

Attachment 4

Level 1 Fauna and Targeted Black Cockatoo Assessment
Technical Memorandum



TECHNICAL MEMORANDUM

Fauna Assessment

Part Lot 103 Great Northern Highway, Middle Swan

PROJECT NUMBER	EP19-105(26)	DOC. NUMBER	EP19-105(26)--017 BRB
PROJECT NAME	Midland Brickworks, Middle Swan	CLIENT	Boral Bricks Western Australia Pty Ltd
AUTHOR	BRB	REVIEWER	ACW
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1. INTRODUCTION

Boral Bricks Western Australia Pty Ltd (Boral) intends to develop a portion of part of Lot 103 (Lot 103) Great Northern Highway, Middle Swan (referred to herein as the 'site') into a hard-stand storage area. The site extends over 4.95 hectares (ha) and is located within the northern portion of the Midland Bricks brickworks site. Lot 103 is bounded by Reid Highway to the north, Great Northern Highway to the east, Bassett Road to the south, and the Swan River foreshore to the west. The site is surrounded by infrastructure associated with the brickworks, including sealed roads and hardstand.

The site is within the City of Swan (CoS) municipality and is zoned 'Industrial' under the Metropolitan Region Scheme (MRS) and 'General Industrial' under CoS Local Planning Scheme (LPS) No. 17. The location of the site and Lot 103 is shown in **Figure 1**.

Emerge Associates (Emerge) were engaged to provide environmental consultancy services to support the planning process for the site. The purpose of this assessment is to provide sufficient information on the fauna values within the site to inform this process. Emerge previously undertook a 'level 1' fauna survey and a targeted black cockatoo survey of the broader Midland Bricks area including the site, in accordance with the Environmental Protection Authority's (EPA's) *Technical Guidance – Terrestrial fauna Surveys* (EPA 2016).

This technical memorandum details the fauna methodology and results recorded within the site during the Emerge Associates (2019b) assessment which included the following tasks:

- Desktop review of background information regarding fauna species relevant to the site and surrounds.
- Compilation of a list of fauna species opportunistically recorded as part of the field survey.
- Identification of potential habitat for conservation significant fauna species and likelihood of occurrence.
- A targeted black cockatoo survey including identification and mapping of potential black cockatoo habitat values.
- Documentation of the desktop assessment, survey methodology and results into a technical memorandum.

2. PREVIOUS SURVEY

An ecologist from Emerge visited the broader Midland Bricks area including the site on 18 September, 8 October and 24 October 2019 to conduct the level 1 fauna and targeted black cockatoo field survey.

3. ENVIRONMENTAL CONTEXT

3.1. Threatened fauna species

Certain fauna taxa that are considered to be rare or under threat warrant special protection under Commonwealth and/or State legislation. At a Commonwealth level, fauna taxa may be listed as 'threatened' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Any action likely to have a significant impact on a taxon listed under the EPBC Act requires approval from the Commonwealth Minister for the Environment and Energy.

In Western Australia fauna species may also be classed as 'threatened' under the *Biodiversity Conservation Act 2016* (BC Act). It is an offence to 'take' or 'disturb' threatened fauna without Ministerial approval.

Threatened fauna species listed under the EPBC Act and/or BC Act are assigned a conservation status according to attributes such as population size and geographic distribution. Further information on threatened species and their categories is provided in **Appendix A**.

3.2. Priority fauna species

Fauna species that do not currently meet the criteria for listing as threatened but are potentially rare or threatened may be added to the Department of Biodiversity, Conservation and Attractions (DBCA) *Priority Fauna List*. These species are classified into 'priority' levels based on threat. Whilst priority species are not under direct statutory protection, they are considered during State approval processes. Further information on priority species and their categories is provided in **Appendix A**.

3.3. Migratory fauna species

Migratory fauna species that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations warrant special protection under Commonwealth and State legislation. At a Commonwealth level, migratory fauna taxa may be listed as 'migratory' under *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Any action likely to have a significant impact on a taxon listed under the EPBC Act requires approval from the Commonwealth Minister for the Environment and Energy.

In Western Australia migratory fauna taxa may be listed as 'specially protected species' and classed as 'migratory' under the *Biodiversity Conservation Act 2016* (BC Act). Further information on migratory species is provided in **Appendix A**.

3.4. Pest fauna species

The term 'pest fauna' can refer to any animal that requires some form of action to reduce its effect on the economy, the environment, human health and amenity. Many non-native fauna species and some fauna species native to Australia but not Western Australia are considered to be pest fauna.

A particularly invasive or detrimental pest species may be listed as a 'declared pest' pursuant to Western Australia's *Biosecurity and Agriculture Management Act 2007* (BAM Act), indicating that it warrants special management to limit its spread. At a National level, pest fauna may be listed as 'Established Pests and Diseases of National Significance' (EPDNS) under the *Australian Pest Animal Strategy (2017-2027)* (DoA 2017). Further information on categories of declared pests is provided in **Appendix A**.

3.5. Black cockatoo habitat

The Swan Coastal Plain is known to provide habitat for three threatened species of black cockatoo, including *Calyptorhynchus latirostris* (Carnaby's cockatoo), *Calyptorhynchus baudinii* (Baudin's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) (referred to herein collectively as 'black cockatoos').

Important black cockatoo habitat includes the following:

- Breeding habitat: Trees that contain hollows that are suitable for breeding black cockatoos. These must generally be located within 7 km of food and water resources (Saunders 1990).
- Roosting habitat: Groups of large trees that are located within 6 km of water and food resources, with overlapping foraging ranges within 12 km (Shah 2006; Le Roux 2017).
- Foraging habitat: Vegetation that contains known foraging plant species for black cockatoos.

The Department of Planning (DoP), in partnership with the Department of the Environment and Energy (DoEE) and fauna experts have identified and mapped Carnaby's cockatoo habitat (breeding, roosting and foraging) on the Swan Coastal Plain and Jarrah Forest to help identify areas of highest potential conflict between land-use planning and conservation of habitat (DEC 2011; Johnstone *et al.* 2011).

The dataset includes confirmed (chicks or eggs observed) and potential (breeding behavior or chew marks observed but no chicks or eggs) Carnaby's cockatoo breeding habitat, as well as confirmed (roosting observed) and potential roosting (requiring further investigation) habitat. Both confirmed and potential breeding sites are presented with a 12 km radius buffer. Potential foraging habitat is mapped based on regional vegetation mapping that may contain plant species known to be foraged upon by Carnaby's cockatoo (Hedde *et al.* 1980; Havel and Mattiske 2000; DEC 2007; Strelein *et al.* 2009).

While this dataset only predicts potential habitat presence for Carnaby's cockatoo, the information is also largely applicable for Baudin's cockatoo and forest red-tailed black cockatoo. Many plant species that are foraged upon by Carnaby's cockatoo are also consumed by Baudin's cockatoo (e.g. *Banksia* spp. cones and *Corymbia calophylla* (marri) nuts) and forest red-tailed cockatoo (e.g. *Eucalyptus marginata* (jarrah) and marri nuts). Similarly, breeding sites that are suitable for Carnaby's cockatoo may also be suitable for Baudin's cockatoo and forest red-tailed cockatoo if located within their distribution/breeding ranges. The potential foraging habitat dataset is likely an overestimation of available foraging habitat for forest red-tailed cockatoos, as it includes a number of plant species that are not consumed by this species (e.g. *Banksia* spp.).

Additionally, Birdlife Australia undertakes annual monitoring of black cockatoo roost sites, as part of the 'Great Cocky Count'. Information gathered from these monitoring events is analysed and

published in annual reports. Spatial information for these roost sites is available to environmental consultancies and is also reviewed as part of this assessment (Peck *et al.* 2017).

3.6. Distribution

The site is located within the known distribution range of all three species of black cockatoo.

3.7. Breeding habitat

The site is located on the border of Baudin's cockatoos modelled breeding range (DoEE 2016), which is extending eastwards from the site.

The site is located approximately 600 m west of a Carnaby's cockatoo confirmed breeding site 12 km buffer (DEC 2011). This breeding site is associated with the Darling Scarp. The entire site is also mapped as potential Carnaby's cockatoo breeding habitat (DEC 2011), as shown in **Figure 2**.

3.8. Roosting habitat

A number of potential roost sites are mapped as occurring near the site. However, no birds have been recorded at most of these sites. The closest known roost site where birds have been recorded is located approximately 6 km west of the site. This roost site is associated with forest red-tailed black cockatoos, as shown in **Figure 2**.

3.9. Foraging habitat

The site is located within approximately 5 km of extensive areas of potential black cockatoo foraging habitat, which comprises remnant native vegetation of the Jarrah Forest on the Darling Scarp. This vegetation is likely suitable for foraging by all three species of black cockatoo. Within the local area, a number of smaller pockets of vegetation are located in close proximity of the site.

The extent of potential black cockatoo breeding and foraging habitat and roosting sites within the site and the wider area is shown in **Figure 2**.

4. METHODS

4.1. Desktop assessment

4.1.1. Database searches

A search was conducted for threatened and priority fauna that may occur or have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DoEE 2019a) and *NatureMap* (DBCA 2019). DBCA's threatened and priority fauna database search was also requested and results were provided within a radius of 5 km (reference number FAUNA#6176).

A total number of species with potential to occur within the site was calculated by adding the total count of non-conservation significant species provided by *NatureMap* to the combined number of conservation significant species provided by *NatureMap* and *Protected Matters Search Tool*.

4.1.2. Likelihood of occurrence

Information on habitat preferences and distribution of threatened and priority vertebrate fauna species¹ identified to potentially occur within the site or wider area was reviewed. This was assessed against the general site conditions and fauna habitat types recorded during the field survey.

An assessment of the likelihood of occurrence of threatened and priority fauna species within the site was undertaken and each was assigned to one of the following categories:

- Recorded: The species in question was positively identified as being present within the site during the field survey or from recent literature records.
- Likely: Potentially suitable habitat for the species in question was identified during the field survey and the site lies within the known distribution of the species.
- Possible: Potentially suitable habitat for the species in question was identified but of marginal quality and/or extent and the site lies within or close to the known distribution of the species.
- Unlikely: The site lies outside of the known distribution of the species in question and/or no suitable habitat was identified within the site.

4.2. Field survey

An ecologist from Emerge visited the site on the 18 September, 8 October and 24 October 2019 to conduct the level 1 fauna and targeted black cockatoo field survey of the broader Midland Bricks area including the site.

4.3. Level 1 fauna

Transects were traversed across the site, during the day, and the characteristics of fauna habitat and presence of fauna species was recorded. Microhabitats such as logs, rocks and leaf litter were investigated and secondary evidence of species presence such as tracks, scats, skeletal remains, foraging evidence or calls was also noted.

A vertebrate fauna list was compiled and fauna habitat values were described, with particular reference to 'threatened' and 'priority' fauna¹ species with potential to occur within the site. Taxonomy and nomenclature for vertebrate fauna species was taken from the *Western Australian Museum Checklist of the Terrestrial Vertebrate Fauna of Western Australia* (Western Australian Museum 2019). Literature listed in **Appendix A** represent the main publications used to identify fauna species and habitats within the site. Non-native species are denoted with asterisk (*) in text and raw data.

4.4. Targeted black cockatoo

The site and the broader Midland Bricks area was searched for potential black cockatoo breeding, roosting and foraging habitat. Habitat trees (HT) were individually identified, tagged and assessed against attributes outlined in **Table 1** below. HTs are typically defined as native eucalypts with diameter at breast height (DBH) ≥ 50 cm. Tree hollows were deemed as potentially suitable for use by breeding black cockatoos if the opening diameter was ≥ 10 cm (Groom 2010) and if the hollow was located in a trunk or branch that is generally large enough to accommodate a black cockatoo.

¹ Invertebrate taxa were not assessed and no evaluation of the potential for invertebrate taxa to occur within the site is provided.

Hollows that were considered to be potentially suitable for breeding by black cockatoos from the ground were then investigated further using a pole-mounted camera to determine internal dimensions.

Table 1: Attributes recorded as part of the black cockatoo habitat tree (HT) assessment.

Attribute	Description
Tag	Unique identifier on a metal tag was attached to each habitat tree (HT).
Image	Each HT was individually photographed.
GPS location	The location of each HT was recorded using a handheld GPS unit.
Tree species	Species and common name were identified.
Diameter at breast height (DBH) (cm)	Each HT was measured using a diameter tape.
Tree height (m)	The height of each HT was estimated.
Hollow information	If observed, hollows were noted and photographed.
Entrance information	The entrance diameter was estimated and the entry position noted (e.g. top-entry or side-entry).
Hollow orientation	The orientation of hollows was recorded (vertical, near-vertical, non-vertical).
Signs of use of hollows	Signs of use of hollows by black cockatoos or other species were noted.

A dusk roost survey was not undertaken. The site was assessed for the potential of providing roosting habitat for black cockatoos, and secondary evidence of roosting activity, such as branch clippings, droppings or moulted feathers was searched. Patches of large native and non-native trees were assumed to provide potential black cockatoo roosting habitat.

Potential black cockatoo foraging habitat was identified by comparing the literature on known foraging habitat resources against the vegetation within the site (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Groom 2011; Johnstone *et al.* 2011; DoEE 2012). Potential foraging habitat was then assessed for importance based on the presence of plant species known to be primary as a food source for black cockatoos, vegetation extent and regional context of the site. Secondary evidence of black cockatoo foraging, such as chewed marri nuts or banksia cones, within the site was searched and allocated to a species where possible.

Active searches were conducted for secondary evidence of breeding, roosting and foraging activity such as chew marks, branch clippings, droppings, moulted feathers and chewed marri nuts or banksia cones.

4.5. Mapping and data analysis

4.5.1. Fauna habitat

Fauna habitats were described according to the dominant flora species and vegetation type present, as determined from observations made during the field survey and information provided in the 'Detailed Flora and Vegetation Assessment' (Emerge Associates 2019a). The identified fauna habitats were mapped on aerial photography with the boundaries interpreted from aerial photography, previously identified plant communities (Emerge Associates 2019a) and notes taken in the field.

Information on specific habitat requirements for conservation significant vertebrate fauna species with potential to occur within the site were compiled as part of the desktop assessment. This information was compared to the fauna habitats identified within the site to determine whether any conservation significant fauna species are considered to have potential to utilise the site.

4.5.2. Black cockatoo habitat

The location of potential black cockatoo habitat trees recorded in the site and information on hollows (if present) were mapped on aerial imagery. The data for each black cockatoo habitat tree was compiled in a table format.

Potential black cockatoo foraging habitat was mapped according to the fauna habitats recorded and notes taken in the field.

4.5.3. Survey limitations

It is important to note the specific constraints imposed on surveys and the degree to which these may have limited survey outcomes. An evaluation of the survey methodology against standard constraints outlined in the EPA document *Technical Guidance – Terrestrial Fauna Surveys* (EPA 2016) is provided in **Table 2**.

Table 2: Evaluation of survey methodology against standard constraints outlined in EPA Technical Guidance – Terrestrial fauna Surveys.

Constraint	Degree of limitation	Details
Level of survey	No limitation	A level 1 survey (desktop study and field survey) in combination with level 2 (targeted) black cockatoo survey was considered adequate given the relatively low habitat values within the site and the generally good availability of fauna information for the region.
Scope	No limitation	The survey focused on vertebrate fauna and habitat values, with particular focus on conservation significant taxa with potential to occur within the site.
Proportion of fauna identified, recorded and/or collected.	No limitation	All observed vertebrate fauna were identified.
Sources of information e.g. previously available information (whether historic or recent) as distinct from new data.	No limitation	Adequate information was available from database searches.
The proportion of the task achieved and further work which might be needed.	No limitation	The task was achieved in its entirety.
Experience level of personnel	Minor limitation	This fauna assessment was undertaken by a qualified, early career ecologist. The ecologist is experienced in conducting fauna surveys but is relatively new to Western Australia. Technical review was undertaken by a senior environmental consultant with 15 years' experience in environmental science in Western Australia.
Suitability of timing	No limitation	The survey was undertaken from the late morning until late afternoon, which is typically not the highest activity period for bird species. However, the weather conditions were optimal for identifying fauna species and survey timing is not considered to be of great importance for Level 1 assessments.
Completeness	No limitation	The desktop assessment, field survey and targeted black cockatoo components of the survey were completed.
Spatial coverage and access	No limitation	Site coverage was comprehensive (track logged).
	No limitation	All parts of the site could be accessed as required.
Survey intensity	No limitation	The intensity of the survey was adequate given the size of the site and the relatively low habitat value present.
Influence of disturbance	No limitation	The site is highly modified due to historical disturbance. However, no recent disturbance was noted that may have affected outcomes of the survey.
Adequacy of resources	No limitation	All resources required to perform the survey were available.

5. RESULTS AND DISCUSSION

5.1. Fauna habitat

Historical disturbance has significantly compromised habitat values within the site. The majority of the native vegetation has been removed and vegetation now predominantly comprises cleared area, and areas dominated by non-native and weed species with scattered or patches of native and non-native trees and shrubs.

A total of three fauna habitats were identified within the site, including ‘scattered native and non-native trees and shrubs’, ‘artificial waterbody’, and ‘cleared area’.

The majority of the site comprises ‘water body’ which relates to the inundated clay basin extending over 1.81 ha, and ‘cleared area’ extending over 1.64 ha, both of which do not provide valuable fauna habitat due to the removal of most or all native vegetation. The remainder of the site (1.50 ha) comprises ‘scattered native and non-native trees and shrubs’, which contains various planted species, particularly *Eucalyptus camaldulensis* (river red gum), and *Eucalyptus rudis* (flooded gum) over scattered native and non-native shrubs. The likelihood that this fauna habitat type would provide important habitat for conservation significant species is low, given its ‘completely degraded’ condition and limited extent. The site now primarily provides habitat that is suitable for common and widespread fauna species with non-specific habitat requirements.

A description and the area of each habitat is provided in **Table 3** and representative photographs of each are provided in **Plate 1 to Plate 3**. The location of each habitat is shown on **Figure 3**.

Table 3: Fauna habitats identified within the site.

Fauna habitat classification	Description	Area (ha)
Scattered native and non-native trees and shrubs	Woodland to tall shrubland of various planted species, particularly <i>Eucalyptus camaldulensis</i> , with scattered <i>E. rudis</i> over scattered native and non-native shrubs over non-native grassland with occasional native species (Plate 1). Where this habitat occurs in lower lying areas it was partially saturated with standing water.	1.50
Artificial waterbody	Artificial waterbody that is surrounded by non-native and scattered native vegetation (Plate 2).	1.81
Cleared area	Heavily disturbed areas comprising planted non-native trees and shrubs over non-native herbs and grasses, with occasional native shrubs and forbs (Plate 3).	1.64



Plate 1: Scattered native and non-native trees and shrubs.



Plate 2: Artificial waterbody.



Plate 3: Cleared area.

5.2. Fauna

5.2.1. Desktop assessment

A total number of 598 fauna species were identified from database searches as occurring or potentially occurring within 10 km of the broader survey area² as listed in **Appendix B**.

This includes 30 threatened, 10 priority, 11 migratory fauna and two other specially protected species as listed in **Appendix C**.

5.2.2. Species inventory

A total of eight native and two introduced fauna species were directly or indirectly (from secondary evidence) recorded during the field survey of the wider Midland Bricks area, encompassing the site. Additionally, although not observed during the survey, staff of the Midland Brick factory have advised Emerge that the artificial waterbody within the site contains turtles which are most likely *Chelodina colliei* (oblong turtle). No fauna species of conservation significance were recorded within the site.

A complete fauna species list is provided in **Appendix D**.

5.2.3. Conservation significant fauna

The majority of the threatened and priority fauna species identified in the desktop assessment are not considered to occur in the site due to lack of suitable habitat or because the site lies outside of the species known distribution range. A total of 10 conservation significant fauna species identified from database searches are considered to have the potential to utilise the site as shown in **Table 4**.

² Includes native and non-native species

Table 4: Summary of conservation significant fauna species with have potential to occur within the site.

Species	Common name	Level of significance		Habitat	Likelihood of occurrence within the site
		BC Act	EPBC Act		
Birds					
<i>Apus pacificus</i>	Pacific swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Johnstone and Storr 1998).	Possible: This aerial species may opportunistically occur in or fly over the site on commute or while searching for prey.
<i>Botaurus poiciloptilus</i>	Australasian bittern	EN	EN	In or over water, in tall reedbeds, sedges, rushes, cumbungi, lignum. Also occurs in ricefields, drains in tussocky paddocks and occasionally in saltmarshes and brackish wetlands.	Possible: This mobile species occurs in areas near the site and therefore could also occur in the site. However, habitat within the site is very marginal as dense reed vegetation is absent.
<i>Calyptorhynchus banksii naso</i>	Forest red-tailed black cockatoo	VU	VU	Eucalypt and Corymbia forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding Corymbia calophylla, Eucalyptus marginata, introduced Melia azedarach and Eucalyptus spp. trees (Johnstone and Storr 1998).	Possible: This mobile species occurs in areas near the site and therefore could also occur in the site. However, habitat within the site is very marginal.
<i>Calyptorhynchus baudinii</i>	Baudin's cockatoo	EN	EN	Mainly eucalypt forests. Attracted to seeding Corymbia calophylla, Banksia spp., Hakea spp., and to fruiting apples and pears (Johnstone and Storr 1998).	Possible: This mobile species occurs in areas near the site and therefore could also occur in the site. However, habitat within the site is very marginal

Table 3: Summary of conservation significant fauna species deemed possible or likely to occur within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence within the site
		BC Act	EPBC Act		
Aves					
<i>Calyptorhynchus latirostris</i>	Carnaby's cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of Pinus spp. Attracted to seeding Banksia spp., Dryandra spp., Hakea spp., Eucalyptus spp., Corymbia calophylla, Grevillea spp., and Allocasuarina spp. (Johnstone and Storr 1998).	Possible: This mobile species occurs in areas near the site and therefore could also occur in the site. However, habitat within the site is very marginal
<i>Falco peregrinus</i>	Peregrine falcon	S	-	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	Possible: This highly mobile species may opportunistically occur in or fly over the site on commute or while searching for prey.
<i>Oxyura australis</i>	Blue-billed duck	P4	-	Mainly deeper freshwater swamps and lakes; occasionally saltlakes and estuaries freshened by flood waters (Johnstone and Storr 1998a).	Possible: This mobile species occurs in areas near the site and therefore could also occur in the site.
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	Shallow and adjacent flats of freshwater lakes and swamps, also river pools, flooded samphire and sewage ponds.	Possible: This mobile species occurs in areas near the site and therefore could also occur in the site.
Mammals					
<i>Isodon fusciventer</i>	Quenda	P4	-	Dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC 2012).	Possible: Areas surrounding the site and within the site provide limited ground cover. However, the species may opportunistically occur in the site as a transient visitor.

Table 3: Summary of conservation significant fauna species deemed possible or likely to occur within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence within the site
		BC Act	EPBC Act		
Moluscs					
<i>Westralunio carteri</i>	Carter's freshwater mussel	VU	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Salinity tolerance quite low (Morgan et al. 2011).	Possible: May occur in waterbody or streams within the site or in adjacent Swan River.

5.2.4. Declared pests

Two species, **Oryctolagus cuniculus* (rabbit) and **Trichoglossus moluccanus* (rainbow lorikeet) listed as a declared pest (C3) pursuant to the BAM Act, were identified within the site.

5.3. Black cockatoo habitat

5.3.1. Breeding habitat

The site does not provide breeding habitat for the three threatened species of black cockatoo (CBC, FRTBC and BC) due to the lack of suitable breeding trees (native eucalypt trees with diameter at breast height (DBH) ≥ 50 cm).

The site comprises a number of mature *Eucalyptus rudis* (flooded gum) trees. However, these trees were not mapped as habitat trees, as flooded gums are not known to be a preferred breeding tree species for BCs. In addition, no signs of use by BCs, such as chew marks, droppings or moulted feathers, was recorded within any of the habitat trees with hollow(s) in the site.

5.3.2. Roosting habitat

A number of native and non-native trees within the site have the potential to provide roosting habitat for BCs. However, no evidence of BC roosting, such as branch clippings, droppings and moulted feathers was observed within the site and no anecdotal records of BCs roosting within the site were reported by Midland Brick staff.

Due to the scattered nature and limited number of large trees, in addition to the absence of any evidence of roosting activity, the site is not considered to contain any roosting habitat of local or regional importance to CBC, BC or FRTBC. The extent of potential black cockatoo roosting sites within the site and the wider area is shown in **Figure 2**.

5.3.3. Foraging habitat

The site does not provide foraging habitat for CBC, FRTBC or BBC due to the lack of foraging plant species present.

The site contains a number of flooded gum and non-native eucalypt trees such as *Eucalyptus camaldulensis* (river red gum). While some evidence exists that these species are foraged upon by species of BC, they are not considered a primary resource and consumption of these species is likely opportunistic if it occurs at all. The flooded gums and non-native eucalypt trees within the site were therefore not mapped as potential foraging habitat.

Large areas of remnant native vegetation are located within close proximity to the site (DEC 2011) as shown in **Figure 2**. This vegetation is likely to comprise foraging habitat for all three species of BC and also to be of higher quality than the vegetation within the site. Given the small extent of primary foraging species within the site and that extensive areas of higher quality foraging habitat are located near the site on the Darling Scarp, it is considered unlikely that the site provides important foraging habitat for BCs.

6. CONCLUSIONS

A total of eight common and widespread native and two non-native fauna species were positively identified to occur within the broader Midland Bricks area including the site. Additionally, 10 species of conservation significance are considered to have potential to occur within the site and the broader Midland Bricks area. However, the likelihood that the site would provide important habitat for these species is low, as the majority of habitat within the site is in relatively poor condition and limited in extent.

No recorded of BCs within the site was made during the field survey. Nor was the presence of BCs within the site reported by Midland Brick staff.

The site does not provide breeding or foraging habitat for CBC, FRTBC or BBC due to the lack of foraging plant species and suitable breeding trees. In addition, no signs of use by BCs, such as chew marks, droppings or moulted feathers, was recorded within any trees in the site. A small number of trees within the site have the potential to provide roosting habitat for BCs. However, no evidence of recent or historical roosting activity was observed within the site.

Therefore the site is likely to be primarily utilised by common and widespread native species without specific habitat requirements.

7. REFERENCES

7.1. General references

- Davies, S. J. J. F. 1966, *The movements of the White-tailed Black Cockatoo (Calyptorhynchus baudinii) in south-western Australia*, Western Australian Naturalist 10: 33-42.
- Department of Biodiversity Conservation and Attractions (DBCA) 2017a, *Fauna Profile: Bilby Macrotis lagotis*, Perth, Western Australia.
- Department of Biodiversity, Conservation and Attractions (DBCA) 2017b, *Fauna Profile: Western Ringtail Possum Pseudocheirus occidentalis*, Perth, Western Australia.
- Department of Environment and Conservation (DEC) 2007, *Vegetation Map for the State of Western Australia*, Perth.
- Department of Environment and Conservation (DEC) 2011, *Carnaby's cockatoo (Calyptorhynchus latirostris) spatial data for Swan Coastal Plain and Jarrah Forest IBRA regions*, Perth.
- Department of Environment and Conservation (DEC) 2012, *Fauna profiles, Quenda Isoodon obesulus (Shaw, 1797)*, Perth.
- Department of Agriculture (DoA) 2017, *Australian Pest Animal Strategy (2017-2027)*, Canberra.
- Department of the Environment and Energy (DoEE) 2012, *EPBC Act referral guidelines for three threatened black cockatoo species*, Australian Government, Canberra.
- Department of Environment and Energy (DoEE) 2016, *Modelled distribution for Baudin's Cockatoo (Calyptorhynchus baudinii)*, Canberra.
- Emerge Associates 2019a, *Detailed Flora and Vegetation Assessment - Middle Swan Brickworks*, EP19-105(01)--001 RAW, Version 1.
- Emerge Associates 2019b, *Level 1 Fauna and Targeted Black Cockatoo Assessment - Middle Swan Brickworks*, EP19-105(26)--011 MS, Version 1.
- Environmental Protection Authority (EPA) 2016, *Technical Guidance - Terrestrial Fauna Surveys*, Perth.
- Groom, C. 2010, *Artificial Hollows for Carnaby's Black Cockatoo: An investigation of the placement, use, monitoring and maintenance requirements of artificial hollows for Carnaby's black cockatoo*, Department of Environment and Conservation, Perth.
- Groom, C. 2011, *Plants Used by Carnaby's Black Cockatoo*, Department of Environment and Conservation, Perth.
- Havel, J. J. and Mattiske, E. M. 2000, *Vegetation mapping of south-west forest regions of Western Australia*, CALMScience, Department of Conservation and Land Management and Environment Australia, Perth.
- Hedde, E. M., Loneragan, O. W. and Havel, J. J. 1980, 'Vegetation Complexes of the Darling System Western Australia', in Department of Conservation and Environment (ed.), *Atlas of Natural Resources Darling System Western Australia*, Perth.
- Johnstone, R. E., Johnstone, C. and Kirkby, T. 2011, *Black Cockatoos on the Swan Coastal Plain: Carnaby's Cockatoo (Calyptorhynchus latirostris), Baudin's Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin-Dunsborough), Western Australia. Studies on distribution, status, breeding, food, movements and historical changes.*, Department of Planning, Western Australia.
- Johnstone, R. E. and Kirkby, T. 1999, *Food of the Red-tailed Forest Black Cockatoo Calyptorhynchus banksii naso in Western Australia*, Western Australian Naturalist, 22: 167-178.
- Johnstone, R. E. and Storr, G. M. 1998, *Handbook of Western Australian Birds. Volume 1 - Non-Passerines (Emu to Dollarbird)*, Western Australian Museum, Perth.
- Le Roux, C. 2017, *Nocturnal roost tree, roost site and landscape characteristics of Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) on the Swan Coastal Plain*, Edith Cowan University Research Online.
- Peck, A., Barret, G. and Williams, M. 2017, *The 2017 Great Cocky Count: a community-based survey for Carnaby's Black-Cockatoo (Calyptorhynchus latirostris), Baudin's Black-Cockatoo*

- (Calyptorhynchus baudinii)* and Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*). BirdLife Australia, Floreat, Western Australia.
- Saunders, D. A. 1980, *Food and Movements of the Short-billed Form of the White-tailed Black Cockatoo*, Australian Wildlife Research, 7: 257-269.
- Saunders, D. A. 1990, *Problems of Survival in an Extensively Cultivated Landscape: the case of Carnaby's Cockatoo Calyptorhynchus funereus latirostris*, Biological Conservation, 54: 277-290.
- Shah, B. 2006, *Conservation of Carnaby's Black Cockatoo on the Swan Coastal Plain, Western Australia*, Birds Australia, Perth.
- Strelein, G., Loewenthal, G. and Davy, A. 2009, *Draft Pre-European vegetation mapping of the Swan Coastal Plain*, Forest Management Branch, Department of Environment and Conservation, Perth.
- Triggs, B. 2003, *Tracks, Scats and Other Traces A Field Guide to Australian Mammals*, Oxford University Press Australia, Melbourne, Victoria.
- Western Australian Museum 2019, *WA Museum Checklist of the Terrestrial Vertebrate Fauna of Western Australia*, Perth, Western Australia.

7.2. Online references

Western Australian Herbarium (2018). *FloraBase—the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. <<https://florabase.dpaw.wa.gov.au>>

Figures



Figure 1: Site Location

Figure 2: Black Cockatoo Habitat Context

Figure 3: Fauna Habitat



Scale: 1:12,500@A4
GDA 1994 MGA Zone 50

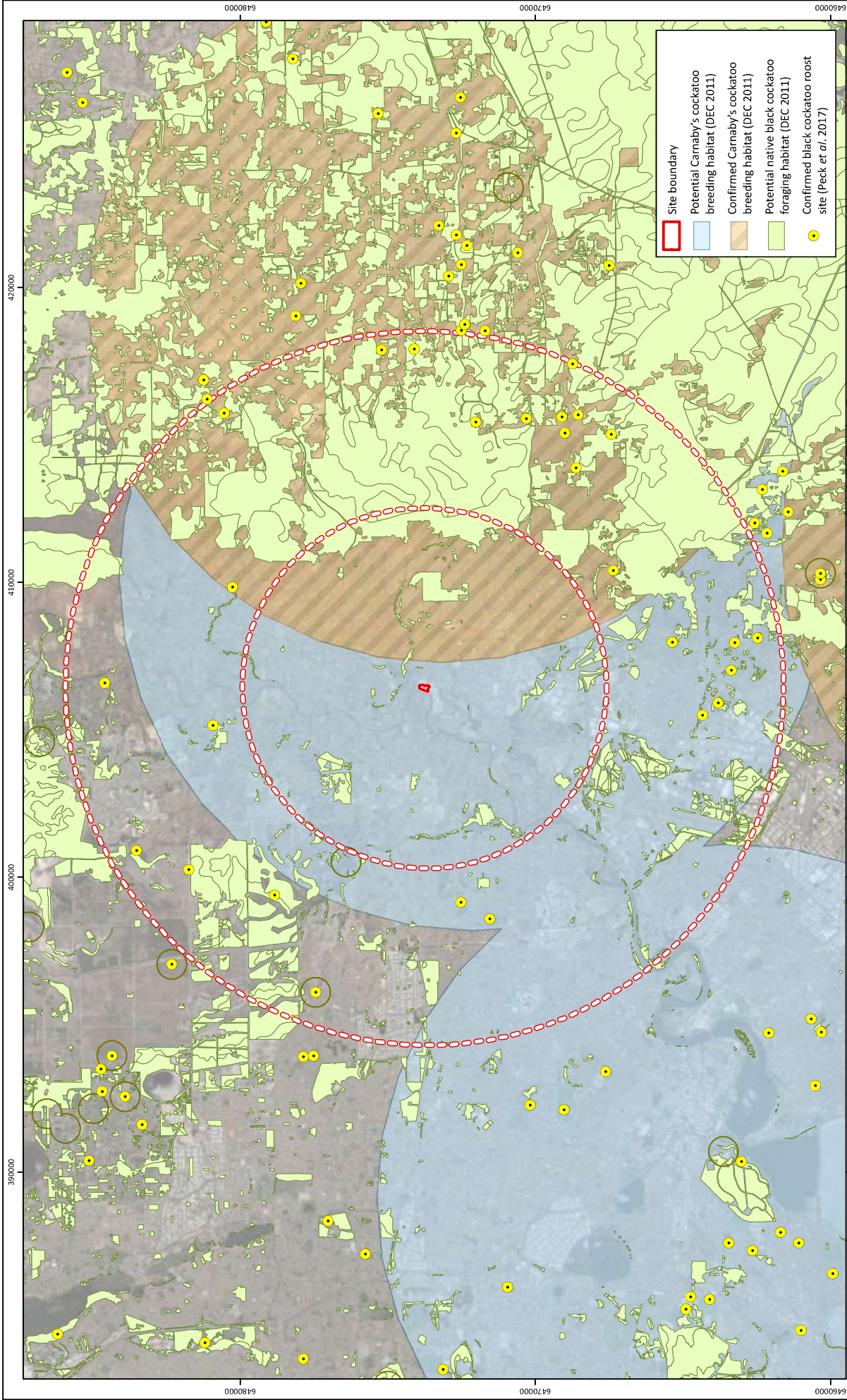
Plan Number: EP19-105(26)-F57
 Drawn: RAW
 Date: 26/11/2019
 Checked: BRB
 Approved: ACW
 Date: 26/11/2019

Figure 1: Site Location

Project: Fauna Assessment
 Part Lot 103 Great Northern Highway, Middle Swan

Client: Boral Bricks Western Australia Pty Ltd

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used



0 2 4 6
Kilometres
Scale: 1:170,000@A4
GDA 1994 MGA Zone 50



Plan Number: EP19-105(26)-F58
Drawn: RAW
Date: 26/11/2019
Checked: BRB
Approved: ACW
Date: 26/11/2019

Figure 2: Black Cockatoo Habitat Context

Project: Fauna Assessment
Part Lot 103 Great Northern Highway, Middle Swan
Client: Boral Bricks Western Australia Pty Ltd

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used



Site boundary
 Cadastral boundary
 Fauna habitat
 Scattered native and non-native trees
 Cleared area
 Water body



0 50 100
 Metres
 Scale: 1:2,500@A4
 GDA 1994 MGA Zone 50



Plan Number: EP19-105(26)-F59
 Drawn: RAW
 Date: 26/11/2019
 Checked: BRB
 Approved: ACW
 Date: 26/11/2019

Figure 3: Fauna Habitat

Project: Fauna Assessment
 Part Lot 103 Great Northern Highway, Middle Swan
Client: Boral Bricks Western Australia Pty Ltd

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used

Appendix A

Additional Information



Conservation Significant Fauna

Threatened and priority fauna

Fauna species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. At the Commonwealth level, fauna species can be listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Migratory birds may be recognised under international treaties including:

- *Japan Australia Migratory Bird Agreement 1981* (JAMBA)
- *China Australia Migratory Bird Agreement 1998* (CAMBA)
- *Republic of Korea-Australia Migratory Bird Agreement 2007* (ROKAMBA)
- *Bonn Convention 1979* (The Convention on the Conservation of Migratory Species of Wild Animals).

All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as ‘matters of national environmental significance’ (MNES) under the EPBC Act. Fauna species considered ‘threatened’ pursuant to Schedule 1 of the EPBC Act are assigned categories as outlined in **Table 1**.

Table 1: Definitions of conservation significant fauna species pursuant to the EPBC Act

Conservation Code	Category
X	Threatened Fauna –Extinct There is no reasonable doubt that the last member of the species has died.
EW [#]	Threatened Fauna –Extinct in the Wild Taxa which are known only to survive in cultivation, captivity or as a naturalised population outside its past range, or taxa which have not been recorded in its known and/or expected habitat despite appropriate exhaustive surveys.
CR [#]	Threatened Fauna – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN [#]	Threatened Fauna – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.
VU [#]	Threatened Fauna – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
Migratory [#]	Migratory Fauna All migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and All native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Ma	Marine Fauna Species in the list established under s248 of the EPBC Act

[#]matters of national environmental significance (MNES) under the EPBC Act

Additional Background Information



In Western Australia, fauna taxa may be classed as ‘specially protected’ under the *Biodiversity Conservation Act 2016* (BC Act) which is enforced by Department of Biodiversity Conservation and Attractions (DBCA). Specially protected fauna species are listed under Schedules 1 to 7 according to their conservation status. The definitions of these Schedules are provided in **Table 2**.

Table 2: Definitions of specially protected fauna schedules under the BC Act.

Conservation Code	Definition
CR	Schedule 1 – Critically Endangered Threatened species considered to be facing an extremely high risk of extinction in the wild.
EN	Schedule 2 – Endangered Threatened species considered to be facing a very high risk of extinction in the wild.
VU	Schedule 3 – Vulnerable Threatened species considered to be facing a high risk of extinction in the wild.
EX	Schedule 4 – Presumed extinct Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
MI	Schedule 5 – Migratory birds protected under an international agreement Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
CD	Schedule 6 – Fauna of special conservation need as conservation dependent fauna Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
OS	Schedule 7 – Other specially protected fauna. Fauna otherwise in need of special protection to ensure their conservation.

Additional Background Information



Fauna species that may be threatened or near threatened but lack sufficient information to be legislatively listed may be added to the DBCA's *Priority Fauna List* (DBCA 2018). Priority fauna species are considered during State approval processes. Priority fauna categories and definitions are listed in **Table 3**.

Table 3: Definitions of priority fauna categories on DBCA's *Priority Fauna List*

Conservation Code	Category
P1	<p>Priority 1 – Poorly known</p> <p>Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.</p>
P2	<p>Priority 2 – Poorly known</p> <p>Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.</p>
P3	<p>Priority 2 – Poorly known</p> <p>Species that are known from several locations and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.</p>
P4	<p>(a) Priority 4 – Rare species</p> <p>Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Priority 4 – Near Threatened</p> <p>Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</p> <p>(c) Priority 4 – Other</p> <p>Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

Pest fauna

A number of legislative and policy documents exist in relation to weed management at state and national levels. The *Biosecurity and Agriculture Management Act 2007* (BAM Act) is the principle legislation guiding weed management in Western Australia and lists declared pest species. At a national level, pest fauna may be listed as ‘Established Pests and Diseases of National Significance’ (EPDNS) under the *Australian Pest Animal Strategy (2017-2027)* (DoA 2017).

Declared Pests

Part 2.3.23 of the BAM Act requires a person must not; “a) keep, breed or cultivate the declared pest; b) keep, breed or cultivate an animal, plant or other thing that is infected or infested with the declared pest; c) release into the environment the declared pest, or an animal, plant or other thing that is infected or infested with the declared pest; or d) intentionally infect or infest, or expose to infection or infestation, a plant, animal or other thing with a declared pest”.

Under the BAM Act, all declared pests are assigned a legal status, as described in **Table 4**. Species assigned to the ‘declared pest, prohibited - s12’ category are placed in one of three control categories, as described in **Table 5**.

The *Biosecurity and Agriculture Management Regulations 2013* specify keeping categories for species assigned to the ‘declared pest - s22(2)’ category, which relate to the purposes of which species can be kept, as well as the entities that can keep them. The categories are described in **Table 6**.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act (DAFWA 2016).

Table 4: Legal status of declared pest species listed under the BAM Act (DAFWA 2016).

Category	Description
Declared Pest Prohibited - s12	May only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest s22(2)	Must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia

Table 5: Control categories of declared pest species listed under the BAM Act (DAFWA 2016).

Category	Description
C1	Exclusion Not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2	Eradication Present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3	Management

Additional Background Information



Category	Description
	Established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Table 6: Keeping categories of declared pest species listed under the BAM Act (DAFWA 2016).

Category	Description
Prohibited	Can only be kept under a permit for public display and education purposes, and/or genuine scientific research, by entities approved by the state authority.
Exempt	No permit or conditions are required for keeping.
Restricted	Organisms which, relative to other species, have a low risk of becoming a problem for the environment, primary industry or public safety and can be kept under a permit by private individuals.

References

General references

Department of Biodiversity, Conservation and Attractions (DBCA) 2018, *Threatened and Priority Fauna List 15 February 2018*, Perth.

Department of Agriculture (DoA) 2017, *Australian Pest Animal Strategy (2017-2027)*, Canberra.

Literature

Table 1: Standard literature used for identifying fauna species and habitats.

Conservation Code	Category
Birds	Johnstone and Storr (1998b), Johnstone and Storr (1998a), Pizzey and Knight (2012), Slater <i>et al.</i> (2003)
Mammals	Menkhorst and Knight (2011), Triggs (2003)
Amphibia	Tyler and Doughty (2009), Bush <i>et al.</i> (2002)
Reptiles	Bush <i>et al.</i> (2002)

References

Bush, B., Maryan, B., Browne-Cooper, R. and Robinson, D. 2002, *Reptiles and Frogs of the Perth Region*, UWA Press, Crawley.

Johnstone, R. E. and Storr, G. M. 1998a, *Handbook of Western Australian Birds. Volume 2 - Passerines (Blue-Winged Pitta to Goldfinch)*, Western Australian Museum, Perth.

Johnstone, R. E. and Storr, T. 1998b, *Handbook of Western Australian Birds: Volume 1 - Non-passerines (Emu to Dollarbird)*, Western Australian Museum, Perth.

Menkhorst, P. and Knight, F. 2011, *Field guide to the mammals of Australia (Third edition)*, Oxford University Press Australia & New Zealand, Melbourne, VIC, Australia.

Pizzey, G. and Knight, F. 2012, *The Fieldguide to the Birds of Australia*, Harper Collins Publishers, Sydney, Australia.

Slater, P., Slater, P. and Slater, R. 2003, *The Slater Field Guide to Australian Birds*, Reed New Holland, Australia.

Triggs, B. 2003, *Tracks, Scats and Other Traces A Field Guide to Australian Mammals*, Oxford University Press Australia, Melbourne, Victoria.

Tyler, M. J. and Doughty, P. 2009, *Field Guide to Frogs of Western Australia*, Western Australian Museum, Perth, Western Australia.

Appendix B

NatureMap Database Results



NatureMap Species Report

Created By Guest user on 25/10/2019

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 00' 29" E, 31° 52' 17" S
Buffer	10km

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
2.	<i>Acanthaluteres brownii</i>			
3.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
4.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
5.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
6.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
7.	<i>Acariformes</i> sp.			
8.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
9.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
10.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
11.	24283 <i>Accipiter fasciatus</i> subsp. <i>didimus</i> (Brown Goshawk)			
12.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
13.	<i>Acentrogobius bifrenatus</i>			
14.	25751 <i>Acridotheres tristis</i> (Common Myna)	Y		
15.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
16.	<i>Acroaspis olorina</i>			Y
17.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
18.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
19.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
20.	<i>Aganippe cupulifex</i>			Y
21.	<i>Akamptogonus novarae</i>			
22.	<i>Aldrichetta forsteri</i>			
23.	<i>Allotherua maculata</i>			
24.	<i>Ambicodamus kochi</i>			
25.	<i>Amblyomma albolimbatum</i>			
26.	<i>Amblyomma fimbriatum</i>			
27.	<i>Amblyomma triguttatum</i>			
28.	<i>Amniataba caudavittata</i>			
29.	<i>Amphisopodidae</i> sp.			
30.	<i>Aname mainae</i>			
31.	<i>Aname tepperi</i>			
32.	24310 <i>Anas castanea</i> (Chestnut Teal)			
33.	24311 <i>Anas clypeata</i> (Northern Shoveler)			Y
34.	24312 <i>Anas gracilis</i> (Grey Teal)			
35.	24313 <i>Anas platyrhynchos</i> (Mallard)			
36.	<i>Anas platyrhynchos</i> subsp. <i>domesticus</i>			
37.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
38.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
39.	<i>Ancylidae</i> sp.			
40.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
41.	44629 <i>Anilius australis</i>			
42.	24506 <i>Anous tenuirostris</i> subsp. <i>melanops</i> (Australian Lesser Noddy)		T	
43.	<i>Anser anser</i>			
44.	25319 <i>Antaresia stimsoni</i> subsp. <i>orientalis</i> (Stimson's Python)			
45.	25241 <i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python)			
46.	25449 <i>Antechinus flavipes</i> (Yellow-footed Antechinus)			
47.	24088 <i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)			
48.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
49.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
50.	25670 <i>Anthus australis</i> (Australian Pipit)			
51.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
52.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
53.	25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
54.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
55.	<i>Arachnura higginsii</i>			
56.	<i>Araneus cyphoxis</i>			
57.	<i>Araneus eburneiventris</i>			
58.	<i>Araneus ginninderranus</i>			
59.	<i>Araneus senicaudatus</i>			
60.	25558 <i>Ardea ibis</i> (Cattle Egret)			
61.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
62.	41324 <i>Ardea modesta</i> (great egret, white egret)			
63.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
64.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
65.	<i>Argiope protensa</i>			
66.	<i>Argiope trifasciata</i>			
67.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
68.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
69.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
70.	<i>Artoria flavimana</i>			
71.	<i>Artoria impedita</i>			
72.	<i>Artoria linnaei</i>			
73.	<i>Artoriopsis expolita</i>			
74.	<i>Asadipus kunderang</i>			
75.	<i>Atherinosoma wallacei</i>			
76.	<i>Austracantha minax</i>			
77.	<i>Australomimetus auriculatus</i>			
78.	<i>Australomimetus ovidi</i>			
79.	48574 <i>Australotomurus morbidus</i> (cemetery springtail, Guildford springtail)		P3	
80.	33972 <i>Austromerope poultoni</i> (earwigfly (southwest), scorpionfly)			
81.	47713 <i>Austronomus australis</i> (White-striped Free-tailed Bat)			
82.	24318 <i>Aythya australis</i> (Hardhead)			
83.	<i>Backobourkia brounii</i>			
84.	<i>Backobourkia heroine</i>			
85.	<i>Badumna insignis</i>			
86.	<i>Baetidae</i> sp.			
87.	<i>Baiami volucripes</i>			
88.	<i>Ballarra longipalpus</i>			
89.	<i>Barmardius zonarius</i>			
90.	25452 <i>Bettongia penicillata</i> (Woylie, Brush-tailed Bettong)		T	
91.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T	
92.	<i>Bigenditia zuytdorp</i>			
93.	24319 <i>Biziura lobata</i> (Musk Duck)			
94.	<i>Bostockia porosa</i>			
95.	24345 <i>Botaurus poiciloptilus</i> (Australasian Bittern)		T	
96.	42380 <i>Brachyurophis fasciolatus</i> subsp. <i>fasciolatus</i> (Narrow-banded Shovel-nosed Snake)			
97.	42381 <i>Brachyurophis semifasciatus</i> (Southern Shovel-nosed Snake)			
98.	<i>Brentidae</i> sp.			
99.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
100.	25713 <i>Cacatua galerita</i> (Sulphur-crested Cockatoo)			
101.	24721 <i>Cacatua galerita</i> subsp. <i>galerita</i> (Sulphur-crested Cockatoo)	Y		
102.	24722 <i>Cacatua leadbeateri</i> (Major Mitchell's Cockatoo)			
103.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
104.	24723 <i>Cacatua pastinator</i> subsp. <i>butleri</i> (Butler's Corella)			
105.	24724 <i>Cacatua pastinator</i> subsp. <i>pastinator</i> (Muir's Corella, Muir's Corella (Western Corella SW WA))		S	
106.	25715 <i>Cacatua roseicapilla</i> (Galah)			
107.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
108.	24727 <i>Cacatua sanguinea</i> subsp. <i>westralensis</i> (Little Corella)			
109.	<i>Cacatua sulphurea</i> subsp. <i>galerita</i>			Y
110.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
111.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
112.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
113.	<i>Caenidae</i> sp.			
114.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
115.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
116.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		T	
117.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
118.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
119.	<i>Carabidae</i> sp.			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
120.	<i>Carassius auratus</i>			
121.	<i>Carcharhinus leucas</i>			
122.	25625 <i>Carduelis carduelis</i> (Goldfinch, European Goldfinch)	Y		
123.	24480 <i>Carduelis carduelis</i> subsp. <i>britannica</i> (Goldfinch)	Y		
124.	<i>Ceinidae</i> sp.			
125.	<i>Celaenia excavata</i>			
126.	<i>Ceratopogonidae</i> sp.			
127.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
128.	<i>Cercophonius granulosus</i>			
129.	<i>Cercophonius sulcatus</i>			
130.	<i>Ceryda cursitans</i>			
131.	<i>Cethegus fugax</i>			
132.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
133.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
134.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
135.	43380 <i>Chelodina colliciei</i> (South-western Snake-necked Turtle)			
136.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
137.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
138.	33939 <i>Cherax cainii</i> (Marron)			
139.	<i>Cherax destructor</i>			
140.	<i>Cherax quinquecarinatus</i>			
141.	<i>Cherax</i> sp.			
142.	<i>Chironominae</i> sp.			
143.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
144.	<i>Chroicocephalus novaehollandiae</i>			
145.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
146.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
147.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
148.	24288 <i>Circus approximans</i> (Swamp Harrier)			
149.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
150.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
151.	<i>Clynotis severus</i>			
152.	<i>Cnidoglanis macrocephalus</i>			
153.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
154.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
155.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
156.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
157.	<i>Cordulidae</i> sp.			
158.	<i>Corixidae</i> sp.			
159.	<i>Cormocephalus aurantiipes</i>			
160.	<i>Cormocephalus rubriceps</i>			
161.	<i>Cormocephalus strigosus</i>			
162.	<i>Cormocephalus turneri</i>			
163.	24416 <i>Corvus bennetti</i> (Little Crow)			
164.	25592 <i>Corvus coronoides</i> (Australian Raven)			
165.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
166.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
167.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
168.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
169.	25456 <i>Crenadactylus ocellatus</i> (Clawless Gecko)			
170.	24918 <i>Crenadactylus ocellatus</i> subsp. <i>ocellatus</i> (Clawless Gecko)			
171.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
172.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
173.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
174.	25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)			
175.	30893 <i>Cryptoblepharus buchananii</i>			
176.	25020 <i>Cryptoblepharus plagiocephalus</i>			
177.	30899 <i>Ctenophorus adelaidensis</i> (Southern Heath Dragon, Western Heath Dragon)			
178.	24883 <i>Ctenophorus ornatu</i> (Ornate Crevice-Dragon)			
179.	25027 <i>Ctenotus australis</i>			
180.	25035 <i>Ctenotus delli</i> (Dell's skink, Darling Range southwest Ctenotus)		P4	
181.	25039 <i>Ctenotus fallens</i>			
182.	25040 <i>Ctenotus gemmula</i> (Jewelled South-west Ctenotus (Swan Coastal Plain subpop P3), skink)			
183.	25047 <i>Ctenotus impar</i>			
184.	25049 <i>Ctenotus labillardieri</i>			
185.	<i>Culicidae</i> sp.			
186.	<i>Curculionidae</i> sp.			
187.	<i>Cyanorhamphus auriceps</i>			Y
188.	<i>Cyclosa trilobata</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
189.	24322 <i>Cygnus atratus</i> (Black Swan)			
190.	24323 <i>Cygnus olor</i> (Mute Swan)	Y		
191.	<i>Cyrtophora parnasia</i>			
192.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
193.	30902 <i>Dacelo novaeguineae</i> subsp. <i>novaeguineae</i> (Laughing Kookaburra)	Y		
194.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
195.	24606 <i>Daphoenositta chrysoptera</i> subsp. <i>pileata</i> (Varied Sittella, Black-capped Sittella)			
196.	24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		T	
197.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
198.	24999 <i>Delma grayii</i>			
199.	25296 <i>Demansia psammophis</i> subsp. <i>reticulata</i> (Yellow-faced Whipsnake)			
200.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
201.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
202.	<i>Dingosa serrata</i>			
203.	<i>Dinocambala ingens</i>			
204.	25469 <i>Diplodactylus granariensis</i>			
205.	24929 <i>Diplodactylus granariensis</i> subsp. <i>granariensis</i>			
206.	44654 <i>Diplodactylus lateroides</i> (Speckled Stone Gecko)			
207.	24939 <i>Diplodactylus polyophthalmus</i>			
208.	24940 <i>Diplodactylus pulcher</i>			
209.	<i>Dolichopodidae</i> sp.			
210.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
211.	<i>Dugesidae</i> sp.			
212.	<i>Dytiscidae</i> sp.			
213.	25251 <i>Echiopsis curta</i> (Bardick)			
214.	25096 <i>Egernia kingii</i> (King's Skink)			
215.	25100 <i>Egernia napoleonis</i>			
216.	<i>Egretta garzetta</i>			
217.	<i>Egretta novaehollandiae</i>			
218.	<i>Elanus axillaris</i>			
219.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
220.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
221.	47937 <i>Elysiornis melanops</i> (Black-fronted Dotterel)			
222.	<i>Engraulis australis</i>			
223.	<i>Eodelena lapidicola</i>			
224.	<i>Eolophus roseicapillus</i>			
225.	25692 <i>Eopsaltria australis</i> (Yellow Robin)			
226.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
227.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
228.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
229.	24258 <i>Equus caballus</i> (Horse)	Y		
230.	<i>Erigone prominens</i>			
231.	<i>Eriophora biapicata</i>			
232.	<i>Eriophora pustulosa</i>			
233.	24379 <i>Erythronyx cinctus</i> (Red-kneed Dotterel)			
234.	<i>Eucyrtops lator</i>			
235.	48579 <i>Euoplos inornatus</i> (inornate trapdoor spider (northern Jarrah Forest))		P3	
236.	<i>Eupograptus kottae</i>			
237.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
238.	25621 <i>Falco berigora</i> (Brown Falcon)			
239.	24471 <i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon)			
240.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
241.	24472 <i>Falco cenchroides</i> subsp. <i>cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
242.	25623 <i>Falco longipennis</i> (Australian Hobby)			
243.	24474 <i>Falco longipennis</i> subsp. <i>longipennis</i> (Australian Hobby)			
244.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
245.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
246.	<i>Favonigobius</i> sp.			
247.	24041 <i>Felis catus</i> (Cat)	Y		
248.	25727 <i>Fulica atra</i> (Eurasian Coot)			
249.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
250.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
251.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
252.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
253.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
254.	<i>Gea theridioides</i>			
255.	24959 <i>Gehyra variegata</i>			
256.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
257.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
258.	34030 <i>Geotria australis</i> (Pouched Lamprey)			

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259.	<i>Gerres subfasciatus</i>			
260.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
261.	<i>Glossiphoniidae</i> sp.			
262.	30918 <i>Glossopsitta concinna</i> (Musk Lorikeet)	Y		
263.	47962 <i>Glyciphila melanops</i> (Tawny-crowned Honeyeater)			
264.	<i>Gomphidae</i> sp.			
265.	<i>Gonorynchus greyi</i>			
266.	<i>Gracula religiosa</i>			
267.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
268.	<i>Gripopterygidae</i> sp.			
269.	<i>Gyrinidae</i> sp.			
270.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
271.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
272.	24689 <i>Halobaena caerulea</i> (Blue Petrel)			
273.	24296 <i>Hamirostra isura</i> (Square-tailed Kite)			
274.	25408 <i>Heleioporus albopunctatus</i> (Western Spotted Frog)			
275.	25409 <i>Heleioporus barycragus</i> (Hooting Frog)			
276.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
277.	25412 <i>Heleioporus psammophilus</i> (Sand Frog)			
278.	<i>Hemicloea</i> sp.			Y
279.	<i>Hemicloea sublimbata</i>			
280.	<i>Hemicorduliidae</i> sp.			
281.	25474 <i>Hemiergus initialis</i>			
282.	25115 <i>Hemiergus initialis</i> subsp. <i>initialis</i>			
283.	25119 <i>Hemiergus quadrilineata</i>			
284.	<i>Heurodes turritus</i>			
285.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
286.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
287.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
288.	<i>Hoggicosa storri</i>			
289.	<i>Hogna crispipes</i>			
290.	<i>Hogna kuyani</i>			
291.	<i>Holasteron perth</i>			
292.	<i>Holconia westralia</i>			
293.	<i>Holocnemus plucheii</i>			
294.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
295.	<i>Hydrophilidae</i> sp.			
296.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
297.	<i>Hydroptilidae</i> sp.			
298.	<i>Hypoblemum</i> sp.			Y
299.	<i>Idiommata blackwallii</i>			
300.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		P3	
301.	<i>Isometroides vesusus</i>			
302.	48588 <i>Isoodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
303.	<i>Isopeda leishmanni</i>			
304.	<i>Isopeda magna</i>			
305.	<i>Isopedella cana</i>			
306.	<i>Isopedella tindalei</i>			
307.	24347 <i>Ixobrychus flavicollis</i> subsp. <i>australis</i> (Black Bittern (southwest subpop.), Australian Black Bittern)		P2	
308.	<i>Karaops ellenae</i>			
309.	24367 <i>Lalage tricolor</i> (White-winged Thriller)			
310.	<i>Lampona cylindrata</i>			
311.	<i>Lampona yanched</i>			
312.	<i>Lamponella ainslie</i>			
313.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
314.	<i>Latrodectus hasseltii</i>			
315.	<i>Latrodectus hasseltii</i>			
316.	<i>Leptoceridae</i> sp.			
317.	<i>Leptophlebiidae</i> sp.			
318.	25131 <i>Lerista distinguenda</i>			
319.	25133 <i>Lerista elegans</i>			
320.	25148 <i>Lerista lineopunctulata</i>			
321.	25165 <i>Lerista praepedita</i>			
322.	25005 <i>Lialis burtonis</i>			
323.	<i>Libellulidae</i> sp.			
324.	25659 <i>Lichenostomus leucotis</i> (White-eared Honeyeater)			
325.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
326.	24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
327.	<i>Limnochares australica</i>			

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328.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
329.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
330.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
331.	<i>Lophochroa leadbeateri</i>			
332.	<i>Lophoichthya isura</i>			
333.	<i>Lycosa ariadnae</i>			
334.	<i>Lycosa godeffroyi</i>			
335.	<i>Lymnaeidae</i> sp.			
336.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
337.	24135 <i>Macropus robustus</i> subsp. <i>erubescens</i> (Euro, Biggada)			
338.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
339.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
340.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
341.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
342.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
343.	24551 <i>Malurus pulcherrimus</i> (Blue-breasted Fairy-wren)			
344.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
345.	24552 <i>Malurus splendens</i> subsp. <i>splendens</i> (Splendid Fairy-wren)			
346.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
347.	<i>Maratus pavonis</i>			
348.	<i>Masasteron mas</i>			
349.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
350.	<i>Megapodagrionidae</i> sp.			
351.	47997 <i>Melanodryas cucullata</i> (Hooded Robin)			
352.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
353.	24586 <i>Melithreptus brevirostris</i> subsp. <i>leucogenys</i> (Brown-headed Honeyeater)			
354.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
355.	25184 <i>Menetia greyii</i>			
356.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
357.	<i>Microcarbo melanoleucos</i>			
358.	25693 <i>Microeca fascinans</i> (Jacky Winter)			
359.	<i>Missulena granulosa</i>			
360.	<i>Missulena hoggi</i>			
361.	<i>Missulena occatoria</i>			
362.	<i>Mituliodon tarantulinus</i>			
363.	<i>Monacanthus chinensis</i>			
364.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
365.	25191 <i>Morethia lineocellata</i>			
366.	25192 <i>Morethia obscura</i>			
367.	48005 <i>Mormopterus kitcheneri</i> (South-western Free-tailed Bat)			
368.	<i>Mugil cephalus</i>			
369.	24223 <i>Mus musculus</i> (House Mouse)	Y		
370.	<i>Myandra bincincta</i>			
371.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
372.	25420 <i>Myobatrachus gouldii</i> (Turtle Frog)			
373.	<i>Nannoperca vittata</i>			
374.	<i>Neatypus obliquus</i>			
375.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
376.	25249 <i>Neelaps calonotos</i> (Black-striped Snake, black-striped burrowing snake)		P3	
377.	<i>Nematoda</i> sp.			
378.	25426 <i>Neobatrachus pelobatoides</i> (Humming Frog)			
379.	25686 <i>Neochmia temporalis</i> (Red-browed Finch)	Y		
380.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
381.	<i>Neophema pulchella</i>			
382.	<i>Nephila edulis</i>			
383.	<i>Nicodamus mainae</i>			
384.	25747 <i>Ninox connivens</i> (Barking Owl)			
385.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
386.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
387.	<i>Notiasemus glauerti</i>			
388.	<i>Notsodipus muckera</i>			
389.	<i>Novakiella trituberculosa</i>			
390.	<i>Nunciella aspera</i>			
391.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
392.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
393.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
394.	<i>Occiperipatoides gilesii</i>			
395.	<i>Ocrisiona leucocomis</i>			
396.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
397.	<i>Oecobius navus</i>			

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398.	<i>Oligochaeta</i> sp.			
399.	<i>Ommatoiulus moreleti</i>			
400.	<i>Ommatoiulus moreletii</i>			
401.	<i>Oniscidae</i> sp.			
402.	<i>Opopaea</i> sp.			Y
403.	<i>Orphnaeus brevilabiatus</i>			
404.	<i>Orthoclaadiinae</i> sp.			
405.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
406.	<i>Ostearius melanopygius</i>			
407.	34016 <i>Ovis aries</i> (Sheep)			
408.	<i>Oxyopes gracilipes</i>			
409.	<i>Oxyopes punctatus</i>			
410.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
411.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
412.	24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
413.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
414.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
415.	<i>Papillogobius punctatus</i>			
416.	<i>Paralampona marangaroo</i>			
417.	<i>Paramelitidae</i> sp.			
418.	<i>Parastacidae</i> sp.			
419.	25253 <i>Parasuta gouldii</i>			
420.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
421.	24625 <i>Pardalotus punctatus</i> subsp. <i>punctatus</i> (Spotted Pardalote)			
422.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
423.	24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
424.	25687 <i>Passer domesticus</i> (House Sparrow)	Y		
425.	<i>Pediana occidentalis</i>			
426.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
427.	<i>Pentastemon securifer</i>			
428.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
429.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
430.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
431.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
432.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
433.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
434.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
435.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
436.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
437.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
438.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
439.	<i>Pholcus phalangoides</i>			
440.	<i>Phryganoporus candidus</i>			
441.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
442.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
443.	<i>Physidae</i> sp.			
444.	<i>Pinkfloydia harveii</i>			
445.	<i>Planorbidae</i> sp.			
446.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
447.	<i>Platycephalus indicus</i>			
448.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
449.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
450.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
451.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
452.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
453.	25007 <i>Pletholax gracilis</i> subsp. <i>gracilis</i> (Keeled Legless Lizard)			
454.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
455.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
456.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
457.	24680 <i>Podiceps cristatus</i> subsp. <i>australis</i> (Great Crested Grebe)			
458.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
459.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
460.	24681 <i>Poliocephalus poliocephalus</i> (Hoary-headed Grebe)			
461.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
462.	24683 <i>Pomatostomus superciliosus</i> (White-browed Babbler)			
463.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
464.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
465.	24769 <i>Porzana fluminea</i> (Australian Spotted Crane)			
466.	25732 <i>Porzana pusilla</i> (Baillon's Crane)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
467.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
468.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
469.	25345 <i>Pseudemadura umbrina</i> (Western Swamp Tortoise, Western Swamp Turtle)		T	
470.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum, ngwayir)		T	
471.	25511 <i>Pseudonaja affinis</i> (Dugite)			
472.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
473.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
474.	25264 <i>Pseudonaja nuchalis</i> (Gwardar, Northern Brown Snake)			
475.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
476.	42344 <i>Pumella albifrons</i> (White-fronted Honeyeater)			
477.	<i>Purpureicephalus spurius</i>			
478.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
479.	24243 <i>Rattus fuscipes</i> (Western Bush Rat)			
480.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
481.	<i>Raveniella cirrata</i>			
482.	<i>Raveniella peckorum</i>			
483.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
484.	<i>Rhabdosargus sarba</i>			
485.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
486.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
487.	24454 <i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			
488.	<i>Richardsonianidae</i> sp.			
489.	<i>Sandalodes joannae</i>			
490.	<i>Sandalodes superbus</i>			
491.	<i>Scirtidae</i> sp.			
492.	<i>Scobinichthys granulatus</i>			
493.	<i>Scolopendra laeta</i>			
494.	<i>Scytodes thoracica</i>			
495.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
496.	<i>Serinus canarius</i>			
497.	<i>Servaea melaina</i>			
498.	<i>Servaea spinibarbis</i>			
499.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
500.	<i>Simuliidae</i> sp.			
501.	<i>Smeringopus natalensis</i>			
502.	<i>Smeringopus natalensis?</i>			Y
503.	30948 <i>Smicromis brevirostris</i> (Weebill)			
504.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
505.	<i>Steatoda capensis</i>			
506.	<i>Steatoda grossa</i>			
507.	24525 <i>Sterna fuscata</i> subsp. <i>nubilosa</i> (Sooty Tern)			
508.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
509.	<i>Storena formosa</i>			
510.	<i>Storena sinuosa</i>			
511.	<i>Stratiomyidae</i> sp.			
512.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
513.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
514.	30951 <i>Streptopelia chinensis</i> subsp. <i>tigrina</i> (Spotted Turtle-Dove)	Y		
515.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
516.	25518 <i>Strophurus spinigerus</i>			
517.	24943 <i>Strophurus spinigerus</i> subsp. <i>inornatus</i>			
518.	24942 <i>Strophurus spinigerus</i> subsp. <i>spinigerus</i>			
519.	<i>Styloniscidae</i> sp.			
520.	<i>Supunna funerea</i>			
521.	<i>Supunna picta</i>			
522.	24259 <i>Sus scrofa</i> (Pig)	Y		
523.	33992 <i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	
524.	<i>Synothele durokoppin</i>			
525.	<i>Synothele michaelsoni</i>			
526.	<i>Synthemistidae</i> sp.			
527.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
528.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
529.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
530.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
531.	<i>Talitridae</i> sp.			
532.	<i>Tamopsis darlingtoniana</i>			
533.	<i>Tamopsis perthensis</i>			
534.	<i>Tanypodinae</i> sp.			
535.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
536.	<i>Tasmanicosa leuckartii</i>			
537.	<i>Tetragnatha demissa</i>			
538.	<i>Tetragnatha luteocincta</i>			Y
539.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
540.	48136 <i>Threskiornis moluccus</i> (Australian White Ibis)			
541.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
542.	25203 <i>Tiliqua occipitalis</i> (Western Bluetongue)			
543.	25519 <i>Tiliqua rugosa</i>			
544.	25204 <i>Tiliqua rugosa</i> subsp. <i>aspera</i>			
545.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
546.	<i>Tipulidae</i> sp.			
547.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
548.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
549.	<i>Trachycosmus sculptilis</i>			
550.	<i>Trachyspina mundaring</i>			
551.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
552.	<i>Trichocyclus nullarbor</i>			
553.	<i>Trichoglossus chlorolepidotus</i>			
554.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
555.	24755 <i>Trichoglossus haematodus</i> subsp. <i>moluccanus</i> (Rainbow Lorikeet)	Y		
556.	24754 <i>Trichoglossus haematodus</i> subsp. <i>rubitorquis</i> (Red-collared Lorikeet)			
557.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
558.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
559.	<i>Tridentiger trionocephalus</i>			
560.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
561.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
562.	48147 <i>Turnix varius</i> (Painted Button-quail)			
563.	24851 <i>Turnix velox</i> (Little Button-quail)			
564.	25762 <i>Tyto alba</i> (Barn Owl)			
565.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
566.	24983 <i>Underwoodisaurus milii</i> (Barking Gecko)			
567.	<i>Urocampus carinirostris</i>			
568.	<i>Urodacus armatus</i>			
569.	<i>Urodacus novaehollandiae</i>			
570.	<i>Urodacus planimanus</i>			
571.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
572.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
573.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
574.	<i>Varanus</i> sp.			
575.	25526 <i>Varanus tristis</i> (Racehorse Monitor)			
576.	<i>Venator immansueta</i>			
577.	<i>Venatrix pullastra</i>			
578.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
579.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		
580.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
581.	<i>Withius piger</i>			
582.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereve)			
583.	unknown unknown			Y

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

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

Appendix C

Conservation Significant Species and
Likelihood of Occurrence Assessment



Table C1: Likelihood of occurrence of conservation significant fauna species within the site.

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Aves					
<i>Anous tenuirostris melanops</i>	Australian lesser noddy	EN	VU	Very common in blue-water seas around the Abrolhos (endemic to this area, accidental occurrences on lower west coast of Australia) (Johnstone and Storr 1998).	Unlikely
<i>Apus pacificus</i>	Pacific swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Pizzey & Knight 2012).	Possible
<i>Botaurus poiciloptilus</i>	Australasian bittern	EN	EN	In or over water, in tall reedbeds, sedges, rushes, cumbungi, lignum. Also occurs in ricefields, drains in tussocky paddocks and occasionally in saltmarshes and brackish wetlands.	Possible
<i>Cacatua pastinator pastinator</i>	Muir's corella	S	-	Wheat and sheep farming country with remnant native forest.	Unlikely, locally extinct
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	MI	Occurs in tidal mudflats, saltmarshes and mangroves, as well as, shallow fresh, brackish or saline inland wetlands. It is also known from floodwaters, irrigated pastures and crops, sewage ponds, saltfields.	Unlikely
<i>Calidris ferruginea</i>	Curlew sandpiper	VU (MI)	CR (MI)	Mainly shallows of estuaries and near-coastal saltlakes (including saltwork ponds) and drying near-coastal freshwater lakes and swamps. Also beaches and near-coastal sewage ponds.	Unlikely
<i>Calidris melanotos</i>	Pectoral sandpiper	MI	MI	Mainly fresh waters (swamps, lagoons, river pools, irrigation channels and sewage ponds); also samphire flats around estuaries and saltlakes (Johnstone & Storr 1998).	Unlikely
<i>Calyptorhynchus banksii naso</i>	Forest red-tailed black cockatoo	VU	VU	Eucalypt and Corymbia forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding Corymbia calophylla, Eucalyptus marginata, introduced Melia azdarach and Eucalyptus spp. trees.	Possible

Table C1: Likelihood of occurrence of conservation significant fauna species within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Aves					
<i>Calyptorhynchus baudinii</i>	Baudin's cockatoo	EN	EN	Mainly eucalypt forests. Attracted to seeding <i>Corymbia calophylla</i> , <i>Banksia</i> spp., <i>Hakea</i> spp., and to fruiting apples and pears (Johnstone and Storr 1998).	Possible
<i>Calyptorhynchus latirostris</i>	Carnaby's cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of <i>Pinus</i> spp. Attracted to seeding <i>Banksia</i> spp., <i>Dryandra</i> spp., <i>Hakea</i> spp., <i>Eucalyptus</i> spp., <i>Corymbia calophylla</i> , <i>Grevillea</i> spp., and <i>Allocasuarina</i> spp. (Johnstone and Storr 1998).	Possible
<i>Diomedea amsterdamensis</i>	Amsterdam albatross	VU (MI)	EN (MI)	The Amsterdam albatross is a marine, pelagic seabird. It nests in open patchy vegetation (among tussocks, ferns or shrubs) near exposed ridges or hillocks (Weimerskirch et al. 1985). It sleeps and rests on ocean waters when not breeding (Marchant and Higgins 1990)	Unlikely
<i>Diomedea epomophora</i>	Southern royal albatross	VU (MI)	VU (MI)	Rare visitor to Western Australian seas; it breeds on subantarctic islands south of New Zealand (Johnstone and Storr 1998).	Unlikely
<i>Diomedea exulans</i>	Wandering albatross	VU (MI)	VU (MI)	Marine, pelagic and aerial species. It breeds on Macquarie Island and feeds in Australian portions of the Southern Ocean (DoE 2018).	Unlikely
<i>Diomedea sanfordi</i>	Northern royal albatross	EN	EN	Species is marine, pelagic and aerial. Habitat includes subantarctic, subtropical, and occasionally Antarctic waters (Marchant & Higgins 1990). Rare visitors to south Western Australian waters.	Unlikely
<i>Falco peregrinus</i>	Peregrine falcon	S	-	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	Possible
<i>Leipoa ocellata</i>	Mallefowl	VU	VU	Scrubs and thickets of <i>Eucalyptus</i> spp., <i>Melaleuca lanceolata</i> and <i>Acacia linophylla</i> ; also other dense litter-forming shrublands. Attracted to fallen wheat in stubbles and along roads (Johnstone and Storr 1998).	Unlikely, locally extinct
<i>Macronectes giganteus</i>	Southern giant-petrel	MI	EN (MI)	Breeds on southern subantarctic and antarctic islands. May visit Western Australian waters from February to December (mostly June to September) (Johnstone and Storr 1998).	Unlikely

Table C1: Likelihood of occurrence of conservation significant fauna species within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Aves					
<i>Macronectes halli</i>	Northern giant petrel	MI	VU (MI)	Breeds on subantarctic islands. May visit Western Australian water from February to September (Johnstone and Storr 1998).	Unlikely
<i>Motacilla cinerea</i>	Grey wagtail	MI	MI	Mainly banks and rocks in fast-running fresh water habitats: rivers, creeks, streams and around waterfalls, both in forest and open country; but occurs almost anywhere during migration.	Unlikely
<i>Numenius madagascariensis</i>	Eastern curlew	VU (MI)	CR (MI)	Mainly tidal mudflats; also reef flats, sandy beaches and rarely near-coastal lakes (including saltwork ponds) (Johnstone and Storr 1998).	Unlikely
<i>Oxyura australis</i>	Blue-billed duck	P4	-	Mainly deeper freshwater swamps and lakes; occasionally saltlakes and estuaries freshened by flood waters (Johnstone and Storr 1998a).	Possible
<i>Pachyptila turtur subantarctica</i>	Fairy prion	-	VU	Breeds on subantarctic islands and is presumed to frequent subtropical waters during non-breeding period (TSSC 2015).	Unlikely
<i>Pandion haliaetus</i>	Osprey	MI	MI	Coasts, estuaries, bays, inlets, islands, and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks (Pizzey & Knight 2012).	Unlikely
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	Shallow and adjacent flats of freshwater lakes and swamps, also river pools, flooded samphire and sewage ponds.	Possible
<i>Rostratula australis</i>	Australian painted snipe	EN	EN	Mainly shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (Marchant and Higgins 1993).	Unlikely
<i>Sterna bergii</i>	Crested tern	MI	MI	Mainly blue-water seas (especially within 3 km of land), including southern estuaries in summer and autumn (when free of silt); also tidal creeks in north, but not penetrating far into larger estuaries.	Unlikely
<i>Sterna caspia</i>	Caspian tern	MI	MI	Mainly sheltered areas, estuaries (when not laden with silt) and tidal creeks; occasionally near-coastal saltlakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh waters.	Unlikely
<i>Sternula nereis nereis</i>	Australian fairy tern	VU	VU	Sheltered blue-water seas close to land, estuaries (when free of silt) and near-coastal lakes (Johnstone and Storr 1998).	Unlikely

Table C1: Likelihood of occurrence of conservation significant fauna species within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Aves					
<i>Thalassarche cauta cauta</i>	Shy albatross	VU (MI)	VU (MI)	Scarce visitor (late May to mid-October) to southwestern and western seas. Breeds on islands off Tasmania and south New Zealand (Johnstone and Storr 1998).	Unlikely
<i>Thalassarche cauta steadi</i>	White-capped albatross	VU (MI)	VU (MI)	Scarce visitor (late May to mid-October) to southwestern and western seas. Breeds on islands off Tasmania and south New Zealand (Johnstone and Storr 1998).	Unlikely
<i>Thalassarche melanophris</i>	Black-browed albatross	EN (MI)	VU (MI)	Seas of south and west coasts. Visitor to Western Australian mainland from January to early November (mostly May to September). Breeds on southern subantarctic and antarctic islands (Johnstone and Storr 1998).	Unlikely
<i>Thalassarche melanophris impavida</i>	Campbell albatross	VU (MI)	VU (MI)	Scarce visitor to south western and western seas. Breeds on Campbell island.	Unlikely
<i>Tringa glareola</i>	Wood sandpiper	MI	MI	Mainly shallow fresh waters (lagoons, swamps, claypans, river pools, dams, bore overflows and sewage ponds); occasionally brackish swamps, rarely saltlakes and estuaries.	Unlikely
<i>Tringa hypoleucos</i>	Common sandpiper	MI	MI	Edge of sheltered waters salt or fresh, e.g. estuaries, mangrove creeks, rocky coasts, near-coastal saltlakes (including saltwork ponds), river pools, lagoons, claypans, drying swamps, flood waters, dams and sewage ponds. Preferring situations where low perches are available (Johnstone & Storr 1998).	Unlikely
<i>Tringa nebularia</i>	Common greenshank	MI	MI	Shallow fresh waters (claypans, lagoons, swamps, river pools, dams and sewage ponds) and salt waters (estuaries, mangrove creeks, lakes, samphire flats, reef flats and saltwork ponds).	Unlikely

Table C1: Likelihood of occurrence of conservation significant fauna species within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Agnatha					
<i>Geotria australis</i>	Pouched lamprey	P1	-	Marine, estuarine and coastal rivers and streams. Adults live in Southern Ocean and migrate upstream to spawn. Larvae live in muddy burrows in the upper reaches of streams (Bray and Gomon 2018).	Unlikely
Invertebrate					
<i>Euoplos inornatus</i>	Inornate trapdoor spider	P3	-	Unknown.	Not assessed
<i>Hesperocolletes douglasi</i>	Douglas's broad-headed bee	CR	CR	Banksia woodland vegetation (Pille Arnold 2019).	Unlikely
<i>Idiosoma sigillatum</i>	Swan Coastal Plain shield-backed trapdoor spider	P3	-	Unknown.	Not assessed
<i>Synemon gratiosa</i>	Graceful sunmoth	P4	-	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the preferred host plant <i>Lomandra maritima</i> . Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant <i>L. hermaphrodita</i> is widespread (DEC 2011).	Unlikely
<i>Westralunio carteri</i>	Carter's freshwater mussel	VU	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Salinity tolerance quite low (Morgan et al. 2011).	Possible
Mammalia					
<i>Bettongia penicillata ogilbyi</i>	Woylie	CR	EN	Woodlands and adjacent heaths with a dense understorey of shrubs, particularly <i>Gastrolobium</i> spp. (TSSC 2018).	Unlikely, locally extinct
<i>Dasyurus geoffroii</i>	Chuditch	VU	VU	Wide range of habitats from woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. Appears to utilise native vegetation along road sides in the wheatbelt (DEC 2012b).	Unlikely, locally extinct
<i>Isodon fusciventer</i>	Quenda	P4	-	Dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC 2012).	Possible

Table C1: Likelihood of occurrence of conservation significant fauna species within the site (continued).

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Mammal					
<i>Macrotis lagotis</i>	Bilby	VU	VU	Open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises and hummock grassland (spinifex) growing on sandplains and dunes, drainage systems, salt lake systems and other alluvial areas (DBCA 2017a).	Unlikely, locally extinct
<i>Notamacropus irma</i>	Western brush wallaby	P4	-	Dry sclerophyll forest, Banksia spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover (Christensen and Strahan 1983).	Unlikely
<i>Phascogale tapoatafa wambenger</i>	South-western brush-tailed phascogale	CD	0	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover (Triggs 2003).	Unlikely, no recent records
<i>Pseudocheirus occidentalis</i>	Western ringtail possum	CR	VU	On the Swan Coastal Plain in <i>Agonis flexuosa</i> woodlands and <i>Agonis flexuosa</i> / <i>Eucalyptus gomphocephala</i> forests. Also <i>Eucalyptus marginata</i> forests (DBCA 2017b).	Unlikely, locally extinct
<i>Setonix brachyurus</i>	Quokka	VU	VU	On the mainland mostly dense streamside vegetation or shrubland and heath areas, particularly around swamps (Cronin 2007).	Unlikely, locally extinct
<i>Falsistrellus mackenziei</i>	Western false pipistrelle	P4	-	High rainfall forests dominated by jarrah, karri, marri, and tuart. Occupies hollow logs for breeding and resting (Van Dyck and Strahan 2008). Also known to utilise Banksia woodland on the Swan Coastal Plain (Hosken and O'Shea 1995).	Unlikely

Appendix D

Species List



Fauna Species List - Middle Swan Brickworks

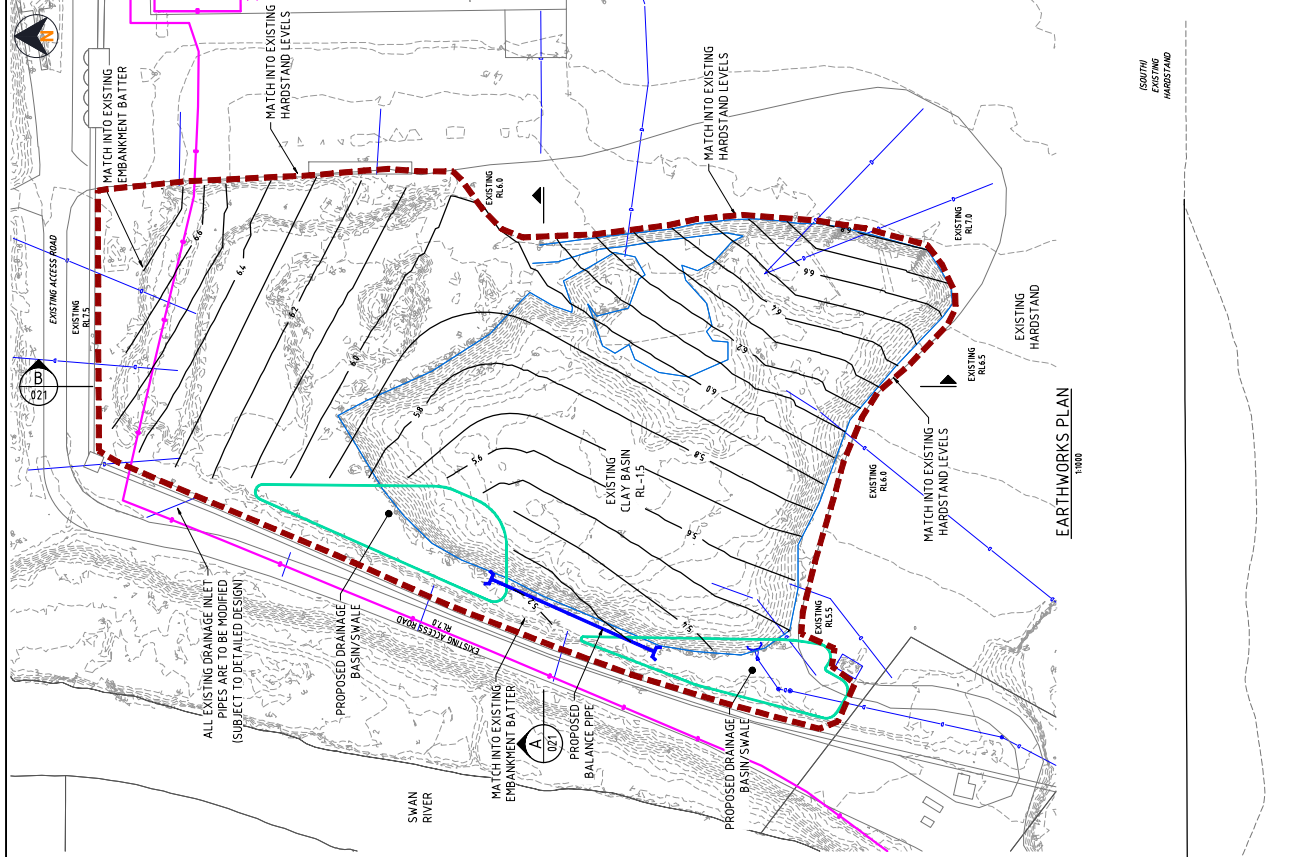
Note: * denotes introduced fauna species, DP=declared pest under the BAM Act

Class	Status	Species	Common name	Record type
Aves				
		<i>Cacatua roseicapilla</i>	Galah	Sight, call
		<i>Corvus coronoides</i>	Australian raven	Sight
		<i>Cracticus tibicen</i>	Australian magpie	Sight
		<i>Grallina cyanoleuca</i>	Magpie-lark	Sight
		<i>Hirundo neoxena</i>	Welcome swallow	Sight
		<i>Platycercus zonarius</i>	Australian ringneck	Sight, call
		<i>Rhipidura leucophrys</i>	Willie wagtail	Sight
	* DP	<i>Trichoglossus moluccanus</i>	Rainbow lorikeet	Sight
Mammalia				
	* DP	<i>Oryctolagus cuniculus</i>	Rabbit	Scat
Reptilia				
		<i>Notechis scutatus</i>	Tiger snake	

Attachment 5

Clay Pit Earthworks Plan





- LEGEND**
- EXISTING GROUND CONTOURS
 - FINISHED SURFACE LEVEL CONTOURS
 - EXISTING DRAINAGE PIPE
 - PROPOSED DRAINAGE PIPE
 - EXISTING DRAINAGE BASIN/SWALE
 - PROPOSED DRAINAGE BASIN/SWALE
 - EXISTING EMBANKMENT BATTER
 - PROPOSED EMBANKMENT BATTER
 - EXISTING ACCESS ROAD
 - PROPOSED ACCESS ROAD

ALL EXISTING DRAINAGE INLET PIPES ARE TO BE MODIFIED (SUBJECT TO DETAILED DESIGN)

MATCH INTO EXISTING EMBANKMENT BATTER

PROPOSED DRAINAGE BASIN/SWALE

PROPOSED DRAINAGE BASIN/SWALE

PROPOSED DRAINAGE BASIN/SWALE

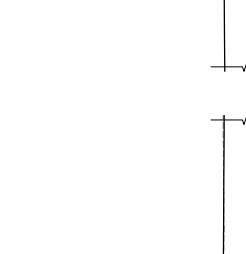
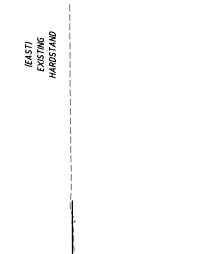
PROPOSED DRAINAGE BASIN/SWALE

PROPOSED DRAINAGE BASIN/SWALE

PROPOSED DRAINAGE BASIN/SWALE

PROPOSED DRAINAGE BASIN/SWALE

PROPOSED DRAINAGE BASIN/SWALE



SECTION A-A
1:1000

NO.	DATE	DRAWN	APPROVED	AMENDMENT

SECTION B-B
1:1000

NO.	DATE	DRAWN	APPROVED	AMENDMENT

CLIENT

DESCRIPTION	DATE	BY	CHECKED
LINE PROPERTY			
DESIGNED			
DRAWN			

APPROVED

DATE	BY	CHECKED
21/11/19		
12/11/19		
06/11/19		

APPROVED DATE 21/11/19

PROJECT MIDLAND BRICK - CLAY BASIN EARTHWORKS D.A.
TITLE EARTHWORKS PLAN AND TYPICAL CROSS SECTIONS
DRAWING NUMBER 24-19-00-DA-021
DATE C



CLIENT LINC PROPERTY
DESIGNED RDE
DRAWN RDE
CHECKED RDE
DATE 21/11/19
APPROVED C.BITHEAD

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REVISIONS

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MINOR AMENDMENTS

NO.	DATE	DRAWN	APPROVED	AMENDMENT

MINOR AMENDMENTS

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NO.	DATE	DRAWN	APPROVED	AMENDMENT

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