



## EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

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### [Summary](#)

### [Details](#)

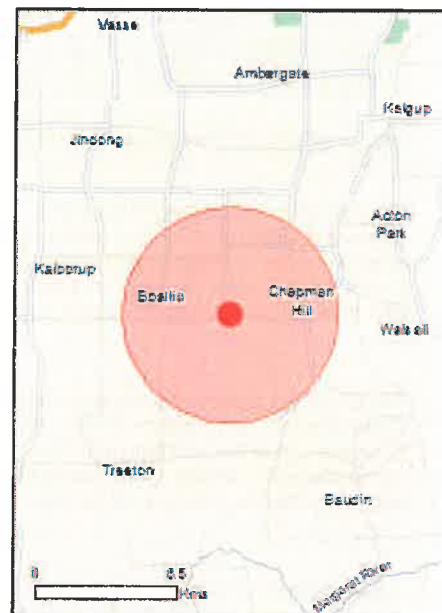
[Matters of NES](#)

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

[Extra Information](#)

### [Caveat](#)

### [Acknowledgements](#)



This map may contain data which are  
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[Coordinates](#)

Buffer: 5.0Km



## Summary

### Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	29
<a href="#">Listed Migratory Species:</a>	6

### Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	10
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

### Extra Information

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

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Invasive Species:</a>	23
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine):</a>	None

## Details

### Matters of National Environmental Significance

#### **Wetlands of International Importance (Ramsar)** **Resource Information**

Name	Proximity
<a href="#">Wallerawang Wetland</a>	10-20km upstream

#### **Listed Threatened Ecological Communities** **Resource Information**

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

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain</a>	Endangered	Community likely to occur within area
<a href="#">Shrublands on southern Swan Coastal Plain ironstones</a>	Endangered	Community likely to occur within area

#### **Listed Threatened Species** **Resource Information**

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern (1001)	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper (856)	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak (6034)	Vulnerable	Species or species habitat known to occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-Cockatoo (169)	Vulnerable	Breeding likely to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo (59523)	Endangered	Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew (84)	Critically Endangered	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dasyurus geoffroii</a> Chuditch, Eastern Quoll (330)	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pseudocheirus occidentalis</a> Eastern Ringtail Possum, Ngwayir, Common, Common, Ngoor, Ngoolangit (25911)	Vulnerable	Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#">Banksia nivea subsp. uliginosa</a> Swamp Oneypot (8266)	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
<a href="#">Banksia squarrosa subsp. argillacea</a> hicher Range Dryandra 8269	Vulnerable	Species or species habitat known to occur within area
<a href="#">Brachyscias verecundus</a> Ironstone Brachyscias 1321	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Caladenia hoffmanii</a> hoffman Spider Orchid 5619	Endangered	Species or species habitat likely to occur within area
<a href="#">Caladenia huegelii</a> King Spider Orchid, Grand Spider Orchid, Rusty Spider Orchid 309	Endangered	Species or species habitat likely to occur within area
<a href="#">Caladenia procera</a> Carbunup King Spider Orchid 6869	Critically Endangered	Species or species habitat may occur within area
<a href="#">Caladenia winfieldii</a> Maestic Spider Orchid 4504	Endangered	Species or species habitat may occur within area
<a href="#">Chamelaucium sp. S coastal plain (R.D.Royce 482)</a> Royce Saxflower 814	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Darwinia whicherensis</a> Abba Bell 3193	Endangered	Species or species habitat may occur within area
<a href="#">Daviesia elongata subsp. elongata</a> ongleaved Daviesia 4883	Vulnerable	Species or species habitat known to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee Orchid 5082	Vulnerable	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossyleaved Hammer Orchid, Glossyleaved Hammer Orchid, arty Hammer Orchid 1653	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer Orchid 5655	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eucalyptus phylacis</a> Meelup Mallee 56422	Endangered	Species or species habitat may occur within area
<a href="#">Gastrolobium modestum</a> Broadleaved Gastrolobium 8361	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Gastrolobium papilio</a> Butterflyleaved Gastrolobium 8415	Endangered	Species or species habitat may occur within area
<a href="#">Grevillea brachystylis subsp. grandis</a> argeflowered Shortstyle Grevillea 85001	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Lambertia echinata subsp. occidentalis</a> estern Prickly Oneysuckle 4528	Endangered	Species or species habitat likely to occur within area
<a href="#">Petrophile latericola</a> laterite Petrophile 64532	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<a href="#">Sphenotoma drummondii</a> Mountain Paperbush (21160)	Endangered	Species or species habitat may occur within area
<a href="#">Tetraria australiensis</a> Southern Tetraria (1013)	Vulnerable	Species or species habitat likely to occur within area

#### Listed Migratory Species [Resource Information](#)

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

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift (608)		Species or species habitat likely to occur within area

#### Migratory Terrestrial Species

<a href="#">Motacilla cinerea</a> Grey Wagtail (642)		Species or species habitat may occur within area
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#### Migratory Wetlands Species

<a href="#">Calidris ferruginea</a> Curlew Sandpiper (856)	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Numenius madagascariensis</a> Eastern Curlew, Bar Eastern Curlew (84)	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Pandion haliaetus</a> Osprey (952)		Species or species habitat may occur within area
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<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank (832)		Species or species habitat likely to occur within area
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### Other Matters Protected by the EPBC Act

#### Listed Marine Species [Resource Information](#)

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

Name	Threatened	Type of Presence
<b>Birds</b>		

<a href="#">Apus pacificus</a> Fork-tailed Swift (608)		Species or species habitat likely to occur within area
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<a href="#">Ardea alba</a> Great Egret, White Egret (9541)		Species or species habitat likely to occur within area
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<a href="#">Ardea ibis</a> Cattle Egret (9542)		Species or species habitat may occur within area
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<a href="#">Calidris ferruginea</a> Curlew Sandpiper (856)	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Haliaeetus leucogaster</a> White-bellied Sea Eagle (943)		Species or species habitat likely to occur within area
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Name	Threatened	Type of Presence
<a href="#">Merops ornatus</a> Rainbow Bee-eater 1600		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail 1642		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Bar Eastern Curlew 184	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey 1952		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank 1832		Species or species habitat likely to occur within area

## Extra Information

### Regional Forest Agreements [Resource Information](#)

Note that all areas with completed RFAs have been included.

Name	State
<a href="#">South West RFA</a>	Western Australia

### Invasive Species [Resource Information](#)

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

Name	Status	Type of Presence
<b>Birds</b>		
<i>Anas platyrhynchos</i> Mallard 194		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon 1803		Species or species habitat likely to occur within area
<i>Streptopelia senegalensis</i> Laughing Turtle Dove, Laughing Dove 181		Species or species habitat likely to occur within area
<i>Sturnus vulgaris</i> Common Starling 1389		Species or species habitat likely to occur within area
<b>Mammals</b>		
<i>Bos taurus</i> Domestic Cattle 16		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog 182654		Species or species habitat likely to occur within area

Name	Status	Type of Presence
<i>Felis catus</i> Cat, House Cat, Domestic Cat 19		Species or species habitat likely to occur within area
<i>Ovis montanus</i> Moose deer Moose deer species in Australia 8533		Species or species habitat likely to occur within area
<i>Mus musculus</i> House Mouse 120		Species or species habitat likely to occur within area
<i>Oryctolagus cuniculus</i> Rabbit, European Rabbit 128		Species or species habitat likely to occur within area
<i>Rattus rattus</i> Black Rat, Ship Rat 84		Species or species habitat likely to occur within area
<i>Sus scrofa</i> Pig 6		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox 8		Species or species habitat likely to occur within area
<b>Plants</b>		
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Nail Creeper, Smilax, Florist's Smilax, Smilax Asparagus 2243		Species or species habitat likely to occur within area
<i>Brachiaria mutica</i> Para Grass 589		Species or species habitat may occur within area
<i>Cenchrus ciliaris</i> Buffelgrass, Black Buffelgrass 20213		Species or species habitat may occur within area
<i>Chrysanthemoides monilifera</i> Bitou Bush, Boneseed 18983		Species or species habitat may occur within area
<i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i> Boneseed 16905		Species or species habitat likely to occur within area
<i>Genista</i> sp. <i>Genista monspessulana</i> Broom 6538		Species or species habitat may occur within area
<i>Olea europaea</i> Olive, Common Olive 9160		Species or species habitat may occur within area
<i>Pinus radiata</i> Radiata Pine Monterey Pine, Insignis Pine,ilding Pine 2080		Species or species habitat may occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry 68406		Species or species habitat likely to occur within area
<i>Tamarix aphylla</i> Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk,owering Cypress, Salt Cedar 16018		Species or species habitat likely to occur within area

## Caveat

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

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

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

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

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'Type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations. Bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

• migratory and

• marine

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

• threatened species listed as extinct or considered as vagrants

• some species and ecological communities that have only recently been listed

• some terrestrial species that overfly the Commonwealth marine area

• migratory species that are very widespread, vagrant, or only occur in small numbers

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

• non-threatened seabirds which have only been mapped for recorded breeding sites

• seals which have only been mapped for breeding sites near the Australian continent

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

## Coordinates

33.945 115.295



## Acknowledgements

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

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Parks and Wildlife Commission NT, Northern Territory Government](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

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

Please feel free to provide feedback via the [Contact Us](#) page.

## Appendix 2. List of vascular flora found within Lots 2629 and 2699 of the Survey Area.

FAMILY NAME	LATIN NAME	NATURALISED	CONSV CODE
Asparagaceae	<i>Chamaescilla corymbosa</i>		
Asteraceae	<i>Hyalosperma cotula</i>		
	<i>Hypochaeris glabra</i>	*	
	<i>Rhodanthe citrina</i>		
Casuarinaceae	<i>Allocasuarina humilis</i>		
Celastraceae	<i>Stackhousia monogyna</i>		
Centrolepidaceae	<i>Aphelia drummondii</i>		
	<i>Centrolepis aristata</i>		
Cyperaceae	<i>Caustis dioica</i>		
	<i>Lepidosperma squamatum</i>		
	<i>Mesomelaena tetragona</i>		
Dilleniaceae	<i>Hibbertia hypericoides</i>		
Droseraceae	<i>Drosera erythrorhiza</i>		
Elaeocarpaceae	<i>Tetratheca hirsuta</i>		
Fabaceae	<i>Acacia pulchella</i>		
	<i>Dillwynia laxiflora</i>		
	<i>Gompholobium tomentosum</i>		
	<i>Lotus subbiflorus</i>	*	
	<i>Trifolium dubium</i>	*	
Goodeniaceae	<i>Dampiera linearis</i>		
	<i>Scaevola calliptera</i>		
Haemodoraceae	<i>Conostylis setigera</i>		
Hemerocallidaceae	<i>Tricoryne elatior</i>		
Hypoxidaceae	<i>Pauridia occidentalis</i>		
Iridaceae	<i>Romulea rosea</i>	*	
Lamiaceae	<i>Hemiandra pungens</i>		
Myrtaceae	<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>		P4
	<i>Corymbia calophylla</i>		
	<i>Eucalyptus marginata</i>		
	<i>Hypocalymma angustifolium</i>		
	<i>Kunzea micrantha</i>		
	<i>Melaleuca incana</i>		
	<i>Melaleuca viminea</i>		
	<i>Pericalymma ellipticum</i>		
Orchidaceae	<i>Caladenia flava</i>		
	<i>Pterostylis recurva</i>		
	<i>Pyrorchis nigricans</i>		
	<i>Thelymitra crinita</i>		
	<i>Thelymitra macrophylla</i>		
Poaceae	<i>Avena fatua</i>	*	
	<i>Briza maxima</i>	*	
	<i>Lachnagrostis plebeia</i>		
	<i>Lolium multiflorum</i>	*	
	<i>Neurachne alopecuroidea</i>		

FAMILY NAME	LATIN NAME	NATURALISED	CONSV CODE
	<i>Vulpia myuros</i>	*	
Podocarpaceae	<i>Podocarpus drouynianus</i>		
Proteaceae	<i>Adenanthos meisneri</i>		
	<i>Banksia dallanneyi</i>		
	<i>Banksia nivea</i> subsp. <i>uliginosa</i>		DRF (T)
	<i>Banksia squarrosa</i> subsp. <i>argillacea</i>		DRF (T)
	<i>Conospermum caeruleum</i> subsp. <i>spathulatum</i>		
	<i>Grevillea trifida</i>		
	<i>Hakea amplexicaulis</i>		
	<i>Hakea lissocarpha</i>		
	<i>Hakea oldfieldii</i>		P3
	<i>Hakea ruscifolia</i>		
	<i>Isopogon formosus</i> subsp. <i>dasylepis</i>		P3
Restionaceae	<i>Desmocladius fasciculatus</i>		
	<i>Loxocarya magna</i>		P3
Rhamnaceae	<i>Cryptandra arbutiflora</i> var. <i>tubulosa</i>		
Stylidiaceae	<i>Stylidium androsaceum</i>		
Xanthorrhoeaceae	<i>Xanthorrhoea gracilis</i>		
	<i>Xanthorrhoea preissii</i>		

### Appendix 3. Photographs and Descriptions of Vegetation units mapped within Lots 2629 and 2699 of the Survey Area

#### Unit A1



Unit A1. Tall shrubland of *Banksia squarrosa* subsp. *argillacea* with scattered emergent *Corymbia calophylla* low trees over open shrubland of *Hibbertia hypericoides*, *Pericalymma ellipticum* and open sedgeland of *Caustis dioica* and *Loxocarya magna* and low grassland of exotic species on ironstone.

## Unit A2



Unit A2. Tall open shrubland to open shrubland of *Hakea oldfieldii* and *Banksia squarrosa* subsp. *argillacea* with scattered emergent *Corymbia calophylla* low trees over scattered shrubs and sedges including *Caustis dioica* and *Loxocarya magna* and low grassland of exotic species on ironstone or shallow orange sand over ironstone.

## Unit B



Unit B. Open forest or woodland of *Corymbia calophylla* over shrubland of *Allocasuarina humilis*, *Calothamnus quadrifidus* subsp. *teretifolius*, *Banksia squarrosa* subsp. *argillacea*, *Dillwynia laxiflora*, *Grevillea trifida*, *Hibbertia hypericoides*, *Melaleuca incana*, *M. viminea*, *Pericalymma ellipticum*, scattered sedges of *Caustis dioica* and *Loxocarya magna* (and in more open areas, pasture grasses on red-brown loam over ironstone).

**Fauna  
Habitat Assessment  
of  
Proposed Clearing Areas**



**Lot 2626  
Jamison's Road  
Chapman Hill**

October 2017  
Version 1

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**TABLES**

TABLE 1: Summary of Potential Black Cockatoo Habitat Trees within the Survey Area

**FIGURES**

FIGURE 1: Air Photo and Camera Trap Locations

FIGURE 2: Habitat Trees (DBH  $\geq$ 50cm)

**APPENDICES**

APPENDIX A: Black Cockatoo Habitat Tree Details

## SUMMARY

This report details the results of a fauna habitat assessment of proposed clearing areas within Lot 2626 Jamison's Road, Chapman Hill (the survey area). The survey area contains about 4.9 hectares of remnant vegetation that is required to be cleared to allow for a proposed extractive industry (gravel) to proceed.

The assessment was undertaken to identify the extent of black cockatoo habitat present with a proposed clearing area, to determine if south-western brush-tailed phascogales are present and to assess the likelihood of any other species of conservation significance occurring.

The assessment has included a daytime survey of the site, carried out on the 15, 19 and 29 September 2017, a camera trap survey (15 to 29 September 2017) and a review of available, relevant literature so as to comply with the requested scope of works and in line with the published guidelines.

The survey area was found to contain 130 potential "black cockatoo breeding habitat trees" (DBH  $\geq$ 50cm). Eighteen of these trees appeared to contain hollows of a size possibly suitable for black cockatoos to utilise for nesting with at least one showing some inconclusive evidence of previous use. Some other larger hollows showed evidence of use by Australian wood ducks.

All of the proposed clearing area (~4.9 hectares) represents black cockatoo foraging habitat given the dominance of marri, jarrah and sheoak. No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

No evidence of south western brush-tailed phascogales being present was found despite a detailed camera trap survey and this coupled with the fact that habitat appears marginal at best would suggest they were absent from the area surveyed.

Habitat within the survey area also appears unsuitable for other species of concern such as the western ringtail possums and chuditch to utilise. This conclusion is supported by the fact that no evidence of any species of conservation significance (besides black cockatoos) being present was observed during the field assessment.

The results of this assessment should be provided to the relevant regulatory authorities for their consideration during the clearing permit assessment process.

## 1. INTRODUCTION

This report details the results of a fauna habitat assessment of proposed clearing areas within Lot 2626 Jamisons Road, Chapman Hill (the survey area).

It is understood that a clearing permit has been applied for so as to allow for an extractive industry to proceed. The extent of the proposed clearing is about 4.9 hectares (Figure 1).

## 2. SCOPE OF WORKS

The scope of works was:

1. Black cockatoo habitat assessment (habitat trees, existing and potential nest hollows, foraging and roosting habitat) over the proposed clearing area;
2. South-western Brush-tailed Phascogale habitat assessment (presence/absence, potential nest hollows and general habitat) over the proposed clearing area;
3. Recording of observations related to the presence of any other fauna species of conservation significance and/or their habitat (e.g. western ringtail possum and chuditch);
4. Report summarising results with management/planning/referral recommendations if required.

Note: For the purposes of this proposal the term black cockatoo is in reference to Baudin's black cockatoo *Calyptorhynchus baudinii*, Carnaby's black cockatoo *Calyptorhynchus latirostris* and the forest red-tailed black cockatoo *Calyptorhynchus banksii naso*.

## 3. METHODS




The habitat assessment has included a daytime survey of the site, carried out on the 15, 19 and 29 September 2017, a camera trap survey (15 to 29 September 2017) and a review of available, relevant literature utilising the following methods so as to comply with the requested scope of works and in line with the published guidelines.

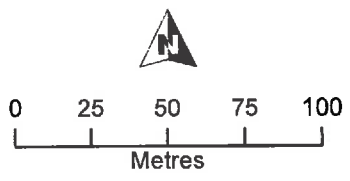
### 3.1 BLACK COCKATOO HABITAT ASSESSMENT

The following methods were employed to comply with the defined scope of works and are based on guidelines published by the federal Department of the Environment and



**Legend**

-  Cadastral Boundaries
-  Proposed Extraction Area (Approx.)
-  Camera Traps




**Fauna Survey**  
 Drawn: G Harewood  
 Date: Oct 2017  
 Scale: 1:2,250  
 Projection/Coordinate System: UTM/MGA Zone 50

Lot 2626 Jamison's Road  
 Chapman Hill

## Air Photo and Camera Trap Locations

Figure: 1

Energy (DotEE) (SEWPaC 2012) which states that surveys for Carnaby's, Baudin's and forest red-tailed black cockatoo habitat should:

- be done by a suitably qualified person with experience in vegetation or cockatoo surveys, depending on the type of survey being undertaken;
- maximise the chance of detecting the species' habitat and/or signs of use;
- determine the context of the site within the broader landscape—for example, the amount and quality of habitat nearby and in the local region (for example, within 10 km);
- account for uncertainty and error (false presence and absences); and
- include collation of existing data on known locations of breeding and feeding birds and night roost locations.

Habitat used by black cockatoos have been placed into three categories by the DotEE (SEWPaC 2012) these being:

- Breeding Habitat;
- Foraging Habitat; and
- Night Roosting Habitat.

### 3.1.1 Black Cockatoo Breeding Habitat

The black cockatoo breeding habitat assessment has involved the identification of all suitable breeding trees species within the subject site that had a DBH of equal to or over 50cm. The DBH of each tree was estimated using a pre-made 50 cm "caliper".

Target tree species included marri and jarrah and any other *Corymbia/Eucalyptus* species of a suitable size that are present. Peppermints, *banksia*, sheoak and melaleuca tree species (for example) were not be assessed as they typically do not develop hollows that are used by black cockatoos.

The location of each tree identified as being over the threshold DBH was recorded with a GPS and details on tree species, number and size of hollows (if any) noted. Trees observed to contain hollows (of any size/type) were marked with "H" using spray paint.

Potential hollows were placed into one of four categories, based on the size of the apparent hollow entrance, these being:

- Small = ~<5cm diameter (i.e. entrance too small for a black cockatoo);
- Medium = ~5cm-10cm diameter (i.e. entrance too small for a black cockatoo);

- Large =  $\sim > 10\text{cm}$  diameter (entrance large enough for a black cockatoo but possible hollow appears to be unsuitable for nesting i.e. wrong orientation, too small, too low or too shallow); or
- Large (cockatoo) =  $\sim > 10\text{cm}$  diameter (entrance appears big enough to provide access to a possible hollow that may be suitable for a black cockatoo to use for nesting).

Based on this assessment trees present within the survey area have then been placed into one of four categories:

- Tree  $< 50\text{cm}$  DBH or an unsuitable species (not assessed/recorded);
- Tree  $\geq 50\text{cm}$  DBH, no hollows seen;
- Tree  $\geq 50\text{cm}$  DBH, one or more hollows seen, none of which appeared suitable for black cockatoos to use for nesting; or
- Tree  $> 50\text{cm}$  DBH, one or more hollows seen, with at least one considered possibly suitable for black cockatoos to use for nesting.

For the purposes of this survey a tree containing a potential cockatoo nest hollow has been defined as:

*Generally, any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) suitable for occupation by black cockatoos for the purpose of nesting/breeding. Hollows that had an entrance greater than about 10cm in diameter and would allow the entry of a black cockatoo into a suitably orientated and sized branch/trunk, were recorded as a "potential nest hollow".*

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). Trees with possible nest hollows were also scratched and raked with a large stick/pole in attempt to flush any sitting birds from hollows and calls of chicks were also listened for. It should be noted that the survey may have been conducted outside of the main breeding season of one or more of the three species of black cockatoo.

### **3.1.2 Black Cockatoo Foraging Habitat**

The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded. The nature and extent of potential foraging habitat present was also documented irrespective of the presence of any actual foraging evidence.

A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo foraging habitat areas in the vicinity of the survey area.

### **3.1.3 Black Cockatoo Roosting Habitat**

Direct and indirect evidence of black cockatoos roosting within trees on site was noted if observed (e.g. branch clippings, droppings or moulted feathers).

A review of available literature was also carried out to determine the location/extent of any known/likely black cockatoo roosting habitat areas in the vicinity of the survey area.

### **3.2 SOUTH-WESTERN BRUSH-TAILED PHASCOGALE SURVEY**

Concurrent with the black cockatoo habitat assessment hollows considered suitable for phascogales were recorded. General information on the overall suitability of habitat for this species was also compiled.

Ten infra-red motion sensing cameras ("camera traps") were also deployed across the area in an attempt to confirm phascogale activity if they are present. The camera traps were deployed on the 15 September 2017 and retrieved on the 29 September 2017 (140 "camera trap nights").

### **3.3 OTHER SPECIES OF CONSERVATION SIGNIFICANCE**

Evidence of the presence or likely presence of other species of conservation significance (including suitable habitat) was also searched for and recorded concurrent with the black cockatoo/phascogale habitat assessment. The aim was to obtain sufficient information to make a definitive comment on the likely significance of the proposed clearing areas to other species of conservation significance.

## **4. SURVEY CONSTRAINTS**

No seasonal sampling has been carried out as part of this fauna assessment. The conclusions presented are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. It should also be recognised that site conditions can change with time.

During the habitat survey trees with hollows were searched for. It should be noted that identifying hollows suitable for fauna species from ground level has limitations. Generally, the full characteristics of any hollow seen are not fully evident (e.g. internal dimensions). It is also difficult to locate all hollows within all trees as some are not observable from ground level.

The location of observations was recorded using a handheld GPS. The accuracy of the GPS cannot be guaranteed above a level of about 5 to 10 metres, though it should

be noted that in some circumstance the accuracy can increase or decrease beyond this range.

## 5. RESULTS

### 5.1 BLACK COCKATOO HABITAT ASSESSMENT

#### 5.1.1 Black Cockatoo Breeding Habitat

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DotEE criteria - SEWPaC 2012, but ultimately subject to a suitable hollow being present or developing and a range of other factors) which were found within the survey area comprised the following species:

- Marri – *Corymbia calophylla*; and
- Jarrah - *Eucalyptus marginata*.

It should be noted that the likelihood of any one particular tree species developing hollows suitable for black cockatoos to use for breeding varies considerably. For example available data suggests that jarrah (*Eucalyptus marginata*) rarely produces hollows large enough for black cockatoos. Kirkby (2009) reports that from a database of 109 confirmed black cockatoo nest trees throughout the jarrah forest only six were located in jarrah trees.

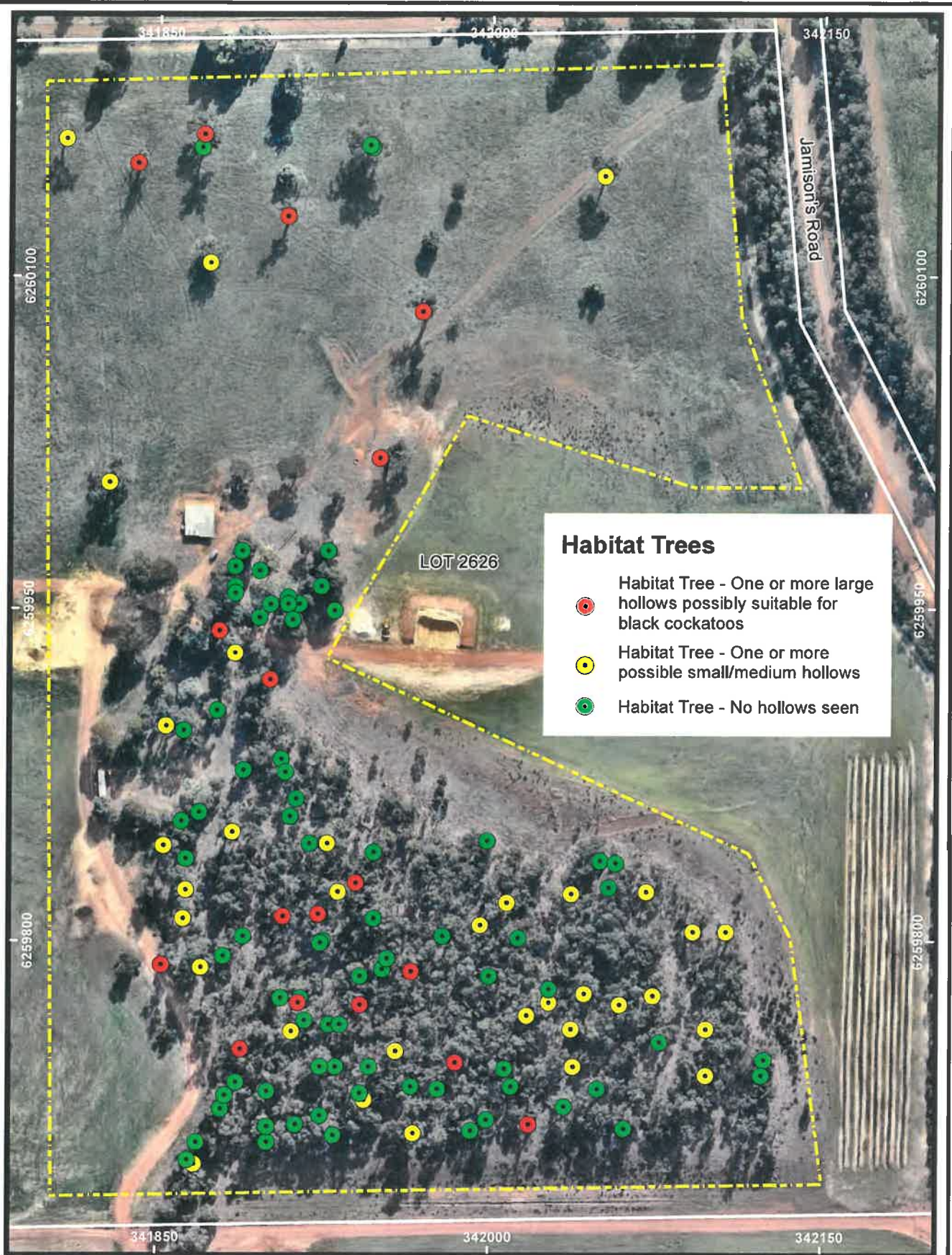
A summary of the potential black cockatoo habitat trees observed within the survey areas is provided in Table 1 below and their location shown in Figure 2.

**Table 1: Summary of Potential Black Cockatoo Habitat Trees (DBH  $\geq$ 50cm) within the Survey Area**

Total Number of Habitat (DBH $\geq$ 50cm) Trees	Number of Trees with No Hollows Observed	Number of Trees with Hollows Considered Unsuitable for Nesting Black Cockatoos	Number of Trees with Hollows Considered Possibly Suitable for Nesting Black Cockatoos	Tree Species	
				Marri	Jarrah
130	79	33	18	97	33

The assessment identified a total of 130 "habitat trees" within the survey area. The majority (79, ~60.8%) of the trees were not observed to contain hollows of any size. Thirty three (~25.4%) of the trees contained one or more "small" hollows (less than



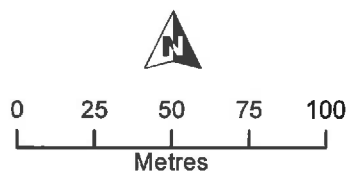


**Habitat Trees**

- Habitat Tree - One or more large hollows possibly suitable for black cockatoos
- Habitat Tree - One or more possible small/medium hollows
- Habitat Tree - No hollows seen

**Legend**

- Cadastral Boundaries
- Proposed Extraction Area (Approx.)



Drawn: G Harewood  
Date: Oct 2017  
Scale: 1:2,250

Lot 2626 Jamison's Road  
Chapman Hill

**Habitat Trees  
(DBH >50cm)**

~10cm entrance size) considered by the Author not to be suitable for black cockatoos to use for nesting purposes. Eighteen (~13.8%) trees appeared to contain hollows with larger entrances (greater than ~10cm) that appeared big enough to possibly allow the entry of a black cockatoo into a suitably sized and orientated branch/trunk.

One hollow showed some evidence of use, possibly by black cockatoos in the form of chew marks around the hollow entrance, though this evidence was not conclusive. No black cockatoos appeared to be in attendance at this hollow at the time of the survey. Another hollow also showed evidence of use which was attributed at the time to smaller parrots (e.g. galah, corella, Australian ringneck parrot).

Three larger hollows appeared to have recently been used by ducks for nesting (most likely Australian wood ducks) as evidence by the presence of light grey down (feathers) around the hollow entrances, which they use to line their nests (unlike black cockatoos which lay eggs directly on the hollow floor). One large hollow was occupied by feral bees. The remaining 12 "potential nest hollows" showed no evidence of use.

Additional details on each habitat tree observed can be found in Appendix A.

A review of available data revealed no documented breeding records from the vicinity of the study area (i.e. within 10km). The survey area does not fall within the mapped breeding range of Carnaby's black-cockatoo within the most current recovery plan produced by DBCA (DEC 2012). The corresponding DBCA recovery plan for Baudin's and the forest red-tailed black-cockatoo (DEC 2007b) does not specifically define any known breeding areas for either species.

Johnstone and Kirkby (2011) also do not specifically mention breeding areas within the vicinity of the survey area though with respect to Baudin's and the forest red-tailed black-cockatoo, both species are noted as utilising marri trees (and other tree species) for breeding in the south west. So while no breeding data appears to exist for the general area there is potential for breeding to take place given the presence of large numbers of marri trees in remnant vegetation in the Chapman Hill area.

### 5.1.2 Black Cockatoo Foraging Habitat

Following is a list of the flora species recorded within the survey area during the course of the assessment that are known to be used as a food source by one or more species of black cockatoo:

- Marri - *Corymbia calophylla* – very common;
- Jarrah - *Eucalyptus marginata* – common;
- Sheoak – *Allocasuarina fraseriana* – common; and
- Bull Banksia – *Banksia grandis* – uncommon.

The proposed clearing area is highly degraded and lacks any significant amount of native groundcover, primarily as a consequence of long term grazing by livestock and possibly frequent fires. Despite this fact most of the proposed clearing area (4.9 hectares) represents black cockatoo foraging habitat given the dominance of marri, jarrah and to a lesser extent sheoak.

Other documented foraging species identified during the survey (i.e. *banksia*) are represented by a relatively small number of individual specimens and therefore they do not contribute to the total potential food resource to any significant degree.

Evidence of all three species of black cockatoo foraging onsite was observed during the field assessment. This evidence was in the form of chewed marri fruits (various examples specifically attributed to the forest red-tailed black cockatoo and Baudin's black cockatoo), chewed jarrah fruits (various examples attributed to the forest red-tailed black cockatoo and/or Carnaby's black cockatoo) and chewed sheoak fruits (attributed to the forest red-tailed black cockatoo) at several locations.

A number of Baudin's and/or Carnaby's black-cockatoos were also observed feeding on introduced pasture grasses (*Erodium* sp.?) just outside of the survey area.

Based on vegetation mapping compiled for the South West Biodiversity Project (2007) it is estimated that there is over 10,000 ha of native vegetation within 10 km the study area, much of which is very likely to represent potential black cockatoo foraging habitat of some type. There is also over 2,500 ha of pine plantations within 10km of the site. Pines are likely to be a significant foraging resource for Carnaby's black-cockatoos in this area. The proposed clearing within Lot 2629 represents 0.048% of this total area of potential foraging habitat.

### **5.1.3 Black Cockatoo Roosting Habitat**

No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey.

A review of available data did not reveal any documented roosts sites within 10km of the study area, though as with breeding habitat this could simply be a consequence of a lack of survey work or a lack of publicly available data. Many roosting options for black cockatoos are however likely to be present in the wider area given the relative large areas of remnant native vegetation within nearby state forest areas.

## **5.2 SOUTH-WESTERN BRUSH-TAILED PHASCOGALE SURVEY**

The habitat tree assessment identified the presence of 51 trees with potential hollows of various sizes. A proportion of these are likely to be potentially suitable for phascogales to use for day time refuge. The suitability of the survey area for phascogales is however considerably lessened by the fact that it is relatively small (<5 ha) and isolated from other remnants in the immediate vicinity. Phascogales

occupy large home ranges (typically 20 ha to 40 ha for females, often over 100 ha for males – Van Dyck and Strahan 2008) within continuous areas of suitable habitat and therefore it would appear that in this respect, the survey area doesn't represent suitable habitat for the species despite the presence of trees with hollows.

The conclusion that the survey area lacks suitable habitat for phascogales is supported by the fact that no individuals were recorded during the camera trap survey. The 10 cameras, deployed over a period of 14 nights capture 779 images. Fauna species recorded were:

- Red Fox;
- Western Grey Kangaroo;
- Common Bronzewing Pigeon; and
- Australian Magpie.

### **5.3 OTHER SPECIES OF CONSERVATION SIGNIFICANCE**

No evidence of any other fauna species of conservation significance was found during the course of the field survey. This couple with observations made in the field of habitat quality strongly suggest that the area proposed to be cleared is very unlikely to support individuals or a population of any other species of conservation significance (e.g. western ringtail possums, chuditch) under normal circumstances. The various species known from the wider area consider unlikely to be present given the fragmented and degraded nature of the remnant vegetation present and/or because their preferred habitat is completely absent.

## **6. CONCLUSION**

The assessment reported on here was undertaken to identify the extent of black cockatoo habitat present with a proposed clearing area, to determine if south-western brush-tailed phascogales are present and to assess the likelihood of any other species of conservation significance occurring.

The survey area was found to contain 130 potential "black cockatoo breeding habitat trees" (DBH  $\geq$ 50cm). Eighteen of these trees appeared to contain hollows of a size possibly suitable for black cockatoos to utilise for nesting with at least one showing some inconclusive evidence of previous use. Some other larger hollows showed evidence of use by Australian wood ducks.

All of the proposed clearing area (~4.9 hectares) represents black cockatoo foraging habitat given the dominance of marri, jarrah and sheoak. No existing roosting trees

(trees used at night by black cockatoos to rest) were positively identified during the survey.

No evidence of south western brush-tailed phascogales being present was found despite a detailed camera trap survey and this couple with the fact that habitat appears marginal at best would suggest they were absent from the area surveyed.

Habitat within the survey area also appears unsuitable for other species of concern such as the western ringtail possums and chuditch to utilise. This conclusion is supported by the fact that no evidence of any species of conservation significance (besides black cockatoos) being present was observed during the field assessment.

The results of this assessment should be provided to the relevant regulatory authorities for their consideration during the clearing permit assessment process.

## 7. REFERENCES

Department of Environment and Conservation (DEC) (2007). Forest Black Cockatoo (Baudin's Cockatoo - *Calyptorhynchus baudinii*) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Recovery Plan. Department of Environment and Conservation, Perth, Western Australia

Department of Environment and Conservation (DEC) (2012). Carnaby's cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Department of Environment and Conservation, Perth, Western Australia.

Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012). EPBC Act Referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*.

Johnstone, R. E. & Kirkby, T. (2011). 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. Report for the Department of Planning, Western Australia.

Kirkby, T. (2009). Results of Black Cockatoo Survey at Lot 2 Dawesville. Unpublished report for WA Limestone.

Van Dyck, S. & Strahan, R. Eds (2008). The Mammals of Australia. Third edition Queensland Museum.

# **APPENDIX A**

## **BLACK COCKATOO HABITAT TREE DETAILS**

Habitat trees (DBH  $\geq$  60cm)  
Datum - GDA 94

Entrance Size Ranges - Small = >6cm, Medium = 5 - 10cm, Large = >10cm

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Hollow Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	341930	6259949	Marri	20+	>50	0		No Signs	No Signs	No	
wpt002	50H	341974	6259960	Jarra	15-20	>50	0		No Signs	No Signs	No	
wpt003	50H	341914	6259952	Jarra	15-20	>50	0		No Signs	No Signs	No	
wpt004	50H	341909	6259955	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt005	50H	341909	6259952	Marri	10-15	>50	0		No Signs	No Signs	No	
wpt006	50H	341911	6259945	Marri	20+	>50	0		No Signs	No Signs	No	
wpt007	50H	341901	6259952	Marri	20+	>50	0		No Signs	No Signs	No	
wpt008	50H	341896	6259946	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt009	50H	341896	6259967	Jarra	15-20	>50	0		No Signs	No Signs	No	
wpt010	50H	341885	6259969	Marri	20+	>50	0		No Signs	No Signs	No	
wpt011	50H	341885	6259958	Marri	20+	>50	0		No Signs	No Signs	No	
wpt012	50H	341885	6259960	Marri	20+	>50	0		No Signs	No Signs	No	
wpt013	50H	341885	6259957	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt014	50H	341878	6259940	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt015	50H	341885	6259930	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt016	50H	341901	6259918	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	Bees in large hollow
wpt017	50H	341877	6259904	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt018	50H	341862	6259895	Marri	20+	>50	0		No Signs	No Signs	No	
wpt019	50H	341854	6259897	Marri	20+	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt020	50H	341861	6259854	Marri	20+	>50	0		No Signs	No Signs	No	
wpt021	50H	341869	6259858	Marri	20+	>50	0		No Signs	No Signs	No	
wpt022	50H	341884	6259849	Marri	20+	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt023	50H	341863	6259837	Marri	20+	>50	0		No Signs	No Signs	No	
wpt024	50H	341853	6259843	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt025	50H	341863	6259823	Marri	20+	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt026	50H	341862	6259810	Marri	20+	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt027	50H	341870	6259788	Marri	20+	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt028	50H	341852	6259789	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt029	50H	341880	6259793	Marri	20+	>50	0		No Signs	No Signs	No	
wpt030	50H	341888	6259751	Marri	20+	>50	1	Large (Cockatoo)	Ducks	No Signs	Yes	Evidence of used by ducks (feathers/down)
wpt031	50H	341906	6259882	Marri	20+	>50	0		No Signs	No Signs	No	
wpt032	50H	341908	6259876	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt033	50H	341889	6259877	Marri	15-20	>50	0		No Signs	No Signs	No	



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Hollow Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt034	50H	341884	6259849	Marri	20+	>50	1	Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt035	50H	341907	6259811	Dead Jarrah	15-20	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt036	50H	341906	6259774	Marri	20+	>50	0		No Signs	No Signs	No	
wpt037	50H	341828	6260007	Marri	15-20	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt038	50H	341808	6260162	Marri	15-20	>50	1	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt039	50H	341840	6260151	Marri	20+	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt040	50H	341869	6260158	Marri	20+	>50	0		No Signs	No Signs	No	
wpt041	50H	341870	6260164	Marri	15-20	>50	1	Large (Cockatoo)	Ducks	No Signs	Yes	Evidence of use by ducks (feathers/down)
wpt042	50H	341873	6260106	Marri	15-20	>50	2+	Small	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt043	50H	341908	6260127	Marri	15-20	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	Internal dimensions of hollows unknown
wpt044	50H	341946	6260158	Marri	20+	>50	0		No Signs	No Signs	No	
wpt045	50H	341946	6260158	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt046	50H	341945	6260159	Marri	20+	>50	0		No Signs	No Signs	No	
wpt047	50H	342051	6260145	Marri	20+	>50	2+	Small & Medium	Parrots	Parrots	No	Evidence of use by parrots?
wpt048	50H	341969	6260084	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt049	50H	341950	6260018	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	Bees	No Signs	Yes	Internal dimensions of hollows unknown
wpt051	50H	341888	6259976	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt052	50H	341927	6259976	Marri	20+	>50	0		No Signs	No Signs	No	
wpt053	50H	341999	6259845	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt054	50H	342008	6259817	Marri	20+	>50	2+	Small & Medium	Parrots	Parrots	No	Evidence of use by parrots?
wpt055	50H	341996	6259807	Marri	15-20	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt056	50H	342013	6259801	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt057	50H	342037	6259821	Dead Jarrah	20+	>50	2+	Small & Medium	Bees	No Signs	No	Internal dimensions of hollows unknown
wpt058	50H	342050	6259836	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt059	50H	342057	6259835	Marri	20+	>50	0		No Signs	No Signs	No	
wpt060	50H	342054	6259824	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt061	50H	342071	6259822	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt062	50H	342092	6259804	Jarrah	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt063	50H	342107	6259804	Jarrah	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt064	50H	342098	6259760	Jarrah	20+	>50	2+	Small & Medium	Parrots	Parrots	No	Evidence of use by parrots
wpt065	50H	342124	6259746	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt066	50H	342123	6259739	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt067	50H	342098	6259739	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt068	50H	342077	6259754	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt069	50H	342074	6259775	Dead Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt070	50H	342059	6259771	Jarrah	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt071	50H	342043	6259776	Marri	20+	>50	1	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Hollow Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt072	50H	342027	6259772	Jarrah	15-20	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt073	50H	342027	6259778	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt074	50H	342037	6259760	Dead Marri	10-15	>50	2+	Small & Medium	Bees	No Signs	No	Internal dimensions of hollows unknown
wpt075	50H	342049	6259733	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt076	50H	342061	6259715	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt077	50H	342034	6259725	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt078	50H	342018	6259717	Jarrah	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt079	50H	342010	6259734	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt080	50H	341999	6259719	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt081	50H	341992	6259714	Dead Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt082	50H	341966	6259713	Marri	20+	>50	2+	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt083	50H	341944	6259728	Jarrah	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt084	50H	341942	6259731	Marri	20+	>50	0		No Signs	No Signs	No	
wpt085	50H	341931	6259743	Marri	20+	>50	0		No Signs	No Signs	No	
wpt086	50H	341924	6259743	Marri	20+	>50	0		No Signs	No Signs	No	
wpt087	50H	341924	6259721	Marri	20+	>50	0		No Signs	No Signs	No	
wpt088	50H	341930	6259712	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt089	50H	341913	6259717	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt090	50H	341900	6259709	Marri	20+	>50	0		No Signs	No Signs	No	
wpt091	50H	341900	6259716	Marri	20+	>50	0		No Signs	No Signs	No	
wpt092	50H	341867	6259699	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt093	50H	341864	6259701	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt094	50H	341868	6259709	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt095	50H	341879	6259724	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt096	50H	341881	6259730	Marri	20+	>50	0		No Signs	No Signs	No	
wpt097	50H	341886	6259736	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt098	50H	341900	6259732	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt099	50H	341911	6259759	Marri	20+	>50	2+	Small & Medium	Parrots	Parrots	No	Evidence of use by parrots
wpt100	50H	341914	6259772	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	Ducks	No Signs	Yes	Evidence of used by ducks (feathers/down)
wpt101	50H	341915	6259774	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt102	50H	341917	6259764	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt103	50H	341928	6259762	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt104	50H	341933	6259762	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt105	50H	341942	6259771	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Cockatoo chew marks?
wpt106	50H	341942	6259784	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt107	50H	341952	6259787	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt108	50H	341965	6259786	Dead Jarrah	15-20	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	DBH (cm)	Number of Hollows	Hollow Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt109	50H	341979	6259802	Jarrah	15-20	>50	0		No Signs	No Signs	No	
wpt110	50H	342000	6259784	Marri	20+	>50	0		No Signs	No Signs	No	
wpt111	50H	342017	6259766	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt112	50H	342007	6259742	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt113	50H	342038	6259743	Dead Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt114	50H	341985	6259745	Marri	20+	>50	2+	Small, Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt115	50H	341958	6259750	Marri	20+	>50	1	Small	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt116	50H	341946	6259743	Marri	20+	>50	0		No Signs	No Signs	No	
wpt117	50H	341965	6259734	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt118	50H	341977	6259733	Jarrah	20+	>50	0		No Signs	No Signs	No	
wpt119	50H	341954	6259792	Marri	20+	>50	0		No Signs	No Signs	No	
wpt120	50H	341948	6259810	Marri	20+	>50	0		No Signs	No Signs	No	
wpt121	50H	341925	6259800	Marri	20+	>50	0		No Signs	No Signs	No	
wpt122	50H	341924	6259799	Marri	10-15	>50	0		No Signs	No Signs	No	
wpt123	50H	341889	6259802	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt124	50H	341910	6259856	Marri	20+	>50	0		No Signs	No Signs	No	
wpt125	50H	341913	6259864	Marri	20+	>50	0		No Signs	No Signs	No	
wpt126	50H	341919	6259844	Marri	15-20	>50	0		No Signs	No Signs	No	
wpt127	50H	341927	6259844	Marri	15-20	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt128	50H	341948	6259840	Marri	20+	>50	0		No Signs	No Signs	No	
wpt129	50H	341940	6259826	Marri	20+	>50	2+	Medium & Large (Cockatoo)	No Signs	No Signs	Yes	Internal dimensions of hollows unknown
wpt130	50H	341932	6259822	Marri	20+	>50	2+	Small & Medium	No Signs	No Signs	No	Internal dimensions of hollows unknown
wpt131	50H	341923	6259812	Marri	20+	>50	2+	Medium & Large (Cockatoo)	Parrots	No Signs	Yes	Evidence of use by parrots?

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