

# Fauna Assessment

## Lot 230



## Elgin Road

## Elgin

June 2020

V2

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## SUMMARY

This report details the results of a fauna assessment with a section of Lot 230, Elgin Road, Elgin (the Lot). It is understood that the landowner is proposing to extract sand from a section of the Lot (the survey area) subject to approval from relevant regulatory authorities. The survey area has a total extent of about 10.8 hectares most of which is cleared with only scattered trees.

The fauna assessment reported on here represents one of several technical reports that will be used to provide an understanding of the suite of environmental values present within the survey area which will be used during the ongoing planning and approval process.

The scope of works was to conduct a level 1 fauna survey as defined by the Environmental Protection Authority (EPA 2016). Because some listed threatened species (i.e. three species of black cockatoo and the western ringtail possum) are known to occur in the general area, the scope of the survey work was expanded to include targeted assessment of the site's significance to these particular species.

Daytime field survey work was carried out on the 28 May 2020. The single nocturnal survey was undertaken on the 4 June 2020. All survey work was done by Greg Harewood (Zoologist).

### Key Findings

The main vegetation unit present consists of an open woodland containing jarrah (*Eucalyptus marginata*), marri (*Corymbia calophylla*), candlestick banksia (*Banksia attenuata*), holly-leaved banksia (*Banksia ilicifolia*), woody pear (*Xylomelum occidentale*), Christmas tree (*Nuytsia floribunda*) and peppermint (*Agonis flexuosa*) in various densities over small areas of spearwood (*Kunzea glabrescens*).

In a low lying area in the north east corner of the survey area a paperbark low woodland (*Melaleuca preissiana*) with emergent marri (*Corymbia calophylla*) over areas of spearwood (*Kunzea glabrescens*) persists.

These two main coherent remnants cover about 3.8 ha with the balance of the survey area (~7 ha) being cleared with only scattered trees of the various species, many of which are dead or dying.

The overall fauna habitat quality of the survey area is very low due to its completely degraded state and in particular the almost complete lack of any native ground cover. The fauna assemblage present would therefore be depauperate as a consequence, in particular in relation to ground dwelling reptile and mammal species. The remnant is also relatively isolated given that the majority of surrounding areas have been cleared and fragmented with only poor connectivity.

A total of 47 black cockatoo "breeding habitat trees" were identified within the survey area. Two thirds (32 – ~68%) of these trees did not appear to contain hollows of any size. Fifteen (~32%) were assessed as possibly having hollows, but of a likely size or orientation that was deemed unsuitable for black cockatoos to utilise. No tree appeared to contain hollows possibly large

enough for black cockatoos to use for nesting. None of the hollows observed showed conclusive signs of use by any fauna.

Evidence of black cockatoos foraging was observed during the field survey in the form of chewed marri fruits. This evidence was attributed to the forest red-tailed black cockatoo based on the nature of the debris (i.e. bite marks). Much of the remnant native vegetation within the survey area can be regarded as foraging habitat for black cockatoos given the presence of jarrah, marri and banksia in various concentrations. The extent of foraging habitat is estimated to total about 3.0 ha with some additional contribution from some scattered tree specimens.

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

Western Ringtail possum dreys and scats were located within the survey area during the daytime inspection. A total of three western ringtail possums were observed during the nocturnal survey of the site. One common brushtail possum was also recorded during the same period.

## 1. INTRODUCTION

This report details the results of a fauna assessment with a section of Lot 230, Elgin Road, Elgin (the Lot) (Figure 1). It is understood that the landowner is proposing to extract sand from a section of the Lot (the survey area – Figure 2) subject to approval from the relevant regulatory authorities. The survey area has a total extent of about 10.8 hectares (ha) most of which is cleared with only scattered trees.

The fauna assessment reported on here represents one of several technical reports that will be used to provide an understanding of the suite of environmental values present within the survey area which will be used during the ongoing planning and approval process.

## 2. SCOPE OF WORKS

The scope of works was to conduct a Level 1 fauna survey as defined by the EPA (EPA 2016). Because the general area is known to be utilised by black cockatoos and western ringtail possums the scope of the survey work was expanded to include a baseline assessment of the site's significance to these species as well. The fauna assessment has therefore included:

1. Level 1 fauna assessment (in accordance with EPA (2016) guidelines);
2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
3. Targeted searches for western ringtail habitat/site use (habitat, individuals, dreys, tree hollows and scats);
4. Report summarising methods, results and conclusions.

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

## 3. METHODS

Daytime field survey work was carried out on the 28 May 2020. The single nocturnal survey was undertaken on the 4 June 2020. All survey work was done by Greg Harewood (Zoologist).

### **3.1 Fauna Habitat Assessment**

The vegetation units, landforms and soils present have been used to classify the area into broad habitat types. As part of the literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the daytime reconnaissance survey the habitats within the survey area were assessed and specific elements identified, if present, to determine the likelihood of listed species of conservation significance occurring and its likely overall value to them on a local and regional scale.

### **3.2 Black Cockatoo Habitat Assessment**

The following methods were employed to comply with the defined scope of works and are based on guidelines published by the federal Department of Agriculture, Water and the Environment (DAWE) (Commonwealth of Australia 2012) which states that surveys for Carnaby's, Baudin's and forest red-tailed black cockatoo habitat should:

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

Habitat used by black cockatoos have been placed into three categories by the DAWE (Commonwealth of Australia 2012) these being:

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

So as to comply with the requested scope of works and in line with the published guidelines the following was carried out.

#### **3.2.1 Black Cockatoo Breeding Habitat**

The black cockatoo breeding habitat assessment has involved the identification of all suitable breeding trees species within the survey area that have a Diameter at Breast Height (DBH) of equal to or over 50cm. The DBH of each tree was estimated using a pre-made 50 cm "caliper".

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

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

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

- Small =  $\sim < 5$ cm diameter (i.e. entrance too small for a black cockatoo);
- Medium =  $\sim 5$ cm-10cm diameter (i.e. entrance too small for a black cockatoo);
- Large =  $\sim \geq 10$ cm diameter (entrance large enough for a black cockatoo but possible hollow appears to be unsuitable for nesting i.e. wrong orientation, too small, too low or too shallow); or
- Large (cockatoo) =  $\sim \geq 10$ cm diameter (entrance appears big enough to provide access to a possible hollow that may be suitable for a black cockatoo to use for nesting).

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

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

For the purposes of this study a tree containing a potential cockatoo nest hollow was defined as:

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

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). Where possible a drone (DJI Mavic Air) was used to photograph hollows



suspected of being possibly suitable for black cockatoos so that a more informed decision on then potential suitability or actual use could be made.

### **3.2.2 Black Cockatoo Foraging Habitat**

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

### **3.2.3 Black Cockatoo Roosting Habitat**

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

### **3.3 Western Ringtail Possum Assessment**

To determine if western ringtail possums were utilising the survey area the following was carried out:

- Concurrent with the daytime black cockatoo habitat assessment dreys (and other potential daytime refuge habitat), scats and individual WRPs were searched for and recorded if observed; and
- One nocturnal count was carried out to provide an estimate of the distribution and abundance of western ringtail possums within the survey area. The nocturnal survey involved walking close spaced transects over the entire survey area once.

### **3.4 Other Species of Conservation Significance**

Evidence of the presence or likely presence of other species of conservation significance (including suitable habitat) was searched for and recorded concurrent with other field work. The aim was to obtain sufficient information to make a definitive comment on the likely significance of the survey area to other species of conservation significance which may be present.

### **3.5 Opportunistic Fauna Observations**

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

## 4. SURVEY CONSTRAINTS

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

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

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

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

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

The location of observations was recorded using a handheld GPS. The accuracy of the GPS cannot be guaranteed above a level of about 5 to 10 metres, though it should be noted that in some circumstance the accuracy can increase or decrease beyond this range.

## 5. RESULTS

### 5.1.1 FAUNA HABITAT ASSESSMENT

The survey area is located in the central section of the southern Swan Coastal Plain. The Swan Coastal Plain (SWA) was classified as part of the Interim Biogeographic Regionalisation for Australia (IUCN) and is in broad terms described as a:

*“Low lying coastal plain mainly covered with Woodlands. It is dominated by Banksia or Tuart on sandy soils, Allocasuarina obesa on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah Woodland. Warm Mediterranean. Three phases of marine sand dune development provide relief. The*

outwash plains, once dominated by *A. obesa* – Marri Woodlands and *Melaleuca* shrublands, are extensive only in the south.” (Thackway and Cresswell, 1996).

The survey area itself is within a further defined subregion of the SWA referred to as the Swan Coastal Plain subregion or the Perth subregion (SWA2). This is defined as:

“Colluvial and aeolian sands, alluvial river flats, coastal limestone. Heath and/or Tuart woodlands on limestone, *Banksia* and Jarrah - *Banksia* woodlands on Quaternary marine dunes of various ages, Marri on colluvial and alluvials. Includes a complex series of seasonal wetlands and also includes Rottnest, Carnac and Garden Islands etc. Rainfall ranges between 600 and 1000 mm annually and the climate is Mediterranean”. The subregion has an area of about 1, 333,900 ha (Mitchell *et al.* 2002).

The majority of Lot 230 is cleared of native vegetation with the largest remnant falling within the survey area, being situated on a centrally located low sandy dune.

The vegetation present would be classified as completely degraded, primarily as a consequence of the fact that it has been open to livestock grazing for many years. Dieback also appears to be prevalent with numerous dead trees (manly jarrah and banksia) being present.

The main vegetation unit present consists of an open woodland containing jarrah (*Eucalyptus marginata*), marri (*Corymbia calophylla*), candlestick banksia (*Banksia attenuata*), holly-leaved banksia (*Banksia ilicifolia*), woody pear (*Xylomelum occidentale*), Christmas tree (*Nuytsia floribunda*) and peppermint (*Agonis flexuosa*) in various densities over small areas of spearwood (*Kunzea glabrescens*).

In a low lying area in the north east corner of the survey area a paperbark low woodland (*Melaleuca preissiana*) with emergent marri (*Corymbia calophylla*) over areas of spearwood (*Kunzea glabrescens*) persists.




These two main coherent remnants cover about 3.8 ha with the balance of the survey area (~7 ha) being cleared with only scattered trees of the various species, many of which are dead or dying.

Example images of the single fauna habitat/dominant vegetation present within the survey area are provided in Table 1. The extent of the identified habitat/vegetation unit is shown in Figure 3.

The overall fauna habitat quality of the survey area is very low due to its completely degraded state and in particular the almost complete lack of any native ground cover. The fauna assemblage present would therefore be depauperate as a consequence, in particular in relation to ground dwelling reptile and mammal species. The remnant is also relatively isolated given that the majority of surrounding areas have been cleared and fragmented with only poor connectivity.

Based on available vegetation mapping it is estimated that there is approximately 19,000 ha of native vegetation within 12 km the survey area (DPIRD 2020). Coherent remnant native vegetation present within the survey area (total ~3.8 ha) makes up ~0.02% of this total.

**Table 1: Main Fauna Habitats within the Survey Area**

Fauna Habitat Description	Example Image
<p>Open woodland of jarrah (<i>Eucalyptus marginata</i>), marri (<i>Corymbia calophylla</i>), candlestick banksia (<i>Banksia attenuata</i>), holly-leaved banksia (<i>Banksia ilicifolia</i>), woody pear (<i>Xylomelum occidentale</i>), Christmas tree (<i>Nuytsia floribunda</i>) and peppermint (<i>Agonis flexuosa</i>) over small areas of spearwood (<i>Kunzea glabrescens</i>) on sand.</p>	
<p>Cleared with scattered jarrah (<i>Eucalyptus marginata</i>), marri (<i>Corymbia calophylla</i>), candlestick banksia (<i>Banksia attenuata</i>), holly-leaved banksia (<i>Banksia ilicifolia</i>), woody pear (<i>Xylomelum occidentale</i>) and peppermint (<i>Agonis flexuosa</i>) on sand. Many dead specimens.</p>	
<p>Low open forest of paperbark (<i>Melaleuca preissiana</i>) with emergent marri (<i>Corymbia calophylla</i>) over areas of spearwood (<i>Kunzea glabrescens</i>) on sand.</p>	

## 5.2 Black Cockatoo Habitat Assessment

### 5.2.1 Black Cockatoo Breeding Habitat

Trees considered potentially suitable for black cockatoos to use as nesting habitat (using DAWE criteria i.e. DBH  $\geq$ 50cm (Commonwealth of Australia 2012) but ultimately subject to a suitable hollow being present or developing and a range of other factors) which were found within the survey area comprised the following species:

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

A summary of the potential black cockatoo habitat trees observed within the survey area area is provided in Table 2 below and their location shown in Figure 4.

**Table 2: Summary of Potential Black Cockatoo Habitat Trees (DBH  $\geq$ 50cm) within the Survey Area**

Total Number of Habitat Trees Recorded	Number of Trees with <u>No Hollows Observed</u>	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly Suitable</u> for Nesting Black Cockatoos	Tree Species		
				Jarrah	Marri	Dead Unknown
47	32	15	0	30	11	6

The assessment identified 47 trees within the survey area with a DBH of  $\geq$ 50cm. Two thirds (32 – ~68%) of these trees did not appear to contain hollows of any size. Fifteen (~32%) were assessed as possibly having hollows, but of a likely size or orientation that was deemed unsuitable for black cockatoos to utilise. No tree appeared to contain hollows possibly large enough for black cockatoos to use for nesting. None of the hollows observed showed conclusive signs of use by any fauna.

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

The survey area falls within the mapped breeding range of Carnaby’s cockatoo as depicted in the most current recovery plan produced by DBCA (Figure 2 - DPaW 2013). The author is also aware of a documented forest red-tailed black cockatoo breeding event on farmland in Elgin about 1.5 km west of the survey area. A review of other available data revealed several Carnaby’s black cockatoo breeding records in Dalyellup and Gelorup, about 11 km distance from the survey area. Bamford (2004) also reports a breeding attempt by Carnaby’s

cockatoo in the Ludlow Tuart Forest in 2003 at a point about 14 km south west of the survey area.

The DBCA recovery plan for Baudin's cockatoo and the forest red-tailed black cockatoo (DEC 2008) does not specifically define any known breeding areas for either species. Johnstone and Kirkby (2011) also do not specifically mention breeding areas of either species of black cockatoo in the vicinity though both are noted as utilising marri trees (and other tree species) for breeding in the south west.

While there appears to be a paucity of breeding data for the general area this could simply be a consequence of a lack of survey work or a lack of publicly available data. Based on available vegetation mapping it is however estimated that there is approximately 19,000 ha of native vegetation within 12 km the survey area and therefore there is significant potential for breeding to take place in the wider area (assuming the presence of suitable trees).

### 5.2.2 Black Cockatoo Foraging Habitat


Following is a list of the main plant species observed within the survey area that are known to be used as a direct food source (i.e. fruits or flowers) by one or more species of black cockatoo:

- Jarrah - *Eucalyptus marginata* – seeds;
- Marri - *Corymbia calophylla* - flowers, seeds, nectar;
- Candlestick Banksia – *Banksia attenuata* - flowers, seeds;
- Holly-leaved Banksia – *Banksia ilicifolia* - flowers, seeds;
- Woody Pear - *Xylomelum occidentale* – seeds; and
- Peppermint - *Agonis flexuosa* – bark, grubs.

It should be noted that the degree to which the various plant species are utilised varies considerably. For example, marri is documented as being the primary food source for all three black cockatoo species, though jarrah and *banksia* make up a high proportion of some species food intake in other areas where they proliferate. Plants such as woody pear and peppermint (for example) are only foraged upon rarely

Evidence of black cockatoos foraging was observed during the field survey in the form of chewed marri fruits. This evidence was attributed to the forest red-tailed black cockatoo based on the nature of the debris (i.e. bite marks). A representative example of the foraging activity observed is shown in Table 3.

**Table 3: Foraging Evidence Example**

Foraging Evidence Description	Example Image
<p>Marri Fruits – foraging activity attributed to the forest red-tailed black-cockatoo.</p>	

Much of the remnant native vegetation within the survey area can be regarded as foraging habitat for black cockatoos given the presence of jarrah, marri and banksia in various concentrations. The extent of foraging habitat is estimated to total about 3.0 ha with some additional contribution from some scattered tree specimens.

Based on available vegetation mapping it is estimated that there is approximately 19,000 ha of native vegetation within 12 km the survey area, much of which is very likely to represent potential black cockatoo foraging habitat of some type.

### 5.2.3 Black Cockatoo Roosting Habitat

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

It is difficult to determine if trees or groves of trees within the survey area represent potential roosting habitat as a range of factors, not all of which can be observed, determine suitability. Some of the larger trees may be suitable but as indicated no actual evidence of use was seen.

A review of the 2018 Great Cocky Count database shows no documented roost sites within the survey area. The 2019 Great Cocky Count (April 2019) recorded the closest active roost, approximately 10 km east, as being used by 183 white-tailed black cockatoos (exact species not specified) (Peck *et al.* 2019). Another three documented roost sites (but not necessarily in current use) occur within 12 kilometres of the survey area.

Based on available vegetation mapping it is estimated that there is approximately 19,000 ha of native vegetation within 12 km the survey area and therefore there is significant potential for roosting habitat to be present in the wider area (assuming the presence of suitable trees).

### **5.3 Western Ringtail Possum Assessment**

The locations of various western ringtail possum observations made during the site surveys are shown in Figure 4.

In total three WRP dreys were observed during the day survey. The survey area also contains a number of hollow bearing trees though not all are likely to be suitable for WRPs to utilise. Forks in trees, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover (e.g. swordgrass/sedges) are also used by WRPs for daytime refuge and therefore observations of dreys and hollows only provide a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist.

WRP scats were observed at two separate locations. In most areas dense leaf litter made searching for scats difficult and time consuming and therefore this method for determining WRP presence was not employed extensively.

A total of three WRPs were observed during the nocturnal survey of the site. One common brushtail possum was also recorded during the same period.

Almost all the coherent remnant vegetation present on site represents WRP habitat of some type (i.e. refuge, foraging or dispersal) however the quality of habitat is relatively low given the relatively sparse vegetation density and poor canopy connectivity in many areas. WRPs appear to be absent from the western half of the survey area where only scattered trees are present.

#### **5.3.1 Other Species of Conservation Significance**

Besides the western ringtail possum and the forest red-tailed black cockatoo no evidence of any other fauna species of conservation significance. It is however considered likely that Carnaby's black cockatoo and Baudin's black cockatoo also frequent the general area and may forage within the survey area on occasions despite no evidence of this being found during the survey period.

Based on the habitats present, their degraded state and limited extent it is considered unlikely that any other fauna species of conservation significance would occur within the site.

#### **5.3.2 Opportunistic Fauna Observations**

A list of all species recorded during the survey period is held in Appendix B. A total of 22 fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the survey area. Most of the fauna species recorded are common, widespread bird species.



## 6. CONCLUSION

The fauna assessment within the survey area was primarily undertaken to determine the significance of the site to black cockatoos and western ringtail possums

The overall fauna habitat quality of the survey area is low due to its completely degraded state and in particular the almost complete lack of any native ground cover. The overall fauna assemblage present is therefore likely to be depauperate as a consequence, in particular in relation to ground dwelling reptile and mammal species. The remnant is also relatively isolated given that the majority of surrounding areas have been cleared and fragmented with only poor connectivity.

The vegetation present does however still have some habitat value for various fauna species and in particular those of conservation significance such as black cockatoos and the western ringtail possum. The assessment identified the presence of “potential” black cockatoo breeding and foraging habitat within the survey area and the presence of western ringtail possums.

## 7. REFERENCES

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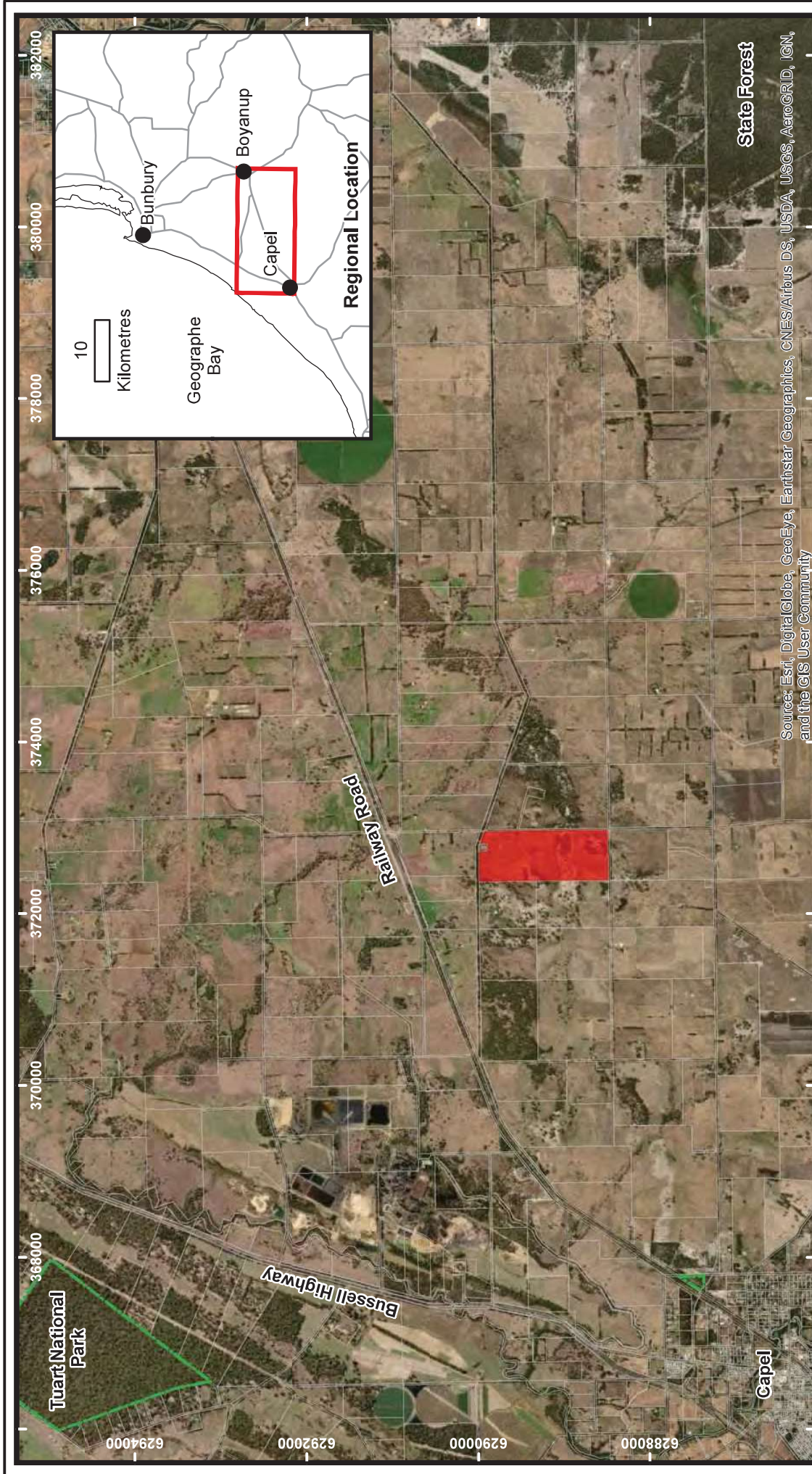
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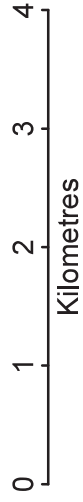
# FIGURES



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Legend**

- Lot\_Boundary
- Cadastral Boundaries
- National Park/Nature Reserve





**Fauna Survey**  
 Drawn: G Harewood  
 Date: June 2020  
 Scale: 1:60,000

Lot 230 Elgin Road  
Elgin

**Survey Area  
and  
Surrounds**

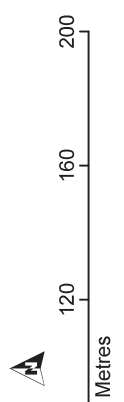



**Futura Survey**  
 Drawn: G. Harewood  
 Date: June 2020  
 Scale: 1:1,500  
 Projection/Coordinate System: UTM/MGA Zone 50

Lot 230 Elgin Road  
Elgin

### Survey Area Aerial Photograph

Figure: 2










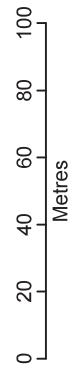
**Legend**

-  Lot\_Boundary
-  Survey Area



**Legend**

-  Lot Boundary
-  Low Open Forest of Paperbark
-  Open Woodland of Jarrah/Banksia
-  Survey Area
-  Habitat Tree - One or more hollows that appear unsuitable for Black Cockatoos
-  Habitat Trees - No Hollows Observed
-  Cleared with Scattered Trees








Fauna Survey
Drawn: G. Harewood
Date: June 2020
Scale: 1:1,500
Projection/Coordinate System: UTM/MGA Zone 50

Lot 230 Elgin Road  
Elgin  
**Fauna Habitats and Habitat Trees**  
Figure: 3



- Legend**
-  Lot Boundary
  -  Survey Area
  -  Western Ringtail Possum
  -  WRP Drey
  -  WRP Scats
  -  Common Brushtail Possum

-  Western Ringtail Possum
-  WRP Drey
-  WRP Scats
-  Common Brushtail Possum




 Palma Survey  
 Drawn G. Harewood  
 Date: June 2020  
 Scale: 1:1,500  
 Projection/Coordinate System: UTM/MGA Zone 50

Lot 230 Elgin Road  
 Elgin  
**Possum Observations**  
 Figure: 4

# **APPENDIX A**

## **HABITAT TREE DETAILS**



Habitat Trees

DBH >50cm

Datum - GDA94

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

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow
wpt001	50H	372894	6289061	Marri	>50	15-20	0				
wpt002	50H	372866	6289083	Dead Marri	>50	15-20	0				
wpt006	50H	372817	6289086	Dead Marri	>50	15-20	2+	Small	No Signs	No Signs	No
wpt007	50H	372791	6289072	Dead Unknown	>50	15-20	2+	Small & Medium	Bees	No Signs	No
wpt008	50H	372771	6289034	Dead Jarrah	>50	15-20	2+	Small & Medium	No Signs	No Signs	No
wpt009	50H	372760	6289006	Dead Jarrah	>50	15-20	2+	Small & Medium	No Signs	No Signs	No
wpt010	50H	372689	6289010	Dead Unknown	>50	15-20	2+	Small & Medium	No Signs	No Signs	No
wpt011	50H	372656	6288997	Dead Jarrah	>50	15-20	0				
wpt012	50H	372653	6288997	Dead Jarrah	>50	15-20	0				
wpt013	50H	372646	6288990	Dead Jarrah	>50	15-20	0				
wpt014	50H	372641	6288986	Dead Jarrah	>50	15-20	0				
wpt015	50H	372640	6288974	Dead Jarrah	>50	15-20	0				
wpt016	50H	372627	6288958	Dead Jarrah	>50	15-20	0				
wpt017	50H	372663	6288913	Dead Unknown	>50	15-20	2+	Small & Medium	No Signs	No Signs	No
wpt018	50H	372624	6288897	Marri	>50	15-20	0				
wpt019	50H	372616	6288892	Marri	>50	15-20	0				
wpt020	50H	372602	6288885	Marri	>50	15-20	0				
wpt021	50H	372611	6288884	Dead Unknown	>50	15-20	2+	Small	No Signs	No Signs	No
wpt022	50H	372413	6288873	Marri	>50	20+	2+	Small & Medium	No Signs	No Signs	No
wpt023	50H	372407	6288864	Marri	>50	15-20	0				
wpt024	50H	372416	6288857	Marri	>50	15-20	0				
wpt025	50H	372405	6288947	Jarrah	>50	10-15	2+	Small	No Signs	No Signs	No
wpt026	50H	372571	6288954	Jarrah	>50	15-20	2+	Small	No Signs	No Signs	No
wpt027	50H	372571	6288965	Jarrah	>50	15-20	0				

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow
wpt028	50H	372593	6288944	Jarrah	>50	15-20	0				
wpt029	50H	372600	6288962	Jarrah	>50	15-20	0				
wpt030	50H	372554	6288987	Dead Jarrah	>50	15-20	0				
wpt031	50H	372524	6288991	Jarrah	>50	15-20	0				
wpt032	50H	372537	6289055	Marri	>50	15-20	0				
wpt033	50H	372569	6289086	Marri	>50	15-20	0				
wpt034	50H	372579	6289087	Dead Jarrah	>50	15-20	0				
wpt035	50H	372671	6289015	Jarrah	>50	15-20	0				
wpt036	50H	372678	6288948	Dead Unknown	>50	15-20	2+	Small & Medium	No Signs	No Signs	No
wpt037	50H	372715	6288973	Jarrah	>50	10-15	2+	Small & Medium	No Signs	No Signs	No
wpt038	50H	372718	6288987	Jarrah	>50	20+	2+	Small	No Signs	No Signs	No
wpt039	50H	372734	6288989	Jarrah	>50	15-20	0				
wpt040	50H	372759	6289004	Dead Unknown	>50	15-20	2+	Small	No Signs	No Signs	No
wpt041	50H	372754	6288944	Jarrah	>50	15-20	2+	Small & Medium	No Signs	No Signs	No
wpt042	50H	372751	6288941	Jarrah	>50	15-20	0				
wpt043	50H	372792	6288937	Jarrah	>50	15-20	0				
wpt044	50H	372815	6289021	Jarrah	>50	15-20	0				
wpt045	50H	372797	6289027	Jarrah	>50	10-15	0				
wpt047	50H	372857	6288970	Jarrah	>50	15-20	0				
wpt048	50H	372852	6288954	Dead Jarrah	>50	5-10	0				
wpt049	50H	372888	6288975	Jarrah	>50	15-20	0				
wpt050	50H	372867	6288982	Jarrah	>50	15-20	0				

## **APPENDIX B**

### **OBSERVED FAUNA LISTING**

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# Fauna Observed During Survey Period

Lot 230 Elgin

Compiled by Greg Harewood - May 2020

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Class Family Species	Common Name	Conservation Status
<b>Aves</b>		
<b>Anatidae</b> Geese, Swans, Ducks		
<i>Tadorna tadornoides</i>	Australian Shelduck	LC
<b>Psittacidae</b> Parrots		
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Bp LC
<i>Neophema elegans</i>	Elegant Parrot	LC
<i>Platycercus spurius</i>	Red-capped Parrot	LC
<i>Platycercus zonarius</i>	Australian Ringneck	LC
<b>Maluridae</b> Fairy Wrens, GrassWrens		
<i>Malurus splendens</i>	Splendid Fairy-wren	Bh LC
<b>Acanthizidae</b> Thornbills, Geryones, Fieldwrens & Whitefaces		
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC
<b>Pachycephalidae</b> Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers		
<i>Pachycephala occidentalis</i>	Western Whistler	Bh LC
<b>Dicruridae</b> Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo		
<i>Grallina cyanoleuca</i>	Magpie-lark	LC
<i>Rhipidura fuliginosa</i>	Grey Fantail	LC
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC
<b>Campephagidae</b> Cuckoo-shrikes, Trillers		
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC

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BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions LC = Least Concern - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

Class Family Species	Common Name	Conservation Status
<b>Artamidae</b> Woodswallows, Butcherbirds, Currawongs		
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Bp LC
<b>Cracticidae</b> Currawongs, Magpies & Butcherbirds		
<i>Cracticus tibicen</i>	Australian Magpie	LC
<i>Cracticus torquatus</i>	Grey Butcherbird	LC
<b>Corvidae</b> Ravens, Crows		
<i>Corvus coronoides</i>	Australian Raven	LC
<b>Hirundinidae</b> Swallows, Martins		
<i>Hirundo neoxena</i>	Welcome Swallow	LC
<i>Hirundo nigricans</i>	Tree Martin	LC
<b>Zosteropidae</b> White-eyes		
<i>Zosterops lateralis</i>	Silvereeye	LC
<b>Mammalia</b>		
<b>Phalangeridae</b> Brushtail Possums, Cuscuses		
<i>Trichosurus vulpecula vulpecula</i>	Common Brushtail Possum	LC
<b>Pseudocheiridae</b> Ringtail Possums		
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 CR CR
<b>Macropodidae</b> Kangaroos, Wallabies		
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions LC = Least Concern - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria> for others.

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The conclusions are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

Within the limitations imposed by the scope of services, the field assessment and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

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