
**REVIEW OF FLORA, VEGETATION AND FAUNA VALUES
ON THE
PROPOSED EXPANSION AREA, WALYUNGA ROAD**

Prepared for

Brikmakers

Prepared by

Mattiske Consulting Pty Ltd

April 2015

BGC1601/08/16



Mattiske Consulting Pty Ltd

Disclaimer and Limitation

This report has been prepared on behalf of and for the exclusive use of Brikmakers in accordance with the agreement between Brikmakers and Mattiske Consulting Pty Ltd. Mattiske Consulting Pty Ltd accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this report by any third party.

Copying of this report or parts of this report is not permitted without the authorisation of Brikmakers or Mattiske Consulting Pty Ltd.

DOCUMENT HISTORY

Report	Version	Prepared By	Reviewed By	Submitted to Client	
				Date	Copies
Draft Report released for Client Review	V2	EMM	EMM	04/04/16	Email and Hard Copy
Final Report	V3	-	EMM	18//04/16	Email and Hard Copy

TABLE OF CONTENTS

	Page
1. INTRODUCTION	1
2. OBJECTIVES.....	1
3. CONTEXT	3
3.1 Clearing of Native Vegetation.....	3
3.2 Western Australia's Flora – A Legislative Perspective	4
3.3 Threatened and Priority Flora.....	4
3.4 Threatened and Priority Ecological Communities	5
3.5 Western Australia's Fauna – A Legislative Perspective	5
3.6 Threatened, Priority and Specially Protected Fauna	6
3.7 Significant Fauna Habitats	7
3.8 Regional Vegetation	7
4. METHODS	8
4.1 Desktop Assessment	8
4.2 Field Assessment	8
5. DESKTOP ASSESSMENT RESULTS	9
5.1 Potential Flora and Threatened and Priority Flora.....	9
5.2 Potential Threatened and Priority Ecological Communities	9
5.3 Potential Fauna and Threatened and Priority Fauna	10
6. FIELD SURVEY RESULTS	11
6.1 Flora and Vegetation.....	11
6.2 Threatened and Priority Flora.....	16
6.3 Threatened and Priority Ecological Communities.....	16
6.4 Threatened and Priority Fauna.....	16
7. REVIEW OF TEN CLEARING PRINCIPLES.....	17
8. CONCLUSIONS	19
9. REFERENCES.....	20

TABLES

- 1: Descriptions of tree condition categories
- 2: Total number of fauna species, number of introduced fauna species and number of fauna species with a conservation status
- 3: Assessment of proposal against 10 Clearing Principles

FIGURES

- 1: Walyunga Road Bullsbrook – Location of Survey Area
- 2: Walyunga Road Bullsbrook – Survey Area 2016
- 3: Walyunga Road Bullsbrook – Survey Area 1965
- 4: Walyunga Road Bullsbrook - Vegetation

1. INTRODUCTION

Mattiske Consulting Pty Ltd was commissioned in March 2016 by Brikmakers to undertake a flora, vegetation and fauna assessment of a proposed expansion area north of Walyunga Road near the current Brikmakers clay extraction operational areas. The proposed expansion area for the stockpile material occurs on approximately 10ha of previously cleared and grazed paddocks to the east of current clay extraction pits, see Figure 1. Of this 10ha, only 1.46ha supports trees or saplings and the remainder supports pasture with no shrubs or trees.

The property has historically been associated with heavy grazing. The proposed clearing area is located on Walyunga Road, Bullsbrook, which is bordered to the east by the Walyunga National Park and Walyunga Road Bushland (Bush forever site 412) to the south.

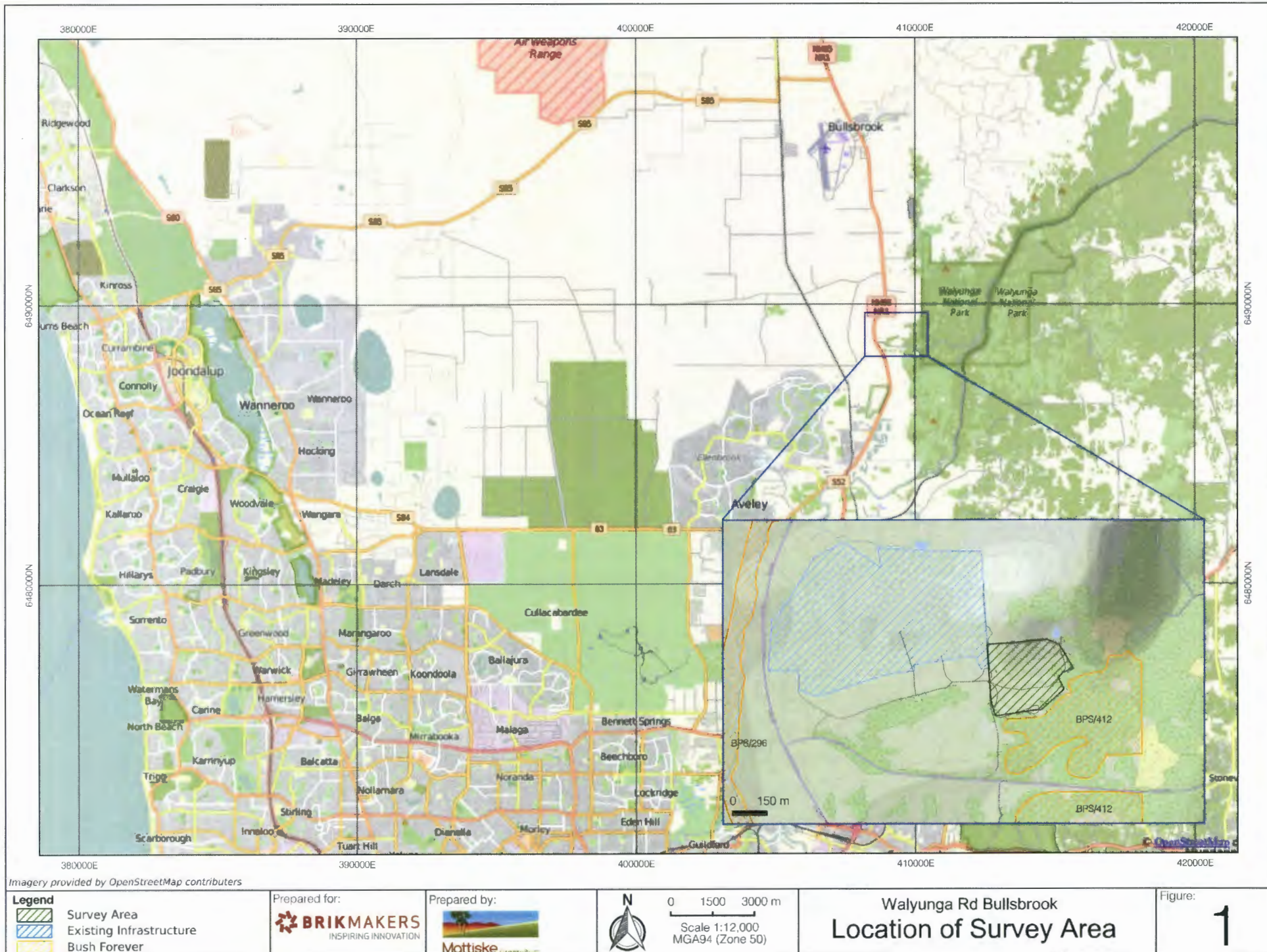
- Bullsbrook Foothills/Pinjarra plain.
- Swan Coastal Plain
- Swan Coastal Plain 2 sub-region

2. OBJECTIVES

The objective of this current assessment was to review the potential flora, vegetation and fauna values and to record the values on the survey area in relation to the proposed clearing activities for the expanded stockpiles associated with the Brikmakers clay extraction operations.

Specifically, the objectives included:

- Review potential flora, vegetation and fauna values that may potentially exist in the local area through current databases and the literature;
- Review the conservation status of any recorded flora, vegetation and fauna values by reference to current literature and current listings by the Department of Parks and Wildlife (2014b) and the Department of the Environment (2014a) under the *Environment Protection and Biodiversity Conservation Act 1999*;
- Review the potential and recorded values against the Ten Clearing Principles *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*; and
- Prepare a report summarising the findings.



3. CONTEXT

3.1 Clearing of Native Vegetation

Under the *Environmental Protection Act 1986*, the clearing of native vegetation requires a permit to do so, from the Department of Environment Regulation or the Department of Mines and Petroleum, unless that clearing is exempted under specific provisions listed in Schedule 6 of the Act, or are prescribed in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Under the *Environmental Protection Act (1986)*, "native vegetation" means indigenous aquatic or terrestrial vegetation, and includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation. Under the *Environmental Protection Act 1986*, Section 51A, "clearing" means the killing or destruction of, the removal of, the severing or ringbarking of trunks or stems of, or the doing of any other substantial damage to, some or all of the native vegetation in an area, and includes the draining or flooding of land, the burning of vegetation, the grazing of stock, or any other act or activity, that causes any of the aforementioned consequences or results.

Under the *Environmental Protection Act 1986*, ten principles for clearing native vegetation are set out in Schedule 5, under which native vegetation should not be cleared. These principles state that native vegetation should not be cleared, if:

- a. it comprises a high level of biological diversity;
- b. it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;
- c. it includes, or is necessary for the continued existence of, threatened flora;
- d. it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community;
- e. it is significant as a remnant of native vegetation in an area that has been extensively cleared;
- f. it is growing in, or in association with, an environment associated with a watercourse or wetland;
- g. the clearing of the vegetation is likely to cause appreciable land degradation;
- h. the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area;
- i. the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water; or
- j. the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

The *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, under Regulation 5, sets out prescribed clearing actions that do not require a clearing permit, as defined in Section 51C of the *Environmental Protection Act 1986*. However, exemptions under these Regulations do not apply in Environmentally Sensitive Areas (ESA's).

Under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, under Regulation 6 –"environmentally sensitive areas" include "the area covered by vegetation within 50 m of threatened flora, to the extent to which the vegetation is continuous with the vegetation in which the threatened flora is located". Similarly, "the area covered by a threatened ecological community" is listed as an environmentally sensitive area under Regulation 6.

3.2 Western Australia's Flora – A Legislative Perspective

Western Australia has a unique and diverse flora, and is recognised as one of the world's 25 biodiversity hotspots (Myers *et al.* 2000). In this context, Western Australia possesses a high degree of species richness and endemism. This is particularly pronounced in the south-west region of the state. There are currently over 12,000 plant species known to occur within Western Australia (Department of Parks and Wildlife 2016b), and scientific knowledge of many of these species is limited.

The legislative protection of flora within Western Australia is principally governed by three Acts. These are:

- The *Wildlife Conservation Act 1950*;
- The *Environmental Protection Act 1986*; and
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

The unique flora of Western Australia is potentially under threat due to historical clearing practices associated with agricultural, mining and human habitation activities. As a consequence of these historical clearing practices, a number of flora species have become threatened or have the potential to become threatened as their habitat is impacted by human activity. In addition, some areas of the State have been affected by past clearing practices such that entire ecological communities are under threat. The following sections describe these threatened and priority flora and ecological communities, and outline the legislative protection afforded to them.

At the State level, the *Wildlife Conservation Act 1950* provides for taxa of native flora (and fauna) to be specially protected because they are subject to identifiable threats. Protection of these taxa has been identified as being warranted because they may become extinct, are threatened, or are otherwise in need of special protection. Ecological communities that are deemed to be threatened are afforded protection under the *Environmental Protection Act 1986*. Listings of threatened species and communities are reviewed annually by the Western Australian Threatened Species Scientific Committee (TSSC), which is a body appointed by the Minister for the Environment and supported by the Department of Parks and Wildlife. The TSSC reviews threatened and specially protected flora (and fauna) listings on an annual basis. Recommendation for additions or deletions to the listings of specially protected flora (and fauna) is made to the Minister for the Environment by the TSSC, via the Director General of the Department of Parks and Wildlife, and the WA Conservation Commission. Under Schedule 1 of the *Wildlife Conservation Act 1950*, the Minister for the Environment may declare a class or description of flora to be threatened flora throughout the State, by notice published in the *Government Gazette* (Department of Parks and Wildlife 2016b).

At the Commonwealth level, under the *Environment Protection and Biodiversity Conservation Act 1999*, a nomination process exists, to list a threatened species or ecological community. Additions or deletions to the lists of Threatened species and communities are made by the Minister for the Environment, on advice from the Federal Threatened Species Scientific Committee. *Environment Protection and Biodiversity Conservation Act 1999* lists of Threatened flora and ecological communities are published on the Department of the Environment website (2016a, 2016b).

3.3 Threatened and Priority Flora

Flora within Western Australia that is considered to be under threat may be classed as either threatened flora or priority flora. Where flora has been gazetted as threatened flora under the *Wildlife Conservation Act 1950*, it is an offence "to take" such flora without the written consent of the Minister. The *Wildlife Conservation Act 1950* states that "to take" flora includes to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means.

Priority flora constitute species which are considered to be under threat, but for which there is insufficient information available concerning their distribution and/or populations to make a proper evaluation of their conservation status (Department of Parks and Wildlife 2016d). Such species are considered to potentially be under threat, but do not have legislative protection afforded under the *Wildlife Conservation Act 1950*.

The Department of Parks and Wildlife categorises priority flora according to their conservation priority, using five categories, P1 to P5, to denote the conservation priority status of such species, with P1 listed species being the most threatened, and P5 the least. Priority flora species are regularly reviewed, and may have their priority status changed when more information on the species becomes available.

At the Commonwealth level, under the *Environment Protection and Biodiversity Conservation Act 1999*, threatened species can be listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable, or conservation dependent, by the Commonwealth Minister for the Environment (Department of the Environment 2016a).

3.4 Threatened and Priority Ecological Communities

An ecological community is defined as a naturally occurring biological assemblage that occurs in a particular type of habitat composed of specific abiotic and biotic factors. At the State level, ecological communities may be considered as threatened once they have been identified as such by the Western Australian Threatened Ecological Communities Scientific Advisory Committee. A threatened ecological community is defined, under the *Environmental Protection Act 1986*, as an ecological community listed, designated or declared under a written law or a law of the Commonwealth as threatened, endangered or vulnerable. There are four State categories of threatened ecological communities, or TECs: presumed totally destroyed (PD); critically endangered (CR); endangered (EN); and vulnerable (VU) (Department of Parks and Wildlife 2016d). Threatened ecological communities are gazetted as such (Department of Parks and Wildlife 2016e).

At the Commonwealth level, some Western Australian TECs are listed as threatened, under the *Environment Protection and Biodiversity Conservation Act 1999*. Under the *Environment Protection and Biodiversity Conservation Act 1999*, a person must not take an action that has or will have a significant impact on a listed threatened ecological community without approval from the Commonwealth Minister for the Environment, unless those actions are not prohibited under the Act. The current *Environment Protection and Biodiversity Conservation Act 1999* list of threatened ecological communities can be located on the Department of the Environment (2016b) website.

Ecological communities identified as threatened, but not listed as threatened ecological communities, can be classified as priority ecological communities (PECs). These communities are under threat, but there is insufficient information available concerning their distribution to make a proper evaluation of their conservation status. The Department of Parks and Wildlife categorises priority ecological communities according to their conservation priority, using five categories, P1 to P5, to denote the conservation priority status of such ecological communities, with P1 communities being the most threatened and P5 the least.

3.5 Western Australia's Fauna – A Legislative Perspective

Australia's faunal biota is recognized as one of the most diverse in the world (Common and Norton 1992). Although vertebrate fauna are generally considered the most well-known faunal group, their taxonomy is constantly evolving (Clayton *et al.* 2006). New species continue to be described and species and genus level revisions continue to add to our understanding of vertebrate diversity in Australia, especially that of reptiles and mammals (Clayton *et al.* 2006). In contrast many invertebrates remain unnamed to the genera and species levels (see Appendix B).

The legislative protection of fauna within Western Australia is principally governed by three Acts. These are:

- The *Wildlife Conservation Act 1950*;
- The *Environmental Protection Act 1986*; and
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

There are also a number of International policies and agreements that are a part of the framework for the protection of biodiversity within Western Australia. These are:

- The *Convention on Wetlands of International Importance 1971* (RAMSAR Convention; Department of the Environment 2016d);
- The *Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment 1974* (Japan-Australia Migratory Bird Agreement – JAMBA);
- The *Convention on the Conservation of Migratory Species of Wild Animals 1979* (Bonn, Germany);
- The *Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment 1986* (China-Australia Migratory Bird Agreement – CAMBA); and
- The *Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds 2007* (Republic of Korea-Australia Migratory Bird Agreement – ROKAMBA).

The unique fauna of Western Australia is potentially under threat due to historical practices associated with European settlement. Activities including mining, agriculture, and establishment of human settlements, excessive exploitation and the introduction of feral animals have impacted Western Australia's fauna. As a consequence of these practices, a number of fauna species have become extinct or have the potential to become extinct as their habitat is impacted by human activity. The following section describes these threatened and priority fauna and outline the legislative protection afforded to them.

3.6 Threatened, Priority and Specially Protected Fauna

Fauna within Western Australia which is considered to be under threat may be classed as threatened fauna, specially protected fauna or priority fauna (Department of Parks and Wildlife 2016c). The Schedule of Threatened Fauna is reviewed at least every three years by the Threatened Fauna Scientific Advisory Committee established under Policy Statement No 33. Individual taxa may be added or deleted at any time if warranted, e.g. if a threatened species not previously known for the State is discovered. Animals (including fish and invertebrates) that are protected fauna under the *Wildlife Conservation Act 1950* may be declared as threatened fauna by the Minister. Threatened fauna species can be listed as extinct, extinct in the wild, critically endangered, endangered or vulnerable by the Minister for the Environment, after being published in the Government Gazette. Taxa may also be declared by the Minister if they have been declared to be threatened by other Australian States or Territories or are classified as threatened in a treaty to which Australia is a party, e.g. JAMBA. Section 14(2) (ba) of the *Wildlife Conservation Act 1950* states "the Minister may, from time to time by notice published in the Government Gazette, declare that any fauna specified in the notice is for the purposes of this Act fauna which is likely to become extinct, or is rare, or otherwise in need of special protection and while such declaration is in operation –

- i) such fauna is wholly protected throughout the whole of the State at all times; and
- ii) a person who commits an offence under section 16 or 16A with respect to or in relation to such fauna is liable, notwithstanding any other provision of this Act, to a penalty of \$10,000".

The Schedule of Specially Protected Fauna is dealt with in the same way as the Schedule of Threatened Fauna by the Minister for the Environment under section 14(2) (ba) of the *Wildlife Conservation Act 1950*. Specially Protected fauna species can be listed as Schedule 1 to 4 by the Minister after being published in the Government Gazette.

The *Wildlife Conservation Act 1950* prohibits the taking of threatened fauna by any person on any land throughout the State without the authority of a license issued by the Executive Director. The illegal destruction of protected fauna is covered in section 6(1) of the *Wildlife Conservation Act 1950*, where the following definition is given:

To take, in relation to any fauna, includes "to kill or capture any fauna by any means or to disturb or molest any fauna by any means or to use any method whatsoever to hunt or kill any fauna whether this results in killing or capturing any fauna or not; and also includes every attempt to take fauna and every act of assistance to another person to take fauna and derivatives and inflections have corresponding meaning".

The destruction or modification of habitat by clearing or other means may result in the demise of sedentary animal species, or the displacement and eventual death of more mobile species, but this is not covered specifically in the definition of "to take". Although it can be argued that to clear habitat would "disturb" the animals and is an indirect and unsatisfactory method of habitat protection.

Priority fauna constitute species which are considered to be under threat, but for which there is insufficient information available concerning their distribution and/or populations to make a proper evaluation of their conservation status. Such species are considered to potentially be under threat, but do not have the legislative protection afforded under the *Wildlife Conservation Act 1950*. The Department of Parks and Wildlife categorizes priority fauna according to their conservation priority, using five categories, P1 to P5, to denote the conservation priority status of such species, with P1 listed species being the most threatened, and P5 the least. Priority fauna species are regularly reviewed, and may have their priority status changed when more information on the species becomes available. The current list of Declared Threatened, Specially Protected and Priority fauna species by region can be found on the Department of Parks and Wildlife website (Department of Parks and Wildlife 2016b).

At the Commonwealth level, under the Environment Protection and Biodiversity Conservation Act 1999, threatened species can be listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable, or conservation dependent, by the Federal Minister, after being published in the Commonwealth Government Gazette. Under the Environment Protection and Biodiversity Conservation Act 1999, a person must not take an action that has or will have a significant impact on a listed threatened species without approval from the Commonwealth Minister for the Environment, unless those actions are not prohibited under the Act. The current Environment Protection and Biodiversity Conservation Act 1999 list of threatened fauna may be found on the Australian Department of the Environment website (Department of the Environment 2016c).

3.7 Significant Fauna Habitats

A small number of Threatened Ecological Communities (TECs) have been defined Australia-wide under Commonwealth legislation. However, while not defined under any legislation, some fauna habitats within a proposed development site may be locally significant because they:

- support rare or vulnerable species;
- support specialised or habitat specific fauna;
- are regionally or locally uncommon; or
- are restricted in area.

Although not protected under State or Commonwealth legislation, in the interests of good project management, where possible, conservation of such locations within a project area will provide the basis for the fauna component of an environmental management plan to be put in place for the duration of a project.

3.8 Regional Vegetation

The proposed Brikmakers expansion area occurs primarily on the Guildford vegetation complex which was defined by described by Heddle *et al.* (1980) and Mattiske and Havel (1998) as a mixture of a woodland *Corymbia calophylla*, *Eucalyptus wandoo*, *Eucalyptus marginata* a woodland of *Eucalyptus wandoo* (with rare occurrences of *Eucalyptus lane-poolei*); with minor components consist of woodlands of *Eucalyptus rudis* and *Melaleuca raphiophylla*. Note the *Eucalyptus lane-poolei* is restricted to the Guildford vegetation complex near Serpentine (well south of the proposed development). The Guildford vegetation complex reflects the vegetation and plant communities that occurred on the Guildford component of the Pinjarra Plains as defined by Churchward and McArthur (1980).

According to May & McKenzie (2002), the vegetation at the project area has been mapped by Beard as vegetation association 3 and 4, which is described as: a medium forest of jarrah-marri and a medium woodland of marri and wandoo.

4. METHODS

4.1 Desktop Assessment

A desktop assessment was conducted using the Department of Parks and Wildlife and Department of the Environment databases to identify the possible occurrence of threatened and priority flora and fauna, and threatened and priority ecological communities within the proposed survey area. A five km search radius about the approximate centre point of the BGC survey area (mE, 6489043 mN 41074) was used as a search reference point. All plant taxa names were verified using Florabase (Department of Parks and Wildlife 2016g).

4.2 Field Assessment

The flora, vegetation and fauna values on the survey area were assessed by Dr Libby Mattiske on 22nd March 2016. No quadrats were established as the vegetation was very disturbed. The flora, vegetation and fauna values were recorded by foot traverses through the survey area to enable coverage of the values. Individual larger trees were inspected for potential hollows and foraging activities associated with fauna activity. The following information was recorded for the tree condition:

- Species;
- Diameter at breast height (DBH) of each tree was assigned categories;
- Condition of each tree was assigned to the categories healthy (H), slightly stressed (SS), stressed (S), very stressed (VS), recent death (DR), moderate death (DM) or old death (DO) (Table 1).

Table 1: Descriptions of tree condition categories

Condition	Code	Classification Contributing Factors
Healthy	H	Canopy essentially intact; No epicormic growth; No-to-little evidence of leaf discolouration; and No-to-little evidence of insect damage.
Slightly Stressed	SS	Some minor canopy loss; Minor epicormic growth; None-to-minor evidence of leaf discolouration, potentially some dead leaves at branch tips; and None-to-minor evidence of insect damage.
Stressed	S	Moderate canopy loss; Some epicormic growth; Evidence of leaf discolouration, evident damage to leaves significant; and Evidence of insect damage obvious.
Very Stressed	VS	Major canopy loss; Epicormic growth present; Leaf discolouration significant, evident damage to leaves significant; and Evidence of insect damage obvious.
Recent Death	DR	Tree dead, but foliage still present.
Moderate Death	DM	Tree dead, foliage absent, bark and fine twigs still present.
Old Death	DO	Tree dead, foliage and fine twigs absent, bark partially-to-completely lost.

5. DESKTOP ASSESSMENT RESULTS

5.1 Potential Flora and Threatened and Priority Flora

A total of 770 flora species from xx families and xx genera have been recorded within a 5km radius of the Brikmakers survey area (Appendix A). This total reflects the proximity of the Walyunga National Park to the east and the Bush Forever site to the south-east of the Brikmakers survey area. The majority of the taxa recorded were representative of the Fabaceae (100 taxa), Proteaceae (63 taxa), Myrtaceae (60 taxa), Asteraceae (49 taxa), Poaceae (45 taxa) and Cyperaceae (35 taxa). Eighty- seven flora species of the 770 potential flora species are introduced/weed flora species.

A total of six Threatened Flora species pursuant to Schedule 1 of the *Wildlife Conservation Act 1950* and as listed by the Department of Parks and Wildlife (2016b) had the potential to occur within the Brikmakers survey area (Appendix A). A total of 5 Endangered Flora species and 1 Vulnerable flora species as listed under *Environment Protection Biodiversity Conservation Act 1999* (Department of the Environment 2015a) had the potential to occur within the Brikmakers survey area (Appendix A).

A total of 21 Priority Flora species as listed by the Department of Parks and Wildlife (2016b) had the potential to be recorded within the Brikmakers survey area (Appendix A). Three Priority 1, three Priority 2, nine Priority 3 and six Priority 4 Flora species were recorded within Brikmakers survey area (Appendix A).

5.2 Potential Threatened and Priority Ecological Communities

Two Threatened Ecological Communities were potentially identified as occurring within 5 km of the proposed Brikmakers expansion area and surrounds (5km radius). The Threatened Ecological Community (Herb rich shrublands in clay pans occurs in the swamp areas approximately 3.5 km west north-west) of the Brikmakers survey area. This threatened ecological community is critically endangered pursuant to the *EPBC Act* and as listed by the Department of the Environment (2016c). The other Threatened Ecological Community (*Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrubland of the Swan Coastal Plain) occurs on the eastern fluvial soils of the Pinjarra Plain including the Guildford system as defined by Churchward and McArthur (1980). This latter community is listed as endangered according to the *EPBC Act* and as listed by the Department of the Environment (2016c). Brief descriptions of both Threatened Ecological Communities are outlined below:

Herb rich shrublands in clay pans (Critically Endangered)

This vegetation community (community type 8) occurs in low lying flats with a clay impeding layer, which allows for seasonal inundation. The vegetation community predominately consists of one or more of the shrubs: *Viminaria juncea*, *Melaleuca viminea*, *Melaleuca lateritia*, *Kunzea micrantha* or *Kunzea recurva* with occasional emergents of *Eucalyptus wandoo* (Wandoo). Species such as *Hypocalymma angustifolium*, *Acacia lasiocarpa* var. *bracteolata* long peduncle variant (G. J. Keighery 5026) and *Verticordia huegelii* occur at moderate frequencies. This vegetation community has a high percentage of weeds and appears to be the clay pan vegetation community type that has the greatest disturbance (Department of the Environment 2016c).

Corymbia calophylla - *Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain (Endangered)

This vegetation community (community type 3c) located on heavy soils of the eastern side of the Swan Coastal Plain between Bullsbrook, and Waterloo near Bunbury. Dominant species in the community are the trees *Corymbia calophylla* and occasionally *Eucalyptus wandoo*; the shrubs *Xanthorrhoea preissii*, *Acacia pulchella*, *Dryandra nivea*, *Gompholobium marginatum*, and *Hypocalymma angustifolium* and the herbs *Burchardia umbellata*, *Cyathochaeta avenacea* and *Neurachne alopecuroides* (Gibson *et al.* 1994). The introduced species *Briza maxima* and *Romulea rosea* are also common (Gibson *et al.* 1994).

Four Priority Ecological Communities were potentially identified as occurring within 5 km of the proposed expansion area and surrounds (5km radius). These are outlined below, according to Department of Parks and Wildlife (2016f):

Banksia *ilicifolia* woodlands, southern Swan Coastal Plain (P3)

This Priority Ecological Community (community type 22) has low lying sites generally consisting of *Banksia ilicifolia* – *Banksia attenuata* woodlands, but *Melaleuca preissiana* woodlands and scrubs are also recorded. Occurs on Bassendean and Spearwood systems in the central Swan Coastal Plain north of Rockingham. Typically has very open understorey, and sites are likely to be seasonally waterlogged.

Low lying Banksia *attenuata* woodlands or shrublands (P3)

This Priority Ecological Community (community type 21c) occurs sporadically between Gingin and Bunbury, and is largely restricted to the Bassendean system. The type tends to occupy lower lying wetter sites and is variously dominated by *Melaleuca preissiana*, *Banksia attenuata*, *Banksia menziesii*, *Regelia ciliata*, *Eucalyptus marginata* or *Corymbia calophylla*. Structurally, this community type may be either a woodland or occasionally shrubland.

Northern Spearwood shrublands and woodlands (P3)

This Priority Ecological Community (community type 24) consists of heathlands that are scattered with *Eucalyptus gomphocephala* occurring on deeper soils north from Woodman Point. Most sites occur on the Cottesloe unit of the Spearwood system. The heathlands in this group typically include *Dryandra sessilis*, *Calothamnus quadrifidus*, and *Schoenus grandiflorus*.

Swan Coastal Plain Banksia *attenuata*-Banksia *menziesii* woodlands (P3)

This Priority Ecological Community (community type 23b) consists of woodlands that occur in the Bassendean system, from Melaleuca Park to Gingin. Occurs in reasonably extensive Banksia woodlands north of Perth.

Of the communities listed above the potential TEC *Corymbia calophylla* – *Xanthorrhoea preissii* community is the only one that is associated with the eastern slopes fluvial soils of the Swan Coastal Plain.

5.3 Potential Fauna and Threatened and Priority Fauna

The desktop survey for potential vertebrate and invertebrate fauna which had the potential to occur in the area included some 541 species (89 Birds, 11 Mammals, 28 Reptiles, 8 Amphibians, 5 Fish, 400 Invertebrates, see Table 2) (Department of Parks and Wildlife 2007-, Department of the Environment 2016c). Of these 541 potential fauna species four fauna species are introduced or feral species (Table 2). Ten fauna species are considered to be significant conservation species (Appendix B, Table 2). In view of the extent of clearing and past agriculture activities the main two species of these conservation species include the Black Cockatoos and the nearby Western Swamp Tortoise (which occurs in the Ellen Brook swamp approximately 3.5km to the west).

Table 2: Total number of fauna species, number of introduced fauna species and number of fauna species with a conservation status

Group	Total No. Species	No. introduced species	No. of species with a conservation status
Amphibian	8	0	0
Bird	89	3	2
Fish	5	0	0
Invertebrate	400	0	0
Mammal	11	1	6
Reptile	28	0	2
Total	541	4	10

Marri (*Corymbia calophylla*) trees are amongst species used for foraging by the listed Cockatoo species, Predominately Carnaby's Black Cockatoo (E) (*Calyptorhynchus latirostris*); Forest Red-tailed Black Cockatoo (V) (*Calyptorhynchus banksia naso*) and Baudin's Black Cockatoo (V) (*Calyptorhynchus baudinii*) (Department of Sustainability, Environment, Water, Populations and Communities, 2012). These cockatoo species are listed as Endangered (E) or Vulnerable (V) pursuant to the *Environment Protection and Biodiversity Conservation Act* (1999).

The study area is within the known or predicted breeding range of both the Forest Red-tailed Black-Cockatoo and Carnaby's Black Cockatoo (Department the Environment 2008). Baudin's Black-Cockatoo does not breed in the area, breeding only as far north as Serpentine (Johnstone *et al.* (2011). The Carnaby's Black-Cockatoo potentially use Jarrah or Marri trees for breeding, and they may use any suitably sized hollow (Johnstone and Storr 1998, Department of Sustainability, Environment, Water, Populations and Communities, 2012). The Forest Red-tailed Black- Cockatoo favours hollows in large, old Marri trees, but may also use Jarrah on occasion (Johnstone and Storr 1998).

The Western Swamp Tortoise is listed as "threatened" under the Western Australian *Wildlife Conservation Act 1950*, "endangered" under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. This species is also listed as critically endangered species in the IUCN 2000 Red List of threatened animals (Burbidge *et al.* 2010). There are only two remaining habitats that remain for this species, Twin Swamps Nature Reserve and Ellen brook Reserve. Ellen brook Reserve contains two TECS which consist of community types 8 and 3C (Gibson *et. al* 1994).

6. FIELD SURVEY RESULTS

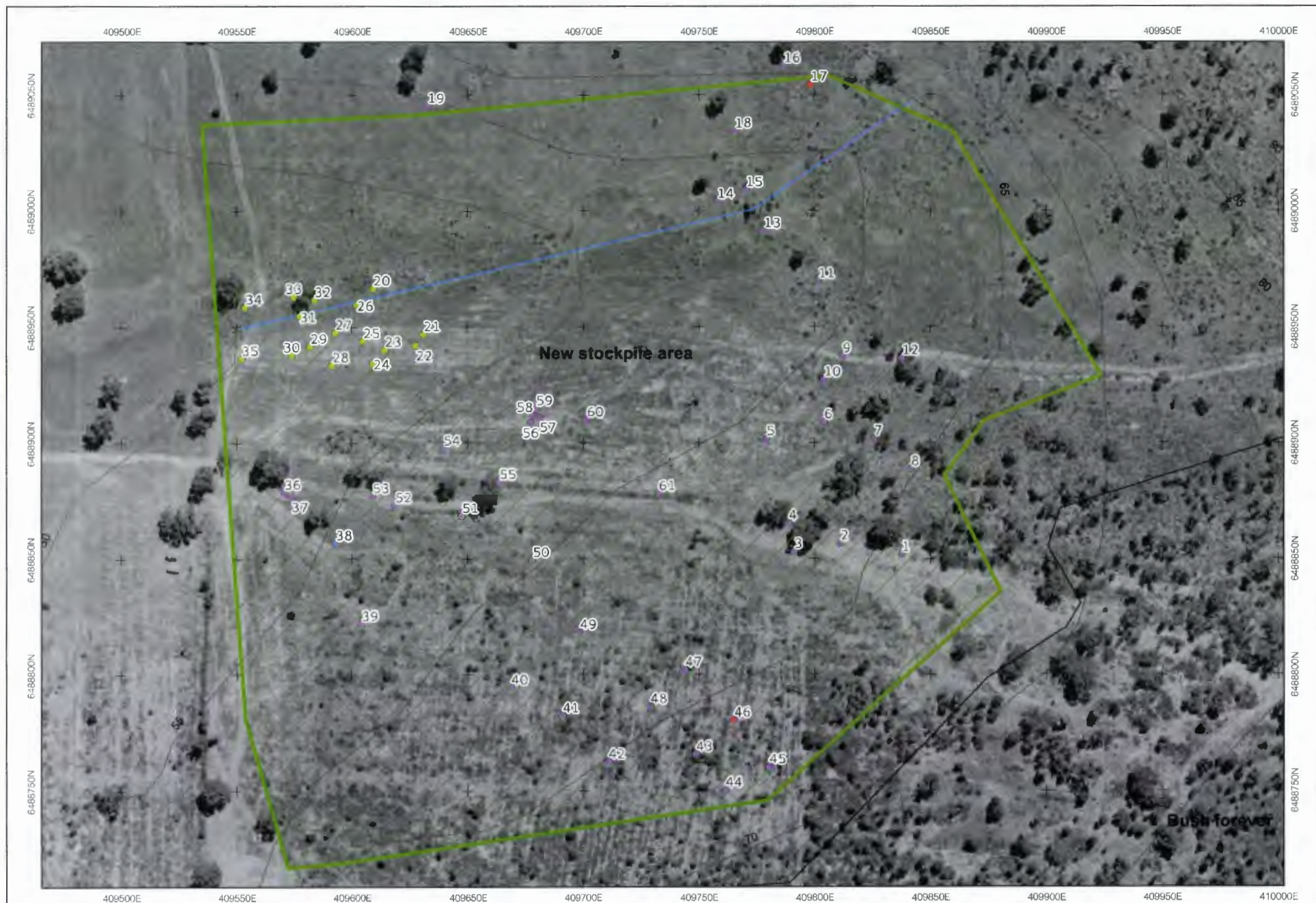
6.1 Flora and Vegetation

The proposed expansion area was cleared in the mid 1960's (see comparison of Figures 2 and 3) and is dominated by Marri (*Corymbia calophylla* trees) over pasture species (Photograph 1) and Figure 4. The previous owners utilized the area for cattle and hence the remnant native species is restricted to the following tree species:

- . Marri (*Corymbia calophylla*) trees that tend to be multi-branched trees with extensive canopies as a result of little competition in the overstorey (Photograph 1). The series of older trees (40 to 50 years) are often associated with a cluster of smaller trees and saplings.
- . Jarrah (*Eucalyptus marginata*) trees that are restricted to a couple of trees, including one dead tree (probably drought caused the decline).
- . Christmas Tree (*Nuytsia floribunda*), an occasional tree only on the mid-slopes.
- . Flooded Gum (*Eucalyptus rudis*) trees in the lower part of the drainage line dissecting the proposed clearing area. No creek line was present, just a slightly lower depression.
- . Wandoo (*Eucalyptus wandoo*) trees that are restricted to the fringes of the proposed development area on slightly drier slopes (Photograph 2).

The understorey consisted of pasture grasses only; although there were some *Xanthorrhoea* species upslope from the survey area. The degree of disturbance is illustrated in the following photographs of the survey area. Consequently, the degree of disturbance as a result of previous agricultural activities and clearing in the 1960's has resulted in degraded communities that support a very low range of native species and as such do not represent any threatened ecological communities. The condition of the property is therefore considered to be degraded to completely degraded. The main values of the flora and vegetation relate to the potential foraging of the Marri trees by the Black Cockatoos.





Imagery provided by BRIKMAKERS

Legend

- Survey Area
- Corymbia calophylla*
- Eucalyptus rudis*
- Eucalyptus wandoo*
- Nuytsia floribunda*

Prepared for:
BRIKMAKERS
 INSPIRING INNOVATION

Prepared by:
Mottishe



0 20 40 m
 Scale 1:1,500
 MGA94 (Zone 50)
 Contours 5m

Walylunga Rd Bullsbrook
 Survey Area 1965

Figure:

3



Imagery provided by BRIKMAKERS

Legend
Survey Area

Prepared for:
BRIKMAKERS
INSPIRING INNOVATION

Prepared by:
Mattiske
environmental consultants

N
0 20 40 m
Scale 1:1,500
MGA94 (Zone 50)
Contours 5m

Walyunga Rd Bullsbrook
Vegetation

Figure:
4



Photograph 1: Open woodland of *Corymbia calophylla* over pasture species



Photograph 2: Open woodland of *Eucalyptus wandoo* – *Corymbia calophylla* over pasture species

6.2 Threatened and Priority Flora

No threatened flora pursuant to Schedule 1 of the *Wildlife Conservation Act 1950* and as listed by the Department of Parks and Wildlife (2016b) were recorded within the Brikmakers survey area. No threatened flora pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and as listed by the Department of the Environment (2016a) were recorded within Brikmakers survey area.

6.3 Threatened and Priority Ecological Communities

The degree of disturbance as a result of previous agricultural activities and clearing in the 1960's has resulted in degraded communities that support a very low range of native species and as such do not represent any threatened ecological communities.

6.4 Threatened and Priority Fauna

During the botanical studies searches an assessment of the potential foraging, nesting and breeding activities of the listed cockatoo species was conducted. As the Marri (*Corymbia calophylla*) trees occurred on open paddocks, the canopy of the trees were broad and as such the branches were extensive and only a few small hollows that were unsuitable for the listed Black Cockatoos were recorded on the larger Marri trees (see numbers trees on Figures 2 and 3). As such, it is unlikely that the trees are suitable for Black Cockatoo nesting. There was also limited foraging and only two trees had had fruit that had been chewed by birds. So the findings indicated that the majority of the larger Marri, the occasional Jarrah, the occasional Wandoo and the Flooded Gums in the gully had largely established over the 50 year period between 1965 and 2016 (see Figure 2 and 3). Consequently the most likely potential use of the paddock trees is likely to be occasional foraging by the Black Cockatoos.

As the Brikmakers expansion area occurs on drier mid slopes and a minor gully the habitat is not suitable for the listed Western Swamp Tortoise. The proposed Brikmakers expansion activities are unlikely to influence the swamps that support this species further west as the proposed expansion area abuts an active clay extraction operational area and the swamps that support this species are some distance away.

7. REVIEW OF TEN CLEARING PRINCIPLES

Under the *Environmental Protection Act 1986*, ten principles for clearing native vegetation are set out in Schedule 5, under which native vegetation should not be cleared. The review of the Ten Clearing Principles are summarized in Table 3.

Table 3: Assessment of proposal against 10 Clearing Principles

No.	Principle / Assessment
1	Clearing principle Native vegetation should not be cleared if it comprises a high level of biological diversity. Assessment: Proposal is not at variance to this principle The area under application is very open and the vegetation consists predominately of <i>Corymbia calophylla</i>, with scattered <i>Eucalyptus wandoo</i>, <i>Eucalyptus rudis</i>, and <i>Nuytsia floribunda</i>. There is no distinct understorey layer and grassy weeds dominate the ground cover in the project area. The 1.46ha of proposed clearing of paddock trees on the 10ha of pasture overlaps the Guilford complex (Mattiske and Havel, 1998). According to the EPA (2006) only 5.3% of the pre-European extent remains. The project area is degraded and according to Keighery (1994) the structure is severely disturbed and therefore regeneration to good condition requires intensive management. This area does not accurately represent the Guilford complex described by Mattiske and Havel (1998). The data collected from the survey completed in March by Dr Mattiske indicates a very low level of biodiversity, with a total of four tree species recorded within the Brikmakers expansion survey area. Comparison of aerial photography of the survey area in the years 1965 and recent studies by Dr Mattiske suggests that the area under application has historically shown signs of degradation. The aerial photography in 1965 shows the area to have been recently cleared with low numbers of scattered tree species. The aerial photograph from the recent survey conducted in 2016 shows evidence of the area experiencing heavy grazing. The trees species have increased in size and numbers over time.
2	Clearing principle 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. Assessment: Proposal is not likely to be at variance to this principle The proposed clearing area located on Walyunga Road, Bullsbrook, which is adjacent to the east by the Walyunga National Park and Walyunga Road Bushland (Bush forever site 412) to the south (Figure 1). The Bush Forever site 296, Ellen Brook, Upper Swan is located to the west of the project area, and is separated by the Great Northern Highway. A total of 37 trees were identified that demonstrated a DBH $\geq$ 50cm; the majority of which were Marri (<i>Corymbia calophylla</i>). Only a few trees had existing small hollows. These hollows were not considered to be suitable for Black-cockatoos. In comparing Figures 2 and 3 it is clearly apparent that most of these latter trees have established and grown since 1965. The presence of trees with a DBH of 50cm or more indicates that the study area is potential breeding habitat for both the Forest Red-tailed Black-Cockatoo and Carnaby's Black-Cockatoo. Observations within the survey conducted by Dr Mattiske indicated that there may be the occasional foraging of the trees by Black-cockatoos; although these trees could not be considered "significant" habitat for the Black-cockatoos. The Western Swamp Tortoise is unlikely to occur on the proposed expansion area as the habitat is not suitable for this species.

Table 3: Assessment of proposal against 10 Clearing Principles (continued)

No.	Principle / Assessment
3	Clearing principle Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora. Assessment Proposal is not at variance to this principle No threatened flora pursuant to Schedule 1 of the <i>Wildlife Conservation Act 1950</i> and as listed by the Department of Parks and Wildlife were recorded within the Brikmakers expansion survey area. No threatened flora pursuant to the <i>Environment Protection and Biodiversity Conservation Act 1999</i> and as listed by the Department of the Environment were recorded within the survey area.
4	Clearing principle (d) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a threatened ecological community. Assessment Proposal is not at variance to this principle The degree of disturbance as a result of previous agricultural activities and clearing in the 1960's has resulted in degraded communities that support a very low range of native species and as such do not represent any threatened ecological communities. Therefore, no Threatened Ecological Communities, pursuant to Schedule 1 of the <i>Wildlife Conservation Act 1950</i> and as listed by the Department of Parks and Wildlife (2016e) were recorded within the Brikmakers expansion survey area. No Threatened Ecological Communities, pursuant to the <i>EPBC Act</i> and as listed by the Department of the Environment (2016c) were recorded within the Brikmakers expansion survey area.
5	Clearing 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. Assessment Proposal is not at variance to this principle The degree of disturbance as a result of previous agricultural activities and clearing in the 1960's has resulted in degraded communities that support a very low range of native species and as such do not represent any threatened ecological communities.
6	Clearing 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. Assessment Proposal is not at variance to this principle The Brikmakers expansion survey area consists of mid slopes and a small gully (supporting a stand of <i>Eucalyptus rudis</i>) and therefore the proposed clearing activities are not at variance to this principle.

Table 3: Assessment of proposal against 10 Clearing Principles (continued)

No.	Principle / Assessment
7	Clearing principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation. Assessment Proposal is not at variance to this principle Comparison of aerial photography of the survey area in the years 1965 and recent studies by Dr Mattiske indicated that the area has been cleared previously and influenced by agricultural activities over 50 years.
8	Clearing 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. Assessment Proposal is not at variance to this principle The Brikmakers expansion survey area occurs on previously highly modified environments the proposal is not at variance to this principle. Although the vegetation that is proposed to be cleared is close in proximity to the three conservation areas, in view of the degree of disturbance the proposal is not considered to impact on the environmental values of these areas as the areas are separated by pasture or by the great Northern highway.
9	Clearing principle (i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface and underground water. Assessment Proposal is not at variance to this principle As the area occurs mainly on a mid-slope and a minor gully it is unlikely that the proposed activities are at variance to this principle.
10	Clearing principle (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding. Assessment Proposal is not at variance to this principle As the area occurs mainly on a mid-slope and a minor gully it is unlikely that the proposed activities are at variance to this principle.

8. CONCLUSIONS

In view of the degree of past clearing activities in the 1960's and the degree of agricultural activities on the proposed Brikmakers expansion survey area the majority of biodiversity values have been highly modified in recent decades. The only exceptions to this trend are the growth of Marri trees since the 1960's to a size that may be suitable for Black-cockatoos nesting. As the larger trees have multiple minor branches the likelihood of suitable nesting hollows was very low. There is some possibility of the trees on this property providing an opportunity for occasional foraging by the listed Black-cockatoo species.

As a result of the evidence that the trees reach a substantial size after some 50 years, it is recommended that rehabilitation activities are undertaken as part of the proposed activities or a similar area with equivalent larger Marri trees is considered as an offset to the proposed clearing of 1.46ha.

The impacts on other native flora values, fauna values and native vegetation is insignificant in a local and regional context.

9. REFERENCES

- Beard, J.S. (1979)
The vegetation of the Pinjarra Area, Western Australia. Map and Explanatory Memoir, 1:250,000 Series, Vegmap Publications, Perth.
- Beard, J.S. (1980)
A New Phytogeographic Map of Western Australia. Western Australian Herbarium Notes Number 3: 37-58.
- Beard, J.S. (1990)
Plant Life of Western Australia. Kangaroo Press, Kenthurst NSW.
- Biosecurity and Agriculture Management Act 2007*
- Biosecurity and Agriculture Management Regulations 2013*
- Bonn Convention (2016)
The **Convention on Migratory Species**, also known as the **Bonn Convention**, aims to conserve terrestrial, aquatic and avian migratory species throughout their range. <http://www.cms.int/>
- Burbidge, A., Kuchling, G., Olejnik, C., and Mutter, L (2010)
Western Swamp Tortoise (Pseudemydura umbrina) Recovery Plan. Western Australian Wildlife Management Program No. 50. 2010.
- Burnham, Q., Barrett, G., Blythman, M. and Scott, R. (2010). *Carnaby's Cockatoo (Calyptorhynchus latirostris) identification of nocturnal roost sites and the 2010 Great Cocky Count*. Report prepared for the WA Department of Environment and Conservation by Birds Australia and DEC, Western Australia.
- Cale, B. (2003). *Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) Recovery Plan 2002-2012*. [Online]. Department of Conservation and Land Management, Perth. URL: http://www.dec.wa.gov.au/pdf/plants_animals/threatened_species/frps/Carnaby_WA_Rec_Plan_2003.pdf
- CAMBA (1988)
Australian treaty Series 1988 No 22. Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment.
- Churchward, H.M. and McArthur, W.M. (1980)
Landforms and Soils of the Darling System, Western Australia. In: Department of Conservation and Environment (1980) *Atlas of Natural Resources Darling System, Western Australia*. Published by the Department of Conservation and the Environment, Perth 1980.
- Clayton, M., Wombey, J.C., Mason, I.J., Chesser, R.T and Wells, A. (2006)
CSIRO List of Australian Vertebrates. Reference with Conservation Status. 2nd Edition.
- Common, M.S. and Norton, T.W. (1992)
Biodiversity: Its Conservation in Australia. AMBIO Vol 21 (3): pp. 61 to 67.
- Department of Parks and Wildlife (2007-)
NatureMap, Mapping Western Australia's Biodiversity. <<http://naturemap.dpaw.wa.gov.au/>>
- Department of Parks and Wildlife (2016a)
Western Australian Flora Statistics. <<http://florabase.dpaw.wa.gov.au/statistics/>>
- Department of Parks and Wildlife (2016b)
Wildlife Conservation (Rare Flora and Fauna) Notice 2015.
<<http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings>>

Department of Parks and Wildlife (2016c)
Conservation Codes for Western Australian Flora and Fauna.
 <http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation_code_definitions.pdf>

Department of Parks and Wildlife (2016d)
Definitions, Categories and Criteria for Threatened and Priority Ecological Communities, December 2010.
 <<http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/tecs/tec-definitions-dec2010.pdf>>

Department of Parks and Wildlife (2016e)
List of Threatened Ecological Communities endorsed by the Western Australian Minister for the Environment, May 2014.
 <http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/tecs/Threatened_ecological_communities_endorsed_by_the_Minister_for_Environment_May2014.pdf>

Department of the Environment (2016d)
The Convention on Wetlands of International Importance 1971 (RAMSAR Convention).
<http://www.ramsar.org/wetland/australia>

Department of Parks and Wildlife (2016f)
Priority Ecological Communities for Western Australia, version 21 (25th November 2014). Species and Communities Branch, Department of Parks and Wildlife.
 <http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Priority_ecological_communities_list.pdf>

Department of Parks and Wildlife (2016g)
Florabase, the Western Australian Flora. <<http://florabase.dpaw.wa.gov.au/>>

Department of Sustainability, Environment, Water, Populations and Communities (2012)
EPBC Act referral guidelines for three threatened black cockatoo species. URL:
<http://www.environment.gov.au/epbc/publications/wa-black-cockatoos.html>.

Department of the Environment (2016a)
Environment Protection and Biodiversity Conservation Act 1999 List of Threatened Flora.
 <<http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora>>

Department of the Environment (2016b)
EPBC Act List of Threatened Ecological Communities.
 <<http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl>>

Department of the Environment (2016c)
Environment Protection and Biodiversity Conservation Act 1999 List of Threatened Fauna.
 <<http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna>>

Environmental Protection Authority (2004)
Guidance for the Assessment of Environmental Factors. Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. Environmental Protection Authority, Perth, 2004.

Environmental Protection Act 1986

Environment Protection and Biodiversity Conservation Act 1999

Environmental Protection (Clearing of Native Vegetation) Regulations 2004

Gibson, N., Keighery, B.J., Keighery, G.J., Burbidge, A.H. and Lyons, M.N. (1994)
A Floristic Survey of the Southern Swan Coastal Plain. Unpublished Report for the Australian Heritage Commission, prepared by the Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc.), Perth, Western Australia.

Heddle, E.M., Havel, J.J. and Loneragan, O.W. (1980)
Vegetation Complexes of the Darling System, Western Australia. In: Department of Conservation and Environment (1980) *Atlas of Natural Resources Darling System, Western Australia*. Published by the Department of Conservation and the Environment, Perth 1980.

Hussey, B.M.J., Keighery, G.J., Dodd, J., Lloyd S.G. and Cousens, R.D. (2007)
Western Weeds: a guide to the weeds of Western Australia (Second Edition). The Weeds Society of Western Australia, Perth.

JAMBA (1981)
Australian treaty Series 1981 No 6. Agreement between the Government of Australia and the Government of Japan for the protection of Migratory Birds in Danger of Extinction and their Environment.

Johnstone, R.E. and Kirkby, T. (1999). Food of the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* in south-west Western Australia. *Western Australian Naturalist*. 22:167-177.

Johnstone, R., Kirkby, T., Stone, P. and Minton, C. (2005) *White-tailed Black-Cockatoos: Identification challenges and changes in distribution and status, and links with a community program – Cockatoo Care*. In: Conserving Carnaby's Black-Cockatoo: Future Directions, Proceedings from a conservation symposium, Edited by C. Gole, Perth, Western Australia.

Johnstone, R.E., Johnstone, C.E. and Kirkby, T. (2011). *Black Cockatoos on the Swan Coastal Plain*. Report to the Department of Planning, Western Australia.

Johnstone, R.E., T. Kirkby & K. Sarti (2013). The breeding biology of the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* Gould in south-western Australia. 1. Characteristics of nest trees and nest hollows. *Pacific Conservation Biology*. 19(3). 121-42.

Johnstone, R.E. & Storr, G.M. (1998). *Handbook of Western Australian Birds. Volume 1: Nonpasserines (Emu to Dollarbird)*. Western Australian Museum, Perth.

Keighery, B.J. (1994)
Bushland Plant Survey. A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc.), Western Australia.

Mattiske, E.M. and Havel, J.J. (1998)
Vegetation Complexes of the South-west Forest region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

May, J.E. and McKenzie, N.L. (2002)
A Biodiversity Audit of Western Australia's Biogeographical Subregions in 2002. Prepared by the Department of Conservation and Land Management.

Myers, N., Mittermeier R.A., Mittermeier, C.G., da Fonseca, G.A.B., and Kent, J. (2000)
Biodiversity hotspots for conservation priorities. *Nature* 403, 853-858.

ROKAMBA (2007)
Australian treaty Series 2007 ATS 24. Agreement between the Government of Australia and the Government of the Republic of Korea on the protection of Migratory Birds.

Shah, B. (2006). *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia* Project Report, Birds Australia Western Australia, Perth.

Wildlife Conservation Act 1950

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
SELAGINELLACEAE	<i>Selaginella gracillima</i>			X	
ISOETACEAE	<i>Isoetes</i> sp.			X	
PTERIDACEAE	<i>Cheilanthes austrotenuifolia</i>			X	
	<i>Cheilanthes distans</i>			X	
ASPLENIACEAE	<i>Pleurosorus subglandulosus</i>			X	
MARSILEACEAE	<i>Marsilea drummondii</i>			X	
ZAMIACEAE	<i>Macrozamia riedlei</i>			X	
JUNCAGINACEAE	<i>Cycnogeton lineare</i>			X	
	<i>Cycnogeton lineare</i>			X	
	<i>Triglochin isingiana</i>			X	
	<i>Triglochin nana</i>			X	
	<i>Triglochin</i> sp.			X	
POACEAE	* <i>Aira caryophyllea</i>			X	
	* <i>Aira cupaniana</i>			X	
	<i>Amphipogon strictus</i>			X	
	<i>Aristida contorta</i>			X	
	<i>Austrostipa campylachne</i>			X	
	<i>Austrostipa tenuifolia</i>			X	
	* <i>Avena barbata</i>			X	
	* <i>Avena fatua</i>			X	
	* <i>Avena sativa</i>			X	
	* <i>Brachypodium distachyon</i>			X	
	* <i>Briza maxima</i>			X	
	* <i>Briza minor</i>			X	
	* <i>Bromus diandrus</i>			X	
	* <i>Bromus hordeaceus</i>			X	
	* <i>Bromus rubens</i>			X	
	* <i>Cenchrus macrourus</i>			X	
	* <i>Cenchrus setaceus</i>			X	
	<i>Deyeuxia</i> sp.			X	
	* <i>Digitaria aequiglumis</i>			X	
	* <i>Digitaria ciliaris</i>			X	
	* <i>Digitaria sanguinalis</i>			X	
	* <i>Ehrharta calycina</i>			X	
	* <i>Ehrharta longiflora</i>			X	
	* <i>Eragrostis curvula</i>			X	
	<i>Eriachne ovata</i>			X	
	* <i>Hordeum distichon</i>			X	
	<i>Lachnagrostis plebeia</i>			X	

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS	SEARCH TOOL
POACEAE (continued)	* <i>Lamarckia aurea</i>			X		
	* <i>Melinis repens</i>			X		
	<i>Microlaena stipoides</i>			X		
	<i>Neurachne alopecuroidea</i>			X		
	<i>Paspalidium constrictum</i>			X		
	* <i>Pentameris airoides</i> subsp. <i>airoides</i>			X		
	* <i>Pentameris pallida</i>			X		
	* <i>Phalaris minor</i>			X		
	<i>Poa</i> sp.			X		
	* <i>Polypogon monspeliensis</i>			X		
	<i>Polypogon tenellus</i>			X		
	<i>Rytidosperma pilosum</i>			X		
	<i>Rytidosperma setaceum</i>			X		
	<i>Spartochloa scirpoidea</i>			X		
	<i>Themeda triandra</i>			X		
	* <i>Triticum aestivum</i>			X		
	* <i>Vulpia bromoides</i>			X		
	* <i>Vulpia myuros</i>			X		
CYPERACEAE	<i>Baumea vaginalis</i>			X		
	<i>Chorizandra enodis</i>			X		
	<i>Cyathochaeta avenacea</i>			X		
	<i>Cyperus gymnocaulos</i>			X		
	* <i>Cyperus tenellus</i>			X		
	<i>Eleocharis keigheryi</i>	T	V	X		X
	<i>Fimbristylis velata</i>			X		
	<i>Isolepis cernua</i>			X		
	* <i>Isolepis hystrix</i>			X		
	<i>Isolepis marginata</i>			X		
	<i>Isolepis oldfieldiana</i>			X		
	<i>Isolepis stellata</i>			X		
	<i>Lepidosperma angustatum</i>			X		
	<i>Lepidosperma apricola</i>			X		
	<i>Lepidosperma costale</i>			X		
	<i>Lepidosperma longitudinale</i>			X		
	<i>Lepidosperma pubisquameum</i>			X		
	<i>Schoenoplectus pungens</i>			X		
	<i>Schoenus bifidus</i>			X		
	<i>Schoenus capillifolius</i>	P3		X		
	<i>Schoenus clandestinus</i>			X		
	<i>Schoenus grammatophyllus</i>			X		
	<i>Schoenus grandiflorus</i>			X		
	<i>Schoenus humilis</i>			X		
	<i>Schoenus nanus</i>			X		
	<i>Schoenus natans</i>	P4		X		
	<i>Schoenus odontocarpus</i>			X		

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
CYPERACEAE (continued)	<i>Schoenus plumosus</i>			X	
	<i>Schoenus rigens</i>			X	
	<i>Schoenus subfascicularis</i>			X	
	<i>Schoenus tenellus</i>			X	
	<i>Schoenus unispiculatus</i>			X	
	<i>Schoenus variicellae</i>			X	
	<i>Schoenus</i> sp. smooth culms (K.R. Newbey 7823)			X	
	<i>Tetraria octandra</i>			X	
ARACEAE	<i>Lemna disperma</i>			X	
RESTIONACEAE	<i>Desmocladius asper</i>			X	
	<i>Lepidobolus preissianus</i>			X	
	<i>Lepidobolus preissianus</i> subsp. <i>preissianus</i>			X	
	<i>Meeboldina cana</i>			X	
ANARTHRIACEAE	<i>Lyginia imberbis</i>			X	
CENTROLEPIDACEAE	<i>Aphelia brizula</i>			X	
	<i>Aphelia cyperoides</i>			X	
	<i>Centrolepis aristata</i>			X	
	<i>Centrolepis drummondiana</i>			X	
	<i>Centrolepis mutica</i>			X	
	<i>Centrolepis</i> sp.			X	
HYDATELLACEAE	<i>Trithuria bibracteata</i>	T	E	X	
	<i>Trithuria occidentalis</i>			X	
	<i>Trithuria submersa</i>			X	
PHILYDRACEAE	<i>Philydrella pygmaea</i>			X	
JUNCACEAE	* <i>Juncus acutus</i>			X	
	* <i>Juncus bufonius</i>			X	
	* <i>Juncus capitatus</i>			X	
ASPARAGACEAE	<i>Chamaescilla corymbosa</i>			X	
	<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>			X	
	<i>Chamaescilla corymbosa</i> var. <i>paradoxa</i>			X	
	<i>Dichopogon capillipes</i>			X	
	<i>Laxmannia grandiflora</i> subsp. <i>grandiflora</i>			X	
	<i>Laxmannia paleacea</i>			X	
	<i>Laxmannia sessiliflora</i>			X	
	<i>Laxmannia squarrosa</i>			X	
	<i>Lomandra integra</i>			X	
	<i>Lomandra nigricans</i>			X	
	<i>Lomandra odora</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
ASPARAGACEAE (continued)	<i>Lomandra preissii</i>			X	
	<i>Lomandra sericea</i>			X	
	<i>Lomandra spartea</i>			X	
	<i>Sowerbaea laxiflora</i>			X	
	<i>Thysanotus dichotomus</i>			X	
	<i>Thysanotus manglesianus</i>			X	
	<i>Thysanotus multiflorus</i>			X	
	<i>Thysanotus patersonii</i>			X	
	<i>Thysanotus rectantherus</i>			X	
	<i>Thysanotus scaber</i>			X	
	<i>Thysanotus tenellus</i>			X	
	<i>Thysanotus thyrsoides</i>			X	
DASYPOGONACEAE	<i>Calectasia narragara</i>			X	
XANTHORRHOEACEAE	<i>Xanthorrhoea gracilis</i>			X	
	<i>Xanthorrhoea preissii</i>			X	
ALLIACEAE	* <i>Allium neapolitanum</i>			X	
COLCHICACEAE	* <i>Baeometra uniflora</i>			X	
	<i>Burchardia bairdiae</i>			X	
	<i>Burchardia congesta</i>			X	
	<i>Burchardia multiflora</i>			X	
	<i>Wurmbea densiflora</i>			X	
	<i>Wurmbea dioica</i> subsp. <i>alba</i>			X	
	<i>Wurmbea monantha</i>			X	
BORYACEAE	<i>Borya scirpoidea</i>			X	
	<i>Borya sphaerocephala</i>			X	
HEMEROCALLIDACEAE	<i>Agrostocrinum scabrum</i>			X	
	<i>Agrostocrinum scabrum</i> subsp. <i>scabrum</i>			X	
	<i>Caesia micrantha</i>			X	
	<i>Caesia</i> sp. Wongan (K.F. Kenneally 8820)			X	
	<i>Dianella revoluta</i> var. <i>divaricata</i>			X	
	<i>Stypandra glauca</i>			X	
	<i>Tricoryne elatior</i>			X	
HAEMODORACEAE	<i>Anigozanthos bicolor</i>			X	
	<i>Anigozanthos bicolor</i> subsp. <i>bicolor</i>			X	
	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>			X	
	<i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			X	
	<i>Blancoa canescens</i>			X	
	<i>Conostylis aculeata</i> subsp. <i>aculeata</i>			X	
	<i>Conostylis aculeata</i> subsp. <i>bromelioides</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
HAEMODORACEAE (continued)	<i>Conostylis androstemma</i>			X	
	<i>Conostylis aurea</i>			X	
	<i>Conostylis setigera</i>			X	
	<i>Conostylis setigera</i> subsp. <i>setigera</i>			X	
	<i>Conostylis setosa</i>			X	
	<i>Conostylis</i> sp.			X	
	<i>Haemodorum discolor</i>			X	
	<i>Haemodorum laxum</i>			X	
	<i>Haemodorum paniculatum</i>			X	
	<i>Haemodorum simplex</i>			X	
	<i>Tribonanthes australis</i>			X	
	<i>Tribonanthes brachypetala</i>			X	
	<i>Tribonanthes longipetala</i>			X	
	<i>Tribonanthes violacea</i>			X	
HYPOXIDACEAE	<i>Pauridia occidentalis</i> var. <i>occidentalis</i>			X	
DIOSCOREACEAE	<i>Dioscorea hastifolia</i>			X	
IRIDACEAE	* <i>Gladiolus caryophyllaceus</i>			X	
	* <i>Hesperantha falcata</i>			X	
	* <i>Ixia maculata</i>			X	
	* <i>Moraea flaccida</i>			X	
	<i>Moraea</i> sp.			X	
	<i>Orthrosanthus laxus</i> var. <i>laxus</i>			X	
	<i>Patersonia juncea</i>			X	
	<i>Patersonia rudis</i> subsp. <i>rudis</i>			X	
	<i>Patersonia umbrosa</i> var. <i>umbrosa</i>			X	
	* <i>Romulea rosea</i>			X	
	* <i>Romulea rosea</i> var. <i>australis</i>			X	
	* <i>Watsonia meriana</i> var. <i>meriana</i>			X	
ORCHIDACEAE	<i>Caladenia barbarossa</i>			X	
	<i>Caladenia denticulata</i>			X	
	<i>Caladenia flava</i>			X	
	<i>Caladenia hirta</i> subsp. <i>hirta</i>			X	
	<i>Caladenia longicauda</i> subsp. <i>eminens</i>			X	
	<i>Caladenia marginata</i>			X	
	<i>Caladenia splendens</i>			X	
	<i>Calochilus stramenicola</i>			X	
	<i>Cyanicula gemmata</i>			X	
	<i>Cyanicula ixioides</i> subsp. <i>ixioides</i>	P4		X	
	<i>Diuris laxiflora</i>			X	
	<i>Diuris</i> sp.			X	
	<i>Eriochilus helonomos</i>			X	
	<i>Leporella fimbriata</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
ORCHIDACEAE (continued)	<i>Microtis media</i> subsp. <i>media</i>			X	
	<i>Prasophyllum elatum</i>			X	
	<i>Prasophyllum fimbria</i>			X	
	<i>Prasophyllum gracile</i>			X	
	<i>Pterostylis sanguinea</i>			X	
	<i>Pterostylis vittata</i>			X	
	<i>Thelymitra antennifera</i>			X	
	<i>Thelymitra benthamiana</i>			X	
	<i>Thelymitra crinita</i>			X	
	<i>Thelymitra villosa</i>			X	
CASUARINACEAE	<i>Allocasuarina fraseriana</i>			X	
	<i>Allocasuarina humilis</i>			X	
	<i>Casuarina obesa</i>			X	
URTICACEAE	<i>Parietaria cardiostegia</i>			X	
	<i>Parietaria debilis</i>			X	
	<i>Parietaria</i> sp.			X	
PROTEACEAE	<i>Adenanthos barbiger</i>			X	
	<i>Adenanthos cygnorum</i>			X	
	<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	P3		X	
	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>			X	
	<i>Adenanthos obovatus</i>			X	
	<i>Banksia armata</i>			X	
	<i>Banksia armata</i> var. <i>armata</i>			X	
	<i>Banksia dallanneyi</i>			X	
	<i>Banksia dallanneyi</i> var. <i>mellicula</i>			X	
	<i>Banksia fraseri</i> var. <i>fraseri</i>			X	
	<i>Banksia micrantha</i>			X	
	<i>Banksia sessilis</i> var. <i>sessilis</i>			X	
	<i>Conospermum brownii</i>			X	
	<i>Conospermum crassinervium</i>			X	
	<i>Conospermum stoechadis</i> subsp. <i>stoechadis</i>			X	
	<i>Grevillea christineae</i>	T	E	X	
	<i>Grevillea curviloba</i> subsp. <i>curviloba</i>	T	E	X	X
	<i>Grevillea endlicheriana</i>			X	
	<i>Grevillea huegelii</i>			X	
	<i>Grevillea insignis</i> subsp. <i>insignis</i>			X	
	<i>Grevillea integrifolia</i>			X	
	<i>Grevillea manglesii</i> subsp. <i>manglesii</i>			X	
	<i>Grevillea petrophiloides</i> subsp. <i>petrophiloides</i>			X	
	<i>Grevillea pilulifera</i>			X	
	<i>Grevillea quercifolia</i>			X	
	<i>Grevillea spinosissima</i>			X	
	<i>Grevillea umbellulata</i>			X	

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPAW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPAW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
PROTEACEAE (continued)	<i>Grevillea vestita</i> subsp. <i>vestita</i>			X	
	<i>Grevillea wilsonii</i>			X	
	<i>Hakea auriculata</i>			X	
	<i>Hakea candolleana</i>			X	
	<i>Hakea erinacea</i>			X	
	<i>Hakea incrassata</i>			X	
	<i>Hakea lissocarpa</i>			X	
	<i>Hakea meisneriana</i>			X	
	<i>Hakea myrtoidea</i>			X	
	<i>Hakea prostrata</i>			X	
	<i>Hakea ruscifolia</i>			X	
	<i>Hakea trifurcata</i>			X	
	<i>Hakea undulata</i>			X	
	<i>Hakea varia</i>			X	
	<i>Isopogon asper</i>			X	
	<i>Isopogon divergens</i>			X	
	<i>Isopogon dubius</i>			X	
	<i>Isopogon sphaerocephalus</i>			X	
	<i>Lambertia multiflora</i>			X	
	<i>Lambertia multiflora</i> var. <i>darlingensis</i>			X	
	<i>Lambertia uniflora</i>	P4		X	
	<i>Persoonia sulcata</i>			X	
	<i>Petrophile biloba</i>			X	
	<i>Petrophile linearis</i>			X	
	<i>Petrophile recurva</i>			X	
	<i>Petrophile seminuda</i>			X	
	<i>Petrophile striata</i>			X	
	<i>Stirlingia latifolia</i>			X	
	<i>Stirlingia simplex</i>			X	
	<i>Synaphea acutiloba</i>			X	
	<i>Synaphea gracillima</i>			X	
	<i>Synaphea interioris</i>			X	
	<i>Synaphea pinnata</i>			X	
	<i>Synaphea polymorpha</i>			X	
	<i>Synaphea spinulosa</i> subsp. <i>major</i>			X	
	<i>Synaphea</i> sp.			X	
SANTALACEAE	<i>Santalum acuminatum</i>			X	
LORANTHACEAE	<i>Nuytsia floribunda</i>			X	
POLYGONACEAE	* <i>Emex australis</i>			X	
	<i>Muehlenbeckia adpressa</i>			X	
	<i>Persicaria decipiens</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
CHENOPODIACEAE	<i>Atriplex hypoleuca</i>			X	
	* <i>Chenopodium glaucum</i>			X	
	* <i>Chenopodium macrospermum</i>			X	
	<i>Didymanthus roei</i>			X	
	<i>Maireana georgei</i>			X	
	<i>Sclerolaena eurotioides</i>			X	
	<i>Tecticornia halocnemoides</i> subsp.				
	<i>halocnemoides</i>			X	
	<i>Tecticornia indica</i> subsp. <i>bidens</i>			X	
AMARANTHACEAE	<i>Alternanthera denticulata</i>			X	
	<i>Ptilotus carlsonii</i>			X	
	<i>Ptilotus declinatus</i>			X	
	<i>Ptilotus esquamatus</i>			X	
	<i>Ptilotus humilis</i>			X	
	<i>Ptilotus manglesii</i>			X	
	<i>Ptilotus nobilis</i> subsp. <i>nobilis</i>			X	
GYROSTEMONACEAE	<i>Codonocarpus cotinifolius</i>			X	
	<i>Gyrostemon racemiger</i>			X	
MOLLUGINACEAE	<i>Glinus oppositifolius</i>			X	
	<i>Macarthuria australis</i>			X	
PORTULACACEAE	<i>Calandrinia granulifera</i>			X	
CARYOPHYLLACEAE	* <i>Cerastium glomeratum</i>			X	
	* <i>Silene gallica</i>			X	
	* <i>Silene gallica</i> var. <i>quinquevulnera</i>			X	
RANUNCULACEAE	<i>Clematis pubescens</i>			X	
	<i>Ranunculus colonorum</i>			X	
	* <i>Ranunculus muricatus</i>			X	
	<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>			X	
LAURACEAE	<i>Cassytha pomiformis</i>			X	
PAPAVERACEAE	* <i>Fumaria capreolata</i>			X	
BRASSICACEAE	* <i>Raphanus raphanistrum</i>			X	
	<i>Stenopetalum filifolium</i>			X	
DROSERACEAE	<i>Drosera erythrorhiza</i>			X	
	<i>Drosera erythrorhiza</i> subsp. <i>collina</i>			X	
	<i>Drosera gigantea</i>			X	
	<i>Drosera gigantea</i> subsp. <i>gigantea</i>			X	
	<i>Drosera glanduligera</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
DROSERACEAE (continued)	<i>Drosera heterophylla</i>			X	
	<i>Drosera leucoblasta</i>			X	
	<i>Drosera menziesii</i>			X	
	<i>Drosera menziesii</i> subsp. <i>menziesii</i>			X	
	<i>Drosera menziesii</i> subsp. <i>penicillaris</i>			X	
	<i>Drosera paleacea</i> subsp. <i>paleacea</i>			X	
	<i>Drosera platystigma</i>			X	
	<i>Drosera porrecta</i>			X	
	<i>Drosera pycnoblata</i>			X	
	<i>Drosera ramellosa</i>			X	
	<i>Drosera rosulata</i>			X	
	<i>Drosera stolonifera</i>			X	
	<i>Drosera subhirtella</i>			X	
	<i>Drosera walyunga</i>			X	
	<i>Drosera</i> sp.			X	
CRASSULACEAE	<i>Crassula colorata</i>			X	
	<i>Crassula decumbens</i>			X	
	<i>Crassula decumbens</i> var. <i>decumbens</i>			X	
	<i>Crassula extrorsa</i>			X	
	* <i>Crassula natans</i> var. <i>minus</i>			X	
PITTOSPORACEAE	<i>Billardiera coriacea</i>			X	
	<i>Billardiera heterophylla</i>			X	
	<i>Cheiranthra preissiana</i>			X	
SURIANACEAE	<i>Stylobasium australe</i>			X	
ROSACEAE	<i>Acaena</i> sp.			X	
FABACEAE	<i>Acacia acuminata</i>			X	
	<i>Acacia applanata</i>			X	
	<i>Acacia barbinervis</i> subsp. <i>barbinervis</i>			X	
	<i>Acacia coolgardiensis</i>			X	
	<i>Acacia dentifera</i>			X	
	<i>Acacia drummondii</i> subsp. <i>affinis</i>	P3		X	
	<i>Acacia drummondii</i> subsp. <i>drummondii</i>			X	
	<i>Acacia ericifolia</i>			X	
	<i>Acacia erinacea</i>			X	
	<i>Acacia hemiteles</i>			X	
	<i>Acacia jibberdingensis</i>			X	
	<i>Acacia lasiocalyx</i>			X	
	<i>Acacia lasiocarpa</i> var. <i>bracteolata</i>			X	
	<i>Acacia leptopetala</i>			X	
	<i>Acacia lullfitziorum</i>			X	
	<i>Acacia meisneri</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
FABACEAE (continued)	<i>Acacia merrallii</i>	P3		X	
	<i>Acacia microbotrya</i>			X	
	<i>Acacia nervosa</i>			X	
	<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>			X	
	<i>Acacia pulchella</i>			X	
	<i>Acacia pulchella</i> var. <i>pulchella</i>			X	
	<i>Acacia restiacea</i>			X	
	<i>Acacia saligna</i>			X	
	<i>Acacia saligna</i> subsp. <i>saligna</i>			X	
	<i>Acacia sessilis</i>			X	
	<i>Acacia sessilispica</i>			X	
	<i>Acacia sphacelata</i> subsp. <i>sphacelata</i>			X	
	<i>Acacia squamata</i>			X	
	<i>Acacia stenoptera</i>			X	
	<i>Acacia</i> sp.			X	
	<i>Bossiaea eriocarpa</i>			X	
	<i>Bossiaea linophylla</i>			X	
	<i>Bossiaea ornata</i>			X	
	<i>Bossiaea spinescens</i>			X	
	<i>Chorizema cordatum</i>	X			
	<i>Chorizema dicksonii</i>	X			
	<i>Cristonia biloba</i> subsp. <i>biloba</i>	X			
	<i>Cullen discolor</i>	X			
	<i>Daviesia angulata</i>	X			
	<i>Daviesia cordata</i>	X			
	<i>Daviesia daphnoides</i>	X			
	<i>Daviesia decurrens</i>	X			
	<i>Daviesia hakeoides</i> subsp. <i>hakeoides</i>	X			
	<i>Daviesia incrassata</i> subsp. <i>incrassata</i>	X			
	<i>Daviesia longifolia</i>	X			
	<i>Daviesia oxylobium</i>	P4		X	
	<i>Daviesia physodes</i>			X	
	<i>Daviesia polyphylla</i>			X	
	<i>Daviesia preissii</i>			X	
	<i>Daviesia</i> sp.			X	
	<i>Dillwynia laxiflora</i>			X	
	<i>Eutaxia virgata</i>			X	
	<i>Gastrolobium calycinum</i>			X	
	<i>Gastrolobium celsianum</i>			X	
	<i>Gastrolobium dilatatum</i>			X	
	<i>Gastrolobium ebracteolatum</i>			X	
	<i>Gastrolobium hookeri</i>			X	
	<i>Gastrolobium laytonii</i>			X	
	<i>Gastrolobium linearifolium</i>			X	
	<i>Gastrolobium microcarpum</i>			X	
	<i>Gastrolobium praemorsum</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
FABACEAE (continued)	<i>Gastrolobium spinosum</i>			X	
	<i>Gastrolobium villosum</i>			X	
	<i>Gastrolobium</i> sp.			X	
	<i>Gompholobium aristatum</i>			X	
	<i>Gompholobium knightianum</i>			X	
	<i>Gompholobium marginatum</i>			X	
	<i>Gompholobium preissii</i>			X	
	<i>Gompholobium scabrum</i>			X	
	<i>Gompholobium tomentosum</i>			X	
	<i>Hardenbergia comptoniana</i>			X	
	<i>Hardenbergia</i> sp.			X	
	<i>Hovea acanthoclada</i>			X	
	<i>Hovea pungens</i>			X	
	<i>Isotropis</i> sp.			X	
	<i>Jacksonia alata</i>			X	
	<i>Jacksonia sternbergiana</i>			X	
	<i>Kennedia coccinea</i>			X	
	<i>Kennedia prostrata</i>			X	
	<i>Kennedia stirlingii</i>			X	
	<i>Labichea lanceolata</i>			X	
	<i>Labichea lanceolata</i> subsp. <i>brevifolia</i>			X	
	<i>Labichea lanceolata</i> subsp. <i>lanceolata</i>			X	
	* <i>Lablab purpureus</i>			X	
	<i>Mirbelia spinosa</i>			X	
	<i>Mirbelia</i> sp.			X	
	<i>Oxylobium</i> sp.			X	
	<i>Senna artemisioides</i> subsp. <i>filifolia</i>			X	
	<i>Senna artemisioides</i> subsp. <i>x sturtii</i>			X	
	<i>Senna charlesiana</i>			X	
	<i>Sphaerolobium medium</i>			X	
	<i>Sphaerolobium vimineum</i>			X	
	<i>Templetonia drummondii</i>			X	
	* <i>Trifolium campestre</i> var. <i>campestre</i>			X	
	* <i>Trifolium cernuum</i>			X	
	* <i>Trifolium subterraneum</i>			X	
	* <i>Vachellia karroo</i>			X	
	* <i>Vicia sativa</i>			X	
	<i>Viminaria juncea</i>			X	
GERANIACEAE	* <i>Erodium botrys</i>			X	
	<i>Erodium crinitum</i>			X	
	<i>Erodium cygnorum</i>			X	
	<i>Erodium</i> sp.			X	
	<i>Geranium retrorsum</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
OXALIDACEAE	<i>Oxalis exilis</i>			X	
	<i>Oxalis perennans</i>			X	
	* <i>Oxalis purpurea</i>			X	
LINACEAE	<i>Linum marginale</i>			X	
	* <i>Linum trigynum</i>			X	
ZYGOPHYLLACEAE	* <i>Tribulus terrestris</i>			X	
	<i>Zygophyllum fruticosum</i>			X	
RUTACEAE	<i>Boronia ovata</i>			X	
	<i>Boronia purdieana</i> subsp. <i>purdieana</i>			X	
	<i>Diplolaena velutina</i>			X	
	<i>Phebalium filifolium</i>			X	
	<i>Phebalium</i> sp.			X	
	<i>Philotheca nodiflora</i> subsp. <i>calycina</i>			X	
POLYGALACEAE	<i>Comesperma calymega</i>			X	
	<i>Comesperma drummondii</i>			X	
	<i>Comesperma volubile</i>			X	
	<i>Comesperma</i> sp.			X	
EUPHORBIACEAE	<i>Beyeria lechenaultii</i>			X	
	<i>Ricinocarpos undulatus</i>			X	
	* <i>Ricinus communis</i>			X	
PHYLLANTHACEAE	<i>Phyllanthus calycinus</i>			X	
CELASTRACEAE	<i>Psammomoya choretroides</i>			X	
	<i>Stackhousia monogyna</i>			X	
SAPINDACEAE	<i>Diplopeltis huegelii</i>			X	
	<i>Diplopeltis huegelii</i> subsp. <i>huegelii</i>			X	
	<i>Diplopeltis huegelii</i> subsp. <i>lehmannii</i>			X	
	<i>Diplopeltis huegelii</i> subsp. <i>subintegra</i>			X	
	<i>Dodonaea pinifolia</i>			X	
	<i>Dodonaea stenozyga</i>			X	
	<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>			X	
RHAMNACEAE	<i>Cryptandra arbutiflora</i>			X	
	<i>Cryptandra arbutiflora</i> var. <i>arbutiflora</i>			X	
	<i>Cryptandra myriantha</i>			X	
	<i>Cryptandra nutans</i>			X	
	<i>Cryptandra</i> sp.			X	
	<i>Stenanthemum emarginatum</i>			X	
	<i>Stenanthemum notiale</i> subsp. <i>notiale</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
RHAMNACEAE (continued)	<i>Trymalium daphnifolium</i> <i>Trymalium ledifolium</i> var. <i>rosmarinifolium</i> <i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>			X X X	
VITACEAE	* <i>Vitis vinifera</i>			X	
ELAEocarpaceae	<i>Platytheca galioides</i> <i>Tetradlea efoliata</i> <i>Tetradlea pilifera</i>	P3		X X X	
MALVACEAE	<i>Commersonia cygnorum</i> <i>Guichenotia macrantha</i> <i>Guichenotia micrantha</i> <i>Guichenotia sarotes</i> <i>Keraudrenia hermanniifolia</i> <i>Keraudrenia velutina</i> <i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i> <i>Lasiopetalum glutinosum</i> subsp. <i>latifolium</i> <i>Thomasia foliosa</i> <i>Thomasia grandiflora</i> <i>Thomasia triloba</i>	P3 P1		X X X X X X X X X X X	
DILLENIACEAE	<i>Hibbertia aurea</i> <i>Hibbertia commutata</i> <i>Hibbertia cunninghamii</i> <i>Hibbertia diamesogenos</i> <i>Hibbertia exasperata</i> <i>Hibbertia huegelii</i> <i>Hibbertia hypericoides</i> <i>Hibbertia pachyrrhiza</i> <i>Hibbertia subvaginata</i>			X X X X X X X X X	
VIOLACEAE	<i>Hybanthus calycinus</i> <i>Hybanthus floribundus</i> subsp. <i>floribundus</i>			X X	
THYMELAEACEAE	<i>Pimelea argentea</i> <i>Pimelea imbricata</i> var. <i>major</i> <i>Pimelea imbricata</i> var. <i>piligera</i> <i>Pimelea suaveolens</i> subsp. <i>suaveolens</i>			X X X X	
MYRTACEAE	<i>Babingtonia camphorosmae</i> <i>Beaufortia macrostemon</i> <i>Beaufortia purpurea</i> <i>Calothamnus lateralis</i> <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i> <i>Calothamnus rupestris</i>			X X X X X X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
MYRTACEAE (continued)	<i>Calothamnus sanguineus</i>	T	E	X	
	<i>Calytrix breviseta</i> subsp. <i>breviseta</i>			X	
	<i>Calytrix flavescens</i>			X	
	<i>Calytrix fraseri</i>			X	
	<i>Calytrix glutinosa</i>			X	
	<i>Calytrix sylvana</i>			X	
	<i>Calytrix violacea</i>			X	
	<i>Chamelaucium</i> sp. Winchester (C. Chapman s.n. PERTH 07879180)			X	
	<i>Corymbia calophylla</i>			X	
	<i>Cyathostemon heterantherus</i>			X	
	<i>Darwinia citriodora</i>			X	
	<i>Darwinia pinifolia</i>			X	
	<i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i>			X	
	<i>Eucalyptus longicornis</i>			X	
	<i>Eucalyptus marginata</i> subsp. <i>marginata</i>			X	
	<i>Eucalyptus patens</i>			X	
	<i>Eucalyptus pyriformis</i>			X	
	<i>Eucalyptus rudis</i>			X	
	<i>Eucalyptus salubris</i>			X	
	<i>Eucalyptus todtiana</i>			X	
	<i>Eucalyptus wandoo</i>			X	
	<i>Eucalyptus wandoo</i> subsp. <i>wandoo</i>			X	
	<i>Hypocalymma angustifolium</i>			X	
	<i>Hypocalymma angustifolium</i> subsp.				
	<i>Dandaragan plateau</i> (S. Patrick 702A)			X	
	<i>Kunzea baxteri</i>			X	
	<i>Kunzea glabrescens</i>			X	
	<i>Kunzea micrantha</i>			X	
	<i>Kunzea praestans</i>			X	
	<i>Kunzea pulchella</i>			X	
	<i>Kunzea recurva</i>			X	
	<i>Leptospermum erubescens</i>			X	
	<i>Melaleuca holosericea</i>			X	
	<i>Melaleuca lateritia</i>			X	
	<i>Melaleuca manglesii</i>	P1		X	
	<i>Melaleuca parviceps</i>			X	
	<i>Melaleuca radula</i>			X	
	<i>Melaleuca raphiophylla</i>			X	
	<i>Melaleuca viminea</i>			X	
	<i>Melaleuca viminea</i> subsp. <i>viminea</i>			X	
	<i>Melaleuca</i> sp.			X	
	<i>Pileanthus</i> sp.			X	
	<i>Scholtzia involucrata</i>			X	
	<i>Verticordia acerosa</i> var. <i>acerosa</i>			X	
	<i>Verticordia acerosa</i> var. <i>preissii</i>			X	
	<i>Verticordia chrysantha</i>			X	
	<i>Verticordia densiflora</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
MYRTACEAE (continued)	<i>Verticordia halophila</i>			X	
	<i>Verticordia huegelii</i>			X	
	<i>Verticordia huegelii</i> var. <i>huegelii</i>			X	
	<i>Verticordia huegelii</i> var. <i>stylosa</i>			X	
	<i>Verticordia insignis</i> subsp. <i>insignis</i>			X	
	<i>Verticordia picta</i>			X	
	<i>Verticordia plumosa</i> var. <i>plumosa</i>			X	
	<i>Verticordia tumida</i> subsp. <i>therogana</i>			X	
HALORAGACEAE	<i>Gonocarpus nodulosus</i>			X	
ARALIACEAE	<i>Hydrocotyle alata</i>			X	
	<i>Hydrocotyle callicarpa</i>			X	
	<i>Hydrocotyle corynophora</i>	P1		X	
	<i>Hydrocotyle diantha</i>			X	
	<i>Hydrocotyle lemnoides</i>	P4		X	
	<i>Trachymene ornata</i>			X	
	<i>Trachymene pilosa</i>			X	
APIACEAE	<i>Actinotus laxus</i>			X	
	<i>Actinotus leucocephalus</i>			X	
	<i>Actinotus superbus</i>			X	
	<i>Daucus glochidiatus</i>			X	
	<i>Eryngium pinnatifidum</i> subsp. <i>pinnatifidum</i>			X	
	<i>Homalosciadium homalocarpum</i>			X	
	<i>Platysace</i> sp.			X	
	<i>Xanthosia atkinsoniana</i>			X	
	<i>Xanthosia candida</i>			X	
	<i>Xanthosia ciliata</i>			X	
ERICACEAE	<i>Andersonia aristata</i>			X	
	<i>Andersonia longifolia</i>	P2		X	
	<i>Andersonia sprengelioides</i>			X	
	<i>Astroloma macrocalyx</i>			X	
	<i>Astroloma microcalyx</i>			X	
	<i>Astroloma pallidum</i>			X	
	<i>Astroloma serratifolium</i>			X	
	<i>Astroloma xerophyllum</i>			X	
	<i>Leucopogon australis</i>			X	
	<i>Leucopogon conostephioides</i>			X	
	<i>Leucopogon cymbiformis</i>	P2		X	
	<i>Leucopogon polymorphus</i>			X	
	<i>Leucopogon propinquus</i>			X	
	<i>Leucopogon pulchellus</i>			X	
	<i>Leucopogon squarrosus</i> subsp. <i>squarrosus</i>			X	
	<i>Leucopogon tenuis</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
ERICACEAE (continued)	<i>Lysinema ciliatum</i> <i>Lysinema pentapetalum</i>			X X	
PRIMULACEAE	* <i>Lysimachia arvensis</i>			X	
LOGANIACEAE	<i>Logania flaviflora</i>			X	
GENTIANACEAE	* <i>Centaurium erythraea</i> * <i>Cicendia filiformis</i>			X X	
MENYANTHACEAE	<i>Liparophyllum capitatum</i>			X	
APOCYNACEAE	<i>Alyxia buxifolia</i>			X	
CONVOLVULACEAE	<i>Convolvulus remotus</i> <i>Wilsonia humilis</i>			X X	
BORAGINACEAE	* <i>Echium plantagineum</i> <i>Halgania corymbosa</i>	P3		X X	
LAMIACEAE	<i>Cyanostegia angustifolia</i> <i>Cyanostegia microphylla</i> <i>Dicrastylis corymbosa</i> <i>Dicrastylis reticulata</i> <i>Dicrastylis sp.</i> <i>Hemiandra incana</i> <i>Hemiandra linearis</i> <i>Hemiandra pungens</i> <i>Hemigenia canescens</i> <i>Hemigenia incana</i> <i>Hemigenia westringioides</i> <i>Prostanthera campbellii</i> <i>Prostanthera gryллоana</i> * <i>Stachys arvensis</i> <i>Teucrium sessiliflorum</i> <i>Westringia rigida</i>	P3		X X X X X X X X X X X X X X X X	
SOLANACEAE	<i>Anthotroche pannosa</i> <i>Cyphanthera microphylla</i> <i>Duboisia hopwoodii</i> <i>Solanum capsiciforme</i> <i>Solanum diversiflorum</i> <i>Solanum hoplopetalum</i> <i>Solanum simile</i>			X X X X X X X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPAW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPAW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
SCROPHULARIACEAE	<i>Eremophila alternifolia</i>			X	
	<i>Eremophila drummondii</i>			X	
	<i>Eremophila lehmanniana</i>			X	
	<i>Eremophila oldfieldii</i> subsp. <i>oldfieldii</i>			X	
	<i>Eremophila subfloccosa</i> subsp. <i>subfloccosa</i>			X	
	<i>Limosella australis</i>			X	
OROBANCHACEAE	* <i>Bartsia trixago</i>			X	
	* <i>Orobanche minor</i>			X	
	* <i>Parentucellia latifolia</i>			X	
	* <i>Parentucellia viscosa</i>			X	
LENTIBULARIACEAE	<i>Utricularia dichotoma</i>			X	
	<i>Utricularia inaequalis</i>			X	
	<i>Utricularia multifida</i>			X	
	<i>Utricularia violacea</i>			X	
PLANTAGINACEAE	* <i>Plantago coronopus</i> subsp. <i>commutata</i>			X	
	<i>Plantago</i> sp.			X	
RUBIACEAE	* <i>Galium divaricatum</i>			X	
	<i>Opercularia vaginata</i>			X	
CAMPANULACEAE	<i>Isotoma hypocrateriformis</i>			X	
	<i>Isotoma petraea</i>			X	
	<i>Isotoma pusilla</i>			X	
	<i>Isotoma scapigera</i>			X	
	<i>Lobelia winfridae</i>			X	
	* <i>Monopsis debilis</i>			X	
	* <i>Monopsis debilis</i> var. <i>depressa</i>			X	
	<i>Wahlenbergia multicaulis</i>			X	
	<i>Wahlenbergia preissii</i>			X	
GOODENIACEAE	<i>Anthotium junciforme</i>			X	
	<i>Anthotium rubriflorum</i>			X	
	<i>Brunonia australis</i>			X	
	<i>Coopernookia strophiolata</i>			X	
	<i>Dampiera coronata</i>			X	
	<i>Dampiera lavandulacea</i>			X	
	<i>Dampiera lindleyi</i>			X	
	<i>Dampiera linearis</i>			X	
	<i>Dampiera wellsiana</i>			X	
	<i>Goodenia convexa</i>			X	
	<i>Goodenia micrantha</i>			X	
	<i>Goodenia pulchella</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
STYLIDIACEAE	<i>Levenhookia leptantha</i>			X	
	<i>Levenhookia stipitata</i>			X	
	<i>Stylidium adpressum</i>			X	
	<i>Stylidium androsaceum</i>			X	
	<i>Stylidium brunonianum</i>			X	
	<i>Stylidium bulbiferum</i>			X	
	<i>Stylidium calcaratum</i>			X	
	<i>Stylidium ciliatum</i>			X	
	<i>Stylidium coroniforme</i> subsp. <i>amblyphyllum</i>	T	E	X	
	<i>Stylidium dichotomum</i>			X	
	<i>Stylidium diuroides</i> subsp. <i>diuroides</i>			X	
	<i>Stylidium divaricatum</i>			X	
	<i>Stylidium ecorne</i>			X	
	<i>Stylidium eriopodum</i>			X	
	<i>Stylidium hispidum</i>			X	
	<i>Stylidium leptophyllum</i>			X	
	<i>Stylidium longitubum</i>	P4		X	
	<i>Stylidium obtusatum</i>			X	
	<i>Stylidium petiolare</i>			X	
	<i>Stylidium piliferum</i>			X	
	<i>Stylidium pubigerum</i>			X	
	<i>Stylidium recurvum</i>			X	
	<i>Stylidium repens</i>			X	
	<i>Stylidium scariosum</i>			X	
	<i>Stylidium septentrionale</i>			X	
	<i>Stylidium tenue</i> subsp. <i>majusculum</i>			X	
	<i>Stylidium thesioides</i>			X	
	<i>Stylidium udusicola</i>			X	
	<i>Stylidium uniflorum</i>			X	
	<i>Stylidium</i> sp. Bindoon (K.F. Kenneally 11405)			X	
ASTERACEAE	* <i>Arctotheca calendula</i>			X	
	<i>Asteridea asteroides</i>			X	
	<i>Asteridea athrixioides</i>			X	
	<i>Asteridea nivea</i>			X	
	<i>Blennospora drummondii</i>			X	
	<i>Brachyscome ciliaris</i>			X	
	<i>Brachyscome iberidifolia</i>			X	
	<i>Brachyscome perpusilla</i>			X	
	<i>Calotis hispidula</i>			X	
	<i>Centipeda cunninghamii</i>			X	
	<i>Cephalopterum drummondii</i>			X	
	<i>Chthonocephalus pseudevax</i>			X	
	* <i>Cotula bipinnata</i>			X	
	<i>Craspedia variabilis</i>			X	
	<i>Euchiton sphaericus</i>			X	

APPENDIX A: SUMMARY OF VASCULAR PLANT SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL OF THE PROPOSED EXPANSION AREA, WALYUNGA ROAD

Note: * denotes introduced species; T denotes Threatened Flora Species and P1-P4 denote Priority Flora Species (DPaW 2016d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2016g) and Protected Matters Search Tool (DotE 2016d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTE D MATTERS SEARCH TOOL
ASTERACEAE (continued)	<i>Helichrysum leucopsidium</i>			X	
	<i>Helichrysum luteoalbum</i>			X	
	<i>Hyalosperma cotula</i>			X	
	<i>Hyalosperma glutinosum</i>			X	
	* <i>Hypochoeris glabra</i>			X	
	* <i>Lactuca serriola</i> forma <i>serriola</i>			X	
	<i>Lawrencella rosea</i>			X	
	<i>Millotia myosotidifolia</i>			X	
	<i>Millotia pilosa</i>	P2		X	
	<i>Millotia tenuifolia</i>			X	
	<i>Myriocephalus appendiculatus</i>			X	
	<i>Myriocephalus occidentalis</i>			X	
	<i>Myriocephalus</i> sp.			X	
	<i>Olearia muelleri</i>			X	
	<i>Pithocarpa corymbulosa</i>	P3		X	
	<i>Podolepis gracilis</i>			X	
	<i>Podolepis lessonii</i>			X	
	<i>Podotheca gnaphalioides</i>			X	
	<i>Pterochaeta paniculata</i>			X	
	<i>Quinetia urvillei</i>			X	
	<i>Rhodanthe pyrethrum</i>			X	
	<i>Schoenia cassiniana</i>			X	
	<i>Senecio multicaulis</i> subsp. <i>multicaulis</i>			X	
	<i>Siloxerus filifolius</i>			X	
	<i>Siloxerus humifusus</i>			X	
	* <i>Sonchus asper</i>			X	
	* <i>Sonchus oleraceus</i>			X	
	<i>Trichocline spathulata</i>			X	
	* <i>Ursinia anthemoides</i>			X	
	* <i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>			X	
	* <i>Vellereophyton dealbatum</i>			X	
	<i>Vittadinia cervicalis</i> var. <i>circularis</i>			X	
	<i>Waitzia acuminata</i> var. <i>albicans</i>			X	
	<i>Waitzia nitida</i>			X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extant, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Amphibians	<i>Crinia glauerti</i> (Clicking Frog)	X	
	<i>Crinia insignifera</i> (Squelching Froglet)	X	
	<i>Crinia</i> sp.	X	
	<i>Heleioporus barycragus</i> (Hooting Frog)	X	
	<i>Heleioporus eyrei</i> (Moaning Frog)	X	
	<i>Litoria adelaidensis</i> (Slender Tree Frog)	X	
	<i>Neobatrachus pelobatoides</i> (Humming Frog)	X	
	<i>Pseudophryne guentheri</i> (Crawling Toadlet)	X	
Birds	<i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)	X	
	<i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)	X	
	<i>Acanthiza inornata</i> (Western Thornbill)	X	
	<i>Acanthorhynchus superciliosus</i> (Western Spinebill)	X	
	<i>Accipiter fasciatus</i> (Brown Goshawk)	X	
	<i>Acrocephalus australis</i> (Australian Reed Warbler)	X	
	<i>Acrocephalus stentoreus</i>	X	
	<i>Anas gracilis</i> (Grey Teal)	X	
	<i>Anas superciliosa</i> (Pacific Black Duck)	X	
	<i>Anthochaera (Anellobia) chrysoptera</i>	X	
	<i>Anthochaera carunculata</i> (Red Wattlebird)	X	
	<i>Anthochaera lunulata</i> (Western Little Wattlebird)	X	
	<i>Aquila audax</i> (Wedge-tailed Eagle)	X	
	<i>Ardea novaehollandiae</i> (White-faced Heron)	X	
	<i>Ardea pacifica</i> (White-necked Heron)	X	
	<i>Artamus cinereus</i> (Black-faced Woodswallow)	X	
	<i>Artamus cyanopterus</i> (Dusky Woodswallow)	X	
	<i>Aythya australis</i> (Hardhead)	X	
	<i>Barnardius zonarius</i>	X	
	<i>Barnardius zonarius</i> subsp. <i>semitorquatus</i>	X	
	<i>Cacatua sanguinea</i> (Little Corella)	X	
	<i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	X	
	<i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)	X	
	<i>Cacomantis pallidus</i> (Pallid Cuckoo)	X	
	<i>Calyptorhynchus baudinii</i> (long-billed black-cockatoo)		V
	<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo))	T	E
	<i>Calyptorhynchus</i> sp.	X	
	<i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)	X	
	<i>Cincloramphus cruralis</i> (Brown Songlark)	X	
	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)	X	
	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)	X	
	<i>Corvus coronoides</i> (Australian Raven)	X	
	<i>Corvus</i> sp.	X	
	<i>Cracticus nigrogularis</i> (Pied Butcherbird)	X	
	<i>Cracticus tibicen</i> (Australian Magpie)	X	
	<i>Cracticus torquatus</i> (Grey Butcherbird)	X	
	<i>Cygnus atratus</i> (Black Swan)	X	
	<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	X	
	<i>Daphoenositta chrysoptera</i> (Varied Sittella)	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extant, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Birds	<i>Dromaius novaehollandiae</i> (Emu)	x	
(continued)	<i>Egretta novaehollandiae</i>	x	
	<i>Elanus axillaris</i>	x	
	<i>Elseyornis melanops</i>	x	
	<i>Eolophus roseicapillus</i>	x	
	<i>Falco cenchroides</i> (Australian Kestrel)	x	
	<i>Fulica atra</i> (Eurasian Coot)	x	
	<i>Gallinula tenebrosa</i> (Dusky Moorhen)	x	
	<i>Gavialis virens</i> (Singing Honeyeater)	x	
	<i>Gerygone fusca</i> (Western Gerygone)	x	
	<i>Grallina cyanoleuca</i> (Magpie-lark)	x	
	<i>Hirundo neoxena</i> (Welcome Swallow)	x	
	<i>Lichmera indistincta</i> (Brown Honeyeater)	x	
	<i>Leipoa ocellata</i> (Malleefowl)		V
	<i>Lophoictinia isura</i>	x	
	<i>Malurus</i> (Malurus) <i>splendens</i>	x	
	<i>Malurus pulcherrimus</i> (Blue-breasted Fairy-wren)	x	
	<i>Malurus splendens</i> (Splendid Fairy-wren)	x	
	<i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)	x	
	<i>Merops ornatus</i> (Rainbow Bee-eater)	IA	
	<i>Microcarbo melanoleucos</i>	x	
	<i>Microeca fascinans</i> (Jacky Winter)	x	
	<i>Nycticorax caledonicus</i> (Rufous Night Heron)	x	
	<i>Ocyphaps lophotes</i> (Crested Pigeon)	x	
	<i>Pachycephala pectoralis</i> (Golden Whistler)	x	
	<i>Pachycephala rufiventris</i> (Rufous Whistler)	x	
	<i>Pardalotus</i> (Pardalotinus) <i>striatus</i>	x	
	<i>Pardalotus punctatus</i> (Spotted Pardalote)	x	
	<i>Pardalotus striatus</i> (Striated Pardalote)	x	
	<i>Petroica goodenovii</i> (Red-capped Robin)	x	
	<i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)	x	
	<i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)	x	
	<i>Phaps chalcoptera</i> (Common Bronzewing)	x	
	<i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)	x	
	<i>Platycercus icterotis</i> (Western Rosella)	x	
	<i>Porphyrio porphyrio</i> (Purple Swampphen)	x	
	<i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swampphen)	x	
	<i>Purpureicephalus spurius</i>	x	
	<i>Rhipidura leucophrys</i> (Willie Wagtail)	x	
	<i>Rostratula australis</i> (Austrian Painted Snipe)		E
	<i>Sericornis frontalis</i> (White-browed Scrubwren)	x	
	<i>Smicromis brevirostris</i> (Weebill)	x	
	<i>Strepera versicolor</i> (Grey Currawong)	x	
	<i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	x	
	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)	x	
	<i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe)	x	
	<i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)	x	
	<i>Threskiornis molucca</i> (Australian White Ibis)	x	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extant, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Birds (continued)	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)	X	
	<i>Todiramphus sanctus</i> (Sacred Kingfisher)	X	
	<i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)	X	
	<i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)	X	
Fishes	<i>Atherinosoma microstoma</i>	X	
	<i>Atherinosoma</i> sp.	X	
	<i>Carassius auratus</i>	X	
	<i>Cyprinus carpio</i>	X	
	<i>Galaxias occidentalis</i> (Western Minnow)	X	
Invertebrates	<i>Ablabesmyia notabilis</i>	X	
	<i>Acercella falcipes</i>	X	
	<i>Acritoptila globosa</i>	X	
	<i>Acritus</i> (<i>Acritus</i>) <i>occidentalis</i>	X	
	<i>Adelium</i> sp.	X	
	<i>Aedes alboannulatus</i>	X	
	<i>Aedriodes nodipennis</i>	X	
	<i>Agetinus nitidivirgatus</i>	X	
	<i>Agraptocorixa</i> sp.	X	
	<i>Alboa worooa</i>	X	
	<i>Allodessus bistrigatus</i>	X	
	<i>Alona</i> sp.	X	
	<i>Alphitobius laevigatus</i>	X	
	<i>Amblyomma triguttatum</i>	X	
	<i>Ametalla spinolae</i>	X	
	<i>Ametalla stenodera</i>	X	
	<i>Amitermes obeuntis</i>	X	
	<i>Aname mainae</i>	X	
	<i>Anisops hyperion</i>	X	
	<i>Anisops occipitalis</i>	X	
	<i>Anisops</i> sp.	X	
	<i>Anisops stali</i>	X	
	<i>Anisops thienemanni</i>	X	
	<i>Anisynta sphenosema</i>	X	
	<i>Anopheles</i> (<i>Cellia</i>) sp.	X	
	<i>Anopheles annulipes</i> sl	X	
	<i>Anoplostethus opalinus</i>	X	
	<i>Antichiropus variabilis</i>	X	
	<i>Antiporus</i> sp.	X	
	<i>Apion fuscotuturale</i>	X	
	<i>Aplopsis lineoligera</i>	X	
	<i>Aplopsis longipes</i>	X	
	<i>Aporocera</i> (<i>Aporocera</i>) <i>obtusa</i>	X	
	<i>Aporocera</i> (<i>Aporocera</i>) <i>variipennis</i>	X	
	<i>Arrenurus</i> sp.	X	
	<i>Arsipoda holomelaena</i>	X	
	<i>Arsipoda nitida</i>	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extant, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Asceparnus subfasciatus</i>	X	
	<i>Astele (Astele) armillatum</i>	X	
	<i>Astichus mirissimus</i>	X	
	<i>Astralium aureum</i>	X	
	<i>Aulacophora olivieri</i>	X	
	<i>Austracantha minax</i>	X	
	<i>Australaphodius frenchi</i>	X	
	<i>Australocyclops australis</i>	X	
	<i>Austroagrion cyane</i>	X	
	<i>Austrochiltonia subtenuis</i>	X	
	<i>Austrolestes analis</i>	X	
	<i>Austrolestes annulosus</i>	X	
	<i>Austrolestes aridus</i>	X	
	<i>Austrolestes io</i>	X	
	<i>Automolius granulatus</i>	X	
	<i>Baetidae sp.</i>	X	
	<i>Bardistus cibarius</i>	X	
	<i>Belosquilla laevis</i>	X	
	<i>Bembicium melanostomum</i>	X	
	<i>Bennelongia australis</i>	X	
	<i>Bennelongia cygnus</i>	X	
	<i>Berosus pulchellus</i>	X	
	<i>Berosus sp.</i>	X	
	<i>Bethelium ruida</i>	X	
	<i>Bidessini sp.</i>	X	
	<i>Blackburniella intricata</i>	X	
	<i>Boeckella robusta</i>	X	
	<i>Bolborhachium recticorne</i>	X	
	<i>Bothriembryon (Bothriembryon) indutus</i>	X	
	<i>Bracalba sp.</i>	X	
	<i>Brevicyttara cyclospila</i>	X	
	<i>Bruchidius modicus</i>	X	
	<i>Bryantella castanea</i>	X	
	<i>Cadmus (Lachnabothra) breweri</i>	X	
	<i>Caedius sphaeroides</i>	X	
	<i>Calamoecia attenuata</i>	X	
	<i>Calamoecia tasmanica subattenuata</i>	X	
	<i>Calomela satelles</i>	X	
	<i>Camponotus sp.</i>	X	
	<i>Carabidae sp.</i>	X	
	<i>Castiarina pallidiventris</i>	X	
	<i>Catasarcus cygnensis</i>	X	
	<i>Catasarcus nephelodes</i>	X	
	<i>Cellana radiata</i>	X	
	<i>Ceratopogonidae sp.</i>	X	
	<i>Ceriodaphnia sp.</i>	X	
	<i>Chalcolampra aenea</i>	X	
	<i>Chalcopteroides eremita</i>	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extinct, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Chalcopteroides longipennis</i>	X	
	<i>Chalcopteroides puncticollis</i>	X	
	<i>Cheirodes sardous</i>	X	
	<i>Cherax quinquecarinatus</i>	X	
	<i>Chironomus</i> aff. <i>alternans</i> (V) (CB)	X	
	<i>Chironomus tepperi</i>	X	
	<i>Chostonectes</i> sp.	X	
	<i>Chrysomelidae</i> sp.	X	
	<i>Chydoridae</i> sp.	X	
	<i>Chydorus</i> sp.	X	
	<i>Cladopelma curtivalva</i>	X	
	<i>Coccophagus</i> sp.	X	
	<i>Colpochila</i> sp.	X	
	<i>Colpochilodes raucipennis</i>	X	
	<i>Copelatus</i> sp.	X	
	<i>Copidita erythroderes</i>	X	
	<i>Cormocephalus aurantiipes</i>	X	
	<i>Cormocephalus strigosus</i>	X	
	<i>Cormocephalus turneri</i>	X	
	<i>Corynoneura australiensis</i>	X	
	<i>Corynoneura scutellata</i>	X	
	<i>Crematogaster rufotestacea</i>	X	
	<i>Cryptocephalus</i> sp.	X	
	<i>Cryptodus costulipennis</i>	X	
	<i>Cryptodus</i> sp.	X	
	<i>Cryptodus variolosus</i>	X	
	<i>Culex</i> (Culex) <i>annulirostris</i>	X	
	<i>Culex</i> (Culex) <i>australicus</i>	X	
	<i>Culex globocoxitus</i>	X	
	<i>Culex</i> sp.	X	
	<i>Culex stricklandi</i>	X	
	<i>Curculionidae</i> sp.	X	
	<i>Cybister</i> sp.	X	
	<i>Cypretta</i> aff. <i>globosa</i>	X	
	<i>Cypretta baylyi</i>	X	
	<i>Cypretta</i> sp.	X	
	<i>Cypretta</i> sp.	X	
	<i>Cyprinotus cingalensis</i> (ex edwardi)	X	
	<i>Cyzicus</i> sp.	X	
	<i>Daphnia carinata</i>	X	
	<i>Diadoxus erythrurus</i>	X	
	<i>Diaea pilula</i>	X	
	<i>Diaphanops westermanni</i>	X	
	<i>Diaphanosoma</i> sp.	X	
	<i>Dicrotendipes conjunctus</i>	X	
	<i>Diptera</i> sp.	X	
	<i>Ditropidella jacobyi</i>	X	
	<i>Ditropidus concolor</i>	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extinct, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Ditropidus distinguendus</i>	x	
	<i>Ditropidus fugitivus</i>	x	
	<i>Ditropidus laeviscolis</i>	x	
	<i>Ditropidus pictus</i>	x	
	<i>Ditropidus pulchellus</i>	x	
	<i>Dryophilodes latipennis</i>	x	
	<i>Dunhevedia</i> aff. <i>crassa</i>	x	
	<i>Eboo pusilla</i>	x	
	<i>Eboo tantilla</i>	x	
	<i>Echinisca</i> sp.	x	
	<i>Ectinorhynchus levis</i>	x	
	<i>Ectyche erebea</i>	x	
	<i>Edusella aureoviridis</i>	x	
	<i>Edusella sericea</i>	x	
	<i>Eleale simplex</i>	x	
	<i>Empididae</i> sp.	x	
	<i>Emplesis sordida</i>	x	
	<i>Enochrus elongatulus</i>	x	
	<i>Enochrus</i> sp.	x	
	<i>Eretes australis</i>	x	
	<i>Ethomela</i> sp.	x	
	<i>Euclarkia costata</i>	x	
	<i>Eucypris virens</i>	x	
	<i>Eulimnadia</i> sp.	x	
	<i>Euomma testacea</i>	x	
	<i>Eupines</i> (Eupines) <i>mira</i>	x	
	<i>Euryspilus viridis</i>	x	
	<i>Euthenarus comes</i>	x	
	<i>Exocelina ater</i>	x	
	<i>Exocelina ferrugineus</i>	x	
	<i>Eylais</i> sp.	x	
	<i>Gastropoda marine</i> sp. RCM	x	
	<i>Geitoneura klugii</i>	x	
	<i>Geloptera nodosa</i>	x	
	<i>Geloptera</i> sp.	x	
	<i>Glossocheilifer labialis</i>	x	
	<i>Gnathoxys granularis</i>	x	
	<i>Gnathoxys insignitus</i>	x	
	<i>Gnathoxys</i> sp.	x	
	<i>Gonocephalum elderi</i>	x	
	<i>Graptoleberis</i> sp.	x	
	<i>Gyraulus</i> sp.	x	
	<i>Haliotis laevigata</i>	x	
	<i>Haliotis roei</i>	x	
	<i>Haliotis scalaris</i> subsp. <i>scalaris</i>	x	
	<i>Haliotis semiplicata</i>	x	
	<i>Haliplus</i> sp.	x	
	<i>Haliplus testudo</i>	x	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extinct, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Helea opacicollis</i>	X	
	<i>Helea perforata</i>	X	
	<i>Helicoverpa punctigera</i>	X	
	<i>Hellyethira malleoforma</i>	X	
	<i>Hellyethira simplex</i>	X	
	<i>Hellyethira</i> sp.	X	
	<i>Hemianax papuensis</i>	X	
	<i>Hemiboeckella andersonae</i>	X	
	<i>Hemicordulia tau</i>	X	
	<i>Henicops dentatus</i>	X	
	<i>Heterocerus scabriusculus</i>	X	
	<i>Heterotermes platycephalus</i>	X	
	<i>Hirudinea</i> sp.	X	
	<i>Homethes sericeus</i>	X	
	<i>Hydaticus</i> sp.	X	
	<i>Hyderodes crassus</i>	X	
	<i>Hydrochus</i> sp.	X	
	<i>Hydrophilidae</i> sp.	X	
	<i>Hyocis</i> (<i>Hyocis</i>) <i>occidentalis</i>	X	
	<i>Hyocis</i> (<i>Nannohyocis</i>) <i>inquilina</i>	X	
	<i>Hyphydrus elegans</i>	X	
	<i>Hyphydrus</i> sp.	X	
	<i>Ilyodromus</i> sp. (south-west, CB)	X	
	<i>Iridomyrmex hartmeyer</i>	X	
	<i>Iridomyrmex innocens</i>	X	
	<i>Isopteron costatum</i>	X	
	<i>Junonia villida</i> subsp. <i>villida</i>	X	
	<i>Karaops ellenae</i>	X	
	<i>Kobonga umbrimargo</i>	X	
	<i>Laccophilus</i> sp.	X	
	<i>Lacrimicypris kumbar</i>	X	
	<i>Lancetes</i> sp.	X	
	<i>Latonopsis</i> sp.	X	
	<i>Leander</i> sp.	X	
	<i>Lecanomerus verticalis</i>	X	
	<i>Leioproctus</i> (<i>Leioproctus</i>) <i>apicalis</i>	X	
	<i>Lemidia obliquefasciata</i>	X	
	<i>Lepidoptera</i> sp.	X	
	<i>Limbodessus inornatus</i>	X	
	<i>Limbodessus</i> sp.	X	
	<i>Limnesia</i> sp.	X	
	<i>Limnichidae</i> sp.	X	
	<i>Limnocythere dorsosicula</i>	X	
	<i>Limnocythere mowbrayensis</i>	X	
	<i>Limnocythere</i> sp.	X	
	<i>Limnophyes</i> sp.	X	
	<i>Limnoxenus zelandicus</i>	X	
	<i>Liparetrus gravidus</i>	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extant, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Liparetrus laevis</i>	X	
	<i>Liparetrus lepidopygus</i>	X	
	<i>Liparetrus picipennis</i>	X	
	<i>Liparetrus rubefactus</i>	X	
	<i>Liparetrus striatus</i>	X	
	<i>Liparetrus tristis</i>	X	
	<i>Lynceus</i> sp.	X	
	<i>Macrothrix</i> sp.	X	
	<i>Macrothrix</i> sp. A (CB)	X	
	<i>Macrothrix</i> sp. b (of RJS) (SAP)	X	
	<i>Marphysa</i> sp.	X	
	<i>Mecynotarsus hortensis</i>	X	
	<i>Megachile latericauda</i>	X	
	<i>Megaporus howitti</i>	X	
	<i>Megaporus solidus</i>	X	
	<i>Megaporus</i> sp.	X	
	<i>Meliboeithon confusum</i>	X	
	<i>Melobasis cuprifera</i>	X	
	<i>Melobasis gloriosa</i>	X	
	<i>Melobasis occidentalis</i>	X	
	<i>Melobasis propinqua</i> subsp. <i>propinqua</i>	X	
	<i>Menochilus sexmaculatus</i>	X	
	<i>Mesocyclops brooksi</i>	X	
	<i>Mesocyclops</i> sp.	X	
	<i>Mesodina cyanophracta</i>	X	
	<i>Metacyclops</i> sp. EB	X	
	<i>Micrectyche ferruginea</i>	X	
	<i>Microcyclops</i> sp. EB	X	
	<i>Microcyclops</i> sp. EB	X	
	<i>Micronecta robusta</i>	X	
	<i>Micronecta</i> sp.	X	
	<i>Mixocyclops</i> sp. LG	X	
	<i>Moina</i> sp.	X	
	<i>Moinidae</i> sp.	X	
	<i>Molophilus (Molophilus) flavoannulatus</i>	X	
	<i>Monocorophium acherusicum</i>	X	
	<i>Monocorophium insidiosum</i>	X	
	<i>Monolepta hypomela</i>	X	
	<i>Myrmecia mandibularis</i>	X	
	<i>Necterosoma regulare</i>	X	
	<i>Neodon laevis</i>	X	
	<i>Neophyllotocus rostratus</i>	X	
	<i>Neothrix armata</i>	X	
	<i>Newnhamia fenestrata</i>	X	
	<i>Nicodamus mainae</i>	X	
	<i>Nothorhaphium aemulans</i>	X	
	<i>Notiobia (Anisotarsus) dampierii</i>	X	
	<i>Notiobia (Anisotarsus) inaequalipennis</i>	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extant, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Novapus crassus</i>	X	
	<i>Ochterus occidentalis</i>	X	
	<i>Odontophlogistus unguatus</i>	X	
	<i>Oligochaeta</i> sp.	X	
	<i>Omolipus cyaneus</i>	X	
	<i>Omorgus</i> (<i>Omorgus</i>) <i>australasiae</i>	X	
	<i>Onychohydrus atratus</i>	X	
	<i>Onychohydrus scutellaris</i>	X	
	<i>Onychohydrus</i> sp.	X	
	<i>Oribatida</i> sp.	X	
	<i>Orthocladinae</i> sp.	X	
	<i>Pachyneuron emersoni</i>	X	
	<i>Pachytricha tecta</i>	X	
	<i>Paracymus pygmaeus</i>	X	
	<i>Paralimnocythere</i> sp. (south-west, CB)	X	
	<i>Paralimnophyes pullulus</i> (V)	X	
	<i>Paramerina levidensis</i>	X	
	<i>Paramphisopus palustris</i>	X	
	<i>Parasemus australiae</i>	X	
	<i>Parastacidae</i> sp.	X	
	<i>Paratanytarsus parthenogeneticus</i>	X	
	<i>Paropsis geographica</i>	X	
	<i>Paropsis</i> sp.	X	
	<i>Paropsisterna beata</i>	X	
	<i>Paropsisterna elliptica</i>	X	
	<i>Paropsisterna rufipes</i>	X	
	<i>Paropsisterna semifumata</i>	X	
	<i>Paropsisterna</i> sp.	X	
	<i>Paroster niger</i>	X	
	<i>Paroster</i> sp.	X	
	<i>Paroster</i> sp. (Ellen Brook)	X	
	<i>Patella (scutellastra)</i>	X	
	<i>Peltoschema nigroconspersa</i>	X	
	<i>Peltoschema oceanica</i>	X	
	<i>Peltoschema</i> sp.	X	
	<i>Peltoschema suturalis</i>	X	
	<i>Perilampomyia notatifrons</i>	X	
	<i>Phasianella ventricosa</i>	X	
	<i>Phlogistus</i> sp.	X	
	<i>Physa</i> sp.	X	
	<i>Physastra</i> sp.	X	
	<i>Piona murleyi</i>	X	
	<i>Piona</i> sp.	X	
	<i>Pison tibiale</i>	X	
	<i>Platydemia aries</i>	X	
	<i>Platynectes</i> sp.	X	
	<i>Podotenus insignior</i>	X	
	<i>Pogonoscopus myrmex</i>	X	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extinct, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Prasonotus submetallicus</i>	x	
	<i>Prochelyna heterodoxa</i>	x	
	<i>Procladius villosimanus</i>	x	
	<i>Promochlonyx australiensis</i>	x	
	<i>Prothalotia</i> sp.	x	
	<i>Pseudocephalus mira</i>	x	
	<i>Pterochelus triformis</i>	x	
	<i>Pterohelaeus cereus</i>	x	
	<i>Pterohelaeus parallelus</i>	x	
	<i>Ptilodactylidae</i> sp.	x	
	<i>Rhamphus</i> sp.	x	
	<i>Rhantus</i> sp.	x	
	<i>Rhantus suturalis</i>	x	
	<i>Rhyssemus blackburnei</i>	x	
	<i>Rhytiphora (platymopsis)</i>	x	
	<i>Rhyzobius nitidus</i>	x	
	<i>Rhyzobius</i> sp.	x	
	<i>Rodwayia occidentalis</i>	x	
	<i>Salinator fragilis</i>	x	
	<i>Saprosites mansuetus</i>	x	
	<i>Sarscypridopsis aculeata</i>	x	
	<i>Scapholeberis kingi</i>	x	
	<i>Scapholeberis</i> sp.	x	
	<i>Scaraphites silenus</i>	x	
	<i>Sciomyzidae</i> sp.	x	
	<i>Scirtidae</i> sp.	x	
	<i>Scitula</i> sp.	x	
	<i>Scolopendra laeta</i>	x	
	<i>Scutus (Scutus) antipodes</i>	x	
	<i>Semanopterus angustatus</i>	x	
	<i>Semanopterus leai</i>	x	
	<i>Simocephalus</i> sp.	x	
	<i>Simosyrphus grandicornis</i>	x	
	<i>Simplisetia aequisetis</i>	x	
	<i>Sphaeroscelis pectoralis</i>	x	
	<i>Staphylinidae</i> sp.	x	
	<i>Stenoderus</i> sp.	x	
	<i>Sternopriscus browni</i>	x	
	<i>Sternopriscus marginatus</i>	x	
	<i>Sternopriscus minimus</i>	x	
	<i>Sternopriscus</i> sp.	x	
	<i>Strandesia</i> sp. (TWS)	x	
	<i>Stratiomyidae</i> sp.	x	
	<i>Succinea</i> sp.	x	
	<i>Sympetes gagates</i>	x	
	<i>Sympetes patelliformis</i>	x	
	<i>Sympetes rotundatus</i>	x	
	<i>Sympetes subrugosus</i>	x	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extinct, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	<i>Sympycnus</i> sp.	x	
	<i>Synothele taurus</i>	x	
	<i>Tabanidae</i> sp.	x	
	<i>Tanypodinae</i> sp.	x	
	<i>Tanytarsus fuscithorax/semibarbitarsus</i>	x	
	<i>Tanytarsus</i> sp.	x	
	<i>Tarsostenus univittatus</i>	x	
	<i>Tasmanicosa leuckartii</i>	x	
	<i>Thalycrodes mixtum</i>	x	
	<i>Thiara</i> sp.	x	
	<i>Thorictosoma ectatommae</i>	x	
	<i>Tiracerus subcylindricornis</i>	x	
	<i>Trachymela granaria</i>	x	
	<i>Trachymela semiglobosa</i>	x	
	<i>Trachyscelis ciliaris</i>	x	
	<i>Trichocyclus nullarbor</i>	x	
	<i>Triplectides australis</i>	x	
	<i>Trissodon curtus</i>	x	
	<i>Trissodon subopacus</i>	x	
	<i>Turbellaria</i> sp.	x	
	<i>Turbo (Ninella) torquatus</i>	x	
	<i>Ulomoides tetraspilotus</i>	x	
	<i>Urodacus novaehollandiae</i>	x	
	<i>Westrpyrgus slacksmithae</i>	x	
	<i>Xanthagrion erythroneurum</i>	x	
	<i>Xenopus pulchripennis</i>	x	
	<i>Xyrosclis crocata</i>	x	
Mammals	<i>Bettongia penicillata ogilbyi</i> (Woylie)		E
	<i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)	x	
	<i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)	x	V
	<i>Hydromys chrysogaster</i> (Water-rat)	x	
	<i>Isodon obesulus</i> (Southern Brown Bandicoot)	x	
	<i>Isodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)	x	
	<i>Macropus eugenii</i> subsp. <i>derbianus</i> (Tamar Wallaby (WA subsp.))	x	
	<i>Macropus fuliginosus</i> (Western Grey Kangaroo)	x	
	<i>Petrogale lateralis</i> subsp. <i>lateralis</i> (Black-flanked Rock-wallaby, Black Rock Wallaby)	x	V
	<i>Rattus rattus</i> (Black Rat)	x	
	<i>Rattus</i> sp.	x	
	<i>Trichosurus vulpecula</i> (Common Brushtail Possum)	x	

APPENDIX B: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA, APRIL 2016

Note: T = Rare or likely to become extint, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2016) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Reptiles	<i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python)	x	
	<i>Aprasia repens</i> (Sand-plain Worm-lizard)	x	
	<i>Brachyuophis semifasciatus</i> (Southern Shovel-nosed Snake)	x	
	<i>Chelodina colliciei</i> (Oblong Turtle)	x	
	<i>Crenadactylus ocellatus</i> subsp. <i>ocellatus</i> (Clawless Gecko)	x	
	<i>Cryptoblepharus buehneri</i>	x	
	<i>Ctenophorus ornatus</i> (Ornate Crevice-Dragon)	x	
	<i>Diplodactylus granariensis</i> subsp. <i>granariensis</i>	x	
	<i>Gehyra variegata</i>	x	
	<i>Hemiergis initialis</i> subsp. <i>initialis</i>	x	
	<i>Hesperoedura reticulata</i>	x	
	<i>Lerista christinae</i>	x	
	<i>Lialis burtonis</i>	x	
	<i>Menetia greyii</i>	x	
	<i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)	x	
	<i>Morethia obscura</i>	x	
	<i>Notechis scutatus</i> (Tiger Snake)	x	
	<i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)	x	
	<i>Pseudechis australis</i> (Mulga Snake)	x	
	<i>Pseudemydura umbrina</i> (Western Swamp Turtle, tortoise)	x	
	<i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)	x	
	<i>Pseudonaja mengdeni</i> (Western Brown Snake)	x	
	<i>Strophurus spinigerus</i> subsp. <i>inornatus</i>	x	
	<i>Strophurus spinigerus</i> subsp. <i>spinigerus</i>	x	
	<i>Tiliqua occipitalis</i> (Western Bluetongue)	x	
	<i>Tiliqua rugosa</i> subsp. <i>rugosa</i>	x	
	<i>Underwoodisaurus milii</i> (Barking Gecko)	x	
	<i>Varanus tristis</i> (Racehorse Monitor)	x	

