods and implementation of ameliorative measures. Management programmes will be designed to fulfil this obligation by controlling impacts to within acceptable limits.

- **Clearing**

The proponent will minimise all clearing of native vegetation required for the proposed extension of the Maddington quarry.

The proponent is committed to recovering the maximum amount of topsoil possible from cleared areas prior to quarrying. This material and associated vegetative material will be stockpiled for later use in the rehabilitation programme.

- **Rehabilitation**

The proponent is committed to maintaining the current low profile of the Maddington quarry on the Darling Scarp. All quarry slopes visible from the coastal plain and local areas will be camouflaged as soon as practicable and fully rehabilitated in the long term.

The proponent is committed to development of revegetation techniques to provide vegetative cover and species diversity approaching that existing previously. This will involve further investigation into propagation, direct seeding, mulches, seed species mixes and application rates. Propagation of rare flora species which will be affected by the quarry expansion will also be included in these investigations. If feasible, these species will be included in the rehabilitation programme.

- **Noise and Dust**

The proponent will resrict noise and dust emissions to within the limits required by the conditions of the quarry licence issued by the EPA. As new technology becomes available the crushing and screening plants and quarrying equipment will be upgraded. Such improvements will reduce noise and dust emissions.

The crushing plant will be relocated into the base of the present quarry when it is both convenient and appropriate. This will occur during Stage 2 (11 to 20 years) of the proposed long term quarry development.

Drainage

The proponent is committed to maintaining surface water regimes surrounding the quarry. Drainage will be carefully controlled to prevent erosion problems associated with operation of the quarry. Preventative measures will include drainage control structures, stabilisation by planting, and mulch treatments. Drainage will be controlled by diversion channels and roadside drainage systems.

The proponent will monitor the quality of water leaving the quarry and undertakes to maintain the quality to the requirements of the EPA quarry licence.

Measures to maintain water quality will be similar to those in current operation, ie roadside drainage controls, silt traps, settling ponds and a reservoir from which water is re-used for dust control.

If monitoring of water leaving the quarry indicates that water quality does not meet the EPA licence requirements, these structures will be upgraded or new measures introduced as necessary.

Management, Monitoring and Reporting

The proponent is committed to preparation of an Environmental Management Programme for the Maddington quarry prior to commencement of preparatory activities and quarrying in the proposed area of extension. This document will be approved by the EPA and will detail management plans for rehabilitation, noise/dust emissions, fire control and the biological environs etc.

The proponent undertakes to conduct monitoring programmes of both physical and biological aspects of the quarry operations in order to assess their impact. Monitoring will facilitate review and refinement of the management techniques employed.

The proponent will submit annual reports to the EPA detailing the results of the monitoring programmes and progress of the Environmental Management Programme.

Community Liaison

Boral Resources staff will be available to respond to queries and problems raised by the local community. Every effort will be made to resolve any issues which may arise and records will be kept of all enquiries and complaints to facilitate this. The quarry staff will be available for consultation and site inspections by council staff at any time. Past practice of inviting City of Gosnells Councillors to inspect the quarry and rehabilitation areas on an annual basis will be continued and extended to include residents in the vicinity of the quarry.

Appendix B
Extractive Industry Licence

CITY OF GOSNELLS

FORM 4

EXTRACTIVE INDUSTRY LICENCE LOCAL LAW 2000

EXTRACTIVE INDUSTRY LICENCE

(REISSUED)

Licensee:	Boral Resources (WA) Limited.
Address:	Po Box 195, Gosnells WA
Land Description:	Boral Quarries (WA) Limited Stephen Street, Orange Grove. Licence area to include portion of Canning Location 677 and Reserve 8587, Lots 181, 465, 466, 467, 453, 457 and 101 Stephen Street. Orange Grove and portion of Reserve 39529 that is leased from the City of Gosnells. *Note- land description for leased area may change once subdivision/amalgamation documentation is completed by Department of Land Information.*
Material to be Excavated:	Stone.
Term of Licence:	21 years from 1 July 2004
Date of Expiry	30 June 2025.

This Licence is issued in accordance with the City of Gosnells Extractive Industry Local Law 2000 subject to the following conditions:

1 Development approval being issued by the Western Australian Planning Commission under the Metropolitan Region Scheme and Council under the provisions of the Town Planning Scheme No 6.

2 Boral Resources contributing to the upgrading and ongoing maintenance of Stephens Street to a maximum contribution of 75% of the cost as determined by an independent assessment.

3 Boral Resources contributing to the upgrading and ongoing maintenance of the intersections of Reservoir Road with Stephens Street and Maddington Road to a maximum contribution of 25% of the cost determined by an independent assessment.

Dated this 24 day of October 2006

Chief Executive Officer

Appendix C
Flora and Vegetation Assessment (360 Environmental 2019)

360 environmental

Boral Quarries - Browns Creek, Orange Grove

DRAFT

Flora & Vegetation Reconnaissance Survey

Prepared for:

Boral Resources

November 2019

people • planet • professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
3215AA	Rev0 Internal	S. Hummerston	N. Whittington		-	09/09/19
3215AA	Rev1 Draft	360 Environmental	Boral Resources	N. Lindroos	1 x Electronic (email)	12/09/19
3215AA	Rev2 Draft (extended survey area)	T. Hudson/ S. Hummerston	F. Jones	S. Hick	1 x Electronic (email)	22/11/19

Disclaimer

Executive Summary

Boral Resources commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a Reconnaissance Flora and Vegetation Survey at Boral Quarries Browns Creek operations in Orange Grove. The Survey Area includes in part Lots 50 & 457 Stephen Street and Lot 453 Grant Street, Orange Grove. The survey was comprised of two areas (Sections A and B). The survey was conducted across three site visits – the first on 29 July 2019 (out of season), the second on 28 October 2019 (in season) and the third on 8th Nov. Boral increased the size of Section A between the first and second site visits.

The initial Survey Area covered 0.44 ha in Section A and 0.52 ha in Section B. In October Section A as increased to a total size of 1.02 ha. Both Sections were in the locality of Orange Grove, approximately 25 km south east of Perth CBD, Western Australia.

Key findings from the Reconnaissance flora and vegetation survey:

- A total of 39 flora taxa from 34 genera and 18 families were identified within the Survey Area
- No Threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* or gazetted as Threatened pursuant to the *Biodiversity Conservation Regulations 2018* were recorded during the survey
- No Priority Flora were located during the field survey
- A pre-survey likelihood of occurrence assessment was undertaken for the 103 species of conservation significance with the potential to occur within the Survey Area and determined that 20 species of conservation significance were considered likely to occur within the Survey Area, however, it was determined post survey that the Survey Area is unlikely to support conservation significant flora species due to conditions of the site
- A total of 12 introduced taxa were recorded during the survey. Three of these are listed as a Declared Pest under the *Biosecurity and Agriculture Management Act 2007*, with two species in Bridal Creeper (**Asparagus asparagoides*) and Prickly Pear (**Opuntia stricta*) being listed as a Weed of National Significance.
- Two Vegetation Types were recorded within the Survey Area
- The reconnaissance survey indicated that no Threatened Ecological Communities occur within the Survey Area.

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1 Introduction

1.1 The Project

Boral Resources commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a Reconnaissance Flora and Vegetation Survey at Boral Quarries Browns Creek operations in Orange Grove. The Survey Area includes in part Lots 50 & 457 Stephen Street and Lot 453 Grant Street, Orange Grove. The survey was comprised of two areas (Sections A and B). The survey was conducted across two site visits – the first on 29 July 2019 (out of season), the second on 28 October 2019 (in season) and the third on 8th November. Boral increased the size of Section A between the first and second site visits.

The initial Survey Area covered 0.44 ha in Section A and 0.52 ha in Section B. In October Section A as increased to a total size of 1.02 ha. The Survey Area (Figure 1) includes in part Lots 50 & 457 Stephen Street and Lot 453 Grant Street, Orange Grove.

360 Environmental understands that Boral is seeking approval to clear the Survey Area to create safer and more efficient access to a mining pit. Lots 50 Stephen Street and Lot 453 Grant Street are zoned Parks and Recreation. Lot 457 Stephen Street is zoned General Rural.

1.2 Objectives and Scope

The objective of the works is to provide environmental services to facilitate legal clearing of a proposed access road.

The scope included a desktop assessment and an out of season Reconnaissance Flora and Vegetation survey, inclusive of:

- A desktop assessment of relevant literature, databases and spatial datasets to determine the environmental values and any potential issues
- A reconnaissance survey using relevés
- Delineate and characterise the flora and the vegetation types present in the Survey Area
- Assess and map the vegetation condition in the Survey Area
- Production of maps, showing vegetation condition, vegetation communities and relevé locations
- An assessment of potential Black Cockatoo breeding trees.

Legend

Survey Area (0.95 ha)

Extended Survey Area (1.02 ha)

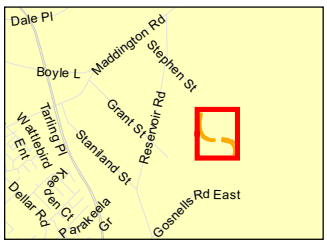
0 20 40 60 N

Meters

1:2,000 @ A4

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

LOCALITY MAP



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PROJECT ID	DATE
3215	04/11/2019

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	SH	SH	0

Boral
Orange Grove

Reconnaissance Flora and Vegetation Survey

Figure 1

Location of Survey Area

K:\Projects\1.0 EBS\3215 Orange Grove flora and vegetation reconnaissance survey\3215 F1 Location of Survey Area.mxd

Legend

- Site Boundary
- Clearing Permit Area
- Local Road

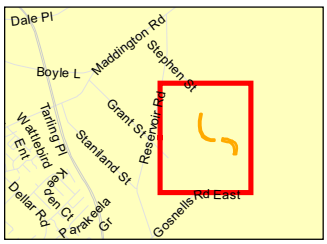
0 40 80 120 N

Meters

1:4,500 @ A4

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

LOCALITY MAP



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Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Area Permit Applicationy

Figure 2
Clearing Permit Area

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2 Background

2.1 Biophysical Environment

2.1.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Gosnells City (9106), located approximately 3.8 km southwest of the Survey Area. The long-term mean minimum temperature for Gosnells City ranges from 8.8°C (July) to 18.7°C (February) (1991 to 2019) and the long-term mean maximum temperature ranges from 18.4°C (June) to 36.0°C (January) (1961 to 2019) (Figure 3) (Bureau of Meteorology, 2019). The long-term annual average rainfall is 811.0 millimetres (mm) (1961 to 2019) (Figure 3) (Bureau of Meteorology, 2019).

The Gosnells City weather station recorded 478.8 mm of rainfall in the 12 months prior to the first site visit (July 2018 to June 2019), which is 332.2 mm below to the long-term average of 311.0 mm (Bureau of Meteorology, 2019). In the three months prior to the survey (April 2019 to June 2019), 201.7 mm of rainfall was recorded, which is 98.0 mm below the long-term average of 308.7 mm for the same time period (1961 to 2019) (Bureau of Meteorology, 2019).

Between August and October (i.e. between the first and second site visits) the Gosnells City weather station recorded 148.3mm of rainfall, 102.2mm below the average rainfall for the area for those months.

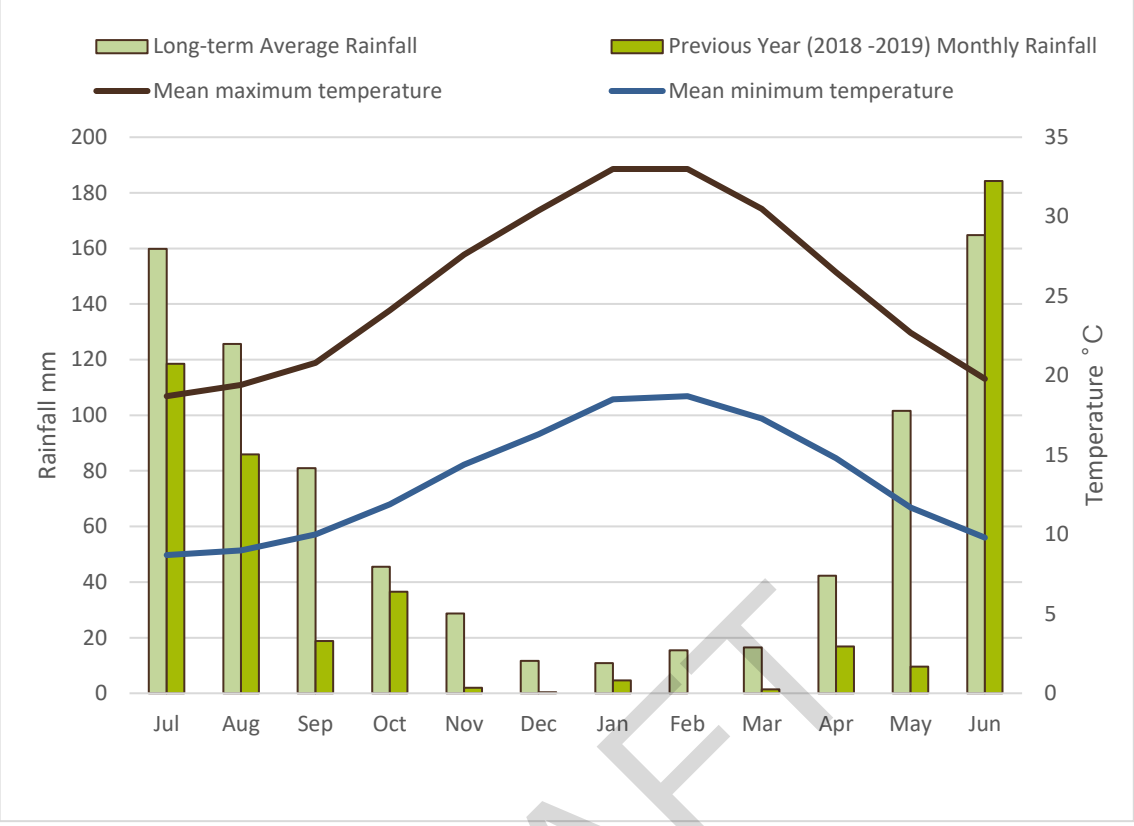


Figure 3: Long Term and Monthly Total Rainfall, Maximum and Minimum Temperatures for Gosnells City (9106) (Bureau of Meteorology, 2019)

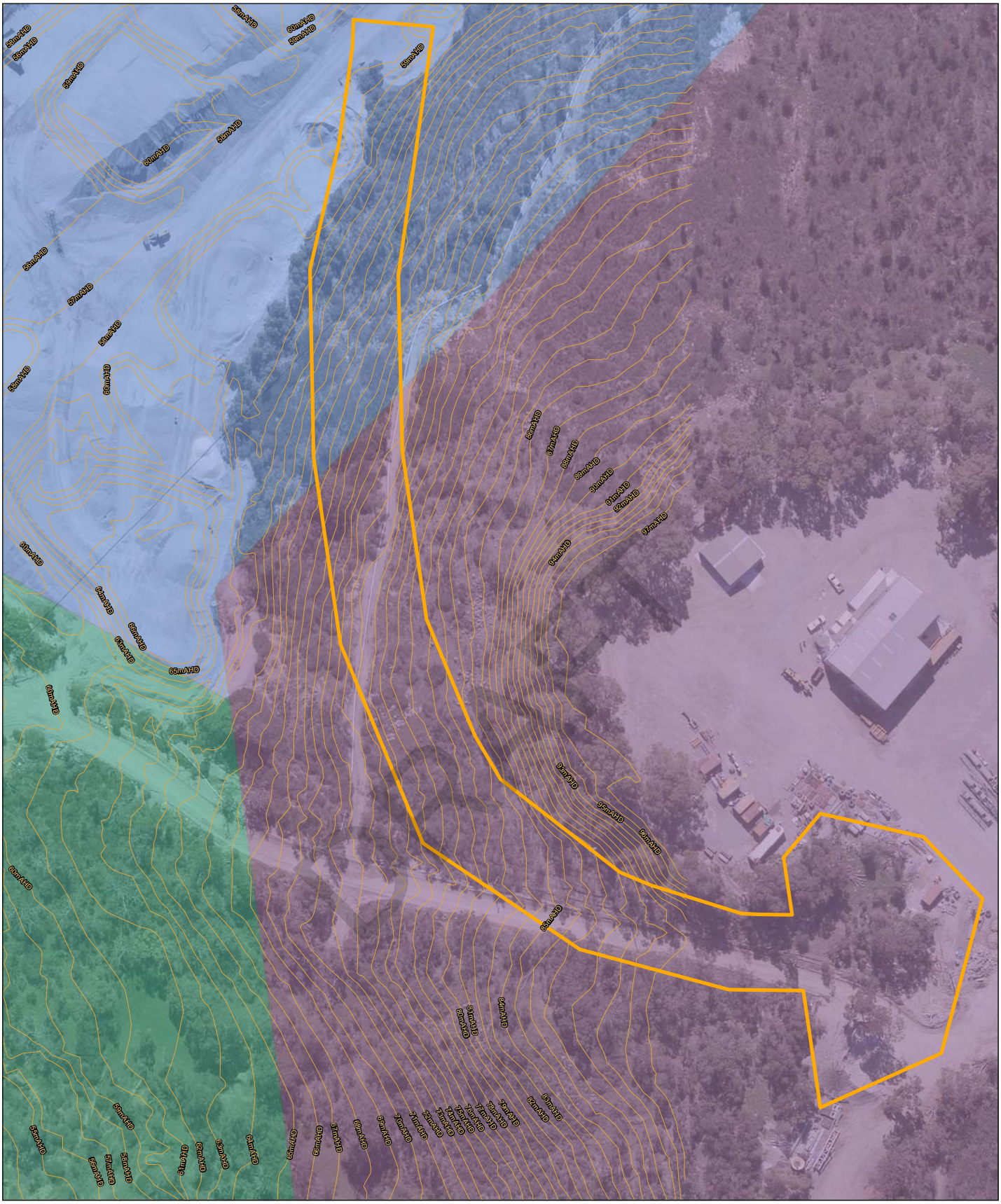
2.2 Biological Environment

2.2.1 Interim Biogeographic Regionalisation of Australia

The Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological and geographical/geological attributes. These bioregions are subdivided into 419 subregions, as part of a refinement of the IBRA framework. The study area is in the Northern Jarrah Forest (JAF01) subregion, part of the Jarrah Forest bioregion. This bioregion is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands (Williams and Mitchell, 2001).

2.2.2 Soil and Land Systems

Soil-landscape system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales. The Survey Area is within the Murray Valleys System which is described as the Western Darling Range from Avon Valley to Harvey. It is characterised as deeply incised valleys with red loamy earths, shallow duplexes and rock outcrop and Jarrah-marri-wandoo forest and woodland with mixed shrubland (Department of Agriculture and Food WA, 2012).



Legend

- Contours 1m
- Lot Boundary
- Clearing Permit Area

Soils Subsystems

- Duplex and gradational soils.
- Red loamy earths, shallow duplexes and rock outcrop
- Variable duplex and gradational soils.

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- OTHER DATA SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
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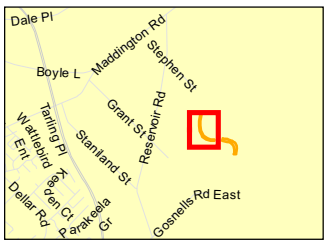
Meters
1:1,428 @ A4

N

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

LOCALITY MAP



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Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Area Permit Applicationy

Figure 4 Topography and Regional Environmental Geology

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2.2.3 Hydrology and Wetlands

A review of GIS datasets has identified two minor, perennial streams (FID 8028 and 7712) occurring within the property boundary (Department of Water and Environmental Regulation, 2016), however, these do not occur within the Survey Area and will not be affected by the proposed clearing.

No geomorphic wetlands are mapped within the site (Department of Biodiversity Conservation and Attractions, 2017b). The closest wetland identified is a Multiple-Use Wetland (ID: 15768) located approximately 580m west of the site.

According to the 1990 EPA referral, surface water occurs in seasonal streamlines in valleys surrounding the site. The initial site and proposed 1990 study area were bounded to the north and south by two streamlines which flowed freely during winter. The northern streamline was intercepted by the initial quarry, its flow maintained by roadside drains, which directed it into silt-traps then into the main storage dam, or the old quarry reservoir (Environmental Protection Authority, 1990).

There are also two artificial water bodies within the property boundary, which are part of the quarry operations.

2.2.4 Broad Vegetation Types

Mapping of pre-European broad vegetation within Western Australia was completed on a broad scale (1:1,000,000) by (Beard, 1981). These vegetation units were later re-assessed by (Shepherd, Beeston and Hopkins, 2002) to account for clearing in the intensive land use zone, dividing some larger vegetation units into smaller units. This pre-European database contains a total of 819 vegetation types within Western Australia.

One broad vegetation type, West Darling 4, is mapped over the Survey Area. The vegetation type is described as a medium woodland comprising of marri and wandoo and its representation across the state, bioregion and local government authority as shown in Table 1.

Table 1: Broad Vegetation Types Within the Survey Area, the State and Regional Representation (Department of Biodiversity Conservation and Attractions, 2019a)

Vegetation Type	Pre-European Extent (HA)	Current Extent (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%)
Vegetation Type in Western Australia				
West Darling 4	1,054,279.89	284,102.41	26.95	23.85
Vegetation Type in Northern Jarrah Forest IBRA sub-region				
West Darling 4	614,200.82	197,903.81	32.22	30.56
Vegetation in City if Gosnells				
West Darling 4	1608.10	1317.22	81.91	10.96

Mapping by Heddle, Loneragan and Havel (1980) used landform-soil units determined by Churchward and McArthur (1978) and has identified one vegetation complex occurring within the Survey Area and is described below. The delineation of vegetation complexes is based on the concept of a series of plant communities forming regularly repeating complexes associated with a soil unit.

- **Darling Scarp Complex:** a mosaic of open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla*, with some admixtures with *Eucalyptus laeliae* in the north (subhumid zone), with occasional *Eucalyptus marginata* subsp. *elegantella* (mainly in subhumid zone) and *Corymbia haematoxylon* in the south (humid zone) on deeper soils adjacent to outcrops, woodland of *Eucalyptus wandoo* (subhumid and semiarid zones), low woodland of *Allocasuarina huegeliana* on shallow soils over granite outcrops, closed heath of Myrtaceae-Proteaceae species and lithic complex on or near granite outcrops in all climate zones.

2.2.5 Conservation Areas and Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared to prevent degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands. Exemptions contained in the *Environmental Protection (Clearing of Native vegetation) Regulations 2004* for low impact land clearing do not apply in ESAs and a clearing permit is required.

No ESAs are identified across the Survey Area. The closest ESA is located approximately 1.2 km m to the south of the Survey Area (Department of Water and Environmental Regulation, 2018).

The Survey Area is not mapped within any Regional Parks or DBCA Managed Lands, however, the vegetated land located to the north, east and south of the quarry boundary is identified as the Banyowla Regional Park (Department of Biodiversity Conservation and Attractions, 2017a). The Banyowla Regional Park contains several parcels of land which are managed by the DBCA.

The Survey Area is not mapped within any Bush Forever Areas (Department of Planning, 2014). The closest Bush Forever Area (BFS: 51) is mapped 1.7 km north, north-west from the Survey Area.

The site is not mapped with the Perth Regional Ecological Linkage (Perth Biodiversity Project, 2008), however, Linkage 34 occurs on the eastern boundary of the Quarry approximately 950 m to the east of the Survey Area.

3 Methods

3.1 Requirements for Flora and Vegetation Surveys

This survey has been carried out as per the EPA requirements for environmental surveying and reporting of flora and fauna surveys in Western Australia where relevant, and as documented in:

Western Australia

- Technical Guidance – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016).

Federal

- Matters of National Environmental Significance impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (DoE, 2013).

3.2 Desktop Assessment

3.2.1 Database Searches

The following government databases were reviewed to provide background information on the flora and vegetation of the Survey Area:

- NatureMap (5 km radial search) (Department of Biodiversity Conservation and Attractions, 2019c)
- DEE Protected Matters Search Tool (5 km radial search) (Department of the Environment and Energy, 2019)
- Relevant biological surveys.

3.2.1.1 Likelihood of Occurrence

Threatened and Priority flora species returned from the database searches were assessed to determine the likely potential of them occurring within the Survey Area. The likelihood of occurrence assessment was based on the following criteria:

- High - Previously recorded within Survey Area or within 5 km of the Survey Area and suitable habitat potentially occurs in the Survey Area
- Medium - Previously recorded within 5 to 10 km of the Survey Area and/or suitable habitat potentially occurs in the Survey Area
- Low - No suitable habitat appears to be present in the Survey Area.

3.3 Reconnaissance Flora and Vegetation Survey

3.3.1 Field Survey

The first field survey was conducted on the 29 of July 2019 by 360 Environmental Botanist Shenaye Hummerston (Flora licence number FB62000125). The survey covered Section A and Section B.

The survey included four relevés as well as vegetation mapping notes. Relevés are unbounded vegetation survey plots with information recorded at each relevé including landscape features, surface soil colour and texture, bare ground, litter cover, disturbance, fire age, aspect and vegetation condition. Each species of dominant plant at each relevé was recorded, including information on height and percentage cover.

Boral Resources slightly increased the proposed area of clearing at Section A (extended) from 0.96 ha to 1.02 ha. As such, 360 Environmental Botanist Tyler Hudson (Flora licence number FB62000172) revisited the site on 28 October 2019 Field maps were amended on site to capture vegetation types and condition within the extended survey area. Botanist Shenaye Hummerston (Flora licence number FB62000125) again visited the site on 8 November 2019 and assessed potential Black Cockatoo breeding trees within the survey area.

3.3.2 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected systematically for later identification utilising resources of the Western Australian Herbarium (WAH).

The finalised species list was checked against FloraBase (Department of Biodiversity Conservation and Attractions, 2019b) to determine the species' conservation status. Threatened and Priority Flora were verified against the EPBC Act listing of threatened species to determine Commonwealth listing. Introduced flora species were compared to the WONS list (Thorp and Lynch, 2000) and the DAFWA list to determine if any are listed as Declared (Department of Primary Industries and Regional Development, 2018).

3.3.3 Opportunistic Observation

Opportunistic searches were undertaken for perennial conservation significant flora likely to occur in the Survey Area based on database searches and vegetation communities present.

3.3.4 Potential Black Cockatoo breeding

Potential Black Cockatoo breeding trees were recorded onsite by measuring the circumference of each tree thought likely to be over 500mm DBH (or approximately 1.57m circumference) for Marri, Jarrah and Tuart and over 300mm DBH (or

approximately 0.94m circumference). Data and location information was recorded using Fulcrum and a hand-held GPS.

4 Results

4.1 Limitations and Constraints

Survey limitations and constraints of the flora and vegetation assessment are detailed in Table 2.

Table 2: Limitations and Constraints Associated with the Survey Area

Variable	Degree of Limitation	Impact on Survey Outcomes
Access	No limitation	The Survey Area was accessed on foot. Focus was given to areas expected to be impacted and areas that may have species or ecological communities of conservation significance.
Experience	No limitation	The personnel who executed the survey were practitioners suitably qualified in their respective fields: • Field Staff: Shenaye Hummerston (Botanist) • Field Staff: Tyler Hudson (Botanist) • Flora Taxonomy: Shenaye Hummerston (Botanist) • Data Interpretation and Reporting: Shenaye Hummerston • Report Review: Narelle Whittington (Principal Botanist) • Report Review: Felicity Jones (Principal Consultant)
Timing, weather, season	Moderate limitation	The initial survey was conducted during July which is outside of the recommended flora survey period for the Southwest botanical province (spring, September - November) (Environmental Protection Authority, 2016). For the three months prior to the survey, the Gosnells weather station (closet to the Survey Area) recorded 210.7 mm of rainfall which is 98 mm below the long-term average rainfall for the same period. No rainfall was recorded during the survey. Flora composition changes with time, particularly seasonally as a result of changes in conditions such as rainfall. With the rainfall recorded significantly lower than expected for this period, flowering and germination of annuals within the survey area may have been delayed. Additional botanical surveys completed at different times of the year will often produce varying results.
Scope: Life forms sampled	Minor limitation	An appropriate number of life forms were sampled in relation to the level of survey undertaken, however as the majority of the survey area was surveyed out of season, some species were not flowering and were unable to be identified.

Variable	Degree of Limitation	Impact on Survey Outcomes
Sources of information	No limitation	Relevant NatureMap and EPBC searches were undertaken for the Survey Area and are listed in Appendix A (excluding GPS coordinates).
Completeness	Minor limitation	Survey Area was sufficiently traversed according to the EPA guidelines Not all specimens were able to be identified with confidence to species level due to the survey being outside the flowering time for some species. However, all dominant species were identified to species level.

4.2 Desktop Assessment

The database searches identified 103 conservation significant flora species as potentially occurring within a 5 km radius of the Survey Area. Of these, 33 species are listed as Threatened and 70 are Priority. The Priority flora included, nine Priority 1 (P1), 11 Priority 2 (P2), 31 Priority 3 (P3) and 19 Priority 4 (P4) (Appendix A).

Based on the likelihood assessment of the 103 species occurring in the Survey Area 69 species have been identified as having a Low likelihood of occurrence, four species have a Medium likelihood of occurrence and 20 species have a High likelihood to occur in the Survey Area. Ten species do not have data available to determine likelihood of occurrence (Appendix B).

Two Priority Ecological Communities (PEC) and two TECs listed by the State are within a five km radius of the Survey Area, all of these communities are also listed as Threatened Ecological Communities (TEC) under the EPBC Act.

- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 [DBCA], Endangered [EPBC])
- *Clay Pans of the Swan Coastal Plain*, (Vulnerable [DBCA], Critically Endangered [EPBC])
- *Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain* (Critically Endangered [DBCA], Endangered [EPBC])
- *Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community* (Priority 3 [DBCA], Critically Endangered [EPBC]).

Prior to survey only one of the above listed TEC was considered likely to occur within the survey area based on the location, the soil types expected within the survey area and the Botanists experience of the area.

- *Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain*, Endangered [EPBC].

4.3 Reconnaissance Flora & Vegetation Survey

4.3.1.1 Flora

A total of 39 flora species (including species, subspecies, varieties and forms) from 18 families and 34 genera were recorded in the Survey Area. The most commonly occurring families were Myrtaceae (eight taxa) and Proteaceae (five taxa). A complete flora species list is presented in Appendix C and each survey site sheet is provided in Appendix D.

Seven species could not be confidently identified to species level due to lack of identifying features such as flowering or fruiting parts and are not thought to represent significant species.

4.3.1.2 Flora of Conservation Significance

No Threatened or Priority flora species listed under the EPBC Act or gazetted as Declared Rare Flora (Threatened) pursuant to the *Biodiversity Conservation Regulations 2018* were recorded within the Survey Area during any site visit.

4.3.1.3 Introduced Flora

A total of 12 introduced species were recorded during the survey, representing approximately 28% of the total taxa. Of these introduced species, 2 introduced grasses could not be identified due to a lack of flowering, three species are listed as Declared Pest species under the *Biosecurity and Agriculture Management Act* 2007 (BAM Act). Of these declared pests, both Bridal Creeper (**Asparagus asparagoides*) and Prickly Pear (**Opuntia stricta*) are listed as a Weed of National Significance (WONS) (Department of Environment and Energy, 2018).

Table 3: Introduced Flora Recorded in the Survey Area

Taxa	Common Name	BAM Act	WONS
**Asparagus asparagoides*	Bridal Creeper	Declared Pest – s22	WONS
**Echium plantagineum*	Paterson's Curse	Declared Pest - s22(2)	-
**Eucalyptus camaldulensis*	Red River Gum	Permitted – s11	-
**Fumaria capreolata*	Fumitory	Permitted – s11	-
**Gladiolus caryophyllaceous*	Pink Gladioli	Permitted – s11	-
**Hypochaeris glabra*	Smooth Cats-ear	Permitted – s11	-
**Sonchus oleraceus*	Common Sowthistle	Permitted – s11	-
**Opuntia stricta*	Prickly Pear	Declared Pest - s22(2) Restricted)	WONS
**Oxalis* sp.	Wood Sorrel	Permitted – s11	-
**Oxalis glabra*	Finger-leaf Oxalis	Permitted – s11	-

Taxa	Common Name	BAM Act	WONS
**Romulea rosea*	Guildford Grass	Permitted – s11	-
**Watsonia ?meriana*	Watsonia	Permitted – s11	-

4.3.1.4 Vegetation Types

Two vegetation types were recorded for the Survey Area (Table 4 and Figure 5). The data collected from each quadrat/relevé is presented in Appendix D. Section B of the Survey Area did not contain any native vegetation.

Table 4: Vegetation Types Recorded within the Survey Area

Vegetation Association Code and Description	Sites	Total Area (ha)	Total Area (%)	Representative Site Photograph
Cr: Closed shrubland of *Calothamnus rupestris* over an open grassland of Poaceae sp.	OG01 OG03 OG04	0.44	42.17	

Vegetation Association Code and Description	Sites	Total Area (ha)	Total Area (%)	Representative Site Photograph
CcBs: Open Woodland of *Corymbia calophylla* over shrubland of *Banksia sessilis*	OG02	0.25	24.68	
Cleared	N/A	0.34	33.14	N/A
Total		1.02		

4.3.1.5 Threatened and Priority Ecological Communities

Statistical analysis was not undertaken of the vegetation to determine if there are any TECs or PECs present. This was due to the scope of the project and the timing of the survey. None of the vegetation types recorded during the survey are considered representative of any TECs or PECs pursuant to the EPBC Act or the *Biodiversity Conservation Regulations 2018.*

Legend

- Extended Survey Area
- Survey Area
- Lot Boundary

VegetationTypesSurvey2

- C, Historically cleared areas including tracks and existing extraction areas
- CcBs, Open woodland of Corymbia calophylla over shrubland of Banksia sessilis.
- Cr, Closed shrubland of Calothamnus rupestris over open grassland of Poacea spp.

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- LOCALITY MAP SOURCED FROM LANDGATE 2017
- OTHER DATA SOURCED LANDGATE 2018
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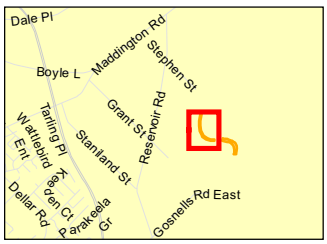

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Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
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Figure 5 Vegetation Types

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4.3.1.6 Vegetation Condition

Only Section A of the Survey Area contained remnant native vegetation. The entire area of Section B has been historically cleared and forms part of the current operational footprint for the Orange Grove Quarry.

The vegetation condition in Section A ranged from Very Good to Completely Degraded The areas considered to be Completely Degraded have been cleared and now consists of bare tracks along with small areas of scattered individual native plants with a high density of weed species.

The major disturbance throughout Section A is cleared tracks. In addition, a large portion appears to have been disturbed at some stage demonstrated by younger plants and lower density of native species as well as a high level of weed invasion. This is more so within the southern portion of Section A with **Eucalyptus camaldulensis* (planted) being dominant. Historical aerials also show that the vegetation within the Survey Area and surrounding area has been previously cleared between 1983 and 1985.

The vegetation condition mapping is presented in Figure 6 and a summary of vegetation condition extent within the Survey Area is outlined in Table 5.

Table 5: Vegetation Condition Extent Within the Survey Area

Condition	Extent in Survey Area (HA)	Proportion in Survey Area (%)
Very Good	0.09	9.53
Good	0.16	16.14
Degraded	0.38	37.82
Completely Degraded	0.37	36.55
Total	**1.02**	**100.0**

Legend

- Extended Survey Area
- Survey Area
- Lot Boundary

VegetationConditionsSurvey2

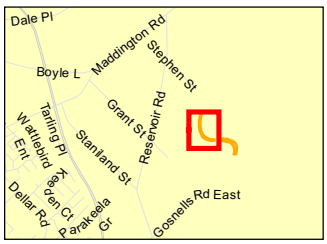
- Completely Degraded
- Degraded
- Good
- Very Good

1:1,500 @ A4

N

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

LOCALITY MAP



- LOCALITY MAP SOURCED FROM LANDGATE 2017
- OTHER DATA SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
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PROJECT ID	DATE
3215	04/11/2019

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	AM	FJ	0

Boral Resources (WA) (Quarry)
Lot 453 Stephen Street,
Orange Grove

NVCP: Area Permit Applicationy

Figure 6 Vegetation Condition

K:\Projects\1.0 EBS\3215 Orange Grove flora and vegetation reconnaissance survey\3215 F5 Vegetation Conditions.mxd

Legend

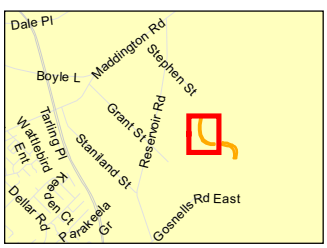
- Extended Survey Area
- Survey Area
- Lot Boundary
- Black Cockatoo Potential Breeding Trees with Hollows
- Black Cockatoo Potential Breeding Trees

0 10 20 30
Meters
1:1,500 @ A4

N

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

LOCALITY MAP



- LOCALITY MAP SOURCED FROM LANDGATE 2017
- OTHER DATA SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
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PROJECT ID	DATE
3215	20/11/2019

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	AM	FJ	0

Boral ResourcesLot 453 Stephen Street, Orange Grove
3215AA Orange Grove Flora and Vegetation Reconnaissance Survey Draft Rev2

Figure 7 Black Cockatoo Potential Breeding Trees

K:\Projects\1.0 EBS\3410 Dampier Dr Biological Survey\3215 F5 Black Cockatoo Potential Breeding Trees.mxd

5 Discussion

5.1 Flora and Vegetation

5.1.1 Flora of Conservation Significance

No Threatened species listed under the EPBC Act or gazetted as T/DRF (Threatened) pursuant to the *Biodiversity Conservation Regulations 2018* were recorded during the survey. No Priority species as listed by DBCA was recorded.

The review of the database searches identified 103 Threatened and Priority flora species as potentially occurring in the vicinity of the Survey Area. Of these potential Threatened species, 20 are considered to have a High Likelihood of occurrence, based on the habitat type present and known distribution, these are as follows:

- *Acacia aphylla* (T) is a divaricately branched, spinescent, glaucous shrub that ranges between 0.9-2.5 m high. It has yellow flowers between August and October. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 2.08km from the Survey Area
- *Acacia oncinophylla* subsp. *patulifolia* (P4) is a shrub ranging between 0.5 and 3m high. It has a distinctive feature of 'minni-ritchi' bark, with phyllodes 4-9cm long and 3-6mm wide. This shrub has yellow flowers between August and December. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 1.3km from the Survey Area
- *Anthocercis gracilis* (T) is an erect, spindly shrub growing 0.6m high. It has unusual yellow-green flowers from Sep to Oct. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 1.25km from the Survey Area
- *Asteridea gracilis* (P3) is an annual herb growing 0.15-0.35m high. Flowers are white to pink between September and December. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 1.48km from the Survey Area
- *Banksia kippistiana* var. *paenepeccata* (P3) is an erect, prickly, lignotuberous shrub growing 0.3-1.2 m high. Flowers are yellow-cream in colour from October to November. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 4.32km from the Survey Area
- *Beaufortia purpurea* (P3) is an erect or spreading shrub between 0.3-1.5 m high. Flowers are red-purple between October and December or January to February. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 2.65km from the Survey Area
- *Boronia tenuis* (P4) is a procumbent or erect & slender shrub growing 0.1-0.5m high. Flowers are blue/pink-white between August and November. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 1.74km from the Survey Area
- *Calothamnus graniticus* subsp. *leptophyllus* (P4) is an erect, multi-stemmed shrub, 1-2 m high. This one-sided bottlebrush has red flowers between June and August. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 3.58km from the Survey Area

- *Cyanicula ixioides* subsp. *ixioides* (P4) This orchid is a tuberous, perennial, herb growing up to 0.15m high. It has yellow flowers between August and October. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 4.64km from the Survey Area
- *Darwinia apiculata* (T) is a densely branched low shrub growing to 0.5m in height. Flowers are green & yellow/red during October. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 2.34km from the Survey Area
- *Goodenia arthrotricha* (T) is an erect perennial herb, to 0.4m high. It has blue flowers between October and November. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 2.75km from the Survey Area
- *Halgania corymbosa* (P3) is an erect shrub between 0.35 and 1m in height. It has blue-purple flowers between August and November. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 2.6km from the Survey Area
- *Hibbertia montana* (P4) is an erect, straggling or sprawling shrub approximately 0.1-0.7m high. It has yellow flowers between July and October. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 4.98km from the Survey Area
- *Pimelea rara* (P4) is a small shrub, 0.2-0.35m high with white flowers either in December or January. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 2.16km from the Survey Area
- *Pithocarpa corymbulosa* (P3) is an erect to scrambling perennial herb, 0.5-1m high. It has white flowers between January and April. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 3.43km from the Survey Area
- *Senecio leucoglossus* (P4) is an erect annual herb which grows to 1.3m high with white flowers between August and December. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 3.61km from the Survey Area
- *Stylidium striatum* (P4) is a rosetted perennial herb, 0.15-0.55m high. It has erect, oblanceolate to spathulate leaves 1.5-4cm long and 1.5-6mm wide. The scape is sparingly glandular on the axis of the inflorescence and glabrous below. With yellow racemose inflorescence between October and November. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 4.68km from the Survey Area
- *Thelymitra magnifica* (P1) The Crystal Brook Star orchid is a perennial herb which flowers in spring (Sept-Oct). It has dark brown flowers with golden yellow blotches or stripes and an orange column. It also has a cinnamon scent. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 3.07km from the Survey Area
- *Thelymitra stellata* (T) This rare Star Sun orchid is a perennial herb which flowers in late spring (Oct-Nov). It has brown flowers with golden yellow streaks and blotches and an orange column. It also has a sweet or cinnamon scent. The Survey Area contains suitable habitat and the nearest recorded location of this species is approximately 3.16km from the Survey Area
- *Thysanotus anceps* (P3) is a Rhizomatous, leafless perennial herb which grows to 0.4m high. It has purple fringed flowers between October and December. The Survey

Area contains suitable habitat and the nearest recorded location of this species is approximately 2.3km from the Survey Area.

The species listed above have been previously recorded within 5 km of the Survey Area. The species are known to occur in vegetation types on the Darling Scarp and many have been located near the quarry south of the Survey Area in similar habitat. Notwithstanding this, the Survey Area contains only 0.35 ha of vegetation that varies in condition from Very Good to Completely Degraded. Historical aerials show that the vegetation within the Survey Area and surrounding area has been previously cleared sometime between 1983 and 1985. It is also evident that existing vegetation has been subject to various disturbances that have impacted the diversity, density and community structure. These circumstances make it unlikely that any conservation significant species would occur.

5.1.2 Vegetation of Conservation Significance

The desktop assessment identified four federally listed Threatened Ecological Communities (TEC's) within a 5 km radius of the Survey Area. None of the vegetation types identified in the Survey Area are considered to represent the TECs identified in the desktop assessment. This is due to the absence of the typical dominant species of any of the communities and/or soil types.

5.1.3 Regional Representation

The DBCA has mapped native vegetation extent by vegetation complex on the Swan Coastal Plain. It is estimated that West Darling 4 has 26.29% native vegetation remaining based on the pre-European extent.

The EPA recognises vegetation complexes that are not well represented as being significant. Vegetation complexes which have 10 – 30% remaining may be considered regionally significant. Proposals that would affect a vegetation complex with 10% or less remaining are likely to be formally assessed by the EPA (Environmental Protection Authority, 2006).

The remaining extent of this vegetation community type is within the percentage range that indicates that the vegetation may be considered regionally significant. Given the small size of the proposed clearing area, however, and the condition of the vegetation, clearing the proposed 0.35 ha of vegetation is unlikely to have a high impact on the vegetation complex.

6 Conclusions and Recommendations

The majority of the flora and vegetation, survey was undertaken outside of the recommended seasonal and flowering period for the Southwest botanical province. The Survey Area was sufficiently traversed and as such the following conclusions can be drawn:

- A total of 39 flora taxa from 34 genera and 18 families were identified within the Survey Area
- No Threatened species listed under the EPBC Act or gazetted as T/DRF (Threatened) pursuant to the *Biodiversity Conservation Regulations 2018* were recorded during the survey. No Priority species as listed by DBCA were recorded
- A total of 12 introduced taxa were recorded during the survey. Three of these species (**Asparagus asparagoides*, **Echium plantagineum and *Opuntia stricta*) are listed as Declared Pests under the *Biosecurity and Agriculture Management Act 2007*. **Asparagus asparagoides* and **Opuntia stricta* are also considered a WONS
- Two vegetation types were mapped for the Survey Area
- Of these vegetation types none are likely to be representative of a TEC or PEC
- Five potential Black Cockatoo breeding trees were recorded within the Survey Area, including two suitable hollows with no signs of use.

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8 Limitations

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

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

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

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

APPENDIX A

Desktop Database Searches

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 29/07/2019

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 01' 47" E,32° 02' 32" S
Buffer	5km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	1220	9486
Other specially protected fauna	2	15
Priority 1	3	12
Priority 2	2	7
Priority 3	21	68
Priority 4	14	152
Protected under international agreement	3	3
Rare or likely to become extinct	19	460
TOTAL	**1284**	**10203**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	3220	*Acacia aphylla (Leafless Rock Wattle)*		T	
2.	6309	*Andersonia gracilis*		T	
3.	6946	*Anthocercis gracilis (Slender Tailflower)*		T	
4.	32211	*Banksia mimica (Summer Honeypot)*		T	
5.	24162	*Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)*		T	
6.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
7.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
8.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
9.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
10.	13653	*Calytrix breviseta subsp. breviseta*		T	
11.	13999	*Conospermum undulatum*		T	
12.	5505	*Darwinia apiculata (Scarp Darwinia)*		T	
13.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
14.	17605	*Eleocharis keigheryi*		T	
15.	7491	*Goodenia arthrotricha*		T	
16.	2107	*Grevillea thelemanniana (Spider Net Grevillea)*		T	
17.	942	*Lepidosperma rostratum*		T	
18.	10862	*Thelymitra stellata (Star Orchid)*		T	
19.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Protected under international agreement					
20.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
21.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
22.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Other specially protected fauna					
23.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
24.	48070	*Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)*		S	
Priority 1					
25.	14932	*Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)*		P1	
26.	33980	*Kawaniphila pachomai (Grey Vernal Katydid (southwest), cricket)*		P1	
27.	20729	*Thelymitra magnifica (Crystal Brook Star Orchid)*		P1	
Priority 2					
28.	41732	*Andersonia sp. Blepharifolia (F. & J. Hort 1919)*		P2	
29.	48680	*Paracaleana sp. Laterite (G. Brockman GBB 3571)*		P2	
Priority 3					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
30.	3373	*Acacia horridula*		P3	
31.	25242	*Acanthophis antarcticus (Southern Death Adder)*		P3	
32.	1729	*Allocasuarina grevilleoides*		P3	
33.	7849	*Asteridea gracilis*		P3	
34.	45402	*Babingtonia urbana (Coastal Plain Babingtonia)*		P3	
35.	32216	*Banksia kippistiana var. paenepeccata*		P3	
36.	32138	*Banksia pteridifolia subsp. vernalis*		P3	
37.	5390	*Beaufortia purpurea (Purple Beaufortia)*		P3	
38.	3178	*Byblis gigantea (Rainbow Plant)*		P3	
39.	1469	*Haemodorum loratum*		P3	
40.	6686	*Halgania corymbosa*		P3	
41.	48935	*Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)*		P3	
42.	29775	*Isopogon drummondii*		P3	
43.	45081	*Lasiopetalum glutinosum subsp. glutinosum*		P3	
44.	33638	*Meionectes tenuifolia*		P3	
45.	6193	*Myriophyllum echinatum*		P3	
46.	25249	*Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)*		P3	
47.	8163	*Pithocarpa corymbulosa (Corymbose Pithocarpa)*		P3	
48.	1008	*Schoenus pennisetis*		P3	
49.	43540	*Stackhousia sp. Red-blotched corolla (A. Markey 911)*		P3	
50.	1317	*Thysanotus anceps*		P3	
Priority 4					
51.	14131	*Acacia oncinophylla subsp. patulifolia*		P4	
52.	4444	*Boronia tenuis (Blue Boronia)*		P4	
53.	5396	*Calothamnus accedens*		P4	
54.	11333	*Calothamnus graniticus subsp. leptophyllus*		P4	
55.	13826	*Cyanicula ixioides subsp. ixioides*		P4	
56.	3115	*Drosera occidentalis (Western Sundew)*		P4	
57.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
58.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
59.	5025	*Lasiopetalum bracteatum (Helena Velvet Bush)*		P4	
60.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
61.	5260	*Pimelea rara (Summer Pimelea)*		P4	
62.	8212	*Senecio leucoglossus*		P4	
63.	7803	*Stylidium striatum (Fan-leaved Triggerplant)*		P4	
64.	14714	*Verticordia lindleyi subsp. lindleyi*		P4	
Non-conservation taxon					
65.	3207	*Acacia alata (Winged Wattle)*			
66.	15429	*Acacia alata var. alata*			
67.	15466	*Acacia applanata*			
68.	3233	*Acacia barbinervis*			
69.	3294	*Acacia dentifera*			
70.	11926	*Acacia drewiana subsp. drewiana*			
71.	11611	*Acacia lasiocarpa var. lasiocarpa*			
72.	3410	*Acacia lateriticola*			
73.	3454	*Acacia nervosa (Rib Wattle)*			
74.	3464	*Acacia obovata*			
75.	3502	*Acacia pulchella (Prickly Moses)*			
76.	15481	*Acacia pulchella var. glaberrima*			
77.	15483	*Acacia pulchella var. pulchella*			
78.	30033	*Acacia saligna subsp. lindleyi*			
79.	30032	*Acacia saligna subsp. saligna*			
80.	3541	*Acacia sessilis*			
81.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
82.	3574	*Acacia teretifolia*			
83.	3602	*Acacia willdenowiana (Grass Wattle)*			
84.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
85.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
86.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
87.	24262	*Acanthiza inornata (Western Thornbill)*			
88.	1205	*Acanthocarpus canaliculatus*			
89.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
90.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
91.	25536	*Accipiter fasciatus (Brown Goshawk)*			
92.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
93.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
94.	6205	*Actinotus leucocephalus (Flannel Flower)*			
95.	14970	*Adenanthos barbiger*			
96.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
97.	1791	*Adenanthos obovatus (Basket Flower)*			
98.	25	*Adiantum aethiopicum (Common Maidenhair)*			
99.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
100.	18396	*Aeonium haworthii*	Y		
101.	1505	*Agave americana (Century Plant)*	Y		
102.	179	*Agrostis gigantea (Redtop Bent)*	Y		
103.	23474	*Agrostocrinum hirsutum*			
104.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
105.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
106.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
107.	1374	*Allium ampeloprasum*	Y		
108.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
109.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
110.	1734	*Allocasuarina microstachya*			
111.	2648	*Alternanthera denticulata (Lesser Joyweed)*			
112.	38756	*Amanita umbrinella*			
113.	7820	*Ambrosia artemisiifolia (Annual Ragweed, Bitterweed, Hay-feverweed, Hog-weed)*	Y		
114.	194	*Amphipogon amphipogonoides*			
115.	197	*Amphipogon debilis*			
116.	199	*Amphipogon strictus (Greybeard Grass)*			
117.	200	*Amphipogon turbinatus*			
118.	2380	*Amyema miquelii (Stalked Mistletoe)*			
119.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
120.		*Aname mainae*			
121.		*Aname tepperi*			
122.	1058	*Anarthria gracilis*			
123.	1059	*Anarthria humilis*			
124.	1060	*Anarthria laevis*			
125.	24310	*Anas castanea (Chestnut Teal)*			
126.	24312	*Anas gracilis (Grey Teal)*			
127.		*Anas platyrhynchos subsp. domesticus*			
128.	24315	*Anas rhynchotis (Australasian Shoveler)*			
129.	24316	*Anas superciliosa (Pacific Black Duck)*			
130.	6300	*Andersonia aristata (Rice Flower)*			
131.	6314	*Andersonia lehmanniana*			
132.	11471	*Andersonia lehmanniana subsp. lehmanniana*			
133.	7833	*Angianthus preissianus*			
134.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
135.	11470	*Anigozanthos bicolor subsp. bicolor*			
136.	1409	*Anigozanthos humilis (Catspaw)*			
137.	11434	*Anigozanthos humilis subsp. humilis*			
138.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
139.	11261	*Anigozanthos manglesii subsp. manglesii*			
140.	29487	*Anigozanthos manglesii var. x angustifolius*			
141.	11566	*Anigozanthos viridis subsp. viridis*			
142.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
143.	24561	*Anthochaera carunculata (Red Wattlebird)*			
144.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
145.	12724	*Anthotium junciforme*			
146.	202	*Anthoxanthum odoratum (Sweet Vernal Grass)*	Y		
147.	1116	*Aphelia brizula*			
148.	1117	*Aphelia cyperoides*			
149.	43548	*Aphelia sp. Albany (B.G. Briggs 596)*			
150.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
151.	24285	*Aquila audax (Wedge-tailed Eagle)*			
152.		*Arachnura higginsi*			
153.		*Araneus eburnus*			
154.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
155.	41324	*Ardea modesta (great egret, white egret)*			
156.	24341	*Ardea pacifica (White-necked Heron)*			
157.	1264	*Arnocrinum preissii*			
158.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
159.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
160.	24356	*Artamus personatus (Masked Woodswallow)*			
161.	28288	*Artemisia arborescens (Silver Wormwood)*	Y		
162.		*Artoria linnaei*			
163.		*Asadipus kunderang*			
164.	20350	*Astartea affinis (West-coast Astartea)*			
165.	20283	*Astartea scoparia (Common Astartea)*			
166.		*Asterella drummondii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
167.	6323	*Astroloma ciliatum (Candle Cranberry)*			
168.	6327	*Astroloma foliosum (Candle Cranberry)*			
169.	6328	*Astroloma glaucescens*			
170.	6334	*Astroloma pallidum (Kick Bush)*			
171.	6337	*Astroloma stomarrhena (Red Swamp Cranberry)*			
172.	6339	*Astroloma xerophyllum*			
173.		*Austracantha minax*			
174.	17233	*Austrostipa campylachne*			
175.	17234	*Austrostipa compressa*			
176.	17245	*Austrostipa mollis*			
177.	17257	*Austrostipa variabilis*			
178.	231	*Avellinia michelii*	Y		
179.	20013	*Axonopus fissifolius*	Y		
180.	24318	*Aythya australis (Hardhead)*			
181.	18279	*Babiana angustifolia*	Y		
182.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
183.	45403	*Babingtonia pelloeae (Pelloe's Babingtonia)*			
184.		*Backobourkia heroine*			
185.	38976	*Badhamia foliicola*			
186.	1382	*Baeometra uniflora*	Y		
187.	32682	*Banksia armata var. armata*			
188.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
189.	32678	*Banksia bipinnatifida subsp. bipinnatifida*			
190.	32576	*Banksia dallanneyi (Couch Honeypot)*			
191.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
192.	32577	*Banksia dallanneyi subsp. dallanneyi var. mellicula*			
193.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
194.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
195.	1823	*Banksia incana*			
196.	32214	*Banksia kippistiana*			
197.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
198.	1834	*Banksia menziesii (Firewood Banksia)*			
199.	32080	*Banksia sessilis var. sessilis*			
200.	12111	*Banksia sphaerocarpa var. sphaerocarpa (Fox Banksia)*			
201.	1852	*Banksia telmatiaea (Swamp Fox Banksia)*			
202.	32031	*Banksia vestita (Summer Dryandra)*			
203.	32315	*Barbula calycina*			
204.		*Barnardius zonarius*			
205.	32321	*Bartramia breutelii*			
206.	32323	*Bartramia pseudostricta*			
207.	743	*Baumea juncea (Bare Twigrush)*			
208.	744	*Baumea laxa*			
209.	747	*Baumea rubiginosa*			
210.	5387	*Beaufortia macrostemon (Darling Range Beaufortia)*			
211.	5393	*Beaufortia squarrosa (Sand Beaufortia, Sand Bottlebrush, Puno)*			
212.	7046	*Bellardia trixago (Bellardia)*	Y		
213.	48868	*Bellardia viscosa*	Y		
214.	3157	*Billardiera floribunda (White-flowered Billardiera)*			
215.	25788	*Billardiera fraseri (Elegant Pronaya)*			
216.	25798	*Billardiera fusiformis (Australian Bluebell)*			
217.	24319	*Biziura lobata (Musk Duck)*			
218.	1417	*Blancoa canescens (Winter Bell)*			
219.	4413	*Boronia crenulata (Aniseed Boronia)*			
220.	11503	*Boronia crenulata subsp. crenulata var. crenulata*			
221.	16636	*Boronia crenulata subsp. viminea*			
222.	4414	*Boronia cymosa (Granite Boronia)*			
223.	4417	*Boronia dichotoma*			
224.	4432	*Boronia ovata*			
225.	4438	*Boronia ramosa*			
226.	11381	*Boronia ramosa subsp. anethifolia*			
227.	11564	*Boronia ramosa subsp. ramosa*			
228.	1272	*Borya scirpoidea*			
229.	1273	*Borya sphaerocephala (Pincushions)*			
230.	48782	*Bossiaea angustifolia*			
231.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
232.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
233.	8661	*Brachypodium distachyon (False Brome)*	Y		
234.	7878	*Brachyscome iberidifolia*			
235.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
236.	244	*Briza maxima (Blowfly Grass)*	Y		

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237.	245	*Briza minor (Shivery Grass)*	Y		
238.	249	*Bromus diandrus (Great Brome)*	Y		
239.	250	*Bromus hordeaceus (Soft Brome)*	Y		
240.	1366	*Bulbine semibarbata (Leek Lily)*			
241.	1383	*Burchardia bairdiae*			
242.	12770	*Burchardia congesta*			
243.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
244.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
245.	25716	*Cacatua sanguinea (Little Corella)*			
246.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
247.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
248.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
249.	1276	*Caesia micrantha (Pale Grass Lily)*			
250.	13853	*Caladenia arrecta*			
251.	44900	*Caladenia denticulata subsp. rubella*			
252.	1590	*Caladenia ferruginea (Rusty Spider Orchid)*			
253.	1592	*Caladenia flava (Cowslip Orchid)*			
254.	15348	*Caladenia flava subsp. flava*			
255.	13859	*Caladenia longicauda subsp. clivicola*			
256.	15503	*Caladenia paludosa*			
257.	15377	*Caladenia reptans subsp. reptans*			
258.	15379	*Caladenia serotina*			
259.	2846	*Calandrinia calyptrata (Pink Purslane)*			
260.	19309	*Calectasia narragara*			
261.	4717	*Callitriche stagnalis (Common Starwort)*	Y		
262.	36520	*Callitris acuminata (Dwarf Cypress)*			
263.	36600	*Callitris pyramidalis (Swamp Cypress)*			
264.	5411	*Calothamnus hirsutus*			
265.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush, Kwowdjard)*			
266.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
267.	5428	*Calothamnus rupestris (Mouse Ears)*			
268.	5431	*Calothamnus torulosus*			
269.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
270.	5437	*Calytrix acutifolia*			
271.	5441	*Calytrix aurea*			
272.	5458	*Calytrix flavescens (Summer Starflower)*			
273.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
274.	5461	*Calytrix glutinosa*			
275.	13655	*Calytrix simplex subsp. suboppositifolia*			
276.	5485	*Calytrix variabilis*			
277.	19713	*Campsis radicans*	Y		
278.	32461	*Campylopus bicolor var. bicolor*			
279.	32338	*Campylopus introflexus*	Y		
280.	2951	*Cassytha flava (Dodder Laurel)*			
281.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
282.	11501	*Cassytha glabella forma casuarinae*			
283.	2956	*Cassytha pomiformis (Dodder Laurel)*			
284.	2957	*Cassytha racemosa (Dodder Laurel)*			
285.	11242	*Cassytha racemosa forma pilosa*			
286.	11799	*Cassytha racemosa forma racemosa*			
287.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
288.	6539	*Centaurium erythraea (Common Centaury)*	Y		
289.	6214	*Centella asiatica*			
290.	1120	*Centrolepis alepyroides*			
291.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
292.	1123	*Centrolepis caespitosa*			
293.	1125	*Centrolepis drummondiana*			
294.	43642	*Centrolepis sp. Kalannie (B.J. Lepschi et al. BJL 3517)*			
295.	17685	*Chaetanthus aristatus*			
296.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
297.	1280	*Chamaescilla corymbosa (Blue Squill)*			
298.	11299	*Chamaescilla corymbosa var. corymbosa*			
299.	8788	*Chamaescilla versicolor*			
300.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
301.	31	*Cheilanthes austrotenuifolia*			
302.	34	*Cheilanthes distans (Bristly Cloak Fern)*			
303.	3169	*Cheiranthera preissiana*			
304.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
305.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
306.	33939	*Cherax cainii (Marron)*			

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307.		*Cherax destructor*			
308.		*Cherax quinquecarinatus*			
309.	17706	*Chordifex sinuosus*			
310.	763	*Chorizandra enodis (Black Bristlerush)*			
311.	3753	*Chorizema dicksonii (Yellow-eyed Flame Pea)*			
312.	24980	*Christinus marmoratus (Marbled Gecko)*			
313.		*Chroicocephalus novaehollandiae*			
314.	11900	*Chrysanthemoides monilifera subsp. monilifera*	Y		
315.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
316.	24288	*Circus approximans (Swamp Harrier)*			
317.	2929	*Clematis pubescens (Common Clematis)*			
318.		*Coenagrionidae sp.*			
319.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
320.	24399	*Columba livia (Domestic Pigeon)*	Y		
321.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
322.	4551	*Comesperma ciliatum*			
323.	4564	*Comesperma virgatum (Milkwort)*			
324.	48634	*Commersonia corniculata*			
325.	15513	*Conospermum boreale subsp. boreale*			
326.	15041	*Conospermum canaliculatum*			
327.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
328.	1875	*Conospermum huegelii (Slender Smokebush)*			
329.	1882	*Conospermum stoechadis (Common Smokebush)*			
330.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
331.	6348	*Conostephium pendulum (Pearl Flower)*			
332.	6349	*Conostephium preissii*			
333.	11826	*Conostylis aculeata subsp. aculeata*			
334.	12109	*Conostylis aculeata subsp. preissii*			
335.	1420	*Conostylis androstemma (Trumpets)*			
336.	1423	*Conostylis aurea (Golden Conostylis)*			
337.	1429	*Conostylis caricina*			
338.	12035	*Conostylis caricina subsp. caricina*			
339.	1434	*Conostylis festucacea*			
340.	1436	*Conostylis juncea*			
341.	1437	*Conostylis latens*			
342.	1453	*Conostylis serrulata*			
343.	1454	*Conostylis setigera (Bristly Cottonhead)*			
344.	11597	*Conostylis setigera subsp. setigera*			
345.	1455	*Conostylis setosa (White Cottonhead)*			
346.	5502	*Conothamnus trinervis*			
347.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
348.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
349.		*Corixidae sp.*			
350.		*Cormocephalus aurantiipes*			
351.		*Cormocephalus strigosus*			
352.	2891	*Corrigiola litoralis (Strapwort)*	Y		
353.	48259	*Cortaderia selloana subsp. selloana*	Y		
354.	24416	*Corvus bennetti (Little Crow)*			
355.	25592	*Corvus coronoides (Australian Raven)*			
356.	17104	*Corymbia calophylla (Marri)*			
357.	18320	*Cotoneaster pannosus*	Y		
358.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
359.	25595	*Cracticus tibicen (Australian Magpie)*			
360.	24422	*Cracticus tibicen subsp. dorsalis (White-backed Magpie)*			
361.	25596	*Cracticus torquatus (Grey Butcherbird)*			
362.	13354	*Craspedia variabilis*			
363.	17701	*Crassula closiana*			
364.	11563	*Crassula colorata var. colorata*			
365.	3139	*Crassula exserta*			
366.	18397	*Crassula tetragona subsp. robusta*	Y		
367.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
368.	29054	*Crepis foetida subsp. foetida (Stinking Hawksbeard)*	Y		
369.	25398	*Crinia georgiana (Quacking Frog)*			
370.	25399	*Crinia glauerti (Clicking Frog)*			
371.	25400	*Crinia insignifera (Squelching Froglet)*			
372.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
373.	35838	*Cristonia biloba subsp. biloba*			
374.	13527	*Croninia kingiana*			
375.	13470	*Cryptandra arbutiflora var. arbutiflora*			
376.	9076	*Cryptandra myriantha*			

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377.	4809	*Cryptandra pungens*			
378.	30893	*Cryptoblepharus buchananii*			
379.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
380.	24883	*Ctenophorus ornatus (Ornate Crevice-Dragon)*			
381.	25027	*Ctenotus australis*			
382.	25039	*Ctenotus fallens*			
383.	25047	*Ctenotus impar*			
384.	15114	*Cyanicula gemmata*			
385.	15404	*Cyanicula sericea*			
386.	51	*Cyathea cooperi*	Y		
387.	768	*Cyathochaeta avenacea*			
388.	17618	*Cyathochaeta equitans*			
389.	40661	*Cycnogeton lineare*			
390.	24322	*Cygnus atratus (Black Swan)*			
391.	285	*Cynosurus echinatus (Rough Dogstail)*	Y		
392.	776	*Cyperus brevifolius (Kyllinga Weed)*	Y		
393.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
394.	792	*Cyperus eragrostis (Umbrella Sedge)*	Y		
395.	18198	*Cyperus papyrus*	Y		
396.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
397.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
398.	10916	*Cyrtostylis huegelii*			
399.	17692	*Cytogonidium leptocarpoides*			
400.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
401.	7420	*Dampiera alata (Winged-stem Dampiera)*			
402.	7428	*Dampiera coronata (Wedge-leaved Dampiera)*			
403.	7454	*Dampiera linearis (Common Dampiera)*			
404.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
405.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
406.	5531	*Darwinia thymoides*			
407.	18193	*Darwinia thymoides subsp. thymoides*			
408.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
409.	1220	*Dasypogon obliquifolius*			
410.	6218	*Daucus glochidiatus (Australian Carrot)*			
411.	3793	*Daviesia angulata*			
412.	3799	*Daviesia cordata (Bookleaf)*			
413.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			
414.	19747	*Daviesia decurrens subsp. decurrens*			
415.	18560	*Daviesia divaricata subsp. divaricata*			
416.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
417.	16585	*Daviesia nudiflora subsp. nudiflora*			
418.	3832	*Daviesia physodes*			
419.	3834	*Daviesia polyphylla*			
420.	3839	*Daviesia rhombifolia*			
421.	3845	*Daviesia triflora*			
422.	24999	*Delma grayii*			
423.	17336	*Dennstaedtia davallioides*	Y		Y
424.	17663	*Desmocladus asper*			
425.	17691	*Desmocladus fasciculatus*			
426.	1259	*Dianella revoluta (Blueberry Lily)*			
427.	11636	*Dianella revoluta var. divaricata*			
428.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
429.	1287	*Dichopogon capillipes*			
430.	1289	*Dichopogon preissii*			
431.	32345	*Didymodon australasiae*			
432.	17838	*Dielsia stenostachya*			
433.	311	*Digitaria ciliaris (Summer Grass)*	Y		
434.	316	*Digitaria longiflora*			
435.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
436.		*Dingosa serrata*			
437.		*Dinocambala ingens*			
438.	1509	*Dioscorea hastifolia (Warrine, Wararn)*			
439.	24939	*Diplodactylus polyophthalmus*			
440.	24940	*Diplodactylus pulcher*			
441.	18589	*Diplopeltis huegelii subsp. lehmannii*			
442.	3867	*Dipogon lignosus (Dolichos Pea)*	Y		
443.	19649	*Disa bracteata*	Y		
444.	32347	*Ditrichum difficile*			
445.	12943	*Diuris brumalis*			
446.	11049	*Diuris corymbosa*			

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447.	1634	*Diuris laxiflora (Bee Orchid)*			
448.	4757	*Dodonaea ceratocarpa*			
449.	4775	*Dodonaea pinifolia*			
450.	15406	*Drakaea gracilis*			
451.	24470	*Dromaius novaehollandiae (Emu)*			
452.	48724	*Drosera collina*			
453.	48751	*Drosera drummondii*			
454.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
455.	3097	*Drosera gigantea (Giant Sundew)*			
456.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
457.	13195	*Drosera helodes*			
458.	3101	*Drosera heterophylla (Swamp Rainbow)*			
459.	48768	*Drosera hirsuta*			
460.	13197	*Drosera hyperostigma*			
461.	3106	*Drosera macrantha (Bridal Rainbow)*			
462.	3109	*Drosera menziesii (Pink Rainbow)*			
463.	3110	*Drosera microphylla (Golden Rainbow)*			
464.	15710	*Drosera miniata (Orange Sundew)*			
465.	3118	*Drosera pallida (Pale Rainbow)*			
466.	3123	*Drosera platystigma (Black-eyed Sundew)*			
467.	29178	*Drosera porrecta*			
468.	3125	*Drosera pycnoblasta (Pearly Sundew)*			
469.	8911	*Drosera rosulata*			
470.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
471.	3131	*Drosera stolonifera (Leafy Sundew)*			
472.	33500	*Dysphania ambrosioides (Mexican Tea)*	Y		
473.		*Dytiscidae sp.*			
474.	32351	*Eccremidium pulchellum*			
475.	11105	*Echinochloa crus-galli*	Y		
476.	16093	*Echinochloa esculenta*	Y		
477.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
478.	25096	*Egernia kingii (King's Skink)*			
479.		*Egretta novaehollandiae*			
480.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
481.		*Elanus axillaris*			
482.	822	*Eleocharis acuta (Common Spikerush)*			
483.	353	*Eleusine indica (Crowsfoot Grass)*	Y		
484.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
485.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
486.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
487.	32353	*Entosthodon apophysatus*			
488.	32354	*Entosthodon productus*			
489.		*Eolophus roseicapillus*			
490.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
491.	374	*Eragrostis cilianensis (Stinkgrass)*	Y		
492.	379	*Eragrostis elongata (Clustered Lovegrass)*			
493.	5540	*Eremaea fimbriata*			
494.	5541	*Eremaea pauciflora*			
495.	14103	*Eremaea pauciflora var. calyptra*			
496.	14104	*Eremaea pauciflora var. pauciflora*			
497.	15412	*Eriochilus dilatatus subsp. multiflorus*			
498.	15413	*Eriochilus dilatatus subsp. undulatus*			
499.	15414	*Eriochilus helonomos*			
500.		*Eriophora biapicata*			
501.	4332	*Erodium botrys (Long Storksbill)*	Y		
502.	6219	*Eryngium pinnatifidum (Blue Devils)*			
503.	15446	*Eryngium pinnatifidum subsp. pinnatifidum*			
504.	5688	*Eucalyptus laeliae (Darling Range Ghost Gum)*			
505.	5690	*Eucalyptus lane-poolei (Salmon White Gum)*			
506.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
507.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
508.	13548	*Eucalyptus marginata subsp. thalassica (Blue-leaved Jarrah)*			
509.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
510.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
511.	5797	*Eucalyptus wandoo (Wandoo, Wondu)*			
512.	12906	*Eucalyptus wandoo subsp. wandoo*			
513.	3872	*Euchilopsis linearis (Swamp Pea)*			
514.		*Eucyrtops latior*			
515.	3880	*Eutaxia virgata*			
516.	25621	*Falco berigora (Brown Falcon)*			

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517.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
518.	24472	*Falco cenchroides subsp. cenchroides (Australian Kestrel, Nankeen Kestrel)*			
519.	25623	*Falco longipennis (Australian Hobby)*			
520.	894	*Fimbristylis velata*			
521.	32367	*Fissidens megalotis*			
522.	32368	*Fissidens taylorii*			
523.	32469	*Fissidens taylorii var. taylorii*			
524.	27748	*Flavoparmelia rutidota*			
525.	18392	*Freesia alba x leichtlinii*	Y		
526.	25727	*Fulica atra (Eurasian Coot)*			
527.	31532	*Fumaria muralis subsp. muralis*	Y		
528.	900	*Gahnia aristata*			
529.	902	*Gahnia decomposita*			
530.	907	*Gahnia trifida (Coast Saw-sedge)*			
531.	34028	*Galaxias occidentalis (Western Minnow)*			
532.	7321	*Galium divaricatum*	Y		
533.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
534.	24765	*Gallirallus philippensis subsp. mellori (Buff-banded Rail)*			
535.	3887	*Gastrolobium acutum*			
536.	20475	*Gastrolobium capitatum*			
537.	20513	*Gastrolobium dilatatum*			
538.	20483	*Gastrolobium linearifolium*			
539.	20482	*Gastrolobium nervosum*			
540.	3912	*Gastrolobium oxylobioides (Champion Bay Poison)*			
541.	3923	*Gastrolobium spathulatum (Poison Bush)*			
542.	3924	*Gastrolobium spinosum (Prickly Poison)*			
543.	24959	*Gehyra variegata*			
544.	32374	*Gemmabryum cheelii*			
545.	32379	*Gemmabryum inaequale*			
546.	32381	*Gemmabryum preissianum*			
547.	32383	*Gemmabryum sullivanii*			
548.	3936	*Genista linifolia (Flaxleaf Broom)*	Y		
549.	25530	*Gerygone fusca (Western Gerygone)*			
550.	32384	*Gigaspermum repens*			
551.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
552.	6143	*Glischrocaryon aureum (Common Popflower)*			
553.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
554.	6587	*Gomphocarpus fruticosus (Narrowleaf Cottonbush)*	Y		
555.	11051	*Gomphocarpus physocarpus*	Y		
556.	3945	*Gompholobium aristatum*			
557.	10909	*Gompholobium confertum*			
558.	3950	*Gompholobium knightianum*			
559.	3951	*Gompholobium marginatum*			
560.	3954	*Gompholobium polymorphum*			
561.	3955	*Gompholobium preissii*			
562.	3956	*Gompholobium shuttleworthii*			
563.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
564.	6149	*Gonocarpus cordiger*			
565.	6159	*Gonocarpus nodulosus*			
566.	29362	*Goodenia coerulea*			
567.	12520	*Goodenia fasciculata*			
568.	12551	*Goodenia micrantha*			
569.	19286	*Goodenia pulchella subsp. Coastal Plain A (M. Hislop 634)*			
570.	24443	*Grallina cyanoleuca (Magpie-lark)*			
571.	1964	*Grevillea bipinnatifida (Fuchsia Grevillea)*			
572.	19628	*Grevillea bipinnatifida subsp. bipinnatifida*			
573.	13429	*Grevillea diversifolia subsp. diversifolia*			
574.	1997	*Grevillea endlicheriana (Spindly Grevillea)*			
575.	13450	*Grevillea manglesii subsp. manglesii*			
576.	2066	*Grevillea pilulifera (Woolly-flowered Grevillea)*			
577.	15839	*Grevillea preissii subsp. preissii*			
578.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
579.	2101	*Grevillea synapheae (Catkin Grevillea)*			
580.	14421	*Grevillea synapheae subsp. synapheae*			
581.	2122	*Grevillea wilsonii (Native Fuchsia)*			
582.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
583.	1465	*Haemodorum discolor*			
584.	1468	*Haemodorum laxum*			
585.	1472	*Haemodorum simplex*			
586.	1473	*Haemodorum simulans*			

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587.	1474	*Haemodorum sparsiflorum*			
588.	1475	*Haemodorum spicatum (Mardja)*			
589.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
590.	2136	*Hakea candolleana*			
591.	2137	*Hakea ceratophylla (Horned Leaf Hakea)*			
592.	2143	*Hakea conchifolia (Shell-leaved Hakea)*			
593.	2152	*Hakea cyclocarpa (Ramshorn)*			
594.	2158	*Hakea erinacea (Hedge-hog Hakea)*			
595.	2166	*Hakea incrassata (Marble Hakea)*			
596.	2175	*Hakea lissocarpha (Honey Bush)*			
597.	2185	*Hakea myrtoides (Myrtle Hakea)*			
598.	45333	*Hakea neospathulata*			
599.	2194	*Hakea petiolaris (Sea Urchin Hakea)*			
600.	16900	*Hakea petiolaris subsp. petiolaris*			
601.	2197	*Hakea prostrata (Harsh Hakea)*			
602.	2203	*Hakea ruscifolia (Candle Hakea)*			
603.	2206	*Hakea stenocarpa (Narrow-fruited Hakea)*			
604.	2212	*Hakea sulcata (Furrowed Hakea)*			
605.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
606.	2215	*Hakea undulata (Wavy-leaved Hakea)*			
607.	2216	*Hakea varia (Variable-leaved Hakea)*			
608.	24295	*Haliastur sphenurus (Whistling Kite)*			
609.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
610.	25409	*Heleioporus barycragus (Hooting Frog)*			
611.	25410	*Heleioporus eyrei (Moaning Frog)*			
612.	3016	*Heliophila pusilla*	Y		
613.	6838	*Hemiandra linearis (Speckled Snakebush)*			
614.	6839	*Hemiandra pungens (Snakebush)*			
615.	25115	*Hemiergis initialis subsp. initialis*			
616.	25119	*Hemiergis quadrilineata*			
617.	6856	*Hemigenia incana (Silky Hemigenia)*			
618.	6866	*Hemigenia pritzelii*			
619.	41020	*Hemiphora bartlingii (Woolly Dragon)*			
620.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
621.	5109	*Hibbertia amplexicaulis*			
622.	5112	*Hibbertia aurea*			
623.	5114	*Hibbertia commutata*			
624.	20051	*Hibbertia diamesogenos*			
625.	19778	*Hibbertia glomerata subsp. darlingensis*			
626.	5134	*Hibbertia huegelii*			
627.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
628.	45534	*Hibbertia hypericoides subsp. hypericoides*			
629.	5148	*Hibbertia mylnei*			
630.	5152	*Hibbertia ovata*			
631.	5155	*Hibbertia pilosa (Hairy Guinea Flower)*			
632.	5169	*Hibbertia serrata (Serrate Leaved Guinea Flower)*			
633.		*Hibbertia sp.*			
634.	5171	*Hibbertia spicata*			
635.	11481	*Hibbertia spicata subsp. spicata*			
636.	48381	*Hibbertia striata*			
637.	5173	*Hibbertia subvaginata*			
638.	5176	*Hibbertia vaginata*			
639.	47965	*Hieraaetus morphnoides (Little Eagle)*			
640.	25734	*Himantopus himantopus (Black-winged Stilt)*			
641.	24491	*Hirundo neoxena (Welcome Swallow)*			
642.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
643.	6222	*Homalosciadium homalocarpum*			
644.	451	*Hordeum vulgare (Barley)*	Y		
645.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
646.	3966	*Hovea pungens (Devil's Pins, Puyenak)*			
647.	3968	*Hovea trisperma (Common Hovea)*			
648.	18296	*Humulus lupulus*	Y		
649.	12741	*Hyalosperma cotula*			
650.	12742	*Hyalosperma demissum*			
651.	16759	*Hyalosperma simplex subsp. simplex*			
652.	5216	*Hybanthus calycinus (Wild Violet)*			
653.	5221	*Hybanthus floribundus*			
654.	12007	*Hybanthus floribundus subsp. floribundus*			
655.	6223	*Hydrocotyle alata*			
656.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			

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657.	452	*Hyparrhenia hirta (Tambookie Grass)*	Y		
658.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
659.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
660.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
661.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
662.	9352	*Hypochaeris radicata (Flat Weed, Cats-ear)*	Y		
663.	1070	*Hypolaena exsulca*			
664.	17841	*Hypolaena pubescens*			
665.		*Idiommata blackwalli*			
666.	20200	*Isolepis cernua var. setiformis*			
667.	912	*Isolepis cyperoides*			
668.	917	*Isolepis marginata (Coarse Club-rush)*			
669.	919	*Isolepis oldfieldiana*			
670.		*Isopeda leishmanni*			
671.		*Isopedella cana*			
672.	2221	*Isopogon asper*			
673.	2229	*Isopogon dubius (Pincushion Coneflower)*			
674.	2237	*Isopogon sphaerocephalus (Drumstick Isopogon)*			
675.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
676.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
677.	1533	*Ixia paniculata*	Y		
678.	1534	*Ixia polystachya (Variable Ixia)*	Y		
679.	8092	*Ixiolaena viscosa (Sticky Ixiolaena)*			
680.	3997	*Jacksonia alata*			
681.	3998	*Jacksonia angulata*			
682.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
683.	4018	*Jacksonia lehmannii*			
684.	4025	*Jacksonia restioides*			
685.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
686.	1298	*Johnsonia pubescens (Pipe Lily)*			
687.	19632	*Johnsonia pubescens subsp. pubescens*			
688.	20454	*Juncus acutus subsp. acutus*	Y		
689.	8328	*Juncus amabilis*			
690.	1177	*Juncus articulatus (Jointed Rush)*	Y		
691.	1178	*Juncus bufonius (Toad Rush)*	Y		
692.	1179	*Juncus caespiticius (Grassy Rush)*			
693.	1180	*Juncus capitatus (Capitate Rush)*	Y		
694.	1186	*Juncus microcephalus*	Y		
695.	1188	*Juncus pallidus (Pale Rush)*			
696.	1195	*Juncus subsecundus (Finger Rush)*			
697.		*Karaops ellenae*			
698.	4036	*Kennedia carinata*			
699.	4037	*Kennedia coccinea (Coral Vine)*			
700.	4044	*Kennedia prostrata (Scarlet Runner)*			
701.	4045	*Kennedia stirlingii (Bushy Kennedia)*			
702.	7068	*Kickxia spuria (Roundleaf Toadflax)*	Y		
703.	1221	*Kingia australis (Kingia, Pulonok)*			
704.	15498	*Kunzea glabrescens (Spearwood)*			
705.	17461	*Kunzea micrantha subsp. micrantha*			
706.	17785	*Kunzea micrantha subsp. petiolata*			
707.	3669	*Labichea punctata (Lance-leaved Cassia)*			
708.	38800	*Labyrinthomyces varius*			
709.		*Lactarius clarkeae*			
710.	29046	*Lactuca serriola forma serriola*	Y		
711.	18585	*Lagenophora huegelii*			
712.	14083	*Lambertia multiflora var. darlingensis*			
713.	4047	*Lathyrus tingitanus (Tangier Pea)*	Y		
714.	38323	*Lavandula stoechas subsp. stoechas*	Y		
715.	4959	*Lawrencia squamata*			
716.	11815	*Laxmannia grandiflora subsp. grandiflora*			
717.	11911	*Laxmannia ramosa subsp. ramosa*			
718.	11464	*Laxmannia sessiliflora subsp. australis*			
719.	1309	*Laxmannia squarrosa*			
720.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
721.	7572	*Lechenaultia expansa*			
722.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
723.	1075	*Lepidobolus preissianus*			
724.	18074	*Lepidobolus preissianus subsp. preissianus*			
725.	42741	*Lepidosperma apricola*			
726.	930	*Lepidosperma costale*			

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727.	936	*Lepidosperma leptostachyum*			
728.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
729.	14642	*Lepidosperma obtusum*			
730.	940	*Lepidosperma pubisquameum*			
731.	941	*Lepidosperma resinosum*			
732.		*Lepidosperma sp.*			
733.	29141	*Lepidosperma sp. Gosnells (A. Markey 1145)*			
734.	16284	*Lepidosperma sp. P1 small head (M.D. Tindale 166A)*			
735.	945	*Lepidosperma squamatum*			
736.	948	*Lepidosperma tetraquetrum*			
737.	949	*Lepidosperma tuberculatum*			
738.	1653	*Leporella fimbriata (Hare Orchid)*			
739.	1077	*Leptocarpus canus (Hoary Twine-rush)*			
740.	1078	*Leptocarpus coangustatus*			
741.	46375	*Leptocarpus decipiens*			
742.	1080	*Leptocarpus scariosus*			
743.	2342	*Leptomeria cunninghamii*			
744.	5847	*Leptospermum erubescens (Roadside Teatree)*			
745.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
746.	1088	*Lepyrodia macra (Large Scale Rush)*			
747.	25131	*Lerista distinguenda*			
748.	25133	*Lerista elegans*			
749.	6367	*Leucopogon capitellatus*			
750.	6374	*Leucopogon conostephioides*			
751.	6434	*Leucopogon polymorphus*			
752.	6436	*Leucopogon propinquus*			
753.	6439	*Leucopogon pulchellus (Beard-heath)*			
754.	28311	*Leucopogon sp. Great Southern (R.S. Cowan A 586)*			
755.	6444	*Leucopogon sprengelioides*			
756.	40803	*Leucopogon squarrosus subsp. squarrosus*			
757.	6447	*Leucopogon strictus*			
758.	6451	*Leucopogon tenuis*			
759.	7676	*Levenhookia pusilla (Midget Stylewort)*			
760.	7677	*Levenhookia stipitata (Common Stylewort)*			
761.	25005	*Lialis burtonis*			
762.		*Libellulidae sp.*			
763.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
764.	25661	*Lichmera indistincta (Brown Honeyeater)*			
765.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
766.	59	*Lindsaea linearis (Screw Fern)*			
767.	4362	*Linum marginale (Wild Flax)*			
768.	4363	*Linum trigynum (French Flax)*	Y		
769.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
770.	9289	*Lobelia anceps (Angled Lobelia)*			
771.	7402	*Lobelia gibbosa (Tall Lobelia)*			
772.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
773.	7407	*Lobelia rhytidosperma (Wrinkled-seeded Lobelia)*			
774.	475	*Lolium multiflorum (Italian Ryegrass)*	Y		
775.	1222	*Lomandra brittanii*			
776.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
777.	1228	*Lomandra hermaphrodita*			
778.	1229	*Lomandra integra*			
779.	1232	*Lomandra micrantha (Small-flower Mat-rush)*			
780.	14542	*Lomandra micrantha subsp. micrantha*			
781.	1234	*Lomandra nigricans*			
782.	1236	*Lomandra odora (Tiered Matrush)*			
783.	1239	*Lomandra preissii*			
784.	1243	*Lomandra sericea (Silky Mat Rush)*			
785.	1245	*Lomandra spartea*			
786.	1246	*Lomandra suaveolens*			
787.		*Lophoictinia isura*			
788.	8564	*Lotus subbiflorus*	Y		
789.	4063	*Lotus uliginosus (Greater Lotus)*	Y		
790.	1092	*Loxocarya cinerea*			
791.	1097	*Lyginia barbata*			
792.	18049	*Lyginia imberbis*			
793.	1656	*Lyperanthus serratus (Rattle Beak Orchid)*			
794.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
795.	34736	*Lysinema pentapetalum*			
796.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		

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797.	2839	*Macarthuria australis*			
798.	18119	*Macrozamia fraseri*			
799.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
800.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
801.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
802.	25654	*Malurus splendens (Splendid Fairy-wren)*			
803.	24583	*Manorina flavigula (Yellow-throated Miner)*			
804.	17637	*Marianthus candidus (White Marianthus)*			
805.	17636	*Marianthus coeruleopunctatus (Blue-spotted Marianthus)*			
806.	4079	*Medicago polymorpha (Burr Medic)*	Y		
807.	4080	*Medicago sativa (Alfalfa)*	Y		
808.	36296	*Melaleuca armillaris subsp. armillaris*	Y		
809.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
810.	5932	*Melaleuca leucadendra*			
811.	20297	*Melaleuca osullivanii*			
812.	18394	*Melaleuca parviceps*			
813.	5952	*Melaleuca preissiana (Moonah)*			
814.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
815.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
816.	5983	*Melaleuca trichophylla*			
817.	5987	*Melaleuca viminea (Mohan)*			
818.	47997	*Melanodryas cucullata (Hooded Robin)*			
819.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
820.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
821.	25184	*Menetia greyii*			
822.	24598	*Merops ornatus (Rainbow Bee-eater)*			
823.	953	*Mesomelaena graciliceps*			
824.	955	*Mesomelaena pseudostygia*			
825.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
826.		*Microcarbo melanoleucos*			
827.	6897	*Microcorys longifolia*			
828.	485	*Microlaena stipoides (Weeping Grass)*			
829.	1657	*Microtis alba (White Mignonette Orchid)*			
830.	34158	*Microtis alboviridis*			
831.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
832.	12761	*Microtis media subsp. densiflora*			
833.	15419	*Microtis media subsp. media*			
834.	8105	*Millotia myosotidifolia*			
835.	14344	*Millotia tenuifolia var. tenuifolia (Soft Millotia)*			
836.	4097	*Mirbelia ramulosa*			
837.	4100	*Mirbelia spinosa*			
838.		*Missulena granulosa*			
839.		*Missulena occatoria*			
840.		*Mitzoruga insularis*			
841.	37440	*Monopsis debilis var. depressa*	Y		
842.	19585	*Monotaxis grandiflora var. grandiflora*			
843.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
844.	19177	*Moraea setifolia*	Y		
845.	25192	*Morethia obscura*			
846.	24223	*Mus musculus (House Mouse)*	Y		
847.	14187	*Myriocephalus occidentalis*			
848.		*Nannoperca vittata*			
849.	44496	*Narcissus tazetta subsp. italicus*	Y		
850.	44495	*Narcissus tazetta subsp. tazetta*	Y		
851.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
852.	25686	*Neochmia temporalis (Red-browed Finch)*	Y		
853.	24738	*Neophema elegans (Elegant Parrot)*			
854.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
855.		*Nicodamus mainae*			
856.	25747	*Ninox connivens (Barking Owl)*			
857.	25252	*Notechis scutatus (Tiger Snake)*			
858.		*Notonectidae sp.*			
859.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
860.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
861.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
862.		*Occiperipatoides gilesii*			
863.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
864.	20052	*Oenothera jamesii*	Y		
865.	2367	*Olax scalariformis*			
866.	8127	*Olearia axillaris (Coastal Daisybush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
867.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
868.		*Oligochaeta sp.*			
869.	18254	*Opercularia apiciflora*			
870.	7346	*Opercularia echinocephala (Bristly Headed Stink Weed)*			
871.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
872.	18255	*Opercularia vaginata (Dog Weed)*			
873.	46207	*Opuntia tomentosa*	Y		
874.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
875.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
876.		*Orthocladiinae sp.*			
877.	11749	*Orthrosanthus laxus var. laxus (Morning Iris)*			
878.	14532	*Ottelia ovalifolia subsp. chrysobasis*			
879.	4348	*Oxalis caprina*	Y		
880.	4349	*Oxalis corniculata (Yellow Wood Sorrel)*	Y		
881.	4352	*Oxalis glabra*	Y		
882.	4355	*Oxalis perennans*			
883.	4356	*Oxalis pes-caprae (Soursob)*	Y		
884.	4358	*Oxalis purpurea (Largeflower Wood Sorrel)*	Y		
885.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
886.	502	*Panicum capillare (Witchgrass)*	Y		
887.	23483	*Paracaleana brockmanii*			
888.	1667	*Paracaleana nigrita (Flying Duck Orchid)*			
889.	20101	*Paragonis grandiflora*			
890.		*Paralampona marangaroo*			
891.	25253	*Parasuta gouldii*			
892.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
893.	25682	*Pardalotus striatus (Striated Pardalote)*			
894.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
895.	527	*Paspalum dilatatum*	Y		
896.	528	*Paspalum distichum (Water Couch)*	Y		
897.	5225	*Passiflora filamentosa*	Y		
898.	1542	*Patersonia babianoides*			
899.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
900.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
901.	30476	*Patersonia occidentalis var. latifolia*			
902.	30472	*Patersonia occidentalis var. occidentalis*			
903.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
904.	14433	*Patersonia rudis subsp. rudis*			
905.	11550	*Patersonia umbrosa var. xanthina (Yellow Flags)*			
906.	43765	*Pauridia glabella var. glabella*			
907.	43761	*Pauridia occidentalis var. occidentalis*			
908.	43762	*Pauridia occidentalis var. quadriloba*			
909.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
910.	40424	*Pentameris airoides subsp. airoides*	Y		
911.	6245	*Pentapeltis peltigera*			
912.	16477	*Pericalymma ellipticum var. ellipticum*			
913.	16478	*Pericalymma ellipticum var. floridum*			
914.	13911	*Persicaria decipiens*			
915.	2255	*Persoonia angustiflora*			
916.	2262	*Persoonia elliptica (Spreading Snottygobble)*			
917.	2273	*Persoonia saccata (Snottygobble)*			
918.	48060	*Petrochelidon ariel (Fairy Martin)*			
919.	48061	*Petrochelidon nigricans (Tree Martin)*			
920.	48066	*Petroica boodang (Scarlet Robin)*			
921.	24659	*Petroica goodenovii (Red-capped Robin)*			
922.	2284	*Petrophile biloba (Granite Petrophile)*			
923.	20391	*Petrophile juncifolia*			
924.	2299	*Petrophile linearis (Pixie Mops)*			
925.	2301	*Petrophile macrostachya*			
926.	2308	*Petrophile seminuda*			
927.	2312	*Petrophile striata*			
928.	19825	*Petrorhagia dubia*	Y		
929.	25697	*Phalacrocorax carbo (Great Cormorant)*			
930.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
931.	25699	*Phalacrocorax varius (Pied Cormorant)*			
932.	547	*Phalaris angusta*	Y		
933.	551	*Phalaris minor (Lesser Canary Grass)*	Y		
934.	552	*Phalaris paradoxa (Paradoxa Grass)*	Y		
935.	24409	*Phaps chalcoptera (Common Bronzewing)*			
936.	25587	*Phaps elegans (Brush Bronzewing)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
937.	20460	*Pheladenia deformis*			
938.	32409	*Philonotis australiensis*			
939.	18529	*Philotheca spicata (Pepper and Salt)*			
940.	1172	*Philydrella drummondii*			
941.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
942.	14306	*Philydrella pygmaea subsp. pygmaea*			
943.		*Phlebia subceracea*			
944.	1479	*Phlebocarya filifolia*			
945.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
946.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
947.	16825	*Phyllangium divergens*			
948.	4675	*Phyllanthus calycinus (False Boronia)*			
949.	4685	*Phyllanthus scaber*			
950.	17794	*Phyllanthus tenellus*	Y		
951.	6983	*Physalis peruviana (Cape Gooseberry)*	Y		
952.		*Physidae sp.*			
953.		*Phytophthora cinnamomi*			
954.	2408	*Pilostyles hamiltonii*			
955.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
956.	5238	*Pimelea ciliata (White Banjine)*			
957.	11928	*Pimelea ciliata subsp. ciliata*			
958.	11402	*Pimelea imbricata var. piligera*			
959.	5259	*Pimelea preissii*			
960.	5264	*Pimelea spectabilis (Bunjong)*			
961.	12041	*Pimelea suaveolens subsp. suaveolens*			
962.	5268	*Pimelea sulphurea (Yellow Banjine)*			
963.	5269	*Pimelea sylvestris*			
964.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
965.	18352	*Pithocarpa pulchella var. melanostigma*			
966.		*Planorbidae sp.*			
967.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
968.	25720	*Platycercus icterotis (Western Rosella)*			
969.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
970.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
971.	6249	*Platysace compressa (Tapeworm Plant)*			
972.	6253	*Platysace filiformis*			
973.	6255	*Platysace juncea*			
974.	6259	*Platysace tenuissima*			
975.	25007	*Pletholax gracilis subsp. gracilis (Keeled Legless Lizard)*			
976.	32478	*Pleuridium nervosum var. nervosum*			
977.	571	*Poa annua (Winter Grass)*	Y		
978.	573	*Poa drummondiana (Knotted Poa)*			
979.	25703	*Podargus strigoides (Tawny Frogmouth)*			
980.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
981.	25704	*Podiceps cristatus (Great Crested Grebe)*			
982.	8175	*Podolepis gracilis (Slender Podolepis)*			
983.	8177	*Podolepis lessonii*			
984.	8182	*Podotheca angustifolia (Sticky Longheads)*			
985.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
986.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
987.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
988.	8188	*Pogonolepis stricta*			
989.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
990.		*Poltys laciniosus*			
991.	8395	*Polygala myrtifolia (Myrtleleaf Milkwort)*	Y		
992.	4578	*Polygala virgata*	Y		
993.		*Polygonarea repanda*			Y
994.	583	*Polypogon tenellus*			
995.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
996.	4691	*Poranthera microphylla (Small Poranthera)*			
997.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
998.	24769	*Porzana fluminea (Australian Spotted Crake)*			
999.	24771	*Porzana tabuensis (Spotless Crake)*			
1000.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
1001.	1671	*Prasophyllum elatum (Tall Leek Orchid)*			
1002.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
1003.	1674	*Prasophyllum giganteum (Bronze Leek Orchid)*			
1004.	16688	*Prasophyllum gracile*			
1005.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
1006.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			

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1007.	10853	*Prasophyllum plumiforme*			
1008.	43303	*Protea repens*	Y		
1009.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
1010.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
1011.	4155	*Psoralea pinnata (African Scurfpea)*	Y		
1012.	13255	*Pterochaeta paniculata*			
1013.	25710	*Pterodroma macroptera (Great-winged Petrel)*			
1014.	24173	*Pteropus scapulatus (Little Red Flying-fox)*			
1015.	1686	*Pterostylis barbata (Bird Orchid)*			
1016.	44527	*Pterostylis erubescens*			
1017.	12217	*Pterostylis sanguinea*			
1018.	1698	*Pterostylis vittata (Banded Greenhood)*			
1019.	2716	*Ptilotus declinatus (Curved Mulla Mulla)*			
1020.	2720	*Ptilotus esquamatus*			
1021.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
1022.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
1023.	4172	*Pultenaea ericifolia*			
1024.		*Purpureicephalus spurius*			
1025.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
1026.	16367	*Pyrorchis nigricans (Red beaks, Elephants ears)*			
1027.	8195	*Quinetia urvillei*			
1028.	3061	*Raphanus raphanistrum (Wild Radish)*	Y		
1029.	24245	*Rattus rattus (Black Rat)*	Y		
1030.		*Raveniella cirrata*			
1031.	6012	*Regelia ciliata*			
1032.	6014	*Regelia inops*			
1033.	38833	*Resupinatus subapplicatus*			
1034.	48096	*Rhipidura albiscapa (Grey Fantail)*			
1035.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
1036.	13300	*Rhodanthe citrina*			
1037.	13234	*Rhodanthe manglesii*			
1038.		*Riccia multifida*			
1039.	4705	*Ricinus communis (Castor Oil Plant)*	Y		
1040.	6020	*Rinzia crassifolia (Darling Range Rinzia)*			
1041.	14485	*Romulea flava var. minor*	Y		
1042.	1556	*Romulea rosea (Guildford Grass)*	Y		
1043.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
1044.	3066	*Rorippa nasturtium-aquaticum (Watercress)*	Y		
1045.	11151	*Rostraria pumila*	Y		
1046.	44608	*Rosulabryum billarderii*			
1047.	20506	*Rubus anglocandicans*	Y		
1048.	38836	*Russula erumpens*			
1049.	40431	*Rytidosperma acerosum*			
1050.	40430	*Rytidosperma pilosum*			
1051.	40427	*Rytidosperma setaceum*			
1052.	79	*Salvinia molesta (Salvinia)*	Y		
1053.	2356	*Santalum acuminatum (Quandong, Warnga)*			
1054.	7602	*Scaevola calliptera*			
1055.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
1056.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
1057.	7635	*Scaevola pilosa (Hairy Fan-flower)*			
1058.	7636	*Scaevola platyphylla (Broad-leaved Fanflower)*			
1059.	13182	*Scaevola repens var. repens*			
1060.	6263	*Schoenolaena juncea*			
1061.	971	*Schoenus andrewsii*			
1062.	972	*Schoenus armeria*			
1063.	973	*Schoenus asperocarpus (Poison Sedge)*			
1064.	975	*Schoenus bifidus*			
1065.	978	*Schoenus brevisetis*			
1066.	979	*Schoenus caespititius*			
1067.	984	*Schoenus curvifolius*			
1068.	986	*Schoenus efoliatus*			
1069.	991	*Schoenus grammatophyllus*			
1070.	1002	*Schoenus nanus (Tiny Bog Rush)*			
1071.	1006	*Schoenus odontocarpus*			
1072.	17614	*Schoenus plumosus*			
1073.	1011	*Schoenus rigens*			
1074.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
1075.	18164	*Schoenus sp. smooth culms (K.R. Newbey 7823)*			
1076.	1016	*Schoenus subbarbatus (Bearded Bog-rush)*			

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1077.	1018	*Schoenus subfascicularis*			
1078.	1026	*Schoenus unispiculatus*			
1079.	17409	*Schoenus variicellae*			
1080.	24199	*Scotorepens balstoni (Inland Broad-nosed Bat)*			
1081.	8203	*Senecio diaschides*			
1082.	20663	*Senecio multicaulis subsp. multicaulis*			
1083.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
1084.	609	*Setaria palmifolia (Palm Grass)*	Y		
1085.	19453	*Setaria parviflora*	Y		
1086.	8224	*Siloxerus filifolius*			
1087.	14583	*Siloxerus multiflorus*			
1088.	30948	*Smicrornis brevirostris (Weebill)*			
1089.	7020	*Solanum linnaeanum (Apple of Sodom)*	Y		
1090.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
1091.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
1092.	617	*Sorghum halepense (Johnson Grass)*	Y		
1093.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
1094.	1558	*Sparaxis bulbifera*	Y		
1095.	4205	*Sphaerolobium linophyllum*			
1096.	4206	*Sphaerolobium macranthum*			
1097.	4207	*Sphaerolobium medium*			
1098.		*Sphaerotrichopus ramosus*			
1099.	1700	*Spiculaea ciliata (Elbow Orchid)*			
1100.	6930	*Stachys arvensis (Staggerweed)*	Y		
1101.	4716	*Stachystemon vermicularis*			
1102.	4733	*Stackhousia monogyna*			
1103.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
1104.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
1105.	16197	*Stenanthemum emarginatum*			
1106.	13475	*Stenanthemum humile*			
1107.	19403	*Stenopetalum gracile*			
1108.		*Stereum illudens*			
1109.	24329	*Stictonetta naevosa (Freckled Duck)*			
1110.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
1111.	2316	*Stirlingia latifolia (Blueboy)*			
1112.	25597	*Strepera versicolor (Grey Currawong)*			
1113.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
1114.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
1115.	24943	*Strophurus spinigerus subsp. inornatus*			
1116.	7681	*Stylidium affine (Queen Triggerplant)*			
1117.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
1118.	17666	*Stylidium amoenum var. amoenum*			
1119.	30278	*Stylidium androsaceum*			
1120.	25831	*Stylidium araeophyllum (Stilt Walker)*			
1121.	7692	*Stylidium breviscapum (Boomerang Triggerplant)*			
1122.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
1123.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
1124.	7696	*Stylidium calcaratum (Book Triggerplant)*			
1125.	7698	*Stylidium caricifolium (Milkmaids)*			
1126.	7702	*Stylidium ciliatum (Golden Triggerplant)*			
1127.	7713	*Stylidium dichotomum (Pins-and-needles)*			
1128.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
1129.	11808	*Stylidium diuroides subsp. diuroides*			
1130.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
1131.	19251	*Stylidium eriopodum*			
1132.	7736	*Stylidium hispidum (White Butterfly Triggerplant)*			
1133.	7745	*Stylidium junceum (Reed Triggerplant)*			
1134.	7749	*Stylidium leptophyllum (Needle-leaved Triggerplant)*			
1135.	7752	*Stylidium lineatum (Sunny Triggerplant)*			
1136.	7772	*Stylidium perpusillum (Tiny Triggerplant)*			
1137.	7773	*Stylidium petiolare (Horn Triggerplant)*			
1138.	7782	*Stylidium pulchellum (Thumbelina Triggerplant)*			
1139.	7783	*Stylidium pycnostachyum (Downy Triggerplant)*			
1140.	33106	*Stylidium recurvum*			
1141.	7785	*Stylidium repens (Matted Triggerplant)*			
1142.	25806	*Stylidium scariosum*			
1143.	7798	*Stylidium schoenoides (Cow Kicks)*			
1144.		*Stylidium sp.*			
1145.	45594	*Stylidium tenue subsp. majusculum (Showy Fountain Triggerplant)*			
1146.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			

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1147.	40947	*Stylidium xanthellum*			
1148.	1260	*Stypandra glauca (Blind Grass)*			
1149.	6476	*Styphelia tenuiflora (Common Pinheath)*			
1150.		*Supunna funerea*			
1151.		*Supunna picta*			
1152.	2321	*Synaphea acutiloba (Granite Synaphea)*			
1153.	2323	*Synaphea gracillima*			
1154.	2325	*Synaphea pinnata (Helena Synaphea)*			
1155.	15532	*Synaphea spinulosa subsp. spinulosa*			
1156.		*Synothele durokoppin*			
1157.		*Tabanidae sp.*			
1158.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1159.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
1160.		*Tanypodinae sp.*			
1161.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1162.		*Tasmanicosa leuckartii*			
1163.	20135	*Taxandria linearifolia*			
1164.	4251	*Templetonia drummondii*			
1165.	32441	*Tetrapterum cylindricum*			
1166.	1034	*Tetraria capillaris (Hair Sedge)*			
1167.	1036	*Tetraria octandra*			
1168.	35579	*Tetraria sp. Jarrah Forest (R. Davis 7391)*			
1169.	667	*Tetrarrhena laevis (Forest Ricegrass)*			
1170.	4535	*Tetratheca hirsuta (Black Eyed Susan)*			
1171.	48342	*Tetratheca hirsuta subsp. hirsuta*			
1172.	4537	*Tetratheca nuda*			
1173.	4544	*Tetratheca setigera*			
1174.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
1175.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
1176.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
1177.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
1178.	11053	*Thelymitra macrophylla*			
1179.	20731	*Thelymitra vulgaris*			
1180.	673	*Themeda triandra*			
1181.	5080	*Thomasia foliosa*			
1182.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
1183.	5087	*Thomasia macrocarpa (Large Fruited Thomasia)*			
1184.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
1185.	1318	*Thysanotus arbuscula*			
1186.	1320	*Thysanotus asper (Hairy Fringe Lily)*			
1187.	1328	*Thysanotus dichotomus (Branching Fringe Lily)*			
1188.	1338	*Thysanotus manglesianus (Fringed Lily)*			
1189.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
1190.	1343	*Thysanotus patersonii*			
1191.	1350	*Thysanotus scaber*			
1192.	46055	*Thysanotus sp. Coastal plain (N.H. Brittan 66/63)*			
1193.	1351	*Thysanotus sparteus*			
1194.	1354	*Thysanotus tenellus*			
1195.	1357	*Thysanotus thyrsoideus*			
1196.	1358	*Thysanotus triandrus*			
1197.	25519	*Tiliqua rugosa*			
1198.	25204	*Tiliqua rugosa subsp. aspera*			
1199.	25207	*Tiliqua rugosa subsp. rugosa*			
1200.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
1201.	24309	*Todiramphus sanctus subsp. sanctus (Sacred Kingfisher)*			
1202.	8248	*Tolpis barbata (Yellow Hawkweed)*	Y		
1203.		*Tortula recurvata*			
1204.	6266	*Trachymene coerulea (Blue Lace Flower)*			
1205.	19045	*Trachymene grandis*			
1206.	6280	*Trachymene pilosa (Native Parsnip)*			
1207.	17684	*Tremulina tremula*			
1208.	11112	*Tribolium uniolae*	Y		
1209.	1481	*Tribonanthes australis (Southern Tiurndin)*			
1210.	1482	*Tribonanthes brachypetala (Nodding Tiurndin)*			
1211.	1483	*Tribonanthes longipetala (Branching Tiurndin)*			
1212.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
1213.	8251	*Trichocline spathulata (Native Gerbera)*			
1214.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
1215.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
1216.	1362	*Tricoryne humilis*			

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1217.	43207	*Tricostularia exsul*			
1218.	4289	*Trifolium angustifolium (Narrowleaf Clover)*	Y		
1219.	17145	*Trifolium angustifolium var. angustifolium*	Y		
1220.	17542	*Trifolium arvense var. arvense*	Y		
1221.	4292	*Trifolium campestre (Hop Clover)*	Y		
1222.	4298	*Trifolium hirtum (Rose Clover)*	Y		
1223.	17788	*Trifolium pratense var. sativum*	Y		
1224.	19970	*Trifolium resupinatum var. majus*	Y		
1225.	15509	*Trifolium tomentosum var. tomentosum*	Y		
1226.	33676	*Triglochin calcitrapa*			
1227.	146	*Triglochin minutissima*			
1228.	151	*Triglochin striata*			
1229.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
1230.	1139	*Trithuria bibracteata*			
1231.	38401	*Tritonia gladiolaris (Lined Tritonia)*	Y		
1232.	13479	*Trymalium ledifolium var. rosmarinifolium*			
1233.	33418	*Trymalium odoratissimum subsp. odoratissimum*			
1234.	48147	*Turnix varius (Painted Button-quail)*			
1235.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
1236.	25764	*Tyto novaehollandiae (Masked Owl)*			
1237.	24983	*Underwoodisaurus milii (Barking Gecko)*			
1238.		*Urodacus novaehollandiae*			
1239.		*Urodacus planimanus*			
1240.		*Urodacus woodwardii*			
1241.	8255	*Ursinia anthemoides (Ursinia)*	Y		
1242.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
1243.	45896	*Ustilago bromivora*			
1244.	45902	*Ustilago nuda*			
1245.	45906	*Ustilago tepperi*			
1246.	7148	*Utricularia multifida*			
1247.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
1248.	25526	*Varanus tristis (Racehorse Monitor)*			
1249.	7665	*Velleia trinervis*			
1250.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
1251.		*Venator immansueta*			
1252.		*Venatrix arenaris*			
1253.	15431	*Verticordia acerosa var. acerosa*			
1254.	12388	*Verticordia acerosa var. preissii*			
1255.	12411	*Verticordia densiflora var. cespitosa*			
1256.	15432	*Verticordia densiflora var. densiflora*			
1257.	15433	*Verticordia huegelii var. huegelii*			
1258.	15434	*Verticordia insignis subsp. insignis*			
1259.	6107	*Verticordia pennigera*			
1260.	12449	*Verticordia plumosa var. brachyphylla*			
1261.	15618	*Verticordia plumosa var. plumosa*			
1262.	24206	*Vespadelus regulus (Southern Forest Bat)*			
1263.	4325	*Viminaria juncea (Swishbush, Koweda)*			
1264.	6575	*Vinca major (Blue Periwinkle)*	Y		
1265.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
1266.	11018	*Vulpia muralis*	Y		
1267.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
1268.	33101	*Vulpia myuros forma myuros*	Y		
1269.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
1270.	7389	*Wahlenbergia preissii*			
1271.	18375	*Watsonia knysnana*	Y		
1272.	32456	*Weissia rutilans*			
1273.	12072	*Wurmbea dioica subsp. alba*			
1274.	1401	*Wurmbea pygmaea*			
1275.	1249	*Xanthorrhoea acanthostachya*			
1276.	14544	*Xanthorrhoea brunonis subsp. brunonis*			
1277.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1278.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
1279.	6283	*Xanthosia atkinsoniana*			
1280.	6284	*Xanthosia candida*			
1281.	6285	*Xanthosia ciliata*			
1282.	6289	*Xanthosia huegelii*			
1283.	44861	*Xerochrysum macranthum*			
1284.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

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

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

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

Australian Government
Department of the Environment and Energy

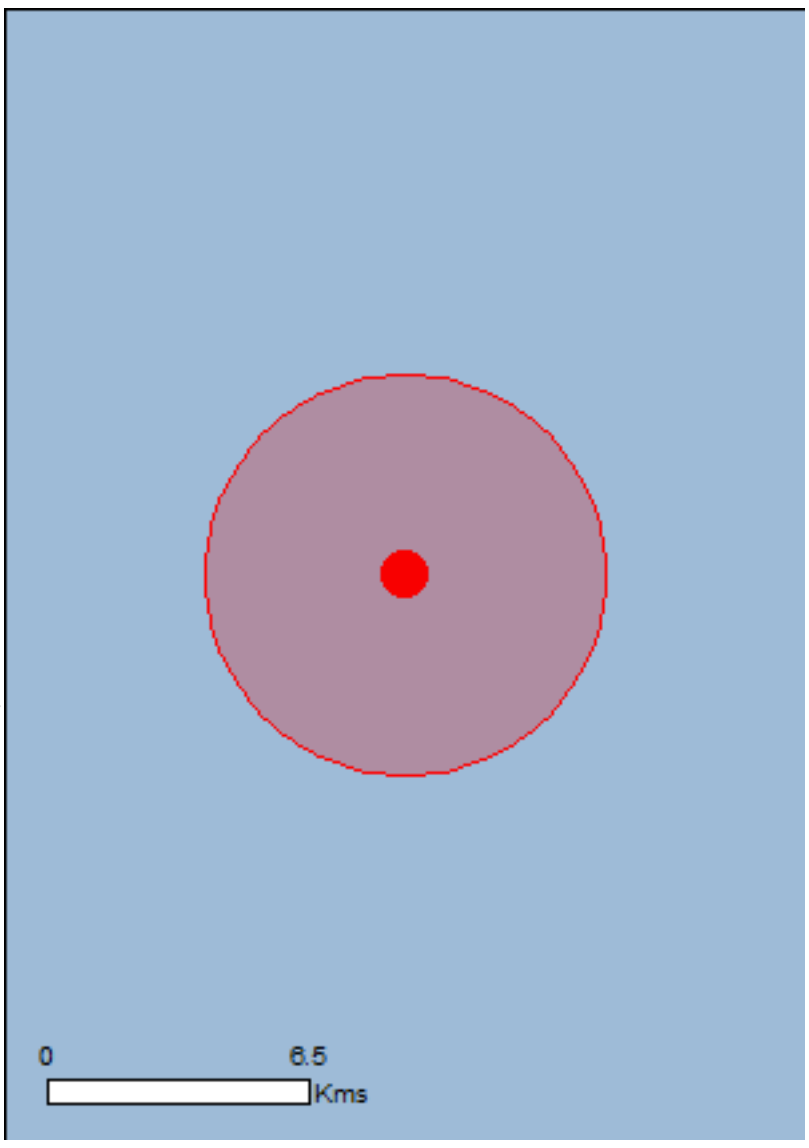
EPBC Act Protected Matters Report

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.

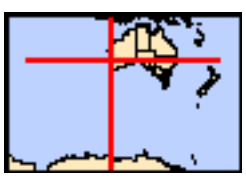
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 29/07/19 18:43:56



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:	40
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	1
Invasive Species:	40
Nationally Important Wetlands:	1
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 10km of Ramsar

Listed Threatened Ecological Communities		[Resource Information]

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

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

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may 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]	Endangered	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
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		

Name	Status	Type of Presence
Bettongia penicillata ogilbyi Woylie [66844]	Endangered	Species or species habitat likely to occur within area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
Other		
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area
Plants		
Acacia anomala Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat likely to occur within area
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
Anthocercis gracilis Slender Tailflower [11103]	Vulnerable	Species or species habitat known to occur within area
Austrostipa bronwenae [87808]	Endangered	Species or species habitat may occur within area
Banksia mimica Summer Honeypot [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 likely 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 known to occur within area
Diplolaena andrewsii [6601]	Endangered	Species or species habitat may occur within area
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat known to occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat likely to occur within area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
Goodenia arthrotricha [12448]	Endangered	Species or species habitat known to occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
Grevillea thelemanniana Spider Net Grevillea [32835]	Critically Endangered	Species or species habitat known to occur within area
Lasiopetalum pterocarpum Wing-fruited Lasiopetalum [64922]	Endangered	Species or species habitat may occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Synaphea sp. Fairbridge Farm (D. Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area
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

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely 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 may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Kenwick Wetlands	WA
Korung	WA
Lesmurdie Falls	WA

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
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

Name	Status	Type of Presence
		within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista 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
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		

Name	Status	Type of Presence
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Brixton Street Swamps	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

-32.04222 116.02972

Acknowledgements

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

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

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

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

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APPENDIX B

Flora Likelihood Table

Appendix D: Assessment of the Likely Occurrence of DRF and Priority Flora (as per DBCA and EPBC Database Searches) in the Survey Area

Closest record to Survey Area based on DBCA 2018. High Likelihood = Suitable habitat present and records less than 5 km from the Survey Area, Medium Likelihood = Suitable habitat present and records between 5 km and 10 km from the Survey Area, and Low Likelihood = No suitable habitat present and/or records greater than 10 km from the Survey Area. EN = Listed as Endangered under the EBPC ActEN = Listed as Endangered under the EBPC Act, VU = Listed as Vulnerable under the EBPC Act.

Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Synaphea sp. Serpentine	T	CR		X		X	-	Swan Coastal Plain and Pinjarrah Plain	No	Low
Synaphea sp. Fairbridge Farm	T	CR	X	X		X	Oct	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses	No	Low
Ptilotus pyramidatus	T	CR	X	X		X	-	Seasonally inundated, flat floodplain underlain by pale grey, muddy-sand to sandy-mud alluvium	No	Low
Grevillea thelemanniana	T	CR	X	X	X		May to Nov	Sand, sandy clay. Winter-wet low-lying flats.	No	Low
Calectasia cyanea	T	CR	X			X	Jun to Oct	White, grey or yellow sand, gravel.	No	Low
Austrostipa jacobsiana	T	CR	X	X		X	-	non-saline, winter-wet, white or grey sandy clay soil	No	Low
Thelymitra stellata	T	EN	X	X	X		Oct to Nov	Sand, gravel, lateritic loam	Yes	High
Thelymitra dedmaniarum	T	EN		X		X	Nov - Jan	Granite	Yes	Low
Macarthuria keigheryi	T	EN	X	X		X	Sep to Dec or Feb to Mar	White or grey sand.	No	Low
Lepidosperma rostratum	T	EN	X	X	X		-	Peaty sand, clay.	No	Low
Lasiopetalum pterocarpum	T	EN		X		X	Aug to Dec	Dark red-brown loam or clayey sand over granite. On sloping banks near creeklines	No	Low
Grevillea curviloba subsp. incurva	T	EN		X		X	Aug to Sep	Sand, sandy loam. Winter-wet heath	No	Low
Goodenia arthrotricha	T	EN	X	X	X		Oct to Nov	Gravel. Granite rocks, slopes.	Yes	High
Eremophila glabra subsp. chlorella	T	EN	X	X		X	Jul to Nov	Sandy clay. Winter-wet depressions.	No	Low
Eleocharis keigheryi	T	EN	X	X	X		Aug - Nov	Clay, sandy loam, emergent in freshwater, creeks, claypans	No	Low
Drakaea elastica	T	EN	X	X		X	Oct - Nov	White, grey sand, low-lying situations adjoining winter-wet swamps	No	Low
Diuris purdiei	T	EN	X	X		X	Sep - Oct	Grey-black sand, moist, winter-wet swamps	No	Low
Diplolaena andrewsii	T	EN		X		X	Jul to Oct	Loam, clay. Granite outcrops & hillsides.	Yes	Low
Darwinia apiculata	T	EN	X	X	X		Oct	Lateritic soils.	Yes	High
Chamelaucium sp. Gingin	T	EN		X			Sep - Nov	White and yellow sands	No	Low
Calytrix breviseta subsp. breviseta	T	EN	X	X	X		Oct to Nov	Sandy clay. Swampy flats.	No	Low
Caladenia huegelii	T	EN	X	X			Sep - Oct	Grey, brown sand, clay loam.	No	Low
Banksia mimica	T	EN		X	X		Dec or Jan to Feb	White or grey sand over laterite, sandy loam	No	Low
Austrostipa bronwenae	T	EN	X	X		X	-	non-saline but seasonally wet grey-brown sandy loam soil containing nodules of Muchea Limestone	No	Low
Andersonia gracilis	T	EN	X	X	X		Sep - Nov	White, grey sand, sandy clay, gravelly loam, winter-wet areas, near swamps.	No	Low
Tetraria australiensis	T	VU	X			X	Nov to Dec	grey sand over clay favours winter-wet, swampy depressions, drainage lines or rises surrounding swamps. Also found in open forest or Marri (Corymbia calophylla) woodland	Yes	Medium

Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Drakaea micrantha	T	VU		X		X	Sep - Oct	White-grey sand	No	Low
Diuris micrantha	T	VU		X		X	Sep - Oct	Brown loamy clay, winter-wet swamps, in shallow water	No	Low
Diuris drummondii	T	VU	X	X		X	Nov to Dec or Jan	Low-lying depressions, swamps	No	Low
Conospermum undulatum	T	VU	X	X	X		May to Oct	Grey or yellow-orange clayey sand.	No	Low
Anthocercis gracilis	T	VU	X		X		Sep to Oct	Sandy or loamy soils. Granite outcrops.	Yes	High
Acacia aphylla	T	VU	X		X		Aug to Oct	Sand, loam, clay loam. Granite outcrops, hills.	Yes	High
Acacia anomala	T	VU	X	X		X	Aug to Sep	Lateritic soils. Slopes.	Yes	Medium
Thelymitra magnifica	P1	-	X		X		-	Stony ridges.	Yes	High
Schoenus sp. Beaufort	P1	-	X			X	Annual	Mud. Winter-wet claypans.	No	Low
Ptilotus sericostachyus subsp. Roseus	P1	-	X			X	Sep to Dec	No information available	Unknown	Unknown
Hydrocotyle striata	P1	-	X			X	-	Clay. Springs.	No	Low
Eriochilus sp. Roleystone	P1	-	X			X	-	No information available	Unknown	Unknown
Calandrinia sp. Piawaning	P1	-	X			X	Oct	Brown/gey silty sandy loam over granite. Near pools, small rise within large saline valley flats, disturbed shrubland.	No	Low
Boronia humifusa	P1	-	X			X	Jun or Sep	Gravelly clay loam over laterite. Jarrah-marri open forest	Yes	Medium
Bolboschoenus fluviatilis	P1	-	X			X	-	winter-wet areas	No	Low
Acacia lasiocarpa var. *bracteolata* long peduncle varient (G.J. K	P1	-	X		X		-	Grey or black sand over clay. Swampy areas, winter wet lowlands.	No	Low
Thysanotus sp. Badgingarra	P2	-	X			X	Dec	Grey sand with lateritic gravel.	No	Low
Stenanthemum sublineare	P2	-	X			X	Oct to Dec	Littered white sand. Coastal plain.	No	Low
Schoenus loliaceus	P2	-	X			X	Aug to Nov	Sandy soils. Winter-wet depressions.	No	Low
Paracaleana sp. Laterite	P2	-	X		X		Aug to Nov	Sandy soils. Winter-wet depressions.	No	Low
Melaleuca viminalis	P2	-	X			X	-	No information available	Unknown	Unknown
Lepyrodia curvescens	P2	-	X			X	Sep to Nov	Sand, laterite. Seasonally inundated swampland.	No	Low
Johnsonia pubescens subsp. cygnorum	P2	-	X			X	Sep	Grey-white-yellow sand. Flats, seasonally-wet sites	No	Low
Comesperma griffinii	P2	-	X			X	Oct	Yellow or grey sand. Plains	No	Low
Bossiaea modesta	P2	-	X			X	Oct to Dec	Soils derived from granite. Damp areas close to stream.	No	Low
Andersonia sp. Blepharifolia	P2	-	X		X		-	No information available	Unknown	Unknown
Acacia benthamii	P2	-	X			X	Aug - Sep	Limestone breakaways	No	Low
Thysanotus anceps	P3	-	X		X		Oct to Dec	White or grey sand, lateritic gravel, laterite	Yes	High

Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Styphelia filifolia	P3	-	X			X	-	Sandy soils of the coastal plain (with one known occurrence from the northern Darling Scarp), usually in Banksia or Jarrah woodland and in low-lying situations.	No	Low
Stylidium periscelianthum	P3	-	X			X	Sep to Nov	Loamy clay, moist soils pockets. Wet flats, low granitic hills.	No	Low
Stylidium aceratum	P3	-	X			X	Oct to Nov	Sandy soils. Swamp heathland.	No	Low
Stackhousia sp. Red-blotched corolla	P3	-	X		X		-	No information available	Unknown	Unknown
Schoenus sp. Waroona (G.J. Keighery 12235)	P3	-	X			X	Oct to Nov	Clay or sandy clay. Winter-wet flats.	No	Low
Schoenus pennisetis	P3	-	X		X		Aug to Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	No	Low
Schoenus capillifolius	P3	-	X			X	Oct to Nov	Brown mud. Claypans.	No	Low
Schoenus benthamii	P3	-	X			X	Oct to Nov	White, grey sand, sandy clay. Winter-wet flats, swamps.	No	Low
Pithocarpa corymbulosa	P3	-	X		X		Jan to Apr	Gravelly or sandy loam. Amongst granite outcrops.	Yes	High
Myriophyllum echinatum	P3	-	X		X		Nov	Clay. Winter-wet flats.	No	Low
Meionectes tenuifolia	P3	-	X		X		Unknown	No information available	Unknown	Unknown
Lasiopetalum glutinosum subsp. glutinosum	P3	-	X		X		Unknown	No information available	Unknown	Unknown
Jacksonia gracillima	P3	-	X			X	-	Winter – wet Bassendean sands. Littered, grey, peaty loamy sands	No	Low
Isotropis cuneifolia subsp. Glabra	P3	-	X			X	Sep	Sand, clay loam. Winter-wet flats.	No	Low
Isopogon drummondii	P3	-	X		X		Feb to Jun	Sandy soils	No	Low
Halgania corymbosa	P3	-	X		X		Aug to Nov	Gravelly soils, soils over granite.	Yes	High
Haemodorum loratum	P3	-	X		X		Nov	Grey or yellow sand, gravel	No	Low
Eryngium sp. Subdecumbens	P3	-	X			X	-	No information available	Unknown	Unknown
Eryngium pinnatifidum subsp. Palustre	P3	-	X			X	-	No information available	Unknown	Unknown
Comesperma rhadinocarpum	P3	-	X			X	Oct to Nov	Sandy soils.	No	Low
Chamaescilla gibsonii	P3	-	X			X	Sep	Clay to sandy clay. Winter-wet flats, shallow water-filled claypans	No	Low
Carex tereticaulis	P3	-	X			X	Sep to Oct	Black peaty sand	No	Low
Byblis gigantea	P3	-	X		X		Sep to Dec or Jan	Sandy-peat swamps. Seasonally wet areas	No	Low
Beaufortia purpurea	P3	-	X		X		Oct to Dec/ Jan to Feb	Lateritic or granitic soils. Rocky slopes.	Yes	High
Banksia pteridifolia subsp. *vernalis*	P3	-	X		X		Sep to Oct	White/grey sand over laterite.	No	Low
Banksia kippistiana var. *paenepeccata*	P3	-	X		X		Oct to Nov	Lateritic gravelly soils.	Yes	High
Babingtonia urbana	P3	-	X		X		-	Associated with wetlands on the coastal plain	No	Low
Asteridea gracilis	P3	-	X		X		Sep to Dec	Sand, clay, gravelly soils.	Yes	High

Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Species	Conservation Status		Source		Distance to Record (NatureMap)		Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Likelihood of Occurrence
	DBCA	EPBC	NatureMap	EPBC	0 - 5km	5-10 km				
Allocasuarina grevilleoides	P3	-	X		X		-	Sand over laterite, gravel.	No	Low
Acacia horridula	P3	-	X		X		May to Aug	Gravelly soils over granite, sand. Rocky hillsides.	Yes	Unknown
Verticordia lindleyi subsp. lindleyi	P4	-	X		X		May or Nov to Dec or Jan	Sand, sandy clay. Winter-wet depressions	No	Low
Thysanotus glaucus	P4	-	X			X	-	Swan coastal plain, white sandy soils	No	Low
Stylidium striatum	P4	-	X		X		Oct to Nov	Brown clay loam over laterite. Hillslopes	Yes	High
Stylidium longitubum	P4	-	X			X	Oct to Dec	Sandy clay, clay. Seasonal wetlands.	No	Low
Senecio leucoglossus	P4	-	X		X		Aug to Dec	Gravelly lateritic or granitic soils. Granite outcrops, slopes.	Yes	High
Schoenus natans	P4	-	X			X	Oct	Winter-wet depressions.	No	Low
Pimelea rara	P4	-	X		X		Dec or Jan	Lateritic soils.	Yes	High
Ornduffia submersa	P4	-	X			X		wetlands	No	Low
Lasiopetalum bracteatum	P4	-	X		X		Aug to Nov	Sandy clay, clay, lateritic gravel. Along drainage lines, creeks, gullies, granite outcrops.	No	Low
Hydrocotyle lemnoides	P4	-	X			X	Aug to Oct	Swamps	No	Low
Hibbertia montana	P4	-	X			X	-	Loam over granite, lateritic soils, gravel. Granite rocks, lateritic ridges & boulders, hills.	Yes	High
Grevillea pimeleoides	P4	-	X			X	May to Nov	Gravelly soils over granite. Rocky hillsides.	Yes	Medium
Drosera occidentalis	P4	-	X		X		Oct to Dec or Jan.	wetlands	No	Low
Cyanicula ixioides subsp. ixioides	P4	-	X		X		Aug to Oct	Laterite, gravel.	Yes	High
Calothamnus graniticus subsp. leptophyllus	P4	-	X		X		Jun to Aug	Clay over granite, lateritic soils. Hillsides.	Yes	High
Calothamnus accedens	P4	-	X		X		-	Sandy soils over laterite. Road verge.	No	Low
Boronia tenuis	P4	-	X		X		Aug to Nov	Laterite, stony soils, granite.	Yes	High
Aponogeton hexatepalus	P4	-	X			X	Jul to Oct	Mud. Freshwater: ponds, rivers, claypans.	No	Low
Acacia oncinophylla subsp. patulifolia	P4	-	X		X		Aug to Nov or Nov to Dec	Granitic soils, occasionally on laterite.	Yes	High

APPENDIX C

Flora Inventory

Family	Species
Asparagaceae	**Asparagus asparagoides*
	Thysanotus sp.
	**Hypochaeris glabra*
	**Sonchus oleraceus*
Boraginaceae	*Echium plantagineum**
Cactaceae	*Opuntia stricta**
Cyperaceae	*Lepidosperma tenue*
Dilleniaceae	*Hibbertia hypericoides*
	Hibbertia subvaginata
Fabaceae	*Acacia saligna*
	Hovea pungens
Iridaceae	**Gladiolus caryocephalus*
	**Romulea rosea*
	**Watsonia ?meriana*
Lauraceae	*Cassytha racemosa*
Malvaceae	*Lasiopetalum ?floribundum*
Myrtaceae	*Baekea camphorosmae*
	Callistemon phoeniceus
	Calothamnus rupestris
	Calytrix ?glutinosa
	Corymbia calophylla
	Darwinia citriodora
	Eucalyptus camaldulensis (planted)
	Melaleuca radula

Family	Species
Oxalidaceae	**Oxalis* sp.
	**Oxalis glabra*
Papaveraceae	**Fumaria capreolata*
Poaceae	*Austrostipa elegentissima*
	Poaceae sp.
	Poaceae sp. 2
Proteaceae	*Banksia armata* var *armata*
	Banksia sessilis
	Grevillea bipinnatifida
	Hakea erinacea
	Hakea undulata
Pteridaceae	*Cheilanthes austrotenuifolia*
Restionaceae	*Desmocladus flexuosus*
Xanthorrhoeaceae	*Xanthorrhoea preissii*
Zamiaceae	*Macrozamia riedlei*

APPENDIX D

Flora Site Sheets

FLORA SITE SHEET - ORANGE GROVE

Project Name Orange Grove
Site: OG1 **MGA** 50H 407947 **mE** 6454586 **mN**

Described by: Shenaye Hummerston
Date: Thursday, August 29, 2019
Type: Releve 10 x 10
Soil Colour: Brown
Soil Type: Clay
Habitat: Upper slope
Vegetation:

Cr: Closed shrubland of *Calothamnus rupestris* over an open grassland of Poaceae sp

Veg Condition: Good
Fire Age: >10 years **Fire Evidence:** -
Notes
Rock Type Granite **Rock Cover:** 1-5 % **Outcropping:** 20-50 % **Logs:** 10 %
Total PFC: 95 % **Bareground:** 2 % **Leaf Litter:** 30 %
Disturbance Type: -

SPECIES LIST

Name	Cover	Height	Notes
**Asparagus asparagoides*	3	0	
Baekea camphorosmae	0.2	3	
Calothamnus rupestris	90	0.2	
**Gladiolus caryocephalus*	0.01	90	
Lepidosperma tenue	0.01	0.01	
Poaceae sp.	20	20	
Thysanotus sp.	0.001	0.001	

FLORA SITE SHEET - ORANGE GROVE

Project Name Orange Grove
Site: OG2 **MGA** 50H 407952 **mE** 6454602 **mN**

Described by: Shenaye Hummerston
Date: Thursday, August 29, 2019
Type: Releve 10 x 10
Soil Colour: Black,Brown
Soil Type: Clay
Habitat: Upper slope
Vegetation:

Open Woodland of *Corymbia calophylla* over shrubland of *Banksia sessilis*

Veg Condition: Very Good
Fire Age: > 15 years **Fire Evidence:** -
Notes
Rock Type Granite **Rock Cover:** 1-5 % **Outcropping:** 20-50 %
Total PFC: 85 % **Bareground:** 5 % **Leaf Litter:** 95 % **Logs:** 0 %
Disturbance Type: -

SPECIES LIST

Name	Cover	Height	Notes
Austrostipa elegentissima	2	10	
Banksia sessilis	75	200	
Calothamnus rupestris	10	300	
Corymbia calophylla	75	10	
Poaceae sp.	5	3	
**Watsonia ?meriana*	4	20	

FLORA SITE SHEET - ORANGE GROVE

Project Name	Orange Grove				
Site:	OG03	**MGA**	50H	407969 **mE**	6454567 **mN**

Described by: Shenaye Hummerston
Date: Thursday, August 29, 2019
Type: Releve 10 x 10
Soil Colour: Brown
Soil Type: Clay
Habitat: Upper slope
Vegetation:

Cr: Closed shrubland of *Calothamnus rupestris* over an open grassland of Poaceae sp

Veg Condition: Degraded
Fire Age: Unknown **Fire Evidence:** -
Notes

Rock Type	Granite	**Rock Cover:**	1-5 %	**Outcropping:**	20-50 %		
Total PFC:	70 %	**Bareground:**	20 %	**Leaf Litter:**	10 %	**Logs:**	0 %

Disturbance Type: -

SPECIES LIST

Name	Cover	Height	Notes
Calothamnus rupestris	40	150	
Calytrix ?glutinosa	30	100	
Hakea erinacea	20	160	
Poaceae sp.	10	5	
**Romulea rosea*	0.01	10	

FLORA SITE SHEET - ORANGE GROVE

Project Name Orange Grove
Site: OG4 **MGA** 50H 407983 **mE** 6454513 **mN**

Described by: Shenaye Hummerston
Date: Thursday, August 29, 2019
Type: Releve 10 x 10
Soil Colour: Brown
Soil Type: Clay
Habitat: Upper slope
Vegetation:

Cr: Closed shrubland of *Calothamnus rupestris* over an open grassland of Poaceae sp

Veg Condition: Degraded
Fire Age: Unknown **Fire Evidence:** -
Notes
Rock Type Granite **Rock Cover:** <1 % **Outcropping:** 2-10 %
Total PFC: 95 % **Bareground:** 5 % **Leaf Litter:** 60 % **Logs:** 0 %
Disturbance Type: -

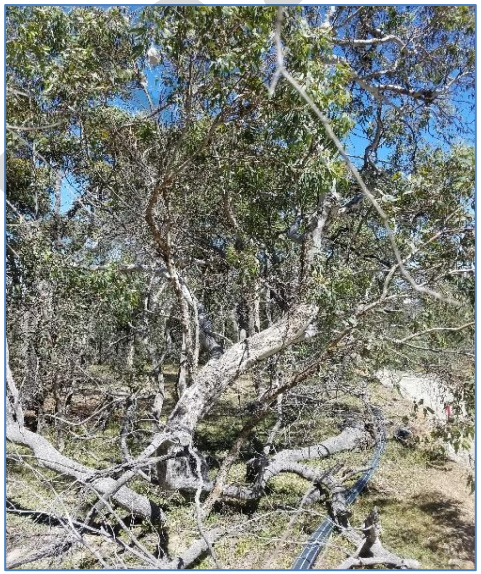
SPECIES LIST

Name	Cover	Height	Notes
**Asparagus asparagoides*	1	c	
Austrostipa elegantissima	0.5	100	
Calothamnus rupestris	80	120	
**Eucalyptus camaldulensis*	40	600	
Hakea undulata	2	150	
Melaleuca radula	5	120	
Poacea sp.	30	10	
**Sonchus oleraceus*	0.001	4	
**Watsonia ?meriana*	25	60	

APPENDIX E

Black Cockatoo Potential Breeding Trees

Latitude	Longitude	Taxa	Circumference (m)	DBH (mm)	Approx Height (m)	Hollows	> 12 cm Diameter	Hollows with Bees	Comments	Tree Photo ID
-32.0421772999999	116.0261485999990	Wandoo (*Eucalyptus wandoo*)	1.25	397.88	10.00	no	-	-		1
-32.0422950856000	116.0265623779990	Wandoo (*Eucalyptus wandoo*)	2.55	811.69	20.00	no	-	-		2
-32.0421231449999	116.0265496370000	Wandoo (*Eucalyptus wandoo*)	1.43	455.18	18.00	no	-	-		3
-32.0419768000000	116.0264159000000	Wandoo (*Eucalyptus wandoo*)	0.95	302.39	12.00	no	-	-		4
-32.0419437999999	116.0264118000000	Wandoo (*Eucalyptus wandoo*)	2.05	652.53	18.00	yes	2	0	Tree likely to be outside of impact area	5

		
Tree Photo ID: 1	Tree Photo ID: 2	Tree Photo ID: 3
		
Tree Photo ID: 4	Tree Photo ID: 5	Tree Photo ID: 6

DRAFT

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