Mattiske Consulting Pty Ltd

[redacted]

REVIEW OF FLORA, VEGETATION AND FAUNA VALUES ON LOTS 5 & 6 (NO 1728) GREAT NORTHERN HIGHWAY, BULLSBROOK

1. INTRODUCTION

Mattiske Consulting Pty Ltd was commissioned in November 2018 by Brikmakers to undertake a flora, vegetation and fauna assessment of a proposed expansion area for clay and sand extraction to the south of Walyunga Road. The proposed expansion area occurs on approximately 15.9141 hectares of which 2.31ha consists of isolated trees and small remnants of Jarrah, Marri and Wandoo over pasture on the proposed northern sand pit, 0.17ha consists of Banksia trees over pasture on the proposed northern sand pit, 0.08ha consists of planted trees on the proposed southern sand pit, 0.08 consists of isolated Sheoak trees over pasture and 0.03ha consists of an isolated Marri tree on the proposed clay pit, see Figures 1 and 2 and Appendix A (photographs). The majority of the area is completely degraded and is currently used for grazing cattle. In the remaining areas of trees, the understorey is dominated by pasture species or introduced species. The latter degraded nature of the area has resulted from the agricultural activities on the area.

It is also intended to clear a small section (620m^2) of the road verges of Walyunga Road, Bullsbrook, Figure 3 and Appendix A. The area occurs on the Pinjarra plain on the eastern section of the Swan Coastal Plain. The section of road verge is proposed to be required to ensure safe access to the areas to the south of Walyunga Road. Currently there is a bend in the road which restricts vision near the proposed access to the proposed expansion area to the south of Walyunga Road.

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 proposed clay and sand extraction and stockpiling of extracted materials.

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 (2018b) and the Department of the Environment and Energy (2018a) 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.

Legend
- Clearing Area 19/11/2018
- 2018 Survey Area

Note
Aerial Photography - Landgate (Aug 2018)

Client: [redacted]

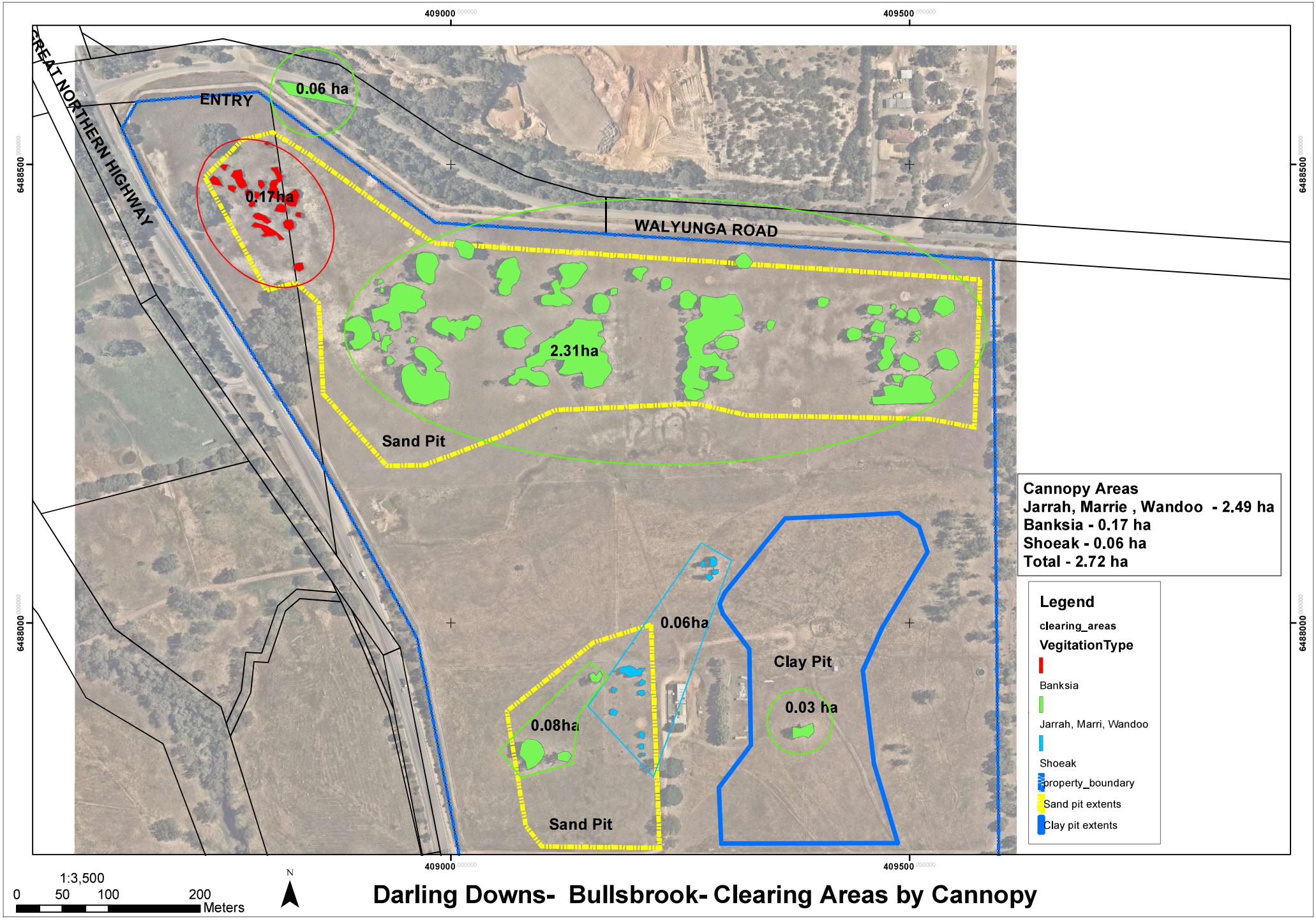
N

0 20 40 60 80 m
Scale: 1:4,000
MGA94 (Zone 50)
CAD Ref: a2471_f06
Date: Nov 2018 | Rev: A | A3

Mattiske Consulting Pty Ltd
[redacted]
MCPL Ref: BGC1801

Walyunga Quarry
Aerial Photography
as at August 2018

Figure: 1



Darling Downs- Bullsbrook- Clearing Areas by Cannopy

Darling Downs- Bullsbrook- Propsed Entry Layout

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 2018b).

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 and Energy website (2018a, 2018b).

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 2018d). 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 and Energy (Department of the Environment and Energy 2018a).

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 2018d). Threatened ecological communities are gazetted as such (Department of Parks and Wildlife 2018e).

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 and Energy (2018b) 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 C).

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 and Energy 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 2018c). 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 2018b).

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 and Energy, 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 and Energy website (Department of the Environment and Energy 2018c).

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 extraction and stockpile 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 rhaphiophylla.* 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 and Energy 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 survey area was used as a search reference point. All plant taxa names were verified using Florabase (Department of Parks and Wildlife 2018g).

4.2 Field Assessment

The flora, vegetation and fauna values on the survey area were assessed by [redacted] on November 21st, 2018. No quadrats were established as the vegetation was very disturbed in the expansion area. Three quadrats were established within the small section of the road reserve south of Walyunga Road which is required to ensure clear vision for vehicles entering the extension area.

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 have been recorded within a 5km radius of the survey area (Appendix B). This total reflects the proximity of the Walyunga National Park to the east and the Bush Forever site to the north of the 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 (2018b) had the potential to occur within the survey area (Appendix B). 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 and Energy 2018a) had the potential to occur within the survey area (Appendix B).

A total of 21 Priority Flora species as listed by the Department of Parks and Wildlife (2018b) had the potential to be recorded within the survey area (Appendix B). Three Priority 1, three Priority 2, nine Priority 3 and six Priority 4 Flora species were recorded within the survey area (Appendix B).

5.2 Potential Threatened and Priority Ecological Communities

Three Threatened Ecological Communities were potentially identified as occurring within 5 km of the proposed extraction and stockpiling 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 survey area. This threatened ecological community is critically endangered pursuant to the *EPBC Act* and as listed by the Department of the Environment and Energy (2018c).

. The Threatened Ecological Community (*Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrubland of the Swan Coastal Plain) occurs on the eastern fluviatile soils of the Pinjarra Plain including the Guildford system as defined by Churchward and McArthur (1980). This latter community is listed as endangered according the *EPBC Act* and as listed by the Department of the Environment and Energy (2018c).

. The Threatened Ecological Community (*Banksia* Woodlands of the Swan Coastal Plain ecological community). This latter community is listed as endangered according the *EPBC Act* and as listed by the Department of the Environment and Energy (2018c).

Brief descriptions of the 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 and energy 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 alopecuroidea* (Gibson *et al.* 1994). The introduced species *Briza maxima* and *Romulea rosea* are also common (Gibson *et al.* 1994).

***Banksia* Woodlands of the Swan Coastal Plain of the Swan Coastal Plain (Endangered)**

These woodlands include Banksia woodlands on primarily on well drained, low nutrient soils in sands of dune landforms, in particular deep Bassendean and Spearwood sands, or occasionally on Quindalup sands. It is also common on sandy colluvium and Aeolian (wind-blown) sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau. Variations occur in the composition, but there is generally a dominant Banksia *(Banksia attenuata, Banksia menziesii, Banksia prionotes* or *Banksia ilicifolia).* The area near Walyunga Road occurs on the Ridge Hill Shelf and as such has the potential to support these woodlands.

The following Priority Ecological Communities were identified as occurring within 5 km of the proposed extraction and stockpiling areas (5km radius). These are outlined below, according to Department of Parks and Wildlife (2018f):

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/PEC communities associated with the eastern slope soils of the Swan Coastal Plain include the TEC - *Corymbia calophylla – Xanthorrhoea preissii* community and the TEC **–** *Banksia* Woodlands 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 and Energy 2018c). 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 C, 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).

Marri (*Corymbia calophylla*) trees are amongst species used for foraging by the listed Cockatoo species, Predominately Carnaby's Black Cockatoo (E) (*Calyptorhyncvhus latirotris*); Forest Red-tailed Black Cockatoo (V) (*Calyptorhyncvhus banksia naso*) and Baudin's Black Cockatoo (V) (*Calyptorhyncvhus 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).

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

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 within Proposed Expansion Area

The majority of the proposed expansion area has been cleared for decades and is dominated Jarrah (*Eucalyptus marginata*), by Marri (*Corymbia calophylla* trees), and Wandoo (*Eucalyptus wandoo*) over pasture species, Figures 1 and 2. A small patch of *Banksia* trees over pasture occurs in the north-western section of the northern area.

- Jarrah (*Eucalyptus marginata*) trees that are restricted to the southern fringes of the proposed extraction and stockpiling areas and consist mainly of previously cut trees that have developed multiple stems (coppicing) from the main base (Photographs 3, 4, 5 in Appendix A).
- Marri (*Corymbia calophylla)* trees that tend to be multi-branched trees with extensive canopies as a result of little competition in the overstorey (Photographs 1, 5 in Appendix A).
- Wandoo (*Eucalyptus wandoo*) trees are restricted to the slopes in the south-eastern section of the property as regrowth stands over pasture on the slopes to the east. These slopes are outside the proposed clearing areas.
- A small patch of mixed *Banksia menziesii* and *Banksia attenuata* over pasture species was recorded on the north-western section of the survey area (see Photograph 6 in Appendix A).
- No creek line was present, just a slightly lower depression.
- There were some planted trees of *Allocasuarina* (Photograph 2 in Appendix A) and *Eucalyptus* that occurred in the small patches in the central and southern sections of the properties. These patches supported only an occasional tree over pasture. No hollows were present in these latter trees.

A total of 34 trees were identified that demonstrated a DBH ≥ 50cm (28 Jarrah and 6 Marri) and a total of 9 trees (3 Jarrah and 6 Marri) were recorded that had a DBH ≥ 100cm. In addition there were patches of regrowth Jarrah with the occasional *Banksia grandis, Allocasuarina fraseriana, Banksia attenuata* and *Banksia menziesii*. As these trees occur in previous agricultural areas over mainly pasture species, the canopies are broad and following close inspection it was apparent that the trees supported smaller upper stems which are not suitable for forming larger hollows that the Black Cockatoos could utilize for 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. The latter was only observed from two larger Marri trees with chewed fruit on the ground during the site inspection. The main values of the flora and vegetation relate to the very occasional foraging of the Marri trees by the Black Cockatoos. At this juncture it is apparent that the foraging resources within the survey area are insignificant when compared with the potential foraging areas within the forested areas to the east in the Walyunga National Park (located east of the survey area on the upper slopes of the Darling Scarp and on the Darling Ranges).

The other community was a stand of mixed *Banksia* species (*Banksia menziesii* and *Banksia attenuata*) on the leached grey sands in the north-western section of the survey area on the expansion area. This community consisted of Banksia trees over pasture grasses and as such reflected the long history of agricultural activities on this survey area. The only alignment with the Banksia TEC woodland community would be the Banksia trees as such have little in common with the more intact areas of the *Banksia* woodlands on the Swan Coastal Plain.

The understorey consisted of pasture grasses only; although there were some *Xanthorrhoea* species upslope from the survey area with a few introduced species including Narrow Leaf Cotton bush (*Gomphocarpus fruticosus*) (a declared pest in Western Australia according to Department of Agriculture and Food 2018 (Declared Plant List - Biosecurity and Agriculture Management Act 2007, Apple of Sodom (*Solanum linnaeanum*), Oats (*Avena* spp.), Veldt Grass (**Ehrharta* spp.). 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.

6.2 Flora and Vegetation within Walyunga Road Reserve

The road reserve supported a woodland of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla* trees) over the occasional *Banksia grandis, Banksia menziesii* and *Banksia attenuata*, over mature *Jacksonia sternbergiana, Xanthorrhoea preissii, Banksia sessilis, Acacia saligna* and *Hibbertia hypoericoides.* The area was dominated by stressed *Jacksonia sternbergiana* and *Banksia sessilis,* Photographs 7, 8 and 9 in Appendix A). The lower understorey was dominated by the introduced grasses **Ehrhardta calycina* (Veldt grass) and **Briza maxima.*

The vegetation on the verge area is relatively disturbed with falling dead *Jacksona sternbergiana* plants. The range of species recorded at the three sites is summarized in Table 3 below. These results reflect a low diversity of native species and the invasion of some introduced species from nearby disturbed areas.

Table 3: Species recorded within the Walyunga Road reserve

Species	Site 1	Site 2	Site 3
Eucalyptus marginata	+		
Corymbia calophylla	+	+	+
Banksia grandis	+	+	+
Banksia menziesii	+	+	+
Banksia attenuata		+	
Jacksonia sternbergiana	+	+	+
Banksia sessilis	+	+	+
Xanthorrhoea preissii	+	+	+
Stirlingia latifolia			+
Banksia dallanneyi			+
Hibbertia hypericoides			+
Hibbertia racemosa			+
Tricoryne elatior		+	+
Chamaescilla corymbosa		+	
Desmocladus flexuosus		*	
Mesomelaena stygia			+
Hardenbergia comptoniana			+
Acacia saligna			+
Ptilotus polystachyus	+		
**Ehrharta calycina*	+	+	+
**Briza maxima*	+	+	+
**Aira caryophyllea*	+		
**Freesia alba x leichtlinii*			+

6.3 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 (2018b) were recorded within the survey area. No threatened flora pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and as listed by the Department of the Environment and Energy (2018a) were recorded within the survey area. The timing of the survey effort in November would not have influenced the coverage of the flora as the proposed clearing areas have been highly modified in the past by grazing, previous clearing, storage areas and office areas. In addition, the seasonal conditions in spring 2018 supported a later flowering of plant species.

6.4 Threatened and Priority Ecological Communities

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

6.5 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*), Jarrah (*Eucalyptus marginata*) and Banksia tree species occurred on open paddocks. The canopies of the Marri and Jarrah trees were broad and as such the branches were extensive and only a few small hollows that were unsuitable for the listed Black Cockatoos. As such, it is unlikely that the trees are suitable for Black Cockatoo nesting. There was also limited foraging and a few very old chewed fruit chewed by birds were observed on the ground under a couple of Marri trees. Consequently the most likely potential use of the paddock trees is likely to be occasional foraging by the Black Cockatoos. At this juncture it is relevant to reiterate that the foraging resources within the survey area and minimal when compared with the potential foraging areas within the forested areas to the east in the Walyunga National Park (located east of the survey area on the upper slopes of the Darling Scarp and on the Darling Ranges).

As the extraction and stockpiling area occurs on drier slopes and a modified minor gully the habitat is not suitable for the listed Western Swamp Tortoise. The proposed activities are unlikely to influence the swamps that support this species further west as the proposed areas abut 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 mainly very open and the vegetation consists predominately of *Eucalyptus marginata, Corymbia calophylla* and several *Banksia* species. There is no distinct understorey layer and grassy weeds dominate the ground cover in the expansion area. The area on the road side verges is less disturbed and is dominated by a few species such as *Jacksonia sternbergiana* and *Banksia sessilis* and a range of introduced grasses. The project area consists of the Guildford 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 Guildford complex described by Mattiske and Havel (1998). The data collected form the survey completed in November by Dr Mattiske indicates a low level of biodiversity, with only a few native tree species and a lack of native understorey species recorded within the survey area. Although the diversity of species was slightly higher on the road verges of Walyunga Road, the diversity remained low relative to less disturbed areas of vegetation in the region. The latter reflects the narrow nature of the road verge in this area. The aerial photograph and photographs from the recent survey conducted in 2018 shows evidence of the area experiencing heavy grazing (Figures 1 and 2, and Appendix A).
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 south of Walyunga Road, Bullsbrook has been heavily cleared and grazed. A total of 34 trees recorded a DBH ≥ 50cm and 9 trees recorded a DBH ≥ 100cm. Only a few trees had existing small hollows. These small hollows were not considered to be suitable for Black-cockatoos. 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 but not suitable for breeding or roosting activities. However in view of the isolated trees and restricted area of the degraded remnants in the area, the condition of the understorey the proposed areas and the proximity of the Walyunga National Park to the east the proposed operations are insignificant locally, regionally and nationally in terms of potential fauna usage. 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 *Wildlife Conservation Act* 1950 and as listed by the Department of Parks and Wildlife were recorded within the survey area. No threatened flora pursuant to the *Environment Protection and Biodiversity Conservation Act 1*999 and as listed by the Department of the Environment and Energy 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 activities the vegetation is degraded and supports 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 *Wildlife Conservation Act 1950* and as listed by the Department of Parks and Wildlife (2018e) were recorded within the survey area. No Threatened Ecological Communities, pursuant to the *EPBC Act* and as listed by the Department of the Environment and Energy (2018c) were recorded within the 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 activities the vegetation is degraded and supports a very low range of native species. The degraded state is shown in the photographs from the assessment area. The small section of the Walyunga road reserve is in a good to very good condition. Due to its size (520m^2) and the degree of disturbance to adjacent areas by agricultural activities it is unlikely that this area will sustain this condition status in the longer term.
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 survey area does not occur on a watercourse or wetland 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 The degree of degradation is evident in the photographs (Appendix A) and as such reflects the previous agricultural and clearing activities.
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 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 largely on agricultural areas 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 largely on agricultural areas the proposed activities are at variance to this principle.

8. CONCLUSIONS

In view of the degree of past clearing activities and past agricultural activities on the 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, Jarrah and Wandoo trees 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. Some of the trees on this property provide an opportunity for occasional foraging by the listed Black-cockatoo species. At this juncture it is relevant to reiterate that the foraging resources within the survey area and minimal when compared with the potential foraging areas within the forested areas to the east in the Walyunga National Park (located east of the survey area on the upper slopes of the Darling Scarp and on the Darling Ranges). The canopy of the tree species that occur in the paddocks constitutes a low percentage of the total area 2.67ha of the 15.9141ha (16.8%). Therefore the area is insignificant in the context of providing foraging areas for the Cockatoos. In view of the lack of suitable hollows, the area covered by potential trees for foraging and the proximity of foraging resources in the nearby Walyunga National Park this application area is insignificant in a local, regional or national context.

The road reserve on the southern fringes of Walyunga Road is in slightly better condition than the expansion area, although there is little diversity and some death of the dominant *Jacksonia sternbergiana* in sections of the area. This latter area is less than 620m^2 in area and as such is included in this proposed expansion application in view of safety concerns for vehicles. The impacts on other native flora values, fauna values and native vegetation is insignificant in a local and regional context.

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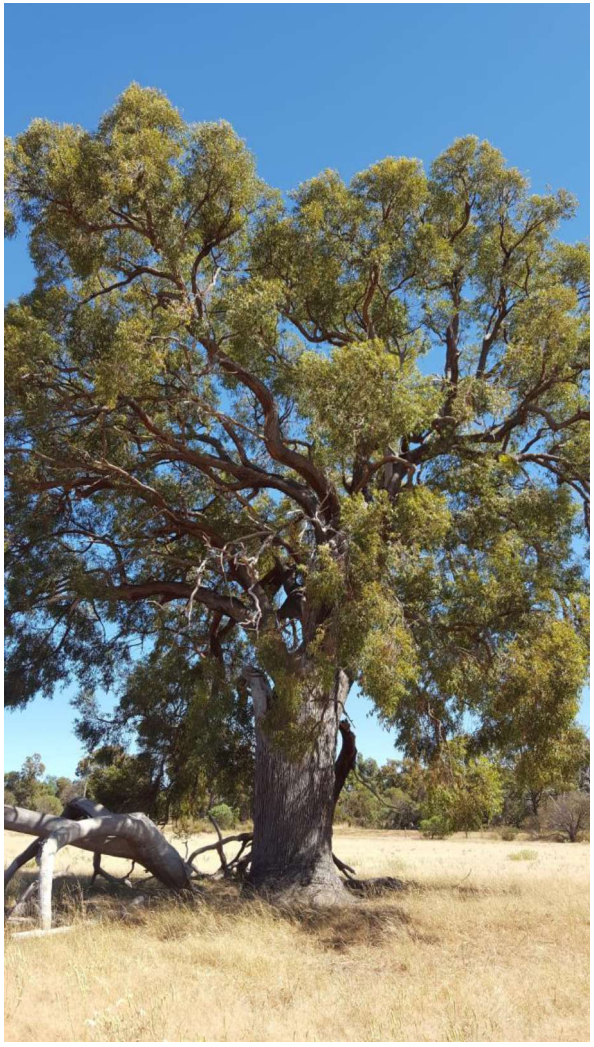
APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK

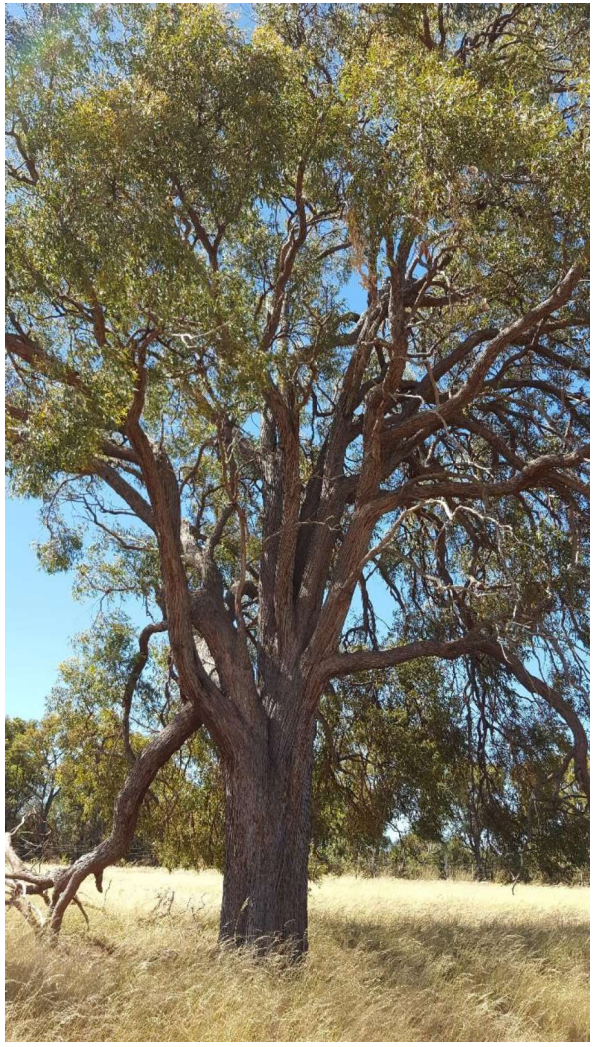
Photograph 1: Isolated Marri (*Corymbia calophylla*) tree over pasture

Photograph 2: Several planted Sheoak trees over pasture in centre of survey area

APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK



Photograph 3: Isolated Jarrah (*Eucalyptus marginata*) tree over pasture



Photograph 4: Isolated Jarrah (*Eucalyptus marginata*) tree over pasture

APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK

Photograph 5: Patch of Regrowth Jarrah – Marri with cattle grazing over pasture species

APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK

Photograph 6: Patch of Regrowth *Banksia menziesii – Banksia attenuata* over pasture species

APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK

Photograph 7: Site 1 on Walyunga Road road reserve, dominance of *Banksia sessilis* and *Jacksonia sternbergiana* over introduced grass species

APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK

Photograph 8: Site 2 on Walyunga Road road reserve, dominance of *Jacksonia sternbergiana* and *Xanthorrhoea preissii* under *Corymbia calophylla* over introduced grass species

APPENDIX A: PHOTOGRAPHIC RECORD OF SURVEY AREA SOUTH OF WALYNUGA ROAD, BULLSBROOK

Photograph 9: Site 3 on Walyunga Road road reserve, dominance of *Banksia sessilis* and *Xanthorrhoea preissii* under *Corymbia calophylla* over introduced grass species

APPENDIX B: 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 2018d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2018g) and Protected Matters Search Tool (DotEE 2018d) refers to the 5 km radius surrounding the survey area.

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX B: 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 2018d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2018g) and Protected Matters Search Tool (DotEE 2018d) refers to the 5 km radius surrounding the survey area.

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

APPENDIX B: 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 2018d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2018g) and Protected Matters Search Tool (DotEE 2018d) refers to the 5 km radius surrounding the survey area.

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

APPENDIX B: 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 2018d); E denotes Endangered and V denotes Vulnerable species (EPBC 1999); Naturemap (DPaW 2018g) and Protected Matters Search Tool (DotEE 2018d) refers to the 5 km radius surrounding the survey area.

FAMILY	SPECIES	SCC	FCC	NATURE MAP	PROTECTED MATTERS SEARCH TOOL
MYRTACEAE (continued)	*Calothamnus sanguineus*			X	
	Calytrix breviseta subsp. *breviseta*	T	E	X	
	Calytrix flavescens			X	
	Calytrix fraseri			X	
	Calytrix glutinosa			X	
	Calytrix sylvana			X	
	Calytrix violacea			X	
	Chamelaucium sp. Winchester (C. Chapman s.n. PERTH 0			X	
	Corymbia calophylla			X	
	Cyathostemon heterantherus			X	
	Darwinia citriodora			X	
	Darwinia pinifolia			X	
	Eremaea asterocarpa subsp. *asterocarpa*			X	
	Eucalyptus longicornis			X	
	Eucalyptus marginata subsp. *marginata*			X	
	Eucalyptus patens			X	
	Eucalyptus pyriformis			X	
	Eucalyptus rudis			X	
	Eucalyptus salubris			X	
	Eucalyptus todtiana			X	
	Eucalyptus wandoo			X	
	Eucalyptus wandoo subsp. *wandoo*			X	
	Hypocalymma angustifolium			X	
	Hypocalymma angustifolium subsp. *Dandaragan plateau* (			X	
	Kunzea baxteri			X	
	Kunzea glabrescens			X	
	Kunzea micrantha			X	
	Kunzea praestans			X	
	Kunzea pulchella			X	
	Kunzea recurva			X	
	Leptospermum erubescens			X	
	Melaleuca holosericea			X	
	Melaleuca lateritia			X	
	Melaleuca manglesii	P1		X	
	Melaleuca parviceps			X	
	Melaleuca radula			X	
	Melaleuca rhaphiophylla			X	
	Melaleuca viminea			X	
	Melaleuca viminea subsp. *viminea*			X	
	Melaleuca sp.			X	
	Pileanthus sp.			X	
	Scholtzia involucrata			X	
	Verticordia acerosa var. *acerosa*			X	
	Verticordia acerosa var. *preissii*			X	
	Verticordia chrysantha			X	
	Verticordia densiflora			X	

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

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

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

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

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

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

APPENDIX C: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA

Note: T = Rare or likely to become extint, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2018) ; V = vulnerable, E = Endangered (EPBC)

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

APPENDIX C: POTENTIAL FAUNA SPECIES RECORDED IN NATUREMAP AND PROTECTED MATTERS SEARCH TOOL FOR THE BRIKMAKERS SURVEY AREA

Note: T = Rare or likely to become extint, IA = Protected under international agreement, P4 = Priority 4, P5 = Priority 5 (DPAW 2018) ; V = vulnerable, E = Endangered (EPBC)

Fauna Group	Species	NatureMap	EPBC
Birds (continued)	*Falco cenchroides* (Australian Kestrel)	x	
	Fulica atra (Eurasian Coot)	x	
	Gallinula tenebrosa (Dusky Moorhen)	x	
	Gavicalis virescens (Singing Honeyeater)	x	
	Gerygone fusca (Western Gerygone)	x	
	Grallina cyanoleuca (Magpie-lark)	x	
	Hirundo neoxena (Welcome Swallow)	x	
	Lichmera indistincta (Brown Honeyeater)	x	
	Leipoa ocellata (Malleefowl)		V
	Lophoictinia isura	x	
	Malurus (Malurus) *splendens*	x	
	Malurus pulcherrimus (Blue-breasted Fairy-wren)	x	
	Malurus splendens (Splendid Fairy-wren)	x	
	Melithreptus brevirostris (Brown-headed Honeyeater)	x	
	Merops ornatus (Rainbow Bee-eater)	IA	
	Microcarbo melanoleucos	x	
	Microeca fascinans (Jacky Winter)	x	
	Nycticorax caledonicus (Rufous Night Heron)	x	
	Ocyphaps lophotes (Crested Pigeon)	x	
	Pachycephala pectoralis (Golden Whistler)	x	
	Pachycephala rufiventris (Rufous Whistler)	x	
	Pardalotus (Pardalotinus) *striatus*	x	
	Pardalotus punctatus (Spotted Pardalote)	x	
	Pardalotus striatus (Striated Pardalote)	x	
	Petroica goodenovii (Red-capped Robin)	x	
	Phalacrocorax melanoleucos (Little Pied Cormorant)	x	
	Phalacrocorax sulcirostris (Little Black Cormorant)	x	
	Phaps chalcoptera (Common Bronzewing)	x	
	Phylidonyris novaehollandiae (New Holland Honeyeater)	x	
	Platycercus icterotis (Western Rosella)	x	
	Porphyrio porphyrio (Purple Swamphen)	x	
	Porphyrio porphyrio subsp. *bellus* (Purple Swamphen)	x	
	Purpureicephalus spurius	x	
	Rhipidura leucophrys (Willie Wagtail)	x	
	Rostratula australis (Austrlian Painted Snipe)		E
	Sericornis frontalis (White-browed Scrubwren)	x	
	Smicrornis brevirostris (Weebill)	x	
	Strepera versicolor (Grey Currawong)	x	
	Streptopelia senegalensis (Laughing Turtle-Dove)	x	
	Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)	x	
	Tachybaptus novaehollandiae subsp. *novaehollandiae* (Australasian Grebe)	x	
	Tadorna tadornoides (Australian Shelduck, Mountain Duck)	x	
	Threskiornis molucca (Australian White Ibis)	x	
	Threskiornis spinicollis (Straw-necked Ibis)	x	
	Todiramphus sanctus (Sacred Kingfisher)	x	
	Tyto alba subsp. *delicatula* (Barn Owl)	x	
	Zosterops lateralis (Grey-breasted White-eye, Silvereye)	x	
Fishes	*Atherinosoma microstoma*	x	
	Atherinosoma sp.	x	
	Carassius auratus	x	
	Cyprinus carpio	x	
	Galaxias occidentalis (Western Minnow)	x	

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Fauna Group	Species	NatureMap	EPBC
Invertebrates	*Ablabesmyia notabilis*	x	
	Acercella falcipes	x	
	Acritoptila globosa	x	
	Acritus (Acritus) *occidentalis*	x	
	Adelium sp.	x	
	Aedes alboannulotus	x	
	Aedriodes nodipennis	x	
	Agetinus nitidivirgatus	x	
	Agraptocorixa sp.	x	
	Alboa worooa	x	
	Allodessus bistrigatus	x	
	Alona sp.	x	
	Alphitobius laevigatus	x	
	Amblyomma triguttatum	x	
	Ametalla spinolae	x	
	Ametalla stenodera	x	
	Amitermes obeuntis	x	
	Aname mainae	x	
	Anisops hyperion	x	
	Anisops occipitalis	x	
	Anisops sp.	x	
	Anisops stali	x	
	Anisops thienemanni	x	
	Anisynta sphenosema	x	
	Anopheles (Cellia) sp.	x	
	Anopheles annulipes sl	x	
	Anoplostethus opalinus	x	
	Antichiropus variabilis	x	
	*Antiporus s*p.	x	
	Apion fuscosuturale	x	
	Aplopsis lineoligera	x	
	Aplopsis longipes	x	
	*Aporocera (*Aporocera) *obtusa*	x	
	Aporocera (Aporocera) *variipennis*	x	
	Arrenurus sp.	x	
	Arsipoda holomelaena	x	
	Arsipoda nitida	x	
	Asceparnus subfasciatus	x	
	Astele (Astele) *armillatum*	x	
	Astichus mirissimus	x	
	Astralium aureum	x	
	Aulacophora olivieri	x	
	Austracantha minax	x	
	Australaphodius frenchi	x	
	Australocyclops australis	x	
	Austroagrion cyane	x	
	Austrochiltonia subtenuis	x	
	Austrolestes analis	x	
	Austrolestes annulosus	x	
	Austrolestes aridus	x	
	Austrolestes io	x	
	Automolius granulatus	x	
	Baetidae sp.	x	
	Bardistus cibarius	x	

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Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	*Belosquilla laevis*	x	
	Bembicium melanostomum	x	
	Bennelongia australis	x	
	Bennelongia cygnus	x	
	Berosus pulchellus	x	
	Berosus sp.	x	
	Bethelium ruida	x	
	Bidessini sp.	x	
	Blackburniella intricata	x	
	Boeckella robusta	x	
	Bolborhachium recticorne	x	
	Bothriembryon (Bothriembryon) *indutus*	x	
	Bracalba sp.	x	
	Brevicyttara cyclospila	x	
	Bruchidius modicus	x	
	Bryantella castanea	x	
	Cadmus (Lachnabothra) *breweri*	x	
	Caedius sphaeroides	x	
	Calamoecia attenuata	x	
	Calamoecia tasmanica subattenuata	x	
	Calomela satelles	x	
	Camponotus sp.	x	
	Carabidae sp.	x	
	Castiarina pallidiventris	x	
	Catasarcus cygnensis	x	
	Catasarcus nephelodes	x	
	Cellana radiata	x	
	Ceratopogonidae sp.	x	
	Ceriodaphnia sp.	x	
	Chalcolampra aenea	x	
	Chalcopteroides eremita	x	
	Chalcopteroides longipennis	x	
	Chalcopteroides puncticollis	x	
	Cheirodes sardous	x	
	Cherax quinquecarinatus	x	
	Chironomus aff. *alternans (*V) (CB)	x	
	Chironomus tepperi	x	
	Chostonectes sp.	x	
	Chrysomelidae sp.	x	
	Chydoridae sp.	x	
	Chydorus sp.	x	
	Cladopelma curtivalva	x	
	Coccophagus sp.	x	
	Colpochila sp.	x	
	Colpochilodes raucipennis	x	
	Copelatus sp.	x	
	Copidita erythroderes	x	
	Cormocephalus aurantiipes	x	
	Cormocephalus strigosus	x	
	Cormocephalus turneri	x	
	Corynoneura australiensis	x	
	Corynoneura scutellata	x	
	Crematogaster rufotestacea	x	
	Cryptocephalus sp.	x	

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Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	*Cryptodus costulipennis*	x	
	Cryptodus sp.	x	
	Cryptodus variolosus	x	
	Culex (Culex) *annulirostris*	x	
	Culex (Culex) *australicus*	x	
	Culex globocoxitus	x	
	Culex sp.	x	
	Culex stricklandi	x	
	Curculionidae sp.	x	
	Cybister sp.	x	
	Cypretta aff. *globosa*	x	
	Cypretta baylyi	x	
	Cypretta sp.	x	
	Cypretta sp.	x	
	Cyprinotus cingalensis (ex edwardi)	x	
	Cyzicus sp.	x	
	Daphnia carinata	x	
	Diadoxus erythrurus	x	
	Diaea pilula	x	
	Diaphanops westermanni	x	
	Diaphanosoma sp.	x	
	Dicrotendipes conjunctus	x	
	Diptera sp.	x	
	Ditropidella jacobyi	x	
	Ditropidus concolor	x	
	Ditropidus distinguendus	x	
	Ditropidus fugitivus	x	
	Ditropidus laevicollis	x	
	Ditropidus pictus	x	
	Ditropidus pulchellus	x	
	Dryophilodes latipennis	x	
	Dunhevedia aff. *crassa*	x	
	Eboo pusilla	x	
	Eboo tantilla	x	
	Echinisca sp.	x	
	Ectinorhynchus levis	x	
	Ectyche erebea	x	
	Edusella aureoviridis	x	
	Edusella sericea	x	
	Eleale simplex	x	
	Empididae sp.	x	
	Emplesis sordida	x	
	Enochrus elongatulus	x	
	Enochrus sp.	x	
	Eretes australis	x	
	Ethomela sp.	x	
	Euclarkia costata	x	
	Eucypris virens	x	
	Eulimnadia sp.	x	
	Euomma testacea	x	
	Eupines (Eupines) *mira*	x	
	Euryspilus viridis	x	
	Euthenarus comes	x	
	Exocelina ater	x	

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Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	*Exocelina ferrugineus*	x	
	Eylais sp.	x	
	Gastropoda marine sp. RCM	x	
	Geitoneura klugii	x	
	Geloptera nodosa	x	
	Geloptera sp.	x	
	Glossocheilifer labialis	x	
	Gnathoxys granularis	x	
	Gnathoxys insignitus	x	
	*Gnathoxys s*p.	x	
	Gonocephalum elderi	x	
	Graptoleberis sp.	x	
	Gyraulus sp.	x	
	Haliotis laevigata	x	
	Haliotis roei	x	
	Haliotis scalaris subsp*. scalaris*	x	
	Haliotis semiplicata	x	
	Haliplus sp.	x	
	Haliplus testudo	x	
	Helea opacicollis	x	
	Helea perforata	x	
	Helicoverpa punctigera	x	
	Hellyethira malleoforma	x	
	Hellyethira simplex	x	
	Hellyethira sp.	x	
	Hemianax papuensis	x	
	Hemiboeckella andersonae	x	
	Hemicordulia tau	x	
	Henicops dentatus	x	
	Heterocerus scabriusculus	x	
	Heterotermes platycephalus	x	
	Hirudinea sp.	x	
	Homethes sericeus	x	
	Hydaticus sp.	x	
	Hyderodes crassus	x	
	*Hydrochus s*p.	x	
	Hydrophilidae sp.	x	
	Hyocis (Hyocis) *occidentalis*	x	
	Hyocis (Nannohyocis) *inquilina*	x	
	Hyphydrus elegans	x	
	Hyphydrus sp.	x	
	Ilyodromus sp. (south-west, CB)	x	
	Iridomyrmex hartmeyeri	x	
	Iridomyrmex innocens	x	
	Isopteron costatum	x	
	Junonia villida subsp. *villida*	x	
	Karaops ellenae	x	
	Kobonga umbrimargo	x	
	Laccophilus sp.	x	
	Lacrimicypris kumbar	x	
	Lancetes sp.	x	
	Latonopsis sp.	x	
	Leander sp.	x	
	Lecanomerus verticalis	x	

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Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	*Leioproctus* (Leioproctus) *apicalis*	x	
	Lemidia obliquefasciata	x	
	Lepidoptera sp.	x	
	Limbodessus inornatus	x	
	Limbodessus sp.	x	
	Limnesia sp.	x	
	Limnichidae sp.	x	
	Limnocythere dorsosicula	x	
	Limnocythere mowbrayensis	x	
	Limnocythere sp.	x	
	Limnophyes sp.	x	
	Limnoxenus zelandicus	x	
	Liparetrus gravidus	x	
	Liparetrus laevis	x	
	Liparetrus lepidopygus	x	
	Liparetrus picipennis	x	
	Liparetrus rubefactus	x	
	Liparetrus striatus	x	
	Liparetrus tristis	x	
	Lynceus sp.	x	
	Macrothrix sp.	x	
	Macrothrix sp. A (CB)	x	
	Macrothrix sp. b (of RJS) (SAP)	x	
	Marphysa sp.	x	
	Mecynotarsus hortensis	x	
	Megachile latericauda	x	
	Megaporus howitti	x	
	Megaporus solidus	x	
	Megaporus sp.	x	
	Meliboeithon confusum	x	
	Melobasis cuprifera	x	
	Melobasis gloriosa	x	
	Melobasis occidentalis	x	
	Melobasis propinqua subsp*. propinqua*	x	
	Menochilus sexmaculatus	x	
	Mesocyclops brooksi	x	
	Mesocyclops sp.	x	
	Mesodina cyanophracta	x	
	Metacyclops sp. EB	x	
	Micrectyche ferruginea	x	
	Microcyclops sp. EB	x	
	Microcyclops sp. EB	x	
	Micronecta robusta	x	
	Micronecta sp.	x	
	Mixocyclops sp. LG	x	
	Moina sp.	x	
	*Moinidae s*p.	x	
	Molophilus (Molophilus) flavoannulatus	x	
	Monocorophium acherusicum	x	
	Monocorophium insidiosum	x	
	Monolepta hypomela	x	
	Myrmecia mandibularis	x	
	Necterosoma regulare	x	
	Neodon laevis	x	

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Fauna Group	Species	NatureMap	EPBC
Invertebrates (continued)	*Neophyllotocus rostratus*	x	
	Neothrix armata	x	
	Newnhamia fenestrata	x	
	Nicodamus mainae	x	
	Nothorhaphium aemulans	x	
	Notiobia (Anisotarsus) *dampierii*	x	
	Notiobia (Anisotarsus) *inaequalipennis*	x	
	Novapus crassus	x	
	Ochterus occidentalis	x	
	Odontophlogistus ungulatus	x	
	Oligochaeta sp.	x	
	Omolipus cyaneus	x	
	Omorgus (Omorgus) *australasiae*	x	
	Onychohydrus atratus	x	
	Onychohydrus scutellaris	x	
	Onychohydrus sp.	x	
	Oribatida sp.	x	
	Orthocladiinae sp.	x	
	Pachyneuron emersoni	x	
	Pachytricha tecta	x	
	Paracymus pygmaeus	x	
	Paralimnocythere sp. (south-west, CB)	x	
	Paralimnophyes pullulus (V)	x	
	Paramerina levidensis	x	
	Paramphisopus palustris	x	
	Parasemus australiae	x	
	Parastacidae sp.	x	
	Paratanytarsus parthenogeneticus	x	
	Paropsis geographica	x	
	Paropsis sp.	x	
	Paropsisterna beata	x	
	Paropsisterna elliptica	x	
	Paropsisterna rufipes	x	
	Paropsisterna semifumata	x	
	Paropsisterna sp.	x	
	Paroster niger	x	
	Paroster sp.	x	
	Paroster sp. (Ellen Brook)	x	
	Patella (scutellastra)	x	
	Peltoschema nigroconspersa	x	
	Peltoschema oceanica	x	
	Peltoschema sp.	x	
	Peltoschema suturalis	x	
	Perilampomyia notatifrons	x	
	Phasianella ventricosa	x	
	*Phlogistus s*p.	x	
	Physa sp.	x	
	Physastra sp.	x	
	Piona murleyi	x	
	Piona sp.	x	
	Pison tibiale	x	
	Platydema aries	x	
	Platynectes sp.	x	
	Podotenus insignior	x	

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Invertebrates (continued)	*Pogonoscopus myrmex*	x	
	Prasonotus submetallicus	x	
	Prochelyna heterodoxa	x	
	Procladius villosimanus	x	
	Promochlonyx australiensis	x	
	Prothalotia sp.	x	
	Pseudocephalus mira	x	
	Pterochelus triformis	x	
	Pterohelaeus cereus	x	
	Pterohelaeus parallelus	x	
	Ptilodactylidae sp.	x	
	Rhamphus sp.	x	
	Rhantus sp.	x	
	Rhantus suturalis	x	
	Rhyssemus blackburnei	x	
	Rhytiphora (platyomopsis)	x	
	Rhyzobius nitidus	x	
	Rhyzobius sp.	x	
	Rodwayia occidentalis	x	
	Salinator fragilis	x	
	Saprosites mansuetus	x	
	Sarscypridopsis aculeata	x	
	Scapholeberis kingi	x	
	Scapholeberis sp.	x	
	Scaraphites silenus	x	
	Sciomyzidae sp.	x	
	Scirtidae sp.	x	
	Scitala sp.	x	
	Scolopendra laeta	x	
	Scutus (Scutus) *antipodes*	x	
	Semanopterus angustatus	x	
	Semanopterus leai	x	
	Simocephalus sp.	x	
	Simosyrphus grandicornis	x	
	Simplisetia aequisetis	x	
	Sphaeroscelis pectoralis	x	
	Staphylinidae sp.	x	
	Stenoderus sp.	x	
	Sternopriscus browni	x	
	Sternopriscus marginatus	x	
	Sternopriscus minimus	x	
	Sternopriscus sp.	x	
	Strandesia sp. (TWS)	x	
	Stratiomyidae sp.	x	
	Succinea sp.	x	
	Sympetes gagates	x	
	Sympetes patelliformis	x	
	Sympetes rotundatus	x	
	Sympetes subrugosus	x	
	Sympycnus sp.	x	
	Synothele taurus	x	
	Tabanidae sp.	x	
	Tanypodinae sp.	x	
	Tanytarsus fuscithorax/semibarbitarsus	x	

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Invertebrates (continued)	*Tanytarsus* sp.	x	
	Tarsostenus univittatus	x	
	Tasmanicosa leuckartii	x	
	Thalycrodes mixtum	x	
	Thiara sp.	x	
	Thorictosoma ectatommae	x	
	Tiracerus subcylindricornis	x	
	Trachymela granaria	x	
	Trachymela semiglobosa	x	
	Trachyscelis ciliaris	x	
	Trichocyclus nullarbor	x	
	Triplectides australis	x	
	Trissodon curtus	x	
	Trissodon subopacus	x	
	Turbellaria sp.	x	
	Turbo (Ninella) torquatus	x	
	Ulomoides tetraspilotus	x	
	Urodacus novaehollandiae	x	
	Westrapyrgus slacksmithae	x	
	Xanthagrion erythroneurum	x	
	Xenanusia pulchripennis	x	
	Xyroscelis crocata	x	
Mammals	*Bettongia penicillata ogilbyi* (Woylie)		E
	Cercartetus concinnus (Western Pygmy-possum, Mundarda)	x	
	Dasyurus geoffroii (Chuditch, Western Quoll)	x	V
	Hydromys chrysogaster (Water-rat)	x	
	Isoodon obesulus (Southern Brown Bandicoot)	x	
	Isoodon obesulus subsp. *fusciventer* (Quenda, Southern Brown Bandicoot)	x	
	Macropus eugenii subsp. *derbianus* (Tammar Wallaby (WA subsp))	x	
	Macropus fuliginosus (Western Grey Kangaroo)	x	
	Petrogale lateralis subsp. *lateralis* (Black-flanked Rock-wallaby, Black-footed R	x	V
	Rattus rattus (Black Rat)	x	
	Rattus sp.	x	
	Trichosurus vulpecula (Common Brushtail Possum)	x	
Reptiles	*Antaresia stimsoni subsp. stimsoni* (Stimson's Python)	x	
	Aprasia repens (Sand-plain Worm-lizard)	x	
	Brachyurophis semifasciatus (Southern Shovel-nosed Snake)	x	
	Chelodina colliei (Oblong Turtle)	x	
	Crenadactylus ocellatus subsp. *ocellatus* (Clawless Gecko)	x	
	Cryptoblepharus buchananii	x	
	Ctenophorus ornatus (Ornate Crevice-Dragon)	x	
	Diplodactylus granariensis subsp. *granariensis*	x	
	Gehyra variegata	x	
	*Hemiergis initialis s*ubsp. *initialis*	x	
	Hesperoedura reticulata	x	
	Lerista christinae	x	
	Lialis burtonis	x	
	Menetia greyii	x	
	Morelia spilota subsp. *imbricata* (Carpet Python)	x	
	Morethia obscura	x	
	Notechis scutatus (Tiger Snake)	x	
	*Pogona mino*r subsp*. minor* (Dwarf Bearded Dragon)	x	

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Reptiles (continued)	*Pseudechis australis* (Mulga Snake)	x	
	Pseudemydura umbrina (Western Swamp Turtle, tortoise)	x	
	Pseudonaja affinis subsp. *affinis (* Dugite)	x	
	Pseudonaja mengdeni (Western Brown Snake)	x	
	Strophurus spinigerus subsp. *inornatus*	x	
	Strophurus spinigerus subsp. *spinigerus*	x	
	Tiliqua occipitalis (Western Bluetongue)	x	
	Tiliqua rugosa subsp*. rugosa*	x	
	Underwoodisaurus milii (Barking Gecko)	x	
	Varanus tristis (Racehorse Monitor)	x	