

## VEGETATION CLEARING APPLICATION

**Lease No. 2071/97 Part of State Forest No. 4,  
Proposed Collie Motorplex Drag Strip**

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## SUMMARY

This report has been prepared to support an Application for a Clearing Permit (area permit) on behalf of Motoring South West, who proposes to construct a drag strip at the Collie Motorplex. The site is situated in State Forest Number 4, approximately 300 metres (m) south-east of the Collie Motorplex in Cardiff and 12 kilometres (km) south-east of the Collie town site (Figure 1).

The proponent is proposing to clear approximately 14.9 ha of vegetation within the site to facilitate the development of a one-eighth of a mile drag strip and associated infrastructure. This development will compliment the motor sports and driver training activities currently being undertaken at the Collie Motorplex.

Groundwater levels underlying the site are at approximately 170 m AHD (Waters and Rivers Commission 2002). When compared to surface elevations, the water table is located more than 250 m below ground level. There are no surface watercourses or wetlands mapped within or in close proximity to the site.

The site falls within the Collie Complex as mapped by Mattiske and Havel (1998). The total remaining area of the Collie (CI) complex is 71% of the pre-European extent, which is above the minimum 30% of pre-clearing extent for retention of the National Targets and Objectives for Biodiversity Conservation (Ecoedge 2013)).

No Declared Rare Flora, Priority Flora, Threatened species pursuant to the Environmental Protection and Biodiversity Conservation (EPBC) Act or other flora of conservation significance was found within the site.

Almost all of the remnant native vegetation within the site (~35 ha) can be regarded as representative of foraging habitat for black cockatoos due to the dominance of jarrah and to a lesser extent marri along with other subdominant species such as *Banksia* and *Allocasuarina*. Several hollows large enough to be used for nesting were observed in the site, but no existing roosting trees were positively identified during the on-site fauna survey.

An assessment against the “10 Clearing Principles” as outlined in Schedule 5 of the Environmental Protection (Clearing of Native Vegetation), found that the project was “not” or “unlikely” to be at variance with nine of the 10 Clearing Principles, but may be at variance with Principle B.

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## I.0 INTRODUCTION

This report has been prepared to support an Application for a Clearing Permit (area permit) (Appendix 1) on behalf of Motoring South West, who propose to construct a drag strip at the Collie Motorplex. The Shire of Collie is acting on behalf of Motoring South West as project manager.

The Motorplex land is currently leased to “Motoring South West Incorporated” by the Department of Parks and Wildlife (DPAW). The lease area is located on Forest Lease No. 2071/97 (Appendix 2) Part of State Forest No.4 and comprises 349 hectares (ha).

Of the 349 ha of land being leased from DPAW, an area of approximately 43 ha has been identified as the preferred option (out of two options investigated) for the proposed drag strip. This 43 ha landholding has previously been referred to as “Area B” in supporting documentation; however from herein it will be referred to as “the site”. The site boundary is shown in Figure 1.

### I.1 Proposed Drag Strip Site

The site is situated in State Forest Number 4, approximately 300 metres (m) south-east of the Collie Motorplex in Cardiff and 12 kilometres (km) south-east of the Collie town site (Figure 1).

The site encompasses an area of approximately 43 ha (Figure 2) of which approximately 6 ha is cleared (road and verges) and the remaining ~34 ha is vegetated land. The proponent is proposing to clear approximately 14.9 ha of vegetation within the site to facilitate the development of the drag strip, further details of which are provided within Table A.

**Table A: Proposal Characteristics – Collie Drag Strip Site**

Aspect	Proposal Characteristic
<b>Project details</b>	
Description	The development includes the installation of a 1/8th mile drag strip, traffic-specific items i.e. arrestor bed, return road and also for access and facilities for parking and spectators, ticketing, storage and security facilities, etc.
Site Area	42.7 ha
Total area of construction	~14.9 ha
Life of the project	Indefinite
Native vegetation to be cleared	~14.9 ha of open forest of jarrah and marri with other subdominant species of native vegetation within understorey
<b>Processing</b>	
Water requirements	Dust control

Aspect	Proposal Characteristic
<b>Transport</b>	
Trucks	
Access	Use of existing haul roads for site access
<b>Noise</b>	
Noise	Noise management will be in accordance with that currently being implemented at the Collie Motorplex

## 1.2 Applicant and Owner Details

The proponent for this vegetation clearing application is as follows:

Motoring South West Inc.  
 PO Box 866  
 COLLIE WA 6225

The land on which this clearing is being proposed is owned by:

Executive Director  
 Department of Parks and Wildlife  
 17 Dick Perry Avenue  
 KENSINGTON WA 6151

## 1.3 Previous Assessments and Approvals

### 1.3.1 Environmental Assessments

Environmental assessments that have been undertaken to support approvals for the site include:

- Level 2 Flora and Vegetation Survey – Collie Motorplex (Ecoedge Environmental 2013)
- Level 1 Fauna Assessment of Collie Motorplex Proposed Clearing Areas (Greg Harewood 2013).

### 1.3.2 Previous Vegetation Clearing Applications

Previous clearing applications that have been undertaken are detailed below.

### 1.3.2.1 LBR 1145

An application was submitted to clear approximately 52 ha of indigenous vegetation for the purposes of Motor Sports Complex on the following land: *Forest Lease No. 2071/97 Part of State Forest No. 4*. This clearing application was approved and a licence to clear (LBR 1145) was issued to Motoring South West Incorporated on 6 July 2004. The area of land which was cleared under this licence is now occupied by the Collie Motorplex. This vegetation clearing licence expired in July 2005.

## 1.4 **Summary of Proposal**

The proponent is proposing to clear approximately 14.9 ha of vegetation within the site to facilitate the development of a one-eighth of a mile drag strip and associated infrastructure. This development will compliment the motor sports and driver training activities currently being undertaken at the Collie Motorplex.

In accordance with Condition 8.6 of the Lease No. 2071/97 Part of State Forest No. 4, the tenant (Motoring South West Incorporated) may not cut down or damage or otherwise interfere with anything growing on the leased area without the written consent of the landlord (DPaW formerly CALM).

In principle, support to proceed with this proposal has been obtained from the landlord and is provided as Appendix 3.

## 2.0 EXISTING ENVIRONMENT

### 2.1 Topography

The site is situated on the Darling Plateau within the Western Darling Range Zone with elevations falling from 447 metres Australian Height Datum (m AHD) in the north-east corner of the site to 417 m AHD in the south-west (Figure 2).

### 2.2 Soils and Geology

The site is situated on the Darling Plateau within the Western Darling Range Zone. The Western Darling Range Zone is a deeply dissected undulating lateritic plateau overlying crystalline rocks (e.g. granite and gneiss). Within the Western Darling Range Zone, the site occurs on the Coalfields System, which is dominated by broad, lateritic divides with gravels and sands (Collie subsystem).

The geology of the site is classified as follows (Figure 3):

- P-CL-ssh: sandstone, carbonaceous shale, coal, pebble conglomerate; includes Ewington, Premier and Muja coal measures.

#### 2.2.1 Acid Sulfate Soils

The site is not covered by the Department of Environment Regulation (DER) Acid Sulfate Soil (ASS) risk mapping. However, in accordance with CSIRO Australian Soil Resource Information System (ASRIS) National ASS Atlas, the site is classed as having an ASS probability of “extremely low occurrence/very low confidence”. A preliminary desktop assessment of the site characteristics including the vegetation, geology, landforms, hydrology and topography also indicates that the ASS risk is low.

Further ASS investigations may be required during the next phase of planning to confirm ASS management requirements (if any) at the site.

### 2.3 Hydrology

#### 2.3.1 Groundwater

The site is located within the Collie Coal Basin and more specifically the Cardiff sub-basin. Aquifers within this sub-basin include Nakina, Muja, Lower Collie Group and Stockton Group (DoW 2007). Recharge occurs mainly via direct infiltration of rainfall and some infiltration from the Collie River south and east branches.

Groundwater levels underlying the site are at approximately 170 m AHD (Waters and Rivers Commission 2002). When compared to surface elevations, the water table is located more than 250 m below ground level.

### 2.3.2 Surface Water

There are no surface watercourses or wetlands mapped within or in close proximity to the site. The nearest waterways are the Collie River South Branch and Lake Kepwari which are approximately 2.5 km west to south-west respectively (Figure 4).

## 2.4 Vegetation

### 2.4.1 Vegetation Complexes

The site falls within the Collie Complex a mapped by Mattiske and Havel (1998). This vegetation complex is described as “Open forest of *Eucalyptus marginata* subsp. *Marginata* – *Corymbia calophylla* – *Allocasuarina fraseriana* on gravelly-sandy upland soils in the subhumid zone.

The total remaining area of the Collie (CI) complex is 71% of the pre-European extent, which is above the minimum 30% of pre-clearing extent for retention of the National Targets and Objectives for Biodiversity Conservation (Ecoedge 2013)).

With regard to conservation status, the Environmental Protection Authority (EPA) has set a target of 15% of pre-European extent for each ecological community to be protected in a comprehensive, adequate and representative reserve system (EPA 2006). The Collie complex has been classified as poorly conserved by Mattiske and Havel (2002), with 14.5% of the then extent in conservation reserves. This falls just below the 15% target set by the EPA (2006).

### 2.4.2 Vegetation Units

A Level 2 Flora and Vegetation assessment was undertaken at the site in September and October 2013 by Ecoedge Environmental. At this time, two locations were being considered for the proposed drag strip; “Area A” and “Area B”. The report: *Level 2 Flora and Vegetation Survey – Collie Motorplex, Collie* (Ecoedge 2013) therefore includes an assessment across both of these areas.

Area B has since been selected as the preferred option for the drag strip site. The vegetation and flora information summarised below is therefore specific (where possible) to Area B (referred to “the site”).

The site comprises of the following vegetation units:

- Unit A: Open Forest of Jarrah (*Eucalyptus marginata*) and *Allocasuarina fraseriana* with occasional Marri (*Corymbia calophylla*) over Low Open Woodland of *Banksia grandis* and *Persoonia longifolia* over Shrubland of *Xanthorrhoea preissii* over Low Shrubland of *Bossiaea ornata*, *Hakea ruscifolia*, *Hibbertia hypericoides*, *Styphelia tenuiflora* and *Xanthorrhoea gracilis* on shallow grey gravelly sand often with exposed laterite.
- Unit B: Open Forest of Jarrah (*Eucalyptus marginata*) and *Allocasuarina fraseriana* with occasional Marri (*Corymbia calophylla*) over Very Low Open Woodland of *Persoonia longifolia* and *Xylomelum occidentale* over Shrubland/Low shrubland of *Acacia extensa*, *Bossiaea eriocarpa*, *B. ornata*, *Macrozamia riedlei*, *Xanthorrhoea preissii* and *X. gracilis* (with *Hypocalymma angustifolium* in damper areas) on grey-brown loamy sands.
- Unit D: Open forest of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) and sometimes *Allocasuarina fraseriana* over Shrubland/Low Shrubland of *Acacia browniana*, *Banksia dallanneyi*, *Bossiaea eriocarpa*, *B. ornata*, *Hakea lissocarpha*, *Hibbertia hypericoides* and *Xanthorrhoea gracilis* on gravelly grey-brown sandy loam (with exposed laterite) or grey-brown sandy loam.

The vegetation units across the site can be seen within Figure 6 of Appendix 4.

### 2.4.3 Vegetation Condition

The site encompasses a landholding of approximately 43 ha in size. The large majority of the vegetation within the site has been classified to be in “Very Good” condition (~36.6 ha), the remainder comprises of roads and road verges in already cleared areas (~6.1 ha).

## 2.5 Flora

One hundred and eighty species of vascular flora were identified across both Area A and Area B, of which 10 are naturalised or planted non-native species. The Fabaceae family was the most well represented with 26 species, followed by the Orchidaceae (17 species), Myrtaceae and Proteaceae (16 species each).

No Declared Rare Flora, Priority Flora, Threatened species pursuant to the Environmental Protection and Biodiversity Conservation (EPBC) Act or other flora of conservation significance was found within the site.

Species richness was low to average for 100 m<sup>2</sup> quadrats in open forest in south-western Australia at 34 taxa within the site (Quadrat COLL01).

## 2.6 Fauna

A Level I Fauna Survey including a Black Cockatoo Habitat Assessment was conducted by Greg Harewood in October 2013. At the time of this assessment, two locations were being considered for the drag strip site: “Area A” and “Area B”. The fauna assessment and associated report; *Fauna Assessment of Collie Motorplex Proposed Clearing Areas Cardiff* (Harewood 2013) therefore includes an assessment across both of these areas.

As discussed above, Area B has since been selected as the preferred option within which the proposed clearing for the drag strip is proposed. The fauna information summarised below is therefore specific to Area B (where practicable).

The following broadly defined fauna habitats identified at the site based on the remaining vegetation units are as follows:

- open-forest of jarrah–marri–sheoak with a range of understorey species (~35 ha)
- plantation and rehabilitation areas – some sections of the study area have been planted with non-endemic eucalypts and/or a range of shrubs (~0.3 ha)
- existing cleared or partly cleared areas: some of which contain scattered trees and shrubs (~7 ha).

Forty native fauna species were observed (or positively identified from foraging evidence, scats, etc.) across Area A and Area B during the survey period. The following three fauna species of conservation significance were identified across both of these areas;

- *Calyptorhynchus banksii naso* forest red-tailed black cockatoo
- *Calyptorhynchus baudinii* Baudin’s black cockatoo
- *Isodon obesulus fusciventer* southern brown bandicoot.

No evidence of migratory fauna species was found.

### 2.6.1 Black Cockatoo Habitat Assessment

The black cockatoo habitat assessment included the following:

- habitat tree survey: identification of all suitable trees species within the study area that have a Diameter at Breast Height (DBH) of over 50 cm
- black cockatoo foraging assessment: The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded



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

Five hundred and fifty-nine trees were examined within the site (Area B) that fit the criteria of black cockatoo breeding habitat i.e. suitable tree species with a DBH of >50 cm (Figure 6). The vast majority of these trees consisted of jarrah (474) with the remaining trees consisting of marri (78) and unknown species (seven). Table B below summarises the habitat tree details.

**Table B: Summary of Habitat Trees (DBH >50 cm)**

Area	Number of Trees with No Hollows Observed	Number of Trees with Small (<12 cm entrance) Hollows	Number of Trees with Large (>12 cm entrance) Hollows
B	283	245	31

Vegetation within the site is dominated by healthy stands of marri and jarrah; both of these are important food sources for black cockatoos. Foraging evidence left by black cockatoos (e.g. chewed jarrah and marri fruits) was found at several locations across the site. This foraging evidence was attributed to the forest red-tailed black cockatoo, though it is possible that some of the chewed jarrah fruits were the result of foraging by Carnaby’s Black-Cockatoo. Several forest red-tailed black cockatoo individuals were also heard calling during the survey period.

Several hollows large enough to be used for nesting were observed in the site, but no existing roosting trees were positively identified during the onsite fauna survey. There are some areas within the site that are heavily logged and in these areas, there were fewer large trees (> 500 mm dbh); however there were several groups of very large marri trees (> 800 mm dbh) present along the unsealed track that runs north to south through the site.

Almost all of the remnant native vegetation within the site (~35 ha) can be regarded as representative of foraging habitat for black cockatoos due to the dominance of jarrah and to a lesser extent marri along with other subdominant species such as *Banksia* and *Allocasuarina*.

Further detail on the fauna habitat assessment is provided within the *Fauna Assessment of Collie Motorplex Proposed Clearing Areas Cardiff* (Harewood 2013) in Appendix 4.

## 2.7 Cultural Heritage

The Department of Aboriginal Affairs (DAA) database (Aboriginal Heritage Inquiry System) indicates that the closest registered heritage site is approximately 2 km north-east of the site (Place ID 4734 Artefacts/Scatter) (Figure 7). A mythological place (Place

ID 16713) has been identified approximately 1 km to the north-west and 1.5 km south to south-west of the site. Neither of these heritage sites/places will be impacted by the proposed clearing considering the distance from the site and buffering provided by dense vegetation.

If any Aboriginal heritage is encountered during clearing activities or excavation, works will be stopped and DAA contacted.

### 3.0 ASSESSMENT AGAINST THE 10 CLEARING PRINCIPLES

Any clearing of native vegetation will require a permit under Part V Division 2 of the *Environmental Protection Act 1986* except where an exemption applies under Schedule 6 of the *Environmental Protection Act 1986* or is prescribed by regulation in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, and it is not in an Environmentally Sensitive Area (ESA).

Table C below provides an assessment of the proposed project against the “10 Clearing Principles” as outlined in Schedule 5 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* to determine whether the proposed development contravenes the principles. These principles aim to ensure that all potential impacts resulting from removal of native vegetation can be assessed in an integrated way.

The proposed development may be at variance with principle b of the “10 Clearing Principles” as discussed below.

**Table C: Assessment against the “10 Clearing Principles”**

Principle Number	Principle	Assessment	Outcome
(a)	Native vegetation should not be cleared if it comprises a high level of biological diversity	The site is located within only one vegetation complex (Collie). Furthermore, during the Level 2 flora survey, species richness within the quadrats surveyed was considered low to average for open forest in south-western Australia (Ecoedge 2013). Consequently, the proposed clearing is unlikely to have any significant impact on the biodiversity of the region.	The proposal is unlikely to be at variance with the principle
(b)	Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous Western Australia.	The vegetation present within the study area may provide habitat for black cockatoo species. Five hundred and fifty-nine potential black cockatoo breeding trees (i.e. DBH > 50 cm) were identified within the site. Thirty-one of these trees had hollows that were potentially large enough for black cockatoos to use for nesting. There was however no evidence of any hollows being used by black cockatoos for nesting. It is estimated that the proposed clearing will impact approximately 255 potential black cockatoo habitat trees. Despite this potential loss of habitat, it is not considered likely that the clearing will have a significant impact on black cockatoo populations. State forest (Collie, Muja and Mumballup) directly surrounds the site, which comprises the same vegetation complex and therefore very likely the same habitat opportunities for black cockatoo species.	The proposal may be at variance with the principle

Principle Number	Principle	Assessment	Outcome
(c)	Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	No Declared Rare Flora, Priority Flora, Threatened species pursuant to the EPBC Act or other flora of conservation significance was found within the site during the L2 Vegetation and Flora survey (Ecoedge 2013).	The proposal is not at variance with the principle
(d)	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community	The results of the L2 Vegetation and Flora Study indicate that none of the vegetation units identified at the site corresponds to a threatened or priority ecological community.	The proposal is not at variance with the principle.
(e)	Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	Aerial photographs indicates that the majority of land around the proposed action is vegetated, with regional mapping showing the following within 10 km of the site: <ul style="list-style-type: none"> <li>▪ Collie State Forest</li> <li>▪ Muja State Forest</li> <li>▪ Mumballup State Forest.</li> </ul> Therefore clearing approximately 14.9 ha is not considered likely to pose a significant impact on remnant vegetation extent.	The proposal is unlikely to be at variance with the principle.
(f)	Native vegetation should not be cleared if it is growing in or in association with a watercourse or wetland.	There are no surface watercourses or wetlands mapped within or in close proximity to the site. The nearest waterways are the Collie River South Branch and Lake Kepwari which are approximately 2.5 km west to south-west respectively	The proposal is not at variance with the principle.
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Land degradation can be caused or exacerbated by uncontrolled run-off and wind or water erosion. Stormwater run-off from hardstand surfaces etc. will be managed through appropriate drainage and erosion management measures in accordance with relevant guidelines. A significant amount of vegetation (~18.4 ha) within the site will be retained and will assist with soil stabilisation and control of erosion.	The proposal is not at variance with the principle.
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The site is located within the Collie State Forest. Consequently, the proposal will involve clearing ~14.9 ha of vegetation within state forest. During the flora survey however, none of this vegetation was identified as significant and no areas of conservation significance have been identified adjacent to or within close proximity of the site. The extent of clearing proposed is therefore not likely to have an impact on the environmental values of conservation areas within the region.	The proposal is not at variance with the principle.

Principle Number	Principle	Assessment	Outcome
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water	<p>The project area does not occur adjacent to any significant surface water courses. The nearest waterways are the Collie River South Branch and Lake Kepwari which are approximately 2.5 km west to south-west respectively.</p> <p>Due to this distance from the proposed clearing and the dense vegetation between the clearing and the nearest watercourses, the clearing of vegetation is not considered likely to significantly alter the quality of surface or ground waters within the project area.</p> <p>Erosion may occur following any potential clearing. Erosion can be mitigated by the use of appropriate stabilisation and surface water management and rehabilitation techniques for longer term protection.</p> <p>Due to the depth to groundwater (over 200 m below ground level), it is unlikely that the proposed action will adversely impact the proposed action.</p>	The proposal is not at variance with the principle
(j)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the intensity of flooding.	The clearing of native vegetation will not cause, or exacerbate the incidence or intensity of flooding due to increased run-off in localised areas.	The proposal is not at variance with the principle

## 4.0 REFERENCES

Department of Water (2007). Managing water in the Upper Collie. A status report on surface and groundwater management.

Ecoedge Environmental (2013). Level 2 Flora and Vegetation Survey – Collie Motorplex.

Environmental Protection Authority (2006). Level of Assessment for Proposals affecting Natural Area within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region. Guidance Statement No. 10, June 2006, Perth.

Greg Harewood (2013). Fauna Assessment of Collie Motorplex Proposed Clearing Areas.

Mattiske Consulting and Havel, J.J. (2002). Review of management options for poorly represented vegetation complexes. Report to the Conservation Commission of Western Australia.

Waters and Rivers Commission (2002). Hydrogeology and Groundwater Resources of the Collie Basin Western Australia. Hydrological Record Series Report HG 5.

## FIGURES

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**LEGEND**

- Coordinates
- Contour (mAHD)
- Proposed Design
- ▭ Site Boundary



Coordinates in GDA 1994 MGA Zone 50S

Location	Easting	Northing	Latitude (DMS)	Longitude (DMS)
A	430290	6300083	33° 26' 10.975" S	116° 15' 0.231" E
B	430720	6300278	33° 26' 4.740" S	116° 15' 16.935" E
C	430955	6299196	33° 26' 39.909" S	116° 15' 25.729" E
D	430575	6299186	33° 26' 40.142" S	116° 15' 10.996" E





**LEGEND**


 Cadastre

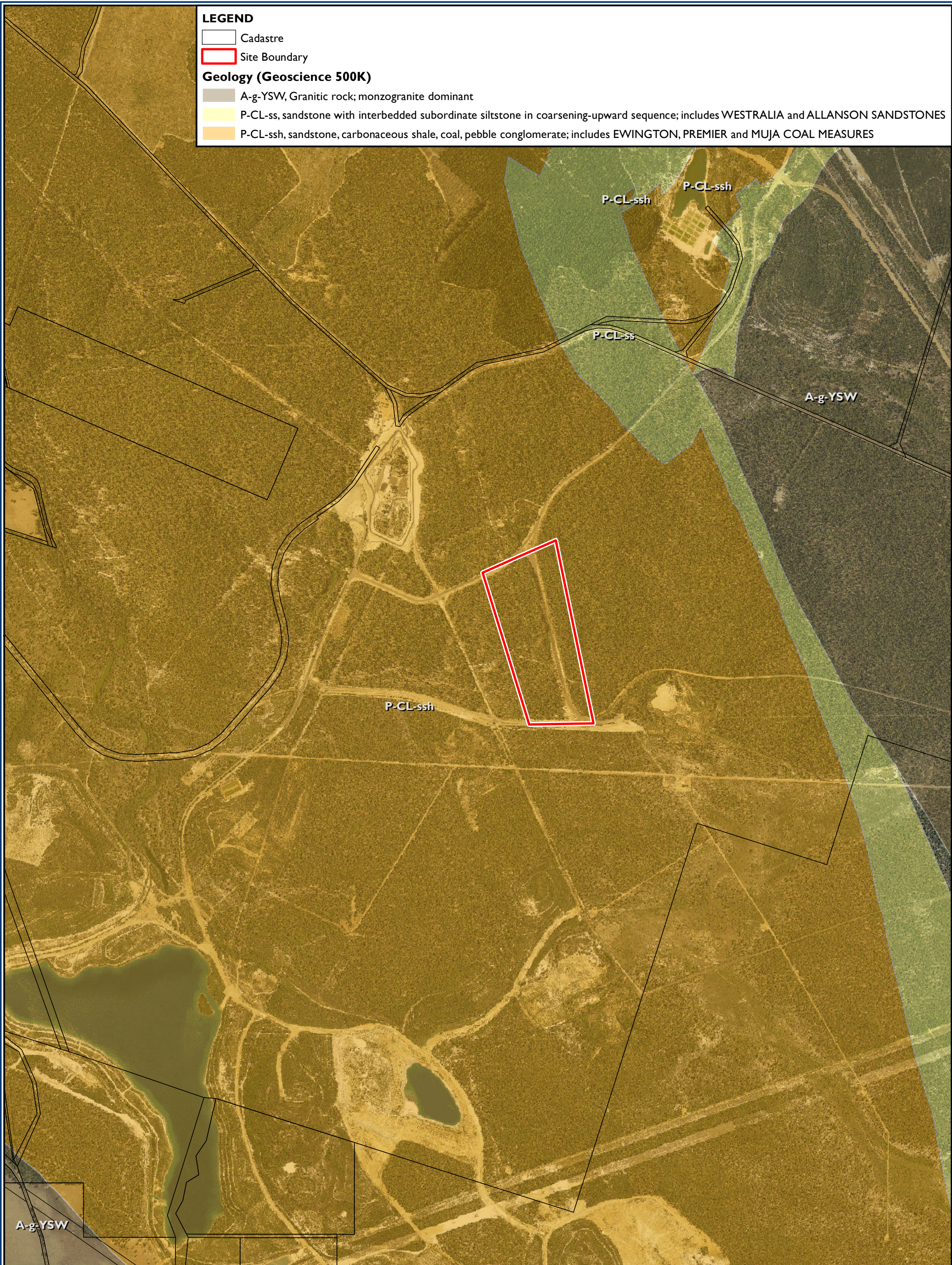
 Site Boundary

**Geology (Geoscience 500K)**

 A-g-YSW, Granitic rock; monzogranite dominant

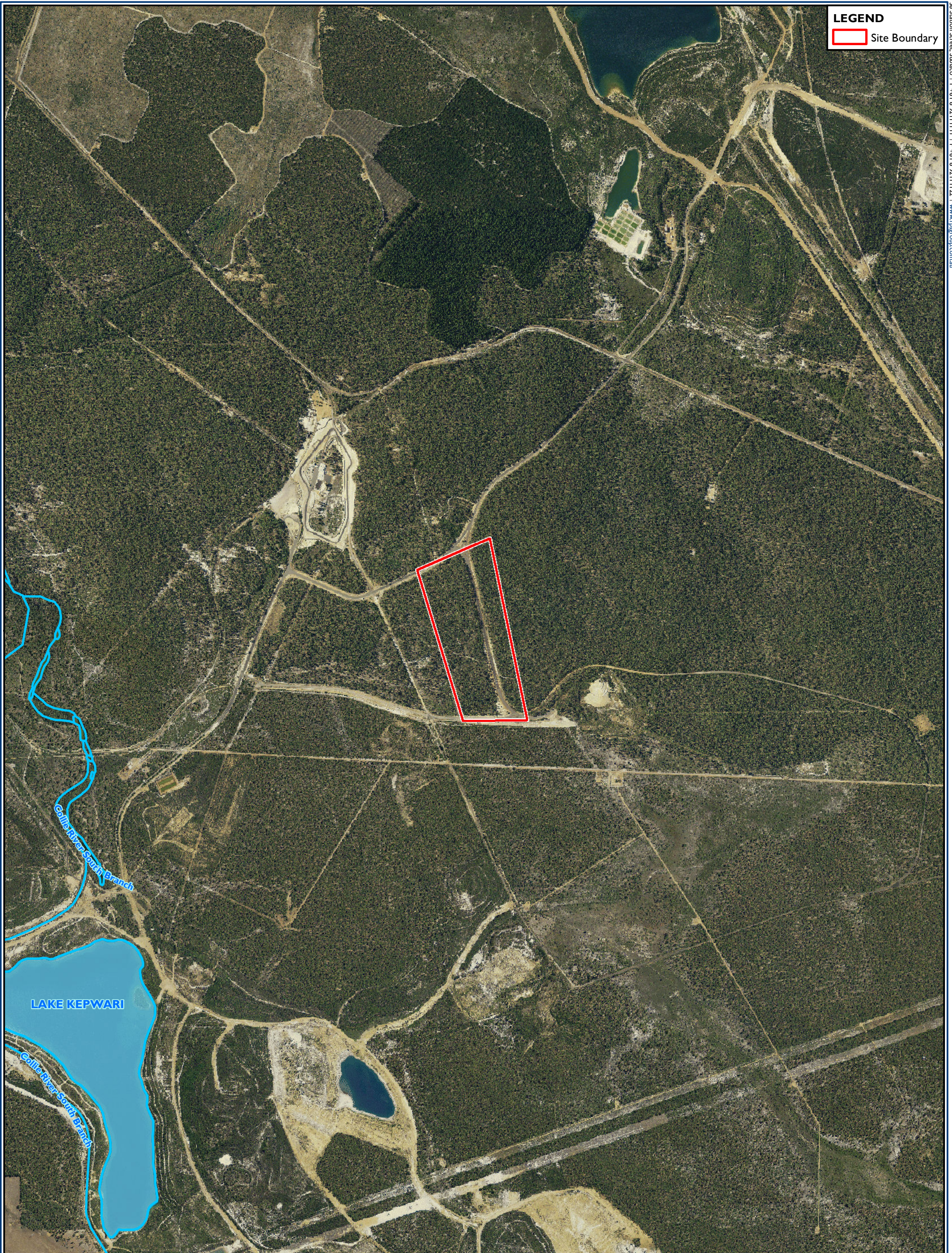
 P-CL-ss, sandstone with interbedded subordinate siltstone in coarsening-upward sequence; includes WESTRALIA and ALLANSON SANDSTONES

 P-CL-ssh, sandstone, carbonaceous shale, coal, pebble conglomerate; includes EWINGTON, PREMIER and MUJA COAL MEASURES

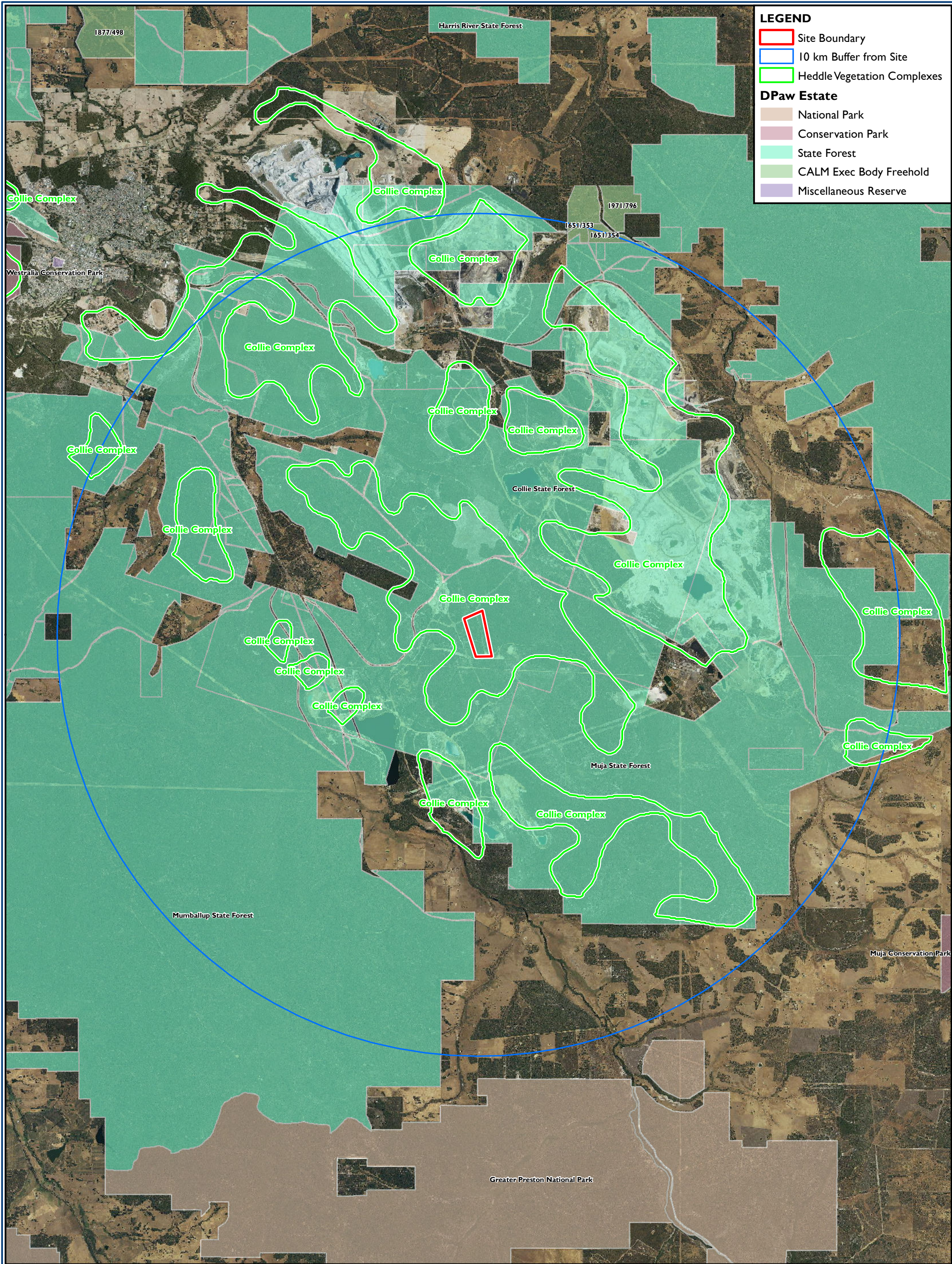




**LEGEND**  
Site Boundary







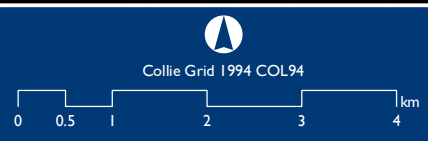
**LEGEND**

- Site Boundary
- 10 km Buffer from Site
- Heddle Vegetation Complexes

**DPaw Estate**

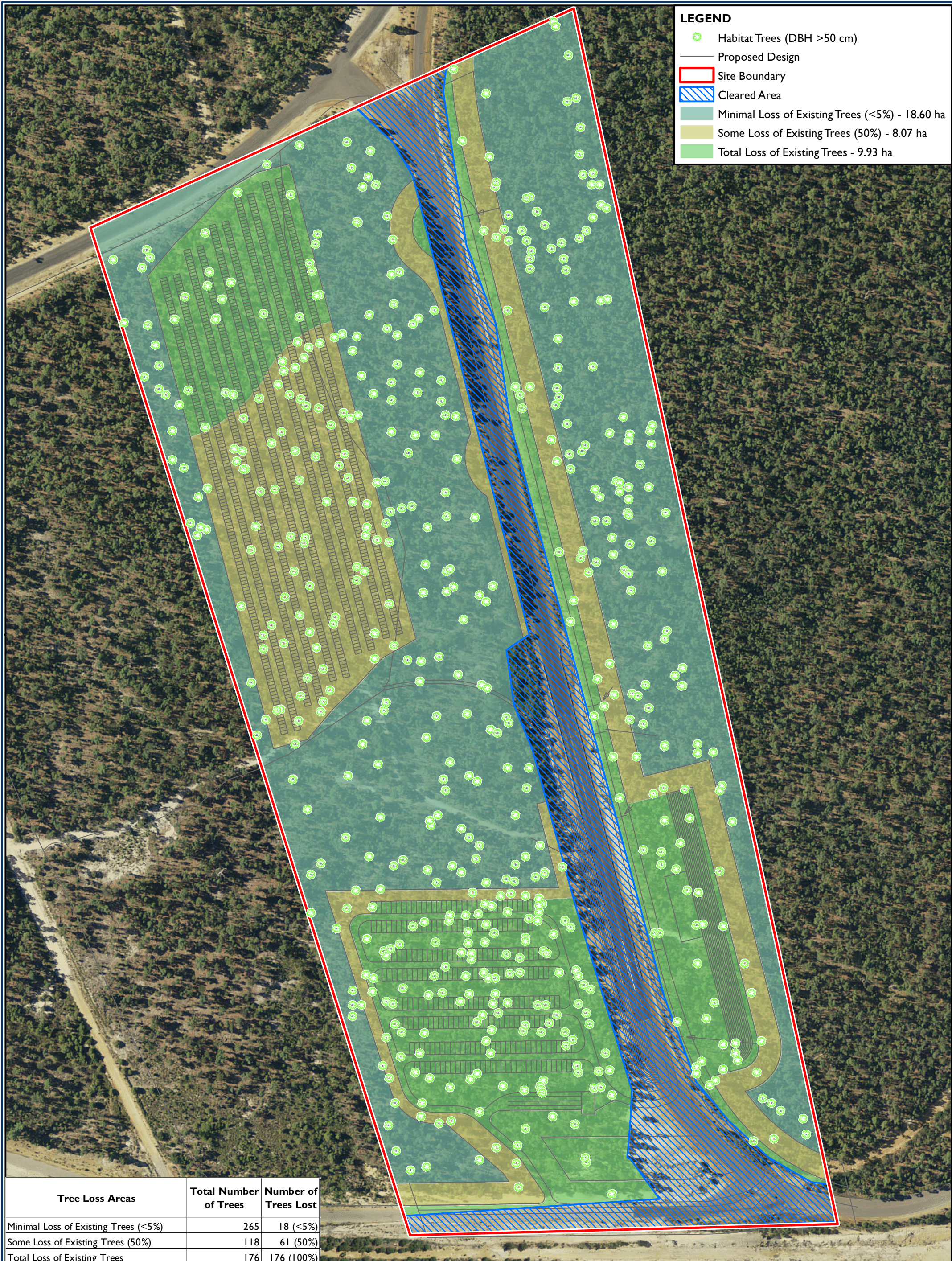
- National Park
- Conservation Park
- State Forest
- CALM Exec Body Freehold
- Miscellaneous Reserve

Job Number: I1319102  
 Doc Number: VCA-005  
 Date: 07.07.14  
 Scale: 1:80,000 @ A3  
 Created by: MA  
 Source: Cadastre - Landgate, 2013 Orthophoto - Landgate, 2012 Proposed Design - 2014



**Figure 5**  
**Vegetation Complexes Protected within Reserves**

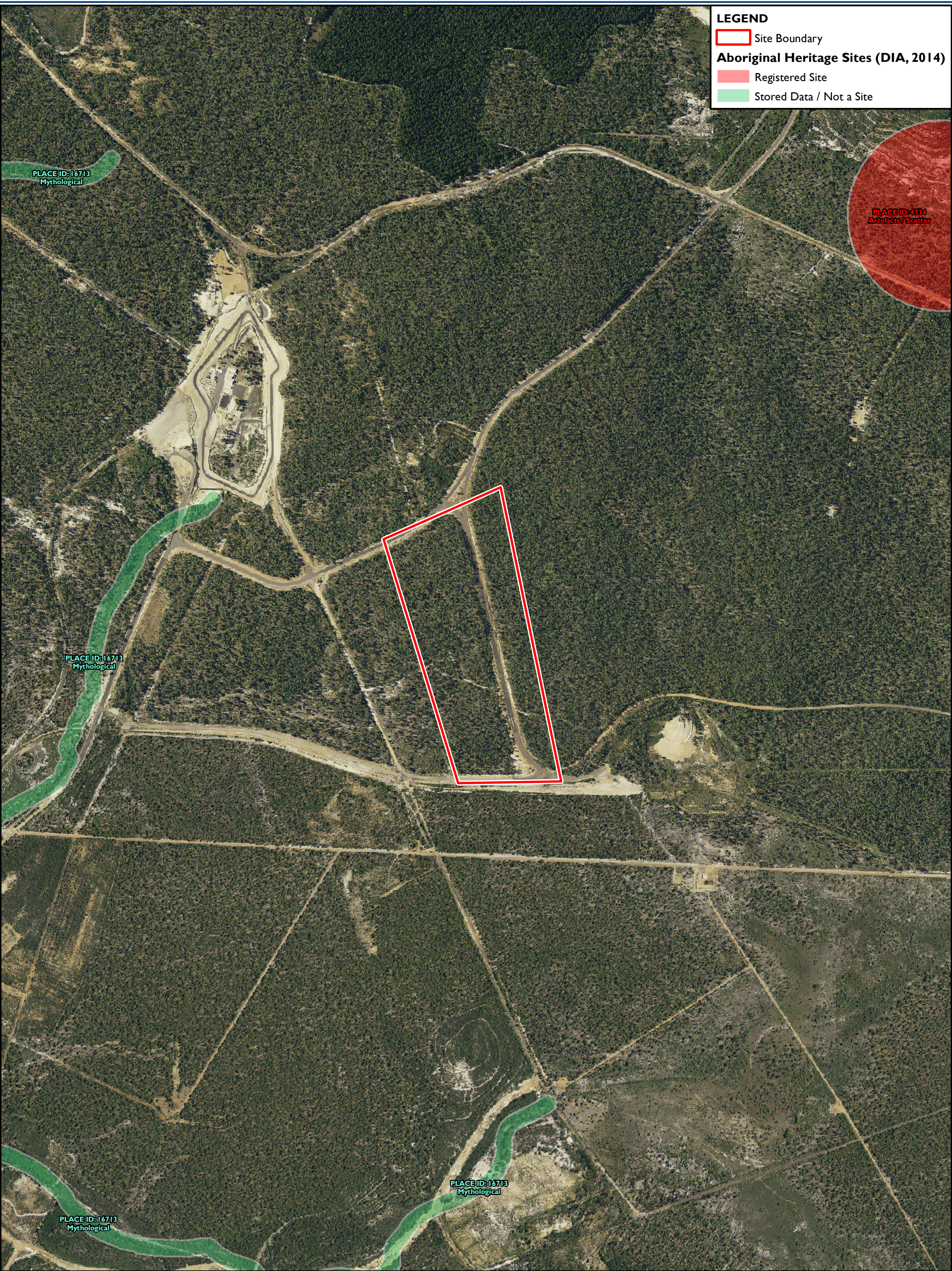






**LEGEND**

- Site Boundary
- Aboriginal Heritage Sites (DIA, 2014)**
- Registered Site
- Stored Data / Not a Site





## **APPENDIX I**

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### **Application for a Clearing Permit (Form CI)**



# Application for a clearing permit (area permit)

Environmental Protection Act 1986 s 51E

## FORM C1

Clearing of native vegetation is prohibited in Western Australia except where a clearing permit has been granted or an exemption applies. A person who causes or allows unauthorised clearing commits an offence.

CPS No.

Date stamp

### Part 1 Assessment bilateral agreement

The native vegetation clearing processes under Part V of the *Environmental Protection Act 1986* (EP Act) have been accredited by the Commonwealth of Australia under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and can be assessed under an assessment bilateral agreement.

To be assessed under the assessment bilateral agreement, the proposed clearing action must be referred to the Commonwealth under the EPBC Act prior to submitting this application form and Annex C7 must also be completed.

For further information see Annex C7 and *A guide to native vegetation clearing processes under the assessment bilateral agreement* available at [www.der.wa.gov.au/nvp](http://www.der.wa.gov.au/nvp).

Do you want your proposed clearing action assessed in accordance with, or under, an EPBC Act Accredited Process such as the assessment bilateral agreement?

Yes  No Proceed to Part 2

Has the proposed clearing action been referred to the Commonwealth of Australia under the EPBC Act?

Yes EPBC Number 2015/7455

No It cannot be assessed under an Accredited Process such as the assessment bilateral agreement until it has been referred to the Commonwealth. Proceed to Part 2.

Has a decision been made under the EPBC Act as to whether the proposed clearing action is a controlled action?

Yes  No Proceed to Part 2

Is the proposed clearing action a controlled action under the EPBC Act?

No It cannot be assessed under an Accredited Process, proceed to Part 2

Yes Complete and attach the requirements of Annex C7 to this completed form

List the controlling provisions identified in the notification of the controlled action decision

Annex C7 is complete and the required supporting information is attached

### Part 2 Land details

The location of the land where clearing is proposed must be accurately described.

Land description: volume and folio number, lot or location number(s), Crown lease or reserve number, pastoral lease number or mining tenement number of all properties

Lease No. 2071/97

Part of State Forest No. 4

Street address

NA

Local government area

Shire of Collie

Land zoning, e.g. rural, residential, industrial

Park and Recreation (Shire of Collie Town Planning Scheme 5)

FILE REFERENCE

### Part 3 Proposal

An aerial photograph or map with a north arrow must be attached, clearly marking the area proposed to be cleared or

if you have the facilities, a digital map on CDROM of the area to clear as an ESRI shapefile with the following properties:

- Geometry type: polygon shape
- Coordinate system: GDA 1994 (Geographic latitude/longitude)
- Datum: GDA 1994 (Geocentric Datum of Australia 1994).

Total area of clearing proposed (hectares)

14.89 ha

and/or number of individual trees to be removed

255

Proposed method of clearing

Clearing will be undertaken with an excavator and loader. Any craft wood timber will be salvaged. Top soil will be stripped and retained for future rehabilitation works.

Period within which clearing is proposed to be undertaken, e.g. May 2014 – June 2014

Spring- Summer 2015/16

Purpose of clearing

Development of a 1/8<sup>th</sup> mile drag strip at the Collie Motorplex.

Clearing will be required for the drag strip and other traffic-specific items i.e. arrestor bed, return road and also for access and facilities for parking and spectators, ticketing, storage and security facilities etc.

Has this clearing application or any related matter been referred to the Environmental Protection Authority (EPA)  Yes  No



**Part 4 Applicant**

To apply for a permit you must either be:

- the landowner
- acting on the landowner's behalf or
- likely to become the landowner.

Note: If you are acting on behalf of the landowner, you must attach a letter of authority from the landowner explicitly stating that you, the applicant, have authority to clear on the said land.

Are you applying as an individual, a company or an incorporated body? – Enter details for one only (please print)

Motoring South West Incorporated are acting on behalf of the landowner Department of Parks and Wildlife (Formerly The Department of Conservation and Land Management)

**Ownership of land**

A landowner can be:

- a person who holds the Certificate of Title
  - a person who is the lessee of Crown land or
  - a public authority that is responsible for care of the land.
- If granted, the permit will be granted in the name of the landowner.

Form of ownership:

- <sup>NA</sup> Certificate of Title (please attach a copy of the certificate and all associated encumbrances with the application—available from Landgate)
- Pastoral lease (please attach a copy of the lease and all associated encumbrances with the application)
- Mining lease
- Public authority that has care, control or management of the land
- Other form of lease, land tenure or specific arrangement. Please state:

Lease 2071/97 Department of Conservation and Land Management: Motor Sports Complex - Competitive motor sports and driver training complex

**Relationship to landowner**

Please indicate your relationship to the landowner.

If you are likely to become the landowner, please attach evidence of the pending transfer of ownership, contract of sale ('offer and acceptance') or letter from current landowner.

I am (tick applicable box)

- the owner of the land
- acting on behalf of the owner and have attached an agent's authority, expressly authorising me to act on behalf of the landowner
- likely to become the owner of the land (please provide copy of 'offer and acceptance')

**Proposed permit holder details**

\*If applying as a company or incorporated body, please also supply the registered business office address.

Given name, family name and title (Mr, Mrs, Ms, etc.)

Mr James Weighell

Position title/Company

CHAIRMAN / MOTOR SOUTH WEST INC

Postal/Business address\* (for future correspondence)

P.O. Box 866 COLLIE WA 6225

Fixed telephone number

08 9734 1577

Mobile telephone number

04 1717 1992

Fax number

08 9734 5095







Email address

jim@colliehome.com.au



<p><b>Contact details</b></p> <p>Person with whom Department of Environment Regulation or Department of Mines and Petroleum should liaise concerning the clearing application.</p> <p>*If applying as a company or incorporated body, please also supply the registered business office address.</p>	<p><input type="checkbox"/> Contact details are the same as above OR:</p> <table border="1"> <tr> <td>           Given name, family name and title (Mr, Mrs, Ms, etc.)            Mr Glenn Yeatman            RPS Environment         </td> <td>           Position title/Company            Principal Scientist/Manager         </td> </tr> <tr> <td colspan="2">           Postal /Business address*            PO Box 749 Busselton 6280            Unit 1, 8 Prince Street Busselton WA 6280         </td> </tr> <tr> <td>           Fixed telephone number            9754 2898         </td> <td>           Mobile telephone number            0457 554 431         </td> </tr> <tr> <td>           Fax number         </td> <td>           Email  <a href="mailto:Glenn.yeatman@rpsgroup.com.au">Glenn.yeatman@rpsgroup.com.au</a> </td> </tr> </table>	Given name, family name and title (Mr, Mrs, Ms, etc.) Mr Glenn Yeatman RPS Environment	Position title/Company Principal Scientist/Manager	Postal /Business address* PO Box 749 Busselton 6280 Unit 1, 8 Prince Street Busselton WA 6280		Fixed telephone number 9754 2898	Mobile telephone number 0457 554 431	Fax number	Email <a href="mailto:Glenn.yeatman@rpsgroup.com.au">Glenn.yeatman@rpsgroup.com.au</a>
Given name, family name and title (Mr, Mrs, Ms, etc.) Mr Glenn Yeatman RPS Environment	Position title/Company Principal Scientist/Manager								
Postal /Business address* PO Box 749 Busselton 6280 Unit 1, 8 Prince Street Busselton WA 6280									
Fixed telephone number 9754 2898	Mobile telephone number 0457 554 431								
Fax number	Email <a href="mailto:Glenn.yeatman@rpsgroup.com.au">Glenn.yeatman@rpsgroup.com.au</a>								

**Part 5 Declaration and signature**

<p>For your application to be accepted, it must be signed either on behalf of the company or as an individual.</p> <p>By signing this form you are declaring that the statements on this form are true and correct.</p> <p>The Department in accepting this form accepts you are an expressly authorised representative and are able to act on behalf of the body corporate in applying for and in holding a permit.</p> <p>Knowingly providing false or misleading information is an offence under section 112 of the <i>Environmental Protection Act 1986</i> and may incur a penalty of up to \$50,000.</p>	<p>Please indicate if you are signing as an individual or a company:</p> <p><input type="checkbox"/> <b>An individual.</b> If an individual landowner is applying, <b>all landowners</b> must sign this form.</p> <p><input type="checkbox"/> <b>A company.</b> A person expressly authorised or authorised to execute on behalf of a body corporate must sign this form. A company must be a legal entity and provide an Australian Company Number (ACN). Please note Australian Business Number (ABN) is not sufficient.</p> <p><input type="checkbox"/> <b>Other entity formed at law.</b> Provide details.</p> <table border="1"> <tr> <td>           Signature(s)            (1)             (2)         </td> <td>           Date            18/03/15         </td> </tr> <tr> <td>           Print name(s)            (1) JAMES WEIGHELL            (2)         </td> <td>           Common seal (if used)   </td> </tr> <tr> <td>           Position (e.g. director, CEO etc.)            (1) CHAIRMAN            (2)         </td> <td></td> </tr> <tr> <td>           Company name/ACN or other entity (incorporation etc.)            MOTORING SOUTH WEST INC         </td> <td></td> </tr> </table>	Signature(s) (1)  (2)	Date 18/03/15	Print name(s) (1) JAMES WEIGHELL (2)	Common seal (if used) 	Position (e.g. director, CEO etc.) (1) CHAIRMAN (2)		Company name/ACN or other entity (incorporation etc.) MOTORING SOUTH WEST INC	
Signature(s) (1)  (2)	Date 18/03/15								
Print name(s) (1) JAMES WEIGHELL (2)	Common seal (if used) 								
Position (e.g. director, CEO etc.) (1) CHAIRMAN (2)									
Company name/ACN or other entity (incorporation etc.) MOTORING SOUTH WEST INC									



## Part 6 Prescribed fee

Make cheques or money orders payable to:

Department of Environment Regulation  
(for all clearing purposes other than mining and petroleum activities)

or  
Department of Mines and Petroleum  
(for mineral and petroleum clearing activities under the Mining Act, various Petroleum Acts or State Agreement Acts).

To make payment with a credit card, please complete Form C3 and attach to this form.

Do not send cash in the mail.

Please indicate the clearing permit application fee that you are paying:

- \$50 for an area of less than one hectare
- \$100 for an area between one hectare and 10 hectares
- \$200 for an area of more than 10 hectares

OFFICE USE ONLY

Payment method (tick applicable box):

- Cheque
- Money order
- Credit card (please complete Form C3 and attach)

## Part 7 Application checklist

Additional information to assist in the assessment of your proposal may be attached to this application – e.g. reports on salinity, fauna or flora studies or other environmental reports conducted for the site could be included in electronic format and submitted on CDROM.

Please ensure you have included the following as part of your application:

### REQUIRED

- A completed application form that is signed and dated by all landowners, or the applicant acting on behalf of or likely to become the landowner.
- Payment.
- An aerial photograph or map with a north arrow clearly identifying the areas of vegetation proposed to be cleared or ESRI shapefile. \*An ERSI shapefile must be provided if the application requires an assessment under an EPBC Act Accredited process.
- I have read and understand the 'Confidential or commercially sensitive information' section at the bottom of this form.

### REQUIRED IF APPLICABLE

- Copy of the Certificate of Title or pastoral lease
- Copy of written authority to act on behalf of the landowner.
- Evidence of the pending transfer of land ownership, such as the offer and acceptance, or written notice from the current landowner
- Form C3 if fee is to be paid by credit card
- Annex C7 if the clearing is also to be assessed under an EPBC Act Accredited Process

Please provide a summary of all attached documentation

See Attached



## Part 8 Lodgement

Send by email or post original applications for all clearing purposes (other than mining and petroleum activities) to:

**Department of Environment Regulation**  
Locked Bag 33, CLOISTERS SQUARE  
PERTH WA 6850  
Email: [nvp@der.wa.gov.au](mailto:nvp@der.wa.gov.au)

Telephone: 6467 5020  
For more information: [www.der.wa.gov.au/nvp](http://www.der.wa.gov.au/nvp)

Send original applications related to mining and petroleum clearing activities (under delegation) to:

**Department of Mines and Petroleum**  
Environment Division  
Mineral House  
100 Plain St EAST PERTH WA 6004

Telephone: 9222 3333  
For more information: [www.dmp.wa.gov.au](http://www.dmp.wa.gov.au)

Please retain a copy of this form for your records.

Incomplete applications will be declined in accordance with section 51E (3) of the *Environmental Protection Act 1986*.

### CONFIDENTIAL OR COMMERCIALY SENSITIVE INFORMATION

Information submitted as part of this application may be made publicly available. If you wish to submit information that you believe to be commercially sensitive or otherwise confidential, then you should submit that information in an appendix to this application, with a written statement of reasons why you request that each item of information be kept confidential. The department will take reasonable steps to protect confidential or commercially sensitive information. Please note in particular that all submitted information may be the subject of an application for release under the *Freedom of Information Act 1992*. If you have any enquiries regarding the provision of relevant information as part of this application contact either the Department of Environment Regulation or the Department of Mines and Petroleum.

If there is insufficient space on any part of this form, please continue on a separate sheet of paper and attach to this form.

## **APPENDIX 2**

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**Lease 2071/97**

**LEASE**

**LEASE NO 2071/97**

**PART OF STATE FOREST NO. 4**

**MOTOR SPORTS COMPLEX**

**EXECUTIVE DIRECTOR OF  
THE DEPARTMENT OF CONSERVATION  
AND LAND MANAGEMENT  
(THE LANDLORD)**

**MOTORING SOUTH WEST INCORPORATED  
(Tenant)**

**WESFARMERS PREMIER COAL LIMITED  
(WPCL)**

**Schedule**

1. Landlord
2. Tenant
3. Leased Area
4. Term
5. Option to Extend the Lease
6. Rent
7. Permitted Use of the Leased Area
8. Minimum Public Liability Insurance Cover
9. Special Provisions

**Terms and Conditions**

1. Grant
2. Option to Extend
3. Rent
4. Rent Review
5. Outgoings
6. Building Work and Cleaning
7. Use of Leased Area
8. Fires and Environmental Protection
9. General Obligations and Restrictions
10. Indemnity and Insurance
11. Management of the Leased Area
12. Assignment and Subletting
13. Holding Over
14. Default
15. Tenant's Obligations on Termination
16. Costs and Expenses
17. Miscellaneous
18. Power of Attorney
19. Notices
20. Trustee Provisions
21. Mining Interest
22. Interpretation

This Lease is signed by the following parties as a deed.

The Landlord:

Signed on 25/9 2003

The Common Seal of THE EXECUTIVE DIRECTOR OF THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT was affixed in the presence of :

M [Signature] Executive Director

[Signature] Witness

The Tenant:

Signed on 25-9-2003

The Common Seal of MOTORING SOUTH WEST INCORPORATED ABN 95 330 658 214

was affixed by

in the presence of :

[Signature]



[Signature]

WPCL:

Signed on 25-09-2003

EXECUTED by WESFARMERS PREMIER COAL LIMITED ABN 21 008 672 599 in accordance with section 127 of the Corporations Act

[Signature] Director/Company Secretary

P D WARRAND Name of Director/Company Secretary (BLOCK LETTERS)



[Signature] Director Secretary

R S GARDNER Name of Director (BLOCK LETTERS) Secretary



---

**1. THE LANDLORD**

---

EXECUTIVE DIRECTOR – DEPARTMENT OF CONSERVATION AND LAND  
MANAGEMENT – 17 DICK PERRY AVENUE KENSINGTON WA 6152

---

**2. Tenant**

---

MOTORING SOUTH WEST INCORPORATED  
P O BOX 866 COLLIE WA 6225

---

**3. Leased Area**

---

That part of State forest No 4 delineated and outlined in green on the plan attached hereto and includes the natural surface and so much as is below the natural surface to a depth of 12.19 metres and the Landlord's fixtures on the Leased Area on the Commencement Date.

---

**4. Term**

---

The period of 21 years from the Commencement Date to the Expiry Date

*Commencement Date: 1 October 2003*

*Expiry Date: 30 September 2024*

---

**5. Option to Extend the Lease**

---

*5.1 First Option Period: 4 years*

---

**6. Rent**

---

\$1,500.00 per annum excluding GST

---

**7. Permitted Use of the Leased Area**

---

Competitive motor sports and driver training complex.

---

**8. Minimum Public Liability Insurance Cover**

---

\$10,000,000

---

**9. Special Provisions**

---

---

**1.0 GRANT**

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**1.1 Grant of Lease**

The Landlord leases the Leased Area to the Tenant for the Term subject to the terms and conditions of this Lease.

**1.2 Quiet Enjoyment**

For as long as the Tenant complies with the Tenant's obligations under this Lease, the Tenant may occupy and use the Leased Area during the Term without disturbance or interference by the Landlord except as permitted by this Lease or by law.

**1.3 Termination by the Landlord**

Despite any other provision of this Lease, the Landlord may at any time or if required by WPCL must terminate this Lease by giving five (5) years written notice of termination to the Tenant.

---

**2.0 OPTION TO EXTEND**

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**2.1 First Option Period**

If a period is specified in item 5.1 of the Schedule, the Tenant has the option to extend this Lease for the First Option Period, but only if:

- (1) the Tenant has before the expiration of the Term obtained the written consent of WPCL to the Tenant renewing the Lease for the First Option Period;
- (2) the Tenant notifies the Landlord in writing that the Tenant wants to extend this Lease for that period at least 3 months before the Expiry Date (but not earlier than 6 months before that date); and
- (3) the Tenant is not in default under this Lease when the option is exercised.

**2.2 Terms and Conditions**

If this Lease is extended under clause 2.1 all the provisions of this Lease continue to apply, except the option in clause 2.1.

**2.3 Rent during Option Term**

The rent payable by the Tenant from the beginning of any extended term of this Lease is to be the same rent payable immediately before the date of commencement of the extended term unless that date is a rent review date, in which case the rent is to be reviewed with effect from that date, and the rent is subject to further review during the extended term as provided in this Lease.

**2.4 Default after exercise of Option**

If the Tenant defaults under this Lease after exercising an option to extend the term of this Lease, the Landlord is not prevented from exercising any rights, including the right to terminate this Lease. If this Lease is terminated, the Landlord is not under any obligation to grant a lease of the Leased Area to the Tenant for any extended term.

**2.5 Definitions**

In this Lease :

**First Option Period** means the period (if any) specified in item 5 of the Schedule.

---

**3.0 RENT**

---

**3.1 Amount of the Rent**

The annual rent payable under this Lease from the Commencement Date is the amount specified in item 6 of the Schedule.

**3.2 Manner of Payment**

The Tenant must pay the rent by equal annual instalments in advance. The first instalment is to be paid on the Commencement Date and subsequent instalments are to be paid on each anniversary of the Commencement Date. Rent payable for part of a year is to be proportionately adjusted on a daily basis.

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**4.0 RENT REVIEW**

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**4.1 CPI**

With effect from (and including) each date specified in this clause 4 as a "CPI Review Date", the rent must be reviewed on the basis that the reviewed rent is to be the higher of :

- (1) The rent applying immediately before the relevant CPI Review Date; and
- (2) the amount calculated by using the following formula:

$$A = \frac{B}{C} \times D$$

Where :

- A = the amount of the reviewed rent which is payable from (and including) the relevant CPI Review Date.
- B = the last quarterly CPI Index Number published before the relevant CPI Review Date.
- C = the last quarterly CPI Index Number published before the previous rent review date (or in the case of the first review, before the Commencement Date).
- D = the amount of the rent applying immediately before the relevant CPI Review Date.

**4.2 Market**

With effect from (and including) each date specified in this clause 4 as a "Market Review Date", the Landlord can require that the rent be reviewed on the following basis.

If the Tenant has not agreed in writing to the amount of the reviewed rent proposed by the Landlord by 1 month before the relevant Market Review Date, the amount of the reviewed rent is to be the higher of :

- (1) the rent applying immediately before the relevant Market Review Date; and
- (2) the market rent for the Leased Area determined by a valuer licensed under the Land Valuers Licensing Act:
  - (i) agreed to by each of the parties; or
  - (ii) if they cannot agree, appointed by the President of the Australian Institute of Valuers and Land Economists (WA Division) at the request of either party.

The parties must each pay half the fees charged by any valuer appointed under this Lease to determine the market rent for the Leased Area.

#### 4.3 Interpretation

In this Lease :

**CPI Index Number** means the Consumer Price Index (All Groups) for Perth published by the Australian Bureau of Statistics. If that index ceases to exist, "CPI Index Number" means the index which replaces it or (if none does) the index which most closely measures changes in the cost of living in Perth, Western Australia as nominated by a senior officer of the Australian Bureau of Statistics.

**CPI Review Date** means each anniversary of the Commencement Date other than each anniversary which is a Market Review Date.

**market rent** means the rent that a sitting tenant would be prepared to pay and an owner of the Leased Area would be prepared to accept taking into account :

- (1) the highest and best use of the Leased Area;
- (2) the provisions of this Lease;
- (3) the period which will elapse between the current rent review date and the next rent review date or, if there is not one, the termination of this Lease;
- (4) the full length of the Term and the benefit of any option to renew;
- (5) any improvement to the Leased Area by the Landlord but disregarding :
- (6) the consequences of any default by the Tenant of this Lease which may have adversely affected the condition, rental value or market rent of the Leased Area;
- (7) any part of the Term which has expired;
- (8) the value of the Tenant's Property and any goodwill created by the Tenant's business or activities on the Leased Area;

**Market Review Date** means the First day of October in the years 2008, 2013, 2018 and 2023.  
**Rent review date** includes each CPI Review Date and Market Review Date.

#### 4.4 Delay

No delay by the Landlord in enforcing any review of the rent prevents the Landlord from requiring at any time that the rent must be reviewed with effect from the dates for review of the rent specified in this clause 4.

#### 5.0 OUTGOINGS

##### 5.1 Rates and Taxes

The Tenant must pay the Rates and Taxes either to the relevant Authority before those Rates and Taxes become overdue or, in the case of any Rates and Taxes imposed on the Landlord, to the Landlord as required by the Landlord whenever the Rates and Taxes become payable.

##### 5.2 Goods and Services Tax

###### (1) Definition

**GST** means a goods and services tax or similar value added tax levied or imposed in Australia pursuant to the GST Act or otherwise on a supply.

**GST Act** means A New Tax System (Goods and Services Tax) Act 1999 (Cth).

**New Tax System changes** has the same meaning as in section 75AT of the Trade Practices Act 1974 (Cth).

**Tax Invoice** includes any document or record treated by the Commissioner of Taxation as a tax invoice or as a document entitling a recipient to an input tax credit.

(2) **Adjustment for GST**

- (a) Unless expressly included, the consideration for any supply made by the Landlord under or in connection with this lease does not include GST.
- (b) GST is payable on any supply of goods and services under this lease.

(3) **Tax Invoices**

The Landlord must issue a Tax Invoice to the Lessee in respect of any supply of goods and services under the lease.

(4) **Reimbursements**

If the Landlord is entitled under the lease to be reimbursed or indemnified by the Tenant for a cost or expense incurred in connection with the lease, the reimbursement or indemnity payment must not include any GST component of the cost or expense for which an input tax credit may be claimed by the Landlord.

**5.3 Other property included**

If Rates and Taxes are not assessed separately on the Leased Area but also on other property which includes the Leased Area, the amount which the Landlord can require the Tenant to pay is the same proportion of those Rates and Taxes as the area of the Leased Area bears to the area of the property the subject of the assessment.

**5.4 Energy Services**

The Tenant must pay the charges of any Energy Supplier and any other costs in respect of the supply of energy services to the Leased Area either to the Energy Supplier before those charges become overdue or, in the case of any such charges imposed on the Landlord, to the Landlord as required by the Landlord whenever the charges become payable.

**5.5 Water**

The Tenant must pay the charges imposed by the Water Supplier in connection with water supplied to the Leased Area either to the Water Supplier before those charges become overdue or, in the case of any such charges imposed on the Landlord, to the Landlord as required by the Landlord whenever the charges become payable.

**5.6 Service Charges**

The Tenant must pay all charges for all other Services which are imposed in respect of the Leased Area either to the supplier before those charges become overdue or, in the case of any such charges imposed on the Landlord, to the Landlord as required by the Landlord whenever the charges become payable.

**6.0 BUILDING WORK AND CLEANING**

---

**6.1 General Obligations**

The Tenant must:

maintain the Leased Area in the condition it was in immediately before the Commencement Date (except for fair wear and tear); and

promptly repair any damage to the Leased Area; and

maintain the Tenant's Property (including signs) located on the Leased Area in good condition.

**6.2 Building Work**

If the Tenant constructs anything on the Leased Area or carries out any other work on the Leased Area, including work relating to Services or work required by any Authority or any law, the Tenant must:

- (i) before carrying out the work, obtain the Landlord's written approval to the carrying out of the work, including if relevant, written approval of the plans and specifications for the work; and
- (ii) comply with all relevant requirements of each Authority and all laws and applicable standards in relation to the work; and
- (iii) carry out the work in a safe and proper manner; and
- (iv) use only good quality materials; and
- (v) employ only qualified and competent persons who have been approved by the Landlord; and
- (vi) pay to the Landlord when the Landlord requests any expenses incurred by the Landlord in approving the work, including fees paid to architects, engineers, contractors or other advisors.

**6.3 Cleaning**

The Tenant must:

- (i) keep the Leased Area clean and tidy and free of vermin; and
- (ii) properly store all rubbish in fly and rodent proof containers;
- (iii) regularly remove rubbish accumulating on the Leased Area to an appropriate rubbish disposal site; and
- (iv) comply with the Landlord's reasonable directions in connection with cleaning and the disposal of rubbish in relation to the Leased Area.

**6.4 Specific obligations**

Without limiting the preceding clause, the Tenant must:

- (i) keep the surrounds of the Leased Area for a distance of 10 metres from the boundary clean and tidy and free of vermin as if the surrounds form part of the Leased Area;
- (ii) not cause or allow any pollutant or contaminant material or substance over which the Tenant has control to be released into or affect the Leased Area; and
- (iii) not dispose of rubbish from the Leased Area in any bins provided by the Landlord for public use in forest or nature conservation areas.

**7. USE OF LEASED AREA****7.1 Permitted Use**

The Tenant may only use the Leased Area for the Permitted Use unless the Landlord consents to another use.

**7.2 Tenant's Own Enquiries**

The Tenant has relied on the Tenant's own enquiries about how the Leased Area may be used and not on any representation from the Landlord. The Tenant has made the Tenant's own enquiries about:

- (i) the suitability of the Leased Area for any use to which it is to be put; and

- (ii) all planning and any other requirements prohibitions or restrictions applying to the Leased Area under any law or as a result of the requirements or orders of any Authority.

### **7.3 No Warranty by Landlord**

The Landlord does not give any warranty of any kind that the Leased Area is suitable for any purpose for which the Tenant intends to use it. Any warranty in relation to the Leased Area which is implied by law is excluded to the extent that the law permits the warranty to be excluded.

### **7.4 The Landlord Not Liable**

The Landlord is not liable to the Tenant and the Tenant will not make a claim against the Landlord in respect of any Liability resulting from any accident, death, injury, damage (including water damage), malfunction or other event in or affecting the Leased Area unless caused by the negligence of the Landlord or any employee, contractor or agent of the Landlord.

### **7.5 Risk Management Plan**

The Tenant is to prepare and have in place to the satisfaction of the Landlord a Risk Management Plan to ensure that any risk to the public, invitees of the Tenant and any other visitors or users of the Leased Area, is managed so as to minimise such risk.

## **8.0 FIRES AND ENVIRONMENTAL PROTECTION**

### **8.1 Fire Prevention**

Without limiting any other provision of this Lease, the Tenant must in relation to the Leased Area promptly comply with :

- (i) the *Bush Fires Act 1954* and any other laws relating to the prevention and control of fires; and
- (ii) all proper directions concerning fire prevention and control given to the Tenant by the Landlord or any Authority.

### **8.2 Fire Control**

The Tenant must immediately :

- (i) notify the Landlord as soon as a fire is detected on the Leased Area;
- (ii) take all reasonable and safe action which the Tenant is able to take to try to extinguish any unauthorised or uncontrolled fire on the Leased Area.

### **8.3 Authorised Fires**

The Tenant must not do anything which causes or may cause a fire on the Leased Area unless the fire is :

- (i) not prohibited by law or by a direction of the Landlord or an Authority; and
- (ii) the fire is not dangerous and is properly controlled so that it cannot become dangerous.

### **8.4 Liability for Fires**

The Tenant is responsible for and must pay or reimburse the Landlord for all Liabilities as a result of any fire which starts on the Leased Area unless the Tenant can prove to the reasonable satisfaction of the Landlord that the fire :

- (i) was not caused by the Tenant's negligent or unlawful act or omission or the Tenant's default under this Lease; or
- (ii) was started by a cause beyond the Tenant's reasonable control.

**8.5 Timber**

8.5.1 This lease does not grant to the Tenant any rights to forest produce as defined in the Conservation and Land Management Act and the provisions of Section 96(4) of the Conservation and Land Management Act are hereby expressly excluded.

8.5.2 Subject to the written authority of the Landlord, the Tenant may fell cut and utilise timber on the Leased Area as the Tenant may require for the erection of fencing or other authorised improvements thereon.

**8.6 Trees and Vegetation**

The Tenant must take all reasonable actions necessary to protect the trees and other vegetation growing on the Leased Area and take reasonable actions necessary to prevent, rectify or ameliorate any erosion, drift or movement of sand or soil from the Leased Area. Without limitation, unless required by clause 8.7, the Tenant may not cut down or damage or otherwise interfere with anything growing on the Leased Area without the written consent of the Landlord. The Tenant must also control declared plants and declared animals as defined in the Agriculture and Related Resources Protection Act, in relation to the Leased Area, as required by that Act.

**8.7 Dangers or Threats to the Public**

The Tenant must :

- (i) regularly check the condition of trees and other vegetation on the Leased Area;
- (ii) prune or remove any tree or other vegetation which is in a dangerous condition or which may threaten the safety of any person;
- (iii) take adequate action to warn the public of any danger or threat constituted by any tree or other vegetation; and
- (iv) generally take any measures necessary to prevent accidents and to protect the safety of the public on the Leased Area.

**8.8 Prevention of Disease**

The Tenant must comply with the Landlord's reasonable directions relating to the prevention of the spread of disease, particularly *Phytophthora cinnamomi* (Jarrah dieback) in connection with the Leased Area, including arranging for the washing of vehicles and equipment and other similar measures.

**8.9 No Interference with Land**

The Tenant acknowledges that the Leased Area may be environmentally sensitive and that the Landlord has a general duty to protect the environment. Accordingly, the Tenant must not, without first obtaining the consent of the Landlord, do anything to damage or otherwise interfere with the natural environment on the Leased Area, including :

- (i) removing rocks, earth, soil or other material from the Leased Area; or
- (ii) clearing or removing trees or other vegetation from the Leased Area by any means; or
- (iii) altering the contours of the surface of the Leased Area; or
- (iv) depositing any earth fill or other similar materials on the Leased Area; or
- (v) altering the natural drainage on the Leased Area; or
- (vi) introducing any new flora or fauna to the Leased Area; or



- (vii) harming or endangering any flora or fauna on the Leased Area; or
- (viii) anything else which in connection with the Leased Area may be harmful to the environment.

#### **8.10 *Notify the Landlord of Threats***

The Tenant must immediately notify the Landlord if the Tenant becomes aware of anything which causes or could cause pollution (as defined in the Environmental Protection Act) on or affecting the Leased Area.

#### **8.11 *Environmental Protection Laws***

Unless otherwise stated, this Lease is not to be taken as exempting the Tenant from or limiting the obligation of the Tenant to comply with any law relating to the protection of the environment.

### **9.0 GENERAL OBLIGATIONS AND RESTRICTIONS**

#### **9.1 *Obligations***

The Tenant must:

- (i) conduct the Tenant's business or activities in the Leased Area in a proper manner; and
- (ii) comply with all relevant requirements of any Authority and every law in connection with the Leased Area and the Tenant's Property except where such requirements relate to work of a structural nature, unless rendered necessary by the nature of the Tenant's business or activities in the Leased Area; and
- (iii) withdraw any 'subject to claim' caveat lodged to protect the Tenant's interest under this Lease at the termination, or on an assignment, of this Lease; and
- (iv) promptly give the Landlord a copy of every notice from any Authority received by the Tenant relating to the Leased Area; and
- (v) immediately notify the Landlord if the Tenant becomes aware of anything which is a threat to the Leased Area and comply with the Landlord's directions for the purpose of protecting property or persons in the Leased Area; and
- (vi) promptly inform the Landlord after becoming aware of any damage to the Leased Area or of the faulty operation of any Services.

#### **9.2 *Restrictions***

In connection with the Leased Area, the Tenant must not (and may not permit anyone else to) except with the Landlord's consent:

- (i) modify or interfere with the facilities for the provisions of Services to the Leased Area or any equipment connected to those facilities; or
- (ii) interfere with or obstruct the operation of or access to the Services; or
- (iii) cause damage to the Leased Area or
- (iv) store or use inflammable or explosive substances in the Leased Area except those normally used for any activity included in the Permitted Use but then only if they are stored in proper containers and used only in accordance with all relevant laws and the requirements of any Authority; or
- (v) use any facilities in or near the Leased Area, including the toilets and drains, for any improper purpose; or
- (vi) put any signs or advertisements outside the Leased Area or within the Leased Area, except as required by this Lease; or

- (vii) permit any other person to carry on business on or from the Leased Area; or
- (viii) use the Leased Area as a residence or for any activity which is dangerous, offensive, illegal or immoral or which is or may become a nuisance or annoyance to anyone; or
- (ix) create any noise or other disturbance which interferes with the use by any other person of land which adjoins or is near to the leased Area; or
- (x) abandon the Leased Area; or
- (xi) create a security interest over this Lease in favour of any person or give another person any right to occupy or use the Leased Area; or
- (xii) lodge an absolute caveat to protect the Tenant's interest under this Lease.

### 9.3 **Local Government Act Requirements**

Even though the Local Government Act and subsidiary legislation, including any building regulations, may not apply in respect of the Leased Area, the Tenant must comply with that Act and subsidiary legislation as if it did apply, except to the extent that the Landlord waives any requirement. The Tenant must pay to the Landlord on request the fees or other costs charged to the Landlord by any consultant or other competent person who provides advice to the Landlord in relation to the Tenant's compliance with the Local Government Act and any subsidiary legislation.

### 9.4 **Wellington Catchment Area / Collie River Surface Water Area**

The Tenant shall comply with the provisions of the Country Areas Water Supply Act with particular reference to restrictions on the clearing of vegetation, and the Rights in Water and Irrigation Act in relation to the taking or diversion of surface water. Management of stormwater from within the Leased Area, and oils, fuels, solvents and other similar products shall be in accordance with the relevant legislation.

## 10.0 **INDEMNITY AND INSURANCE**

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### 10.1 **Indemnity**

The Tenant is responsible for and indemnifies the Landlord against any Liability resulting from:

- (i) any loss or damage to property or any injury to or death of any person occurring in the Leased Area or caused by the Tenant wherever occurring ; or
- (ii) any reasonable action taken by the Landlord to remedy a default by the Tenant.

This indemnity does not apply to the extent that the Liability is contributed to by the Landlord.

### 10.2 **Insurance**

The Tenant must maintain with a reputable insurer:

- (i) public liability insurance of at least the amount specified in item 8 of the Schedule for each accident or event in the Leased Area; and
- (ii) insurance for the Tenant's Property and any insurance required by law as a result of the Tenant's use of the Leased Area.

### 10.3 **Variation of Insurance amount**

The Landlord may by notice to the Tenant at any time require the Tenant to increase the minimum cover for the Tenant's public liability insurance if in the circumstances it is reasonable for the cover to be increased.

### 10.4 **Insurance obligations**

The Tenant must also:

- (i) pay each premium due under the insurance policies taken out by the Tenant before the due date and, when reasonably requested by the Landlord, provide evidence of payment; and
- (ii) when reasonably requested by the Landlord, provide evidence of currency for each insurance policy certified by the insurer; and
- (iii) immediately notify the Landlord if an event occurs which may give rise to a claim under any insurance or which could adversely affect it or if an insurance policy is cancelled; and
- (iv) if required by the Landlord, ensure that the Landlord's interests are noted on the policy of public liability insurance.
- (v) if required by WPCL, ensure that WPCL's interests are noted on the policy of public liability insurance.

#### **10.5 Landlord's insurance**

Unless the Landlord consents, the Tenant must not:

- (i) do or allow anything to be done which could adversely affect any insurance taken out by the Landlord in connection with the Leased Area or which could increase the cost of obtaining that insurance; or
- (ii) settle, compromise or waive any claim under any policy of insurance relating to the Leased Area .

### **11.0 MANAGEMENT OF THE LEASED AREA**

#### **11.1 Managing Agent**

The Landlord may appoint a managing agent to manage the Leased Area and represent the Landlord in relation to this Lease. If the Landlord appoints a managing agent, the managing agent may exercise the rights and powers of the Landlord under this lease. The Landlord may at any time vary or terminate the authority of the managing agent. Decisions of the Landlord override those of the managing agent if there is any inconsistency between them.

#### **11.2 Exercise of Rights under the Conservation and Land Management Act**

The Landlord reserves the right to enter the Leased Area at any time in order to exercise any right, power or authority which the Landlord has under the *Conservation and Land Management Act 1984*. The Tenant is not entitled to any compensation or to make any other claim against the Landlord for anything done by the Landlord on the Leased Area in the exercise of any right or authority under that Act.

#### **11.3 Right to Enter**

- 11.3.1 The Landlord may after giving reasonable notice to the Tenant (or in an emergency, without notice) enter the Leased Area to do any one or more of the following things:
- (i) inspect the state of repair and condition of the Leased Area;
  - (ii) maintain or repair the Leased Area and equipment or facilities in the Leased Area;
  - (iii) maintain, repair, alter or remove the Services;

- (iv) carry out structural work to the Leased Area or any other work required by an Authority;
- (v) remove anything which is harmful or dangerous;
- (vi) anything which should have been done by the Tenant but which has not been done properly;
- (vii) anything else which the Landlord is required to do by law or is permitted to do under this Lease;

without affecting the Tenant's obligations under this Lease.

11.3.2 The tenant shall upon reasonable notice or without notice in the case of an emergency permit the Minister in the Government of the State of Western Australia for the time being responsible for the administration of the Collie Coal (Western Collieries) Agreement Act 1978 or any officer or other person authorised in that behalf by him to enter upon the Leased Area for the purpose of making any survey, inspection or examination for the purpose of the State Agreement the subject of that Act.

#### **11.4 Minimise disruption**

If the Landlord does anything permitted by the preceding clause the Landlord must:

- (i) give the Tenant reasonable notice of the intended action before it is taken (except in an emergency); and
- (ii) use its best endeavours to minimise disruption to the Tenant's business; and
- (iii) make good any damage to the Tenant's Property (other than minor damage) caused by the Landlord.

#### **11.5 Dealing with the Leased Area**

The Landlord reserves the right to deal with the Leased Area by granting easements, licences or other rights or interests of any kind to any person over it at any time so long as this does not unreasonably interfere with the Tenant's use of the Leased Area for the Permitted Use. The rights which the Landlord may grant include the right to cut down and remove timber or other vegetation from the Leased Area, the right to draw water or the right to excavate and remove rocks, earth, soil or other materials from the Leased Area. The Tenant is not entitled to any compensation or to make any other claim against the Landlord in relation to the proper exercise of any right given to another person by the Landlord. The Tenant is responsible for and indemnifies the Landlord against any Liability resulting from any claim made by a person to whom a right or interest has been granted by the Landlord in connection with any negligent act or omission of the Tenant or any default by the Tenant under this Lease.

### **12.0 ASSIGNMENT AND SUBLETTING**

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#### **12.1 Consent Required**

Unless the Landlord consents under the next clause, the Tenant may not assign this Lease or sublet the Leased Area.

#### **12.2 Requirements for Consent**

The Tenant may assign this Lease or sublet the Leased Area if the Landlord consents and if the Tenant:

- (i) complies with the next clause; and
- (ii) supplies to the Landlord evidence acceptable to the Landlord that the proposed assignee or subtenant is able and qualified to use the Leased Area for the Permitted Use, is financially sound and has a good reputation; and

- (iii) remedies any default under this Lease unless it has been waived by the Landlord; and
- (iv) if requested by the Landlord, arranges for the proposed assignee or subtenant to obtain from one or more persons, as reasonably nominated by the Landlord, a guarantee of the obligations under this Lease to be assumed by the proposed assignee or subtenant in a form prepared or approved by the Landlord's solicitors.

#### **12.3 Obligations on assignment or sublease**

If the Tenant assigns this Lease or sublets the Leased Area, the Tenant must :

- (1) deliver to the Landlord, before the date that the proposed assignment or sublease is to take effect, a completed agreement in the form of a deed prepared or approved by the Landlord's solicitors, by which the proposed assignee or subtenant agrees with the Landlord to be bound by this Lease as from the date the assignment or sublease takes effect; and
- (2) pay to the Landlord on request the Landlord's expenses, including legal costs:
  - (a) incurred in making reasonable enquiries about the proposed assignee or subtenant; and
  - (b) in connection with the preparation, completion and stamping of the assignment or sublease documents and any other related documents, (including the stamp duty on those documents).

#### **12.4 Tenant Remains Liable**

The Tenant remains fully liable under this Lease even if the Tenant assigns this Lease or sublets the Leased Area or gives any right in relation to this Lease or the Leased Area to any other person.

#### **12.5 Change in Control**

If the Tenant is a company, and there is a change in control of the Tenant the Landlord may require the Tenant to obtain from the persons who have acquired control, as reasonably nominated by the Landlord, a guarantee of the Tenant's obligations under this Lease in a form prepared or approved by the Landlord's solicitors. If the Tenant is a subsidiary company a change in control includes a change in control of its holding company.

In this clause:

- (1) **company** does not include a company which is listed on the Australian Stock Exchange or is wholly owned by such a company; and
- (2) **control** means control of the composition of the board of directors or control of more than 20% of the shares with the right to vote at general meetings; and
- (3) words defined in the Corporations Law have the meanings given to them by that Law.

#### **12.6 Exclusion of Statutory Provisions**

The provisions of sections 80 and 82 of the Property Law Act do not apply to this Lease.

#### **12.7 Fees**

The Tenant must reimburse the Landlord on request for all fees paid by the Landlord to any agent or consultant engaged by the Landlord in connection with a proposed assignment or sub-letting by the Tenant.

#### **12.8 Tenant May Licence**

The Tenant may grant licences from time to time to authorise other parties to use the Leased Area provided:

- (i) the use is consistent with the Lease Purpose;
- (ii) the licence requirements are generally consistent with this Lease;
- (iii) nothing in the licence shall diminish the Tenant's responsibilities and obligations under this Lease, and the Tenant shall remain fully liable under this lease even if a licence is granted to another party.

**13.0 HOLDING OVER**

If the Landlord consents to the Tenant continuing to occupy the Leased Area after the Expiry Date or after the end of any extended term, the Tenant is a monthly tenant of the Leased Area and:

- (i) the monthly tenancy may be terminated by either party giving to the other at least one month's notice which may expire on any day; and
- (ii) the rent is the same rent payable immediately before the Expiry Date or after the end of any extended term; and
- (iii) all the other provisions of this Lease apply to the monthly tenancy except any option to extend this Lease.

**14.0 DEFAULT****14.1 Re-entry**

The Landlord may terminate this Lease by notice to the Tenant or by re-entering the Leased Area if:

- (i) the Tenant repudiates this Lease; or
- (ii) the Tenant abandons the Leased Area; or
- (iii) the Tenant ceases to use the Leased Area for the Permitted Use other than for a temporary period; or
- (iv) the rent or any other money payable by the Tenant is unpaid for longer than [3 months] after it is due to be paid; or
- (v) the Tenant is in default under this Lease and, if the default can be remedied, the Tenant has not remedied the default within [3 months] after receiving a notice from the Landlord specifying the default and requiring it to be remedied; or
- (vi) an Insolvency Event occurs; or

Except for the notice given under subclause (v) and except for any notice otherwise required by law the Landlord does not need to give notice to the Tenant before re-entering the Leased Area.

**14.2 Essential Terms and Damages**

Every obligation of the Tenant under this Lease:

- (i) to pay money; or
- (ii) not to do something without the Landlord's consent; or
- (iii) relating to damage to the Leased Area or to the state of repair or condition of the Leased Area,

is an essential term of this Lease. (This clause does not prevent other obligations being essential terms).

If the Tenant defaults by not performing or complying with any obligation which is an essential term, The Landlord is entitled to recover damages for losses over the whole Term, including losses caused by the non-payment of money by the Tenant over that period, even if this Lease is terminated by the Landlord as a result of the Tenant's default before the Expiry Date. This clause is not to be taken as relieving the Landlord of any duty to mitigate losses which is imposed by law.

**14.3 Right to Damages not Affected**

The Landlord's right to recover damages is not affected if:

- (i) the Landlord accepts the Tenant's repudiation of this Lease; or
- (ii) the Landlord terminates this Lease by notice or re-entry; or
- (iii) the Tenant has abandoned the Leased Area; or
- (iv) there is a surrender of this Lease by law.

#### 14.4 **Interest on Overdue Money**

The Tenant must pay interest on any money which is not paid by the due date. Interest is to be the higher of:

- (1) 15%; or
- (2) the current reference rate or other base rate charged by the Commonwealth Bank on overdraft loans of less than \$100,000 plus 2%,

and is to be calculated on a daily basis from the due date until the money is paid. The interest is to be paid when requested by the Landlord.

#### 14.5 **Acceptance of Rent or Mitigation**

The acceptance of rent or other money owing under this Lease or an attempt by the Landlord to mitigate losses is not to be taken as a waiver of a default by the Tenant under this Lease or a surrender by law.

### 15.0 **TENANT'S OBLIGATIONS ON TERMINATION**

#### 15.1 **Tenant to Move Out**

The Tenant must move out of the Leased Area and remove all the Tenant's Property as detailed in Annexure A – Category 2 from the Leased Area by the end of the Term except that if this Lease is terminated before that date, the Tenant must move out and remove the Tenant's Property as soon as reasonably possible after this Lease is terminated.

#### 15.2 **Abandonment of Tenant's Property**

If the Tenant does not remove all the Tenant's Property when the Tenant has to move out of the Leased Area the Tenant is deemed to have abandoned the Tenant's Property remaining in the Leased Area and the Tenant's Property will become the property of the Landlord.

#### 15.3 **Risk**

The Tenant's Property is at the Tenant's risk at all times before and after the termination of this Lease.

#### 15.4 **Damage Caused by Moving Out**

The Tenant must repair any damage to the Leased Area caused by moving out of the Leased Area or removing the Tenant's Property.

#### 15.5 **Reinstatement**

- (1) If the Tenant has made any improvements or alterations to the Leased Area or carried out any work on the Leased Area or done anything else to change the Leased Area if the Landlord requires, the Tenant must reinstate the Leased Area before the end of the Term so that the Leased Area is returned to the condition it was in before the improvements or alterations were made, or the work carried out or the other changes were made. The Tenant's obligations under this clause include removing any building or other structure erected in the Leased Area by the Tenant unless the Landlord agrees otherwise or unless this Lease provides otherwise.
- (2) The Landlord will undertake the remaining rehabilitation of the Lease Area at the end of the Term if WPCL does not require the area for mining purposes.

**15.6 Landlord's Property**

At the end of the term the buildings referred to in Annexure A – Category 1 shall remain on the Leased Area including all fixtures and fittings contained therein.

**16.0 COSTS AND EXPENSES****16.1 Costs and Expenses**

The Tenant must pay or reimburse the Landlord on request for all the Landlord's costs and expenses (including legal costs and expenses) in relation to:

- (i) arranging for any survey or demarcation drawing necessary to identify the Leased Area; and
- (ii) negotiating, preparing, signing and stamping of this Lease and any document assigning, varying or surrendering this Lease; and
- (iii) enforcing any right under this Lease including giving a notice of default under section 81 of the Property Law Act; and
- (iv) any default by the Tenant which causes loss to the Landlord; and
- (v) giving any consent or approval under this Lease.

**16.2 Duties and Fees**

The Tenant must pay or reimburse the Landlord on request for all stamp duty and fees (including fines and penalties attributable to the Tenant) payable in connection with this Lease.

**17.0 MISCELLANEOUS****17.1 Remedies Cumulative**

The rights, powers and remedies in this Lease are in addition to the rights, powers and remedies provided by law independently of this Lease.

**17.2 Accrued Rights**

The termination of this Lease for any reason does not affect the rights of the Landlord in relation to a default by the Tenant before termination.

**17.3 Severance**

If any part of this Lease or the application of that part to any person or circumstance is or becomes unenforceable, the other provisions of this Lease are not affected but continue to be enforceable.

**17.4 Payments**

The Tenant must make all payments under this Lease without set-off, counterclaim or deduction. Payments by the Tenant under this Lease are to be made to the Landlord or any other person nominated by the Landlord. The Landlord need not make a demand for payment of any amount required to be paid by the Tenant under this Lease unless required by law. If this Lease does not specify when a payment is due, it is due within 14 days after the Landlord requests payment.

**17.5 Transfer of Land Act**

The covenants and powers implied in every lease made under the Transfer of Land Act 1893 are implied in this Lease, whether registered under that Act or not, except:

- (1) to the extent that they are modified by this Lease; and
- (2) the implied covenant set out in section 92(ii), which is excluded.

**17.6 Cost of Complying with Obligations**

Unless otherwise stated in this Lease, the Tenant must pay the cost of performing or complying with every obligation of the Tenant under this Lease.



**21.0 MINING INTEREST****21.1 Consent**

The parties acknowledge that WPCL is the holder of the Mining Interest and that Mining Lease M262SA which is part of that Mining Interest also exists over the land comprising the Leased Area. WPCL at the request of the Landlord and the Tenant hereby consents to the grant of this Lease to the Tenant.

**21.2 Mining Operations**

Subject to the provisions of this clause 21.0, WPCL agrees that it will not conduct any mining operations on the Leased Area during the currency of this Lease or any period of holding over consented to by WPCL.

**21.3 Termination on Notice**

WPCL may at any time notify the Landlord that it requires the Landlord to give notice of termination under clause 1.3 of this Lease. The Landlord agrees that it will give notice of termination under clause 1.3 of this Lease promptly upon being requested to do so by WPCL.

The Landlord also agrees not to grant its consent under clause 13.0 of this Lease to the Tenant continuing to occupy the Leased Area after the Expiry Date or after the end of any extended term, without the prior written consent of WPCL, and to give notice of termination of any holding over immediately upon being requested to do so by WPCL.

**21.4 Right of Access**

The Tenant agrees to allow WPCL and its employees, agents and contractors reasonable access (with or without equipment) to the Leased Area for the purpose of carrying out rehabilitation of any part of the Leased Area or complying with any of WPCL's other obligations under the Mining Interest. In exercising its rights under this clause, WPCL will give the Tenant reasonable notice of its intention to enter the Leased Area (other than in the case of an emergency) and will use its reasonable endeavours to minimise any inconvenience to the Tenant.

**21.5 Prohibition**

The Tenant agrees that it will not, without the prior written consent of WPCL, assign this Lease or sublet or grant a licence to occupy the whole or any part of the Leased Area or grant any other right or interest in the Leased Area to any person. The Tenant also agrees that it will not, without the prior written consent of WPCL, amend or replace its Constitution.

**21.6 No Warranty**

WPCL does not give any warranty of any kind that the Leased Area is suitable for any purpose for which the Tenant intends to use it. Any warranty in relation to the Leased Area which is implied by law is excluded to the extent that the law permits the warranty to be excluded.

**21.7 WPCL Not Liable**

WPCL is not liable to the Tenant and the Tenant will not make a claim against WPCL in respect of any Liability resulting from any accident, death, injury, damage or other event on or affecting the Leased Area unless caused by the negligence of WPCL or any employee, contractor or agent of WPCL.

**21.8 Indemnity**

The Tenant is responsible for and indemnifies WPCL against any Liability resulting from any loss or damage to property or any injury to or death of any person occurring on the Leased Area or caused by the Tenant wherever occurring. This indemnity does not apply to the extent that the Liability is contributed to by WPCL.

**21.9 No Compensation**

Notwithstanding any other provision of this Lease, the Tenant is not entitled to any payment or compensation from WPCL upon the expiration, termination or non-renewal of this Lease.

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**22.0 INTERPRETATION**

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**22.1 Definitions**

In this Lease:

**Act** means the Conservation and Land Management Act 1984.

**Authority** means any governmental or public authority of any kind.

**Business Day** means a day on which banks are open for business in Perth other than a Saturday or a Sunday.

**Commencement Date** means the date in item 4.1 of the Schedule.

**Energy Supplier** means any Authority, company or other body which supplies, at the Landlord's request, gas, electricity or other sources of energy to the Leased Area.

**Expiry Date** means the date in item 4.2 of the Schedule.

**Insolvency Event** means the happening of any of the following events in relation to the Tenant :

- (1) the Tenant is unable to pay all the Tenant's debts as and when they become due and payable or the Tenant has failed to comply with a statutory demand as provided in section 459F of the Corporations Law, or the Tenant is deemed to be unable to pay the Tenant's debts under section 585 of the Corporations Law;
- (2) a meeting is convened to place the Tenant in voluntary liquidation or to appoint an administrator.
- (3) an application is made to a court for the Tenant to be wound up;
- (4) the appointment of a controller (as defined in section 9 of the Corporations Law) of any of the Tenant's assets;
- (5) the Tenant proposes to enter into or enters into any form of arrangement (formal or informal) with the Tenant's creditors or any of them, including a deed of company arrangement; or
- (6) the Tenant becomes an insolvent under administration, as defined in section 9 of the Corporations Law.

**Leased Area** means the area of land described in item 3 of the Schedule and includes all buildings and other improvements on that area of land unless this Lease provides that ownership of any buildings or improvements constructed by the Tenant on the Leased Area remains in or vests in the Tenant.

**Liability** includes any obligation to pay money or other loss, cost or expense of any kind.

**Permitted Use** means the use described in item 7 of the Schedule.

**Mining Interest** means the right, title, interest and estate of WPCL under Mining Lease M262SA and the State Agreement ratified by the Collie Coal (Western Collieries) Agreement Act 1979.

**Rates and Taxes** means any rate, tax, levy or any other charge imposed at any time during the Term of the Lease by any State, local or Federal governmental body, authority, department or instrumentality or any other authority of any kind, in relation to the supply or use of the Leased Area or any thing under or in connection with the Lease.

**Services** means all services to the Leased Area or parts of the Leased Area including air conditioning, electric power, gas, water, sewerage, telecommunications and fire sprinkler services.

**Tenant** means the person or persons named in item 2 of the Schedule and includes the Tenant's successors and an assignee, a subtenant or any other person having a right to possess, use or occupy the Leased Area

**Tenant's Property** means the property detailed in Annexure A or other property which the Tenant constructs on or brings in to the Leased Area.

**Term** means the period referred to in item 4 of the Schedule.

**The Landlord** means the statutory body described in item 1 of the Schedule and includes the Landlord's successors and an assignee of the reversion and, where the context permits, any person authorised by the Landlord to do any act on behalf of the Landlord for the purposes of this Lease, including a managing agent.

**Water Supplier** means any Authority, company or other body which supplies, at the Landlord's request, water or sewerage services to the Leased Area.

**WPCL** means Wesfarmers Premier Coal Limited, ABN 21 008 672 599 who is the holder of the Mining Interest and includes WPCL's successors and an assignee of the Mining Interest.

## 22.2 Interpretation

In this Lease, unless the contrary intention appears:

- (1) a reference to the Tenant includes the Tenant's employees, agents, contractors, subtenants, licensees, customers and any other person who is in the Leased Area with the Tenant's permission (direct or implied);
- (2) a reference to a statute, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them occurring at any time before or after the Commencement Date;
- (3) the singular includes the plural and vice versa;
- (4) the word "person" includes a firm, a body corporate, an unincorporated association or an Authority;
- (5) an obligation, representation or warranty:
- (6) in favour of 2 or more persons is for the benefit of them jointly and severally; and
- (7) on the part of 2 or more persons binds them jointly and severally;
- (8) each obligation of a party to this Lease has effect as a covenant given in favour of the party who may enforce the obligation;
- (9) if a period of time is expressed to be calculated from or after a specified day, that day is not included in the period;
- (10) a reference to a day is a reference to the 24 hour period commencing at midnight;
- (11) a reference to a month is to a calendar month and a reference to a year is a calendar year;
- (12) if the word 'including' or 'includes' is used, the words: "without limitation" are deemed to immediately follow;
- (13) a reference to the termination of this Lease includes the expiry of the Term; and
- (14) a reference to the Term in relation to any obligation of the Tenant is to be taken as including a reference to any period during which the Tenant occupies or uses the Leased Area with the Landlord's consent.

## 22.3 Schedule

All the provisions in the Schedule at the front of this Lease are incorporated in and form part of this Lease.

22.4 ***This Lease***

A reference to this Lease includes:

- (1) everything forming part of this document; and
- (2) any agreed changes to this document which are recorded in a separate document.

**LEASE No. 2071/97 - ANNEXURE A**

**INVENTORIES OF LEASE AREA**

Annexure A identifies items in the following two categories:

**Category 1**

Items to become the property of the State (through the lessor – the Department of Conservation and Land Management) at the termination of the lease.

**Category 2**

Items that have been procured by Motoring South West (Inc) and remain the property of Motoring South West.

**CATEGORY 1**

The Buildings to become the property of the State are shown on Map 1. Roads to become the property of the State are shown on Map 1C.

**CATEGORY 2**

Items that have been procured by Motoring South West (Inc) and remain the property of Motoring South West.

**Location - Delta Road Drag Strip.**

1. Removable concrete barriers.
2. Removable fencing.
3. Sea container (blue) - 40 foot.
4. Sea container (Blue/yellow) - 20 foot.
5. Demountable control tower.
6. Timing equipment cabling.
7. Demountable scrutineering hut.
8. Demountable toilet block.

**Location - Sprint Circuit.**

1. Steel control tower.
2. Plastic water tank - 5,000 litre.
3. Onga water pump.
4. Fencing.
5. Steel gates x 3
6. Haulpack tyres.
7. Demountable toilet block.
8. Public address system.
9. Various signage.
10. Gas bottles x 4.

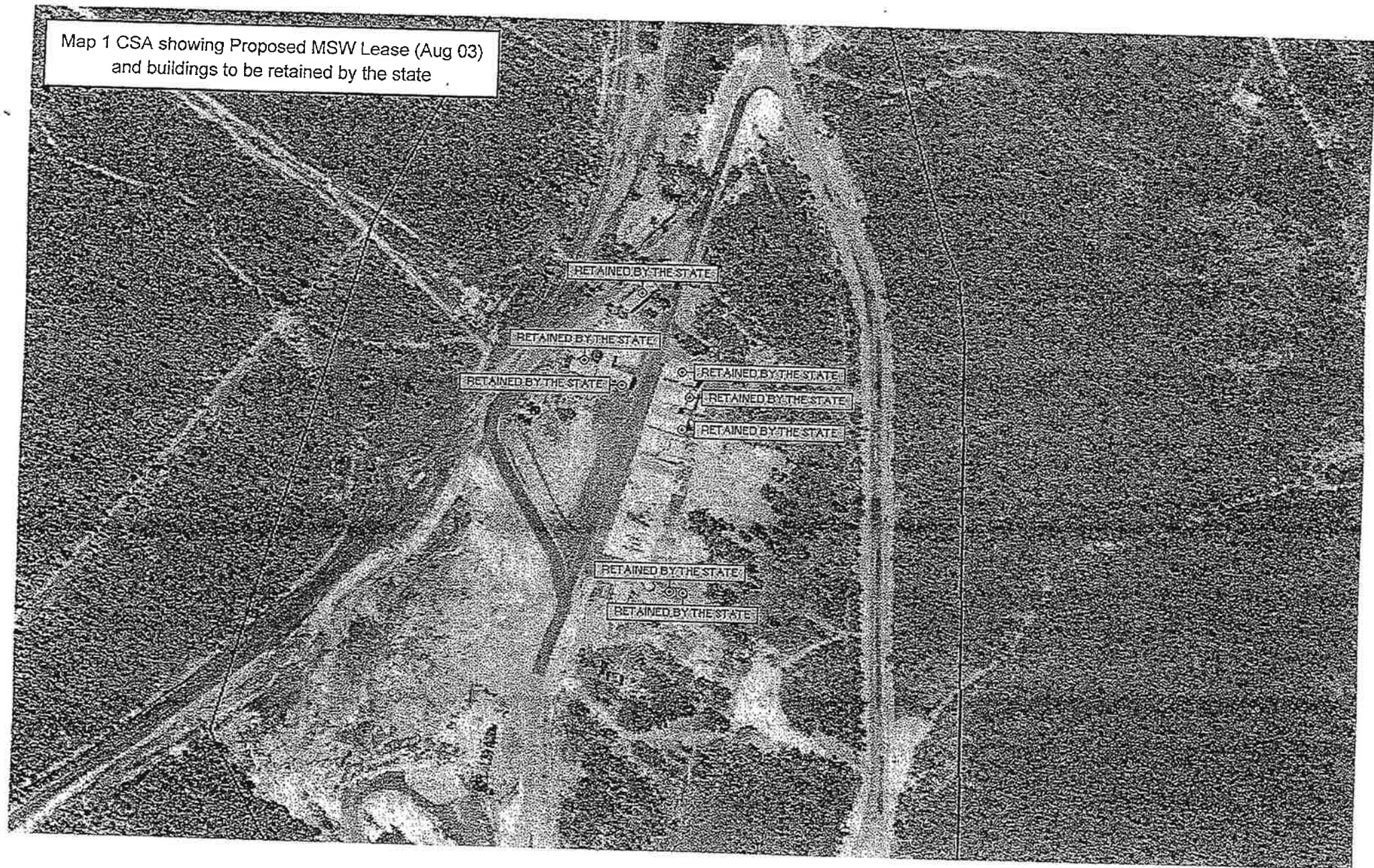
11. Gas bottle storage cage and fittings.
12. Gas hot water system.
13. 55 kva Generator.
14. 15 kva Generator/welder.
15. Road sweeper.
16. Various sections of steelwork.
17. Portable chemical toilets x 40.
18. BBQ plates and surrounds x 12.
19. Bore, bore pump and reticulation.
20. Floodlighting.
21. Security mesh doors x 10.
22. Large wood heater - Club house.
23. Kitchen benches and sink - Clubhouse.
24. Kitchen benches and sink - Campers kitchen.
25. Copper pipe and plumbing fittings.
26. Gas stove x 2
27. Electric hot water system.
28. Whiteboard fixed x 2.
29. Fluorescent light fittings.
30. Sweep fans.
31. Security mesh on windows.
32. Security system - electronic.
33. Telephone system - 2 lines, two phones and various cabling.

**Location - Burn out pad/skid pan.**

1. Fencing.
2. Haulpack tyres.
3. Control tower.
4. Removable concrete barriers.
5. Signage.
6. Steel gates x 2.

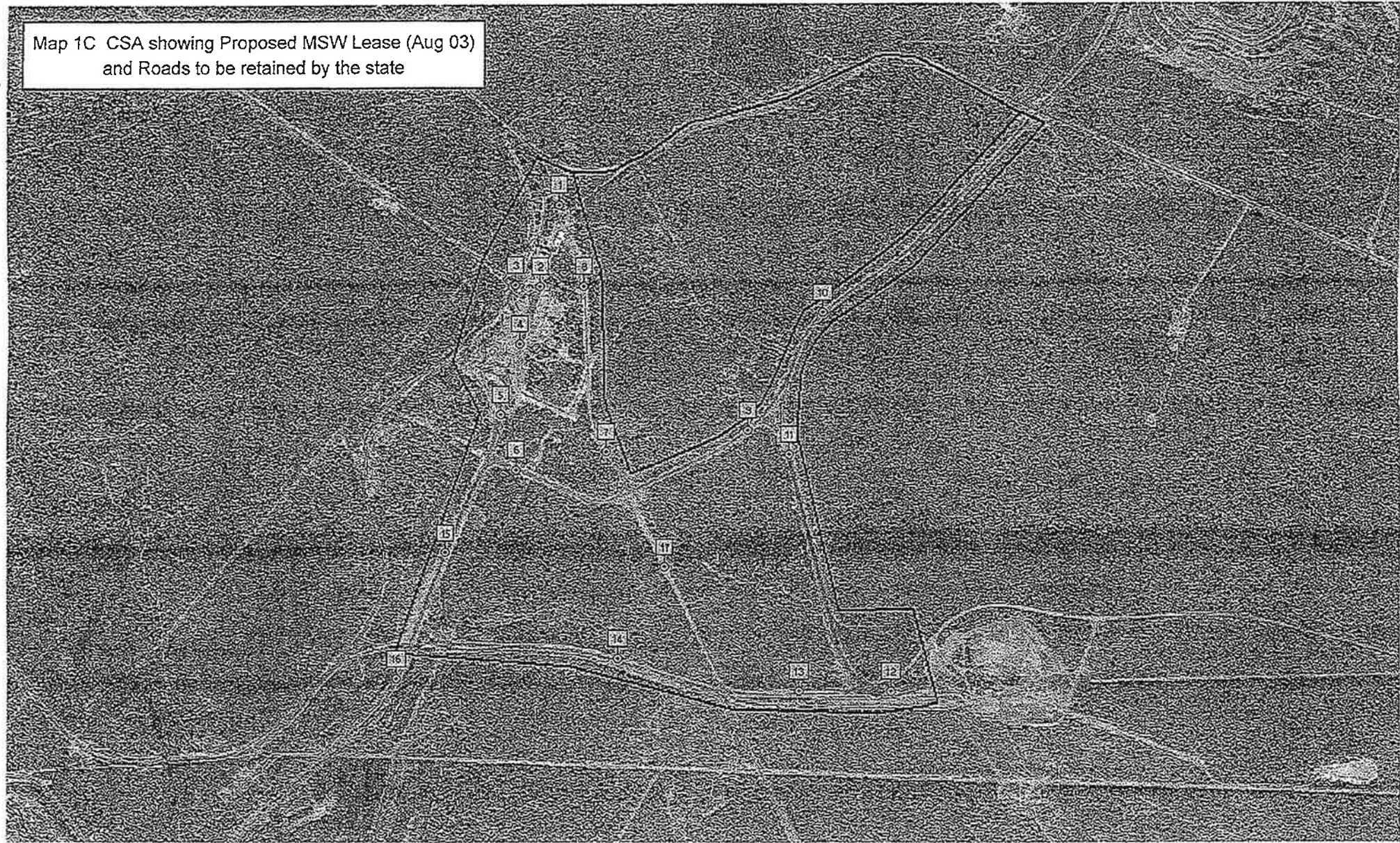


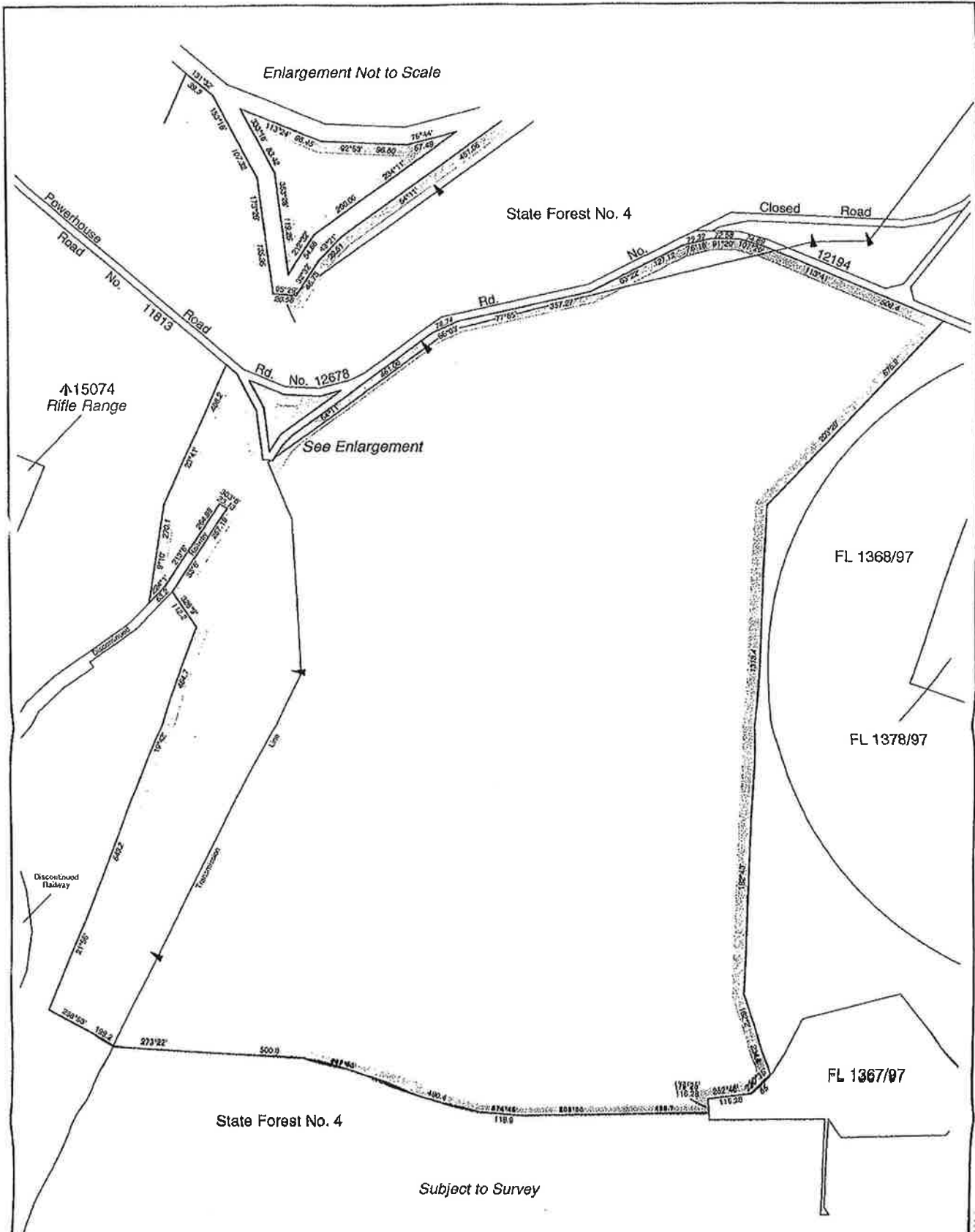
Map 1 CSA showing Proposed MSW Lease (Aug 03)  
and buildings to be retained by the state







Map 1C CSA showing Proposed MSW Lease (Aug 03)  
and Roads to be retained by the state





<b>FOREST LEASE No. 2071/97</b>				 SCALE 1 : 10 000
LESSEE	SOUTH WEST DRIVER TRAINING AND CLUB MOTOR SPORTS COMPLEX			
LAND DISTRICT	WELLINGTON	AREA	Abt 349 ha	
CALM DISTRICT	WELLINGTON	DRAWN	JLF 24.9.03	
PLAN	COLLIE (ET.75)	CHECKED	GLH 24.9.03	
		FILE No.	1999F000373	
				 DEPARTMENT OF <b>Conservation</b> AND LAND MANAGEMENT <small>Caring the future of WA</small>

LOCATION: 33° 25' 52.84" S  
 116° 14' 36.87" E

## **APPENDIX 3**

---

### **DPaW In-principal Support Correspondence**



**Government of Western Australia**  
**Department of Parks and Wildlife**

Your ref:  
Our ref: CEO1774/14  
Enquiries: Steve Watson  
Phone: 9423 2528  
Fax: 9423 2253  
Email: [steve.watson@dpaw.wa.gov.au](mailto:steve.watson@dpaw.wa.gov.au)

Mr Jim Weighell  
Acting Chairman  
Motoring South West Inc.  
PO Box 866  
COLLIE WA 6225

Dear Mr Weighell

Thank you for your letters dated 1 and 4 August 2014 regarding Motoring South West Inc's (MSW) proposal to develop a drag racing strip and associated infrastructure within its leased area in State Forest No. 4 near Collie.

The proposal has been considered and is consistent with the purpose of your lease. The Department of Parks and Wildlife grants in-principle support for MSW to proceed, subject to the preparation and presentation of a master development plan that provides in-part, a detailed concept plan of the track design and associated infrastructure for consideration and comment. The plan will need to address such aspects as visual impact, built form, road access, noise and proposed parking areas.

To inform the master planning process and to help guide you in respect to the types of approvals MSW will need to gain from other agencies or stakeholders, it is suggested you contact:

- Department of Environment Regulation regarding approvals for clearing of native vegetation under Part V of the *Environmental Protection Act 1986* and other approvals (e.g. noise) that may be required;
- Department of Water, regarding requirements under *Country Areas Water Supply Act 1947*, as the leased area is situated within the Wellington catchment;
- Department of Aboriginal Affairs in regard to heritage issues; and
- Department of State Development regarding any potential conflicts with Lanco Griffin Coal's developments, in particular its miscellaneous licence application (L12/2) for a rail corridor in the vicinity of the leased area.

It is acknowledged that Yancoal Premier Coal has provided in-principal support for MSW's proposal.

I understand that a flora and fauna survey has been carried out for the proposed area. Please arrange for a copy of the survey to be forwarded with the master development plan.

Should you require further information, please contact the department's Leasing Officer, Mr Steve Watson on 9423 2528 or [steve.watson@dpaw.wa.gov.au](mailto:steve.watson@dpaw.wa.gov.au).

Yours sincerely



Jim Sharp  
DIRECTOR GENERAL

18 December 2014



Shire of Collie  
28 OCT 2014  
RECEIVED

**PREMIER COAL LIMITED**

SITE: Premier Road, Collie WA 6225

POSTAL: PO Box 21, Collie WA 6225

PHONE: +61 8 9760 2222

FAX: +61 8 9760 2222

EMAIL: info@premiercoal.com.au

WEBSITE: www.premiercoal.com.au

ABN 21 008 672 599

SHIRE OF COLLIE  
28 OCT 2014  
I-14-5534  
Retention/Disposal: CEO  
Dept/Officer: EDV/067  
File Number:

24 October 2014

Mr David Blurton  
Chief Executive Officer  
Shire of Collie  
87 Throssell Street  
COLLIE WA 6225

Dear David,

**COLLIE MOTORPLEX DRAG STRIP**

I refer to your correspondence dated 3 September 2014 regarding the Collie Motorplex Drag Strip.

Premier Coal Limited has reviewed the plans associated with your request for support for the project and raises no objections to the project progressing through the approval procedures to construction.

Yours Truly,



Colin Moffatt  
General Manager

## **APPENDIX 4**

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### **Level 2 Flora and Vegetation Survey – Collie Motorplex, Collie**

# Level 2 Flora and Vegetation Survey – Collie Motorplex, Collie



Prepared for  
RPS Australia Asia Pacific

December 2013

Ecoedge Environmental Pty Ltd  
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a: PO Box 1180 Bunbury, 6231  
Western Australia  
e: [enquiries@ecoedge.com.au](mailto:enquiries@ecoedge.com.au)  
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<b>Version</b>	<b>Purpose</b>	<b>Origin</b>	<b>Review</b>	<b>Review date</b>	<b>Ecoedge release approval</b>	<b>Issue date</b>
v1		TB	R Smith	12 Nov 13		
v2		TB, RS	R Smith	13 Nov 13		
v3		TB, RS	R Smith, M Strang	03 Dec 13		
v4		TB, RS	M Strang	06 Dec 13		
Final Draft	Released for client review		Client	5 Feb 2014	M Strang	06 Dec 13
Final	Released to client				M Strang	5 Feb 2014

## Executive Summary

Ecoedge was engaged by RPS to carry out a Level 2 flora and vegetation assessment over 62 ha in two separate areas, Area “A” of 20 ha and “B” of 42.7 ha adjacent to the Collie Motorplex racetrack. The study area was twice traversed on foot by two botanists; on 24<sup>th</sup> September and 30<sup>th</sup> October 2013. The vegetation survey was undertaken in accordance with EPA Guidance Statement 51 “Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia” (EPA, 2004).

One hundred and eighty one species of vascular flora were identified from within the study area, of which 10 are naturalised or planted non-native species. One of the naturalized species, *Echium plantagineum* (Patterson’s Curse) is a Declared Plant under the *Agriculture and Related Resources Protection Act, 1976*. It is classified as P1 (“Introduction of the plant into, or movement of the plant within, an area is prohibited”) and P3 (“Plant to be controlled by reduction in number or distribution of the plant or both”).

No Declared Rare Flora, Priority Flora, listed threatened species pursuant to the *EPBC Act 1999* or other flora of conservation significance were found in the study area.

Vegetation in the study area is representative of both the Collie (CI) and Muja (MJ) vegetation complexes, which are mapped as being present onsite. These were both classified as poorly conserved by Matiske and Havel (2002), with 14.5% and 14.0%, respectively, of the current extent in conservation reserves. This falls just below the 15% target set by the EPA (2006).

Four native vegetation units were recognised in the study area plus one vegetation unit predominantly composed of planted exotic species. None of the vegetation units in the study area corresponds to a threatened or priority ecological community.

A quarter of the study area has been cleared, the remainder (46.8 ha) contains native vegetation of varying condition. The majority of the native vegetation in the study area (89%) was classified as “Very Good” condition – it is floristically diverse although the structure has been somewhat altered by past logging activities. The main cause of degradation has been partial clearing, dieback disease and planting of non-native species. Heavy grazing by kangaroos is also probably a factor.

A breakdown of vegetation condition for the two parts of the study area; Area A and Area B, is provided. The large majority of Area B (85.7%) is in “Very Good” condition, the remainder of being comprised of roads and road verges. Condition is much more varied in Area A almost half (48%) of which is cleared, however 40% was rated as “Good” or “Very Good” condition.

A detailed assessment of use of the study area by black cockatoos was beyond the scope of this study and only some general comments about sightings, habitat use and habitat suitability are made in this report.

Vegetation within the study area is dominated by healthy stands of Marri and Jarrah – both of these are important food sources for the Forest Red-tailed Black-Cockatoo (FRBC). This species was observed and heard in and near both Area A and Area B during the visits to the study area. Fruit of Marri trees that had been partially eaten by FRBC was observed in several places in Area B, particularly near the northern boundary, as well as along the track leading to Area B from Powerhouse Road. Fewer signs of foraging by black cockatoos were observed in Area A, perhaps because it is closer to the Motorplex racetrack.

Large eucalypts with dead branches that have potential for nesting hollow development were present in both Area A and B, but were probably most frequent in the northern part of Area A. Several hollows large enough to be used for nesting were observed in Area B. Area B has been heavily logged in places and in these areas there were fewer large trees (> 500m dbh) – however there were several groups of very large Marri trees (> 800 mm dbh) present along the unsealed track that runs north to south through this part of the study area.

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## **Statement of limitations**

### **Reliance on Data**

In the preparation of this report, Ecoedge has relied on data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report. Unless stated otherwise in the report, Ecoedge has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report are based in whole or in part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Ecoedge will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, unavailable, misrepresented or otherwise not fully disclosed to Ecoedge.

### **Report for Benefit of Client**

The report has been prepared for the benefit of the Client and for no other party. Ecoedge assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including, without limitation, matters arising from any negligent act or omission of Ecoedge or for any loss or damage suffered by any other party relying on the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions, and should make their own enquiries and obtain independent advice in relation to such matters.

# 1 Introduction

Ecoedge was engaged by RPS in September 2013 to undertake a Level 2 vegetation and flora assessment over 62 ha of the Collie Motorplex site, a recreational motoring and sporting facility, which is situated approximately 11.5 km due south-east of the Collie town site. The Motorplex site covers approximately 349 hectares in total. Two separate areas, Area A comprising 20.0 ha and Area B comprising 42.7 ha are being considered as alternative sites for a planned redevelopment of the Motorplex.

The remnant vegetation requiring assessment totalled approximately 40 ha.

In 2008, GHD undertook a Flora and Fauna Survey within the vicinity of but not including the Survey Area. This survey included desktop and field investigations of the fauna and flora at the site with subsequent reporting on its significance (GHD, 2008).

GHD also undertook a Flora and Vegetation Survey within the vicinity of but not including the Survey Area in 2009. This survey included desktop and field investigations of the vegetation and flora at the site with subsequent reporting on the significance of the flora and vegetation (GHD, 2009).

In the current survey, the study area was visited on 24<sup>th</sup> September and 30<sup>th</sup> October 2013 to carry out the assessment. The vegetation survey was undertaken in accordance with EPA Guidance Statement 51, "Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia" (EPA, 2004).

This report compiles findings of the Level 2 Vegetation and Flora survey.

## 1.1 Scope and objectives

The project scope was to carry out a Level 2 vegetation and flora assessment to assess the floristic diversity and determine vegetation communities occurring in the Survey Area.

The objectives of the flora and vegetation survey for the study area were to:

- conduct an assessment of flora and vegetation values within the study area;
- conduct a review of other literature to summarise the values of flora and vegetation significance in the project area;
- review the documented flora and vegetation of significance, based on DEC and / or Department of Parks and Wildlife records (databases);
- conduct a field assessment to:
  - identify the vascular flora species present;

- determine the presence or absence of Declared Rare Flora (DRF), Priority Flora, EPBC Act Listed Flora or Significant Species;
- define and spatially map vegetation communities; (achieved through the installation of two x 100 m<sup>2</sup> floristic quadrats and a number of floristic relevés)
  - define and spatially map vegetation condition;
- Assess the extent and suitability of the vegetation as existing and/or potential feeding, nesting and roosting habitat for Carnaby's, Baudin's and Forest Red-tailed Black Cockatoos
- prepare a report that summarises the findings of the desktop and field assessments

## 1.2 Biogeographic region

The Survey Area is located within the Southern Jarrah Forest (JF2) sub-region of the Jarrah Forest Bioregion as defined in the Interim Biogeographical Regionalisation for Australia (IBRA) (Australian Government, 2009).

## 1.3 Site location and features

The Survey Area is situated approximately 11.5 km south-east of the Collie town site (**Figure 1**).

The Survey Area is situated on the Darling Plateau within the Western Darling Range Zone. Elevation falls from approximately 230 m above sea level (ASL) in the east to approximately 220 m in the west.

The entire Survey Area is located in State forest number 4 on a lease held by Motoring South West Incorporated. According to the Shire of Collie Town Planning Scheme 5, the Collie Motorplex is currently zoned as 'Parks and Recreation'.

## 1.4 Geology

The site is situated on the Darling Plateau within the Western Darling Range Zone (WDRZ) geomorphological and geological unit as defined in Tille (1996).

The Western Darling Range Zone is a deeply dissected undulating lateritic plateau overlying crystalline rocks (e.g. granite and gneiss). Major river systems have cut into the plateau to form deep, steep sided valleys and expose fresh rock. Three soil-landscape systems containing 24 subsystems have been identified and mapped within this zone (Tille, 1996).

Within the WDRZ the Survey Area occurs on the Coalfields System (**Figure 2**):

Coalfields System: The Coalfields system is dominated by broad, lateritic divides with gravels and sands (Collie Subsystem). In between these are broad tracts of swampy terrain (Cardiff Subsystem) and shallow, minor valleys with swampy floors (Stockton Subsystem). The Collie

River has formed shallow valleys with well drained flats (Muja Subsystem). The Coalfields System overlies Permian sedimentary basins containing coal (Tille, 1996).

Soil Mapping Units occurring within the Survey Area are presented in **Table 1**.



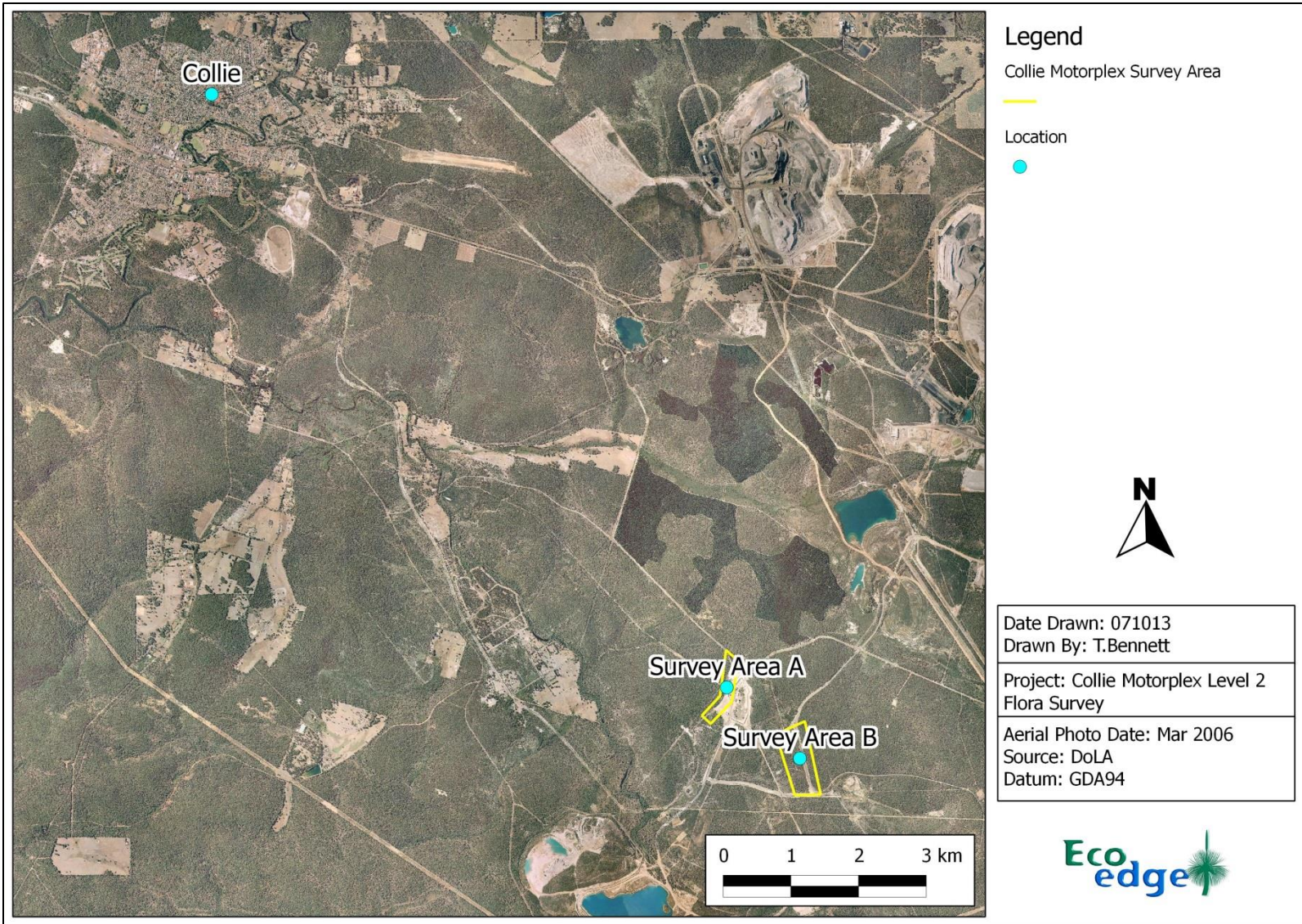


Figure 1. Aerial Photograph showing location of Survey Area





Figure 2. Soil landscapes occurring within the Survey Area



Soil Mapping Unit	Description	Supports Remnant Vegetation (Yes/No)
255CfSKu	Shallow, upstream, minor valleys with sands and gravels. The valley floor is usually narrower than the downstream valleys.	Yes
255CfCI	Consists of broad lateritic divides with deep sands and sandy gravels	Yes

Table 1. Soil Mapping Units occurring within the Survey Area (Tille, 1996).

## 1.5 Vegetation

The Survey Area supports approximately 40 ha of remnant vegetation, 10.4 ha in Area A and 36.6 ha in Area B.

Vegetation complexes on the Darling Scarp and Plateau were mapped for the purposes of the Regional Forest Agreement by Mattiske and Havel (1998). This classification system emphasises the relationships between underlying geology and plant communities.

The upslope part of Area A is mapped as the Collie (CI) vegetation complex (7.4 ha) and the remainder (3 ha) comprising the lower, damp areas, as the Muja (MJ) complex. All of Area B is mapped as the Collie (CI) vegetation complex (**Figure 3**).

These two complexes are described below:

- **Collie (CI)** - Open forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla*-*Allocasuarina fraseriana* on gravelly-sandy upland soils in the subhumid zone.
- **Muja (MJ)** - Open woodland of *Melaleuca preissiana*-*Banksia littoralis*-*Banksia ilicifolia* with some *Eucalyptus patens* on moister sites, *Banksia* spp. on drier sites of valley floors in the subhumid zone.

In 2001, the Commonwealth of Australia stated National Targets and Objectives for Biodiversity Conservation, which recognised that the retention of 30%, or more, of the pre-clearing extent of each ecological community was necessary if Australia's biological diversity was to be protected (Environment Australia, 2001). This level of recognition is in keeping with the targets set in the Environmental Protection Authority (EPA)s Position Statement on the 'Environmental protection of native vegetation in Western Australia: clearing of native vegetation, with particular reference to the agricultural area' (EPA, 2000). With regard to conservation status, the EPA has set a target of 15% of pre-European extent for each ecological community to be protected in a comprehensive, adequate and representative reserve system (EPA, 2006).

Both the Collie (CI) and Muja (MJ) vegetation complexes have been classified as poorly conserved by Mattiske and Havel (2002), with 14.5% and 14.0%, respectively, of the then extent in conservation reserves. This falls just below the 15% target set by the EPA (2006).

However, the total remaining area of the Collie (CI) complex is 71% of the pre-European extent and the Muja (MJ) is 51%; thus both are close to or above the minimum 30% of pre-clearing extent for retention of the National Targets and Objectives for Biodiversity Conservation (Environment Australia, 2001).

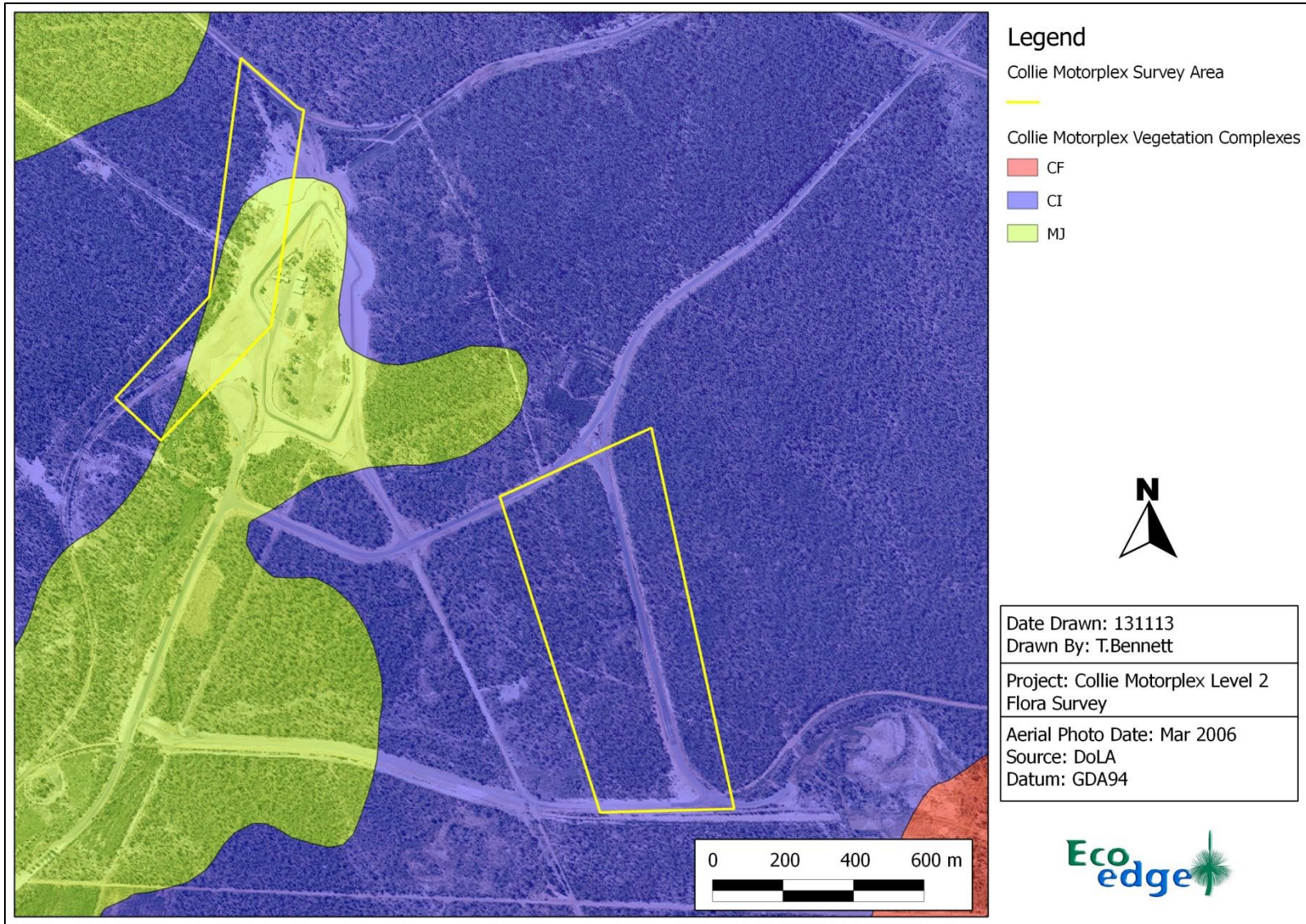


Figure 3. Vegetation complexes within the Survey Area

## 1.6 Threatened and Priority Ecological Communities

Ecological communities are defined by Western Australia's Department of Parks and Wildlife (DPaW, previously the Department of Environment and Conservation (DEC)) as "...naturally occurring biological assemblages that occur in a particular type of habitat. They are the sum of species within an ecosystem and, as a whole, they provide many of the processes which support specific ecosystems and provide ecological services." (DEC, 2010a).

A threatened ecological community (TEC) is one which is found to fit into one of the following categories; 'presumed totally destroyed', 'critically endangered', 'endangered' or 'vulnerable' (DEC, 2012a). Possible threatened ecological communities that do not meet survey criteria are added to DPaW's Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5 (DPaW, 2013d). Threatened Ecological Communities can also be listed under the Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act*) (Department of Sustainability, Environment, Water, Population and Communities (SEWPaC, 2010a).

A DEC data search for threatened or priority ecological communities known to occur within 5 km of the Study Area was undertaken (DEC, 2013a). A Protected Matters Search Tool query for communities listed under the *EPBC Act* (1999) occurring within a 10 km radius of the Study Area was also undertaken (Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), 2012c).

No threatened or priority ecological communities are known to occur within or in the vicinity of the Survey Area.

The complete Protected Matters Search Tool results are included in **Appendix 1**.

## 1.7 Threatened and Priority Flora

Species of flora and fauna are defined as Declared Rare (Threatened) or Priority conservation status where their populations are restricted geographically or threatened by local processes. The DEC recognises these threats of extinction and consequently applies regulations towards population and species protection.

Rare Flora species are gazetted under Subsection 2 of Section 23F of the *Wildlife Conservation Act* (1950) (*WC Act*) and therefore it is an offence to 'take' or damage rare flora without Ministerial approval. Section 23F of the *WC Act* 1950-1980 defines 'to take' as "... to gather,



pick, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means.”

Priority Flora are under consideration for declaration as ‘rare flora’, but are in need of further survey (Priority One to Three) or require monitoring every 5-10 years (Priority Four). **Table 2** presents the categories of Declared Rare and Priority Flora as defined by the *WC Act* (DPaW 2013e).

Threats of extinction of species are also recognised at a Federal Government level and are categorised according to the *EPBC Act*, 1999 (SEWPaC, 2012a).

CONSERVATION CODE	CATEGORY
R	Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such.
P1	Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat. Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.
P2	Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat. Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.
P3	Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as ‘rare flora’, but are in need of further survey.
P4	Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

Table 2. Definitions of Declared Rare and Priority List flora

Under the *EPBC Act* (1999) a species may be listed in one of six categories; the definitions of these categories are summarised in **Table 3**.

Threatened or Priority flora occurring within 10 km of the Survey Area (DPaW, 2013b) generated from a DEC data search and a Naturemap data search are listed in **Table 4**. Taxa listed under the *EPBC Act* (based on results of the Protected Matters Search Tool query (SEWPaC, 2013)) are listed in **Appendix 1**.

CATEGORY	DEFINITION
Extinct (Ex)	A native species is eligible to be included in the <b><i>extinct</i></b> category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (ExW)	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (E)	A native species is eligible to be included in the endangered category at a particular time if, at that time (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (V)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent (CD)	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Table 3. Categories of Threatened Species (Environment Protection and Biodiversity Conservation Act 1999)



Species	WC Act status (EPBC Act status in brackets)	Flowering	Description	Habitat
<i>Acacia cuneifolia</i>	P4	Jul - Oct	Erect or straggly shrub, 1-3 m high. Flowers yellow.	Sand, clay or loam over granite. Granite outcrops & hills, rocky watercourses.
<i>Acacia semitrullata</i>	P4	May – Oct	Slender, erect, pungent shrub, (0.1-) 0.2-0.7 (-1.5) m high. Flowers cream, white.	White/grey sand, sometimes over laterite, clay. Sandplains, swampy areas.
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	P3	Jul – Jan	Prostrate, mat-forming, non-lignotuberous shrub, to 0.3 m high. Flowers white, cream, pink, green.	Grey sand, lateritic gravel.
<i>Caladenia lodgeana</i>	T (CE)	Oct	Tuberous, perennial, herb. Flowers white.	Black loam.
<i>Caladenia</i> sp. Collie	T			
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	P4	Jun - Aug	Erect, multi-stemmed shrub, 1-2 m high. Flowers red.	Clay over granite, lateritic soils. Hillsides.
<i>Calothamnus rupestris</i>	P4	Jul – Dec	Erect, compact or spreading shrub or tree (occasionally), 0.9-4 m high. Flowers pink-red.	Gravelly skeletal soils. Granite outcrops & rocks, hillsides.
<i>Calytrix pulchella</i>	P3	Aug – Nov	Shrub, 0.3-0.7(-1) m high. Flowers pink.	Grey or white sand over laterite. Ridges, flats.
<i>Eryngium</i> sp. Ferox	P3	Nov	Erect, open tuberous, herb, 0.1–0.3 m high. Flowers green.	Grey to brown loamy to sandy clay, brown cracking clay. Winter-wet flats, swamps, dried claypans, ridges.
<i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>	P4	Jul – Sep	Tree, 5-20 m high, bark rough, box-type. Flowers white.	Loam. Flats, hillsides.
<i>Grevillea prominens</i>	P3	Sep - Oct	Spreading shrub, 0.5–1.7 m high, 0.3-1 m wide. Flowers cream, white.	Gravelly loam. Along creeklines
<i>Grevillea rara</i>	T (EN)	Oct	Dense, prickly shrub, to 2 m high. Flowers white, pink.	Lateritic loam. Creeklines.

Species	WC Act status (EPBC Act status in brackets)	Flowering	Description	Habitat
<i>Grevillea ripicola</i>	P4	Jan or Mar –Apr or Nov –Dec	Spreading, much-branched, non-lignotuberous shrub, 0.6-2(-3) m high, to 4 m wide. Flowers red, orange.	Sandy clay, clay or gravelly loam. Swampy flats, granite outcrops, along watercourses.
<i>Hemigenia rigida</i>	P1	Aug – Dec or Jan	Upright or spreading shrub, 0.1-0.6(-1) m high. Flowers blue-purple/violet.	Sandy soils, lateritic gravelly soils. Hillslopes, granite outcrops, flats, ironstone ridges.
<i>Jacksonia velveta</i>	T (EN)	Dec	Open, upright, sometimes sprawling shrub, to 1.9 m high. Flowers yellow-orange.	Brown gravelly loam, dry grey sand, ironstone. Slight hillslopes, ridges.
<i>Lasiopetalum cardiophyllum</i>	P4	Aug - Jan	Erect, multi-stemmed shrub, 0.2–0.5 m high. Flowers pink.	Lateritic gravelly soils, sandy clay. Flats, hillslopes.
<i>Leucopogon extremus</i>	P2	Sep – Oct	Low spreading shrub to 40 cm high x 70 cm wide, corolla greenish white.	Seasonally wet areas.
<i>Logania sylvicola</i>	P2	Aug - Sep	Spreading, compact shrub to 40 cm x 50 cm. Inflorescence more or less pendant. Flowers cream.	Mid slopes. Dry brown gravelly, sandy loam over laterite.
<i>Meeboldina thysanantha</i>	P3	Dec	Rhizomatous, perennial, herb (rush-like), 0.4-1 m high. Flowers brown.	Sand. Swamps.
<i>Millotia tenuifolia</i> var. <i>laevis</i>	P2	Sep - Oct	Ascending to erect annual, herb, 0.02-0.1 m high. Flowers yellow.	Granite or laterite soils.
<i>Pultenaea skinneri</i>	P4	Jul - Sep	Slender shrub, 1-2 m high. Flowers yellow, orange, red.	Sandy or clayey soils. Winter-wet depressions.
<i>Sphaerolobium benetectum</i>	P2	Oct - Nov	Slender, caespitose shrub, 0.2-1 m high, to 0.45 m wide. Flowers pink & red & yellow.	White gravelly sandy clay, sandy loam, granite, laterite. Ridges, swamps, undulating rises.

Species	WC Act status (EPBC Act status in brackets)	Flowering	Description	Habitat
<i>Stylidium acuminatum</i> subsp. <i>acuminatum</i>	P1	Oct – Dec or Jan	Rosetted perennial, herb, Leaves oblanceolate. Inflorescence racemose. Flowers yellow.	Clayey sand over laterite. Hillslopes, ridges and valleys. Eucalypt forest, open woodland, Agonis shrubland.
<i>Stylidium lepidum</i>	P3	Oct - Nov	Spreading, rosetted perennial, herb, ca 0.05 m high, forming densely packed colonies. Flowers pink, orange.	Gravelly sand or loam, clay. Winter- wet depressions.
<i>Stylidium rhipidium</i>	P3	Oct - Nov	Slender annual, herb, ca 0.05 m high. Flowers white.	Sandy soils. Wet creek flats, swamps, granite outcrops.
<i>Synaphea hians</i>	P3	Jul - Nov	Prostrate or decumbent shrub, 0.15- 0.6 m high, to 1 m wide. Flowers yellow.	Sandy soils. Rises.
<i>Synaphea petiolaris</i> subsp. <i>simplex</i>	P2	Sep - Oct	Tufted shrub, 0.1–0.6 m high. Flowers yellow.	Sandy soils. Flats, winter-wet areas.
<i>Tetrateca parvifolia</i>	P3	Oct	Small shrub, 0.2-0.3 m high. Flowers pink.	Jarraah, woodland, wandoo woodland, gravelly soils.
<i>Thysanotus unicus</i>	P2		Erect perennial dwarf shrub, height to 15 cm, width to 11 cm. Flowers purple.	Jarraah - Marri forest
<i>Verticordia attenuata</i>	P3	Dec - May	Shrub, 0.4–1 m high. Flowers pink.	White or grey sand. Winter-wet depressions

Table 4. List of Declared Rare and Priority List flora known to occur within 10 km of the survey area.

Not all of the species listed in **Table 4** are likely to occur within the survey area, based on an assessment of their preferred habitats. Most of them would have been flowering at the time of survey. Of those that were unlikely to be flowering all are identifiable in the absence of flowers except perhaps for *Eryngium* sp. *Ferox*.

## 1.8 Ecological Linkages

Ecological linkages were defined in Molloy *et al.* (2009) in their report on the South West Regional Ecological Linkages (SWREL) Project as;

*“A series of (both contiguous and non-contiguous) patches which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape.”*

The Molloy *et al.* (2009) report is the result of collaboration between the Western Australian Local Government Association’s *South West Biodiversity Project* and the DEC’s *Swan Bioplan* to provide a tool for the identification of ecological linkages and guidance for the protection of linkages through planning policy documents.

It is stressed in the above report, that the proximity value of an ecological linkage is not intended to replace the need to consider the other biodiversity conservation values of a patch of remnant vegetation. Regional Ecological Linkages link protected patches of regional significance by retaining the best (condition) patches available as stepping stones for flora and fauna between regionally significant areas. This increases the long-term viability of all the constituent areas (Molloy *et al.*, 2009).

The *South West Regional Ecological Linkages Technical Report* (Molloy *et al.*, 2009) identifies a regional ecological linkage axis line passing within 1.3 km to the west of the Area A and approximately 2.19 km west of Area B in vegetation that is contiguous with that contained within the Study Area (**Figure 4**). As a result, all patches of remnant vegetation within the Study Area are assigned to proximity category ‘1a’, which is the highest category, and effectively means that the vegetation within the Study Area directly forms part of the ecological linkage.

While there is no statutory basis for regional ecological linkages identified through the SWREL project, the importance of ecological linkages has been recognised as an environmental policy consideration in EPA and Planning policy over the last decade (EPA, 2009 and references therein). In its statement regarding the SWREL Project, the EPA stated that even though Ecological Linkages are just one measure of the conservation values of a patch of remnant vegetation it expected that:

*In preparing plans and proposals for development, consideration will be given to both the site-specific biodiversity conservation values of patches of native vegetation, as well as the landscape function and core linkage significance of a patch in supporting the maintenance of ecological linkage (EPA, 2009).*



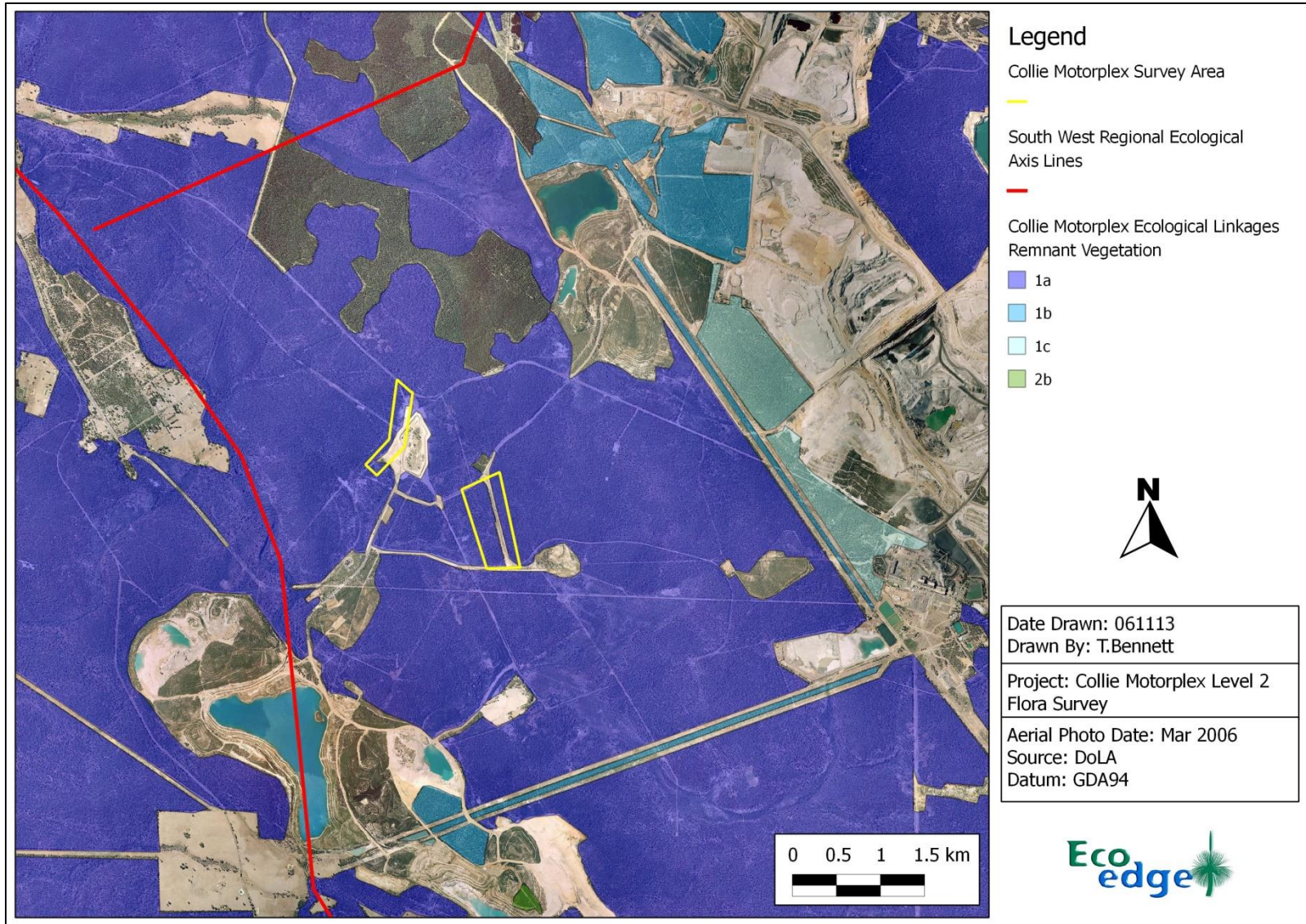


Figure 4. Ecological linkages passing near to the Survey Area

## 2 Methods

### 2.1 Survey Methodology

The study area was traversed on foot by a senior botanist (Russell Smith) and a field botanist (Tiffany Bennett) on two occasions to carry out the assessment, viz. 24<sup>th</sup> September and 30<sup>th</sup> October 2013. The vegetation survey was undertaken in accordance with EPA Guidance Statement 51 “Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia” (EPA, 2004). Methods used for the four main components of the field assessment are described below.

During the visits to the study area, a comprehensive list of native and many non-native vascular flora was compiled. Taxa not able to be identified with certainty in the field were photographed, and in a few cases collected, for later identification. Taxonomy and conservation status was checked against the WA Herbarium Census of WA Plants Database (WACENSUS) (DPaW, 2013). The Declared Rare Flora and Priority Flora known to occur within a 5 km distance of the study area (**Table 4**) were targeted during the search.

In order collect detailed information on vegetation composition within the study area, two 10 m x 10 m floristic quadrats were installed and data was collected from them using methods consistent with those used in the Swan Coastal Plain Survey (Gibson *et al.* 1994). The quadrats were placed in patches of the least degraded vegetation in the study area so as to best sample the range of different communities or soil-landforms. One quadrat was placed in Area A and one in Area B (**Figure 5**).

The following information was recorded for each quadrat:

- Each corner was marked by a steel fence dropper
- A GPS coordinate for the centre of the quadrat
- A description of the quadrat, including:
  - Soil colour and texture at 5 cm
  - Landscape position
  - Type and percentage surface rock
  - Litter and Logs/Debris cover (%)
  - A list of all vascular plant taxa together with a cover/abundance estimate
  - A photograph of the quadrat from the SW and NE corner

As well as taxa that occurred in the floristic quadrats, species found opportunistically outside the quadrats but within the Study Area were recorded with the aim of compiling a complete list of vascular flora.



In addition to the floristic quadrats, information regarding the dominant species, vegetation structure and vegetation condition was recorded at 34 unmarked assessment points or releves situated in remnant vegetation in the study area. Vegetation condition was scored according to the method of Keighery (1994) (**Table 5**). Using both the quadrat data and information from the releves together with recent aerial photography, vegetation community types were defined and described using a structural method based on that used by Muir (1977) and Aplin (1979). These vegetation community types and vegetation condition were mapped over the study area.

During the initial survey, general observations were made on the suitability of vegetation in the study area as black cockatoo habitat (DSEWPC, 2012d).

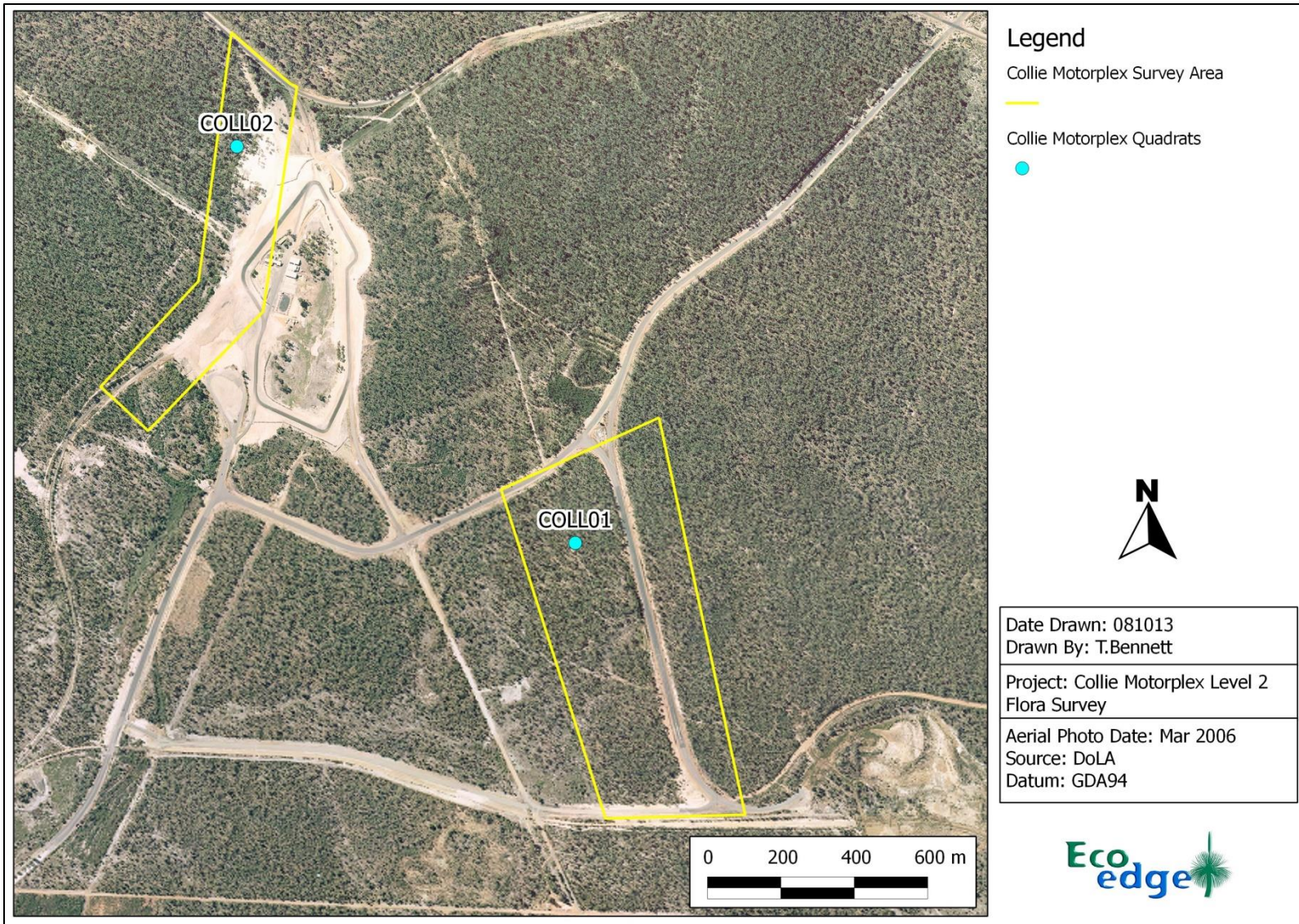


Figure 5. Floristic quadrat locations in the Survey Area

SCORE	DESCRIPTION
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as “parkland cleared’ with the flora comprising weed or crop species with isolated native trees or shrubs.

Table 5. Vegetation Condition Scale developed by Keighery (1994).

## 2.2 Survey Limitations

The limitations of this survey are outlined in **Table 6**.

Aspect	Constraint	Comment
Scope	No	The survey scope was prepared in consultation with the stakeholders and was designed to comply with EPA requirements.
Proportion of flora identified	Negligible	The survey was carried out over September/October - a period which experience has shown to be the prime flowering time for flora in southern Western Australia. It is estimated that 90-95% of species in the remnant vegetation were identified.
Availability of contextual information	Minor/Somewhat	Apart from the broadscale vegetation complex mapping by Mattiske and Havel (1998) there have been relatively few vegetation surveys in the Collie Basin. Two surveys that do provide some contextual information are GHD (2008) and GHD (2009) – which were carried out in the nearby Shotts Industrial Park.
Completeness of the survey	Negligible	All areas of remnant vegetation were visited and traversed on foot. Further assessments outside the spring season and extra floristic quadrats would add to the completeness of the survey but probably only marginally affect the conclusions presented.
Climate	Negligible	September rainfall in this part of south western Australia was substantially above the long-term average - overall it is considered that rainfall had negligible effect on flowering in the Study Area.
Access Problems	No	All parts of the Study Area were easily accessible.
Site Effects	Somewhat	As noted in Section 4 the study area has previously been subject to partial clearing; this and past fires and infestation by <i>Phytophthora cinnamomi</i> have caused some change to vegetation structure and composition.
Competency and experience of consultants	No	The senior botanist Russell Smith has 20 years' experience of flora surveys in the south west of Western Australia.

Table 6. Limitations of the Survey.



## 3 Results and Discussion

### 3.1 Flora

One hundred and eighty species of vascular flora were identified from within the study area, of which 10 are naturalised or planted non-native species (**Appendix 2**). The Fabaceae family was the most well represented with 26 species, followed by the Orchidaceae (17 species), Myrtaceae and Proteaceae (16 species each). One of the naturalised species, *Echium plantagineum* (Patterson’s Curse) is a Declared Plant under the *Agriculture and Related Resources Protection Act, 1976* (DAFWA, 2011). It is classified as P1 (“Introduction of the plant into, or movement of the plant within, an area is prohibited”) and P3 (“Plant to be controlled by reduction in number or distribution of the plant or both”).

No Declared Rare Flora (DPaW, 2013g), Priority Flora (DPaW, 2013c), Threatened species pursuant to the *EPBC Act* or other flora of conservation significance were found in the study area.

Data for the two floristic quadrats is presented in **Appendix 3**. Species richness was low to average for for 100m<sup>2</sup> quadrats in open forest in south-western Australia at 34 taxa (Quadrat COLL01) and 46 taxa (COLL02) (Keighery *et al.*, 2008 and references cited therein).

### 3.2 Vegetation Units

Four native vegetation units were recognised in the study area plus one vegetation unit predominantly composed of planted exotic species. The distribution of these vegetation units is shown in **Figure 6** and the native vegetation units are described below.

Vegetation Unit A: Open Forest of Jarrah (*Eucalyptus marginata*) and *Allocasuarina fraseriana* with occasional Marri (*Corymbia calophylla*) over Low Open Woodland of *Banksia grandis* and *Persoonia longifolia* over Shrubland of *Xanthorrhoea preissii* over Low Shrubland of *Bossiaea ornata*, *Hakea ruscifolia*, *Hibbertia hypericoides*, *Styphelia tenuiflora* and *Xanthorrhoea gracilis* on shallow grey gravelly sand often with exposed laterite.

Vegetation Unit B: Open Forest of Jarrah (*Eucalyptus marginata*) and *Allocasuarina fraseriana* with occasional Marri (*Corymbia calophylla*) over Very Low Open Woodland of *Persoonia longifolia* and *Xylomelum occidentale* over Shrubland/Low shrubland of *Acacia extensa*, *Bossiaea eriocarpa*, *B. ornata*, *Macrozamia riedlei*, *Xanthorrhoea preissii* and *X. gracilis* (with *Hypocalymma angustifolium* in damper areas) on grey-brown loamy sands.

Vegetation Unit C: Woodland of Jarrah (*Eucalyptus marginata*) and *Nuytsia floribunda* with *Melaleuca preissiana* in damper areas over Open Low Woodland of *Xylomelum occidentale* over Shrubland/Low Shrubland of *Acacia extensa*, *Adenanthos obovatus*, *Hibbertia vaginata*, *Kunzea glabrescens* and *Xanthorrhoea preissii* on grey-brown loamy sand. (This vegetation unit was only found in Area A).

Vegetation Unit D: Open forest of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) and sometimes *Allocasuarina fraseriana* over Shrubland/Low Shrubland of *Acacia browniana*, *Banksia dallaneyi*, *Bossiaea eriocarpa*, *B. ornata*, *Hakea lissocarpha*, *Hibbertia hypericoides* and *Xanthorrhoea gracilis* on gravelly grey-brown sandy loam (with exposed laterite) or grey-brown sandy loam.

Vegetation Units A, B and D are similar to the “Jarrah – Marri– Sheoak Open Forest” and Unit C has similarities to the “*Melaleuca preissiana* – *Taxandria linearifolia* – *Kunzea glabrescens* Low Woodland” vegetation types of the Shotts Industrial Park located several kilometres to the west of the study area (GHD, 2008).

### 3.3 Vegetation Condition

A quarter of the study area has been cleared, the remainder (46.8 ha) contains native vegetation of varying condition (**Figure 7**). The majority of the native vegetation in the study area (89%) was classified as “Very Good” condition – it is floristically diverse although the structure has been somewhat altered by past logging activities. A small portion of the remnant vegetation was classified as “Good” (6.3%) or “Degraded” (4.7%). The main cause of degradation in these areas has been partial clearing, dieback disease and planting of non-native species. Heavy grazing by kangaroos is also probably a factor.

A breakdown of vegetation condition for the two parts of the study area; Area A and Area B, is given in **Table 7**, below. The large majority of Area B (85.7%) is in “Very Good” condition, the remainder of being comprised of roads and road verges. Condition is much more varied in Area A, almost half (48%) of which is cleared, however almost 40% is in “Good” or “Very Good” condition.



Category	Area A (ha)	Area B
Very Good	5.1 (25.5%)	36.6 (85.7%)
Good	2.9 (14.5%)	-
Degraded	2.3 (11.5%)	-
Cleared	9.6 (48.0%)	6.1 (14.3%)
<b>Total</b>	<b>20.0 (100.0%)</b>	<b>42.7 (100.0%)</b>

Table 7. Comparison of vegetation condition within Area A and Area B.

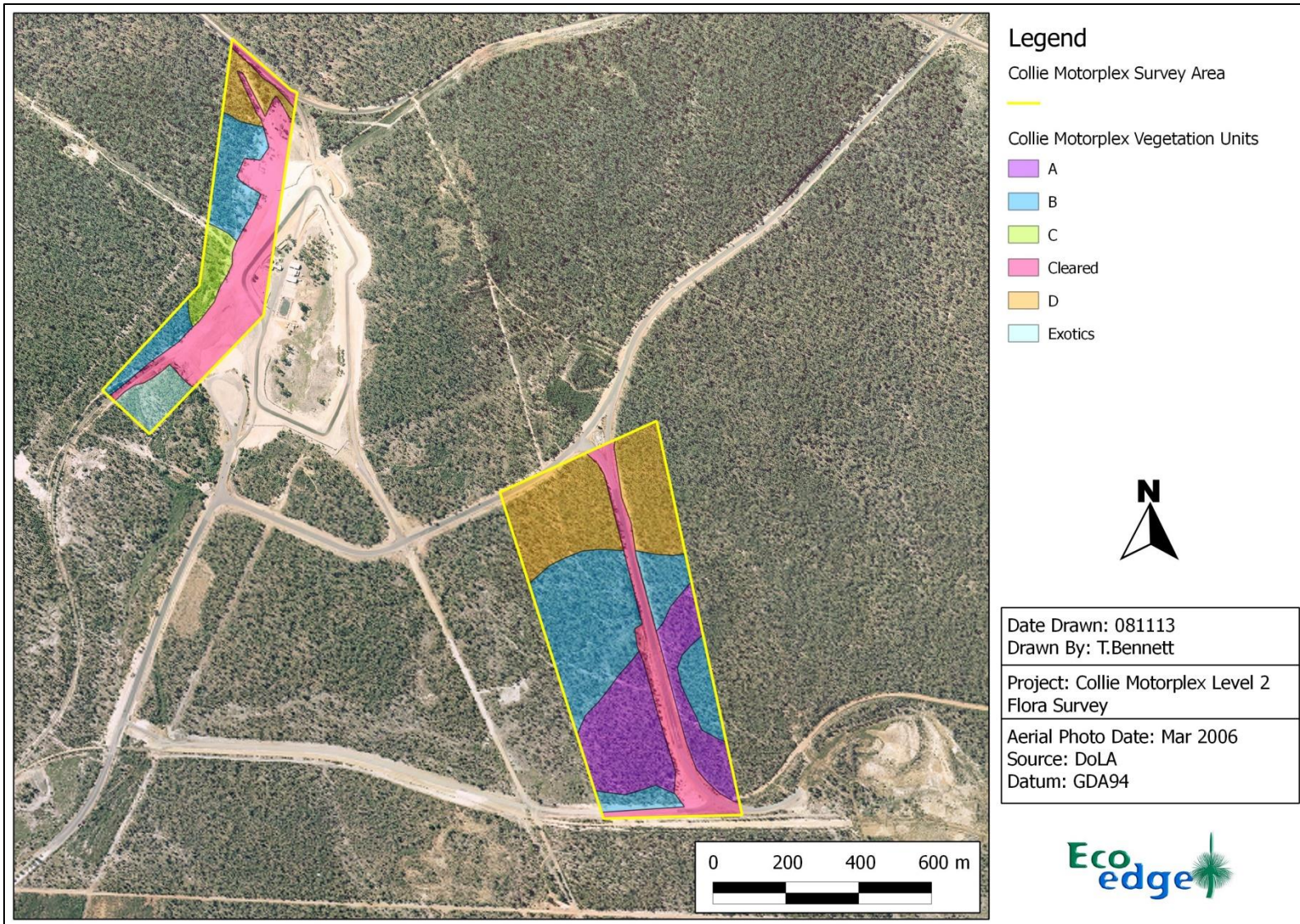


Figure 6. Vegetation Units of the Survey Area



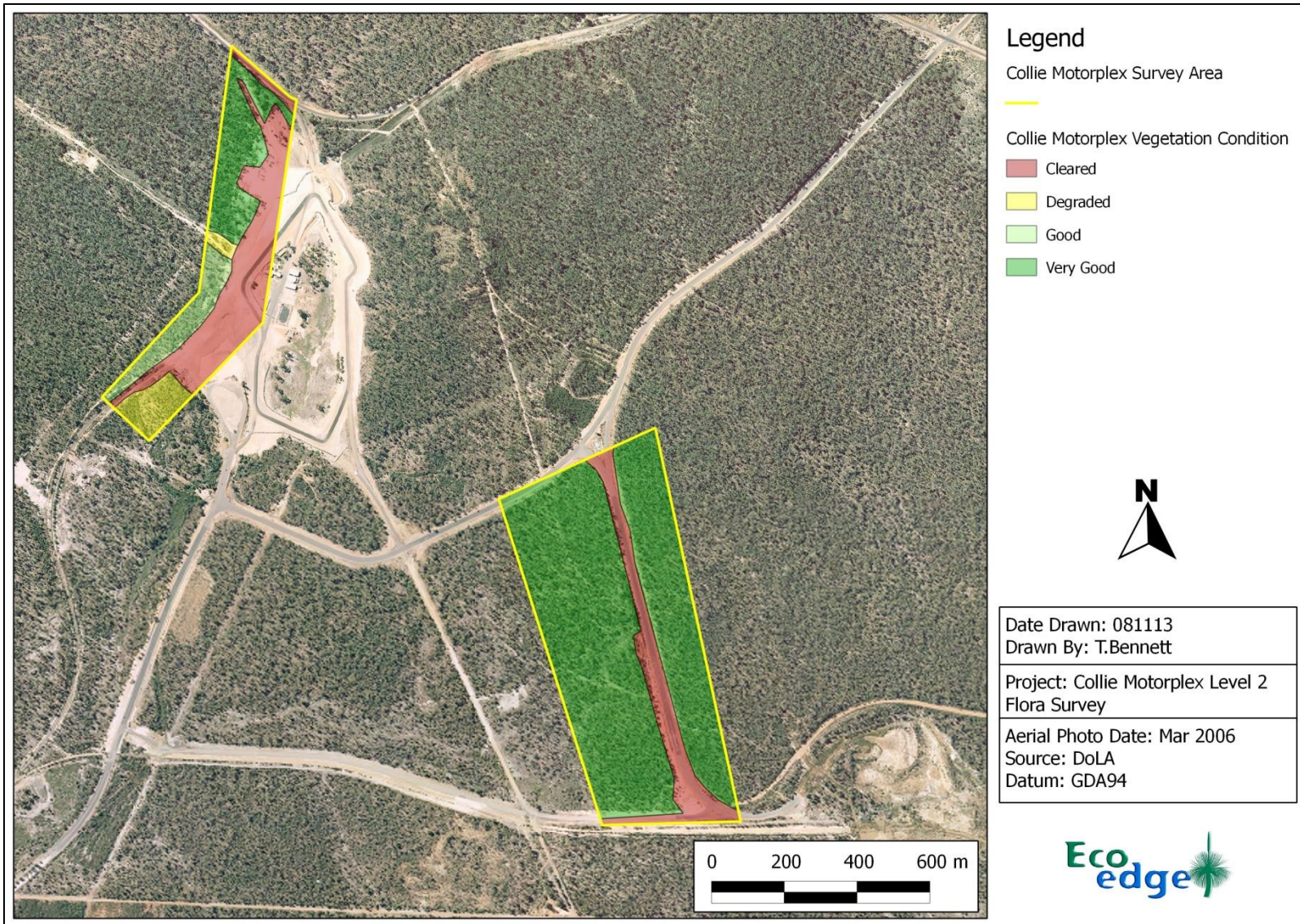


Figure 7. Vegetation condition of the Survey Area

### 3.4 Floristic Values of the Study Area

Vegetation in the study area is representative of both the Collie (CI) and Muja (MJ) vegetation complexes, which are mapped as being present onsite (**Figure 3**). As stated in Section 1.5, these were both classified as poorly conserved by Mattiske and Havel (2002), with 14.5% and 14.0%, respectively, of the current extent in conservation reserves. This falls just below the 15% target set by the EPA (2006). The total remaining area of Collie (CI) is 71% of the pre-European area and that of Muja (MJ) is 51%.

None of the vegetation units in the study area correspond to a threatened or priority ecological community (DPaW, 2013f, 2013h).

### 3.5 Black Cockatoo Habitat in the Study Area

Three species of black cockatoo are known to occur in the Collie area (Johnstone *et al.*, 2010) and potentially use the study area for feeding, roosting or nesting. These are the Long-billed (Baudin's) Black-Cockatoo (*Calyptorhynchus baudinii*), the Short-billed (Carnaby's) Black-Cockatoo (*C. latirostris*) and the Forest Red-tailed Black-Cockatoo (*C. banksii naso*). All three cockatoo species are protected under both Federal and State legislation and are considered to be of very high conservation significance.

Forest Red-tailed Black Cockatoo primarily feeds on Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) seeds. Baudin's Black-Cockatoo primarily feeds on Marri. Carnaby's Black-Cockatoo feeds on a broader range of plants, including proteaceous trees and heath (e.g. *Banksia*, *Dryandra*, *Hakea*, *Grevillea*), eucalypt trees, and introduced or plantation trees (e.g. *Pinus* spp.). Potential nesting habitat comprises hollow-bearing trees greater than 500 mm DBH, with hollows present, and with hollow diameter greater than 100 mm (Bancroft and Bamford, 2011).

A detailed assessment of use of the study area by black cockatoos was beyond the scope of this study and only some general comments about sightings, habitat use and habitat suitability are made in this report.

Vegetation within the study area is dominated by healthy stands of Marri and Jarrah – as stated above both of these are important food sources for the Forest Red-tailed Black-Cockatoo (FRBC). This species was observed and heard in and near both Area A and Area B during the visits to the study area. Fruit of Marri trees that had been partially eaten by FRBC was observed in several places in Area B, particularly near the northern boundary, as well as along the track leading to Area B from Powerhouse Road. Fewer signs of foraging by black cockatoos were observed in Area A, perhaps because it is closer to the Motorplex racetrack.

Large eucalypts with dead branches that have potential for nesting hollow development were present in both Area A and B, but were probably most frequent in the northern part of Area A. Several hollows large enough to be used for nesting were observed in Area B. Area B has been heavily logged in places and in these areas there were fewer large trees (> 500m dbh) – however there were several groups of very large Marri trees (> 800 mm dbh) present along the unsealed track that runs north to south through this part of the study area.

Photographs of suitable habitat trees and nesting hollows in the study area are presented below (**Figure 8**).





Figure 8. Trees with potential for hollow development in Area A (left), Area B (centre) and a large tree hollow in Area B (right)



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## **Appendix 1 Protected Matters Search Tool (Attachment)**



## Appendix 2 List of all Vascular Flora Species

FAMILY NAME	LATIN NAME	NATURALISED	
Apiaceae	<i>Apium prostratum</i>		
	<i>Xanthosia candida</i>		
	<i>Xanthosia huegelii</i>		
Araliaceae	<i>Xanthosia singuliflora</i>		
	<i>Hydrocotyle callicarpa</i>		
	<i>Trachymene pilosa</i>		
Asparagaceae	<i>Chamaescilla corymbosa</i>		
	<i>Lomandra hermaphrodita</i>		
	<i>Lomandra sericea</i>		
	<i>Thysanotus multiflorus</i>		
	<i>Thysanotus patersonii</i>		
Asteraceae	<i>Thysanotus tenellus</i>		
	<i>Thysanotus thyrsoides</i>		
	<i>Arctotheca calendula</i>	*	
	<i>Craspedia variabilis</i>		
	<i>Gamochaeta calviceps</i>	*	
	<i>Helichrysum luteoalbum</i>		
	<i>Hypochaeris glabra</i>	*	
	<i>Lagenophora huegelii</i>		
	<i>Millotia tenuifolia</i>		
	<i>Podolepis gracilis</i>		
Boraginaceae	<i>Rhodanthe citrina</i>		
	<i>Senecio quadridentatus</i>		
	<i>Siloxerus humifusus</i>		
	<i>Trichocline spathulata</i>		
	<i>Ursinia anthemoides</i>	*	
	<i>Echium plantagineum</i>	*	
	Campanulaceae	<i>Isotoma hypocrateriformis</i>	
	Casuarinaceae	<i>Allocasuarina fraseriana</i>	
	Celastraceae	<i>Stackhousia monogyna</i>	
		<i>Tripterococcus brunonis</i>	
Colchicaceae	<i>Burchardia congesta</i>		
Cyperaceae	<i>Cyathochaeta avenacea</i>		
	<i>Lepidosperma gracile</i>		
	<i>Lepidosperma leptostachyum</i>		
	<i>Lepidosperma squamatum</i>		
	<i>Lepidosperma tenue</i>		
	<i>Mesomelaena tetragona</i>		
Dennstaedtiaceae	<i>Tetralia capillaris</i>		
	<i>Pteridium esculentum</i>		
Dilleniaceae	<i>Hibbertia amplexicaulis</i>		
	<i>Hibbertia commutata</i>		

FAMILY NAME	LATIN NAME	NATURALISED
Dilleniaceae	<i>Hibbertia diamesogenos</i>	
	<i>Hibbertia hypericoides</i>	
	<i>Hibbertia notibractea</i>	
	<i>Hibbertia racemosa</i>	
	<i>Hibbertia stellaris</i>	
	<i>Hibbertia vaginata</i>	
Droseraceae	<i>Drosera erythrorhiza</i>	
	<i>Drosera glanduligera</i>	
	<i>Drosera huegelii</i>	
	<i>Drosera marchantii</i> subsp. <i>marchantii</i>	
	<i>Drosera pallida</i>	
	<i>Drosera stolonifera</i>	
Elaeocarpaceae	<i>Platytheca galioides</i>	
	<i>Tetratheca hirsuta</i>	
Ericaceae	<i>Astroloma ciliatum</i>	
	<i>Astroloma pallidum</i>	
	<i>Leucopogon australis</i>	
	<i>Leucopogon capitellatus</i>	
	<i>Styphelia tenuiflora</i>	
Fabaceae	<i>Acacia applanata</i>	
	<i>Acacia celastrifolia</i>	
	<i>Acacia extensa</i>	
	<i>Acacia lateriticola</i>	
	<i>Acacia melanoxylon</i>	*
	<i>Acacia nervosa</i>	
	<i>Acacia pulchella</i>	
	<i>Acacia saligna</i>	
	<i>Acacia stenoptera</i>	
	<i>Acacia urophylla</i>	
	<i>Bossiaea eriocarpa</i>	
	<i>Bossiaea ornata</i>	
	<i>Daviesia decurrens</i>	
	<i>Daviesia incrassata</i>	
	<i>Daviesia preissii</i>	
	<i>Gastrolobium capitatum</i>	
	<i>Gompholobium confertum</i>	
	<i>Gompholobium knightianum</i>	
	<i>Gompholobium marginatum</i>	
	<i>Gompholobium tomentosum</i>	
<i>Hovea chorizemifolia</i>		
<i>Hovea trisperma</i>		
<i>Kennedia coccinea</i>		
<i>Kennedia prostrata</i>		

FAMILY NAME	LATIN NAME	NATURALISED
Fabaceae	<i>Mirbelia dilatata</i>	
	<i>Sphaerolobium medium</i>	
Goodeniaceae	<i>Dampiera linearis</i>	
	<i>Lechenaultia biloba</i>	
	<i>Scaevola calliptera</i>	
	<i>Velleia trinervis</i>	
Haemodoraceae	<i>Anigozanthos bicolor</i>	
	<i>Anigozanthos manglesii</i>	
	<i>Conostylis aculeata</i>	
	<i>Conostylis pusilla</i>	
	<i>Conostylis serrulata</i>	
	<i>Haemodorum spicatum</i>	
Haloragaceae	<i>Glischrocaryon aureum</i>	
Hemerocallidaceae	<i>Caesia micrantha</i>	
	<i>Dianella revoluta</i>	
Iridaceae	<i>Patersonia occidentalis</i>	
	<i>Patersonia pygmaea</i>	
Juncaceae	<i>Juncus pallidus</i>	
Lamiaceae	<i>Hemiandra pungens</i>	
Lindsaeaceae	<i>Lindsaea linearis</i>	
Loganiaceae	<i>Logania serpyllifolia</i>	
Loranthaceae	<i>Nuytsia floribunda</i>	
Malvaceae	<i>Thomasia macrocarpa</i>	
Myrtaceae	<i>Astartea scoparia</i>	
	<i>Babingtonia camphorosmae</i>	
	<i>Calothamnus lateralis</i>	
	<i>Calothamnus pallidifolius</i>	
	<i>Calothamnus quadrifidus</i>	
	<i>Calytrix flavescens</i>	
	<i>Corymbia calophylla</i>	
	<i>Eucalyptus citriodora</i>	
	<i>Eucalyptus marginata</i>	
	<i>Hypocalymma angustifolium</i>	
	<i>Kunzea glabrescens</i>	
Myrtaceae	<i>Kunzea recurva</i>	
	<i>Melaleuca incana</i>	
	<i>Melaleuca preissiana</i>	
	<i>Pericalymma ellipticum</i>	
	<i>Rinzia fumana</i>	
Orchidaceae	<i>Caladenia flava</i> subsp. <i>flava</i>	
	<i>Caladenia macrostylis</i>	
	<i>Caladenia pectinata</i>	
	<i>Caladenia reptans</i> subsp. <i>reptans</i>	



FAMILY NAME	LATIN NAME	NATURALISED
Orchidaceae	<i>Caladenia splendens</i>	
	<i>Cyanicula sericea</i>	
	<i>Disa bracteata</i>	*
	<i>Diuris longifolia</i>	
	<i>Drakaea livida</i>	
	<i>Elythranthera brunonis</i>	
	<i>Elythranthera emarginata</i>	
	<i>Paracaleana nigrita</i>	
	<i>Pterostylis barbata</i>	
	<i>Pterostylis recurva</i>	
	<i>Pyrorchis nigricans</i>	
	<i>Thelymitra cornicina</i>	
	<i>Thelymitra crinita</i>	
	Oxalidaceae	<i>Oxalis glabra</i>
Phyllanthaceae	<i>Poranthera huegelii</i>	
Poaceae	<i>Aira caryophyllea</i>	*
	<i>Neurachne alopecuroidea</i>	
	<i>Rytidosperma setaceum</i>	
	<i>Tetrarrhena laevis</i>	
	<i>Vulpia myuros</i>	*
Proteaceae	<i>Adenanthos obovatus</i>	
	<i>Banksia bipinnatifida</i>	
	<i>Banksia dallanneyi</i>	
	<i>Banksia grandis</i>	
	<i>Banksia sessilis</i>	
	<i>Conospermum capitatum</i>	
	<i>Grevillea quercifolia</i>	
	<i>Hakea lissocarpha</i>	
	<i>Hakea ruscifolia</i>	
	<i>Hakea undulata</i>	
	<i>Isopogon crithmifolius</i>	
	<i>Persoonia longifolia</i>	
	<i>Petrophile linearis</i>	
	<i>Stirlingia simplex</i>	
	<i>Synaphea damopsis</i>	
<i>Xylomelum occidentale</i>		
Restionaceae	<i>Desmocladius fasciculatus</i>	
	<i>Loxocarya cinerea</i>	
Rhamnaceae	<i>Trymalium ledifolium</i>	
Rubiaceae	<i>Opercularia apiciflora</i>	
	<i>Opercularia hispidula</i>	
Rutaceae	<i>Boronia crenulata</i>	
	<i>Boronia spathulata</i>	

<b>FAMILY NAME</b>	<b>LATIN NAME</b>	<b>NATURALISED</b>
Stylidiaceae	<i>Levenhookia pusilla</i>	
	<i>Stylidium amoenum</i>	
	<i>Stylidium brunonianum</i>	
	<i>Stylidium ciliatum</i>	
	<i>Stylidium crassifolia</i>	
Thymelaeaceae	<i>Pimelea suaveolens</i>	
Xanthorrhoeaceae	<i>Xanthorrhoea gracilis</i>	
	<i>Xanthorrhoea preissii</i>	
Zamiaceae	<i>Macrozamia riedlei</i>	

## Appendix 3 Quadrat Data

**QUADRAT: COLLØ1**  
**LOCATION: Collie Motorplex, Collie**  
**NORTHING: 6299937 m N; EASTING: 0430492 m E**  
**LANDSCAPE POSITION: Upper slope**  
**SOIL: Grey brown loamy sand with gravel**  
**CONDITION: Very Good**

LATIN NAME	COVER
<i>Acacia applanata</i>	1
<i>Acacia nervosa</i>	1
<i>Astroloma pallidum</i>	1
* <i>Aira caryophyllea</i>	1
<i>Banksia bipinnatifida</i>	1
<i>Banksia dallanneyi</i>	1
<i>Bossiaea ornata</i>	3
<i>Caladenia flava</i> subsp. <i>flava</i>	1
<i>Chamaescilla corymbosa</i>	1
<i>Conostylis aculeata</i>	1
<i>Corymbia calophylla</i>	2
<i>Craspedia variabilis</i>	2
<i>Dampiera linearis</i>	1



<i>Desmocladius fasciculatus</i>	1
<i>Drosera huegelii</i>	1
<i>Drosera erythrorhiza</i>	1
<i>Drosera platystigma</i>	1
<i>Eucalyptus marginata</i>	4
<i>Hakea lissocarpha</i>	1
<i>Hibbertia diamesogenos</i>	1
<i>Hibbertia hypericoides</i>	3
<i>Hydrocotyle callicarpa</i>	1
<i>Lagenophora huegelii</i>	2
<i>Lomandra sericea</i>	1
<i>Platytheca galioides</i>	1
<i>Stylidium brunonianum</i>	1
<i>Tetraria capillaris</i>	1
<i>Thelymitra cornicina</i>	1
<i>Trachymene pilosa</i>	1
<i>Trichocline spathulata</i>	1
<i>Trymalium ledifolium</i>	1
<i>Xanthorrhoea gracilis</i>	1
<i>Xanthorrhoea preissii</i>	2
<i>Xanthosia candida</i>	1



COLLØ1 – SW corner



COLLØ1 – NE corner

**QUADRAT: COLLØ2**  
**LOCATION: Collie Motorplex, Collie**  
**NORTHING: 6301017 m N; EASTING: 0429571 m E**  
**LANDSCAPE POSITION: Lower slope**  
**SOIL: Grey brown loamy sand**  
**CONDITION: Very good**

LATIN NAME	COVER
<i>Acacia applanata</i>	1
<i>Acacia extensa</i>	2
<i>Acacia pulchella</i>	1
<i>Astartea scoparia</i>	1
* <i>Aira caryophyllea</i>	1
<i>Babingtonia camphorosmae</i>	1
<i>Banksia bipinnatifida</i>	1
<i>Bossiaea eriocarpa</i>	2
<i>Bossiaea ornata</i>	2
<i>Caladenia reptans</i> subsp. <i>reptans</i>	1
<i>Chamaescilla corymbosa</i>	1
<i>Conostylis pusilla</i>	1
<i>Corymbia calophylla</i>	1
<i>Craspedia variabilis</i>	1
<i>Cyanicula sericea</i>	1
<i>Cyathochaeta avenacea</i>	1

<i>Daviesia incrassata</i>	1
<i>Daviesia preissii</i>	1
<i>Desmocladius fasciculatus</i>	1
* <i>Disa bracteata</i>	1
<i>Drosera marchantii</i> subsp. <i>marchantii</i>	1
<i>Eucalyptus marginata</i>	4
<i>Helichrysum luteoalbum</i>	1
<i>Hibbertia amplexicaulis</i>	1
<i>Hibbertia hypericoides</i>	3
<i>Hovea chorizemifolia</i>	1
<i>Hypocalymma angustifolium</i>	1
<i>Isotoma hypocrateriformis</i>	1
* <i>Hypochaeris glabra</i>	1
<i>Lagenophora huegelii</i>	1
<i>Levenhookia pusilla</i>	1
<i>Millotia tenuiflora</i>	1
<i>Neurachne alopecuroidea</i>	1
<i>Persoonia longifolia</i>	1
<i>Podolepis gracilis</i>	1
<i>Rhodanthe citrina</i>	1
<i>Stylidium brunonianum</i>	1
<i>Tetraria capillaris</i>	1
<i>Thysanotus tenellus</i>	1
<i>Thysanotus thyrsoides</i>	1
<b>LATIN NAME</b>	<b>COVER</b>
<i>Trachymene pilosa</i>	1
<i>Trymalium ledifolium</i>	1
* <i>Vulpia myuros</i>	1
<i>Xanthorrhoea preissii</i>	2
<i>Xylomelum occidentale</i>	2





COLLØ2 – SW corner



COLLØ2 – NE corner

## **APPENDIX 5**

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### **Fauna Assessment of Collie Motorplex Proposed Clearing Areas Cardiff**

**Fauna Assessment  
of  
Collie Motorplex  
Proposed Clearing Areas  
Cardiff**

DECEMBER 2013

*Version 1*

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FIGURE 1:	Study Areas & Surrounds
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FIGURE 3:	Fauna Habitats
FIGURE 4:	Habitat Trees (DBH >50cm)

## **PLATES**

- PLATE 1: Open-forest of jarrah-marri-sheoak with a range of understorey species – Area B.
- PLATE 2: Low Open Woodland of *Melaleuca* sp. – Area A.
- PLATE 3: Man-made dam – Area A
- PLATE 4: Planted non-endemic *Eucalyptus* species and man-made drain – Area A

## **APPENDICES**

- APPENDIX A: Conservation Categories
- APPENDIX B: Fauna Observed or Potentially in Study Area
- APPENDIX C: DPaW & EPBC Database Search Results
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## SUMMARY

This report details the results of a fauna assessment of two areas of land associated with the Collie Motorplex located in Cardiff near Collie (Figure 1). The two areas of investigation have been designated Area A and Area B and have a combined total area of about 63 hectares (ha). Area A covers about 20 ha and is over 65% cleared of native vegetation. Area B has a total area of about 43 ha, with about 18% of the native vegetation having been previously cleared (Figure 2).

It is understood that the owners/operators of the existing Motorplex are assessing the feasibility of expanding the existing complex. One of the two investigation areas will be selected for future development based on a range of criteria. Development in either area will require the clearing of some native vegetation and a range of investigations, including this fauna survey, have been undertaken in order to fully understand the suite of environmental values across the area.

It is anticipated that the information presented will be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats as part of any required approval process.

The scope of works was to conduct a level 1 fauna survey as defined by the Environmental Protection Authority (EPA 2004). Because some listed threatened species (i.e. several species of black cockatoo) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these particular species. The assessment has included a desktop study and two day reconnaissance survey.

Descriptions of the broadly defined fauna habitats, mainly based on the remaining vegetation units onsite are given below, with the extent of each identified unit being shown in Figure 3. Plates 1 to 4 illustrate the nature of the vegetation units/habitats present inside the boundary of the two study areas.

- Open-forest of jarrah-marri-sheoak with a range of understorey species as summarised by Maunsell (2004) (Plate 1). Total area about 41 ha (Area A ~6 ha, Area B ~35 ha);
- Low Open Woodland of *Melaleuca* sp. – this small area of vegetation is located in Area A and is subject to seasonal inundation/waterlogging (Plate 2). Total area about 0.5 ha (Area A ~0.5 ha, Area B = 0 ha);
- Man-made dam – A small man-made dam is present within the open low woodland area (Plate 3). Total area about 260 m<sup>2</sup> (Area A ~260 m<sup>2</sup>, Area B = 0 m<sup>2</sup>);
- Plantation and rehabilitation areas - Some sections of the study area have been planted with non-endemic eucalypts and/or a range of shrubs (Plate 4). Total area about 2 ha (Area A ~1.7 ha, Area B ~0.3 ha);

- Man-made drain – A man-made drain is present with the plantation area located in Area A and would be subject to seasonal inundation/waterlogging (Plate 4).
- Existing cleared or partly cleared areas: Represented by the existing racetrack area and associated infrastructure including car parks and storage areas, some of which contain scattered trees and shrubs and also includes previously constructed mine roads and a decommissioned railway line. Total area about 19 ha (Area A ~12 ha, Area B ~7 ha).

Opportunistic fauna observations are listed in Appendix B. A total of 40 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the study area during the two day survey period. Three introduced species were also either seen or evidence of their presence found.

Evidence of two listed threatened species was observed (the forest red-tailed black-cockatoo – individuals heard calling and foraging evidence (chewed marri/jarrah fruits) and Baudin's black-cockatoo - individuals observed flying overhead/heard calling). Diggings attributed to the southern brown bandicoot (Department of Parks and Wildlife (DPaW) Priority 5 species) were found at a number of locations. No evidence of any migratory fauna species using the area was found.

The habitat tree assessment identified 681 specimens within the areas examined that fit the federal Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC 2012) criteria for black cockatoo breeding habitat (i.e. suitable tree species with a diameter at breast height (DBH) of >50cms) (Figure 4). A summary of the habitat trees identified and the area they were located is provided in Table 1.

Three hundred and fourteen (314) of the 681 trees were observed to contain hollows of some type with 38 assessed at the time to possibly have large enough hollows for black cockatoos to use for nesting though this assessment was based on the size of the entrance into an apparent hollow only. No actual evidence of any hollows being used by black cockatoos for nesting (currently or previously) was however seen.

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

Foraging evidence left by black cockatoos in the form of chewed jarrah and marri fruits were found at several; locations across the site. This evidence was attributed to the forest red-tailed black cockatoo, though it is possible that some of the chewed jarrah fruits were the result of foraging by Carnaby's black-cockatoo. Several forest red-tailed black cockatoo individuals were also heard calling during the survey period. No foraging evidence directly attributable to Baudin's black-cockatoos was seen though several individuals were observed flying overhead and calling during the survey period.

Almost all the remnant native vegetation within Area A (estimated to total ~6 ha) and Area B (estimated to total ~35 ha) can be regarded as representing foraging habitat for

black cockatoos due to the dominance of jarrah and to a lesser extent marri along with other subdominant species such as *Banksia and Allocasuarina*.

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

With respect to native vertebrate fauna, 22 mammals (including nine bat species), 101 bird, 38 reptile and 12 frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the study area at times.

Of the 172 native animals that are listed as potentially occurring in the area, eight are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law. In addition, three migratory species and six DPaW priority species may frequent the area at times.

Constraints on development within the study area will largely be centred on the presence of habitat used or potentially used by threatened fauna species in particular those listed under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, namely the three species of black cockatoo and to a lesser extent the western ringtail possum. Any proposed development may also compromise some Department of Environment Regulation (DER) criteria used when assessing clearing permits given the area is used or potentially used by a number of species of conservation significance including those mentioned above and also several additional species only listed under state legislation (*Wildlife Conservation Act 1950 (WC Act)*) or given priority status by DPaW. The potential impacts on these species and/or their habitat will therefore need to be taken into consideration during the planning process to minimise impacts and facilitate approvals.

The extent of clearing that may be required at the site is yet to be determined so impact *EPBC Act* threatened fauna species identified as utilising the site cannot be fully determined at this stage. The need to commence dialogue or submit a referral to DSEWPaC regarding this project should be assessed against relevant significant impact criteria once areas to be cleared are accurately defined.

A series of other recommendations aimed at mitigating and minimising potential impacts on fauna and fauna habitat in general are provided in Section 8. These should be taken into consideration during planning and development where considered reasonable and practicable.



## **1. INTRODUCTION**

This report details the results of a fauna assessment of two areas of land associated with the Collie Motorplex located in Cardiff near Collie (Figure 1). The study areas the subjects of this assessment are situated about 11.5 kilometres south east of the Collie townsite in south west Western Australia and are centred at approximately - 33.43535°S and 116.24489°E.

The two areas of investigation have been designated Area A and Area B (Figure 2). The sites have a combined total area of about 63 hectares (ha). Area A covers about 20 ha and is over 65% cleared of native vegetation. Area B has a total area of about 43 ha, with about 18% of the native vegetation having been previously cleared.

## **2. DEVELOPMENT PROPOSAL**

It is understood that the owners/operators of the existing Motorplex are assessing the feasibility of expanding the existing complex. Two potential areas have been identified (Area A and Area B – Figure 2), one of which will be selected for future development based on a range of criteria.

Development in either area will require the clearing of some native vegetation and a range of investigations, including this fauna survey, have been undertaken in order to fully understand the suite of environmental values across the area. The findings of this fauna survey and other investigations will be used to inform and support the selection of the final development area based on identified opportunities and constraints.

It is anticipated that the information presented will be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats as part of any required approval process.

## **3. SCOPE OF WORKS**

The scope of works was to conduct a level 1 fauna survey as defined by the Environmental; Protection Authority (EPA 2004). Because some listed threatened species (i.e. several species of black cockatoo) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these species.



The fauna assessment has therefore included:

1. Level 1 Fauna Survey (to EPA standard).
2. Black Cockatoo habitat Assessment (“habitat trees” = DBH >50cm, existing and potential nest hollows, roosting habitat and foraging evidence); and
3. Report summarising results with management/planning recommendations and requirements under state and federal legislation

Note: For the purposes of this report 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*.

## **4. METHODS**

### **4.1 POTENTIAL FAUNA INVENTORY - DESKTOP STUDY**

#### **4.1.1 Database Searches**

Searches of the following databases were undertaken to aid in the compilation of a list of vertebrate fauna potentially occurring within the study area:

- DPaW’s NatureMap Database Search (combined data from DPaW, Western Australian Museum, Birds Australia and consultants reports) (DPaW 2013b): and
- Protected matters search tool (Department of Sustainability, Environment, Water, Population and Communities – DSEWPaC 2013).

It should be noted that these lists are based on observations from a broader area than the study site and therefore may include species that would only ever occur as vagrants in the actual study area due to a lack of suitable habitat or the presence of only marginal habitat. The databases also often included very old records and in some cases the species in question have become locally or regionally extinct.

Information from these sources should therefore be taken as indicative only and local knowledge and information needs also to be taken into consideration when determining what actual species may be present within the specific area being investigated.

#### **4.1.2 Previous Fauna Surveys in the Area**

Fauna surveys, assessments and reviews have been undertaken in nearby areas in the past, though not all are publically available and could not be referenced. The



most significant of those available have been used as the primary reference material for compiling the potential fauna assemblage for the general area.

Those reports referred to included, but were not limited to:

- Bancroft, W. and Bamford, M. (2006). Fauna Survey of the Muja South Extension Project. Unpublished report for Griffin Coal.
- Bancroft, W.J., Metcalf, B.M. and Bamford, M.J (2006). Fauna survey of Griffin Coal's Ewington II and Buckingham sites, January 2006. Unpublished report prepared for Kellogg Brown and Root (KBR) Pty Ltd on behalf of Griffin Coal Mining Company Pty Ltd.
- Bancroft, W. J. and Bamford, M. J. (2007). Fauna survey of Griffin Coal's Buckingham site, September 2006. Unpublished report to Griffin Coal Mining Co Pty Limited.
- Bancroft, W.J. Metcalf, B.M. and Bamford, M.J (2007). Fauna values of Griffin Coal's proposed Ewington conveyor alignment. Unpublished report prepared for The Griffin Group.
- Bancroft, W.J. and Bamford, M.J (2008). Inspection of Griffin Coal's proposed Ewington powerline clearing zones for Black-Cockatoo nesting activity, August 2008. Unpublished report prepared for The Griffin Group.
- Coffey Environments (2008). Fauna Relocation Program at Ewington Mine Site, Collie. Unpublished letter report prepared for The Griffin Coal Mining Company Pty Ltd by Coffey Environments. May 2008.
- Ecologia (1991). Ewington Consultative Environmental Review: Fauna Survey. Prepared for Halpern Glick Maunsell on behalf of Griffin Coal Mining Company. January 1991.
- GHD (2008). Collie Shotts Industrial Park, Spring Flora, Fauna and Wetland Assessment. Unpublished report for LandCorp.
- GHD (2009). Level 1 Fauna Assessment - Collie Urea Project. Unpublished report for Perdaman Industries.
- Griffin Coal (2008). Ewington Mining Operations Environmental Management Programme - Fauna Management Plan.





- Halpern Glick Maunsell (1994). Notice of Intent for: Ewington II Open-Cut Mine. Prepared on behalf of the Griffin Coal Mining Company Pty Ltd. July 1994.
- Halpern Glick Maunsell (2002). South West Project Strategic Environmental Review. Unpublished report for Griffin Energy.
- Harewood, G. (2010). Fauna Survey (Level 2) - Buckingham Way - Collie - Residential Development. Unpublished report for Strategen.
- Harewood, G. (2013). Fauna Assessment - Coalfields Highway Realignment (15.9 SLK to 26.3 SLK) Allanson. Unpublished report for RPS/MRWA.
- Maunsell (2003). Bluewater's Power Station Flora and Fauna Survey. Unpublished report for Griffin Energy.
- Maunsell (2004). Ewington I Open-Cut Mine: Environmental Management Programme. Prepared for Griffin Coal Mining Company, May 2004.
- Tonga, J. (2008). Ewington Mine Micro Bat Survey. Unpublished report prepared for Griffin Coal Mining Company by Natsync Environmental. May 2008.

As with the databases searches some reports refer to species that would not occur in the study area due to a lack of suitable habitat (extent and/or quality) and this fact was taken into consideration when compiling the potential fauna species list for the study area. It should also be noted that the NatureMap database is likely to include some records from previous fauna surveys in the area including some of those listed above.

#### **4.1.3 Existing Publications**

The following represent the main publications used to identify and refine the potential fauna species list for the study area:

- Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.
- Bush, B., Maryan, B., Browne-Cooper, R. & Robinson, D. (2007). Reptiles and Frogs in the Bush: Southwestern Australia. UWA Press, Nedlands.
- Churchill, S. (2008). Australian Bats. Second Edition, Allen & Unwin.



- Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.
- Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth Western Australia.
- Menkhorst, P. and Knight, F. (2011). A Field Guide to the Mammals of Australia. Oxford University Press, Melbourne.
- Morgan, D.L., Beatty, S.J., Klunzinger, M.W, Allen, M.G. and Burnham, Q.E (2011). Field Guide to the Freshwater Fishes, Crayfishes and Mussels of South Western Australia. Published by SERCUL.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1983). Lizards of Western Australia II: Dragons and Monitors. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.
- Van Dyck, S. & Strahan, R. Eds (2008). The Mammals of Australia. Third edition. Queensland Museum.
- Wilson, S. and Swan, G. (2013). A Complete Guide to Reptiles of Australia. Reed, New Holland, Sydney.

#### **4.1.4 Fauna of Conservation Significance**

The conservation significance of fauna species has been assessed using data from the following sources:

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Administered by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC);



- *Wildlife Conservation Act 1950 (WC Act)*. Administered by the Western Australian Department of Parks and Wildlife (DPaW) (Govt. of WA 2012);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and the
- DPaW Priority Fauna list. A non-legislative list maintained by the DPaW for management purposes (DPaW 2013a).

The *EPBC Act* also requires the compilation of a list of migratory species that are recognised under international treaties including the:

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

(Note - Species listed under JAMBA are also protected under Schedule 3 of the *WC Act*.)

All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as matters of national environmental significance (NES) under the *EPBC Act*.

The conservation status of all vertebrate fauna species listed as occurring or possibly occurring in the vicinity of the study area has been assessed using the most recent lists published in accordance with the above-mentioned instruments and is indicated as such in the fauna listings of this report. A full listing of conservation codes are provided in Appendix A.

A number of other species not listed in official lists can also be considered of local or regional conservation significance. These include species that have a restricted range, those that occur in breeding colonies and those at the limit of their range.

While not classified as rare, threatened or vulnerable under any State or Commonwealth legislation, a number of bird species have been listed as of significance on the Swan Coastal portion of the Perth Metropolitan Region (Bush Forever - Government of Western Australia 1998 and 2000). The bird species are often referred to as Bush Forever Decreaser Species. The three categories used for birds within the Bush Forever documents are:





- Habitat specialists with reduced distribution on the Swan Coastal Plain (code Bh)
- Wide ranging Species with reduced population's on the Swan Coastal Plain. (code Bp)
- Extinct in the Perth region (code Be)

Other fauna species of regional significance due to declining populations on the Swan Coastal Plain, especially between Mandurah and Busselton, include the honey possum and pygmy possum (Dell 2000).

While the study area is not on the coastal plain, the presence of Bush Forever species should be taken into some consideration when determining the fauna values of an area. Bush Forever decreaser species are indicated as such within the species list held in Appendix B.

#### 4.1.5 Invertebrates

It can be difficult to identify what may be significant invertebrate species (e.g. Short Range Endemics - SREs) as there are uncertainties in determining the range-restrictions of many species due to lack of surveys, lack of taxonomic resolutions within target taxa and problems in identifying certain life stages. Where invertebrates are collected during surveys, a high percentage are likely to be unknown, or for known species there can be limited knowledge or information on their distribution (Harvey 2002).

For this project, the assessment for conservation significant invertebrates has been limited to those listed by the DPaW and *EPBC Act* database searches (which rely on distribution records and known habitat preferences). No assessment of the potential for SREs to be present has been made.

#### 4.1.6 Taxonomy and Nomenclature

Taxonomy and nomenclature for fauna species used in this report is generally taken from the DPaW's WA Fauna Census Database which is assumed to follow Aplin and Smith (2001) for amphibians and reptiles, How *et al.* (2001) for mammals and Johnstone (2001) for birds.

Common names are taken from the Western Australia Museum (WAM) recognised primary common name listings when specified, though where common names are not provided they have been acquired from other publications. Sources include Wilson and Swan (2013), Van Dyck *et al.* (2013), Christidis and Boles (2008), Bush *et al.* (2007), Bush *et al.* (2002), Tyler *et al.* (2000), and Glauret (1961). Not all common names are generally accepted.



## **4.2 SITE SURVEYS**

The daytime reconnaissance surveys of the site were carried out on the 9 and 10 October, 2013. All survey work was carried out by Greg Harewood (B.Sc. Zoology).

### **4.2.1 Fauna Habitat Assessment**

Vegetation units, landforms and soils observed during the site survey have been used to define broad fauna habitat types present within the study area. The main aim of the habitat assessment was to determine if it was likely that any species of conservation significance would be utilising the areas that maybe impacted on as a consequence of development at the site. The habitat information obtained was also used to aid in finalising the overall potential fauna list.

As part of the desktop literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the field survey the habitats within the study area were assessed and specific elements identified, if present, to determine the likelihood of listed threatened species utilising the area and its significance to them.

### **4.2.2 Opportunistic Fauna Observations**

Opportunistic observations of fauna species were made during all field survey work which involved a series of close spaced transects across the site during the day while searching microhabitats such as logs, rocks, leaf litter and observations of bird species with binoculars. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

### **4.2.3 Black Cockatoo Habitat Assessment**

The black cockatoo habitat assessment included a:

- **Habitat tree survey:** This involved the identification of all suitable trees species within the study area that have a Diameter at Breast Height (DBH) of over 50cm (irrespective of the presence/absence of suitable hollows – DSEWPaC (2012) criteria). The location of each tree identified was recorded with a GPS and details on tree species, number and size of hollows (if any) noted. Trees with hollows were marked with “H” using spray paint.

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



For the purposes of this study a potential cockatoo nest hollow was 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 any of the three black cockatoo species for the purpose of nesting/breeding. Hollows that had an entrance greater than about 12cm in diameter and would allow the entry of a cockatoo (white tailed or red-tailed) 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 to flush any sitting birds from hollows and calls of chicks were also listened for.

- Black cockatoo foraging assessment: The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded.
- Roosting habitat survey: Direct and indirect evidence of black cockatoos roosting within trees on site was noted if observed (e.g. branch clippings, droppings or moulted feathers).

## 5. 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.

Some fauna species are reported as potentially occurring within the study area based on there being suitable habitat (quality and extent) within the study area or immediately adjacent. With respect to opportunistic observations, the possibility exists that certain species may not have been detected during field investigations due to:

- seasonal inactivity during the field survey;
- species present within micro habitats not surveyed;
- cryptic species able to avoid detection; and





- transient wide-ranging species not present during the survey period.

Lack of observational data on some species should therefore not necessarily be taken as an indication that a species is absent from the site.

The habitat requirements and ecology of many of the species known to occur in the wider area are often not well understood or documented. It can therefore be difficult to exclude species from the potential list based on a lack of a specific habitat or microhabitat within the study area. As a consequence of this limitation the potential fauna list produced is most likely an overestimation of those species that actually utilise the study area for some purpose. Some species may be present in the general area but may only use the study area itself on rare occasions or as vagrants/transients.

In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any fauna species that would possibly occur within the study area (or immediately adjacent), as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the Author, has been assumed to potentially occur in the study area.

During the black cockatoo 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 be worse or better than this.

## **6. RESULTS**

### **6.1 POTENTIAL FAUNA INVENTORY - DESKTOP STUDY**

A list of fauna species considered most likely to occur in the study area has compiled from information obtained during the desktop study and is presented in Appendix B. This listing was refined after information gathered during the site reconnaissance survey was assessed. The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DPaW NatureMap database search results. The raw database search results from NatureMap (DPaW 2013b) and the Protected Matters Search Tool (DSEWPaC 2013) are contained within Appendix C.



The list of potential fauna takes into consideration that firstly the species in question is not known to be locally extinct and secondly that suitable habitat for each species, as identified during the habitat assessment, is present within the study area, though compiling an accurate list has limitations (see Section 5 above) and therefore as discussed the listing is likely to be an overestimation of the fauna species that actually use the site for some purpose.

## 6.2 SITE SURVEYS

### 6.2.1 Fauna Habitat Assessment

The Motorplex site falls within the Southern Jarrah Forest subregion of the greater Jarrah Forest Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) classification system (EA 2000; McKenzie *et al.* 2003). The general features of this bioregion were summarised as part of the Biodiversity Audit of Western Australia:

*“Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of speciesrich shrublands. The climate is Warm Mediterranean. Southern Jarrah Forest: South of Collie the plateau broadens and slopes gently to the south coast. Drainage is still dissected in the west but broadening and levelling of the surface in the east causes poor drainage and large and small wetlands. The ironstone becomes less evident being buried beneath sands. Rainfall is from 1200 mm in the south-west to 500 mm in the east. Vegetation comprises Jarrah - Marri forest in the west grading to Marri and Wandoo woodlands in the east. There are extensive areas of swamp vegetation in the south-east, dominated by Paperbarks and Swamp Yate. The understory component of the forest and woodland reflects the more mesic nature of this area. The majority of the diversity in the communities occurs on the lower slopes or near granite soils where there are rapid changes in site conditions.”* (Hearn *et al.* 2002).

The major vegetation complexes of the broader Collie area were summarised by Mattiske Consulting and reported in Maunsell (2004). Vegetation in the vicinity of the Motorplex supports the Collie Complex, as described in Maunsell (2004):

“consisting of an open-forest of jarrah-marri-sheoak with a range of understorey species that reflect the relative proportion of sand and gravel in the soils.

Those species commonly associated with gravelly soils include *Banksia grandis*, *Persoonia longifolia*, *Hibbertia hypercoides*, *Leucopogon capitellatus*, *Bossiaea ornata*, *Acacia browniana*, *Hakea lissocarpha* and *Astroloma pallidum*.



On the sandier soils common plant species include *Xylomelum occidentale*, *Daviesia incrassata*, *Bossiaea eriocarpa*, *Lyginia barbata* (formerly *Lyginia tenax*), *Dasypogon bromeliifolius* and species of *Calytrix*.”

Descriptions of the broadly defined fauna habitats, mainly based on the remaining vegetation units onsite are given below, with the extent of each identified unit being shown in Figure 3. Plates 1 to 4 illustrate the nature of the vegetation units/habitats present inside the boundary of the two study areas.

- Open-forest of jarrah-marri-sheoak with a range of understorey species as summarised by Maunsell (2004) (Plate 1). Total area about 41 ha (Area A ~6 ha, Area B ~35 ha);
- Low Open Woodland of *Melaleuca* sp. – this small area of vegetation is located in Area A and is subject to seasonal inundation/waterlogging (Plate 2). Total area about 0.5 ha (Area A ~0.5 ha, Area B = 0 ha);
- Man-made dam – A small man-made dam is present within the open low woodland area (Plate 3). Total area about 260 m<sup>2</sup> (Area A ~260 m<sup>2</sup>, Area B = 0 m<sup>2</sup>);
- Plantation and rehabilitation areas - Some sections of the study area have been planted with non-endemic eucalypts and/or a range of shrubs (Plate 4). Total area about 2 ha (Area A ~1.7 ha, Area B ~0.3 ha);
- Man-made drain – A man-made drain is present with the plantation area located in Area A and would be subject to seasonal inundation/waterlogging (Plate 4).
- Existing cleared or partly cleared areas: Represented by the existing racetrack area and associated infrastructure including car parks and storage areas, some of which contain scattered trees and shrubs and also includes previously constructed mine roads and a decommissioned railway line. Total area about 19 ha (Area A ~12 ha, Area B ~7 ha).

## 6.2.2 Opportunistic Fauna Observations

Opportunistic fauna observations are listed in Appendix B. A total of 40 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the study area during the two day survey period. Three introduced species were also either seen or evidence of their presence found.

Evidence of two listed threatened species was observed (the forest red-tailed black-cockatoo – individuals heard calling and foraging evidence (chewed marri/jarrah





fruits) and Baudin’s black-cockatoo - individuals observed flying overhead/heard calling). Diggings attributed to the southern brown bandicoot (DPaW Priority 5 species) were found at a number of locations. No evidence of any migratory fauna species using the area was found.

### 6.2.3 Black Cockatoo Habitat Assessment

The habitat tree assessment identified 681 specimens within the areas examined that fit DSEWPac’s (2012) criteria for black cockatoo breeding habitat (i.e. suitable tree species with a diameter at breast height (DBH) of >50cms) (Figure 4). Most of the trees were jarrah (*E. marginata*) (581 specimens), while the balance were comprised of marri (*C. calophylla* - 100 specimens) and 10 unidentified species.

A summary of the habitat trees identified and the area they were located is provided in Table 1.

**Table 1: Summary of habitat trees (DBH >50cm)**

Area	Number of Trees >50cm DBH	Number of Trees with No Hollows Observed	Number of Trees with Small (<12cm entrance) Hollows	Number of Trees with Large (>12cm entrance) Hollows	Tree Species		
					Jarrah	Marri	Unknown*
“A”	122	84	30	8	107	12	3
“B”	559	283	245	31	474	78	7

\*Note: Unknown tree species were all dead individuals that could not be identified to species level.

Three hundred and fourteen (314) of the 681 trees were observed to contain hollows of some type with 38 assessed at the time to possibly have large enough hollows for black cockatoos to use for nesting though this assessment was based on the size of the entrance into an apparent hollow only. No actual evidence of any hollows being used by black cockatoos for nesting (currently or previously) was however seen.

Additional details on each observed “habitat tree” can be found in Appendix D.

Foraging evidence left by black cockatoos in the form of chewed jarrah and marri fruits were found at several; locations across the site. This evidence was attributed to the forest red-tailed black cockatoo, though it is possible that some of the chewed jarrah fruits were the result of foraging by Carnaby’s black-cockatoo. Several forest red-tailed black cockatoo individuals were also heard calling during the survey period. No foraging evidence directly attributable to Baudin’s black-cockatoos was



seen though several individuals were observed flying overhead and calling during the survey period.

Almost all the remnant native vegetation within Area A (estimated to total ~6 ha) and Area B (estimated to total ~35 ha) can be regarded as representing foraging habitat for black cockatoos due to the dominance of jarrah and to a lesser extent marri along with other subdominant species such as *Banksia* and *Allocasuarina*.

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

## **6.3 FAUNA INVENTORY – SUMMARY**

### **6.3.1 Vertebrate Fauna**

Table 2 summarises the number of vertebrate fauna species potentially occurring within or utilising at times the study area, based on results from the desktop study and observations made during the field assessment. A complete list of vertebrate fauna possibly inhabiting or frequenting the study area is located in Appendix B.

Not all species listed as potentially occurring within the study area in existing databases and publications (i.e. *EPBC Act* Threatened Fauna and Migratory species lists, DPaW's NatureMap database, various reports and publications) are shown in the expected listing in Appendix B. Some species have been excluded from this list based largely on the lack of suitable habitat at the study site and in the general area or known local extinction even if suitable habitat is present.

Despite the omission of some species it should be noted that the list provided is still very likely an over estimation of the fauna species utilising the site (either on a regular or infrequent basis) as a result of the precautionary approach adopted for the assessment. At any one time only a small proportion of the listed potential species would likely to be present.



**Table 2: Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)**

Group	Total number of potential species	Potential number of specially protected species	Potential number of migratory species	Potential number of priority species	Number of species observed - field survey 2013
Fish	0	0	0	0	0
Amphibians	12	0	0	0	0
Reptiles	38	1	0	1	2
Birds	104 <sup>3</sup>	4	3	2	35 <sup>1</sup>
Non-Volant Mammals	20 <sup>7</sup>	3	0	2	6 <sup>2</sup>
Volant Mammals (Bats)	9	0	0	1	0
<b>Total</b>	<b>183<sup>10</sup></b>	<b>8</b>	<b>3</b>	<b>6</b>	<b>43<sup>3</sup></b>

Superscript = number of introduced species included in total.

### 6.3.2 Vertebrate Fauna of Conservation Significance

A review of the *EPBC Act* threatened fauna list, DPaW’s Threatened Fauna Database and Priority List, unpublished reports and scientific publications identified 22 specially protected, priority or migratory vertebrate fauna species as potentially occurring in the general vicinity of the study area. Of these species, most that have no potential whatsoever to utilise the study area for any purpose have been omitted from the potential list for the site (Appendix B), principally due to lack of suitable habitat on-site (including extent and/or quality) or known local extinction.

In summary, three vertebrate fauna species of conservation significance were positively identified as utilising the study area for some purpose during the survey period, these being:

- *Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo – S1 (*WC Act*), Vulnerable (*EPBC Act*)  
Individuals of this species were heard calling during the field survey and foraging evidence observed (chewed marri and jarrah fruits). Almost all of the vegetation present represents foraging habitat for this species (e.g. marri trees, jarrah trees) and using DSEWPaC criteria the area also contains





potential breeding habitat (i.e. any suitable tree species with a DBH>50cm). May also roost on site though no evidence of this was found.

- *Calyptorhynchus baudinii* Baudin's Black Cockatoo - S1 (*WC Act*), Vulnerable (*EPBC Act*)  
Observed flying overhead and heard calling several times within the survey area and nearby. Almost all the remnant vegetation within the study area presents potential foraging habitat for this species. Larger trees (>50cm DBH) can be considered potential breeding habitat. This species may also roost on site on occasions though no roost trees observed.
- *Isodon obesulus fusciventer* Southern Brown Bandicoot – P5 (DPaW Priority Species)  
Evidence of this species foraging (diggings) in some sections of the study area observed.

Based on the habitats present and current documented distributions it is considered possible that six additional species may use the study site for some purpose at times, though, as no evidence of any using the study site at the time of the field survey was found, the status of some in the area remains uncertain.

These species are:

- *Ctenotus delli* Dell's Ctenotus – P4 (DPaW Priority Species)  
Potentially present though actual status onsite is difficult to determine. A single record from 2006 1.5km east of the study area (DPaW 2013). Most areas probably represent marginal habitat due to history of disturbance.
- *Morelia spilota imbricata* Southern Carpet Python - S4 (*WC Act*)  
Status onsite difficult to determine. Very few records near Collie. Most habitats look marginal due to sparse nature of groundcover. Typically only occurs in low densities.
- *Ardea alba* Great Egret – S3 (*WC Act*), Migratory (*EPBC Act*)  
Suitable habitat for this species is limited to the very small man made dam present in the western section of the area investigated. Listed as a potential species but would only occur very infrequently and for limited periods. Would not breed within the study area.
- *Ardea ibis* Cattle Egret – S3 (*WC Act*), Migratory (*EPBC Act*)  
Suitable habitat for this species is limited to the very small man made dam present in the western section of the area investigated. Listed as a potential species but would only occur very infrequently and for limited periods. Would not breed within the study area.



- *Falco peregrinus* Peregrine Falcon - S4 (WC Act),  
Study site may form part of larger home range for individuals of this species.  
No existing nest sites observed.
- *Tyto novaehollandiae* Masked Owl – P3 (DPaW Priority Species)  
Status on the site and in the general area difficult to determine. May frequent the area at times.
- *Merops ornatus* Rainbow Bee-eater – S3 (WC Act), Migratory (EPBC Act)  
Common seasonal visitor to south west and likely to forage and roost in sections of the study area. Possibly breeds in some sections of the study area where sandier ground conditions are present though population levels would not be significant as it usually breeds in pairs, rarely in small colonies (Johnstone and Storr 1998).
- *Phascogale tapoatafa ssp* Southern Brush-tailed Phascogale - S1 (WC Act).  
This species is known to persist in state forest and national park areas surrounding Collie and therefore it may frequent the study site.
- *Dasyurus geoffroyi* Chuditch - S1 (WC Act), Vulnerable (EPBC Act)  
This species is known to persist in state forest and national park areas surrounding Collie and therefore it may frequent the study site.
- *Pseudocheirus occidentalis* Western Ringtail Possum - S1 (WC Act), Vulnerable (EPBC Act)  
No evidence of this species observed which suggests low population densities at best. In general terms the vegetation appears largely unsuitable or at best marginal for WRPs to utilise. WRPs are however known to occur in some areas of bushland surrounding Collie and therefore their presence within some sections of the study area, if only infrequently, cannot be discounted.
- *Macropus irma* Western Brush Wallaby – P4 (DPaW Priority Species)  
This species is relatively common in the Collie area and is likely to frequent sections of the study area at times.
- *Falsistrellus mackenziei* Western False Pipistrelle - P4 (DPaW Priority Species)  
Potentially present with the study area when it is likely to forage and possibly roost given presence of suitable tree hollow.

Note: Habitat for some of these species on-site, while considered possibly suitable, may be marginal in extent/quality and species listed may only visit the area for short periods, or as rare/uncommon vagrants/transients.

A number of other species of conservation significance, while possibly present in the wider area (e.g. forested areas of the Darling Range), are not listed as potential species due to known localised extinction (and no subsequent recruitment from adjoining areas) and/or lack of suitable habitat and/or the presence of feral



predators. Details on conservation significant species and reasons for the omission of some from the potential listing are provided in Appendix E and Table 3.

Thirty two bird species that potentially frequent or occur in the study area are noted as Bush Forever Decreaser Species in the Perth Metropolitan Region (seven were sighted/identified as having used the study area during the survey). Decreaser species are a significant issue in biodiversity conservation in the Perth section of the coastal plain as there have been marked reductions in range and population levels of many sedentary bird species as a consequence of disturbance and land clearing (Dell & Hyder-Griffiths 2002).

### 6.3.3 Invertebrate Fauna

One species of conservation significant invertebrate species appeared in the DPaW or *EPBC Act* database searches (DPaW 2013b, DSEWPaC 2013), this being an unnamed cricket (*Pachysaga mungga*) which is listed a priority 3 by DPaW (DPaW 2013a and 2013b).

The actual status of this species in and near the study area is difficult to determine. The general areas history of disturbance (logging and frequent fires) would suggest the area represents marginal habitat for this species given the reduced ground cover and leaf litter. It therefore considered unlikely that any part of the possible clearing areas would represent an area of significance for this species given the extent of similar habitat in surrounding areas.

Additional information on both species can be found in Appendix E.

## 7. POTENTIAL IMPACTS AND DEVELOPMENT CONSTRAINTS

### 7.1 POTENTIAL IMPACTS OF DEVELOPMENT

In general the most significant potential impacts to fauna of any development include:

- Loss of vegetation/fauna habitat that may be used for foraging, breeding, roosting, or dispersal (includes loss of hollow bearing trees);
- Fragmentation of vegetation/fauna habitat which may restrict the movement of some fauna species;
- Modifications to surface hydrology, siltation of creek lines;





- Changes to fire regimes;
- Pollution (e.g. oil spills);
- Noise/Light/Dust;
- Spread of plant pathogens (e.g. dieback) and weeds;
- Potential increase in the number of predatory introduced species (e.g. cats);
- Death or injury of fauna during clearing and construction; and
- An increase in fauna road kills subsequent to development.

The location and extent of clearing that may take place has yet to be decided, however based on the habitats present and the maximum extent of clearing likely to be required the anticipated impacts on species of conservation significance previously recorded in the general area has been assessed, a summary of which is provided in Table 3 below. Additional information on specific fauna species is provided in Appendix E.

**Table 3: Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance (continues on following pages).**

Common Name	Genus & Species	Conservation Status	Habitat Present	Likelihood of Occurrence	Possible Impacts
Unnamed cricket	<i>Pachysaga munggai</i>	P3	Yes?/Marginal?	Possible but unlikely	Loss/modification of small areas of marginal habitat
Darling Range Heath Ctenotus	<i>Ctenotus dell</i>	P4	Yes/Marginal	Possible	Loss/modification of small areas of habitat
Southern Carpet Python	<i>Morelia spilota imbricata</i>	S4	Yes/Marginal	Possible	Loss/modification of small areas of habitat
Malleefowl	<i>Leipoa ocellata</i>	S1, Mig	No	Unlikely - species locally extinct.	None
Great Egret	<i>Ardea alba</i>	S3, Mig	Yes/Very Marginal	Possible but unlikely	Loss/modification of very small areas of man-made habitat
Cattle Egret	<i>Ardea ibis</i>	S3, Mig	Yes/Very Marginal	Possible but unlikely	Loss/modification of very small areas of man-made habitat
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	S3, Mig	No	Unlikely	None
Osprey	<i>Pandion haliaetus</i>	Mig	No	Unlikely	None



Common Name	Genus & Species	Conservation Status	Habitat Present	Likelihood of Occurrence	Possible Impacts
Peregrine Falcon	<i>Falco peregrinus</i>	S4	Yes	Possible	Loss/modification of some areas of habitat
Carnaby's Black Cockatoo	<i>Calyptorhynchus latirostris</i>	S1, EN	Yes	Possible	Loss/modification of some areas of habitat
Baudin's Black Cockatoo	<i>Calyptorhynchus baudinii</i>	S1, VU	Yes	Known to occur	Loss/modification of some areas of habitat
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	S1, VU	Yes	Possible	Loss/modification of some areas of habitat
Masked Owl (SW population)	<i>Tyto n. novaehollandiae</i>	P3	Yes	Possible	Loss/modification of some areas of habitat
Fork-tailed Swift	<i>Apus pacificus</i>	S3, Mig	Yes	Unlikely	None
Rainbow Bee-eater	<i>Merops ornatus</i>	S3, Mig	Yes	Possible	Loss/modification of some areas of habitat
Chuditch	<i>Dasyurus geoffroii</i>	S1, VU	Yes	Possible	Loss/modification of some areas of habitat
Numbat	<i>Myrmecobius fasciatus</i>	S1, VU	Yes	Unlikely - species locally extinct.	None
Southern Brush-tailed Phascogale	<i>Phascogale tapoatafa ssp</i>	S1	Yes	Possible	Loss/modification of some areas of habitat
Southern Brown Bandicoot	<i>Isodon obesulus fusciventer</i>	P5	Yes	Known to occur	Loss/modification of some areas of habitat
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	S1, VU	Yes/Marginal	Possible	Loss/modification of some small areas of habitat
Western Brush Wallaby	<i>Macropus irma</i>	P4	Yes	Possible	Loss/modification of some areas of habitat
Quokka	<i>Setonix brachyurus</i>	S1, VU	No	Unlikely	None
Western False Pipistrelle	<i>Falsistrellus mackenziei</i>	P4	Yes	Possible	Loss/modification of some areas of habitat



## 7.2 POTENTIAL CONSTRAINTS ON DEVELOPMENT

The primary constraint on any proposed development in either of the identified locations (i.e. Area A or Area B) will largely be related to the presence of habitat used or potentially used by threatened fauna species in particular those listed under the *EPBC Act*, namely the three species of black cockatoo, the chuditch and to a lesser extent the western ringtail possum. While the exact location and extent of clearing that may be required is unknown, the removal of almost any portion of native vegetation within either area has the potential to trigger the need for a federal referral to DSEWPaC to ensure compliance with the *EPBC Act* with respect to significant impact on the abovementioned fauna species.

The results of this assessment also suggest that criteria relating to fauna, used by the Department of Environment Regulation (DER) when assessing clearing permits may also be compromised, as any proposed clearing may impact on areas considered to have a relative “high level of biological diversity” or as being “necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia”. This conclusion is primarily based on the fact that the area is used or potentially used by a number of species of conservation significance including those mentioned above and also several additional species only listed under state legislation (*WC Act*) or given priority status by DPaW.

It is difficult to predict how any application to clear will be assessed by regulatory authorities as a range of factors (including some not related to fauna and therefore not assessed here) are taken into consideration when assessing a developments likely impact. For example, DSEWPaC referral guidelines (DSEWPaC 2012) state that: "In determining the potential significance of your action, the department will consider the particular circumstances of your case. This may include factors such as the suitability of the habitat, its connectivity, and the amount of habitat remaining in the region". It is understood that DER also take a similar approach when to assessing clearing permits.

As the proposed development project is located within large areas of relatively continuous native forest, similar in character to that contained within the project areas, impacts may not be considered as overly significant and clearing will be allowed subject to standard conditions that are relatively easy to comply with.

Proceeding with development in Area A is likely to be less constrained by fauna issues than Area B as it is already mostly cleared though other factors (flora, geotechnics) also need to be considered.





## 8. RECOMMENDATIONS

The following recommendations aimed at reducing the impact on fauna and fauna habitat as much as reasonable and practicable are provided for guidance during ongoing site selection, development planning and for the formulation of management plans. This listing is not exhaustive and management plans and offsets (if required) will need to be finalised after liaison with relevant regulatory advisers/authorities (e.g. DPaW/DER and DSEWPaC). It is recommended that:

- Planning for the development should aim to avoid the need to clear as much of the existing vegetation as possible. Existing disturbed/previously cleared areas should be used where possible. Reducing the area of vegetation requiring removal will minimise possible offset requirements that maybe set by DER/DSEWPaC if conditional approval is obtained.
- The need to commence dialogue or submit a referral to DSEWPaC regarding this project should be assessed against relevant significant impact criteria once site selection and planning for the development is finalised.
- Any proposed landscaping/plantings on site should utilise local seed stock that includes cockatoo food plants, specifically *Eucalyptus*, *Corymbia*, *Banksia*, *Hakea*, and *Allocasuarina*. The final selection of suitable species should be carried out after liaison with appropriate experts or local land care groups to ascertain which species are most suitable for the area. Dieback resistant species may need to be utilised if the spread of the disease in rehabilitated areas cannot be managed.
- During site works areas requiring clearing should be clearly marked and access to other areas restricted to prevent accidental clearing of areas to be retained.
- No dead, standing or fallen timber should be removed unnecessarily. Logs (hollow or not) and other debris resulting from land clearing should be used to enhance fauna habitat in untouched and rehabilitated areas if possible.
- During clearing operations a suitably experienced “fauna spotter” should be employed to inspect logs and hollow trees (where possible) before clearing to reduce likelihood of injury to fauna. If feasible any fauna encountered should be relocated to retained suitable habitat.
- A Construction and Operations Fire Management Plan should be prepared to reduce the risk of unplanned fires and provide contingency measures to minimise any associated impacts. The plan will include a contingency and



response plan in the event of any bushfires that commence as a result of the works on site.

- Native fauna injured during clearing or normal site operations should be taken to a designated veterinary clinic or a DPaW nominated wildlife carer.
- Any trenching required for services should be kept open for only as long as necessary and suitable escape ramps (45°) and bridging provided if the site is to be left unattended for extended periods (>1day). Significant sized trenches should be inspected for fauna immediately prior to filling.

## 9. CONCLUSION

The fauna assessment of the two potential development areas was undertaken for the purposes of categorising the fauna assemblages and identifying fauna habitats. A targeted assessment of the areas value as black cockatoo habitat was also carried out.

With respect to native vertebrate fauna, 22 mammals (including nine bat species), 101 bird, 38 reptile and 12 frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise sections of the study area at times.

Of the 172 native animals that are listed as potentially occurring in the area, eight are considered to be endangered/vulnerable or in need of special protection under State and/or Federal law. In addition, three migratory species and six DPaW priority species may frequent the area at times.

Constraints on development within the study area will largely be centred on the presence of habitat used or potentially used by threatened fauna species in particular those listed under the *EPBC Act*, namely the three species of black cockatoo and to a lesser extent the western ringtail possum. Any proposed development may also compromise some DER criteria used when assessing clearing permits given the area is used or potentially used by a number of species of conservation significance including those mentioned above and also several additional species only listed under state legislation (*WC Act*) or given priority status by DPaW. The potential impacts on these species and/or their habitat will therefore need to be taken into consideration during the planning process to minimise impacts and facilitate approvals.

The extent of clearing that may be required at the site is yet to be determined so impact *EPBC Act* threatened fauna species identified as utilising the site cannot be



fully determined at this stage. The need to commence dialogue or submit a referral to DSEWPaC regarding this project should be assessed against relevant significant impact criteria once areas to be cleared are accurately defined.

A series of other recommendations aimed at mitigating and minimising potential impacts on fauna and fauna habitat in general are provided in Section 8. These should be taken into consideration during planning and development where considered reasonable and practicable.





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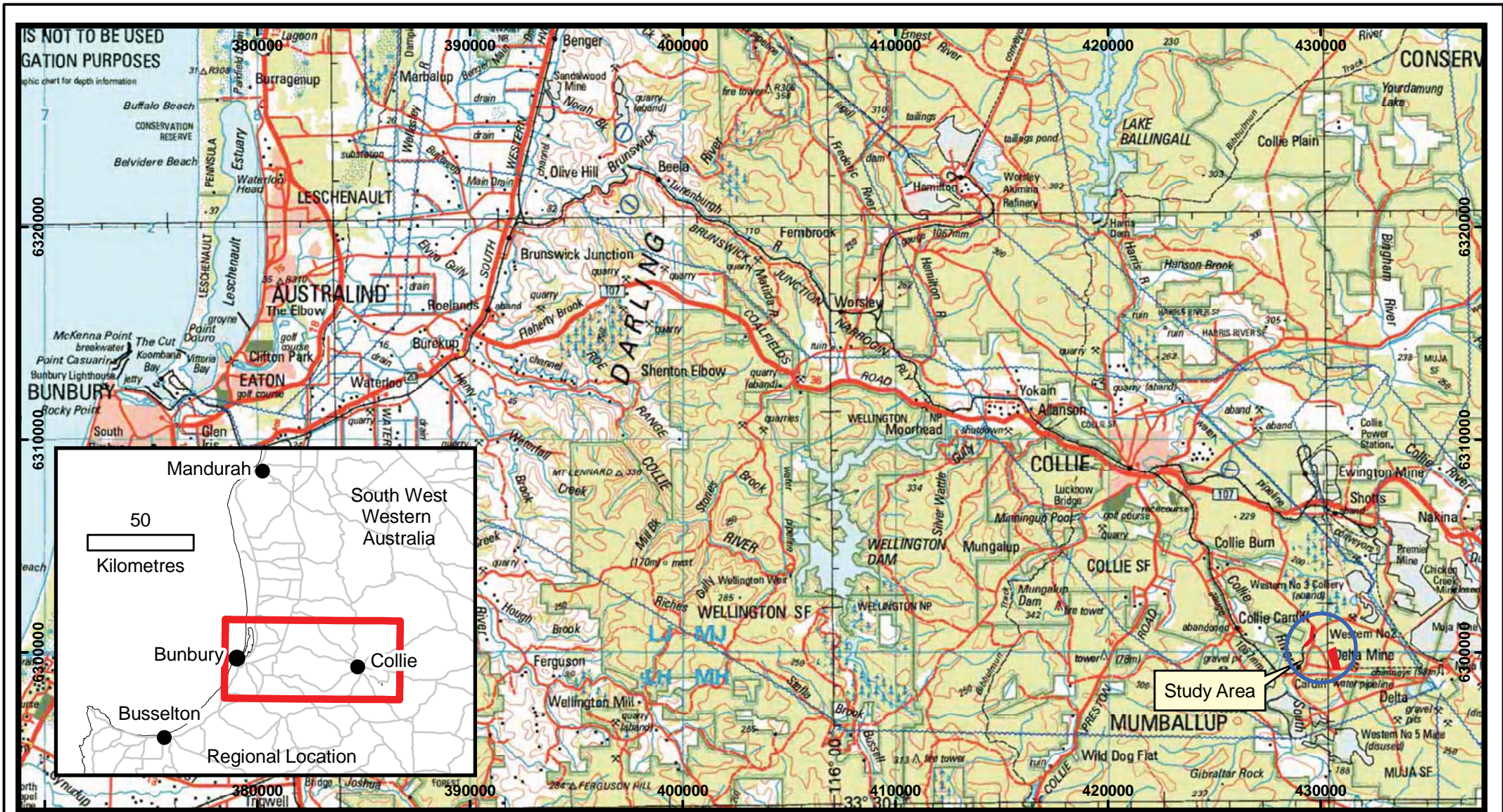
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# FIGURES







**Legend**

 Collie Motorplex Study Areas



0 2 4 6 8 10  
Kilometres  
MGA Zone 50




DRAWN: G Harewood  
DATE: Dec 2013  
SCALE: 1: 250,000

Collie Motorplex  
Cardiff  
**Study Areas  
and Surrounds**





**Legend**

 Collie Motorplex Study Areas



0 100 200 300 400 500

Metres

MGA Zone 50



DRAWN: G Harewood

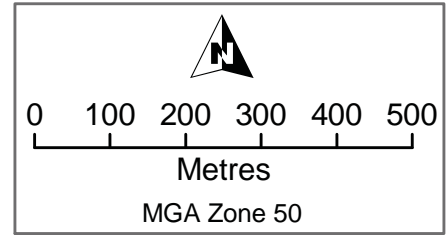
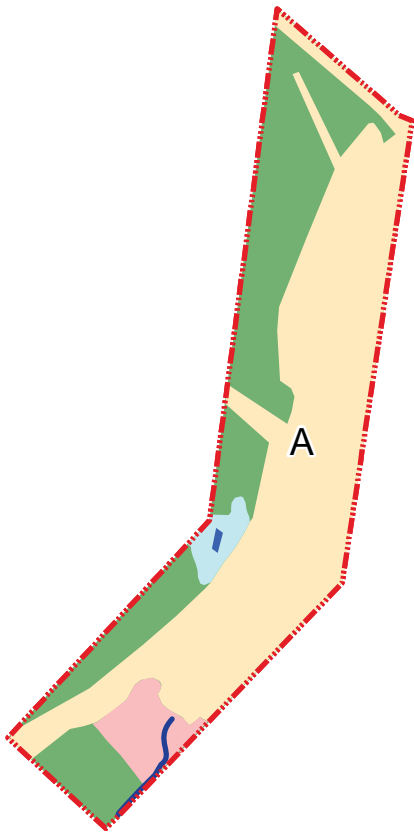
DATE: Dec 2013

SCALE: 1:10,000







Collie Motorplex  
Cardiff

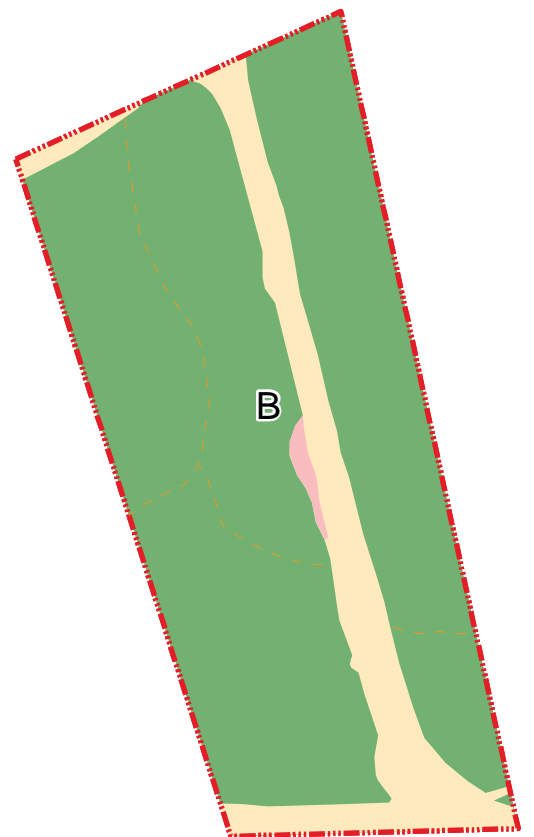
**Study Areas  
Air Photo**








**Fauna Habitats**

-  Open-forest of jarrah-marri-sheoak
-  Low Open Woodland of Melaleuca
-  Man-made Dam
-  Plantation and Rehabilitation areas
-  Man-made Drain
-  Existing cleared or partly cleared areas



**Legend**

-  Collie Motorplex Study Areas
-  Tracks

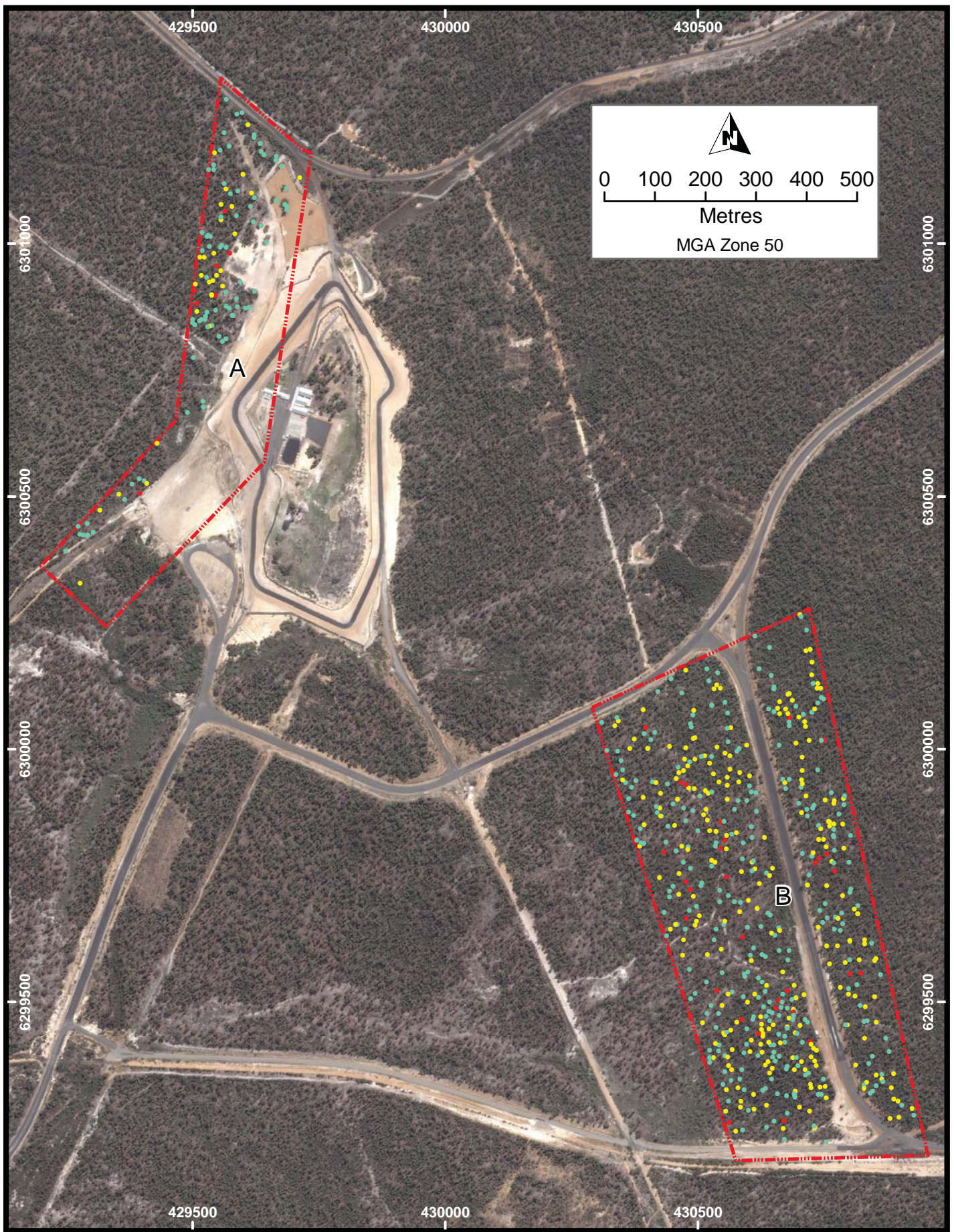


**Fauna Survey**  
DRAWN: G Harewood  
 DATE : Dec 2013  
 SCALE: 1:10,000





**Collie Motorplex  
 Cardiff**

**Fauna Habitats**





**Legend**

-  Collie Motorplex Study Areas
-  Tree >50cm DBH, no hollows seen (367)
-  Tree >50cm DBH, one or more hollows seen (275)
-  Tree >50cm DBH, one or more hollows possibly suitable for a Black Cockatoo (39)



DRAWN: G Harewood  
 DATE: Dec 2013  
 SCALE: 1:10,000

**Collie Motorplex  
 Cardiff**

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



# PLATES





Plate 1: Open-forest of jarrah-marri-sheoak with a range of understorey species – Area B.



Plate 2: Low Open Woodland of *Melaleuca* sp. – Area A.





Plate 3: Man-made dam – Area A.



Plate 4: Planted non-endemic *Eucalyptus* species and man-made drain – Area A.

# **APPENDIX A**

## **CONSERVATION CATEGORIES**



## EPBC Act (1999) Threatened Fauna Categories

Category	Code	Description
Extinct	E	There is no reasonable doubt that the last member of the species has died.
*Extinct in the wild	EW	A species (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
*Critically endangered	CE	A species is facing an extremely high risk of extinction in the wild in the immediate future.
*Endangered	EN	A species: (a) is not critically endangered; and (b) is facing a very high risk of extinction in the wild in the near future.
*Vulnerable	VU	A species (a) is not critically endangered or endangered; and (b) is facing a high risk of extinction in the wild in the medium-term future.
Conservation dependent	CD	A species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered
*Migratory	Migratory	(a) 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 (c) 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.
Marine	Ma	Species in the list established under s248 of the EPBC Act

Note: Only species in those categories marked with an asterisk are matters of national environmental significance under the *EPBC Act*.



### Western Australian Wildlife Conservation Act (1950) Threatened Fauna Categories

Category	Code	Description
Schedule 1	S1	<p>Fauna which is rare or likely to become extinct</p> <p>Threatened fauna (Schedule 1) are further ranked by the DEC according to their level of threat using IUCN Red List criteria:</p> <p><b>CR: Critically Endangered</b> - considered to be facing an extremely high risk of extinction in the wild.</p> <p><b>EN: Endangered</b> - considered to be facing a very high risk of extinction in the wild.</p> <p><b>VU: Vulnerable</b> - considered to be facing a high risk of extinction in the wild.</p>
Schedule 2	S2	Fauna which is presumed extinct
Schedule 3	S3	Birds which are subject to an agreement between the governments of Australia and Japan (JAMBA) relating to the protection of migratory birds and birds in danger of extinction
Schedule 4	S4	Fauna that is otherwise in need of special protection

### Western Australian DPaW Priority Fauna Categories

Category	Code	Description
Priority 1	P1	Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes..
Priority 2	P2	Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
Priority 3	P3	Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
Priority 4	P4	<p>(a) <b>Rare.</b> Taxa 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 taxa are usually represented on conservation lands.</p> <p>(b) <b>Near Threatened.</b> Taxa 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) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>
Priority 5	P5	Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

## IUCN Red List Threatened Species Categories

Category	Code	Description
Extinct	EX	Taxa for which there is no reasonable doubt that the last individual has died.
Extinct in the Wild	EW	Taxa which is known only to survive in cultivation, in captivity or and as a naturalised population well outside its past range and it has not been recorded in known or expected habitat despite exhaustive survey over a time frame appropriate to its life cycle and form.
Critically Endangered	CR	Taxa facing an extremely high risk of extinction in the wild.
Endangered	EN	Taxa facing a very high risk of extinction in the wild.
Vulnerable	VU	Taxa facing a high risk of extinction in the wild.
Near Threatened	NT	Taxa which has been evaluated but does not qualify for CR, EN or VU now but is close to qualifying or likely to qualify in the near future.
Least Concern	LC	Taxa which has been evaluated but does not qualify for CR, EN, VU, or NT but is likely to qualify for NT in the near future.
Data Deficient	DD	Taxa for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.

A full list of categories and their meanings are available at:

<http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>



# **APPENDIX B**

**FAUNA OBSERVED OR POTENTIALLY IN STUDY AREA**

# Fauna Observed or Potentially in Study Area

Collie Motorplex, Cardiff, W.A.

Approx Centroid -33.43535°S and 116.24489°E

Compiled by Greg Harewood - November 2013

Recorded (Trapped/Sighted/Heard/Signs) = X

A = Harewood, G. (2013b). Fauna Assessment of Collie Motorplex, Proposed Clearing Areas, Cardiff. Unpublished report for RPS.

B = Harewood, G. (2013a). Fauna Assessment Coalfields Highway Realignment (15.9 SLK to 26.3 SLK), Allanson. Unpublished report for RPS.

C = Harewood, G. (2010). Fauna Survey (Level 2) Buckingham Way, Collie. Unpublished report for Stategen.

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E = GHD (2009). Level 1 Fauna Assessment - Collie Urea Project. Unpublished report for Perdaman Industries.

F = GHD (2008). Collie Shotts Industrial Park, Spring Flora, Fauna and Wetland Assessment. Unpublished report for LandCorp.

G = Bancroft, W. and Bamford, M. (2006). Fauna Survey of the Muja South Extension Project. Unpublished report for Griffin Coal.

H = DPaW (2013). NatureMap Database search. "By Circle" 116°14' 42" E, 33°26' 07" S – Study area (plus 10 km buffer). 22 November 2013.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Amphibians</b>										
<b>Myobatrachidae</b>										
Ground or Burrowing Frogs										
<i>Crinia georgiana</i>	Quacking Frog	LC				X		X	X	X
<i>Crinia glauerti</i>	Glauert's Froglet	LC				X	X	X	X	X

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<i>Crinia pseudinsignifera</i>	Bleating Froglet	LC					X	X		
<i>Geocrinia leai</i>	Lea's Frog	LC					X	X		X
<i>Heleioporus barycragus</i>	Western Marsh Frog	LC							X	
<i>Heleioporus eyrei</i>	Moaning Frog	LC				X			X	X
<i>Heleioporus inornatus</i>	Whooping Frog	LC				X			X	X
<i>Heleioporus psammophilus</i>	Sand Frog	LC				X	X		X	
<i>Limnodynastes dorsalis</i>	Banjo Frog	LC				X			X	X
<i>Pseudophryne guentheri</i>	Güenther's Toadlet	LC							X	
<b>Hylidae</b>										
Tree or Water-Holding Frogs										
<i>Litoria adelaidensis</i>	Slender Tree Frog	LC							X	X
<i>Litoria moorei</i>	Motorbike Frog	LC							X	

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.



Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Reptiles</b>										
<b>Gekkonidae</b> Geckoes										
<i>Christinus marmoratus</i>	Marbled Gecko									
<i>Diplodactylus polyophthalmus</i>	Speckled Stone Gecko					X				
<i>Underwoodisaurus milii</i>	Barking Gecko									
<b>Pygopodidae</b> Legless Lizards										
<i>Aprasia pulchella</i>	Pretty Worm Lizard					X			X	X
<i>Aprasia repens</i>	Sand-plain Worm Lizard					X			X	
<i>Lialis burtonis</i>	Common Snake Lizard					X				
<i>Pygopus lepidopus</i>	Southern Scaleyfoot									

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Agamidae</b> Dragon Lizards										
<i>Pogona minor</i>	Western Bearded Dragon					X			X	
<b>Varanidae</b> Monitor's or Goanna's										
<i>Varanus gouldii</i>	Gould's Sand Monitor					X			X	
<i>Varanus rosenbergi</i>	Heath Monitor					X			X	

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Scincidae</b> Skinks										
<i>Acritoscincus trilineatum</i>	South-western Cool Skink					X			X	X
<i>Cryptoblepharus buchananii</i>	Fence Skink		X	X		X			X	X
<i>Ctenotus catenifer</i>	Chain-striped Heath Ctenotus									
<i>Ctenotus delli</i>	Dell's Skink	P4				X				X
<i>Ctenotus impar</i>	South-western Odd-striped Ctenotus					X			X	X
<i>Ctenotus labillardieri</i>	Red-legged Skink					X				
<i>Egernia kingii</i>	King's Skink									
<i>Egernia napoleonis</i>	Salmon-bellied Skink			X		X			X	X
<i>Egernia pulchra</i>	Spectacled Rock Skink									
<i>Hemiergus gracilipes</i>	Southwestern Mulch Skink					X				X

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.



Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<i>Hemiergus initialis</i>	Five-toed Earless Skink									
<i>Hemiergus peronii peronii</i>	Four-toed Mulch Skink									X
<i>Lerista distinguenda</i>	South-western Four-toed Lerista			X		X			X	X
<i>Lerista microtis microtis</i>	Southwestern Five-toed Lerista									
<i>Menetia greyii</i>	Dwarf Skink					X			X	
<i>Morethia obscura</i>	Dusky Morethia			X		X			X	X
<i>Tiliqua rugosa rugosa</i>	Western Bobtail		X	X	X	X		X	X	X
<b>Typhlopidae</b> Blind Snakes										
<i>Ramphotyphlops australis</i>	Southern Blind Snake					X			X	
<i>Ramphotyphlops pinguis</i>	Stout Blind Snake									X

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Boidae</b> Pythons, Boas										
<i>Morelia spilota imbricata</i>	Southern Carpet Python	S4 NT								
<b>Elapidae</b> Elapid Snakes										
<i>Echiopsis curta</i>	Bardick									
<i>Elapognathus coronatus</i>	Crowned Snake									
<i>Neelaps bimaculatus</i>	Black-naped Snake									
<i>Notechis scutatus</i>	Tiger Snake							X	X	X
<i>Parasuta gouldii</i>	Gould's Hooded Snake						X		X	
<i>Parasuta nigriceps</i>	Black-backed Snake									
<i>Pseudonaja affinis</i>	Dugite					X		X	X	X
<i>Simoselaps bertholdi</i>	Jan`s Banded Snake									

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Birds</b>										
<b>Casuariidae</b> Emus, Cassowaries										
<i>Dromaius novaehollandiae</i>	Emu	Bp LC	X							X
<b>Phasianidae</b> Quails, Pheasants										
<i>Coturnix ypsilophora</i>	Brown Quail	LC								X
<b>Anatidae</b> Geese, Swans, Ducks										
<i>Anas gracilis</i>	Grey Teal	LC								X
<i>Anas superciliosa</i>	Pacific Black Duck	LC				X	X	X	X	X
<i>Chenonetta jubata</i>	Australian Wood Duck	LC	X			X		X	X	X
<i>Tadorna tadornoides</i>	Australian Shelduck	LC								X

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<b>Ardeidae</b> Herons, Egrets, Bitterns										
<i>Ardea alba</i>	Great Egret	S3 Mig CA JA								
<i>Ardea ibis</i>	Cattle Egret	S3 Mig CA JA								
<i>Ardea pacifica</i>	White-necked Heron	LC								X
<i>Egretta novaehollandiae</i>	White-faced Heron	LC					X			X

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<b>Accipitridae</b> Kites, Goshawks, Eagles, Harriers										
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Bp LC		X					X	
<i>Accipiter fasciatus</i>	Brown Goshawk	Bp LC	X			X			X	
<i>Aquila audax</i>	Wedge-tailed Eagle	Bp LC		X		X			X	X
<i>Aquila morphnoides</i>	Little Eagle	Bp LC		X		X			X	
<i>Circus approximans</i>	Swamp Harrier	LC							X	
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC		X		X				
<i>Haliastur sphenurus</i>	Whistling Kite	Bp LC	X							
<i>Hamirostra isura</i>	Square-tailed Kite	Bp LC								

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<b>Falconidae</b> Falcons										
<i>Falco berigora</i>	Brown Falcon	Bp LC							X	
<i>Falco cenchroides</i>	Australian Kestrel	LC				X			X	X
<i>Falco longipennis</i>	Australian Hobby	LC								
<i>Falco peregrinus</i>	Peregrine Falcon	S4 Bp LC								X
<b>Turnicidae</b> Button-quails										
<i>Turnix varia</i>	Painted Button-quail	Bp LC				X				
<i>Turnix velox</i>	Little Button-quail	LC				X				
<b>Charadriidae</b> Lapwings, Plovers, Dotterels										
<i>Charadrius melanops</i>	Black-fronted Dotterel					X			X	

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<b>Columbidae</b> Pigeons, Doves										
<i>Columba livia</i>	Domestic Pigeon	Introduced								
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC								X
<i>Phaps chalcoptera</i>	Common Bronzewing	Bh LC	X	X	X	X	X	X	X	X
<i>Streptopelia senegalensis</i>	Laughing Turtle-Dove	Introduced								
<b>Cacatuidae</b> Cockatoos, Corellas										
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S1 VU Be VU A2c+3c+4c	X	X	X	X	X		X	X
<i>Calyptorhynchus baudinii</i>	Baudin`s Black-Cockatoo	S1 VU Bp VU C2a(ii)	X	X	X	X	X	X		X
<i>Calyptorhynchus latirostris</i>	Carnaby`s Black-Cockatoo	S1 EN Bp EN A2bcde+3bcd		X		X	X		X	X
<i>Eolophus roseicapilla</i>	Galah	LC			X	X				

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<b>Psittacidae</b>										
Parrots										
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	LC							X	X
<i>Neophema elegans</i>	Elegant Parrot	LC	X			X			X	X
<i>Platycercus icterotis icterotis</i>	Western Rosella (Western ssp)	Bp LC	X	X		X	X	X		X
<i>Platycercus spurius</i>	Red-capped Parrot	LC	X		X	X	X	X	X	X
<i>Platycercus zonarius</i>	Australian Ringneck Parrot	LC	X	X	X	X	X	X	X	X
<i>Polytelis anthopeplus</i>	Regent Parrot	LC								

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<b>Cuculidae</b> Parasitic Cuckoos										
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	LC	X			X		X	X	X
<i>Chrysococcyx basalis</i>	Horsfield's Bronze Cuckoo	LC				X			X	
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC	X		X	X			X	
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC				X		X	X	
<b>Strigidae</b> Hawk Owls										
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC		X		X				
<b>Tytonidae</b> Barn Owls										
<i>Tyto alba</i>	Barn Owl	LC								
<i>Tyto n. novaehollandiae</i>	Masked Owl (SW population)	P3 Bp								

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<b>Podargidae</b> Frogmouths										
<i>Podargus strigoides</i>	Tawny Frogmouth	LC				X			X	X
<b>Aegothelidae</b> Owlet-nightjars										
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC							X	
<b>Halcyonidae</b> Tree Kingfishers										
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced	X	X	X	X	X	X	X	X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC				X		X	X	X
<b>Meropidae</b> Bee-eaters										
<i>Merops ornatus</i>	Rainbow Bee-eater	S3 Mig JA LC		X		X			X	X
<b>Climacteridae</b> Trecreepers										
<i>Climacteris rufa</i>	Rufous Trecreeper	Bh		X		X				

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<b>Maluridae</b> Fairy Wrens, GrassWrens										
<i>Malurus elegans</i>	Red-winged Fairy-wren	Be LC		X	X	X				X
<i>Malurus splendens</i>	Splendid Fairy-wren	Bh LC	X	X		X	X	X	X	X

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<b>Pardalotidae</b>										
Pardalotes, Bristlebirds, Scrubwrens, Gerygones, Thornbills										
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	Bh LC	X	X	X	X	X		X	X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Bh LC	X	X		X		X	X	X
<i>Acanthiza inornata</i>	Western Thornbill	Bh LC	X	X	X	X			X	X
<i>Gerygone fusca</i>	Western Gerygone	LC	X	X	X	X	X	X	X	X
<i>Pardalotus punctatus</i>	Spotted Pardalote	LC			X	X			X	
<i>Pardalotus striatus</i>	Striated Pardalote	LC	X		X	X			X	X
<i>Sericornis frontalis</i>	White-browed Scrubwren	Bh LC		X		X		X	X	X
<i>Smicrornis brevirostris</i>	Weebill	Bh LC	X		X	X	X	X	X	X

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<b>Meliphagidae</b> Honeyeaters, Chats										
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	LC	X	X	X	X			X	X
<i>Anthochaera carunculata</i>	Red Wattlebird	LC	X	X	X	X	X	X	X	X
<i>Anthochaera lunulata</i>	Western Little Wattlebird	Bp	X						X	X
<i>Lichenostomus ornatus</i>	Yellow-plumed Honeyeater	Bh LC								
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC				X			X	
<i>Lichmera indistincta</i>	Brown Honeyeater	LC	X	X	X	X	X	X	X	X
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	LC								
<i>Melithreptus chloropsis</i>	Western White-naped Honeyeater	LC	X	X						X
<i>Phylidonyris melanops</i>	Tawny-crowned Honeyeater	Bp LC				X		X		
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater	Bp LC								

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<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Bp LC	X		X	X		X	X	X
<b>Petroicidae</b> Australian Robins										
<i>Eopsaltria australis</i>	Western Yellow Robin	Bh LC	X	X			X		X	X
<i>Eopsaltria georgiana</i>	White-breasted Robin	Bh LC		X						X
<i>Microeca fascinans</i>	Jacky Winter	LC					X			
<i>Petroica cucullata</i>	Hooded Robin	Bh				X				
<i>Petroica goodenovii</i>	Red-capped Robin	LC				X				
<i>Petroica multicolor</i>	Scarlet Robin	Bh LC	X	X	X	X	X		X	X
<b>Pomatostomidae</b> Babblers										
<i>Pomatostomus superciliosus ashbyi</i>	White-browed Babbler (Western spp)	P4	X							

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<b>Neosittidae</b>										
Sitellas										
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Bh LC	X	X	X	X			X	X
<b>Pachycephalidae</b>										
Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers										
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Bh LC	X	X		X	X	X	X	X
<i>Pachycephala pectoralis</i>	Golden Whistler	Bh LC	X	X	X	X	X		X	X
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC			X	X			X	X
<b>Dicruridae</b>										
Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo										
<i>Grallina cyanoleuca</i>	Magpie-lark	LC		X	X	X	X		X	X
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC	X	X	X	X	X	X	X	X
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC		X	X	X	X	X	X	X

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<b>Campephagidae</b> Cuckoo-shrikes, Trillers										
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC		X	X	X	X	X	X	X
<i>Lalage sueurii</i>	White-winged Triller	LC				X				
<b>Artamidae</b> Woodswallows, Butcherbirds, Currawongs										
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Bp LC		X		X		X	X	X
<i>Cracticus nigrogularis</i>	Pied Butcherbird	LC						X		
<i>Cracticus tibicen</i>	Australian Magpie	LC		X	X	X	X	X	X	X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC		X	X	X			X	X
<i>Strepera versicolor</i>	Grey Currawong	Bp LC							X	
<b>Corvidae</b> Ravens, Crows										
<i>Corvus coronoides</i>	Australian Raven	LC	X	X	X	X	X	X	X	X

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<b>Motacillidae</b> Old World Pipits, Wagtails										
<i>Anthus novaeseelandiae</i>	Australian Pipit	LC				X			X	
<b>Passeridae</b> Grass Finches, Mannikins, Sparrows										
<i>Stagonopleura oculata</i>	Red-eared Firetail	LC				X	X			
<b>Dicaeidae</b> Flowerpeckers										
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC								
<b>Hirundinidae</b> Swallows, Martins										
<i>Hirundo ariel</i>	Fairy Martin	LC				X				
<i>Hirundo neoxena</i>	Welcome Swallow	LC				X	X	X	X	X
<i>Hirundo nigricans</i>	Tree Martin	LC		X		X			X	X

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<b>Sylviidae</b>										
Old World Warblers										
<i>Cincloramphus cruralis</i>	Brown Songlark	LC								
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC								X
<b>Zosteropidae</b>										
White-eyes										
<i>Zosterops lateralis</i>	Grey-breasted White-eye	LC		X	X	X	X	X	X	X
<b>Mammals</b>										
<b>Tachyglossidae</b>										
Echidnas										
<i>Tachyglossus aculeatus</i>	Echidna	LC	X			X	X		X	X

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<b>Dasyuridae</b> Carnivorous Marsupials										
<i>Antechinus flavipes</i>	Yellow-footed Antechinus	LC				X	X		X	X
<i>Dasyurus geoffroii</i>	Chuditch	S1 VU VU C1				X	X		X	X
<i>Phascogale tapoatafa ssp</i>	Southern Brush-tailed Phascogale	S1 NT								X
<i>Sminthopsis gilberti</i>	Gilbert`s Dunnart	LC							X	
<b>Peramelidae</b> Bandicoots										
<i>Isoodon obesulus fusciventer</i>	Southern Brown Bandicoot	P5 LC	X			X			X	X
<b>Phalangeridae</b> Brush-tail Possums, Cuscuses										
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	LC	X	X	X	X	X	X	X	X
<b>Burramyidae</b> Pygmy Possums										
<i>Cercartetus concinnus</i>	Western Pygmy-possum	LC								X

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<b>Tarsipedidae</b>										
Honey Possum										
<i>Tarsipes rostratus</i>	Honey Possum	LC								
<b>Pseudocheiridae</b>										
Ringtail Possums										
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 VU VU C2a								X
<b>Macropodidae</b>										
Kangaroos, Wallabies										
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC	X	X	X	X	X	X	X	X
<i>Macropus irma</i>	Western Brush Wallaby	P4 NT				X	X	X	X	X
<b>Molossidae</b>										
Freetail Bats										
<i>Mormopterus planiceps</i>	Western Freetail Bat	LC			X				X	
<i>Tadarida australis</i>	White-striped Freetail-bat	LC			X	X				

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Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Vespertilionidae</b> Ordinary Bats										
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	LC			X	X			X	
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	LC			X					
<i>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4 VU A2c			X					
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC			X				X	
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	LC								
<i>Nyctophilus timoriensis</i>	Western Long-eared Bat	DD								
<i>Vespadelus regulus</i>	Southern Forest Bat	LC			X				X	

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Muridae</b> Rats, Mice										
<i>Mus musculus</i>	House Mouse	Introduced				X			X	
<i>Rattus fuscipes</i>	Western Bush Rat	LC								
<i>Rattus rattus</i>	Black Rat	Introduced								X
<b>Canidae</b> Dogs, Foxes										
<i>Canis lupus</i>	Dog	Introduced			X	X	X		X	
<i>Vulpes vulpes</i>	Red Fox	Introduced			X	X	X		X	
<b>Felidae</b> Cats										
<i>Felis catus</i>	Cat	Introduced			X					
<b>Suidae</b> Pigs										
<i>Sus scrofa</i>	Pig	Introduced	X			X	X			X

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status	A	B	C	D	E	F	G	H
<b>Leporidae</b> Rabbits, Hares										
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced	X	X		X	X	X	X	X

WC Act Status - S1 to S4, EPBC Act Status - EN = Endangered, VU = Vulnerable, EX = Extinct, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region. IUCN Red List Category Definitions LC = Least Concern - see Appendix A and <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

# **APPENDIX C**

## **DPaW & EPBC DATABASE SEARCH RESULTS**



# NatureMap - Invertebrates - Cardiff

Created By Greg Harewood on 22/11/2013

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Species Group** Invertebrates  
**Method** 'By Circle'  
**Centre** 116°14' 42" E,33°26' 07" S  
**Buffer** 10km

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	33939	<i>Cherax cainii</i> (Marron)			
2.	33988	<i>Pachysaga munggai</i> (cricket)		P3	

**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

<sup>1</sup> 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.

# NatureMap - Frogs - Cardiff

Created By Greg Harewood on 22/11/2013

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Species Group** Amphibians  
**Method** 'By Circle'  
**Centre** 116°14' 42" E,33°26' 07" S  
**Buffer** 10km

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	25398	<i>Crinia georgiana</i> (Quacking Frog)			
2.	25399	<i>Crinia glauerti</i> (Clicking Frog)			
3.	25404	<i>Geocrinia leai</i> (Ticking Frog)			
4.	25410	<i>Heleioporus eyrei</i> (Moaning Frog)			
5.	25411	<i>Heleioporus inornatus</i> (Whooping Frog)			
6.	25415	<i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
7.	25378	<i>Litoria adelaidensis</i> (Slender Tree Frog)			

**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

<sup>1</sup> 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.

# NatureMap - Reptiles - Cardiff

Created By Greg Harewood on 22/11/2013

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Species Group** Reptiles  
**Method** 'By Circle'  
**Centre** 116°14' 42" E,33°26' 07" S  
**Buffer** 10km

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
2.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
3.	30893 <i>Cryptoblepharus buehananii</i>			
4.	25035 <i>Ctenotus delli</i> (Dell's Ctenotus, Darling Range Heath Ctenotus)		P4	
5.	25047 <i>Ctenotus impar</i>			
6.	25100 <i>Egernia napoleonis</i>			
7.	30919 <i>Hemiergis gracilipes</i>			
8.	25118 <i>Hemiergis peronii</i> subsp. <i>tridactyla</i>			
9.	25131 <i>Lerista distinguenda</i>			
10.	25192 <i>Morethia obscura</i>			
11.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
12.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
13.	25285 <i>Ramphotyphlops pinguis</i>			
14.	25519 <i>Tiliqua rugosa</i>			

**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

<sup>1</sup> 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.

# NatureMap - Birds - Cardiff

Created By Greg Harewood on 22/11/2013

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Species Group** Birds  
**Method** 'By Circle'  
**Centre** 116°14' 42" E,33°26' 07" S  
**Buffer** 10km

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
2.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
3.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
4.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
5.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
6.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
7.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
8.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
9.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
10.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
11.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
12.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
13.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
14.	24731 <i>Calyptorhynchus banksii subsp. naso</i> (Forest Red-tailed Black-Cockatoo)		T	
15.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo (long-billed black-cockatoo), Baudin's Cockatoo)		T	
16.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
17.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
18.	24834 <i>Cincloramphus mathewsi</i> (Rufous Songlark)			
19.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
20.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
21.	25592 <i>Corvus coronoides</i> (Australian Raven)			
22.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
23.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
24.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
25.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
26.	25692 <i>Eopsaltria australis</i> (Yellow Robin)			
27.	24651 <i>Eopsaltria australis subsp. griseogularis</i> (Western Yellow Robin)			
28.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
29.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
30.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
31.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
32.	24735 <i>Glossopsitta porphyrocephala</i> (Purple-crowned Lorikeet)			
33.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
34.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
35.	25629 <i>Hirundo nigricans</i> (Tree Martin)			
36.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
37.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
38.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
39.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
40.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
41.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
42.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
43.	25679 <i>Pachycephala pectoralis</i> (Golden Whistler)			
44.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
45.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
46.	25695 <i>Petroica multicolor</i> (Scarlet Robin)			
47.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
48.	25587 <i>Phaps elegans</i> (Brush Bronzewing)			
49.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
50.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
51.	24745 <i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
52.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
53.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
54.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
55.	25613 <i>Rhipidura fuliginosa</i> (Grey Fantail)			
56.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
57.	25616 <i>Rhipidura rufiventris</i> (Northern Fantail)			
58.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
59.	30948 <i>Smicromnis brevirostris</i> (Weebill)			
60.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
61.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereve)			

**Conservation Codes**

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 X - Presumed extinct  
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 1 - Priority 1  
 2 - Priority 2  
 3 - Priority 3  
 4 - Priority 4  
 5 - Priority 5

<sup>1</sup> 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.

# NatureMap - Mammals - Cardiff

Created By Greg Harewood on 22/11/2013

**Kingdom** Animalia  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Species Group** Mammals  
**Method** 'By Circle'  
**Centre** 116°14' 42" E,33°26' 07" S  
**Buffer** 10km

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	25449 <i>Antechinus flavipes</i> (Yellow-footed Antechinus)			
2.	24088 <i>Antechinus flavipes</i> subsp. <i>leucogaster</i> (Yellow-footed Antechinus, Mardo)			
3.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
4.	24092 <i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)		T	
5.	24153 <i>Isoodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)		P5	
6.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
7.	24133 <i>Macropus irma</i> (Western Brush Wallaby)		P4	
8.	24146 <i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T	
9.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
10.	25508 <i>Phascogale tapoatafa</i> (Brush-tailed Phascogale)			
11.	34045 <i>Phascogale tapoatafa</i> subsp. (WAM M434) (Brush-tailed Phascogale (SW subsp), Wambenger)		T	
12.	24166 <i>Pseudocheirus occidentalis</i> (Western Ringtail Possum)		T	
13.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
14.	24145 <i>Setonix brachyurus</i> (Quokka)		T	
15.	24259 <i>Sus scrofa</i> (Pig)	Y		
16.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
17.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			

**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

<sup>1</sup> 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.



# EPBC Act Protected Matters Report

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

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

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

Report created: 22/11/13 16:24:35

[Summary](#)

[Details](#)

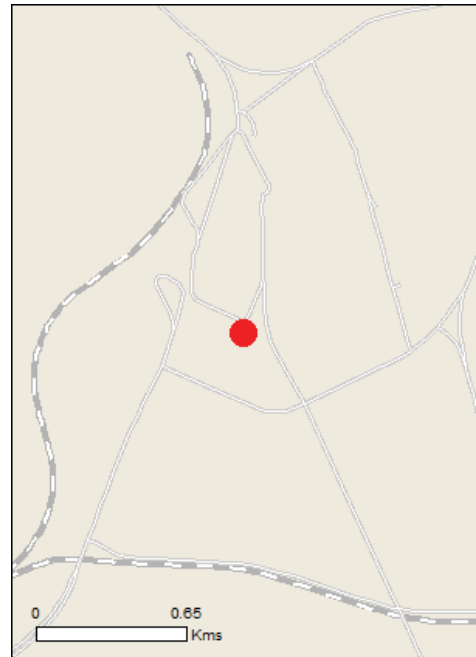
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

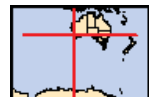
[Acknowledgements](#)



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

Buffer: 0.0Km



# 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>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Areas:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	8
<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 and the heritage values of a place on the Register of the National Estate.

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.

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>	6
<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="#">Place on the RNE:</a>	None
<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Invasive Species:</a>	15
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

## Details

### Matters of National Environmental Significance

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Breeding likely to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum [25911]	Vulnerable	Species or species habitat may occur within area
<a href="#">Setonix brachyurus</a> Quokka [229]	Vulnerable	Species or species habitat may occur within area
<b>Plants</b>		
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	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>		

Name	Threatened	Type of Presence
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

Listed Marine Species	<a href="#">[ Resource Information ]</a>	
* 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 [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may 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 WA RFA</a>	Western Australia

### Invasive Species

[ [Resource Information](#) ]

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

Name	Status	Type of Presence
------	--------	------------------

#### Birds

##### [Columba livia](#)

Rock Pigeon, Rock Dove, Domestic Pigeon [803]

Species or species habitat likely to occur within area

##### [Passer domesticus](#)

House Sparrow [405]

Species or species habitat likely to occur within area

##### [Passer montanus](#)

Eurasian Tree Sparrow [406]

Species or species habitat likely to occur within area

##### [Streptopelia senegalensis](#)

Laughing Turtle-dove, Laughing Dove [781]

Species or species habitat likely to occur within area

#### Mammals

##### [Felis catus](#)

Cat, House Cat, Domestic Cat [19]

Species or species habitat likely to occur within area

##### [Feral deer](#)

Feral deer species in Australia [85733]

Species or species habitat likely to occur within area

##### [Mus musculus](#)

House Mouse [120]

Species or species habitat likely to occur within area

##### [Oryctolagus cuniculus](#)

Rabbit, European Rabbit [128]

Species or species habitat likely to occur within area

##### [Rattus rattus](#)

Black Rat, Ship Rat [84]

Species or species habitat likely to occur within area

##### [Sus scrofa](#)

Pig [6]

Species or species habitat likely to occur within area

##### [Vulpes vulpes](#)

Red Fox, Fox [18]

Species or species habitat likely to occur within area

#### Plants

##### [Asparagus asparagoides](#)

Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]

Species or species habitat likely to occur within area

##### [Genista sp. X Genista monspessulana](#)

Broom [67538]

Species or species

Name	Status	Type of Presence
<a href="#">Pinus radiata</a> Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		habitat may occur within area  Species or species habitat may occur within area
<a href="#">Rubus fruticosus aggregate</a> Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area



# Coordinates

-33.43535 116.24489

## 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 Heritage and Register of National Estate properties, Wetlands of International 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.

# 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:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA 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](#)
- [State Forests of 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.

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# **APPENDIX D**

## **HABITAT TREE DETAILS**

Habitat Trees  
Datum - GDA94

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	430613	6300224	Jarrah	15-20	0											No Signs	No Signs	No	
wpt002	50H	430702	6300266	Marri	15-20	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt003	50H	430704	6300262	Jarrah	15-20	0											No Signs	No Signs	No	
wpt004	50H	430715	6300236	Jarrah	20+	0											No Signs	No Signs	No	
wpt005	50H	430722	6300198	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt006	50H	430714	6300195	Marri	15-20	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt007	50H	430726	6300172	Marri	15-20	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt008	50H	430725	6300148	Marri	20+	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt009	50H	430728	6300130	Jarrah	0-5	0											No Signs	No Signs	No	
wpt010	50H	430737	6300131	Jarrah	20+	2	Knot Hole	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt011	50H	430736	6300121	Jarrah	15-20	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt012	50H	430743	6300121	Jarrah	20+	5+	Knot Hole	<5	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt013	50H	430744	6300103	Jarrah	20+	0											No Signs	No Signs	No	
wpt014	50H	430749	6300100	Jarrah	20+	0											No Signs	No Signs	No	
wpt015	50H	430737	6300092	Jarrah	20+	0											No Signs	No Signs	No	
wpt016	50H	430731	6300080	Jarrah	20+	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt017	50H	430725	6300073	Jarrah	20+	0											No Signs	No Signs	No	
wpt019	50H	430750	6300019	Jarrah	15-20	2	Spout Branch	12-20	Spout Trunk	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt020	50H	430744	6300018	Marri	20+	0											No Signs	No Signs	No	
wpt022	50H	430764	6299914	Jarrah	15-20	0											No Signs	No Signs	No	
wpt023	50H	430752	6299900	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt024	50H	430770	6299899	Marri	20+	5+	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt025	50H	430769	6299893	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt026	50H	430788	6299902	Jarrah	15-20	1	Spout Trunk	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt027	50H	430790	6299907	Jarrah	15-20	0											No Signs	No Signs	No	
wpt028	50H	430789	6299890	Jarrah	15-20	0											No Signs	No Signs	No	
wpt029	50H	430447	6300139	Marri	20+	0											No Signs	No Signs	No	
wpt030	50H	430779	6299872	Jarrah	15-20	0											No Signs	No Signs	No	
wpt031	50H	430758	6299857	Jarrah	20+	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt032	50H	430761	6299856	Jarrah	20+	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt033	50H	430761	6299848	Jarrah	20+	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt034	50H	430743	6299843	Jarrah	15-20	5+	Branch	<5	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt035	50H	430749	6299822	Jarrah	15-20	5+	Branch	5-12	Spout Branch	12-20							No Signs	No Signs	No	Depth of hollows unknown
wpt036	50H	430739	6299822	Marri	20+	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt037	50H	430754	6299807	Jarrah	15-20	1	Spout Trunk	20+									No Signs	No Signs	No	Depth of hollows unknown
wpt038	50H	430755	6299792	Jarrah	20+	5+	Branch	5-12	Branch	12-20							No Signs	No Signs	Yes	Depth of hollows unknown
wpt039	50H	430740	6299785	Jarrah	20+	2	Fissure	12-20	Spout Branch	12-20							No Signs	No Signs	Yes	Depth of hollows unknown
wpt040	50H	430765	6299778	Jarrah	15-20	2	Knot Hole	5-12	Knot Hole	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt041	50H	430769	6299775	Jarrah	0-5	0											No Signs	No Signs	No	
wpt042	50H	430771	6299760	Jarrah	15-20	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt043	50H	430799	6299777	Jarrah	15-20	0											No Signs	No Signs	No	
wpt044	50H	430789	6299804	Dead Unknown	5-10	1	Spout Trunk										No Signs	No Signs	No	Too shallow
wpt045	50H	430802	6299829	Jarrah	20+	0											No Signs	No Signs	No	
wpt046	50H	430787	6299852	Jarrah	15-20	1	Spout Branch	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt047	50H	430769	6299852	Dead Jarrah	10-15	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt048	50H	430769	6299841	Jarrah	20+	0											No Signs	No Signs	No	
wpt049	50H	430768	6299829	Jarrah	15-20	0											No Signs	No Signs	No	
wpt050	50H	430769	6299827	Jarrah	15-20	0											No Signs	No Signs	No	
wpt051	50H	430770	6299801	Jarrah	20+	0											No Signs	No Signs	No	
wpt052	50H	430803	6299724	Jarrah	20+	0											No Signs	No Signs	No	
wpt053	50H	430801	6299717	Jarrah	20+	0											No Signs	No Signs	No	
wpt054	50H	430786	6299711	Jarrah	20+	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt055	50H	430817	6299691	Jarrah	15-20	0											No Signs	No Signs	No	
wpt056	50H	430810	6299684	Dead Jarrah	10-15	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt057	50H	430817	6299675	Jarrah	15-20	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt058	50H	430816	6299675	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt059	50H	430830	6299623	Jarrah	15-20	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt060	50H	430830	6299615	Jarrah	5-10	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt061	50H	430844	6299616	Jarrah	20+	0											No Signs	No Signs	No	
wpt062	50H	430819	6299583	Jarrah	15-20	5+	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt063	50H	430850	6299582	Jarrah	15-20	1	Spout Trunk	20+									No Signs	No Signs	No	Depth of hollows unknown
wpt064	50H	430852	6299586	Jarrah	15-20	4	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt065	50H	430861	6299554	Jarrah	20+	0											No Signs	No Signs	No	
wpt066	50H	430850	6299510	Jarrah	5-10	1	Spout Trunk	20+									No Signs	No Signs	No	Too shallow
wpt067	50H	430831	6299491	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Spout Branch	12-20	Spout Trunk	20+	No Signs	No Signs	No	Depth of hollows unknown
wpt068	50H	430853	6299461	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt069	50H	430835	6299463	Jarrah	20+	0											No Signs	No Signs	No	
wpt070	50H	430829	6299462	Marri	20+	0											No Signs	No Signs	No	
wpt071	50H	430872	6299428	Jarrah	15-20	0											No Signs	No Signs	No	
wpt072	50H	430878	6299402	Jarrah	20+	0											No Signs	No Signs	No	
wpt073	50H	430887	6299359	Jarrah	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt074	50H	430864	6299357	Jarrah	20+	0											No Signs	No Signs	No	
wpt075	50H	430853	6299356	Jarrah	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt076	50H	430864	6299348	Dead Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt077	50H	430866	6299342	Jarrah	20+	0											No Signs	No Signs	No	
wpt078	50H	430883	6299331	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt079	50H	430888	6299308	Dead Jarrah	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Depth of hollows unknown
wpt080	50H	430896	6299304	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt081	50H	430904	6299297	Jarrah	15-20	0											No Signs	No Signs	No	
wpt082	50H	430924	6299290	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt083	50H	430927	6299276	Marri	20+	0											No Signs	No Signs	No	
wpt084	50H	430898	6299272	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt085	50H	430880	6299270	Jarrah	20+	3	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt086	50H	430846	6299324	Marri	20+	0											No Signs	No Signs	No	
wpt087	50H	430841	6299320	Marri	20+	0											No Signs	No Signs	No	
wpt088	50H	430853	6299334	Marri	20+	0											No Signs	No Signs	No	
wpt089	50H	430834	6299341	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt090	50H	430829	6299336	Marri	15-20	0											No Signs	No Signs	No	
wpt091	50H	430829	6299330	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt092	50H	430838	6299379	Marri	20+	0											No Signs	No Signs	No	
wpt093	50H	430845	6299393	Marri	20+	0											No Signs	No Signs	No	
wpt094	50H	430812	6299376	Jarrah	15-20	3	Fissure	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt095	50H	430830	6299428	Jarrah	15-20	1	Fissure	12-20									Bees	No Signs	No	Depth of hollows unknown
wpt096	50H	430796	6299455	Dead Jarrah	10-15	4	Branch	5-12	Spout Branch	5-12	Spout	5-12	Branch	5-12			No Signs	No Signs	No	Depth of hollows unknown
wpt097	50H	430792	6299455	Jarrah	20+	0											No Signs	No Signs	No	
wpt098	50H	430821	6299493	Jarrah	20+	0											No Signs	No Signs	No	
wpt099	50H	430811	6299512	Jarrah	20+	5+	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt100	50H	430798	6299516	Dead Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt101	50H	430798	6299527	Marri	15-20	0											No Signs	No Signs	No	
wpt102	50H	430782	6299529	Jarrah	20+	1	Fissure	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt103	50H	430801	6299555	Dead Jarrah	15-20	2	Spout Branch	20+	Spout Branch	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt104	50H	430815	6299535	Jarrah	15-20	0											No Signs	No Signs	No	
wpt105	50H	430823	6299557	Marri	15-20	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt106	50H	430800	6299584	Jarrah	15-20	0											No Signs	No Signs	No	
wpt107	50H	430791	6299579	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt108	50H	430761	6299575	Dead Unknown	5-10	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt109	50H	430801	6299621	Jarrah	15-20	4	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12			No Signs	No Signs	No	Depth of hollows unknown
wpt110	50H	430801	6299622	Jarrah	15-20	1	Knot Hole	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt111	50H	430776	6299612	Jarrah	20+	1	Knot Hole	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt112	50H	430755	6299612	Jarrah	20+	4	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12			No Signs	No Signs	No	Depth of hollows unknown
wpt113	50H	430782	6299641	Jarrah	20+	0											No Signs	No Signs	No	
wpt114	50H	430770	6299645	Marri	15-20	0											No Signs	No Signs	No	
wpt115	50H	430787	6299655	Jarrah	15-20	0											No Signs	No Signs	No	
wpt116	50H	430772	6299668	Jarrah	20+	0											No Signs	No Signs	No	
wpt117	50H	430777	6299666	Jarrah	20+	4	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12			No Signs	No Signs	No	Depth of hollows unknown
wpt118	50H	430784	6299676	Jarrah	20+	0											No Signs	No Signs	No	
wpt119	50H	430756	6299667	Jarrah	20+	0											No Signs	No Signs	No	
wpt120	50H	430747	6299657	Jarrah	20+	0											No Signs	No Signs	No	
wpt121	50H	430738	6299648	Jarrah	20+	5+	Knot Hole	5-12	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt122	50H	430741	6299681	Jarrah	15-20	0											No Signs	No Signs	No	
wpt123	50H	430752	6299695	Jarrah	15-20	0											No Signs	No Signs	No	
wpt124	50H	430755	6299730	Jarrah	20+	5+	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	12-20	No Signs	No Signs	No	Depth of hollows unknown
wpt125	50H	430717	6299732	Jarrah	20+	5+	Knot Hole	5-12	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt126	50H	430720	6299751	Jarrah	20+	0											No Signs	No Signs	No	
wpt127	50H	430733	6299776	Jarrah	15-20	5+	Branch	5-12	Branch	12-20	Spout	12-20	Spout Branch	12-20	Branch	5-12	No Signs	No Signs	Yes	Depth of hollows unknown
wpt128	50H	430726	6299789	Jarrah	15-20	0											No Signs	No Signs	No	
wpt129	50H	430728	6299795	Jarrah	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt130	50H	430707	6299794	Jarrah	15-20	0											No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt131	50H	430739	6299850	Jarrah	15-20	0											No Signs	No Signs	No	
wpt132	50H	430717	6299868	Jarrah	15-20	0											No Signs	No Signs	No	
wpt133	50H	430716	6299881	Jarrah	15-20	0											No Signs	No Signs	No	
wpt134	50H	430727	6299884	Jarrah	15-20	0											No Signs	No Signs	No	
wpt135	50H	430705	6299875	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt136	50H	430700	6299894	Jarrah	20+	0											No Signs	No Signs	No	
wpt137	50H	430704	6299925	Marri	20+	0											No Signs	No Signs	No	
wpt138	50H	430705	6299940	Jarrah	15-20	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt139	50H	430707	6299932	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt140	50H	430714	6299908	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt141	50H	430730	6299889	Marri	20+	0											No Signs	No Signs	No	
wpt142	50H	430737	6299959	Marri	20+	0											No Signs	No Signs	No	
wpt143	50H	430706	6299958	Jarrah	20+	5+	Knot Hole	5-12	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt144	50H	430681	6299941	Jarrah	15-20	0											No Signs	No Signs	No	
wpt145	50H	430672	6299934	Jarrah	20+	3	Fissure	5-12	Branch	5-12	Knot Hole	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt146	50H	430674	6299922	Jarrah	15-20	0											No Signs	No Signs	No	
wpt147	50H	430668	6299941	Marri	15-20	0											No Signs	No Signs	No	
wpt148	50H	430661	6300009	Marri	20+	0											No Signs	No Signs	No	
wpt149	50H	430681	6300055	Jarrah	20+	0											No Signs	No Signs	No	
wpt150	50H	430681	6300046	Jarrah	20+	0											No Signs	No Signs	No	
wpt151	50H	430711	6300055	Jarrah	15-20	1	Spout Trunk	20+									No Signs	No Signs	No	Depth of hollows unknown
wpt152	50H	430713	6300045	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt153	50H	430720	6300017	Dead Unknown	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt154	50H	430694	6300012	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt155	50H	430706	6299984	Jarrah	20+	5+	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt156	50H	430709	6300069	Jarrah	15-20	0											No Signs	No Signs	No	
wpt157	50H	430700	6300064	Jarrah	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt158	50H	430682	6300062	Jarrah	20+	5+	Branch	5-12	Branch	12-20	Branch	5-12	Branch	12-20	Spout Branch	12-20	No Signs	No Signs	Yes	Depth of hollows unknown
wpt159	50H	430678	6300071	Jarrah	15-20	5+	Knot Hole	12-20	Knot Hole	12-20	Branch	<5	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt160	50H	430640	6300080	Jarrah	15-20	0											No Signs	No Signs	No	
wpt161	50H	430651	6300074	Jarrah	15-20	0											No Signs	No Signs	No	
wpt162	50H	430658	6300081	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Spout Branch	12-20	No Signs	No Signs	No	Depth of hollows unknown
wpt163	50H	430662	6300071	Jarrah	15-20	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt164	50H	430674	6300080	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	5-12	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt165	50H	430662	6300094	Jarrah	15-20	4	Branch	5-12	Branch	5-12	Spout	5-12	Spout Branch	5-12			No Signs	No Signs	No	Depth of hollows unknown
wpt166	50H	430650	6300119	Jarrah	20+	0											No Signs	No Signs	No	
wpt167	50H	430651	6300123	Jarrah	20+	0											No Signs	No Signs	No	
wpt168	50H	430645	6300146	Jarrah	20+	0											No Signs	No Signs	No	
wpt169	50H	430621	6300160	Jarrah	20+	0											No Signs	No Signs	No	
wpt170	50H	430642	6300202	Marri	20+	0											No Signs	No Signs	No	
wpt172	50H	430681	6300110	Dead Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt173	50H	430678	6300109	Jarrah	10-15	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt174	50H	430687	6300097	Jarrah	15-20	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt175	50H	430694	6300085	Jarrah	15-20	0											No Signs	No Signs	No	
wpt176	50H	430710	6299514	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt177	50H	430694	6299509	Jarrah	15-20	0											No Signs	No Signs	No	
wpt178	50H	430694	6299508	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt179	50H	430686	6299505	Jarrah	15-20	0											No Signs	No Signs	No	
wpt180	50H	430689	6299486	Marri	10-15	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt181	50H	430692	6299481	Jarrah	20+	0											No Signs	No Signs	No	
wpt182	50H	430689	6299480	Marri	15-20	2	Spout Branch	20+	Spout Trunk	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt183	50H	430689	6299474	Jarrah	20+	0											No Signs	No Signs	No	
wpt184	50H	430680	6299468	Jarrah	20+	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt185	50H	430688	6299466	Jarrah	20+	0											No Signs	No Signs	No	
wpt186	50H	430677	6299451	Jarrah	15-20	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt187	50H	430677	6299448	Jarrah	20+	0											No Signs	No Signs	No	
wpt188	50H	430693	6299439	Jarrah	20+	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt189	50H	430696	6299437	Jarrah	20+	0											No Signs	No Signs	No	
wpt190	50H	430702	6299454	Dead Jarrah	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt191	50H	430712	6299466	Jarrah	20+	0											No Signs	No Signs	No	
wpt192	50H	430717	6299460	Jarrah	15-20	0											No Signs	No Signs	No	
wpt193	50H	430707	6299420	Jarrah	20+	0											No Signs	No Signs	No	
wpt194	50H	430722	6299422	Jarrah	20+	1	Knot Hole	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt195	50H	430724	6299417	Dead Jarrah	15-20	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt196	50H	430729	6299409	Jarrah	20+	5+	Branch	5-12	Branch	12-20	Spout	20+	Spout Branch	12-20	Spout Branch	20+	No Signs	No Signs	No	Depth of hollows unknown
wpt197	50H	430735	6299405	Jarrah	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt198	50H	430724	6299392	Jarra	15-20	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt199	50H	430731	6299384	Jarra	20+	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt200	50H	430734	6299374	Jarra	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt201	50H	430748	6299348	Jarra	20+	0											No Signs	No Signs	No	
wpt202	50H	430752	6299333	Jarra	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt203	50H	430742	6299332	Jarra	15-20	4	Knot Hole	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt204	50H	430754	6299311	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt205	50H	430754	6299223	Jarra	15-20	0											No Signs	No Signs	No	
wpt206	50H	430731	6299251	Jarra	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt207	50H	430730	6299255	Jarra	20+	0											No Signs	No Signs	No	
wpt208	50H	430670	6299266	Jarra	20+	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt209	50H	430669	6299250	Jarra	15-20	5+	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt210	50H	430671	6299229	Jarra	20+	0											No Signs	No Signs	No	
wpt211	50H	430636	6299253	Jarra	15-20	0											No Signs	No Signs	No	
wpt212	50H	430651	6299264	Jarra	15-20	0											No Signs	No Signs	No	
wpt213	50H	430589	6299247	Jarra	15-20	0											No Signs	No Signs	No	
wpt214	50H	430575	6299244	Dead Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt215	50H	430562	6299261	Dead Jarrah	15-20	2	Spout Branch	20+	Spout Branch	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt216	50H	430555	6299284	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt217	50H	430561	6299304	Jarra	15-20	0											No Signs	No Signs	No	
wpt218	50H	430556	6299326	Jarra	20+	3	Branch	5-12	Spout Branch	5-12	Spout	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt219	50H	430550	6299337	Jarra	20+	0											No Signs	No Signs	No	
wpt220	50H	430566	6299345	Jarra	20+	0											No Signs	No Signs	No	
wpt221	50H	430553	6299362	Jarra	20+	0											No Signs	No Signs	No	
wpt222	50H	430567	6299367	Jarra	20+	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt223	50H	430561	6299374	Jarra	20+	3	Branch	<5	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt224	50H	430553	6299394	Jarra	20+	0											No Signs	No Signs	No	
wpt225	50H	430559	6299392	Jarra	20+	5+	Branch	<5	Branch	5-12	Branch	<5					No Signs	No Signs	No	Depth of hollows unknown
wpt226	50H	430541	6299403	Jarra	20+	0											No Signs	No Signs	No	
wpt227	50H	430531	6299391	Dead Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5					No Signs	No Signs	No	Depth of hollows unknown
wpt228	50H	430523	6299381	Jarra	15-20	0											No Signs	No Signs	No	
wpt229	50H	430523	6299404	Marri	15-20	0											No Signs	No Signs	No	
wpt230	50H	430523	6299391	Jarra	15-20	0											No Signs	No Signs	No	
wpt231	50H	430509	6299459	Marri	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt232	50H	430486	6299473	Jarra	15-20	2	Spout Branch	20+	Spout Trunk	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt233	50H	430486	6299507	Jarra	15-20	0											No Signs	No Signs	No	
wpt234	50H	430495	6299517	Jarra	15-20	0											No Signs	No Signs	No	
wpt235	50H	430483	6299565	Jarra	20+	0											No Signs	No Signs	No	
wpt236	50H	430470	6299592	Jarra	15-20	2	Spout Branch	5-12	Spout Branch	12-20							No Signs	No Signs	No	Too low/shallow
wpt237	50H	430472	6299623	Jarra	15-20	5+	Knot Hole	5-12	Knot Hole	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt238	50H	430519	6299595	Jarra	15-20	5+	Knot Hole	5-12	Knot Hole	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt239	50H	430546	6299605	Jarra	15-20	2	Spout Branch	5-12	Spout Branch	12-20							No Signs	No Signs	No	Too shallow
wpt240	50H	430532	6299623	Jarra	15-20	0											No Signs	No Signs	No	
wpt241	50H	430536	6299644	Jarra	15-20	0											No Signs	No Signs	No	
wpt242	50H	430593	6299551	Jarra	15-20	0											No Signs	No Signs	No	
wpt243	50H	430592	6299555	Jarra	15-20	0											No Signs	No Signs	No	
wpt244	50H	430599	6299560	Jarra	20+	0											No Signs	No Signs	No	
wpt245	50H	430620	6299548	Jarra	15-20	0											No Signs	No Signs	No	
wpt246	50H	430627	6299540	Jarra	15-20	0											No Signs	No Signs	No	
wpt247	50H	430636	6299533	Marri	15-20	1	Spout Branch	12-20									No Signs	No Signs	No	Too shallow
wpt248	50H	430633	6299521	Jarra	20+	0											No Signs	No Signs	No	
wpt249	50H	430668	6299516	Jarra	15-20	0											No Signs	No Signs	No	
wpt250	50H	430677	6299523	Dead Jarrah	15-20	1	Spout Trunk	12-20									No Signs	No Signs	Yes	Depth of hollows unknown
wpt251	50H	430690	6299533	Jarra	15-20	5+	Fissure	5-12	Branch	5-12	Spout	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt252	50H	430677	6299488	Jarra	20+	0											No Signs	No Signs	No	
wpt253	50H	430664	6299490	Jarra	20+	0											No Signs	No Signs	No	
wpt254	50H	430655	6299488	Marri	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	Yes	Depth of hollows unknown
wpt255	50H	430661	6299474	Jarra	20+	0											No Signs	No Signs	No	
wpt256	50H	430642	6299463	Jarra	20+	0											No Signs	No Signs	No	
wpt257	50H	430649	6299455	Jarra	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt258	50H	430641	6299447	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt259	50H	430660	6299436	Jarra	20+	0											No Signs	No Signs	No	
wpt260	50H	430672	6299433	Jarra	15-20	0											No Signs	No Signs	No	
wpt261	50H	430672	6299420	Jarra	20+	0											No Signs	No Signs	No	
wpt262	50H	430663	6299419	Jarra	20+	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt263	50H	430688	6299391	Jarra	20+	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt264	50H	430695	6299391	Jarrah	20+	0											No Signs	No Signs	No	
wpt265	50H	430705	6299382	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt266	50H	430698	6299375	Marri	20+	0											No Signs	No Signs	No	
wpt267	50H	430691	6299367	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt268	50H	430712	6299367	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt269	50H	430719	6299360	Jarrah	15-20	0											No Signs	No Signs	No	
wpt270	50H	430713	6299355	Jarrah	20+	0											No Signs	No Signs	No	
wpt271	50H	430723	6299337	Jarrah	15-20	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt272	50H	430724	6299331	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	12-20	Branch	<5	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt273	50H	430738	6299317	Jarrah	20+	0											No Signs	No Signs	No	
wpt274	50H	430744	6299318	Jarrah	15-20	0											No Signs	No Signs	No	
wpt275	50H	430721	6299285	Jarrah	15-20	2	Knot Hole	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt276	50H	430701	6299292	Jarrah	15-20	2	Branch	5-12	Branch	5-12							Bees	No Signs	No	Depth of hollows unknown
wpt277	50H	430677	6299281	Jarrah	15-20	0											No Signs	No Signs	No	
wpt278	50H	430636	6299296	Dead Jarrah	15-20	5+	Knot Hole	<5	Knot Hole	5-12	Knot Hole	<5	Knot Hole	5-12	Spout Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt279	50H	430611	6299288	Jarrah	20+	5+	Branch	<5	Branch	<5	Branch	<5	Branch	<5	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt280	50H	430600	6299286	Jarrah	20+	0											No Signs	No Signs	No	
wpt281	50H	430584	6299292	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	5-12	Branch	<5	Spout Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt282	50H	430585	6299304	Jarrah	15-20	5+	Branch	<5	Branch	5-12	Branch	5-12	Branch	<5	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt283	50H	430592	6299326	Jarrah	15-20	0											No Signs	No Signs	No	
wpt284	50H	430579	6299331	Marri	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt285	50H	430583	6299348	Jarrah	20+	0											No Signs	No Signs	No	
wpt286	50H	430587	6299366	Jarrah	20+	0											No Signs	No Signs	No	
wpt287	50H	430591	6299400	Jarrah	15-20	0											No Signs	No Signs	No	
wpt288	50H	430603	6299402	Jarrah	15-20	1	Spout Trunk	20+									No Signs	No Signs	No	Too shallow
wpt289	50H	430596	6299417	Jarrah	20+	0											No Signs	No Signs	No	
wpt290	50H	430606	6299425	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt291	50H	430624	6299417	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt292	50H	430627	6299401	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt293	50H	430619	6299394	Jarrah	20+	0											No Signs	No Signs	No	
wpt294	50H	430639	6299382	Jarrah	20+	1	Knot Hole	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt295	50H	430634	6299376	Jarrah	20+	5+	Fissure	<5	Branch	5-12	Branch	5-12	Branch	12-20	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt296	50H	430647	6299369	Dead Jarrah	15-20	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt297	50H	430675	6299368	Marri	20+	0											No Signs	No Signs	No	
wpt298	50H	430677	6299373	Jarrah	20+	0											No Signs	No Signs	No	
wpt299	50H	430693	6299324	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt300	50H	430690	6299319	Jarrah	20+	0											No Signs	No Signs	No	
wpt301	50H	430691	6299316	Jarrah	20+	0											No Signs	No Signs	No	
wpt302	50H	430692	6299313	Jarrah	20+	0											No Signs	No Signs	No	
wpt303	50H	430676	6299315	Jarrah	20+	0											No Signs	No Signs	No	
wpt304	50H	430628	6299325	Jarrah	20+	0											No Signs	No Signs	No	
wpt305	50H	430610	6299318	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt306	50H	430634	6299330	Jarrah	15-20	0											No Signs	No Signs	No	
wpt307	50H	430646	6299348	Jarrah	15-20	0											No Signs	No Signs	No	
wpt308	50H	430657	6299319	Jarrah	20+	0											No Signs	No Signs	No	
wpt309	50H	430642	6299359	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt310	50H	430653	6299384	Jarrah	15-20	0											No Signs	No Signs	No	
wpt311	50H	430661	6299393	Jarrah	15-20	0											No Signs	No Signs	No	
wpt312	50H	430648	6299392	Jarrah	15-20	0											No Signs	No Signs	No	
wpt313	50H	430650	6299401	Jarrah	15-20	0											No Signs	No Signs	No	
wpt314	50H	430650	6299415	Jarrah	15-20	0											No Signs	No Signs	No	
wpt315	50H	430644	6299415	Jarrah	15-20	0											No Signs	No Signs	No	
wpt316	50H	430640	6299420	Dead Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Spout Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt317	50H	430629	6299432	Jarrah	20+	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt318	50H	430629	6299437	Jarrah	20+	2	Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt319	50H	430626	6299446	Jarrah	20+	5+	Fissure	<5	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Bees	No Signs	No	Depth of hollows unknown
wpt320	50H	430620	6299438	Dead Jarrah	20+	5+	Spout Trunk	20+	Branch	12-20	Branch	5-12	Branch	12-20	Branch	5-12	No Signs	No Signs	Yes	Depth of hollows unknown
wpt321	50H	430597	6299447	Jarrah	20+	0											No Signs	No Signs	No	
wpt322	50H	430587	6299465	Jarrah	15-20	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt323	50H	430598	6299500	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt324	50H	430590	6299511	Jarrah	20+	0											No Signs	No Signs	No	
wpt325	50H	430568	6299520	Jarrah	15-20	0											No Signs	No Signs	No	
wpt326	50H	430560	6299515	Jarrah	15-20	1	Knot Hole	12-20									No Signs	No Signs	No	Too low/shallow
wpt327	50H	430538	6299523	Marri	10-15	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt328	50H	430548	6299558	Jarrah	15-20	0											No Signs	No Signs	No	
wpt329	50H	430517	6299540	Jarrah	20+	0											No Signs	No Signs	No	



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt330	50H	430526	6299493	Jarrah	20+	0											No Signs	No Signs	No	
wpt331	50H	430518	6299477	Jarrah	20+	0											No Signs	No Signs	No	
wpt332	50H	430536	6299450	Jarrah	20+	0											No Signs	No Signs	No	
wpt333	50H	430551	6299439	Jarrah	15-20	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt334	50H	430553	6299435	Jarrah	15-20	2	Knot Hole	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt335	50H	430557	6299441	Jarrah	15-20	0											No Signs	No Signs	No	
wpt336	50H	430565	6299445	Jarrah	20+	1	Knot Hole	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt337	50H	430542	6299415	Jarrah	15-20	0											No Signs	No Signs	No	
wpt338	50H	430535	6299418	Jarrah	15-20	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt339	50H	430568	6299406	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt340	50H	430577	6299461	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt341	50H	430548	6299494	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt342	50H	430541	6299478	Marr	15-20	0											No Signs	No Signs	No	
wpt343	50H	430609	6299466	Jarrah	20+	0											No Signs	No Signs	No	
wpt344	50H	430610	6299471	Jarrah	20+	0											No Signs	No Signs	No	
wpt345	50H	430624	6299471	Jarrah	20+	2	Knot Hole	5-12	Knot Hole	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt346	50H	430626	6299456	Jarrah	20+	2	Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt347	50H	430635	6299472	Jarrah	15-20	0											No Signs	No Signs	No	
wpt348	50H	430647	6299479	Jarrah	20+	0											No Signs	No Signs	No	
wpt349	50H	430641	6299481	Jarrah	20+	0											No Signs	No Signs	No	
wpt350	50H	430630	6299491	Jarrah	15-20	0											No Signs	No Signs	No	
wpt351	50H	430620	6299509	Jarrah	15-20	0											No Signs	No Signs	No	
wpt352	50H	430612	6299515	Jarrah	10-15	1	Spout Trunk	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt353	50H	430642	6299500	Jarrah	20+	0											No Signs	No Signs	No	
wpt354	50H	430476	6300156	Dead Unknown	20+	3	Spout Branch	5-12	Spout Branch	5-12	Spout	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt355	50H	430660	6299503	Marr	10-15	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt356	50H	430667	6299501	Jarrah	20+	0											No Signs	No Signs	No	
wpt357	50H	430518	6300159	Jarrah	15-20	0											No Signs	No Signs	No	
wpt358	50H	430539	6300151	Jarrah	20+	0											No Signs	No Signs	No	
wpt359	50H	430522	6300136	Jarrah	20+	0											No Signs	No Signs	No	
wpt360	50H	430537	6300128	Dead Jarrah	15-20	5+	Branch	5-12	Spout Branch	5-12	Spout	5-12	Spout Branch	5-12	Spout Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt361	50H	430544	6300121	Jarrah	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt362	50H	430532	6300119	Marr	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt363	50H	430468	6300112	Marr	20+	0											No Signs	No Signs	No	
wpt364	50H	430490	6300068	Marr	20+	0											No Signs	No Signs	No	
wpt365	50H	430492	6300077	Dead Unknown	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt366	50H	430528	6300087	Jarrah	15-20	0											No Signs	No Signs	No	
wpt367	50H	430527	6300088	Jarrah	20+	0											No Signs	No Signs	No	
wpt368	50H	430554	6300093	Jarrah	20+	0											No Signs	No Signs	No	
wpt369	50H	430559	6300072	Marr	15-20	0											No Signs	No Signs	No	
wpt370	50H	430565	6300043	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	12-20							No Signs	No Signs	No	Depth of hollows unknown
wpt371	50H	430558	6300041	Jarrah	20+	0											No Signs	No Signs	No	
wpt372	50H	430560	6300015	Jarrah	15-20	0											No Signs	No Signs	No	
wpt373	50H	430596	6300009	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt374	50H	430582	6300002	Marr	20+	0											No Signs	No Signs	No	
wpt375	50H	430577	6299997	Jarrah	20+	0											No Signs	No Signs	No	
wpt376	50H	430554	6299993	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt377	50H	430563	6299987	Jarrah	15-20	2	Spout Branch	12-20	Spout Branch	12-20							No Signs	No Signs	No	Too shallow
wpt378	50H	430563	6299961	Jarrah	20+	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt379	50H	430558	6299945	Marr	15-20	1	Spout Branch	5-12									Bees	No Signs	No	Depth of hollows unknown
wpt380	50H	430581	6299936	Marr	15-20	1	Spout Branch	12-20									No Signs	No Signs	No	Too shallow
wpt381	50H	430583	6299954	Jarrah	15-20	5+	Branch	5-12	Spout Branch	5-12	Branch	5-12	Spout Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt382	50H	430602	6299947	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt383	50H	430602	6299928	Jarrah	15-20	0											No Signs	No Signs	No	
wpt384	50H	430606	6299916	Jarrah	20+	0											No Signs	No Signs	No	
wpt385	50H	430615	6299915	Jarrah	20+	0											No Signs	No Signs	No	
wpt386	50H	430597	6299898	Jarrah	20+	0											No Signs	No Signs	No	
wpt387	50H	430579	6299898	Jarrah	20+	0											No Signs	No Signs	No	
wpt389	50H	430616	6299877	Marr	20+	0											No Signs	No Signs	No	
wpt390	50H	430606	6299847	Jarrah	20+	0											No Signs	No Signs	No	
wpt391	50H	430607	6299826	Jarrah	20+	0											No Signs	No Signs	No	
wpt392	50H	430632	6299825	Marr	20+	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt393	50H	430590	6299816	Jarrah	20+	0											No Signs	No Signs	No	
wpt394	50H	430607	6299777	Dead Jarrah	10-15	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt395	50H	430610	6299779	Jarrah	20+	0											No Signs	No Signs	No	
wpt396	50H	430613	6299763	Dead Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt397	50H	430636	6299756	Jarrah	20+	0											No Signs	No Signs	No	
wpt398	50H	430642	6299750	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	3	Branch	<5	No Signs	No Signs	No	Depth of hollows unknown
wpt399	50H	430648	6299764	Jarrah	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt400	50H	430622	6299734	Jarrah	15-20	1	Knot Hole	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt401	50H	430600	6299701	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt402	50H	430584	6299697	Jarrah	15-20	0											No Signs	No Signs	No	
wpt403	50H	430583	6299679	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt404	50H	430617	6299685	Dead Unknown	10-15	2	Knot Hole	<5	Knot Hole	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt405	50H	430638	6299676	Jarrah	15-20	0											No Signs	No Signs	No	
wpt406	50H	430643	6299673	Jarrah	15-20	0											No Signs	No Signs	No	
wpt407	50H	430625	6299650	Jarrah	15-20	0											No Signs	No Signs	No	
wpt408	50H	430646	6299636	Jarrah	15-20	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt409	50H	430652	6299633	Jarrah	20+	0											No Signs	No Signs	No	
wpt410	50H	430660	6299647	Jarrah	20+	0											No Signs	No Signs	No	
wpt411	50H	430662	6299642	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt412	50H	430661	6299602	Jarrah	20+	0											No Signs	No Signs	No	
wpt413	50H	430680	6299602	Jarrah	15-20	0											No Signs	No Signs	No	
wpt414	50H	430678	6299584	Marri	15-20	0											No Signs	No Signs	No	
wpt415	50H	430668	6299560	Marri	10-15	1	Spout Trunk	12-20									No Signs	No Signs	No	Too shallow
wpt416	50H	430634	6299590	Jarrah	20+	0											No Signs	No Signs	No	
wpt417	50H	430627	6299595	Jarrah	15-20	0											No Signs	No Signs	No	
wpt418	50H	430606	6299582	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt419	50H	430604	6299592	Jarrah	20+	0											No Signs	No Signs	No	
wpt420	50H	430610	6299607	Marri	20+	0											No Signs	No Signs	No	
wpt421	50H	430598	6299648	Jarrah	20+	0											No Signs	No Signs	No	
wpt422	50H	430589	6299629	Jarrah	20+	5+	Knot Hole	20+	Branch	5-12	Branch	12-20	Branch	5-12	Branch	12-20	No Signs	No Signs	Yes	Depth of hollows unknown
wpt423	50H	430551	6299653	Jarrah	20+	0											No Signs	No Signs	No	
wpt424	50H	430553	6299660	Jarrah	15-20	1	Knot Hole	<5									No Signs	No Signs	No	Depth of hollows unknown
wpt425	50H	430572	6299698	Jarrah	20+	0											No Signs	No Signs	No	
wpt426	50H	430543	6299699	Jarrah	15-20	0											No Signs	No Signs	No	
wpt427	50H	430560	6299711	Jarrah	15-20	0											No Signs	No Signs	No	
wpt428	50H	430543	6299722	Jarrah	15-20	0											No Signs	No Signs	No	
wpt429	50H	430556	6299748	Jarrah	15-20	1	Knot Hole	12-20									No Signs	No Signs	Yes	Depth of hollows unknown
wpt430	50H	430586	6299758	Marri	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt431	50H	430607	6299759	Jarrah	20+	0											No Signs	No Signs	No	
wpt432	50H	430588	6299783	Jarrah	15-20	0											No Signs	No Signs	No	
wpt433	50H	430556	6299803	Jarrah	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt434	50H	430545	6299805	Marri	10-15	3	Knot Hole	5-12	Spout Branch	5-12	Spout	20+					No Signs	No Signs	Yes	Depth of hollows unknown
wpt435	50H	429260	6300306	Dead Jarrah	20+	5+	Branch	5-12	Spout Branch	5-12	Spout	12-20	Branch	5-12	Branch	5-12	No Signs	No Signs	Yes	Depth of hollows unknown
wpt436	50H	430553	6299820	Jarrah	15-20	5+	Branch	5-12	Branch	12-20	Branch	5-12	Spout Branch	5-12	Spout Branch	12-20	No Signs	No Signs	Yes	Depth of hollows unknown
wpt437	50H	430557	6299830	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt438	50H	430536	6299837	Jarrah	15-20	5+	Branch	5-12	Spout Branch	12-20	Branch	5-12	Spout Branch	12-20	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt439	50H	430545	6299856	Dead Jarrah	5-10	2	Spout Branch	20+	Spout Trunk	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt440	50H	430552	6299857	Jarrah	15-20	0											No Signs	No Signs	No	
wpt441	50H	430516	6299881	Marri	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt442	50H	430521	6299913	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt443	50H	430528	6299916	Jarrah	20+	0											No Signs	No Signs	No	
wpt444	50H	430515	6299918	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	12-20							No Signs	No Signs	No	Depth of hollows unknown
wpt445	50H	430504	6299907	Jarrah	15-20	0											No Signs	No Signs	No	
wpt446	50H	430493	6299922	Dead Jarrah	5-10	1	Spout Trunk	20+									No Signs	No Signs	No	Too shallow
wpt447	50H	430482	6299924	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt448	50H	430472	6299958	Dead Jarrah	15-20	4	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt449	50H	430461	6299964	Marri	20+	0											No Signs	No Signs	No	
wpt450	50H	430480	6299967	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt451	50H	430484	6299976	Jarrah	15-20	0											No Signs	No Signs	No	
wpt452	50H	430494	6299980	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt453	50H	430474	6299981	Jarrah	15-20	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt454	50H	430476	6300003	Jarrah	15-20	1	Spout Trunk	20+									Bees	No Signs	No	Depth of hollows unknown
wpt455	50H	430494	6300023	Jarrah	15-20	5+	Branch	5-12	Spout Branch	5-12	Branch	5-12	Spout Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt456	50H	430485	6300051	Marri	20+	0											No Signs	No Signs	No	
wpt457	50H	430487	6300044	Jarrah	20+	0											No Signs	No Signs	No	
wpt458	50H	430491	6300022	Dead Jarrah	10-15	1	Spout Trunk	20+									No Signs	No Signs	No	Too shallow
wpt459	50H	430538	6300005	Dead Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt460	50H	430514	6299988	Dead Jarrah	10-15	1	Spout Trunk	20+									No Signs	No Signs	No	Too shallow
wpt461	50H	430507	6299985	Jarrah	20+	0											No Signs	No Signs	No	
wpt462	50H	430527	6299986	Jarrah	20+	0											No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt463	50H	430523	6299973	Dead Jarrah	5-10	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt464	50H	430531	6299951	Dead Marri	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt465	50H	430542	6299935	Dead Unknown	5-10	1	Spout Trunk	20+									No Signs	No Signs	No	Depth of hollows unknown
wpt466	50H	430558	6299929	Marri	20+	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt467	50H	430558	6299901	Jarrah	20+	5+	Branch	55	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt468	50H	430573	6299882	Jarrah	15-20	0											No Signs	No Signs	No	
wpt469	50H	430576	6299835	Jarrah	15-20	2	Branch	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt470	50H	430567	6299833	Dead Marri	5-10	0											No Signs	No Signs	No	
wpt471	50H	430536	6299816	Jarrah	20+	0											No Signs	No Signs	No	
wpt472	50H	430535	6299809	Jarrah	20+	0											No Signs	No Signs	No	
wpt473	50H	430527	6299781	Dead Marri	5-10	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt474	50H	430534	6299777	Dead Marri	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt475	50H	430527	6299769	Jarrah	20+	0											No Signs	No Signs	No	
wpt476	50H	430508	6299736	Jarrah	20+	0											No Signs	No Signs	No	
wpt477	50H	430506	6299730	Jarrah	15-20	0											No Signs	No Signs	No	
wpt478	50H	430485	6299723	Jarrah	10-15	5+	Spout Branch	12-20	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	Yes	Depth of hollows unknown
wpt479	50H	430491	6299709	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Spout Branch	5-12	Spout Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt480	50H	430497	6299690	Jarrah	20+	0											No Signs	No Signs	No	
wpt481	50H	430483	6299682	Jarrah	15-20	0											No Signs	No Signs	No	
wpt482	50H	430503	6299671	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt483	50H	430497	6299661	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Bees	No Signs	No	Depth of hollows unknown
wpt484	50H	430495	6299652	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt485	50H	430477	6299666	Dead Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Spout	12-20	Spout Trunk	20+	Branch	5-12	No Signs	No Signs	Yes	Depth of hollows unknown
wpt486	50H	430475	6299644	Jarrah	20+	0											No Signs	No Signs	No	
wpt487	50H	430459	6299654	Jarrah	20+	0											No Signs	No Signs	No	
wpt488	50H	430456	6299653	Dead Jarrah	10-15	3	Branch	5-12	Spout Branch	12-20	Spout	20+					No Signs	No Signs	No	Too low/shallow
wpt489	50H	430446	6299645	Dead Jarrah	10-15	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt490	50H	430438	6299631	Jarrah	15-20	0											No Signs	No Signs	No	
wpt491	50H	430433	6299678	Jarrah	20+	0											No Signs	No Signs	No	
wpt492	50H	430444	6299708	Jarrah	15-20	0											No Signs	No Signs	No	
wpt493	50H	430444	6299720	Jarrah	20+	0											No Signs	No Signs	No	
wpt494	50H	430451	6299729	Jarrah	20+	0											No Signs	No Signs	No	
wpt495	50H	430424	6299746	Jarrah	20+	5+	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt496	50H	430433	6299796	Jarrah	20+	5+	Branch	5-12	Branch	12-20	Branch	20+	Branch	5-12	Branch	12-20	No Signs	No Signs	Yes	Depth of hollows unknown
wpt497	50H	430437	6299817	Jarrah	20+	0											No Signs	No Signs	No	
wpt498	50H	430393	6299814	Jarrah	20+	0											No Signs	No Signs	No	
wpt499	50H	430385	6299809	Jarrah	15-20	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt500	50H	430388	6299816	Jarrah	20+	0											No Signs	No Signs	No	
wpt501	50H	430379	6299820	Jarrah	20+	0											No Signs	No Signs	No	
wpt502	50H	430386	6299843	Jarrah	15-20	0											No Signs	No Signs	No	
wpt503	50H	430394	6299851	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt504	50H	430373	6299869	Jarrah	20+	0											No Signs	No Signs	No	
wpt505	50H	430363	6299876	Jarrah	15-20	0											No Signs	No Signs	No	
wpt506	50H	430363	6299902	Jarrah	20+	0											No Signs	No Signs	No	
wpt507	50H	430369	6299925	Marri	20+	0											No Signs	No Signs	No	
wpt508	50H	430377	6299938	Jarrah	20+	0											No Signs	No Signs	No	
wpt509	50H	430357	6299934	Jarrah	20+	0											No Signs	No Signs	No	
wpt510	50H	430351	6299939	Marri	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt511	50H	430338	6299950	Marri	20+	0											No Signs	No Signs	No	
wpt512	50H	430351	6299960	Marri	20+	0											No Signs	No Signs	No	
wpt513	50H	430348	6299978	Jarrah	20+	0											No Signs	No Signs	No	
wpt514	50H	430341	6299996	Jarrah	20+	0											No Signs	No Signs	No	
wpt515	50H	430320	6299998	Jarrah	20+	0											No Signs	No Signs	No	
wpt516	50H	430310	6300054	Marri	15-20	0											No Signs	No Signs	No	
wpt517	50H	430336	6300047	Jarrah	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt518	50H	430343	6300056	Marri	20+	2	Knot Hole	5-12	Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt519	50H	430340	6300063	Marri	20+	0											No Signs	No Signs	No	
wpt520	50H	430392	6300078	Marri	15-20	5+	Branch	5-12	Spout Branch	12-20	Branch	12-20	Branch	5-12	Branch	12-20	No Signs	No Signs	No	Depth of hollows unknown
wpt521	50H	430421	6300114	Jarrah	20+	0											No Signs	No Signs	No	
wpt522	50H	430415	6300034	Jarrah	20+	0											No Signs	No Signs	No	
wpt523	50H	430396	6300043	Marri	15-20	1	Spout Branch	12-20									No Signs	No Signs	Yes	Depth of hollows unknown
wpt524	50H	430394	6300031	Jarrah	20+	0											No Signs	No Signs	No	
wpt525	50H	430407	6300019	Jarrah	20+	0											No Signs	No Signs	No	
wpt526	50H	430444	6300006	Marri	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt527	50H	430462	6299955	Marri	20+	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt528	50H	430457	6299943	Jarrah	15-20	5+	Spout Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt529	50H	430467	6299934	Marri	20+	3	Knot Hole	12-20	Branch	5-12	Branch	5-12					No Signs	No Signs	Yes	Depth of hollows unknown
wpt530	50H	430477	6299930	Marri	20+	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt531	50H	430460	6299901	Jarra	15-20	1	Spout Trunk	20+									No Signs	No Signs	No	Depth of hollows unknown
wpt532	50H	430451	6299891	Marri	15-20	0											No Signs	No Signs	No	
wpt533	50H	430472	6299884	Jarra	20+	0											No Signs	No Signs	No	
wpt534	50H	430490	6299879	Jarra	20+	0											No Signs	No Signs	No	
wpt535	50H	430476	6299858	Jarra	20+	0											No Signs	No Signs	No	
wpt536	50H	430511	6299871	Jarra	15-20	3	Knot Hole	5-12	Spout Branch	12-20	Spout	12-20					No Signs	No Signs	No	Depth of hollows unknown
wpt537	50H	430519	6299860	Marri	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt538	50H	430523	6299839	Jarra	20+	1	Spout Branch	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt539	50H	430500	6299839	Jarra	15-20	0											No Signs	No Signs	No	
wpt540	50H	430481	6299807	Jarra	20+	0											No Signs	No Signs	No	
wpt541	50H	430480	6299802	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt542	50H	430468	6299808	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt543	50H	430457	6299799	Jarra	15-20	0											No Signs	No Signs	No	
wpt544	50H	430471	6299777	Jarra	15-20	0											No Signs	No Signs	No	
wpt545	50H	430463	6299754	Dead Jarrah	15-20	1	Knot Hole	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt546	50H	430476	6299738	Jarra	15-20	5+	Spout Branch	12-20	Spout Branch	12-20	Spout	12-20	Spout Branch	12-20	Spout Branch	20+	No Signs	No Signs	Yes	Depth of hollows unknown
wpt547	50H	430462	6299713	Dead Jarrah	20+	5+	Branch	5-12	Spout Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt548	50H	430485	6299764	Jarra	15-20	0											No Signs	No Signs	No	
wpt549	50H	430454	6299850	Jarra	10-15	1	Spout Branch	12-20									No Signs	No Signs	No	Depth of hollows unknown
wpt550	50H	430441	6299848	Jarra	20+	0											No Signs	No Signs	No	
wpt551	50H	430428	6299868	Jarra	15-20	0											No Signs	No Signs	No	
wpt552	50H	430426	6299868	Marri	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt553	50H	430420	6299875	Marri	15-20	0											No Signs	No Signs	No	
wpt554	50H	430425	6299884	Marri	15-20	2	Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt555	50H	430418	6299886	Jarra	20+	0											No Signs	No Signs	No	
wpt556	50H	430392	6299905	Jarra	15-20	4	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12			No Signs	No Signs	No	Depth of hollows unknown
wpt557	50H	430410	6299936	Jarra	20+	0											No Signs	No Signs	No	
wpt558	50H	430417	6299934	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt559	50H	430426	6299913	Jarra	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt560	50H	430440	6299931	Jarra	20+	0											No Signs	No Signs	No	
wpt561	50H	430402	6300002	Jarra	20+	0											No Signs	No Signs	No	
wpt562	50H	430401	6300001	Jarra	20+	1	Spout Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt563	50H	430365	6300001	Marri	20+	5+	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt564	50H	430374	6300021	Jarra	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt565	50H	429278	6300328	Dead Unknown	15-20	5+	Branch	5-12	Spout Branch	12-20	Branch	5-12	Spout Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt567	50H	429249	6300392	Jarra	20+	0											No Signs	No Signs	No	
wpt568	50H	429277	6300426	Jarra	15-20	0											No Signs	No Signs	No	
wpt569	50H	429284	6300424	Jarra	15-20	0											No Signs	No Signs	No	
wpt570	50H	429291	6300423	Jarra	15-20	0											No Signs	No Signs	No	
wpt571	50H	429293	6300424	Jarra	15-20	0											No Signs	No Signs	No	
wpt572	50H	429274	6300441	Jarra	15-20	0											No Signs	No Signs	No	
wpt573	50H	429292	6300447	Jarra	20+	0											No Signs	No Signs	No	
wpt574	50H	429304	6300430	Jarra	20+	0											No Signs	No Signs	No	
wpt575	50H	429317	6300473	Jarra	15-20	3	Branch	5-12	Branch	5-12	Spout	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt576	50H	429355	6300505	Dead Unknown	15-20	5+	Branch	5-12	Branch	12-20	Branch	5-12	Branch	12-20	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt577	50H	429366	6300494	Jarra	20+	0											No Signs	No Signs	No	
wpt578	50H	429381	6300525	Jarra	15-20	0											No Signs	No Signs	No	
wpt579	50H	429395	6300535	Jarra	15-20	0											No Signs	No Signs	No	
wpt580	50H	429405	6300531	Jarra	15-20	0											No Signs	No Signs	No	
wpt581	50H	429410	6300526	Jarra	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt582	50H	429430	6300606	Jarra	20+	5+	Knot Hole	<5	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt583	50H	429490	6300666	Jarra	15-20	0											No Signs	No Signs	No	
wpt584	50H	429502	6300775	Jarra	20+	0											No Signs	No Signs	No	
wpt585	50H	429521	6300688	Jarra	20+	0											No Signs	No Signs	No	
wpt586	50H	429522	6300677	Jarra	20+	0											No Signs	No Signs	No	
wpt587	50H	429396	6300506	Jarra	15-20	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown
wpt588	50H	429712	6301131	Jarra	20+	5+	Knot Hole	5-12	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt589	50H	429665	6301165	Jarra	20+	0											No Signs	No Signs	No	
wpt590	50H	429666	6301173	Jarra	20+	0											No Signs	No Signs	No	
wpt591	50H	429677	6301153	Jarra	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Spout Branch	12-20	No Signs	No Signs	No	Depth of hollows unknown
wpt591a	50H	429677	6301153	Jarra	20+	0											No Signs	No Signs	No	
wpt592	50H	429686	6301110	Jarra	20+	0											No Signs	No Signs	No	
wpt593	50H	429666	6301086	Jarra	20+	0											No Signs	No Signs	No	
wpt594	50H	429683	6301078	Jarra	20+	0											No Signs	No Signs	No	



Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt595	50H	429686	6301074	Jarrah	20+	0											No Signs	No Signs	No	
wpt596	50H	429687	6301067	Jarrah	20+	0											No Signs	No Signs	No	
wpt597	50H	429636	6301035	Jarrah	20+	0											No Signs	No Signs	No	
wpt598	50H	429621	6301044	Jarrah	20+	0											No Signs	No Signs	No	
wpt599	50H	429647	6301004	Jarrah	20+	0											No Signs	No Signs	No	
wpt600	50H	429595	6300924	Jarrah	20+	0											No Signs	No Signs	No	
wpt601	50H	429623	6300906	Jarrah	20+	0											No Signs	No Signs	No	
wpt602	50H	429612	6300874	Jarrah	20+	0											No Signs	No Signs	No	
wpt603	50H	429605	6300873	Jarrah	20+	0											No Signs	No Signs	No	
wpt604	50H	429589	6300875	Jarrah	20+	0											No Signs	No Signs	No	
wpt605	50H	429587	6300891	Jarrah	20+	0											No Signs	No Signs	No	
wpt606	50H	429566	6300904	Jarrah	20+	0											No Signs	No Signs	No	
wpt607	50H	429560	6300917	Jarrah	20+	5+	Branch	<5	Branch	5-12	Branch	<5	Branch	5-12	Spout Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt608	50H	429567	6300876	Jarrah	20+	0											No Signs	No Signs	No	
wpt609	50H	429573	6300873	Jarrah	20+	0											No Signs	No Signs	No	
wpt610	50H	429579	6300858	Jarrah	20+	0											No Signs	No Signs	No	
wpt611	50H	429581	6300858	Jarrah	20+	0											No Signs	No Signs	No	
wpt612	50H	429566	6300812	Jarrah	20+	0											No Signs	No Signs	No	
wpt613	50H	429559	6300807	Jarrah	20+	0											No Signs	No Signs	No	
wpt614	50H	429553	6300818	Jarrah	20+	0											No Signs	No Signs	No	
wpt615	50H	429539	6300838	Jarrah	20+	0											No Signs	No Signs	No	
wpt616	50H	429533	6300837	Jarrah	20+	2	Spout Branch	5-12	Spout Branch	5-12							No Signs	No Signs	No	Depth of hollows unknown
wpt617	50H	429530	6300836	Jarrah	20+	0											No Signs	No Signs	No	
wpt618	50H	429525	6300851	Jarrah	20+	0											No Signs	No Signs	No	
wpt619	50H	429518	6300851	Jarrah	20+	0											No Signs	No Signs	No	
wpt620	50H	429514	6300848	Jarrah	20+	0											No Signs	No Signs	No	
wpt621	50H	429505	6300840	Jarrah	15-20	0											No Signs	No Signs	No	
wpt622	50H	429500	6300843	Jarrah	20+	0											No Signs	No Signs	No	
wpt623	50H	429501	6300850	Jarrah	20+	0											No Signs	No Signs	No	
wpt624	50H	429509	6300866	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt625	50H	429509	6300882	Dead Unknown	15-20	5+	Branch	5-12	Branch	12-20	Branch	5-12	Spout Branch	5-12	Spout Branch	12-20	No Signs	No Signs	Yes	Depth of hollows unknown
wpt626	50H	429504	6300907	Jarrah	20+	5+	Branch	5-12	Branch	12-20	Branch	5-12	Spout Branch	5-12	Spout Branch	12-20	No Signs	No Signs	Yes	Depth of hollows unknown
wpt627	50H	429506	6300920	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt628	50H	429523	6300973	Jarrah	20+	1	Branch	5-12									No Signs	No Signs	No	Depth of hollows unknown
wpt629	50H	429518	6300937	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt630	50H	429515	6300974	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt631	50H	429520	6300987	Jarrah	20+	0											No Signs	No Signs	No	
wpt632	50H	429534	6300995	Jarrah	15-20	0											No Signs	No Signs	No	
wpt633	50H	429536	6301015	Marri	20+	0											No Signs	No Signs	No	
wpt634	50H	429531	6301017	Jarrah	20+	0											No Signs	No Signs	No	
wpt635	50H	429529	6301014	Jarrah	20+	0											No Signs	No Signs	No	
wpt636	50H	429519	6301023	Jarrah	15-20	0											No Signs	No Signs	No	
wpt637	50H	429557	6301078	Jarrah	15-20	5+	Knot Hole	<5	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt638	50H	429566	6301108	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt639	50H	429563	6301119	Marri	20+	0											No Signs	No Signs	No	
wpt640	50H	429542	6301146	Marri	20+	0											No Signs	No Signs	No	
wpt641	50H	429532	6301147	Marri	15-20	0											No Signs	No Signs	No	
wpt642	50H	429542	6301156	Jarrah	15-20	0											No Signs	No Signs	No	
wpt643	50H	429544	6301180	Jarrah	15-20	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt644	50H	429555	6301185	Jarrah	20+	0											No Signs	No Signs	No	
wpt645	50H	429563	6301220	Jarrah	15-20	0											No Signs	No Signs	No	
wpt646	50H	429573	6301193	Marri	15-20	0											No Signs	No Signs	No	
wpt647	50H	429600	6301138	Dead Marri	20+	5+	Branch	5-12	Spout Branch	12-20	Branch	5-12	Spout Branch	20+	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt648	50H	429590	6301104	Jarrah	20+	0											No Signs	No Signs	No	
wpt649	50H	429575	6301100	Jarrah	20+	0											No Signs	No Signs	No	
wpt650	50H	429617	6301101	Jarrah	10-15	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt651	50H	429623	6301091	Jarrah	20+	0											No Signs	No Signs	No	
wpt652	50H	429615	6301074	Jarrah	15-20	0											No Signs	No Signs	No	
wpt653	50H	429587	6301056	Marri	20+	0											No Signs	No Signs	No	
wpt654	50H	429584	6301019	Jarrah	10-15	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt655	50H	429574	6300981	Jarrah	20+	2	Spout Branch	5-12	Spout Trunk	20+							No Signs	No Signs	Yes	Depth of hollows unknown
wpt656	50H	429567	6300994	Jarrah	20+	0											No Signs	No Signs	No	
wpt657	50H	429558	6300997	Jarrah	15-20	0											No Signs	No Signs	No	
wpt658	50H	429555	6300994	Marri	20+	0											No Signs	No Signs	No	
wpt659	50H	429543	6300981	Jarrah	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt660	50H	429548	6300956	Jarrah	20+	1	Spout Trunk	20+									No Signs	No Signs	Yes	Depth of hollows unknown

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Hollow Type 1	Hollow Size 1 (cm)	Hollow Type 2	Hollow Size 2 (cm)	Hollow Type 3	Hollow Size 3 (cm)	Hollow Type 4	Hollow Size 4 (cm)	Hollow Type 5	Hollow Size 5 (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt661	50H	429556	6300947	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt662	50H	429548	6300938	Marri	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt663	50H	429540	6300928	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt664	50H	429528	6300934	Jarrah	20+	0											No Signs	No Signs	No	
wpt665	50H	429533	6300924	Jarrah	0-5	1	Spout Trunk	20+									No Signs	No Signs	No	Too low/shallow
wpt666	50H	429545	6300898	Jarrah	15-20	1	Spout Trunk	12-20									No Signs	No Signs	Yes	Depth of hollows unknown
wpt667	50H	429538	6300898	Marri	15-20	3	Branch	5-12	Branch	5-12	Branch	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt668	50H	429538	6300900	Jarrah	20+	3	Branch	5-12	Branch	5-12	Spout	5-12					No Signs	No Signs	No	Depth of hollows unknown
wpt669	50H	429546	6300869	Jarrah	20+	0											No Signs	No Signs	No	
wpt670	50H	429529	6300865	Jarrah	20+	0											No Signs	No Signs	No	
wpt671	50H	429526	6300857	Jarrah	20+	0											No Signs	No Signs	No	
wpt672	50H	429557	6301047	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt673	50H	429557	6301053	Jarrah	15-20	0											No Signs	No Signs	No	
wpt674	50H	429565	6301065	Jarrah	20+	5+	Spout Trunk	20+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	Yes	Depth of hollows unknown
wpt675	50H	429578	6301074	Jarrah	20+	5+	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt676	50H	429567	6301286	Jarrah	20+	0											No Signs	No Signs	No	
wpt677	50H	429588	6301257	Jarrah	20+	0											No Signs	No Signs	No	
wpt678	50H	429598	6301259	Jarrah	20+	0											No Signs	No Signs	No	
wpt679	50H	429610	6301235	Jarrah	20+	5+	Knot Hole	5-12	Knot Hole	5-12	Branch	5-12	Branch	5-12	Branch	5-12	No Signs	No Signs	No	Depth of hollows unknown
wpt680	50H	429622	6301216	Marri	20+	0											No Signs	No Signs	No	
wpt681	50H	429622	6301211	Jarrah	15-20	0											No Signs	No Signs	No	
wpt682	50H	429634	6301199	Jarrah	20+	0											No Signs	No Signs	No	
wpt683	50H	429634	6301198	Jarrah	20+	0											No Signs	No Signs	No	
wpt684	50H	429636	6301183	Jarrah	20+	0											No Signs	No Signs	No	
wpt685	50H	429642	6301176	Marri	15-20	0											No Signs	No Signs	No	

# **APPENDIX E**

## **SIGNIFICANT SPECIES PROFILES**

### **Unnamed cricket *Pachysaga munggai***

Status and Distribution: Listed as Priority 3 by the DPaW. Distribution is poorly documented. NatureMap database contains only five records, two of which are in relatively close proximity to the study area (near Shots and Coalfields Hwy ~3 km east of Collie - DPaW 2013).

Habitat: Heathland habitat with occasional eucalypts and abundant leaf litter. Vegetation and leaf litter must be sufficient to provide this ground dwelling species with cover. Most NatureMap records are in the Jarrah forest belt.

Likely presence in study area: Status in the study area difficult to determine. History of disturbance (logging and frequent fires) would suggest the area represents marginal habitat for this species at best given reduced ground cover and leaf litter.

Potential impact of proposed development: Loss of an area of potential though marginal habitat. It is however unlikely that any part of the proposed clearing areas would represent an area of significance for this species given the extent of similar habitat in surrounding areas.

### **Darling Range Heath Ctenotus *Ctenotus delli***

Status and Distribution: Listed as Priority 4 by DPaW. Main distribution is in the Darling Range from the Darlington/Mundaring area to near Collie (Storr *et al* 1999).

Habitat: Humid zone, mainly laterite and clays (Storr *et al.* 1999) supporting jarrah/marri woodland with a shrub dominated understorey, sheltering in dense vegetation, inside grass trees and beneath rocks, sometimes in burrows (Nevill 2005). Occasionally found on granite outcrops (Bush 2002).

Likely presence in study area: Potentially present though actual status onsite is difficult to determine. A single record from 2006 1.5km east of the study area (DPaW 2013). Most areas probably represent marginal habitat due to history of disturbance.

Potential impact of proposed development: If this species is present then development may result in the loss of some habitat though it is unlikely to alter the species overall status given the relatively small area involved.

### **Southern Carpet Python *Morelia spilota imbricata***

Status and Distribution: The south western population is classified as Schedule 4 under the *WC Act*. This subspecies has wide distribution within the south west



but is uncommon. Occurs north to Geraldton and Yalgoo and east to Pinjin, Kalgoorlie, Fraser Range and Eyre (Storr *et al.* 2002).

Habitat: This species has been recorded from semi-arid coastal and inland habitats, Banksia woodland, Eucalypt woodlands, and grasslands. Most often found utilising hollow logs in addition the burrows of other animals for shelter. Often arboreal and will also use tree hollows for refuge.

Likely presence in study area: Status onsite difficult to determine. Very few records near Collie. Most habitats looks marginal due to sparse nature of groundcover. Typically only occurs in low densities.

Potential impact of proposed development: Loss of an area of potential habitat. Low probability but the potential for individuals to be killed or injured during clearing.

### **Malleefowl *Leipoa ocellata***

Status and Distribution: This species is listed as Schedule 1 under the *WC Act* and as Vulnerable and Migratory under the *EPBC Act*. Originally common, but now generally rare to uncommon and patchily distributed.

Current distribution mainly southern arid and semi-arid zones, north to Shark Bay, Jingemarra, Colga Downs and Yeelirrie, east to Earnest Giles Range, Yeo Lake, lower Ponton Creek and to Eucla and west and south to Cockleshell Gully, the Wongan Hills, Stirling Range, Beaufort Inlet, Hatters Hill, Mt Ragged and Point Malcolm (Johnstone and Storr 1998).

Habitat: Mainly scrubs and thickets of mallee *Eucalyptus* spp., boree *Melaleuca lanceolata* and bowgada *Acacia linophylla*, also dense litter forming shrublands.

Likely presence in study area: This species is regionally extinct and would never, under normal circumstances occur anywhere on the Swan Coastal Plain/Darling Range.

Potential impact of proposed development: No impact on this species or its preferred habitat will occur.

### **Great Egret *Ardea alba***

Status and Distribution: This species of egret is listed as migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The Great Egret is common and very widespread in any suitable permanent or temporary habitat (Morcombe 2004).

Habitat: Wetlands, flooded pasture, dams, estuarine mudflats, mangroves and reefs (Morcombe 2004).

Likely presence in study area: Suitable habitat for this species is limited to the very small man made dam present in the western section of the area investigated. Listed as a potential species but would only occur very infrequently and for limited periods. Would not breed within the study area.

Potential impact of proposed development: No impact on this species is anticipated. Habitat that this species is likely to use in the study area is comprised of highly degraded man mad dam of limited extent.

### **Cattle Egret *Ardea ibis***

Status and Distribution: This species of egret is listed as migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The Cattle Egret is common in the north sections of its range but is an irregular visitor to the better watered parts of the state (Johnstone and Storr 1998). The population is expanding (Morcombe 2003).

Habitat: Moist pastures with tall grasses, shallow open wetlands and margins, mudflats (Morcombe 2003).

Likely presence in study area: Suitable habitat for this species is limited to the very small man made dam present in the western section of the area investigated. Listed as a potential species but would only occur very infrequently and for limited periods. Would not breed within the study area.

Potential impact of proposed development: No impact on this species is anticipated. Habitat that this species is likely to use in the study area is comprised of highly degraded man mad dam of limited extent.

### **White-bellied Sea Eagle *Haliaeetus leucogaster***

Status and Distribution: This species is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. White-bellied sea eagles are moderately common to common on Kimberley and Pilbara islands, coasts and estuaries, on Bernier, Dorre and Dirk Hartog Is., in Houtman Abrolhos and in the Archipelago of the Recherche; rare to uncommon elsewhere (Johnstone and Storr 1998). Also found in New Guinea, Indonesia, China, southeast Asia and India. Scarce near major coastal cities (Morcombe 2004).

Habitat: They nest and forage usually near the coast over islands, reefs, headlands, beaches, bays, estuaries, mangroves, but will also live near seasonally flooded inland swamps, lagoons and floodplains, often far inland on

large pools of major rivers. Established pairs usually sedentary, immatures dispersive (Morcombe 2004). White-bellied Sea-Eagles build a large stick nest, which is used for many seasons in succession.

Likely presence in study area: No suitable habitat in or near the study area.

Potential impact of proposed development: No impact on this species or its preferred habitat is considered likely.

### **Osprey *Pandion haliaetus***

Status and Distribution: This species is listed as Migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. Moderately common to very common in sheltered seas around the north and west coast islands south to 31°S; uncommon to common on mainland coasts, estuaries and large rivers north of tropic, rare to uncommon elsewhere (Johnstone and Storr 1998).

Habitat: Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers (Pizzey & Knight 2012). Construct nests on prominent headland, large trees, communication towers (Simpson & Day 2010).

Likely presence in study area: No suitable habitat in or near the study area.

Potential impact of proposed development: No impact on this species or its preferred habitat is considered likely.

### **Peregrine Falcon *Falco peregrinus***

Status and Distribution: This species is listed as Schedule 4 under the *WC Act*. Individuals of this species are uncommon/rare but wide ranging across Australia. Moderately common at higher levels of the Stirling Range, uncommon in hilly, north west Kimberley, Hamersley and Darling Ranges; rare or scarce elsewhere (Johnstone and Storr 1998).

Habitat: Diverse from rainforest to arid shrublands, from coastal heath to alpine (Morcombe 2004). Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes (Johnstone and Storr 1998). The species utilises the ledges, cliff faces and large hollows/broken spouts of trees for nesting. It will also occasionally use the abandoned nests of other birds of prey.

Likely presence in study area: Individuals of this species potentially utilises some sections of the study area as part of a much larger home range.

Potential impact of proposed development: Modification of potential foraging habitat and potential for the loss of potential breeding sites (i.e. tall trees with broken spouts).



**Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso***

Status and Distribution: Listed as Scheduled 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Found in the humid and subhumid south west, mainly hilly interior, north to Gingin and east to Mt Helena, Christmas Tree Well, North Bannister, Mt Saddleback, Rock Gully and the upper King River (Johnstone and Storr 1998).

Habitat: Eucalypt forests, feeds on Marri, Jarrah, Blackbutt, Karri, Sheoak and Snottygobble. The Forest Red-tailed Black Cockatoo nests in the large hollows of Marri, Jarrah and Karri (Johnstone and Kirkby 1999). In Marri, the nest hollows of the Forest Red-tailed Black Cockatoo range from 8-14m above ground, the entrance is 12 – 41cm in diameter and the depth is one to five metres (Johnstone and Storr 1998).

Breeding commences in winter/spring. There are few records of breeding in the Forest Red-tailed Black Cockatoo (Johnstone and Storr 1998), but eggs are laid in October and November (Johnstone 1997; Johnstone and Storr 1998). Recent data however indicates that breeding in all months of the year occurs with peaks in spring and autumn–winter (Ron Johnstone pers comms). Incubation period 29 – 31 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

J	F	M	A	M	J	J	A	S	O	N	D

 Period in which breeding is most likely to commence  
 Period in which fledging/weaning could extend through

Likely presence in study area: Individuals of this species were heard calling during the field survey and foraging evidence observed (chewed marri and jarrah fruits). Almost all of the vegetation present represents foraging habitat for this species (e.g. marri trees, jarrah trees) and using DSEWPaC criteria the area also contains potential breeding habitat (i.e. any suitable tree species with a DBH>50cm). May also roost on site though no evidence of this was found.

Potential impact of proposed development: Loss of foraging, breeding and roosting opportunities.

**Baudin’s Black- Cockatoo *Calyptorhynchus baudinii***

Status and Distribution: Listed as Scheduled 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Confined to the south-west of Western Australia, north to Gidgegannup, east to Mt Helena, Wandering, Quindanning,





Kojonup, Frankland and King River and west to the eastern strip of the Swan Coastal Plain including West Midland, Byford, Nth Dandalup, Yarloop, Wokalup and Bunbury (Johnstone and Storr 1998). On the southern Swan Coastal Plain this cockatoo is in some areas resident but mainly a migrant moving from the deep south-west to the central and northern Darling Range. Between March and September most flocks move north and are concentrated in the northern parts of the Darling Range. During this period birds forage well out onto the southern Swan Coastal Plain to areas such as Harvey, Myalup, Bunbury, Capel, Dunsborough and Meelup. While generally more common in the Darling Range this species can also be common on parts of the southern Swan Coastal Plain especially in mid-August – September when flocks begin to return to their breeding quarters (Johnstone 2008).

Habitat: Mainly eucalypt forests where it feeds primarily on the Marri seeds, (Morcombe, 2003), Banksia, Hakeas and *Erodium* sp. Also strips bark from trees in search of beetle larvae (Johnstone and Storr 1998). This species of cockatoo nests in large tree hollows, 30–40 cm in diameter and more than 30 cm deep (Saunders 1974).

Baudin's Black-Cockatoo breeds in late winter and spring, from August to November or December (Gould 1972; Johnstone 1997; Saunders 1974; Saunders *et al.* 1985). Eggs laid in October (Johnstone and Storr 1998). Based on observations at currently known nest sites breeding mainly occurs within the October-December period (Ron Johnstone pers comms). Incubation is 28 – 30 days. Young fledge at 8 to 9 weeks (Simpson and Day 2004).

J	F	M	A	M	J	J	A	S	O	N	D

 Period in which breeding is most likely to commence  
 Period in which fledging/weening could extend througho

Likely presence in study area: Observed flying overhead and heard calling several times within the survey area and nearby. Almost all the remnant vegetation within the study area presents potential foraging habitat for this species. Larger trees (>50cm DBH) can be considered potential breeding habitat. This species may also roost on site on occasions though no roost trees observed.

Potential impact of proposed development: Loss of foraging, breeding and roosting opportunities.

**Carnaby's Black- Cockatoo *Calyptorhynchus latirostris***

Status and Distribution: Carnaby's Black Cockatoo is listed as Scheduled 1 under the *WC Act* and as Endangered under the *EPBC Act*. Confined to the



south-west of Western Australia, north to the lower Murchison River and east to Nabawa, Wilroy, Waddi Forest, Nugadong, Manmanning, Durokoppin, Noongar (Moorine Rock), Lake Cronin, Ravensthorpe Range, head of Oldfield River, 20 km ESE of Condingup and Cape Arid; also casual on Rottnest Island (Johnstone and Storr 1998).

**Habitat:** Forests, woodlands, heathlands, farms; feeds on Banksia, Hakeas and Marri. Carnaby's Cockatoo has specific nesting site requirements. Nests are mostly in smoothed-barked eucalypts with the nest hollows ranging from 2.5 to 12m above the ground, an entrance from 23-30cm diameter and a depth of 0.1-2.5m (Johnstone and Storr, 1998).

Breeding occurs in winter/spring mainly in eastern forest and wheatbelt where they can find mature hollow bearing trees to nest in (Morcombe, 2003). Judging from records in the Storr-Johnstone Bird Data Bank, this species is currently expanding its breeding range westward and south into the Jarrah – Marri forest of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain including the region between Mandurah and Bunbury. Carnaby's Black Cockatoo has been known to breed close to the town of Mandurah, as well as at Dawesville, Lake Clifton and Baldivis (pers. comm., Ron Johnstone, WA Museum) and there are small resident populations on the southern Swan Coastal Plain near Mandurah, Lake Clifton and near Bunbury. At each of these sites the birds forage in remnant vegetation and adjacent pine plantations (Johnstone 2008).

Carnaby's Black-Cockatoo lays eggs from July or August to October or November, with most clutches being laid in August and September (Saunders 1986). Birds in inland regions may begin laying up to three weeks earlier than those in coastal areas (Saunders 1977). The female incubates the eggs over a period of 28-29 days. The young depart the nest 10–12 weeks after hatching (Saunders 1977; Smith & Saunders 1986).

J	F	M	A	M	J	J	A	S	O	N	D

 Period in which breeding is most likely to commence  
 Period in which fledging/weening could extend through

**Likely presence in study area:** Not observed during the survey period but foraging evidence found. Remnant vegetation represents foraging habitat. Potential to also breed in the area but probability of this occurring can be considered to be low. This species may also roost on site on occasions though no roost trees observed.

**Potential impact of proposed development:** Loss of foraging, breeding and roosting opportunities.

### **Masked Owl *Tyto novaehollandae novaehollandae***

Status and Distribution: Listed as Priority 3 by DPaW. Found north to Yanchep and east to Yealering, Gnowangerup and Albany, casual further north. Locally common in south west but generally uncommon (Johnstone and Storr 1998).

Habitat: Roosts and nests in heavy forest, hunts over open woodlands and farmlands (Morcombe 2004). Probably breeding in forested deep south west with some autumn–winter wanderings northwards (Johnstone and Storr 1998).

Likely presence in study area: Status on the site and in the general area difficult to determine. May frequent the area at times.

Potential impact of proposed development: Modification of potential foraging habitat and the loss of potential breeding and roosting opportunities.

### **Fork-tailed Swift *Apus pacificus***

Status and Distribution: The Fork-tailed Swift is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* as migratory under the *EPBC Act 1999* and under international agreements to which Australia is a signatory. It is a summer migrant (Oct-Apr) to Australia (Morcombe 2004).

Habitat: Low to very high airspace over varied habitat from rainforest to semi desert (Morcombe 2003).

Likely presence in study area: It is potentially an occasional summer visitor to the study area but is entirely aerial and largely independent of terrestrial habitats.

Potential impact of proposed development: No impact on this species is anticipated.

### **Rainbow Bee-eater *Merops ornatus***

Status and Distribution: This species is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* and under international agreements to which Australia is a signatory. The Rainbow Bee-eater is a common summer migrant to southern Australia but in the north they are resident (Morcombe 2003).

Habitat: Open Country, of woodlands, open forest, semi arid scrub, grasslands, clearings in heavier forest, farmlands (Morcombe 2004). Breeds underground in areas of suitable soft soil firm enough to support tunnel building.

Likely presence in study area: Common seasonal visitor to south west and likely to forage and roost in sections of the study area. Possibly breeds in some sections of the study area where sandier ground conditions are present though

population levels would not be significant as it usually breeds in pairs, rarely in small colonies (Johnstone and Storr 1998).

Potential impact of proposed development: Modification and/or loss of some habitat but impact will not be significant. This species can be expected to continue to utilise the area, as it does now, despite any future development.

### **Chuditch *Dasyurus geoffroii***

Status and Distribution: Listed as Scheduled 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Formerly occurred over nearly 70 per cent of Australia. The Chuditch now has a patchy distribution throughout the Jarrah forest and mixed Karri/Marri/Jarrah forest of southwest Western Australia. Also occurs in very low numbers in the Midwest, Wheatbelt and South Coast Regions with records from Moora to the north, Yellowdine to the east and south to Hopetoun.

Habitat: Chuditch are known to have occupied a wide range of habitats from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts. Riparian vegetation appears to support higher densities of Chuditch, possibly because food supply is better or more reliable and better cover is offered by dense vegetation. Chuditch appear to utilise native vegetation along road sides in the wheatbelt (CALM 1994). The estimated home range of a male Chuditch is over 15 km<sup>2</sup> whilst that for females is 3-4 km<sup>2</sup> (Sorena and Soderquist 1995).

Likely presence in study area: This species is known to persist in state forest and national park areas surrounding Collie and therefore it may frequent the study site.

Potential impact of proposed development: Loss of some potential habitat. Some possibility that individuals maybe killed or injured during clearing operations.

### **Numbat *Myrmecobius fasciatus***

Status and Distribution: Listed as Scheduled 1 under the *WC Act* (1950) and as Vulnerable under the *EPBC Act* (1999). Once occurred across much of arid and semi arid southern Australia, now restricted to a few remnant forests of Wandoo, Powderbark Wandoo or jarrah in South west WA (Menkhorst & Knight 2001). Rare, scattered. Found only at Dryandra, Perup and six other translocation sites (Van Dyck & Strahan 2008).

Habitat: Generally dominated by eucalypts that provide hollow logs and branches for shelter and termites for food (Van Dyck & Strahan 2008).



Likely presence in study area: Available evidence suggests this species is locally and regionally extinct.

Potential impact of proposed development: No impact on this species is anticipated.

### **Southern Brush-tailed Phascogale *Phascogale tapoatafa ssp***

Status and Distribution: Listed as Scheduled 1 under the *WC Act*. Present distribution is believed to have been reduced to approximately 50 per cent of its former range. Current document distribution is from Perth and south to Albany, west of Albany Highway. Occurs at low densities in the northern Jarrah forest. Highest densities occur in the Perup/Kingston area, Collie River valley, and near Margaret River and Busselton (DPaW information pamphlet). Records are less common from wetter forests.

Habitat: This subspecies has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. A nocturnal carnivore relying on tree hollows as nest sites. The home range for a female Brush-tailed Phascogale is estimated at between 20 and 70 ha, whilst that for males is given as twice that of females. In addition, they tend to utilise a large number (approximately 20) of different nest sites throughout their range (Soderquist, 1995).

Likely presence in study area: This species is known to persist in state forest and national park areas surrounding Collie and therefore it may frequent the study site.

Potential impact of proposed development: Loss of some potential habitat. Some possibility that individuals maybe killed or injured during clearing operations.

### **Southern Brown Bandicoot *Isoodon obesulus fusciventer***

Status and Distribution: Listed as Priority 5 by DPaW. Widely distributed in the south west from near Cervantes north of Perth to east of Esperance, patchy distribution through the Jarrah and Karri forest and on the Swan Coastal Plain, and inland as far as Hyden. Has been translocated to Julimar State Forest, Hills Forest Mundaring, Tutanning Nature Reserve, Boyagin Nature Reserve, Dongolocking Nature Reserve, Leschenault Conservation Park, and Karakamia and Paruna Sanctuaries (DPaW information pamphlet) and Nambung National Park (DPaW pers. coms.)

Habitat: Dense scrubby, often swampy, vegetation with dense cover up to one metre high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover.

Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quendas can thrive in more open habitat subject to exotic predator control (DPaW information pamphlet).

Likely presence in study area: Evidence of this species foraging in some sections of the study area observed.

Potential impact of proposed development: Loss of some potential habitat. Some possibility that individuals maybe killed or injured during clearing operations.

### **Western Ringtail Possum *Pseudocheirus occidentalis***

Status and Distribution: Listed as Scheduled 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Common in suitable habitat (de Tores 2008). The highest densities of this species are recorded in Peppermint habitat near Busselton area; relatively high densities are found in Jarrah/Marri forest at Perup (de Tores 2008).

The Western Ringtail Possum (WRP) has a restricted distribution in south-western Western Australia. Most known populations (natural and translocated) are now restricted to near coastal areas of the south west from the Dawesville area to the Waychinicup National Park. Inland, it is also known to be relatively common in a small part of the lower Collie River valley, the Perup Nature Reserve and surrounding forest blocks near Manjimup. It has also been recorded in stands of Peppermint near the Harvey River and in Jarrah/Marri forest near Collie; however, the long term persistence of the species in these areas is not confirmed (de Tores *et al* 2004). The Western Ringtail was formerly more widespread: in the 1970s it was known from Casuarina woodlands in the wheatbelt near Pingelly (south-east of Perth), and it is thought to have once occurred throughout much of south-western Western Australia (but not necessarily continuously distributed) (Maxwell *et al.* 1996; de Tores 2008).

The species is widespread and relatively common in vegetated remnants within the Swan Coastal Plain and along the Whicher Scarp between Bunbury and Busselton (G. Harewood per. obs.). The most northern known natural coastal population is centred on the Binningup townsite.

Habitat: The Western Ringtail Possum was once located in a variety of habitats including Coastal Peppermint, Coastal Peppermint-Tuart, Jarrah-Marri associations, Sheoak woodland, and eucalypt woodland and mallee. Coastal populations mostly inhabit Peppermint-Tuart associations with highest densities in habitats with dense, relatively lush vegetation. In these areas the main determinants of suitable habitat for WRPs appears to be the presence of *Agonis flexuosa* either as the dominant tree or as an understorey component of Eucalypt

forest or woodland (Jones *et al.* 1994a). Inland, the largest known populations occur in the Upper Warren area east of Manjimup (Wayne *et al.* 2005). In this area the peppermint tree is naturally absent and jarrah-marri associations constitute the species refuge and foraging habitat. In areas where Peppermint is absent or rare WRP's have been observed feeding predominately on young Jarrah, *Nuytsia floribunda* and *Allocasuarina fraseriana* (G Harewood pers. obs.).

Likely presence in study area: Despite targeted searching for dreys, scats and individuals no evidence of this species within study area was found. This evidence and observations of vegetation structure and composition suggest that WRP's are either absent from the study or are present in low densities, at only a few locations. This is supported by the lack of observations of the species during other more detailed fauna surveys in the near vicinity (see Appendix B).

In general terms the vegetation appears largely unsuitable or at best marginal for WRP's to utilise. This is primarily based on the fact that the majority of the vegetation is dominated by young, relatively tall trees with an overall structure that lacks a significant density of midstorey vegetation/canopy and therefore connectivity between trees is compromised. This would make it difficult for WRP's to move through the vegetation without coming to ground.

Western Ringtails Possums are however known to occur in some areas of bushland surrounding Collie and therefore their presence within some sections of the study area, if only infrequently, cannot be discounted. They are most likely to be found utilising areas with the best quality midstorey vegetation (i.e. highest density and high species variation). WRP's also use hollows in trees and Grass Trees/Balga Bushes for daytime refuge and this should be taken into consideration during clearing operations.

Potential impact of proposed development: Loss of some potential though marginal habitat. Some possibility that individuals maybe killed or injured during clearing operations.

### **Quokka *Setonix brachyurus***

Status and Distribution: Listed as Scheduled 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Rare and restricted in south west W.A. from south of Perth to Two Peoples Bay. The distribution of the Quokka includes Rottnest and Bald Islands, and at least 25 known sites on the mainland, including Two Peoples Bay Nature Reserve, Torndirrup National Park, Mt Manypeaks National Park, Walpole-Nornalup National Park, and various swamp areas through the south-west forests from Jarrahdale to Walpole. As of 2008 there were nine known quokka populations in the Wellington National Park area (DEC 2008). One population, north of the Collie River, is considered to be the largest

in the northern jarrah forest, although numbers appear to be declining (DEC 2008).

Habitat: Mainland populations of this species are currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems where they are less vulnerable to predation. The species is nocturnal.

Likely presence in study area: There is no suitable habitat for this species within the study area.

Potential impact of proposed development: No impact on this species is anticipated.

### **Western Brush Wallaby *Macropus irma***

Status and Distribution: Listed as Priority 4 by DPaW. The Western Brush Wallaby is distributed across the south-west of Western Australia from north of Kalbarri to Cape Arid (DPaW information pamphlet nd).

Habitat: The species optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland, and is uncommon in karri forest (DPaW information pamphlet nd).

Likely presence in study area: This species is relatively common in the Collie area and is likely to frequent sections of the study area at times.

Potential impact of proposed development: Loss of small areas of potential habitat.

### **Western False Pipistrelle *Falsistrellus mackenziei***

Status and Distribution: Listed as Priority 4 by DPaW. Listed as Vulnerable by the ICUN. Confined to south west W.A. south of Perth and east to the wheat belt. Most records from Karri forests but also recorded in wetter stands of jarrah and tuart and woodlands on the Swan Coastal Plain (Menkhorst and Knight 2001). Range appears to be contracting southwards, presumably due to drying climate.

Habitat: This species of bat occurs in high forest and coastal woodlands. It roosts in small colonies in tree hollows and forages at canopy level and in the cathedral-like spaces between trees.

Likely presence in study area: Potentially present with the study area when it is likely to forage and possibly roost given presence of suitable tree hollows.



Potential impact of proposed development: Loss/modification of foraging habitat and loss of potential roosting habitat (hollow trees).

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