

FLORA and VEGETATION ASSESSMENT

Pit and Processing Area Lot 501
Coalfields Road, Wellington

Prepared for B and J Catalano Pty Ltd

September 2017



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SUMMARY

Background

Lot 501 lies back from the Darling Scarp south of Coalfields Highway. The land is a productive farming property on which a gravel extraction and crushing activity has operated for over ten years.

A small hard rock quarry has been approved by the State Administrative Tribunal (2017 WASAT 55) which utilises the following areas. See the attached Plan "A".

Processing and stockpile area

- 6.5 ha - Flat active ground for processing and stockpiles contained within
- 8.28 ha - Footprint that includes the vegetated bunds, vegetated batter slopes, drainage and detention basins etc

Pit and Excavation

- 6.5 ha - Active excavation contained within
- 8.43 ha - Footprint that includes the vegetated bunds, vegetated batter slopes, drainage, haul roads and detention basins etc

The processing area footprint of 8.28 hectares contains a clump of three smaller Marri regrowth trees. DWER have informed B and J Catalano that clearing of those three trees will be included in the Works Approval 5828. The other trees on the edges will be retained as shown on the attached Plan "A".

The pit footprint is parkland pasture of 8.43 hectares with scattered regrowth trees that include some older larger trees. A separate Clearing Permit is applied for to cover this clearing. This documentation is provided in support for the application for the Clearing Permit.

The proposed clearing for the pit will result in the clearing of some Marri and Jarrah trees that may require referral to the Commonwealth Department of Environment and Energy under the EPBC Guidelines for the protection of Black Cockatoos. Pre-referral discussions were held with the Commonwealth Department of Environment and Energy on 29 August 2017, (Contact Anita Mathers, Senior Assessment Officer, Assessments WA, SA and NT). Initial discussions suggested that with the proposed mitigation and provision of 10 nesting boxes, the proposed clearing was unlikely to constitute a "controlled action".

Referral of the proposed clearing for the pit footprint will be referred to the Commonwealth Department of Environment and Energy under *Section 523 of the EPBC Act 1999*. The referral will also be this document.

Extensive noise modelling, dust, water, transport and other management measures are proposed for the quarry and processing operations.

Clearing Applications

A Clearing Permit is applied for under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and a referral under the EPBC Act 1999 is made.

A vegetation assessment has been completed to *EPA December 2016 Technical Guidance – Flora and Vegetation Surveys for Environmental Impact*.

Site Conditions

The site is very species poor and consists almost solely of pasture with some Marri and Jarrah trees.

The approved disturbance areas were selected to minimise impacts on flora and fauna.

There are no significant species on site, no Threatened or Priority Flora or communities.

As there is potential, and there is evidence of, Black Cockatoos use of the disturbance footprint for the pit, an assessment to the EPBC Act Referral guidelines for tree threatened black cockatoo species, has been conducted.

The assessment found that there was;

- One tree to be cleared which showed obvious chewing around a hollow and may represent a nest tree.
- There is less than a total of 1 hectares of trees to be cleared.
- 22 trees greater than 500 mm diameter will be required to be cleared.
- Large areas of similar habitat in the surrounding locality and areas of remnant vegetation and cockatoo habitat trees on Lot 501 that include habitat and trees suitable for nesting that will not be impacted and are protected by the conditions of approval of the quarry (Condition 2). Within a 12 km radius approximately half of the land is occupied by Jarrah – Marri forest. Pine plantation adjoins to the west.
- No evidence of impact on Black Cockatoos behaviours has been observed, resulting from the gravel operations. Birds visit Lot 501 at any time, even when gravel operations are being conducted.

EPBC Referral Requirements

Under the current EPBC Guidelines 2012 for Black Cockatoos, for referral to the Commonwealth, the clearing does not exceed 1 hectare.

It is unclear whether Tree 9 contains an active nesting hollow, but the tree shows signs obvious evidence of chewing and so one potential nesting tree is required to be cleared. This is classified into the “High Risk” category which can be addressed by mitigation measures which are proposed.

Under the Draft EPBC Referral Guidelines 2017 for Black Cockatoos the vegetation impacted is assessed as Score 7 in the which is the lowest category of “High Risk” which can be addressed by mitigation measures which are proposed.

Pre-referral discussions have been held with the Commonwealth Department of Environment and Energy. See above under “Background”. The preliminary discussions suggest that the proposed mitigation measures are likely to comply with the EPBC Guidelines.

- A range of mitigation measures are proposed, including the Progressive clearing. These mitigation measures are compliant with the mitigation recommended in the EPBC 2017 Draft Guidelines for Black Cockatoos.
- The habitat is likely to be habitat of Baudins Black Cockatoo based on the feeding debris found.
- Restrictions on clearing and protection of the remnant vegetation.

- Planting of around 2.0 hectares of local native trees on bunds and batters slopes.
- Provision of ten nesting boxes.
- Revegetation of the pit faces and batter slopes to local native vegetation.

In order to ensure compliance the proposal will be referred to the Commonwealth Department of Environment and Energy concurrently with referral of the application for a Clearing Permit.

CONTENTS

1.0	INTRODUCTION	1
2.0	METHODOLOGY	1
2.1	Aims of the Survey	1
2.2	Methods of Survey	1
2.3	Limitations of the Survey	3
3.0	PHYSICAL ENVIRONMENT	3
3.1	Site Description	3
3.2	Soils	3
3.3	Climate	3
4.0	VEGETATION ASSESSMENT	8
	Community Types	8
	Species List	8
	Plant Density	10
	Vegetation Structure	10
	Vegetation Condition	10
5.0	SIGNIFICANT VEGETATION	12
5.1	Threatened, Priority or Significant Taxa	12
5.2	Threatened or Priority Ecological Communities	13
5.3	EPBC Legislation	13
5.4	Vegetation Representation	13
6.0	FAUNA HABITATS AND IMPACTS	14
7.0	CLEARING ASSESSMENT	24
8.0	CLEARING ASSESSMENT AGAINST EPBC GUIDELINES	29
REFERENCES - READING		
TABLES		
Table 1	Vegetation condition score table	11
Table 2	Vegetation condition on the pit footprint	11
Table 3	Large trees recorded on the approved pit footprint	16
Table 4	Summary of potential Black Cockatoo habitats	17
Table 5	Impact Score from EPBC 2017 Draft Referral Guidelines	18
Table 6	Trees recorded that have been used by Cockatoos outside the approved footprints	19
Table 7	Clearing Principles	24
Table 8	Additional clearing considerations	25
Table 9	Assessment against the Clearing Principles	25
FIGURES		
Footprint Figure		See the Summary
Figure 1	Location of Lot 501	4
Figure 2	Location of the approved pit and processing area	5
Figure 3	Aerial photograph of the pit and processing area	6
Figure 4	Vegetation across the approved pit footprint	7

Figure 5	Vegetation across the approved footprint	8
Figure 6	Typical clumps of regrowth vegetation that contain some larger trees	10
Figure 7	Location of the habitat trees and hollows	15
Figure 8	Two examples of larger trees on the pit footprint	19
Figure 9	Trees used by Cockatoos outside the approved footprints	21
Figure 10	Vegetation edging the processing area showing regrowth and large trees with hollows.	22
Figure 11	12 km radius from the proposed operations – remnant vegetation	attached
Figure 12	12 km radius from proposed operations – aerial photograph	attached

ATTACHMENTS

Assessments by Tony Kirkby.

EPBC Referral Guidelines for three threatened black cockatoo species.

Quarry Approval from the State Administrative Tribunal.

Flora and Vegetation Assessment

1.0 INTRODUCTION

B and J Catalano were granted approval to develop a hard rock quarry on portion of Lot 501, Coalfields Road, Wellington, by the State Administrative Tribunal on 31 March 2017, Catalano and Shire of Harvey [2017] WASAT 55.

The processing area of around 6.5 hectares of flat ground for processing and stockpiles and together with the vegetated bunds, batter slopes and drainage will constitute an area of 8.28 hectares that is cleared apart from a clump of three regrowth Marri Trees *Corymbia (Eucalyptus) calophylla*. The clearing of those trees is contained in the DER Works Approval application W5828/2015/1. See the Figure showing the Footprints located in the Summary.

The pit has an area of approximately 6.5 hectares and together with the bunds, batter slopes, haul roads and the existing pit will result in the impact and is parkland pasture with some clumps of scattered Marri and Jarrah *Eucalyptus marginata* trees of 8.43 hectares. See the Figure showing the Footprints located in the Summary.

2.0 METHODOLOGY

2.1 Aims of the Survey

The aim of the survey was to

- Identify any Significant flora such as Priority or Threatened flora,
- Assess the vegetation for Threatened and Priority Communities
- Assess the habitat trees that may be used by Carnaby's Cockatoo,
- Provide information on the vegetation and the species present.

2.2 Methods of Survey

Background

The vegetation was assessed by Lindsay Stephens of Landform Research.

To assist with the assessment studies have been conducted on a number of occasions through 2013 to 2017. The trees were assessed for cockatoo habitat late in 2016 and the trees revisited on 13 July 2017.

Other tree specific studies were conducted by Tony Kirkby, an expert on Black Cockatoos was commissioned to review the vegetation and the trees for Cockatoo habitat. See the attached report.

The 2004 Guidance has now been superseded by the *EPA December 2016 Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* was reviewed and led to the vegetation being re-inspected in 2017.

The vegetation and flora study has been reviewed in light of the updated Guidance and complies with the Guidance for a Targeted Survey which appears appropriate for the area of vegetation to be impacted and the existing level of disturbance.

This report updates and confirms the vegetation assessments conducted for the application for the development consideration.

Desktop Review

The DEC (now DBCA) Rare and Priority Flora and Ecological Communities databases were searched through Florabase. The Commonwealth EPBC databases were also searched and Naturebase was searched.

The main references for plant identification were knowledge of the assessor, published texts, and Florabase.

The Protected Matters Search Tool, Commonwealth Department of Environment for the local authority area was used. See attached.

Naturemap was also searched for a radius of 10 km.

Determinations and inferences on the Vegetation Complexes and Floristic Community Types were not possible because of the paucity of the vegetation, being parkland cleared.

Determinations and inferences on the original Vegetation Complexes and Floristic Community Types were made in a number of ways, relating to comparisons to published floristics and geomorphic and regolith matching.

- Comparisons were made to published boundaries of *Vegetation Complexes in Heddlie et al, 1980*.
- Comparisons were made to published boundaries of *Vegetation Complexes in Mattiske and Havel, 1998*.
- Comparison to regolith and geological mapping produced by the *Western Australian Geological Survey*.

On Ground Assessment

The vegetation assessment was conducted as a review assessment of the vegetation.

During the inspections the whole of the land to be excavated was traversed at intervals dependant on the quality of the vegetation on a number of occasions from 2015 through 2017.

All native species noted during the traverses were recorded.

No 100 m² plot were assessed because of the paucity of species and parkland pasture which occupies the site.

All trees larger than chest elevation diameter of 500 mm were identified, located and assessed for hollows.

Tony Kirkby, an expert on Black Cockatoos reviewed all trees and reviewed all trees with potential hollows and whether the hollows had evidence of use by cockatoos. He completed the assessments on two occasions, on 28 April 2017 and early August 2017. His reports are attached.

A series of ground photographs was also taken.

Targeted searches were made for listed Threatened, Priority or Significant species were made.

2.3 Limitations of the Survey

The survey was conducted on a number of occasions over three years including spring surveys. There are no limitations of the survey. The assessors are experienced in their fields.

3.0 PHYSICAL ENVIRONMENT

3.1 Site Description

The site lies on the western side of the Yilgarn Plateau approximately 8 km from the edge of the Darling Scarp. The plateau at this point consists of portion of dissected plateau remnants running down to valley floors related to the Collie River System.

The elevation of the plateaus at this location are 280 - 300 metres AHD with the tributary floors 160 metres and 60 metres for the Collie River to the south.

The whole site is underlain by the Granitoid rocks of the Boddington Terrane of Archaean age (Wilde 2001). The Boddington Terrane consists of granitic migmatites which have granitic composition but have lineations and some gneissosity, generally trending north.

The geology is described in the geological assessment of the resource, Swindells 1982 attached as Appendix 1.

Overlying the granite is the remnants of an ancient Tertiary weathering plateau which is represented by the laterite gravel and duricrust that caps the higher ridges and forms the gravel resource.

In more recent times the plateau has been dissected and the granitoid basement exposed on the valley sides.

3.2 Soils

The soils overlying the weathered granite are generally thin brown loam soils over light coloured and mottled local clay and clay subsoils.

On the upper slopes gravel is added to the surface soil horizons by colluvial action by washing from the gravelly plateau.

There is no evidence of soil salinity and none would be expected on this site with high winter rainfall and drainage.

The regional soils have been mapped as part of the Wellington – Blackwood Land Resources Survey.

The upper parts of the site are shown as HRi, Hester System, "*Hester ironstone gravel ridges have mainly gravels*".

The lower slopes are shown as BL4, Balingup System, "*Balingup moderate slopes have relief of 80 – 120 metres and gradients of 15 – 35%*".

3.3 Climate

The climate is Mediterranean with warm summers and cool moist winters.

Data is recorded at the Collie.

Temperatures are relatively mild, and extremes above 40° Celsius in summer and below 2° Celsius in winter are uncommon.

The temperatures range from maxima of 15.5 degrees C in winter to 30.5 degrees C in summer, with minima ranging from 4.2 degrees C in winter to 13.2 degrees C in summer.

The area receives a mean annual precipitation of 932.6 mm with peak rainfall from May to August when 69% of the annual rainfall is received. The driest months are during summer when the monthly rainfall averages 13.9 – 17.4 mm. The wettest months June and July receive over 170 mm of rainfall.

The mean daily evaporation records are not recorded locally but normally exceed precipitation in all but the main winter months.

Relative humidity in the area is high, with the mean humidity ranging from 60 - 91% at 9.00 am, to 37-66% at 3.00 pm. Early morning dews and fogs are not frequent, and are confined to the wetter months of the year.

Summer morning winds can be moderate to strong east to south easterly with afternoon sea breezes from the south to south west. In winter the winds tend to be lighter and more variable depending on the winter pressure systems. There are some strong northerly winds prior to winter storms from the north to north west.

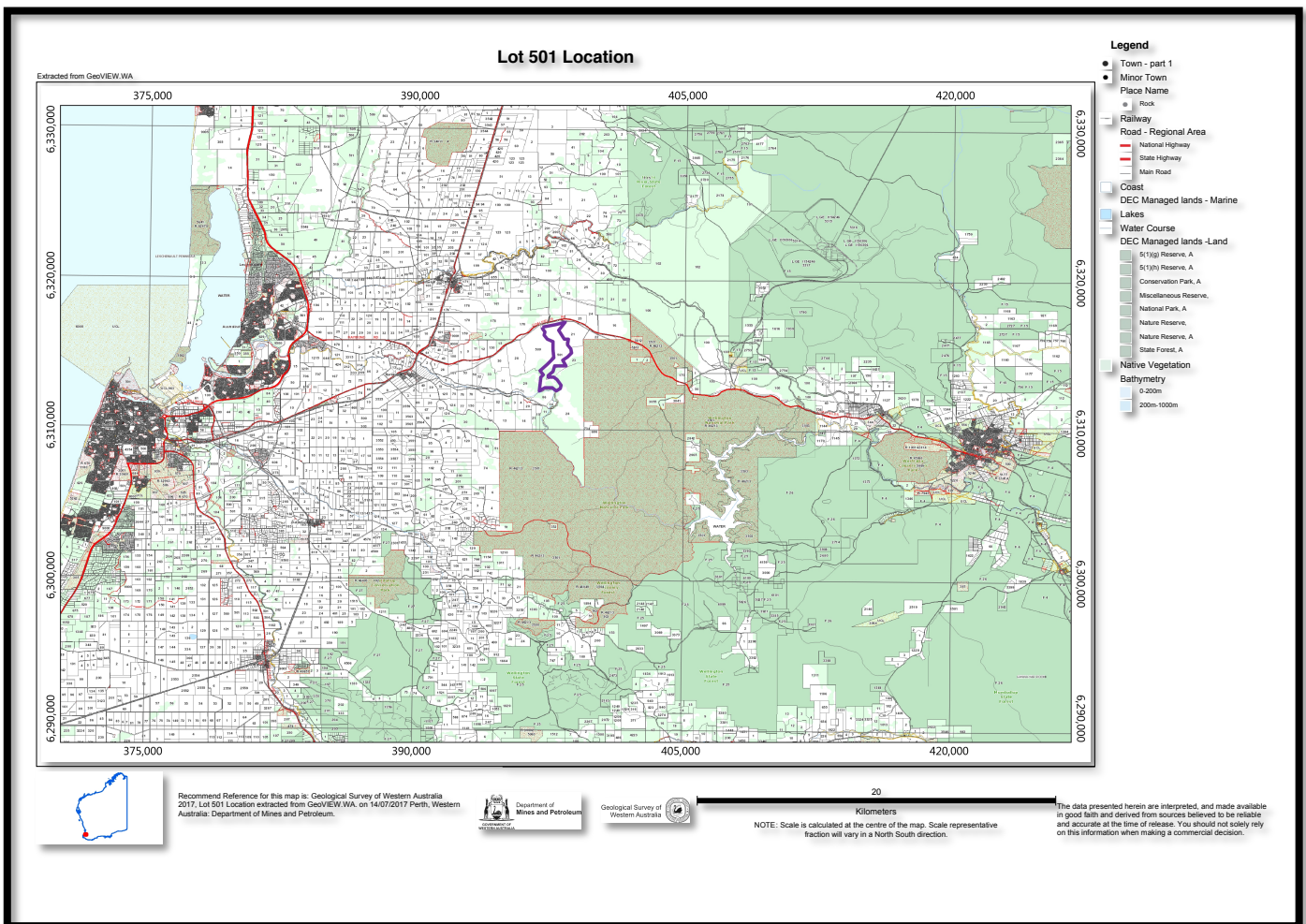


Figure 1 Location of Lot 501

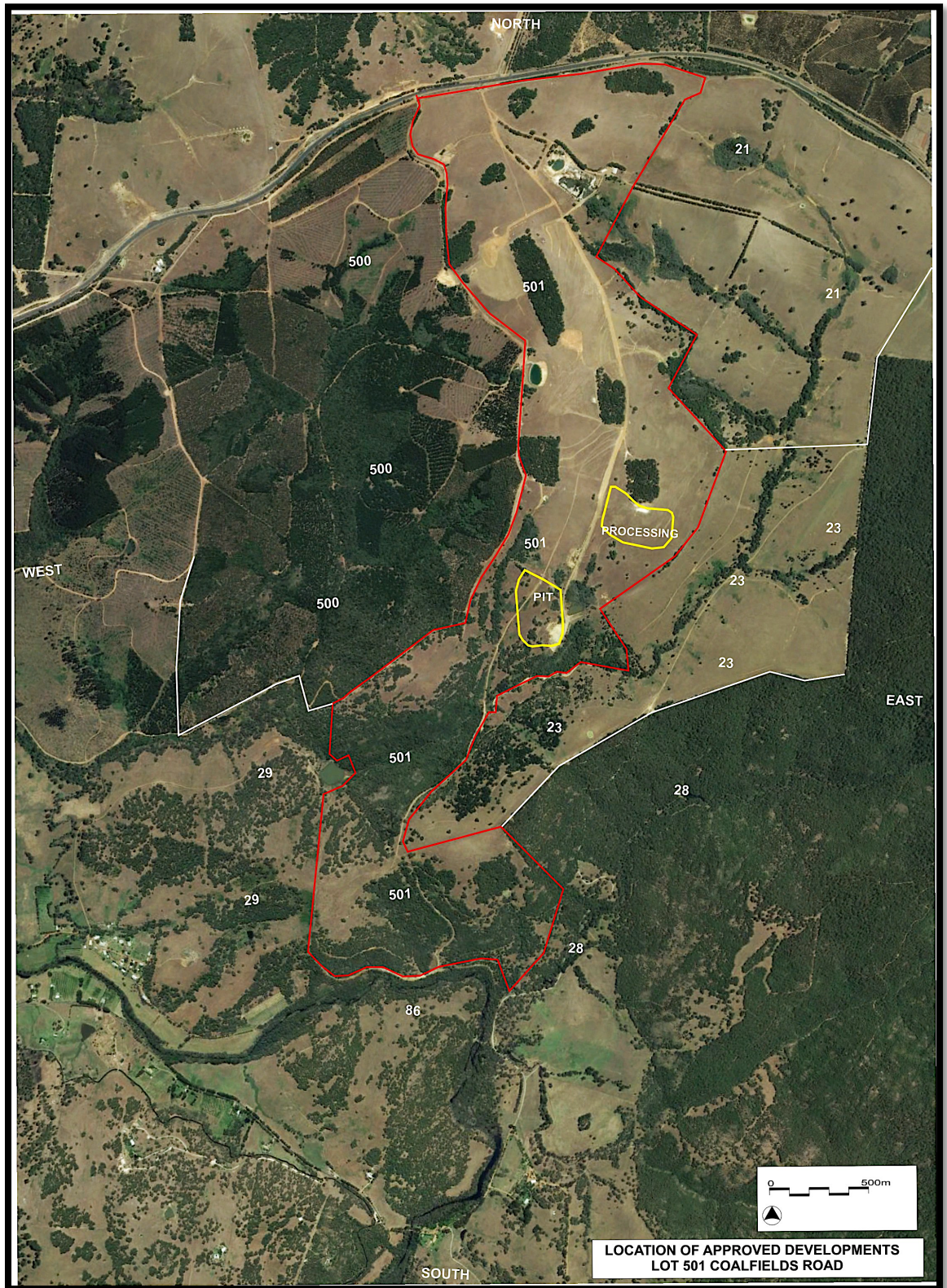


Figure 2 Location of the approved pit and processing area

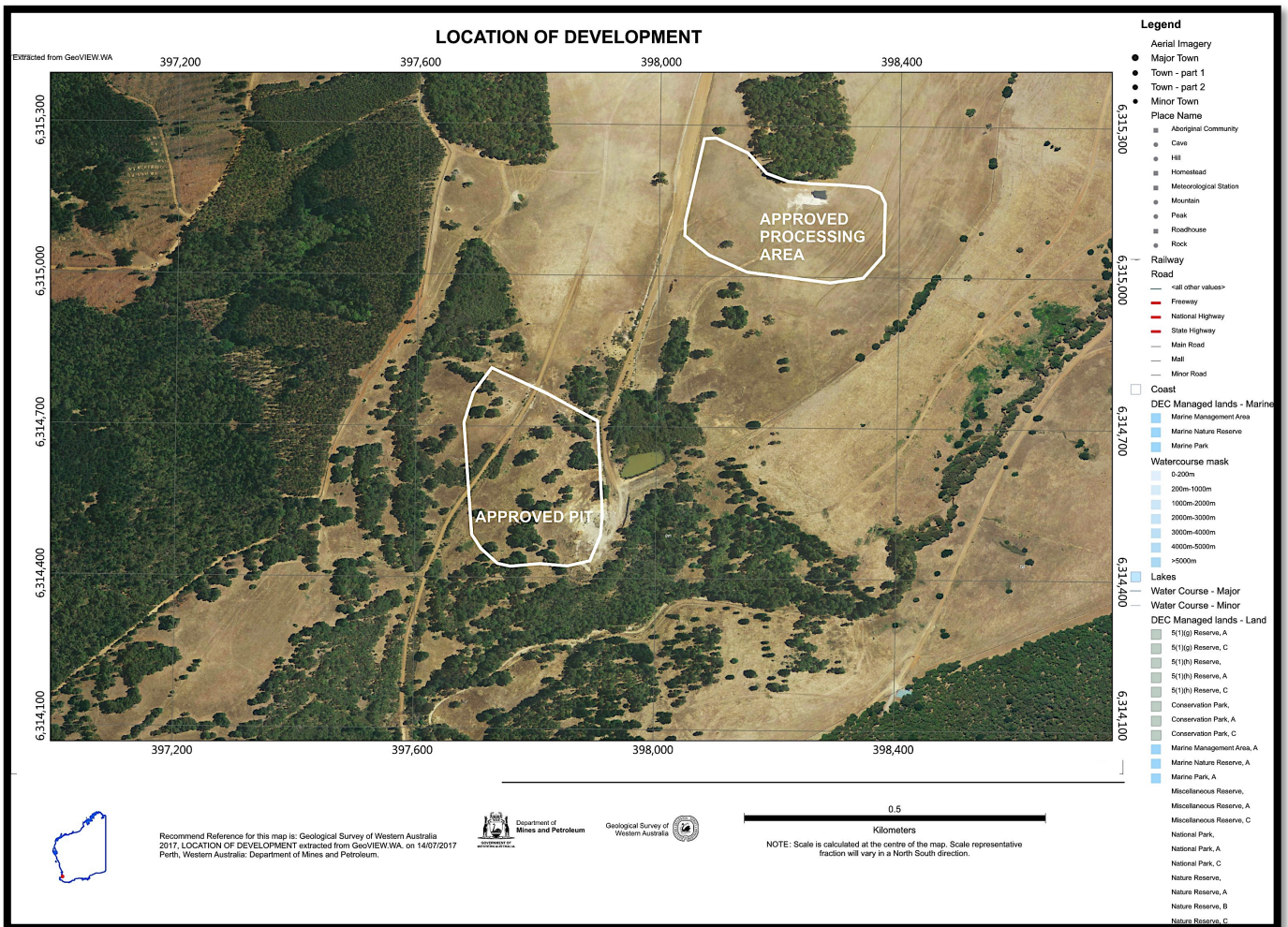


Figure 3 Aerial photograph of the pit and processing area

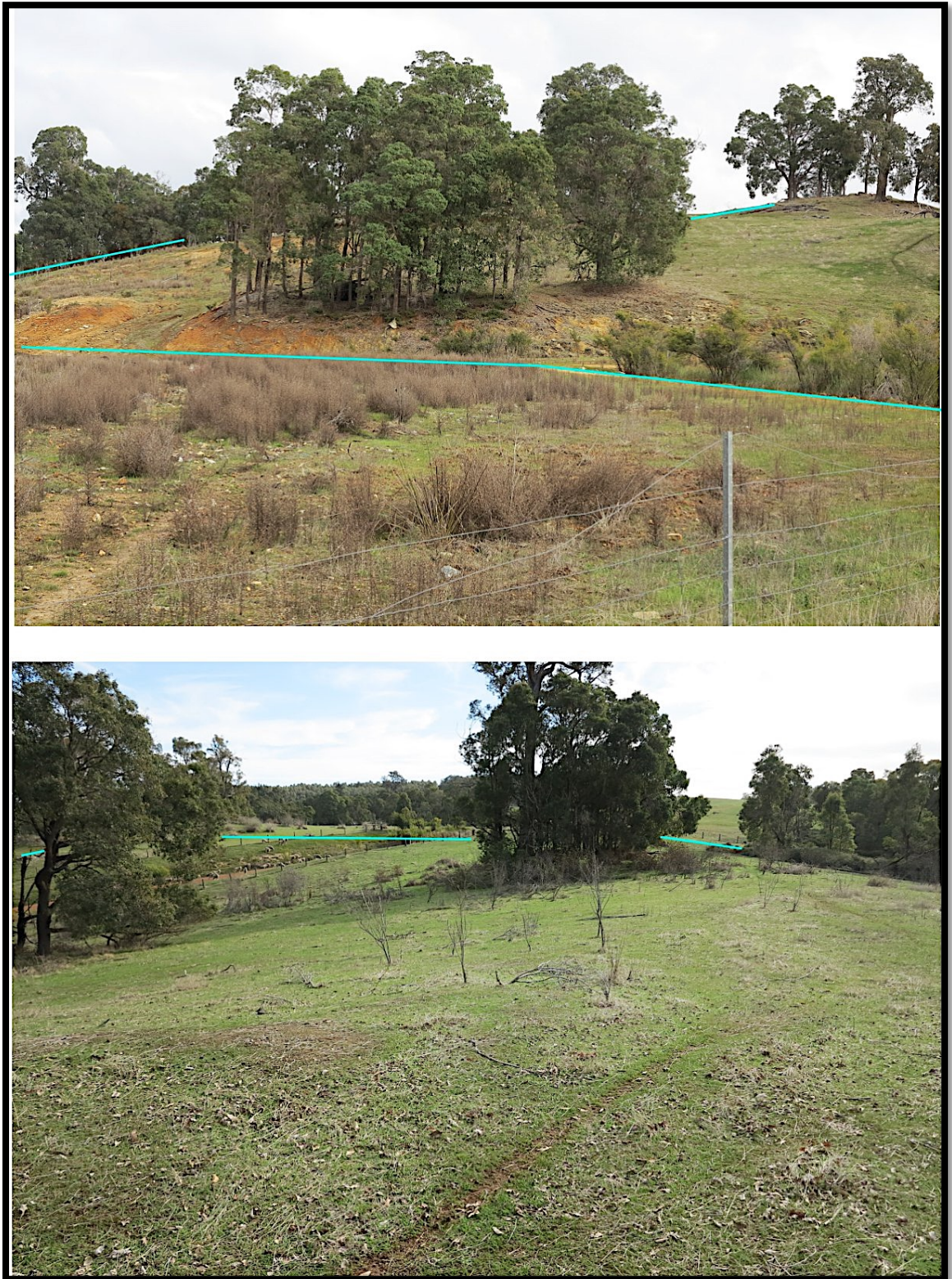


Figure 4 Vegetation across the approved pit footprint. Upper photo from the east and the lower photo from the centre of the pit north.



Figure 5 Vegetation across the approved pit footprint. Lower photo from the centre east and the upper photo from the centre north

4.0 VEGETATION ASSESSMENT

Community Types

The site of the proposed pit is cleared to parkland pasture.

There are, behind the pit, some minor *Darwinia citriodora* as clumps of low shrubs, several *Xanthorrhoea preissii*, on the edge of the proposed pit and one *Grevillea wilsonii* and isolated plants of *Trymalium floribundum*, clumps of Marri *Corymbia (Eucalyptus) calophylla* occasional small Jarrah *Eucalyptus marginata* and *Xanthorrhoea gracilis*, one plant of *Dichopogon capillipes* and occasional plants of *Acacia pulchella* were observed to occur on site.

All other taxa observed were pasture species. Weeds of Ink Plant *Phytolacca octandra*, Bridal Creeper *Asparagus asparagoides* and Narrow Leaf Cotton Bush *Gomphocarpus fruticosus* occur occasionally but are subject to spraying programs.

The drainage lines which lie outside the disturbance footprint are being colonised by *Taxandria scoparia* regrowth spreading across paddocks and the road drains with occasional *Acacia pulchella*, *Acacia urophylla* and *Trymalium floribunda*.

A patch of colonising *Taxandria scoparia* is present near the western part of the pit, in the latter stages of excavation. This vegetation has grown and spread in recent years through increased soil moisture recharge, following past clearing decades ago which has locally increased the soil moisture to the point where the species can colonise.

The naturalised dam east of the pit is fringed by *Baumea juncea* with some *Typha* spp in the eastern end of the dam.

The species listed above are the total native species observed that might be impacted by the developments.

Mattiske and Havel list the vegetation complex as originally being;

Dwellingup 1, "Open forest of *Eucalyptus marginata* subsp *marginata*, *Corymbia calophylla* on lateritic uplands in mainly humid and sub humid zones".

Yarragil 1, "Open forest of *Eucalyptus marginata* subsp *marginata*, *Corymbia calophylla* on slopes with mixtures of *Eucalyptus patens* and *Eucalyptus megacarpa* on the valley floors in humid and sub humid zones".

The adjoining vegetation complex to the west is Lowdon, which contains *Agonis flexuosa* which is not present on Lot 501.

The vegetation on both the processing area and pit is Dwellingup 1 with the pit being at the interface of Dwellingup 1 and Yarragil 1. Both these vegetation complexes are some of the most common on the Darling Scarp and Yilgarn plateau with Yarragil 1 extending from the Avon river in the north to the Preston River in the south and Dwellingup 1 extending from Jarrahdale in the north to Bridgetown in the south.

The same vegetation is dominant in the State Forest and the Wellington National Park to the east.



Figure 6 Typical clumps of regrowth vegetation that contain some larger trees

Plant Density

The native plant density is low with, being interspersed with pasture.

Vegetation Structure

Photographs of the vegetation provide information on the vegetation structure. The vegetation is parkland pasture.

Vegetation Condition

The vegetation condition is assessed to VEGETATION CONDITION NOTES – SOUTH WEST AND INTERZONE BOTANICAL PROVINCES

The vegetation condition mapping is taken from EPA December 2016 *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, modified from Keighery 1994 and Trudgen 1988.

Additional columns are added from *the EPBC Guidelines for the identification of the condition of Banksia Woodland 2016*.

Condition Score	Vegetation Condition	Vegetation Descriptors	Indicative condition measures – thresholds (EPBC Approved Conservation Advice 2016).	
			Typical native vegetation composition	Typical weed cover
1	Pristine	<i>Pristine or nearly so, no obvious signs of disturbance</i>	<i>Native plant species diversity fully retained or almost so</i>	<i>Zero or almost so weed cover - abundance</i>
2	Excellent	<i>Vegetation structure intact, disturbance affecting individual species, and weeds are non aggressive species.</i>	<i>High native plant species diversity</i>	<i>Less than 10%</i>
3	Very Good	<i>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.</i>	<i>Moderate native plant species diversity</i>	<i>5 – 20%</i>
4	Good	<i>Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.</i>	<i>Low native plant diversity</i>	<i>5 – 50%</i>
5	Degraded	<i>Basic structure of the vegetation severely impacted on by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.</i>	<i>Very low native plant diversity</i>	<i>20 – 70%</i>
6	Completely Degraded	<i>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.</i>	<i>Very low to no native species diversity</i>	<i>>70%</i>

Table 1 Vegetation Condition Score Table

Vegetation Structure	Height	<i>Eucalypt Parkland Pasture</i>
Overstorey	> 4 m	Restricted to isolated trees and small clumps of original trees and regrowth. <i>Completely Degraded</i>
Tall Shrub layer	2 – 4 m	Absent • <i>Completely Degraded</i>
Lower Shrub Layer	0.5 – 2 m	Absent • <i>Completely Degraded</i>
Ground Cover	<0.5 m	Isolated to scattered plants replaced by pasture species • <i>Completely Degraded.</i>

Table 2 Vegetation condition on the pit footprint

The vegetation condition is therefore Parkland pasture, classified as Completely Degraded.

5.0 SIGNIFICANT VEGETATION

5.1 Threatened, Priority or Significant Taxa

Databases held under State Legislation and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* were searched.

The species listed on NatureMap was searched in 2014 and again searched in 2017.

Searches with a radius of 10 km were conducted and from DPAW records show the presence of several significant local species as listed below.

These were checked with public records and searched for but none were found. No plant similar to the listed species was found.

State Database

<i>Chamaescilla cinereus</i>	P3
<i>Lomandra whicherensis</i>	P3
<i>Rumex drummondii</i>	P4
<i>Grevillea rosieri</i>	P2
<i>Stylidium acuminatum</i> subsp <i>acuminatum</i>	P2

EPBC database

See the attached database.

<i>Banksia nivea</i> subsp <i>uliginosa</i>	<i>Endangered</i>
<i>Banksia squarrosa</i> subsp <i>argillacea</i>	Vulnerable
<i>Brachyscias verecundus</i>	Critically Endangered
<i>Caladenia huegelii</i>	Endangered
<i>Caladenia winfieldii</i>	Endangered
<i>Chamelaucium</i> sp S coastal plain	Vulnerable
<i>Darwinia whicherensis</i>	Endangered
<i>Diuris micrantha</i>	Vulnerable
<i>Diuris purdiei</i>	Vulnerable
<i>Eleocharis keigheryi</i>	Vulnerable
<i>Lambertia echinata</i> subsp <i>occidentalis</i>	Endangered
<i>Synaphea</i> sp Fairbridge Farm	Critically Endangered

Synaphea stenoloba

Endangered

The taxa listed were not found and a number do not normally occur on the types of soils or habitat covered by the proposed pit.

5.2 Threatened or Priority Ecological Communities

No plant communities listed as a Threatened Ecological Community under State or Commonwealth databases were recorded.

5.3 EPBC Legislation

Databases held under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* were searched. See attached. These were searched a number of times from 2013 – 2017 and were again searched in 2017.

The Community listed on the EPBC database is the Banksia Woodland Communities of the Swan Coastal Plain which is not related to the site. Potential Black Cockatoo Impacts are listed and are addressed later.

No listed communities listed were observed.

5.4 Vegetation Representation

EPA Position Statement No 2, December 2000, *Environmental Protection of Native Vegetation in Western Australia*, specifically targets the retention of native vegetation in the Agricultural Areas in 4.1, *Clearing in the agricultural areas for agricultural purposes*. In 4.3, *Clearing in other areas of Western Australia*, it is unclear what "other areas" refers to, but may refer to retention of a 30% threshold in non agricultural areas.

Section 4.3 *Clearing in other areas of Western Australia*, (EPA Position Statement No 2, December 2000) expects that clearing will not take vegetation types below the 30% of the pre-clearing vegetation as recommended by ANZECC, 1999, *National Framework for the Management and Monitoring of Australia's Native Vegetation*. The National Objectives and Targets for Biodiversity Conservation 2001 - 2005 (Commonwealth of Australia 2001) also recognise 30% as the trigger value.

As noted above the vegetation complexes are some of the most common on the Darling Scarp and Yilgarn plateau with Yarragil 1 extending from the Avon river in the north to the Preston River in the south and Dwellingup 1 extending from Jarrahdale in the north to Bridgetown in the south.

The same vegetation is dominant in the State Forest and the Wellington National Park to the east.

6.0 FAUNA HABITATS AND IMPACTS

The survival and disturbance to fauna will depend on the end use of the site which will be a return to pasture and native vegetation on the steeper slopes. However this will not occur for at least the life of the development but when implemented will produce more native vegetation than currently occurs on site.

Possibly the most significant fauna are Black Cockatoos which have been recorded in the general area. These are listed on State (under the *Wildlife Conservation Act 1950*) and EPBC conservation databases. On the State database the taxa are listed in Schedule 1 as “Fauna that is rare or is likely to become extinct”.

Other listed fauna are unlikely to occur on the pit site, but if locally present may visit the site which is unlikely to change as a result of the proposed development. Such fauna might be the

Chuditch *Dasyurus geoffroii*

Quokka *Setonix brachyurua*

Carpet Python *Morelia spilota imbricata*

Peregrine Falcon *Falco peregrinus*

Quenda *Isodon obesulus fusciventer*

Western Brush Wallaby *Macropus irma*

Woylie *Bettongia penicillata subsp ogilbyi*

Water Rat *Hydromys chrysogaster*

Other significant fauna that occurs in the south west is *Pachysaga munggai* P3, a cricket that is more likely to occur in undisturbed habitats other than parkland pasture that is grazed.

if they occur local in vegetation remnants. Other listed fauna are either marine species, associated with wetlands or do not rely on this type of habitat.

The Department of Environment and Energy EPBC Act referral Guidelines for threatened black cockatoo species (2012) list three species of Black Cockatoo as likely to be present, Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) as occurring and the Forest Red Tail Black Cockatoo (*Calyptorhynchus banksii naso*) as “may occur”.

The 2017 draft update to the referral guidelines state that all three cockatoo species potential occur across the local area. Tony Kirkby noted that the feeding patterns were typical of the Red Tailed Black Cockatoo and concluded that they were the most likely cockatoo to use the site.

Carnaby's Cockatoo forages on native Kwongan shrubland and feeds on Marri. The Red Tail Black Cockatoo feeds on Jarrah, Marri and Wandoo. Baudin's Cockatoo feeds on protaceae shrubs and *Eucalyptus woodlands*, particularly Marri.

The risks of significant impact are listed in Table 3 of the EPBC Guideline which might apply to the site area clearing more than 1 hectare of foraging habitat, clearing a known roosting habitat, clearing a known nesting tree, creating a gap of more than 4 km between habitat, degradation though altered fire regimes, actions known to introduce *Phytophthora* spp.

In addition the Guideline lists potential nesting impacts as a suitable nest hollow or trees capable of developing hollows as having diameter breast height (DBH) of 500 mm for most species and 300 mm for Wandoo. The trees on the pit site have been assessed for size and hollows. Other trees occur but are regrowth or smaller than 500 mm.

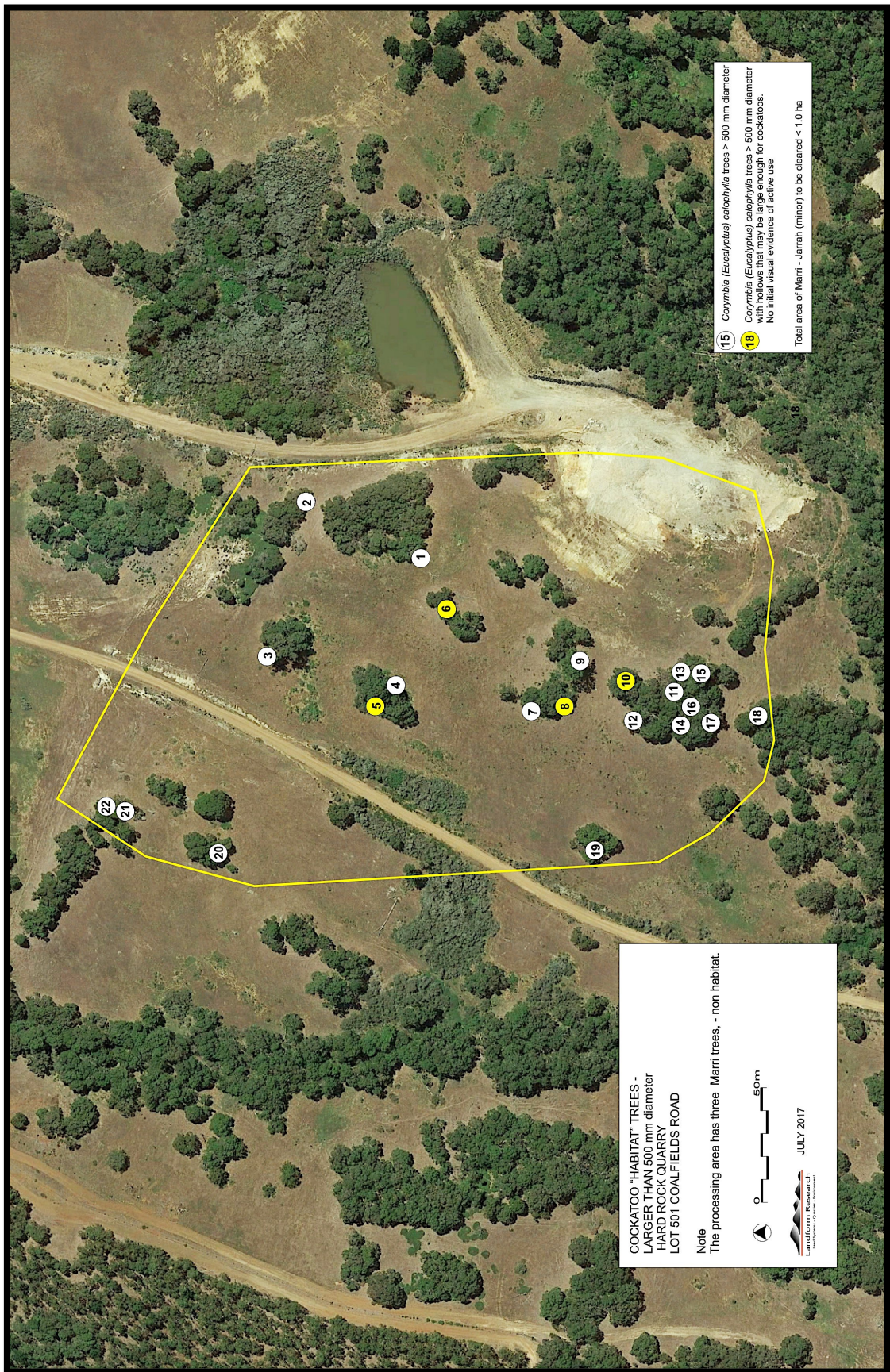


Figure 7 Location of the habitat trees and hollows

There are no trees of significance on the processing site.

A list of all potential Cockatoo habitat trees on the pit area was made during the site investigations and is summarised in the table below. See Figures 7 and 8.

Tony Kirkby a Cockatoo expert the assessed the vegetation on site with particularly reference to use by cockatoos and the listed trees. Tony reviewed the trees on 24th April 2017 and summarised the information in the attached report. Subsequent to the receipt of the report, discussions were held with Tony Kirkby on several occasions to clarify the status of the hollows.

Tony noted that recent feeding residue from Baudin's Cockatoos were noted beneath three Marri trees.

Only two trees with hollows on the application area were deemed to be suitable for cockatoos and these have been annotated in the table below. The other trees which appeared to have hollows were determined by Tony to have hollows that were too small

Tony Kirkby stated that hollows that were used were in his experience well chewed. He expanded that comments to say that cockatoos may use the same nesting hollow for several years, and then there may be a gaps of one or more years when other hollows are used or no breeding occurs, with the birds returning some years later.

Tree Number 3 contained a suitable hollow but shows no signs of chewing and therefore it is concluded by Tony Kirkby that the hollow has not been used.

No roosting sites were identified by Tony Kirkby.

Tony Kirkby concluded that as the feeding residue belonged to Baudins Cockatoo then the well chewed Marri hollow may belong to that species.

Table 3 Large trees recorded on the approved pit footprint.
 (No large trees are recorded on the approved processing area footprint)

No	Northing	Easting	Diameter	Comment	Hollows
1	6314 629	397 864	650 mm	Marri	Nil
2	6314 682	397 885	500-700 mm	Marri – low and leaning	Nil
3	6314 689	397 810	1400 mm	Marri	A possible hollow was found by Tony Kirkby to be of suitable entrance size for black cockatoos, but to have no sign of chewing. Tony concluded that the hollow has not been used and is not an active nesting hollow. – Tony Kirkby)
4	6314 636	397 794	900 mm	Marri	Nil
5	6314 631	397 782	950 mm	Marri	A possible hollow was deemed by Tony Kirkby to be not suitable for cockatoo use because they were too small. No signs of cockatoo use such as chewing was recorded by Tony – Tony Kirkby).
6	6314 609	397 833	950 mm	Marri	A possible hollow was determined by Tony to be not suitable for cockatoo use because it was too small and the orientation and form was not suitable – (Tony Kirkby)
7	6314 571	397 784	750 mm	Marri	Nil
8	6314 539	397 786	800 mm	Marri	A possible hollow was determined by Tony to be not suitable for cockatoo use because the

					orientation and form was not suitable. There was no sign of use. – (Tony Kirkby)
9	6314 538	397 804	1250 mm	Marri	Contains a larger hollow. Tony Kirkby observed that the hollow was well chewed and showed signs of recent use.
10	6314 507	397 794	800 mm	Marri	A possible hollow was determined by Tony to be not suitable for cockatoo use because it was too small and the orientation and form was not suitable. There was no sign of use. – (Tony Kirkby)
11	6314 506	397 789	900 mm	Marri	Nil
12	6314 502	397 776	750 mm	Marri	Nil
13	6314 485	397 791	900 mm	Marri	Nil
14	6314 478	397 795	680 mm	Marri	Nil
15	6314 474	397 797	1050 mm	Marri	Nil?
16	6314 476	397 780	700 mm	Marri	Nil
17	6314 472	397 775	800 mm	Marri	Nil
18	6314 446	397 777	750 mm	Marri	Nil
19	6314 447	397 769	480 – 500 mm	Marri	Nil
20	6314 526	397 707	800 mm	Marri	Nil
21	6314 777	397 723	900 mm	Jarrah edge of pit, to be excluded	Nil
22	6314 770	397 730	700 mm	Jarrah edge of pit, to be excluded	Nil

The site lies within the Jarrah Forest region for consideration under the EPBC Guidelines 2017 Revised draft referral guideline for three threatened black cockatoo species Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) and the Forest Red Tail Black Cockatoo (*Calyptorhynchus banksii naso*).

The updated Draft EPBC Guideline introduce an assessment method for impacts. The results of this are shown in the table below.

Table 4 Impact Score from EPBC 2017 Draft Referral Guidelines

Score	Foraging Habitat for Baudins Cockatoo	Discussion
Starting Score		
1 (Low quality)	Individual foraging plants or small stand of foraging plants	Less than 1 hectare of habitat trees consisting of 20 Marri Trees and 2 Jarrah habitat trees > 500 mm diameter.
Additions		
+3	Contains suitable nest hollows	Tony Kirkby found one tree that has been used most likely for nesting and one hollow that does not show signs of use.
+2	Primarily Marri Trees with several Jarrah trees	Scattered clumps of trees
+2	Contains trees with > 500 mm diameter.	20 Marri Trees and 2 Jarrah habitat trees > 500 mm diameter. No known roost sites.
Subtractions		
No subtraction	Evidence of feeding debris	
No subtraction	Foraging habitat surrounding the site.	There is extensive foraging habitat on Lot 501, the pine plantation to the west and the large areas of remnants nearby within 12 km radius.
No subtraction	> 12 km from known breeding location	
No subtraction	> 12 km from known roost	Not known

	site	
No subtraction	> 2 km from watering site	There is extensive local water.
-1	Dieback disease and/or Marri canker	Evidence of dieback of branches of both Marri and Jarrah in local remnants. See Figures 8 and 10.
7	TOTAL SCORE	Classified as High Quality habitat. Mitigation measures are proposed.

Table 5 Summary of potential Black Cockatoo habitats – EPBC Referral Guidelines

Potential impacts	Carnaby's Black Cockatoo (<i>Calyptorhynchus latirostris</i>)	Baudin's Black Cockatoo (<i>Calyptorhynchus baudinii</i>)	Forest Red Tail Black Cockatoo (<i>Calyptorhynchus banksii naso</i>)
Presence of breeding trees	<p>The site lies within the known breeding habitat but Carnaby's Cockatoo. No evidence of use by Carnaby's Cockatoo.</p> <p>Four other trees that show use by Cockatoos are located outside the approved developments.</p> <p>One tree with evidence of use was found and on the basis of the feeding debris was assumed by Tony Kirkby to be used by Baudin's Cockatoo.</p> <p>Ten nesting boxes are proposed to be installed in forest remnants on Lot 501.</p>	<p>One tree with evidence of use was found and on the basis of the feeding debris was assumed by Tony Kirkby to be used by Baudin's Cockatoo. (Tree 9 in Figure 7).</p> <p>Four other trees that show use by Cockatoos are located outside the approved developments.</p> <p>The site lies on the northern limit of the breeding area on the edge of the wintering area.</p> <p>Ten nesting boxes are proposed to be installed in forest remnants on Lot 501</p>	<p>One tree with evidence of use was found and on the basis of the feeding debris was assumed by Tony Kirkby to be used by Baudin's Cockatoo.</p> <p>The site lies within the known range of this species.</p> <p>Four other trees that show use by Cockatoos are located outside the approved developments.</p> <p>Ten nesting boxes are proposed to be installed in forest remnants on Lot 501</p>
Roosting habitat	<p>Roosting areas near water.</p> <p>No evidence of roosting habitat use was found by Tony Kirkby.</p>	<p>Roosting areas near water.</p> <p>No evidence of roosting habitat use was found by Tony Kirkby.</p>	<p>Roosting areas near water.</p> <p>No evidence of roosting habitat use was found by Tony Kirkby.</p>
Feeding habitat	<p>Jarrah and Marri can be suitable feeding habitat. No Proteacea shrubland is present.</p> <p><i>Pinus</i> species form significant food sources and grow on the property to the west.</p> <p>This will be considered by the DER through the Clearing Permit process and by the Commonwealth through the EPBC Act 1999 and potential offsets.</p> <p>A Clearing Permit will be sought from DER and the</p>	<p>Jarrah and Marri can be suitable feeding habitat. No Proteacea shrubland is present.</p> <p>Evidence of feeding debris from Baudin's Cockatoo was found on the pit footprint.</p> <p><i>Pinus</i> species form significant food sources and grow on the property to the west.</p> <p>This will be considered by the DER through the Clearing Permit process and by the</p>	<p>Jarrah and Marri can be suitable feeding habitat</p> <p><i>Pinus</i> species form significant food sources and grow on the property to the west.</p>

	<p>application be sent to the Commonwealth for review. Offsets will be negotiated between the company that State and Commonwealth.</p>	<p>Commonwealth through the EPBC Act 1999 and potential offsets.</p> <p>A Clearing Permit will be sought from DER and the application be sent to the Commonwealth for review.</p> <p>Offsets will be negotiated between the company that State and Commonwealth.</p>	
<p>Anticipated disturbance</p>	<ul style="list-style-type: none"> • Less than 1 hectare of Marri potential feeding habitat will require clearing. Figure 7. • 20 Marri trees of > 500 mm in diameter will require clearing. Figure 7, Table 3. • One Marri tree with Cockatoo activity will be required to be cleared on the pit area. • Two Jarrah trees >500 mm. 		
<p>Proposed avoidance, mitigation and explanation</p>	<ul style="list-style-type: none"> • No roosting habitat was identified. Table 3, Figure 7 (Tree 9). • Within a 12 km radius approximately 50 % of the land is remnant Marri – Jarrah Forest included in State Forest, Reserves and the Wellington National Park. There are nearby pine plantations including on the land adjoining to the west. There is abundant water and many alternative habitat trees. Figures 11 and 12. • Large trees with hollows are present in forest remnants on Lot 501 outside the approved development area that are available as alternative habitat. Figure 10. Table 5. • Four potential nest trees with observed chew marks are present in forest remnants on Lot 501 outside the disturbance footprint that are alternative breeding habitat if not utilised for breeding. Figure 9. • Planting tree belts around the processing are and on the bunds and disturbed slopes will add to the feeding habitat available on Lot 501. Approximately 2 hectares of trees will be planted. This is consistent with the Priority mitigation options of the Guidance and will increase the number and availability of Marri and Jarrah food trees.. • All other vegetation and trees on Lot 501 are excluded from the approved development, including habitat trees and trees with hollows. (Condition 2 on the approval of the Quarry). Figures 9 and 10. • Weed programs are in place through normal farming operations and commitments and actions proposed for the hard rock quarry. • There will be no alteration to surface or groundwater availability or quality. A Water management Plan is in place and has been approved by the Department Water Environment Regulation. • Remnant vegetation on Lot 501 contains old and mature Marri and Jarrah trees which contain hollows. Figure 10. • Clearing on the pit footprint will be progressive with not all vegetation being cleared on commencement, but rather clearing will be spread over a 10 plus year time frame. This will provide time for the planted trees to grow. • Permanent water supplies have been provided in the past as part of rural activities on site and are available as permanent water supplies. • The road speed on the haul road and access roads are to be limited. The haul road 		

	<p>will be limited to 30 kph with most traffic travelling slower because of the slopes. The internal access road from Coalfields Highway is limited to below 60 kph with trucks normally limited to 40 kph.</p> <ul style="list-style-type: none">• Large areas of natural Jarrah and Marri Forest and pine plantation lie within 500 metres of the pit footprint.• The Wellington National Park lies 1.5 km to the east with large areas of State forest adjoining that national Park.• 10 additional nesting boxes will be installed in nearby or adjoining remnant vegetation. This is consistent with the Priority mitigation options of the Guidance and will increase the number and availability of suitable hollows.
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Figure 8 Two examples of the larger trees on the pit footprint.

Tony Kirkby then reviewed the clusters of vegetation in other part of Lot 501 in early August 2017 and confirmed that that there were large trees in other locations outside the disturbance foot[prints, such as those shown in Figure 10. The email containing the information is attached.

It is noted that there are a number of large trees in the remnants, mainly higher up the slopes away from the pit area. He identified at least four trees with likely active nesting hollows outside the approved development footprints.

The four are listed in Table 6 below.

It is noted that nesting hollows C and D lie adjacent to the gravel crushing operation which has been operating for ten years on site. Gravel and duricrust rock has been removed from a large area east from the hollows and yet the hollows are active, demonstrating the similar quarrying activities have not impacted on the cockatoos in the past.

Table 6 Trees recorded that have been used by Cockatoos outside the approved footprints

No	Northing	Easting	Diameter	Comment	Hollows
A	6315 232	397 712		Marri	Hollow with slight chewing. Possible Cockatoo hollow – Tony Kirkby
B	6315 326	397 716		Marri	Well chewed hollow. Almost certainly a breeding hollow – Tony Kirkby
C	6316 004	397 725		Marri	Chewed top entry hollow. Possible cockatoo nest hollow – Tony Kirkby.
D	6316 007	397 727		Marri	Chewed top entry hollow, likely to be a cockatoo nest hollow Tony Kirkby.

The forest remnants on Lot 501 provide feeding habitat for Black Cockatoos and some nest sites. No roost sites were observed by Tony Kirkby on the approved disturbance areas.

The forest areas adjacent including the large areas of State Forest that occur nearby and particularly to the east were not surveyed but were noted (pers. Com.) by Tony Kirkby to contain many large trees with hollows and hollows suitable for cockatoo nesting.

In order to compensate for the hollow on the pit site (Tree 9) B and J Catalano propose to located 10 nesting boxes high up large trees in the patches of remnant forest remaining on Lot 501.

This means that there will be a net gain of nine suitable nesting sites located on Lot 501 as a result of the offset actions. The remnant vegetation on Lot 501 will be protected and remain uncleared. In addition vegetation belts of Marri trees will be included on the bunds to the processing operations which will in time provide additional food sources but will take many years for them to have any chance of developing nesting hollows.

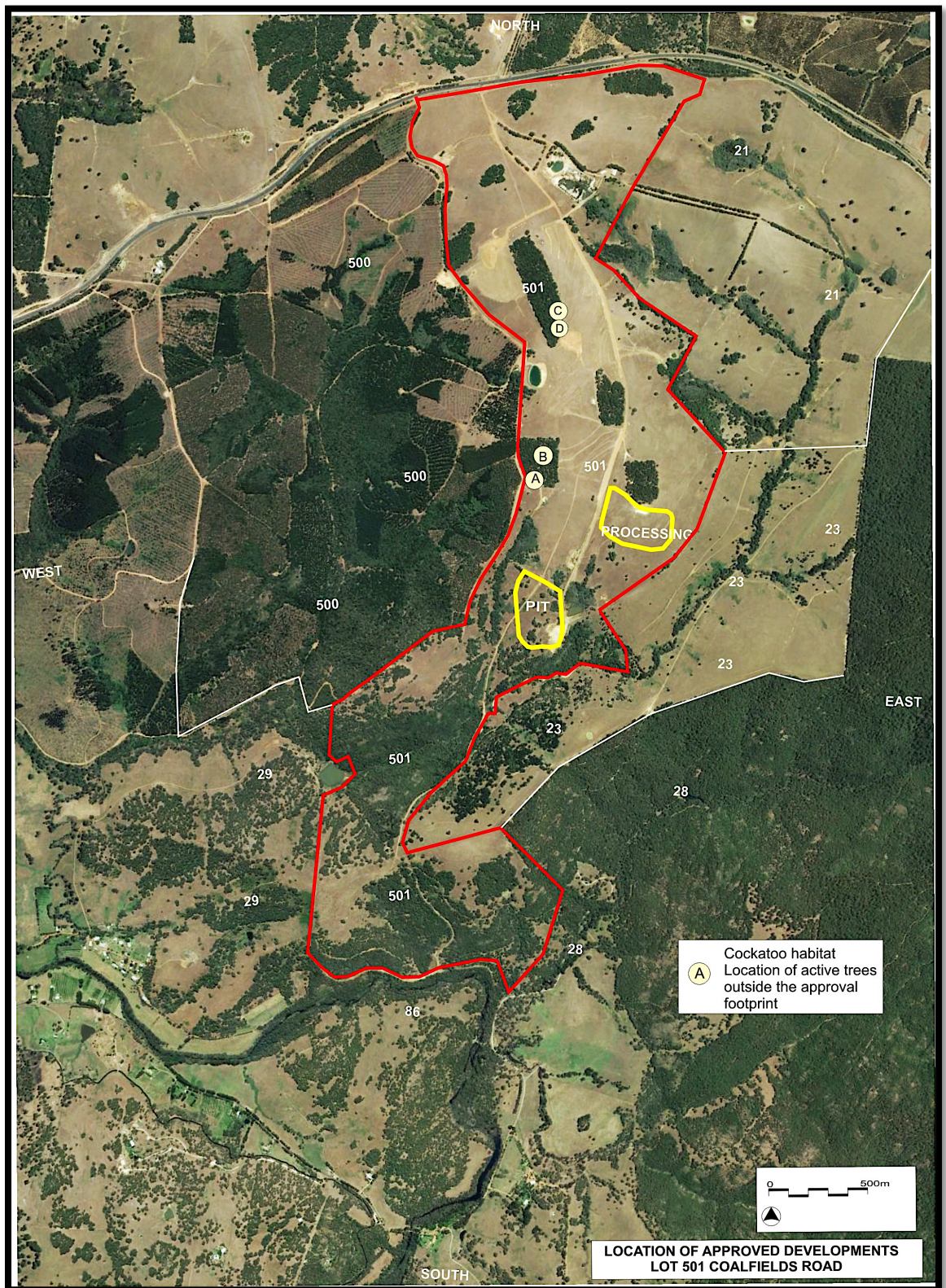


Figure 9 Trees used by Cockatoos outside the approved footprints



Figure 10

Vegetation edging the processing area showing regrowth, and large trees with containing hollows. This vegetation will remain in place.

7.0 CLEARING ASSESSMENT

Clearing is controlled under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. These regulations provide for a number of principles against which clearing is assessed.

	CLEARING PRINCIPLE <i>(Schedule 5 Environmental Protection Amendment Act, 1986</i>
1a	<i>High Level of diversity</i>
1b	<i>Significant fauna habitat</i>
1c	<i>Necessary to existence of Rare flora</i>
1d	<i>Threatened Ecological Community</i>
1e	<i>Significant area of vegetation in an area that has been extensively cleared</i>
1f	<i>Wetland or watercourse</i>
1g	<i>Land degradation</i>
1h	<i>Impact on adjacent or nearby conservation areas</i>
1i	<i>Deterioration of underground water</i>
1j	<i>Increase flooding</i>

Table 7 Clearing Principles

The *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* provide for planning and other policy issues to be taken into account when determining clearing applications.

Section 51O of the *Environmental Protection Act 1986* allows the CEO to take planning matters into account when making clearing decisions, such as a State Planning Policy.

As well as considering Biodiversity and other conservation issues the Clearing Principles that have to be satisfied are apparently designed for rural regions and do not adequately address the issues of resource needs. Therefore some additional principles need to be added when considering the need for essential Raw Materials. In an attempt to provide a better balance to the clearing principles those principles have been expanded as listed in the tables below.

The issue of clearing native vegetation and fauna habitat cannot therefore be considered separately but must be considered in terms of community needs and end use of the site.

The DER considered the Clearing Principles in their and the Preliminary Assessment is attached, but this is also assessed in the light of new information.

ADDITIONAL CLEARING PRINCIPLES – EXTRACTIVE INDUSTRIES	
Environmental Protection Act 1984 Section 510	
Planning Matters	
1	<i>Planning Matters</i>
Environmental Protection Act 1984 Section 510	
Relevant Matters	
2a	<i>Need for the resource</i>
2b	<i>Classification of the resource and existing approvals</i>
2c	<i>Availability of alternative resources and the impact of their use</i>
2d	<i>Proposed final land use</i>
2e	<i>Offsite Environmental impacts if the resource is not used</i>
2f	<i>Sound environmental management and rehabilitation</i>

Table 8 Additional Clearing Considerations

Table 9 Assessment against the Clearing Principles

	CLEARING PRINCIPLE <i>(Schedule 5 Environmental Protection Amendment Act, 1986).</i>	COMMENT
1a	High Level of diversity	<ul style="list-style-type: none"> The site has been assessed in flora surveys by Landform Research and found to be parkland pasture with few understory plants of species. The vegetation condition is Completely Degraded. <p><i>The proposed clearing is not at variance with this principle.</i></p>
1b	Significant fauna habitat	<ul style="list-style-type: none"> The relatively small area of vegetation to be cleared of < 1.0 hectares of trees with no understory compared to that occupying the local and adjoining area, combined with a return to local native vegetation and pasture. Whilst habitat will be cleared progressively, it will be replaced at the end of excavation by similar species composition that will be capable of developing into similar habitat to the pre-mined vegetation. 22 trees of > 500 mm are anticipated to require clearing. Table 3, Figure 7. Only one exhibiting chewing use will be required to be cleared. Figure 7, Table 4. Over 2 hectares of tree revegetation will be planted on batter slopes and bunds. At least ten nesting boxes will be placed in nearby remnant. Alternative trees with evidence of activity are located in other forest remnants and will be protected. See the Proposed Mitigation in Table 5. <p><i>The proposed clearing is not at variance with this principle.</i></p>
1c	Necessary to existence of Rare flora	<ul style="list-style-type: none"> No Threatened (Declared Rare) or Priority Flora was found. The species on site were examined to check for Threatened species that occur within 10 km and were not to be present. <p><i>The proposed clearing is not at variance with this principle.</i></p>
1d	Threatened Ecological Community	<ul style="list-style-type: none"> No Threatened Ecological Community occurs on site. The vegetation on both the processing area and pit is Dwellingup 1 with the pit being at the interface of Dwellingup 1 and Yarragil 1. Both these vegetation complexes are some of the most common on the Darling Scarp and Yilgarn plateau with Yarragil 1 extending from the Avon river in the north to the Preston River in the south and Dwellingup 1 extending from Jarrahdale in the north to Bridgetown in the south. The same vegetation is dominant in the State Forest and the

		Wellington National Park to the east. <i>The proposed clearing is partially at variance with this principle.</i>
1e	Significant area of vegetation in an area that has been extensively cleared	<ul style="list-style-type: none"> • See above <p><i>The proposed clearing is not at variance with this principle.</i></p>
1f	Wetland or watercourse	<ul style="list-style-type: none"> • The Department of Environment Water Regulation have approved the Water management Plan (Daniel Wong, DWER Bunbury, 11 October 2017). • There are no wet areas in or near the proposed resource excavation area. • <i>There is some colonisation by Taxandria scoparia</i> that occurs because soil moistures have increased because of land clearing in the past. • Extensive water management and retention of all pit water on site is proposed. <p><i>The proposed clearing is not at variance with this principle.</i></p>
1g	Land degradation	<ul style="list-style-type: none"> • The excavation will be managed in a manner that does not lead to degradation of the soil and land integrity apart from normal development issues. • There is no evidence of any changes to adjoining native vegetation as a result of the current farming operations or is likely to occur as a result of quarrying. • Dieback and weed management is proposed to continue through normal farm practice. • Whilst the vegetation will be cleared progressively it represents a very small area and may lead to a slight but not significant increase in recharge which will reduce back to the pre-clearing situation when the site is rehabilitated. • The resource lies on the granitic basement, which means there is no clearing of vegetation on deep laterite profile (where salt is stored) on site. • Naturally there will be some changes to the soils as topsoil and overburden, which is a thin layer, is removed and replaced and the soils reconstructed. <p><i>The proposed clearing is unlikely to be at variance with this principle.</i></p>
1h	Impact on adjacent or nearby conservation areas	<ul style="list-style-type: none"> • The clearing area lies in the centre of Lot 501 and does not adjoin any conservation area. • Extensive water management and retention of all pit water on site is proposed. <p><i>The proposed clearing is not at variance with this principle.</i></p>
1i	Deterioration of underground water	<ul style="list-style-type: none"> • This principle relates to the land clearing only and not the extraction. • The extraction of granite has already been approved. • The Department of Environment Water Regulation have approved the Water management Plan (Daniel Wong, DWER Bunbury, 11 October 2017). • During the assessment process it was determined that water quality from excavation was not a significant environmental issue and the Department of Water Environment Regulation provided comments which have been incorporated into water management of excavation. • The resource lies on the granitic basement, with thin overlying soils and common granite outcrop. • As noted above deep laterite profiles will not be cleared of vegetation as they do not occur on site. • Granite basement is predominantly an aquiclude with only minor fractured zone aquifers. • The main aquifer is at the base of the soil, running along the top of the granite. The catchment for this aquifer is very small and

		not significant within the context of the local catchments <i>The proposed clearing is not at variance with this principle.</i>
1j	Increase flooding	<ul style="list-style-type: none"> The Department of Environment Water Regulation have approved the Water management Plan (Daniel Wong, DWER Bunbury, 11 October 2017). The site is relatively high in the landscape and, with a relatively small area of clearing, will have no observable impact on water elevations or recharge. There is no evidence of the access roads or excavations impacting on water regimes, flooding or surrounding vegetation. The removal of trees will not have a significant impact on soil moisture recharge and all water generated by the pit will be retained and used in the pit or for processing. Water management relating to the extraction of granite has been approved. <p><i>The proposed clearing is not at variance with this principle.</i></p>

ADDITIONAL CLEARING PRINCIPLES – EXTRACTIVE INDUSTRIES		COMMENT
<i>Environmental Protection Act 1984 Section 510 Planning Matters</i>		
1	<i>Planning Matters</i>	<ul style="list-style-type: none"> The resource has been recognised for many years as a valuable local resource of basic raw material. State Planning Policy, SPP 2.5 Agricultural and Rural land Use Planning predominantly deals with the continued rural use of suitable land and its protection for the future. The policy was updated in December 2016 and provides strong measures to identify, protect and use basic raw materials. SPP 2.5 does reiterate the need to protect and use basic raw materials. Basic Raw Materials are included in the definitions as <i>Sand (including silica sand), clay, hard rock, limestone (including metallurgical limestone), agricultural lime, gravel, gypsum, and other construction materials. The materials may be of State, regional or local significance depending on the resource location, size, relative scarcity, value and demand for the product.</i> Amongst seeking to protect agricultural values, Policy Objective 4 (c) states <i>Outside the Perth and Peel Planning regions, secure significant basic raw material resources and provide for their extraction.</i> Section 5.9 deals with Basic Raw Materials and seeks to achieve the following in an environmentally acceptable manner; <i>Protect the resources until the resource is extracted (5.9.a)</i> <i>Identify significant basic raw materials on sub-regional and local planning strategies, region and local planning schemes (5.9.b, 5.9.c, 5.9.d)</i> <i>The extraction of basic raw materials should not be generally prohibited (5.9.e)</i> <i>Provide for sequential land use (5.9.f)</i> <i>Limit sensitive land uses to locations demonstrated to not limit existing or potential extraction of basic raw materials</i>

		<p>(5.9.g)</p> <p><i>Provide for the consideration of native vegetation or significant biodiversity values and may require retention and protection of vegetation and environmental assets (5.9.h)</i></p> <p><i>Have regard for the potential impacts of fragmentation and connectivity of native vegetation (5.9.i)</i></p> <p><i>Maintain adequate buffers to protect water quality in public drinking water source areas (5.9j).</i></p> <ul style="list-style-type: none"> • SPP 2.5 also supports preventing conflicting land uses (5.12.1), supports the generic buffers recommended by other Government documents such as the EPA Guidelines for separation distances (5.12.3), and seeks to restrict subdivision from impinging on basic raw material resources. • The Policy is also supported by Guidelines that seek to protect the Landscape and secure Transport Routes. • The extraction of granite has been approved by the State Administrative Tribunal for extraction. <p><i>The proposed clearing is compatible with this factor.</i></p>
<p>Environmental Protection Act 1984 Section 51O Relevant Matters</p>		
2a	<i>Need for the resource</i>	<ul style="list-style-type: none"> • The resource is to be used for construction processes. • Most hard rock locally is basalt which has different characteristics to granite. <p><i>The proposed clearing is compatible with this factor.</i></p>
2b	<i>Classification of the resource and existing approvals</i>	<ul style="list-style-type: none"> • The extraction of granite has been approved by the State Administrative Tribunal for extraction. <p><i>The proposed clearing is compatible with this factor.</i></p>
2c	<i>Availability of alternative resources and the impact of their use</i>	<ul style="list-style-type: none"> • The extraction of granite has been approved by the State Administrative Tribunal for extraction. <p><i>The proposed clearing is compatible with this factor.</i></p>
2d	<i>Proposed final land use</i>	<ul style="list-style-type: none"> • The proposed final land use is to return the site to a void rehabilitated to local native vegetation and pasture. • The extraction of granite has been approved by the State Administrative Tribunal for extraction. • Whilst habitat will be cleared progressively, it will be replaced progressively by similar species composition that will be capable of developing into similar habitat to the pre-mined vegetation on the steeper final slopes. <p><i>The proposed clearing is compatible with this factor.</i></p>
2e	<i>Offsite Environmental impacts if the resource is not used</i>	<ul style="list-style-type: none"> • Not taking the resource will result in granite hard rock having to be imported from other areas that will also likely require clearing and will involve greater transport distances and costs. Any alternative area may not offer any better environmental impacts. <p><i>The proposed clearing is compatible with this factor.</i></p>
2f	<i>Sound environmental management and rehabilitation</i>	<ul style="list-style-type: none"> • Environmental and rehabilitation management procedures are proposed. • A management, rehabilitation and closure plan has been prepared and is approved. • The extraction of granite has been approved by the State Administrative Tribunal for extraction. <p><i>The proposed clearing is compatible with this factor.</i></p>

8.0 CLEARING ASSESSMENT AGAINST EPBC GUIDELINES

The EPBC Act referral guidelines for three threatened black cockatoo species are attached.

The guidelines have been used to direct the searches and targeted investigations for black cockatoo habitat and occurrence.

The assessments have been completed in accordance with the EPBC Guidelines.

The initial tree searches and assessments were completed by Lindsay Stephens of Landform Research who holds an MSc in Botany. These searches and site inspections were conducted over a number of years as outlined in Section 2.0.

In addition Tony Kirkby, an expert on Black Cockatoos reviewed all trees and including all trees with potential hollow. He searched whether the hollows had evidence of use by cockatoos. He completed the assessments on two occasions, on 28 April 2017 and early August 2017. His reports are attached.

Tony has access to the databases on Cockatoo nesting sites, habitats and occurrences in the local and wider area. He examined the whole of Lot 501 and provided an overview of the surrounding areas up to an exceeding 10 km.

The habitats on Lot 501 and surrounding areas were considered and are described in this vegetation survey. The adjoining land to the west is pine plantation that has recently over some period of time been harvested and replanted.

Targeted surveys were completed on the approved disturbance areas and nearby remnant forest on Lot 501 assessing for feeding debris and chewing activities on trees.

Under the current EPBC Guidelines 2012 for Black Cockatoos, for referral to the Commonwealth, the clearing does not exceed 1 hectare.

It is unclear whether Tree 9 contains an active nesting hollow, but the tree shows obvious evidence of chewing and so one potential nesting tree is required to be cleared. This is classified into the "High Risk" category which can be addressed by mitigation measures which are proposed.

Under the Draft EPBC Referral Guidelines 2017 for Black Cockatoos the vegetation impacted is assessed as Score 7 in the which is the lowest category of "High Risk" which can be addressed by mitigation measures which are proposed.

Pre-referral discussions were held with the Commonwealth Department of Environment and Energy on 29 August 2017, (Contact Anita Mathers, Senior Assessment Officer, Assessments WA, SA and NT). Initial discussions suggested that with the proposed mitigation and provision of 10 nesting boxes, the proposed clearing was unlikely to constitute a "controlled action".

Assessed Impacts

The impacts of the approved development are provided in Section 6.0 of this document and are summarised in Table 5.

In summary the impacts are as follows;

- Less than 1 hectare of Marri - Jarrah potential feeding habitat will require clearing. Figure 7.

- 20 Marri and 2 Jarrah trees of > 500 mm in diameter will require clearing. Figure 7, Table 3.
- One Marri tree with significant Cockatoo chewing activity will be required to be cleared on the pit area.

Mitigation strategies have been developed and are also summarised in Table 4. These include the confirmation that alternative habitat is available, additional trees will be planted and 10 nesting boxes approved by Department of Biodiversity, Conservation and Attractions are placed in remnant vegetation on Lot 501.

Two habitat trees that have been used and appear to contain nesting hollows (Trees C and D) in Figure 9 are located adjacent to the existing gravel crushing activities that have taken operated on site using the similar crushing and mobile plant to the proposed hard rock operations. This indicates that Black Cockatoos are not normally frightened by human activities and feed from trees in busy urban situations and at other hard rock quarries on the Darling Scarp.

Proposed Mitigation

The proposed mitigation is compliant with Section 5 of the EPBC Referral Guideline. See Table 5.

Habitat Loss

- There is no net loss of habitat.
- A total of less than 1 hectare of Marri trees with minor Jarrah will be cleared for the pit and processing area in an area totalling around 16.6 hectares.
- The pit location is restricted by the distribution of the resource and results in the clearing of scattered mature and regrowth trees. Figures 4, 5 and 7. The processing area is selected as having only one clump of three regrowth trees. Figure 3.
- Clearing will be progressive.
- Additional habitat trees will be planted around the pit and processing areas on bunds and batter slopes, representing around 2.0 hectares of vegetation.
- All riparian vegetation will be retained. No roosting sites are present or are to be impacted. Movement corridors are protected. Large areas of feeding habitat are available locally and in the wider area. Watering points are retained and increased with additional detention basins.

Human Interaction

- No evidence of impact or death of any black cockatoo has occurred during the agricultural activities or gravel crushing operations on site.
- Active nesting hollows are present adjacent to the existing gravel operations which have been active for 10 years.
- Speed limits apply to vehicles on the access and haul roads.
- Site activities are in campaigns but can occur at any time of year.

- The land is fenced and protected by soil management measures.
- No evidence of hollows being used by competing fauna was noted.
- Dieback and weed management procedures are in place on Lot 501 and are integral to continued farming and the extraction of gravel and hard rock from the site. There is some evidence of dieback of branches in the trees that appear to be Marri Canker.
- No evidence of impact on Black Cockatoos behaviours has been observed, resulting from the gravel operations. Birds visit Lot 501 at any time, even when gravel operations are being conducted.

EPBC Referral Requirements

The EPBC Referral Guidelines list the risk to Black Cockatoos.

The main potential impacts are the clearing a known nesting tree or the clearing of greater than 1 hectare of breeding habitat which is a High Risk. It is unclear whether Tree 9 contains an active nesting hollow, but the tree shows signs obvious evidence of chewing.

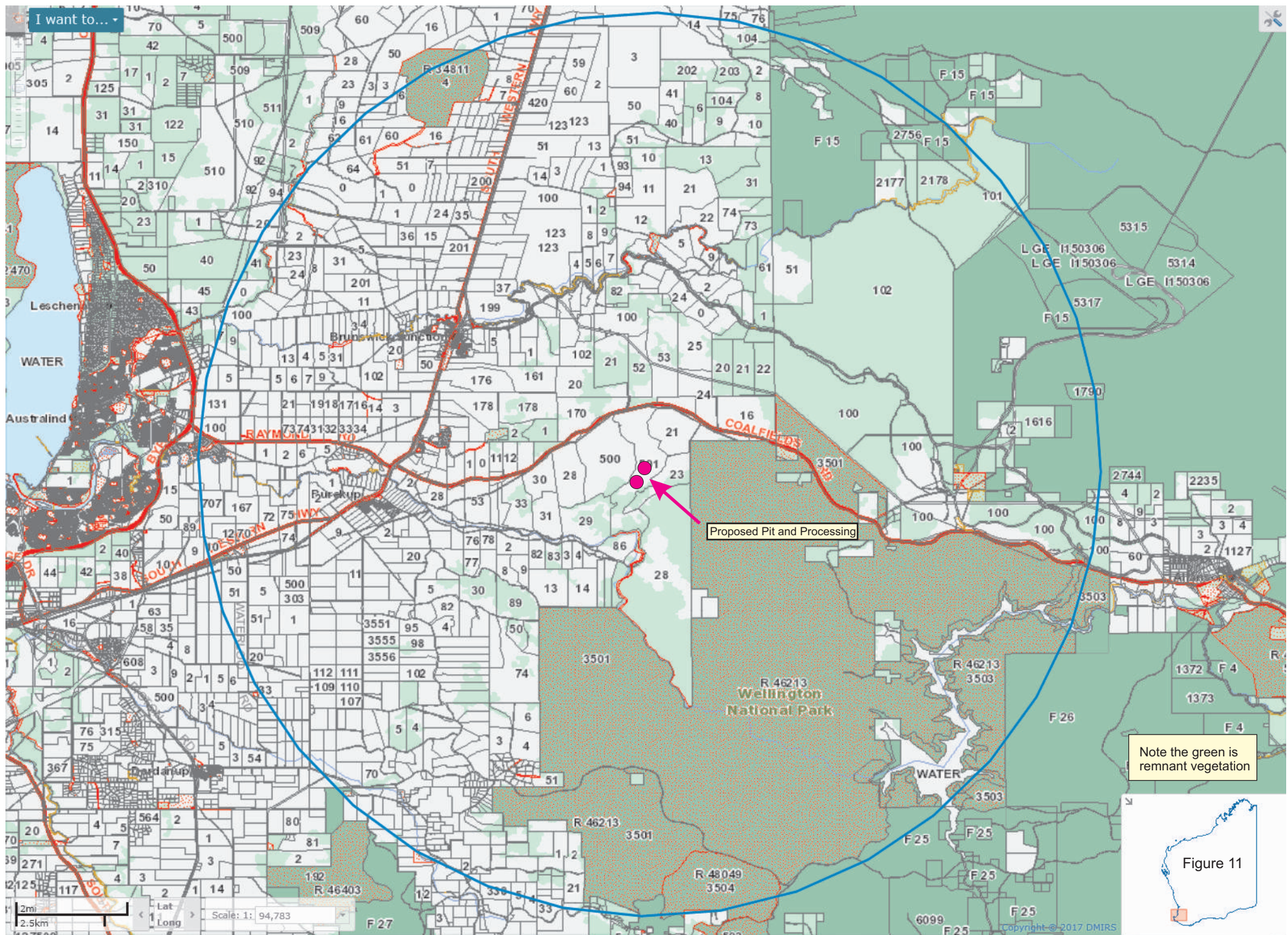
Less than one hectare of habitat trees are proposed to be cleared over ten years. The habitat is likely to be habitat of Baudins Black Cockatoo based on the feeding debris found.

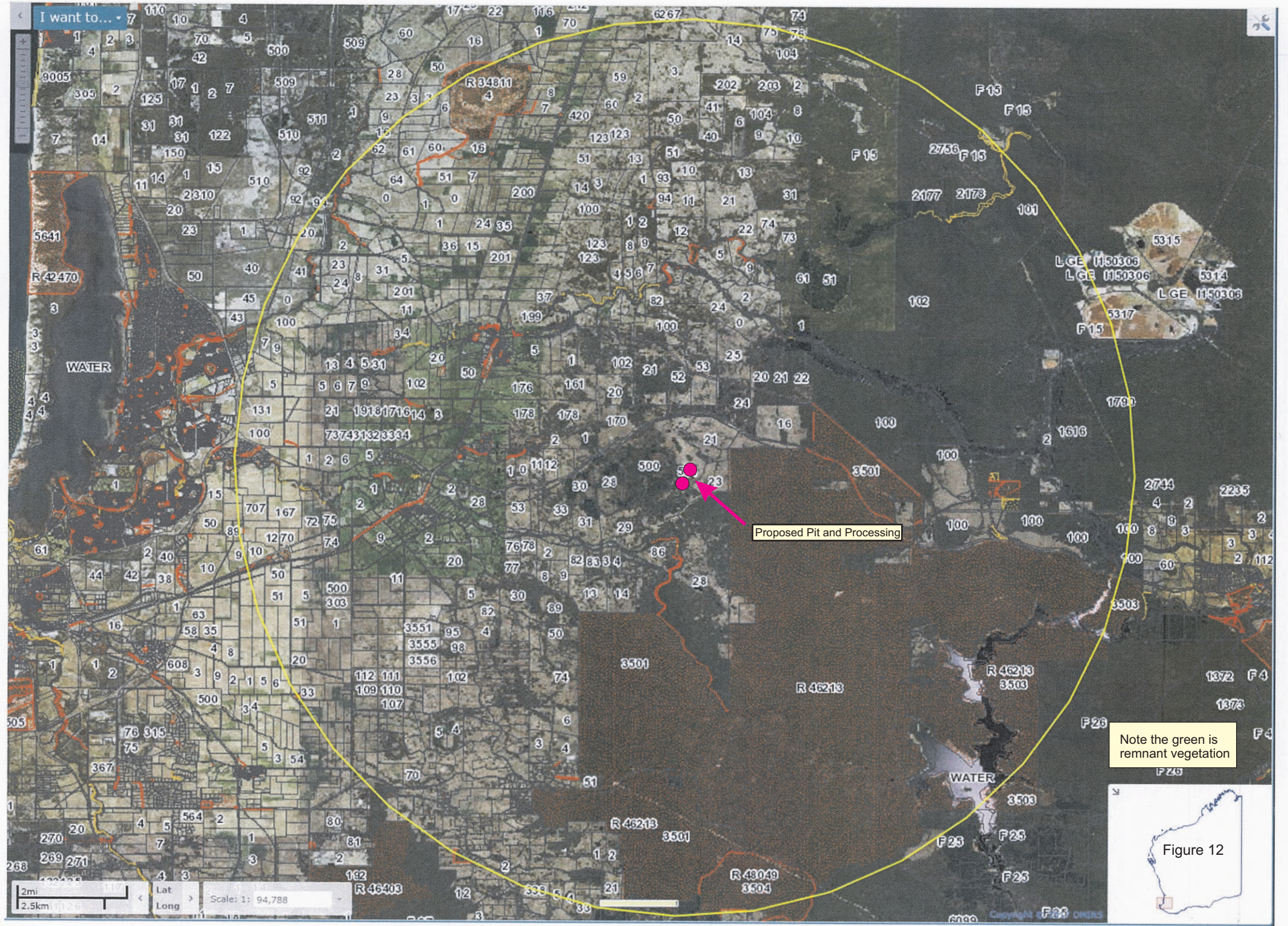
Preliminary discussions have been held with the Commonwealth Department of Environment and Energy. The preliminary discussions suggest that the proposed mitigation measures are likely to comply with the EPBC Guidelines.

In order to ensure compliance the proposal will be referred to the Commonwealth Department of Environment and Energy concurrently with referral of the application for a Clearing Permit.

REFERENCES - READING

- Beard J S, 1981, *Vegetation Survey of Western Australia 1 : 1 000 000 Swan Sheet*.
- Commonwealth Environment Protection and Biodiverstiy Conservation Act 1999*.
- Commonwealth of Australia, 2001, *National Objectives and Targets for Biodiversity Conservation 2001 – 2005*.
- Environmental Protection Authority (2016), *Guidance Statement, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*,
- Shepherd D P, G R Beeston and A J M Hopkins, 2002 *Native Vegetation in Western Australia Extant, Type and Status*. DFWA Resource Management Technical Report 249.
- Tille P J and N C Lantzke, 1990, *Busselton Margaret River Augusta land capability study*, Department of Agriculture and Food.
- Department of Conservation and Land Management, 1980, *Atlas of Natural Resources of the Darling System*.
- Department of Environment and Energy, 2012, *Referral Guidelines for three threatened black cockatoo species*.
- Department of Environment and Energy, 2017, *Draft Update Referral Guidelines for three threatened black cockatoo species*.
- Hedde et al, 1980, *Vegetation Complexes of the Darling System, Western Australia in Atlas of Natural Resources, Darling System, Western Australia*, Department of Conservation and Environment.
- Mattiske E M and J J Havel, 1998, *Collie 1 : 250 000 Regional Forest Agreement Mapping*, CALM and Environment Australia.
- Tille P J, 1996, *Wellington – Blackwood Land Resources Survey, Natural Resources Assessment Group*, Department of Agriculture and Food WA.
- Western Australian Planning Commission, *State Planning Policy No 2.5, Agricultural and Rural Land Use Planning*.
- Western Australian Planning Commission, 1995, *Bunbury – Wellington Region Plan*
- Western Australian Planning Commission, 2007, *Greater Bunbury Region Scheme*.
- Western Australian Planning Commission, 2011, *Greater Bunbury Strategy 2011 (Draft)*,
- Western Australian Planning Commission, 2011, *Greater Bunbury Structure Plan 2011-2031+ (draft)*
- Western Australian Planning Commission 2000, *Greater Bunbury Region Scheme*.
- Wilde S A and I W Walker, 1982, *1 : 250 000 Geological Series, Collie*, Geological Survey of Western Australia.
- Wilde, S A, 2001, *Jimperding and Chittering Metamorphic Belts, South Western Yilgarn Craton, Western Australia*, Geological Survey of Western Australia, Record 2001/12.





Proposed Pit and Processing

Note the green is remnant vegetation

Figure 12

I want to... - 7

2mi 2.5km Lat Long Scale: 1: 94,788

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BLACK COCKATOO HABITAT SURVEY, SHENTON RIDGE, COLLIE.

The purpose of the survey was to assess and document suitable breeding, feeding and roosting habitat used by black cockatoos *Calyptrorhynchus spp.* at the proposed quarry site at Shenton Ridge.

Three species of black cockatoos occur in the south west of Western Australia – Forest Red-tailed Black Cockatoo *C. banksii naso*, Carnaby's Cockatoo *C. latirostris* and Baudin's Cockatoo *C. baudinii*. Carnaby's and Baudin's Cockatoos are also known collectively as white-tailed black cockatoos.

It is known that Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo breed in the Colie area. Baudin's Cockatoo have also recently been recorded as breeding in the area (pers. comm. Mike Bamford 20km WNW of Collie) and the lack of breeding records until recently may reflect the lack of survey effort in the region.

The survey site is mainly cleared open paddock and remaining tree species which could provide a breeding hollow are Marri *Corymbia calophylla* and Jarrah *Eucalyptus marginata*. These trees need to have reached a minimum diameter of 500mm at breast height (DBH) to be large enough to have formed a black cockatoo breeding hollow.

Methods

The survey was undertaken on 24th April 2017.

All trees of a suitable size were inspected from ground level using binoculars and those containing hollows were raked with a pole. This method will flush any female black cockatoo which may be incubating an egg or brooding a chick.

The area beneath possible feeding or roosting trees was searched for feeding debris and signs of roosting such as clipped branches and an accumulation of droppings.

Coordinates were picked up using hand held GPS. Zone 50 GDA94.

Breeding

The survey area is generally cleared open paddock with approximately 20 remaining Marri and Jarrah (two only) trees above 500mm DBH. Two of these Marri contain hollows suitable for black cockatoos though one shows no signs of recent use and may not be suitable.

397810E – 6314693N. Hollow with suitable entrance size but shows no signs of use.

397803E – 6314539N. Well chewed hollow showing signs of recent use by black cockatoos.

Feeding

Both recent and old feeding residues from Baudin's Cockatoos were noted beneath three of the Marri trees.

Roosting

No roosting sites were located at the survey area.

No roosting sites were located at the survey area.

Results

As feeding residues from Baudin's Cockatoo feeding on the seeds from Marri were located at the survey area it is possible that the well chewed Marri hollow may belong to this species.

The EPBC act referral guidelines state that a referral may be needed if the following is to occur:

- clearing of any known nesting tree.
- clearing or degradation of breeding habitat.

The proposed clearing may need to be referred unless this habitat can be avoided.

If the clearing is assessed as a 'controlled action' under the Environmental Protection Regulations possible mitigation could possibly include:

- installation of artificial nesting boxes near the cleared area.
- revegetation of previously cleared (paddock) areas adjacent to the survey area.

Tony Kirkby.

Black Cockatoo Researcher.

Tel. 041 992 7384

Jurisdiction:	<i>Planning and Development Act 2005</i>
Application:	Review of a decision under a local planning scheme or region planning scheme
Parties:	B and J Catalano Pty Ltd (Applicant) Shire of Harvey (Respondent)
Matter Number:	DR 17/2016
Application Lodged:	13 January 2016
Date of Decision:	31 March 2017 (decision on documents)
Decision of:	Deputy President Judge Sharp and Member Patric De Villiers
Outcome:	Final Order

1. The application for review is allowed.
2. The decision made by the respondent on 18 October 2016 to refuse the proposed Extraction of Granite from Lot 501 Coalfields Highway in accordance with application nos 13/29601 and 14/11545, submitted by Landform Research is set aside and a decision is substituted that development approval is granted under the Greater Bunbury Region Scheme and the Shire of Harvey District Planning Scheme No 1 for the proposed development subject to the following conditions:
 1. The extraction (including blasting) and processing of hard rock may not commence until:
 - (a) the applicant has obtained a licence to extract hard rock from Lot 501 Coalfields Highway, Wellington (Lot 501), pursuant to the Shire of Harvey Extractive Industry Local Law 2007; and
 - (b) an upgraded access to Lot 501 from Coalfields Road has been designed and constructed to the requirements of Main Roads WA.
 2. The applicant must:
 - (a) lodge with the Shire a plan showing the location of native trees which are near to places where activities will take place pursuant to this approval and identifying any native tree proposed to be cleared for the purposes of the development;
 - (b) obtain a clearing permit under the Environmental Protection Act 1986 (WA) in respect of any native vegetation to be cleared on Lot 501 for the purposes of the development; and
 - (c) carry out the development in accordance with the clearing permit.



3. Unless required by law or any other condition of this approval, the development must at all times comply with:

(a) the Blast Management Plan (Landform Research, March 2014);

(b) the Water Management Plan (Landform Research, December 2015);

(c) the operational procedures and commitments set out in the Excavation and Rehabilitation Management Plan (Landform Research, March 2014) with respect to:

(i) visual management (section 5.1);

(ii) noise management (section 5.2);

(iii) dust management (section 5.3);

(iv) dieback management (section 6.4);

(v) weed management (section 6.5); and

(vi) water monitoring and sampling (section 5.4.3).

4. A best practice Storm Water Management Plan (SWP) is to be lodged with the Shire for approval (on advice from the Department of Water) prior to the grant of an Extractive Industry Licence. The SWP is to include the following elements:

(a) any release offsite will need to achieve the requirements of the Department of Water's Water Quality Guidelines. This release may need to be controlled, prior to overland flow and before release to the main tributary to the south;

(b) provision of appropriate buffers to all internal waterways and natural drainage lines that feed the major tributaries of the Collie River and the Collie River itself;

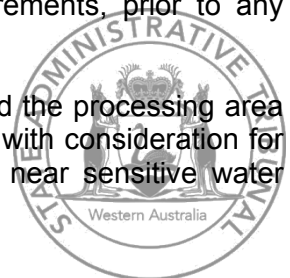
(c) demonstration that the proposed detention basin at the processing area can provide sufficient capacity for collection and storage of stormwater and seepage, to provide sufficient time for treatment, prior to controlled release or overflow;

(d) provision of details of the expected volume of water that will be captured within the quarry and the expected volume of water that will be required to be treated to a suitable standard for its next use (e.g. dust suppression, release to environment);

(e) provision of details of the capacity of the treatment basins (sediment trapping facilities) and outline how they will provide suitable treatment and treatment time before next use;

(f) water quality is to be consistent with Department of Water requirements, prior to any release from the property;

(g) an internal access road to be constructed between the operation and the processing area to the satisfaction of the Executive Manager of Technical Services and with consideration for the Department of Water 'Water Quality Protection Note 44 - Roads near sensitive water resources';



- (h) proposed water monitoring parameters;
- (i) site drainage is to aim to separate natural runoff from water generated in active areas of quarrying and processing operations;
- (j) stormwater management at the quarry site is to provide for the collection, storage and disposal of water;
- (k) stormwater may be diverted from the site if it is not contaminated, to minimise the amount of water that needs to be treated or retained; and
- (l) the project site is to be considered as a number of individual 'catchments', with each catchment having design criteria that reflect the level of risk.

The development must at all times comply with the approved SWP.

5. Notwithstanding anything in the Water Management Plan and the approved SWP, no water may be discharged from the quarry pit area without the prior approval of the Shire (on advice from the Department of Water).

6. All soil and overburden disturbed during the development must be reused on Lot 501, and may not be removed from the site.

7. The quarry shall be progressively rehabilitated in accordance with the Closure and Rehabilitation Program contained in the Excavation and Rehabilitation Management Plan (Landform Research, March 2014), and in accordance with the following requirements:

(a) revegetation of the steep slopes is to be at least at a density of at least 10 trees per 100m squared, in addition to 20 local provenance shrubs;

(b) revegetation of disturbed areas no longer required is to be undertaken annually;

(c) rehabilitation/revegetation is to be of a standard that achieves at least a similar vegetation coverage to that of the pre-disturbance native vegetation; and

(d) rehabilitation of each stage is to be monitored for a period of three years, or until the Shire confirms the rehabilitation has met the establishment and sustainability criteria, whichever is later.

8. A reinstatement bond of \$5,000 per hectare is to be provided to the Shire prior to the issue of an Extractive Industry Licence. The Shire may:

(a) call on the bond for the purpose of carrying out or maintaining rehabilitation work required by the Closure and Rehabilitation Management Plan, where that work has not been satisfactorily carried out by the applicant;

(b) with one week's written notice to the applicant enter Lot 501 for the purpose of carrying out or maintaining the rehabilitation work; and

(c) retain the bond and/or enter Lot 501 in accordance with the preceding paragraph for three years after the expiration of this approval.



9. In addition to the requirements of the Blast Management Plan referred to in condition 3(a) above, blasting is subject to the following conditions:

(a) all drilling equipment is to be fitted with noise suppression features and be regularly checked to ensure compliance with the requirements of the Mines Safety and Inspection Act 1994 (WA);

(b) no explosives are to be kept on site;

(c) suitably qualified consultants will monitor each blast and provide written documentation reporting on each blast to the applicant;

(d) the blast holes are to be located and designed to produce the best outcome with the least impact;

(e) blasting must take place between 10 am and 3 pm;

(f) blasting must only take place when weather conditions are suitable, such that temperature inversions in the atmosphere are avoided and wind conditions are appropriate;

(g) notification is to be provided to all adjoining landowners by email and text, and by email to the Shire at least seven days prior to each blast; and

(h) major production blasts shall occur not more than four times per year.

10. Stockpiles are to be located within the approved areas and kept to a maximum height of nine metres to avoid visual impact and/or material wind drift.

11. The quarry and processing areas must be located in the respective places shown in the 'Contour and Site Survey of Proposed Quarry Lot 501 Coalfields Highway Roelands', Plan E3612-01B at Figure 5 of the Excavation and Rehabilitation Management Plan (Landform Research, March 2014).

12. The applicant is to have the approved quarry and processing area boundaries surveyed and pegged by a suitably qualified surveyor, with the location of such pegs to be confirmed by the Shire prior to the issue of an Extractive Industry Licence. The pegs are to remain in place for the duration of the operation.

13. Crushing, screening and excavation activities are restricted to the hours between 7 am and 5 pm Monday to Saturday with no extraction to take place on Sunday or public holidays.

14. The applicant must lodge a Noise Management Plan with the Shire for approval prior to the grant of an Extractive Industry Licence. In addition to the operational procedures and commitments set out in section 5.2 of the Excavation and Rehabilitation Management Plan (Landform Research, March 2014) with respect to noise management (see condition 3(c)(ii) above), the Noise Management Plan must set out how the development can be carried out at all times in compliance with the applicable assigned levels under the Environmental Protection (Noise) Regulations 1997 (WA) and in particular must include:

(a) that only broad band reversing beepers will be used on vehicles driven on Lot 501 in the course of the development;



- (b) identification of the proposed location of the crushing and screening plant;
 - (c) construction of the four metre high bund to the east of the processing area (as shown in the attached plan titled 'Noise bunds for processing area and pit' dated 24 January 2017 (Bund Plan)), before the commencement of extraction of extraction or processing operations;
 - (d) construction of all bunds necessary to achieve compliant noise levels on the western boundary, before the commencement of extraction of extraction or processing operations;
 - (e) construction of the bunds on the western side of the quarry and processing area as shown in the Bund Plan, in the event a dwelling is constructed on Lot 500 in accordance with the development approval dated 27 April 2016; and
 - (f) monitoring of noise to be carried out following commencement of extraction and processing operations to demonstrate compliance with the applicable assigned levels.
15. The development must be carried out in accordance with the approved Noise Management Plan.
16. The applicant is to engage a suitably qualified independent expert approved by the Shire to carry out an annual audit of compliance of the conditions of planning consent and which is to include all matters referred to in the 'Monitoring and Reporting' section of the Excavation and Rehabilitation Management Plan (Landform Research, March 2014). The audit must be submitted to the Shire by no later than 31 January of each calendar year.
17. Any refuelling activities must be undertaken in accordance with the Department of Water's Water Quality Protection Note - Toxic and Hazardous Substance Storage and Use. Maintenance, servicing and fuel storage are to be completed using best practice and Department of Water Guidelines.
18. This approval is valid for:
- (a) a period of fifteen years from the date of commencement of the licence referred to in condition 1(a) above (Initial Period), and
 - (b) a further period of five years following immediately upon the expiry of the Initial Period, provided that the Shire is satisfied, by reference to the last of the audits referred to in condition 16 above submitted during the Initial Period, that the conditions of this planning consent have been complied with by the applicant.
19. In this approval the 'applicant' includes the owner of Lot 501 and every person or entity carrying out the approved development from time to time.





Australian Government

Department of Sustainability, Environment,
Water, Population and Communities



EPBC Act referral guidelines for three threatened black cockatoo species:

Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*

Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*

Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*



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Disclaimer

The contents of this document have been compiled using a range of source materials and is valid as at April 2012. The Australian Government is not liable for any loss or damage that may be occasioned directly or indirectly through the use of reliance on the contents of the document.

Front page photograph: male Carnaby's cockatoo (Leonie McMahon).



Important notice

Please note that these guidelines are general in nature and do not remove your obligation to consider whether you need to make a referral to the federal environment minister under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). While these guidelines provide information to help you decide whether to refer your action, the possible impacts of your proposal will depend on the particular circumstances of the action. These circumstances may include issues such as the proximity of the action to habitat, indirect impacts and impact-mitigation measures.

These guidelines were made on the basis of the best information available at the time of writing. However, the impacts of proposals will be assessed by the department on the basis of the best information available at that point in time, which may differ from the information on which these guidelines are based.

These guidelines do not provide guidance on requirements under state and local government laws. Information on Western Australian and local government council laws can be obtained from the Western Australian Department of Environment and Conservation (www.dec.wa.gov.au/) and the local councils in or near the proposed project area.



How to use these guidelines

These guidelines are intended to assist you in determining whether your action needs to be referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities (the department). These guidelines should be read in conjunction with EPBC Act Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance (www.environment.gov.au/epbc/publications/nes-guidelines.html).

These guidelines apply to Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and the forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*), collectively referred to here as black cockatoos, anywhere they may occur in Western Australia. These species are listed as threatened under the EPBC Act as follows:

- Carnaby's cockatoo: endangered.
- Baudin's cockatoo: vulnerable.
- Forest red-tailed black cockatoo: vulnerable.

Listed threatened species and ecological communities are matters of national environmental significance under the EPBC Act.

If you plan to undertake an action that has, will have or is likely to have a significant impact on any of these species of black cockatoos, you must refer the proposal to the minister before starting. The minister will then decide within 20 business days whether assessment is required under the EPBC Act. The potential significance of each action is judged on a case-by-case basis. Substantial penalties apply for undertaking an action, to which the EPBC Act applies, without approval (civil penalties up to \$5.5 million or criminal penalties of up to seven years imprisonment). More information on referral, assessment and compliance is available at www.environment.gov.au/epbc/.

The criteria used to judge significant impact for vulnerable and endangered species are listed in the **Significant impact guidelines 1.1**. The criteria in the significant impact guidelines refer to 'populations' and 'important populations'. These terms have not been defined for black cockatoos, due to the mobile and widely-distributed nature of these species, and the variation in flock compositions (for example, between breeding and non-breeding seasons). For black cockatoos, it is more appropriate to consider significance in terms of impacts on habitat rather than a resident population. Section 6 provides guidance for when one or more of these criteria may trigger the need to refer your action.





A **national recovery plan**, www.environment.gov.au/biodiversity/threatened/publications/recovery/wa-forest-black-cockatoos.html is in place for Baudin's and forest red-tailed black cockatoos. A national recovery plan for Carnaby's cockatoo is in development at the time of writing. The federal environment minister must not make a decision that is inconsistent with a national recovery plan.

The decision tree in Figure 1 and the rest of these guidelines are designed to assist you in determining whether your proposed action needs to be referred. You may also refer your proposed action if you are uncertain about the need to refer, or contact the department by emailing epbc.referrals@environment.gov.au.

Possible exceptions to the need to refer

Certain actions are exempt from the requirement of assessment and approval under the EPBC Act. These include lawful continuations of land use that started before 16 July 2000, or actions that were legally authorised before 16 July 2000. There are a number of criteria that must be satisfied to rely on any such exemptions. More information on exemptions under the EPBC Act is available at www.environment.gov.au/epbc/publications/exemptions.html.

Under certain circumstances a Regional Forest Agreement (RFA) forestry operation that is undertaken in accordance with an RFA may also be exempt from having to be referred under the EPBC Act. For more information on RFAs see www.daff.gov.au/rfa.



WHERE TO GET MORE INFORMATION

The **SPRAT** profiles for these species provides the biological and ecological context for survey guidelines, significant impact guidance and mitigation measures. They can be accessed at www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

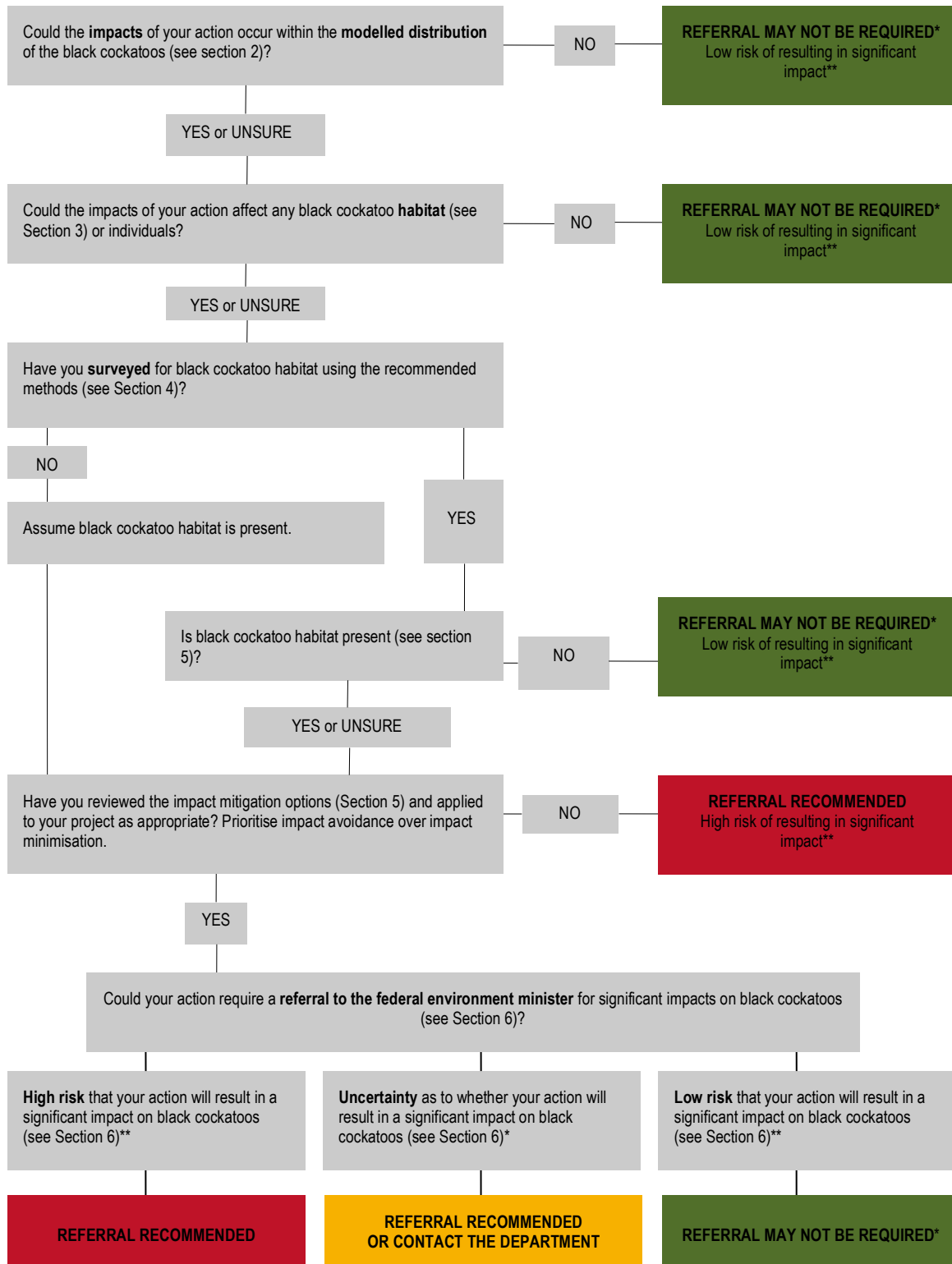
Other EPBC Act policy statements are available to help you understand the EPBC Act and your obligations. They are available from the department's website at www.environment.gov.au/epbc/guidelines-policies.html or by contacting the community information unit by email: ciu@environment.gov.au or by phone: 1800 803 772. The department can provide assistance in ensuring your action complies with the EPBC Act, especially when contacted early in the planning process.

The **Protected Matters Search Tool**, www.environment.gov.au/epbc/pmst/index.html can provide a good starting point for determining the likelihood of having matters of national environmental significance in your area. State and territory government agencies may also hold relevant information including habitat and species distribution information.

Further information on these species can be obtained from the Western Australian Department of Environment and Conservation and relevant non-government agencies.



Figure 1: Decision making



* Although it may appear that there is a low risk of a significant impact, and that a referral may not be required, you may still choose to refer your proposed action. If you are uncertain about the need to refer then you can contact the department to discuss your action by emailing epbc.referrals@environment.gov.au.

** Risk is the chance of something happening that will have a [significant] impact on objectives [for example, protecting matters of national environmental significance] (adapted from Australian / New Zealand Risk Management Standard ISO 31000:2009).



1. WHAT IS KNOWN ABOUT BLACK COCKATOOS?

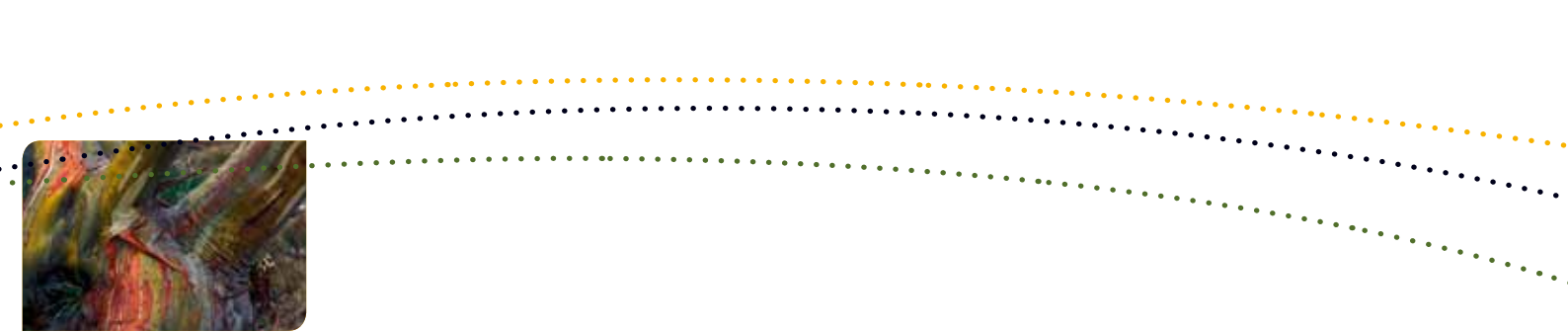
Black cockatoos are long-lived, slow-breeding birds that display strong pair bonds and probably mate for life. These characteristics exacerbate the effects of population decline and habitat loss, and make population recovery very slow.

Baudin's cockatoo breeds from August/September to February/March, while Carnaby's cockatoo breeds from July/August to January/February. The forest red-tailed black cockatoo is thought to breed in October/November, but in years with good autumn rainfall they may breed in March/April. All three black cockatoos addressed in these guidelines breed in hollows in very long-lived trees. Hollows large enough for nesting black cockatoos are usually only found in trees that are more than 200 years old.

Currently, the overall population trend for all three black cockatoo species is declining. Large-scale clearing has seen a significant proportion of original black cockatoo habitat removed. Habitat loss and alteration continue to contribute to the major decline in population density and occupancy of habitat across the range.

Relevant background information on the biology and ecology of the black cockatoos is provided in the department's **Species Profile and Threats (SPRAT)** database.





2. COULD THE IMPACTS OF YOUR ACTION¹ OCCUR WITHIN THE MODELLLED DISTRIBUTION OF BLACK COCKATOOS?

Baudin's cockatoo breeds in the eucalypt forests of the south western humid and subhumid zones. From March, flocks migrate north to the central and northern parts of the Darling Scarp for the non-breeding season. Some flocks also move on to the southern Swan Coastal Plain and south coast during the non-breeding season (Map 1). They move back to breeding areas from August.

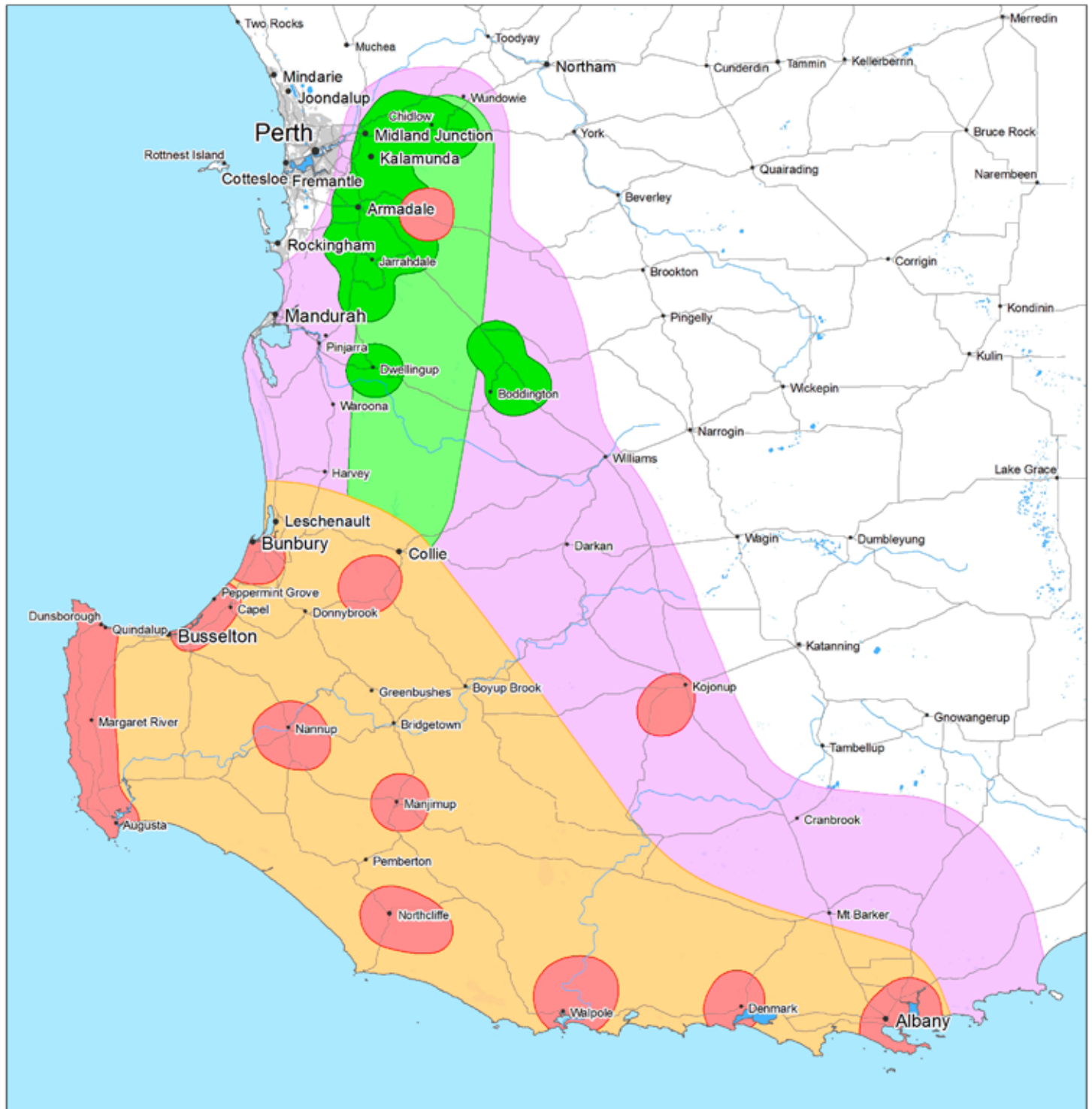
Carnaby's cockatoo breeds in the semi-arid and sub-humid interior ("wheatbelt") and some locations along the south and west coasts (Map 2). From late January/early February most interior-breeding birds leave their breeding areas, moving west, south and east towards the coast. The movement back to breeding sites in the interior occurs in July/August, and September/October to breeding areas on the Swan Coastal Plain.

The forest red-tailed black cockatoo is endemic to the south-west humid and subhumid zones of Western Australia (Map 3). Their distribution extends north to Perth and east to Wundowie, Mount Helena, Christmas Tree Well, North Bannister, Mount Saddleback, Rocky Gully and the upper King River. They are also found on parts of the Swan Coastal Plain.

The maps presented in this document are based on the best available information at the time of publication and remain a static product. For the most up-to-date report of whether black cockatoos may occur in your project area, always use the **Protected Matters Search Tool**.

¹ When considering whether your action will have a significant impact on black cockatoos, you should consider all adverse impacts from the action, including direct, indirect and offsite impacts such as downstream, upstream and facilitated impacts (impacts that result from further actions, which are made possible or facilitated by the action).

Map 1: Modelled distribution of Baudin's black cockatoo (*Calyptorhynchus baudinii*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbc/index.html



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Contextual data sources:
DEWHA (2006), Collaborative Australian Protected Areas Database
Geoscience Australia (2006), Geodata Topo 250K Topographic Data

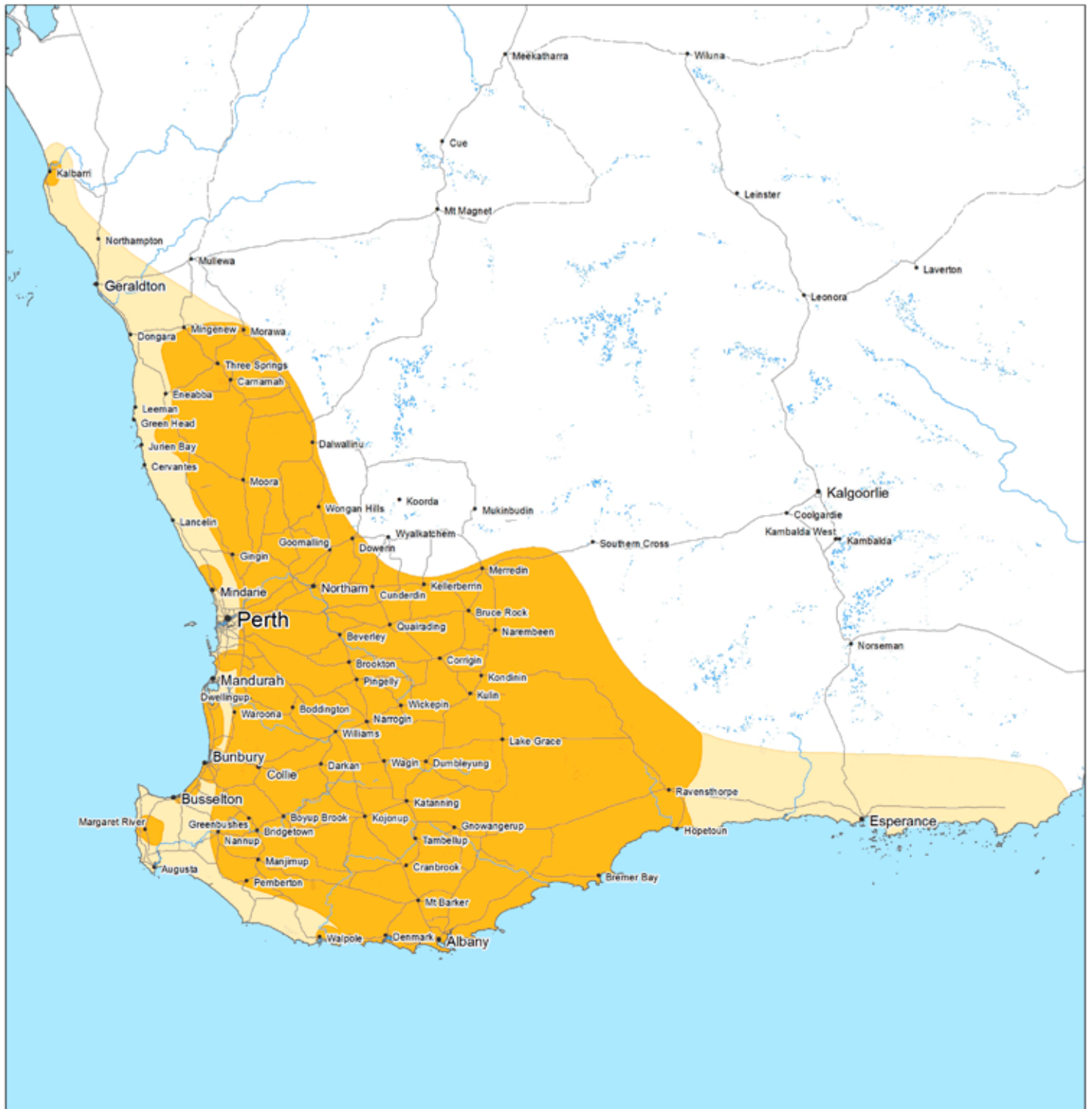
Legend

- Known Breeding Areas
- Predicted Breeding Range
- Known Foraging Areas
- Main Wintering Area
- Species Likely to Occur
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: Known breeding areas represent locations known to be used by birds for breeding as at December 2009. As habitat has been lost in traditional breeding areas, birds have begun breeding at new locations. Distribution created and verified using point locations in SPRAT database (DSEWPac, 2011) and from expert feedback (R. Johnstone, 2011).

CAVEAT: The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein.
INDICATIVE MAP ONLY: This map has been compiled from datasets with a range of geographic scales and quality. Species or ecological community distributions are indicative only and not to be used for local assessment. Local knowledge and information should be sought to confirm the presence of the species, or species habitat, at the location of interest.

Map 2: Modelled distribution of Carnaby's black cockatoo (*Calyptorhynchus latirostris*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbc/index.html



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Contextual data sources:
DEWHA (2006), Collaborative Australian Protected Areas Database
Geoscience Australia (2006), Geodata Topo 250K Topographic Data

Legend

- Breeding Range
- Non-breeding Range
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: The breeding range represents the areas known to be used by birds for breeding as at December 2009. As habitat has been lost in traditional breeding areas, birds have begun breeding at new locations. Distribution created and verified using point locations in SPRAT database (DSEWPaC, 2011) and from expert feedback (R. Johnstone, 2011).

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Map 3: Modelled distribution of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbc/index.html



Australian Government
**Department of Sustainability, Environment,
 Water, Population and Communities**

Produced by: Environmental Resources Information Network (ERIN)
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Contextual data sources:
 DEWHA (2006), Collaborative Australian Protected Areas Database
 Geoscience Australia (2006), Geodata Topo 250K Topographic Data

Legend

- Species May Occur
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: Distribution created and verified using point locations in SPRAT database (DSEWPac, 2011) and from expert feedback (R. Johnstone, 2011).

CAVEAT: The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein.
INDICATIVE MAP ONLY: This map has been compiled from datasets with a range of geographic scales and quality. Species or ecological community distributions are indicative only and not to be used for local assessment. Local knowledge and information should be sought to confirm the presence of the species, or species habitat, at the location of interest.



3. COULD THE IMPACTS OF YOUR ACTION AFFECT HABITAT FOR BLACK COCKATOOS?

The seasonal movements of black cockatoos means they require large areas of habitat for breeding, night roosting and foraging, as well as connectivity between these habitats to assist their movement through the landscape.

Breeding habitat

Black cockatoos breed in large hollow-bearing trees, generally within woodlands or forests. The size of the tree (measured as the diameter at breast height) can be a useful indication of the hollow-bearing potential of the tree. In a woodland stand with trees of suitable diameter at breast height, all trees of all ages and size are potentially important for maintaining breeding in the long term through maintaining the integrity of the habitat and allowing for recruitment of trees to provide future nest hollows. Maintaining the long-term supply of trees of trees of a size to provide suitable nest hollows is particularly important in woodland stands that are known to support cockatoo breeding.

'Breeding habitat' is defined in these referral guidelines as trees of species known to support breeding (see Table 1) within the range of the species which either have a suitable nest hollow OR are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm.

Foraging habitat

While breeding, black cockatoos will generally forage within a 6–12 km radius of their nesting site. Following breeding, birds assemble into flocks and move through the landscape searching for food, usually foraging within 6 km of a night roost. Because of this mobility, potential for reduced seed set and flowering due to drought, and the irregular or infrequent flowering and fruiting patterns of many of their food sources, large areas of foraging habitat are required to support black cockatoo populations.



Night roosting habitat

All three black cockatoos use communal night roosting sites. Flocks may use several different night roosts across the year, with major night roosts typically used for a period of weeks or until the local foraging resources are exhausted. Flocks of black cockatoos show some fidelity to roost sites, with 'traditional' night roost sites being used in most years to access high-quality feeding sites. Due to changing patterns of food and water availability across the landscape, not all night roosts will be used every year. Different roost sites are used under different weather conditions, so a flock requires a range of options within each area frequented.

Carnaby's and Baudin's cockatoos mainly use night roost sites in the non-breeding areas. However, both breeding and non-breeding forest red-tailed black cockatoos use night roosting sites. Groups of birds will roost in a suitable tree or group of tall trees, usually close to an important water source, and within an area of quality foraging habitat. The cockatoos fly to feeding areas each day before returning to the night roost. However, use of a particular night roost site may vary from daily to weekly. Night roosts are generally located in the tallest trees in an area.

Details on the habitat types used by each species for breeding, foraging and night roosting are listed in Table 1.



Table 1: habitats used by black cockatoos.

Habitat	Baudin's	Carnaby's	Forest red-tailed
Breeding²	Generally in woodland or forest ³ , but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of karri <i>Eucalyptus diversicolor</i> , marri <i>Corymbia calophylla</i> , wandoo <i>E. wandoo</i> and tuart <i>E. gomphocephala</i> .	Generally in woodland or forest ³ , but also breeds in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of salmon gum <i>E. salmonophloia</i> , wandoo, tuart, jarrah <i>E. marginata</i> , flooded gum <i>E. rudis</i> , york gum <i>E. loxophleba</i> subsp. <i>loxophleba</i> , powderbark <i>E. accedens</i> , karri and marri.	Generally in woodland or forest ³ , but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of marri, karri, wandoo, bullich <i>E. megacarpa</i> , blackbutt <i>E. patens</i> , tuart and jarrah.
Night roosting⁴	Generally in or near riparian environments or other permanent water sources. Jarrah, marri, flooded gum, blackbutt <i>E. patens</i> , tuart, and introduced eucalypts including blue gum <i>E. globulus</i> , and lemon scented gum <i>Corymbia citriodora</i> .	Generally in or near riparian environments or natural and artificial permanent water sources. Flat-topped yate <i>E. occidentalis</i> , salmon gum, wandoo, marri, karri, blackbutt, tuart, introduced eucalypts (for example blue gum) and introduced pines.	Tall jarrah, marri, blackbutt, tuart and introduced eucalypt trees within or on the edges of forests.

2. See glossary (p25).


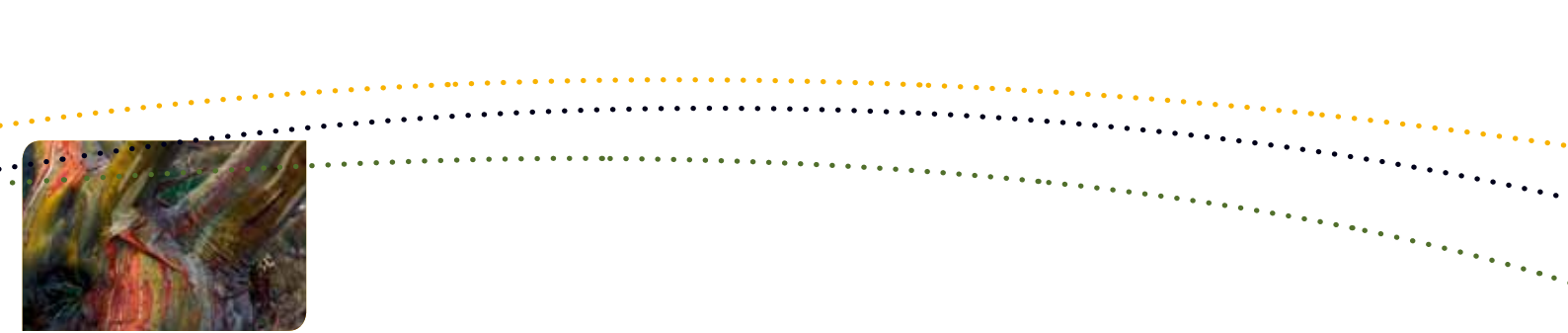
3. For definitions see for example the CSIRO *Australian soil and land survey field handbook*.

4. Black cockatoos may roost overnight in any native or introduced tree in the Perth metropolitan area which has suitable features (including height and proximity to water and foraging habitat).



Habitat	Baudin's	Carnaby's	Forest red-tailed
Foraging	Eucalypt woodlands and forest, and proteaceous woodland and heath. During the breeding season feed primarily on native vegetation, particularly marri. Outside the breeding season, may feed in fruit orchards (mostly apple and pear, but also persimmon) and tips of <i>Pinus</i> spp.	Native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp. Forages in pine plantations (<i>Pinus</i> spp.), eucalypt woodland and forest that contains foraging species. Also individual trees and small stands of these species.	Jarrah and marri woodlands and forest, and edges of karri forests including wandoo and blackbutt, within the range of the subspecies.
Foraging: common food items	Mostly marri (seeds, flowers, nectar and grubs) and proteaceous trees and shrubs. Also other native seeds and introduced fruits; insects and insect larvae; pith of kangaroo paw <i>Anigozanthos flavidus</i> ; juice of ripe persimmons; tips of <i>Pinus</i> spp. and seeds of apples and pears.	Seeds, flowers and nectar of native proteaceous plant species (for example, <i>Banksia</i> spp., <i>Hakea</i> spp., <i>Dryandra</i> spp. and <i>Grevillea</i> spp), eucalypts and Callistemon. Also seeds of introduced species including <i>Pinus</i> spp., <i>Erodium</i> spp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.	Mostly seeds of marri and jarrah, also <i>Eucalyptus caesia</i> , <i>illyarrie E. erythrocorys</i> and some introduced eucalypts such as river red gum <i>E. camaldulensis</i> and flooded gum <i>E. grandis</i> , <i>Allocasuarina</i> cones, fruits of snottygobble <i>Persoonia longifolia</i> and mountain marri <i>Corymbia haematoxylon</i> . On the Swan Coastal Plain, often feed on introduced cape lilac <i>Melia azedarach</i> .





4. HAVE YOU SURVEYED FOR BLACK COCKATOO HABITAT USING THE RECOMMENDED METHODS?

A guide to conducting surveys for Carnaby's, Baudin's and forest red-tailed black cockatoo habitat is outlined below. Surveys should:

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

Habitat assessment

Habitat assessment is the primary technique used to inform decisions on significant impact for black cockatoos. Assess the extent, type and quality of the vegetation present, including the presence and extent of plants known to be used by the black cockatoos (see Table 1). In potential breeding habitat, measurements of the diameter at breast height of trees in the patch of woodland/forest must be made to determine whether the habitat meets the definition of 'breeding habitat'. Surveys for black cockatoo foraging habitat should be done in any remaining vegetation containing proteaceous heath/woodland, eucalypt woodlands or forest (particularly marri and jarrah forest) and in areas dominated by *Pinus* spp. Any area within the range of the black cockatoos that contains known food or nesting plant species is considered to be potential habitat for the species.



Additional information on black cockatoo use of an area can be determined by searching for signs of use by black cockatoos, if this information is desired. Signs of use include suitable nest hollows, feeding signs or feeding debris, and sighting records. The presence of cockatoo droppings and feathers, or 'chewed' banksia or pine cones or marri nuts, can indicate feeding by black cockatoos (including, if possible, the identification of bite patterns to indicate which black cockatoo species fed there). This can be assessed at any time of year, as cones can remain on the ground for up to two years. Signs of use should be identified by a person with at least three years' experience surveying for black cockatoos.

Targeted surveys for birds

Targeted presence/absence surveys for birds are considered **optional** for the purposes of environmental impact assessment, and, if done, lack of detection should not be taken to mean that black cockatoos do not use the site. Short-term surveys for bird presence are unlikely to give a true representation of habitat use by black cockatoos, due to the mobile nature of these birds and their reliance on different areas of habitat at different times of the year and between years. A guide to conducting targeted surveys can be found in the relevant **SPRAT** profiles for the three species.





5. IS YOUR IMPACT MITIGATION BEST PRACTICE SO THAT IT MAY REDUCE THE SIGNIFICANCE OF YOUR IMPACTS?

When designing your proposed action, avoiding impacts on black cockatoos should be your principal aim. Effective avoidance will result in no net loss of habitat for the species. For example, locate developments on previously cleared land that that does not contain black cockatoo habitat. If you believe your options to retain habitat and preserve populations are not possible, then you should mitigate any impacts.

Table 2 outlines the main threats to black cockatoos, the associated impacts and mitigation measures to reduce the level of impacts. It is not intended to be exhaustive or prescriptive.

Impact mitigation should be monitored to ensure that it is effective and to allow for adaptive management responses.



Table 2: Primary threats, impacts and mitigation

Threat and impact	Avoidance and mitigation
<p>Habitat loss and degradation⁵</p> <ul style="list-style-type: none"> • Loss and isolation of mature, hollow-bearing trees necessary for breeding. • Lack of or loss of younger age class trees required to replace old trees that die or are destroyed, leading to a shortage of hollows in the future. • Loss, degradation and fragmentation of foraging habitat. This is particularly important in breeding areas: removal of vegetation around breeding sites, and the removal of native vegetation corridors that connect breeding and foraging sites, reduces the amount of food available to breeding birds and can affect chick survival rates. Breaks of more than 4 km have been shown to prevent breeding birds reaching resources. • Removal of native vegetation corridors, restricting the birds' ability to migrate across the landscape. • Loss, degradation and isolation of night roost sites and surrounding feeding or watering habitat. • Loss and degradation of habitat by secondary impacts such as introduction of dieback caused by <i>Phytophthora cinnamomi</i> (and other plant diseases), weed invasion which can affect seed set, and hydrological changes (such as flooding, drainage or salinity). 	<ul style="list-style-type: none"> • Mitigation and management actions should prioritise impact avoidance over impact reduction measures. • Design the action to avoid or minimise clearing of cockatoo habitat. • Manage forested and eucalypt woodland areas to protect present and future hollow-bearing trees in areas where birds breed. • Retain habitat along riparian and other corridors to preserve roosting habitat, movement corridors and watering points. • Improve and manage habitat on or next to the site of the impact. • Preserve foraging habitat near to breeding resources to allow for the successful fledging of chicks. • Re-create movement corridors between patches of remnant habitat, particularly where these link breeding or roosting sites to patches of foraging habitat. • Maintain a mosaic of vegetation age classes and species to increase the ecological value and longerterm viability of the vegetation. • Plant a mix of foraging habitat species, using local plant species. Plant in blocks or corridors of several hectares to produce enough food to sustain a local population for some weeks. Plantings should be local species of suitable quantity and quality to ensure that they contribute to the local functioning of the landscape and become self-sustaining to support black cockatoos over the long term. Note that it will take many years before new plantings are mature enough to support flocks. • Avoid or control plant diseases. • Notify landowners of the importance of artificial watering points, such as stock watering points, close to night roost sites.





Threat and impact	Avoidance and mitigation
<p>Interactions with humans</p> <ul style="list-style-type: none"> • Death or injury when hit by cars or trucks, particularly road constructions that concentrate birds at roadsides to feed on roadside vegetation and spilt grain, or drink from rainwater retained as puddles on roadsides. • Death or injury from crop protection measures which may trap or injure birds, or prohibit them from accessing nearby native vegetation. • Disturbance to birds from noise, light, vibrations and fumes. • Shooting of birds (for example where they are coming into conflict with humans over fruit or nut crops). • Poaching of birds and eggs. 	<ul style="list-style-type: none"> • Manage habitat for conservation (for example, preventing access from people, livestock, pets, machinery etc.). • Appropriate road and construction design and management to limit concentration of birds on roadsides. For example, avoid planting tree species that will attract cockatoos along road verges. • Signage to alert motorists to watch for birds along roadsides. • Practice good crop transport and farm hygiene. Cover loads (eg canola) when transporting and take care to avoid and clean up crop spills on roadsides. • In apple, pear or other tree crops that may suffer damage by black cockatoos, remove all the fruit when harvesting to avoid attracting cockatoos with surplus fruit left on trees or on the ground. • Employ effective, safe crop protection such as netting that excludes birds during production periods for fruit and nut crops. Contact the Western Australian departments of Environment and Conservation, or Agriculture and Food. • Shooting and poaching are illegal under Western Australian wildlife laws. Substantial penalties may apply to any person found guilty of interfering with native wildlife.
<p>Invasive species</p> <ul style="list-style-type: none"> • Competition for nest hollows with European honeybees and invading bird species • Injury and death from European honeybees. 	<ul style="list-style-type: none"> • Where necessary, control hollow-competing fauna (for example, feral bees, corellas, galahs, wood and mountain ducks) under licence.

5. Degradation may occur through a variety of sources, including changes to the hydrology or fire regimes, and chemical application (causing death or dieback) to known roosting or nesting trees.



6. COULD YOUR ACTION REQUIRE A REFERRAL TO THE FEDERAL ENVIRONMENT MINISTER FOR SIGNIFICANT IMPACTS ON BLACK COCKATOOS?

As the person proposing the action it is your responsibility to decide whether or not to refer your action. If you believe your action is at high risk of having a significant impact on black cockatoos, you should refer the action to the federal environment minister. If you are uncertain whether your action will have a significant impact on black cockatoos you may also refer your action or contact the department.

Table 3 provides guidance on what may be at high to low risk of requiring a referral to the department, and where uncertainty may exist. **Table 3 provides guidance on your need to refer regardless of any mitigation measures adopted.** If your action meets or exceeds the referral triggers in Table 3 you should consider the referral recommendation even if you have included mitigation in your proposed action. This guidance is not intended to be comprehensive. Other types of actions or impacts may constitute varying degrees of risk.

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.



Table 3: Referral guidelines

High risk of significant impacts: referral recommended
<ul style="list-style-type: none">• Clearing of any known nesting tree (see glossary).• Clearing or degradation of any part of a vegetation community known to contain breeding habitat (see Section 3).• Clearing of more than 1 ha of quality⁶ foraging habitat⁷ (see Table 1).• Clearing or degradation (including pruning the top canopy) of a known night roosting site (see glossary).• Creating a gap of greater than 4 km between patches of black cockatoo habitat (breeding, foraging or roosting).
Uncertainty: referral recommended or contact the department
<ul style="list-style-type: none">• Degradation (such as through altered hydrology or fire regimes) of more than 1 ha of foraging habitat⁷. Significance will depend on the level and extent of degradation and the quality of the habitat.• Clearing or disturbance in areas surrounding black cockatoo breeding, foraging or night roosting habitat that has the potential to degrade habitat through introduction of invasive species, edge effects, hydrological changes, increased human visitation or fire.• Actions that do not directly affect the listed species but that have the potential for indirect impacts such as increasing competitors for nest hollows.• Actions with the potential to introduce known plant diseases such as <i>Phytophthora</i> spp. to an area where the pathogen was not previously known.
Low risk of significant impacts: referral may not be required
<ul style="list-style-type: none">• Actions that do not affect black cockatoo habitat or individuals.• Actions whose impacts occur outside the modelled distribution of the three black cockatoos.

6. Quality should be assessed as it pertains specifically to black cockatoo use of the habitat. For example, the condition of the understorey is a standard component of most ecological habitat quality surveys but is of limited relevance to considerations for some black cockatoos, particularly in relation to breeding habitat which may consist of mature woodland canopy with little or no understorey.
7. Maintaining the availability of foraging habitat is especially important in the breeding range, as sufficient foraging habitat within a 6–12 km radius of breeding sites is necessary to successfully raise chicks. Maintaining foraging habitat is also particularly important in the Perth metropolitan area, due to the role of these feeding areas in the survival of young birds and the maintenance of the population between breeding seasons, coupled with the lack of habitat remaining in this region and its connectivity values.



7. GLOSSARY

Affected area: The area likely to be affected by the action. This includes the project site and any additional areas likely to be affected, either directly or indirectly. That is, anywhere on or off site where the effects, good and bad, of the proposed action would be felt. Habitat and/or populations may, and often will, extend beyond the development site boundaries. Therefore, the affected area should extend as far as necessary to take all potential impacts, including off site impacts, into account. This is the area that the person proposing an action must survey.

Breeding habitat: Habitat which meets the definition set out in Table 1 for the respective species. This habitat is considered to have the potential to support breeding by the species. Breeding habitat predominantly applies to those areas with the breeding range of the respective species as identified in the maps provided. However, given: incomplete knowledge of breeding activity; the potential for these areas to change; and known breeding sites outside the traditional breeding ranges, habitat that meets the definition set out here, but is outside of the predicted breeding range, is considered breeding habitat unless proven otherwise.

Known nesting trees: Any existing tree in which breeding has been recorded or suspected. Information on known nesting trees within or near the area of an action is available from the Western Australian Department of Environment and Conservation and the Western Australian Museum.

Known night roosting site: A tree or group of trees where there are records or recent evidence of night roosting.

Suitable nest hollow: Any hollow that appears to be deep enough and with an opening large enough to be used by black cockatoos. Usually this will be a natural hollow, but artificial hollows may also be suitable in some circumstances (for example, where the artificial hollow has been specifically designed for use by threatened black cockatoos).





