

Fauna Assessment



Lot 43 Plantation Road

Ludlow

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On behalf of:

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SUMMARY

This report details the results of a fauna assessment over Lot 43 Plantation Road, Ludlow in the Shire of Capel (the survey area). The landowners are proposing to clear sections of the survey area for the purpose of sand extraction and will be applying to the Department of Water and Environmental Regulation for a clearing permit pursuant to Section 51E of the *Environmental Protection Act 1986*.

The information presented here will be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats at the site, during the project evaluation and clearing permit approval process.

The field component of the fauna assessment was carried out on 30 October and the 13 December 2021 by Greg Harewood (Zoologist) and consisted of a daytime reconnaissance survey and nocturnal spotlighting.

Key Findings

The survey area has a total extent of about 27 hectares (ha) and contains a mosaic of remnant native vegetation, regrowth and cleared land around an existing house and sheds.

About half of the vegetation present (~13 ha) consists of a *Kunzea* tall shrubland with scattered emergent trees including but not limited to jarrah, peppermint, *Banksia* spp. and *Nuytsia floribunda* on grey sand. A significant proportion of this vegetation appears to be regrowth from an historical clearing event the extent of which is evident on old air photos.

The balance of the site is either cleared (with bare sand/open grassland) or contains small areas of other vegetation types.

The fauna habitats present range from completely degraded (existing cleared areas) to very good (intact remnant native vegetation), however the majority is degraded, largely a consequence of historical clearing and livestock grazing. Given the degree of disturbance the original fauna assemblage within the survey area is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is absent/sparse in many areas. Thirty two fauna species (mainly common bird species) were observed or secondary evidence of their presence recorded during the field survey.

A total of 49 potential black cockatoo breeding “habitat trees” were identified within the survey area. The vast majority of these trees (35) appeared to not contain hollows of any size. Thirteen (13) trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for black cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or low height above ground level. One tree (1) appeared to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes but this was not confirmed and no actual signs of use were noted.

Quality black cockatoo foraging habitat within the survey area can mainly be defined as the areas containing the densest areas of marri, jarrah and/or banksia vegetation. Marri woodland makes up about 3.2 ha of the survey area though the density of marri varies considerably. Jarrah and *banksia* are the dominant tree species in Unit C which makes up about 50% of the vegetation present however the density of these specific species is relatively low which reduces the overall quality rating of this unit. No evidence black cockatoos roosting within the survey area was noted.

Evidence of western ringtail possums were observed during the day and night survey in the form of scats and dreys during the day survey and five individuals during the spotlighting survey. Most of the remnant native vegetation (including advanced regrowth) present within the survey area appears to be suitable for western ringtail possums though the level of occupancy varies from area to area and appears overall to be generally low. The species is likely to be favouring the denser woodland/low woodland habitats with lower levels of occupancy within the areas of tall shrubland which make up about half of the survey area.

In summary four vertebrate fauna species of conservation significance (listed as State or Federal threatened/migratory species or as DBCA priority species) was positively identified as utilising the survey area for some purpose during the survey period, these being :

- Forest Red-tailed Black Cockatoo – Vulnerable (WA/Federal);
- Baudin's Black Cockatoo – Endangered (WA/Federal);
- Western Ringtail Possum – Critically Endangered (WA/Federal); and
- Quenda – Priority 4 (DBCA Priority Species).

Several other species of conservation significance may utilise the survey area for some purpose at times, but their status on-site and/or in the general area is difficult to determine because they were not sighted during the field survey, or evidence of use was not observed. These species are:

- Swan Coastal Plain Shield-backed Trapdoor Spider – Priority 3 (DBCA Priority Species);
- Coastal Plains Skink *Ctenotus ora* – Priority 3 (DBCA Priority Species);
- Peregrine Falcon – Schedule 7 (WA);
- Masked Owl – Priority 3 (DBCA Priority Species);
- Carnaby's Black Cockatoo – Endangered (WA/Federal);
- South-western Brush-tailed Phascogale - Schedule 6 (WA); and
- Western False Pipistrelle – Priority 4 (DBCA Priority Species).

The actual extent of proposed clearing within the survey area has not been finalised and therefore specific impacts on fauna species are difficult to predict. In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Potential impacts on fauna should be reviewed as planning progresses.

1. INTRODUCTION

This report details the results of a fauna assessment over Lot 43 Plantation Road, Ludlow in the Shire of Capel (the survey area) (Figure 1). The survey area is approximately 27.0 hectares (ha) in size and contains a mosaic of remnant native vegetation, regrowth and cleared land (Figure 2). Parts of the survey area have up until recently been used for many years for the livestock grazing.

The landowners are proposing to clear sections of the survey area for the purpose of sand extraction and will be applying to the Department of Water and Environmental Regulation (DWER) for a clearing permit pursuant to Section 51E of the *Environmental Protection Act 1986*.

The information presented here will be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats at the site, during the project evaluation and clearing permit approval process.

Information obtained as part of this fauna assessment report will also be used in conjunction with other environmental investigations to guide project planning and for the formulation of management plans, which will aim to minimise potential environmental impacts.

2. SCOPE OF WORKS

The scope of works was to conduct a “basic” fauna assessment and carry out a targeted survey for black cockatoo habitat and western ringtail possums. The assessment has therefore involved:

1. A basic (Level 1) Fauna Assessment (EPA 2020);
2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
3. Targeted western ringtail possum (WRP) survey; and
4. Report for summarising methods and results.

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

3. METHODS

3.1 LITERATURE REVIEW – FAUNA SPECIES OF CONSERVATION SIGNIFICANCE

A list of conservation significant fauna recorded or likely to occur within the survey area has been compiled by a review of available databases and literature including, but not limited to the following data sources:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened Fauna Database (NatureMap) (DBCA 2021). A 20 km buffer around the survey area was applied to capture previous fauna records within the immediate vicinity;
- *EPBC Act* Protected Matters database for fauna of national environmental significance (DAWE 2021). The minimum buffer (1 km) was applied to this search as the databases contains distribution data (areas) and not actual fauna records; and
- Literature search and review of other fauna surveys in the vicinity.

The conservation status of each species has been based on current lists produced under Federal and State Acts (EPBC Act and the *Biodiversity Conservation Act 2016 (BC Act)*), those species recognised under international treaties (CAMBA, JAMBA and the Bonn Convention) and Priority Fauna (as listed by the DBCA).

3.2 FIELD SURVEYS

The field component of the fauna assessment was carried out on 30 October and the 13 December 2021 by Greg Harewood (Zoologist) and consisted of a daytime reconnaissance survey and nocturnal spotlighting as described in the sections below.

3.2.1 FAUNA HABITAT ASSESSMENT

Vegetation units identified by Ecoedge (2022) have been used to define broad scale fauna habitats across the survey area. This information has been supplemented with observations made during the site reconnaissance survey.

The main objective of the assessment was to determine if it were likely that species of conservation significance would utilise the habitats identified as occurring within the survey area based on their documented habitat preference and current known distribution.

3.2.2 FAUNA OBSERVATIONS

Evidence of the presence or likely presence of fauna species of conservation significance (or suitable habitat) was searched for and recorded concurrent with other site surveys. Opportunistic observations of all fauna species were made during all field survey work and recorded where positive species identifications were made.

This aspect of the assessment included but was not limited to:

- Undertaking a series of transects across the survey area.
- Searching for evidence (i.e. individuals, tracks, scats, calls) of potential conservation significant species under logs, rocks and leaf litter.
- Observing bird species with binoculars.

3.2.3 BLACK COCKATOO HABITAT ASSESSMENT

The following methods were employed to comply with the defined scope of works and are based on Commonwealth of Australia (2012) guidelines which state 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.

The Commonwealth of Australia (2012) places habitats used by black cockatoos into the following three categories:

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

3.2.3.1 Breeding Habitat Assessment

The black cockatoo breeding habitat assessment identified all suitable breeding tree species within the survey area that have a diameter at breast height (DBH) equal to or greater than 50cm. The DBH of each tree was estimated using a pre-made "caliper".

Target tree species included marri, jarrah, tuart and flooded gum and any other *Corymbia/Eucalyptus* species of a suitable size that was present. Peppermints, *Banksia*, sheoak and *Melaleuca* tree species (for example) were not assessed as they typically do not develop hollows 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.

Hollow/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 = ~ 5 cm-10cm diameter (i.e. entrance too small for a black cockatoo);
- Large = $\sim > 10$ cm diameter (entrance large enough for a black cockatoo but hollow appears unsuitable for nesting i.e. wrong orientation, appears too small, too low or too shallow); or
- Large (cockatoo) = $\sim > 10$ cm diameter (entrance and apparent hollow appears big enough and suitably sized/orientated for a black cockatoo to use for nesting).

Based on this assessment, trees present within the survey area were placed into one of four categories:

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

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

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

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). Details recorded included hollow size, height, type, orientation, comments on suitability and any evidence of use

Trees with possible nest hollows were also scratched and raked with a large stick in attempt to flush any sitting birds from hollows and calls of chicks were listened for. Where the assessment was inconclusive, and if possible, trees identified as having potential nest hollows were subsequently examined and photographed using a drone (DJI Mavic Air).

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

3.2.3.2 Foraging Habitat Assessment

The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded. The nature and extent of potential foraging habitat present was also documented irrespective of the presence of any actual foraging evidence. Foraging habitat is represented by plant species that are known to provide a food source for black cockatoos. This can be in the form of seeds, flowers and also boring grubs that are extracted from some plant species.

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

3.2.3.3 Night Roosting Habitat Assessment

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

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

3.2.4 WESTERN RINGTAIL POSSUM ASSESSMENT

3.2.4.1 Daytime Survey

A day time survey to locate and record dreys, obvious tree hollows, scats and individual WRPs was carried out and involved a series of traverses on foot across the survey area.

3.2.4.2 Night Time Survey

A single night time survey to locate and record individual WRPs was carried out. This involved a series of transect across the survey area, on foot using a LED head torch to locate animals by way of eyeshine.

3.2.4.3 Habitat Assessment

Description and comments on the amount and quality of WRP habitat within the survey area are provided based on observations made during the site surveys.

4. SURVEY LIMITATIONS

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

Lack of observational data on some species should also not necessarily be taken as an indication that a species is absent from the site or does not utilise it for some purpose at times.

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

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

5. RESULTS

5.1 LITERATURE REVIEW – FAUNA SPECIES OF CONSERVATION SIGNIFICANCE

The literature review identified multiple fauna species of conservation significance as potentially occurring in the general area as listed in Table 1. The NatureMap (DBCA 2021) and Protected Matter Search Tool (DAWE 2021) results, used as a primary source for compiling this listing, are held within Appendix B. Because of the proximity of the survey area to the ocean a number of conservation significant marine species have appeared in database searches (Appendix B). These species have been excluded from the assessment as they would not, under normal circumstances, occur within the survey area.

Table 1: Conservation significant fauna previously recorded or potentially occurring within the general vicinity of survey area.

Species	Conservation Status ¹	
	BC Act/ DBCA Priority	EPBC Act
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU
Swan Coastal Plain Shield-backed Trapdoor Spider <i>Idiosoma sigillatum</i>	P3	-
Pouched Lamprey <i>Geotria australis</i>	P3	-
Salamander Fish <i>Lepidogalaxias salamandroides</i>	S2	-
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-
Lined Skink <i>Lerista lineata</i>	P3	-

¹ See Appendix A for conservation status codes

Species	Conservation Status ¹	
	BC Act/ DBCAs Priority	EPBC Act
Australasian Bittern <i>Botaurus poiciloptilus</i>	S2	EN
Migratory Shorebirds/Wetland Species	Various	Various
Eastern Osprey <i>Pandion cristatus</i>	S5	Mig, Ma
Peregrine Falcon <i>Falco peregrinus</i>	S7	-
Grey Falcon <i>Falco hypoleucos</i>	S3	VU
Masked Owl <i>Tyto novaehollandiae novaehollandiae</i>	P3	-
Blue-billed Duck <i>Oxyura australis</i>	P4	-
Hooded Plover <i>Thinornis rubricollis</i>	P4	-
Carnaby`s Black Cockatoo <i>Zanda latirostris</i>	S2	EN
Baudin`s Black Cockatoo <i>Zanda baudinii</i>	S2	EN
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus banksia naso</i>	S3	VU
Fork-tailed Swift <i>Apus pacificus</i>	S5	Mig
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig
Chuditch <i>Dasyurus geoffroii</i>	S3	VU
Quenda <i>Isoodon fusciventer</i>	P4	-
Bilby <i>Macrotis lagotis</i>	S3	VU
South-western Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	CR
Quokka <i>Setonix brachyurus</i>	S3	VU
Woylie <i>Bettongia penicillata ogilbyi</i>	S1	EN
Western Brush Wallaby <i>Notamacropus irma</i>	P4	-
Water Rat <i>Hydromys chrysogaster</i>	P4	-
Western Mouse <i>Pseudomys occidentalis</i>	P4	-
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-

5.2 FIELD SURVEYS

5.2.1 FAUNA HABITAT ASSESSMENT



The survey area has a total extent of about 27 ha and contains a mosaic of remnant native vegetation, regrowth and cleared land around an existing house and sheds.




About half of the vegetation present (~13 ha) consists of a *Kunzea* tall shrubland with scattered emergent trees including but not limited to jarrah, peppermint, *Banksia* spp. and *Nuytsia floribunda* on grey sand. A significant proportion of this vegetation appears to be regrowth from an historical clearing event the extent of which is evident on old air photos.



The balance of the site is either cleared (with bare sand/open grassland) or contains small areas of other vegetation types. To put the area of native remnant vegetation remaining within the survey area into perspective there is approximately 11,000 ha of remnant native vegetation within 12 km of the survey area (DPIRD 2021).

Example images of the various fauna habitats present are provided in Table 2.

Table 2: Example images of the fauna habitats within the survey area

Fauna Habitat Description	Example Image
<p>Unit A: Medium open forest of marri over a very open low woodland over a tall sparse shrubland over a fernland or grassland on grey sandy loam.</p> <p>Area – 0.85 ha (3.1%)</p>	
<p>Unit B: Open low woodland of paperbark over a sedgeland with patches of tall shrubland over a low shrubland over an open grassland/forbland on grey sand (winter wet).</p> <p>Area – 0.63 ha (2.3%)</p>	

Fauna Habitat Description	Example Image
<p>Unit C: Very open medium woodland of marri over medium woodland of paperbark over a tall shrubland over a low shrubland over an open sedgeland and open forbland on grey sand (winter damp).</p> <p>Area – 1.16 ha (4.2%)</p>	
<p>Unit D: Tall shrubland with scattered emergent trees such as jarrah, peppermint, <i>Banksia</i> and <i>Nuytsia</i> on grey sand.</p> <p>Area – 13.31 ha (48.6%)</p>	
<p>Unit E: Medium woodland of marri and flooded gum over low woodland of peppermint and paperbark over open medium shrubland over a low sedgeland and open forbland on grey-brown sandy loam or red-brown loam.</p> <p>Area – 1.89 ha (6.9%)</p>	

Fauna Habitat Description	Example Image
<p>Existing Cleared Areas. Area – 9.53 ha (34.8%)</p>	
<p>Manmade dam. Area – 0.02 ha (0.1%)</p>	

The fauna habitats present range from completely degraded (existing cleared areas) to very good (intact remnant native vegetation), however the majority is degraded, largely a consequence of historical clearing and livestock grazing. Given the degree of disturbance the original fauna assemblage within the survey area is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is absent/sparse in many areas.

Despite the history of disturbance, the areas of more coherent remnant vegetation are still likely to be utilised in some fashion by a reasonably wide range of species though most would be relatively common and widespread bird species. Exceptions to this generalised statement include black cockatoos, which utilise sections of the area as habitat (see section 5.2.3). Most of the natural habitat present also appears to be suitable for western ringtail possums though the level of occupancy varies from area to area and appears to be generally low (see section 5.2.4).

5.2.2 FAUNA OBSERVATIONS

Thirty two fauna species (mainly common bird species) were observed or secondary evidence of their presence recorded during the field survey. A full listing of the species observed is held on Appendix C.

Evidence of four fauna species of conservation significance was recorded, these being Baudin’s black cockatoo (endangered), the forest red-tailed black cockatoo (vulnerable), the western ringtail possum (critically endangered) and quenda (priority 4).

No evidence of any other fauna species of conservation significance was observed. However, this does not eliminate the potential for some species to still occur, if only infrequently.

5.2.3 BLACK COCKATOO HABITAT ASSESSMENT

5.2.3.1 Breeding Habitat Assessment

Trees considered potentially suitable for black cockatoos to use as nesting habitat (subject to a suitable hollow being present and other factors) found within the survey area comprised the following species:

- Marri – *Corymbia calophylla*;
- Jarrah – *Eucalyptus marginata*;
- Flooded Gum - *Eucalyptus rudis*;
- Tuart - *Eucalyptus gomphocephala* (planted);
- Dead Unidentified - *Eucalyptus* spp.; and
- Non-endemic eucalypts (planted - various unidentified species) - *Eucalyptus* spp.

A summary of the habitat trees observed is provided in Table 3. The locations of habitat trees are shown in Figure 4.

Table 3: Summary of potential habitat trees (DBH \geq 50cm) within the survey area

Total Number of Habitat Trees Recorded	Number of Trees with <u>No Hollows</u> Observed	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly</u> Suitable for Nesting Black Cockatoos	Tree Species					
				Marri	Jarrah	Non-endemic Eucalypt	Flooded Gum	Dead Unknown	Tuart
49	35	13	1	26	14	4	2	2	1

The assessment identified 49 trees within the survey area with a DBH of ≥ 50 cm. The vast majority of these trees (35) appeared to not contain hollows of any size. Thirteen (13) trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for black cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or low height above ground level. One tree (1) appeared to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes but this was not confirmed and no actual signs of use were noted.

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

Based on available mapping, there is approximately 11,000 ha of remnant native vegetation within 12 km of the survey area (DPIRD 2021). Much of this is likely to contain “potential” breeding habitat as defined by DAWE (i.e. suitable tree species with a DBH ≥ 50 cm).

5.2.3.2 Foraging Habitat Assessment



The following flora species, known to be or potentially used as a direct food source (e.g. seeds, flowers, nectar, bark or grubs) by one or more species of black cockatoo were recorded within the survey area:

- Marri – *Corymbia calophylla*;
- Jarrah – *Eucalyptus marginata*;
- Flooded Gum - *Eucalyptus rudis*;
- Tuart - *Eucalyptus gomphocephala*;
- Non-endemic eucalypts (planted - various unidentified species) - *Eucalyptus* spp.;
- Banksia – various *Banksia* species;
- Grey Stinkwood - *Jacksonia furcellata*; and
- Peppermint – *Agonis flexuosa*.

It should be noted that some of the above-mentioned species (e.g. tuart, flooded gum, grey stinkwood and peppermint) while foraged upon on occasions would make up only a small proportion of any one bird’s diet relative to more favoured plant species such as marri and banksia. Some species are also represented by only a small number of specimens and therefore do not contribute to the overall resource to a significant degree.

Evidence of black cockatoos foraging was observed during the field survey at a number of locations. The evidence was in all cases in the form of chewed fruits from marri fruits. The foraging activity was attributed to either the forest red-tailed black cockatoo or Baudin’s black cockatoo. Examples of the foraging debris observed and the species attributed to the activity are provided in Table 4.

Table 4: Foraging Evidence Examples

Foraging Evidence Description	Example Image
Marri fruits – foraging activity attributed to Baudin’s Black Cockatoo.	
Marri fruits – foraging activity attributed to the Forest Red-tailed Black Cockatoo.	

Quality foraging habitat within the survey area can mainly be defined as the areas containing the densest areas of marri, jarrah and/or banksia vegetation. Marri woodland makes up about 3.2 ha of the survey area though the density of marri varies considerably. Jarrah and banksia are the dominant tree species in Unit C which makes up about 50% of the vegetation present however the density of these specific species is relatively low which reduces the overall quality rating of this unit.

Based on available mapping there is about 11,000 ha of remnant native vegetation within 12 km of the survey area (DPIRD 2021). Much of this is likely to represent black cockatoo foraging habitat of some type.

5.2.3.3 Night Roosting Habitat Assessment

No evidence of black cockatoos roosting within trees located within the survey area was observed during the survey period. 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 (including non-endemics) may be suitable for roosting but as indicated no actual evidence of use was seen.

A review of the 2019 Great Cocky Count database shows no documented roost sites within the survey area. The 2019 Great Cocky Count recorded the closest active roost,

approximately 4 kilometres north of the survey area (Site ID: CAPCAPR001). This roost was not being used during the April 2019 survey (Peck *et al.* 2019). There are no other documented roost sites within 12 km of the survey area.

5.2.4 WESTERN RINGTAIL POSSUM ASSESSMENT

5.2.4.1 Daytime Survey

Evidence of western ringtail possums were observed during the day survey in the form of scats and dreys at about 14 locations across the survey area (Figure 5).

Fourteen hollow bearing “habitat trees” (i.e. DBH >50cm) were also recorded within the survey area. Some of these trees (and some additional trees with smaller DBHs) may have hollows suitable for WRPs to use for daytime refuge.

5.2.4.2 Night Time Survey

Five WRPs were observed within the survey area during the nocturnal survey. Four common brushtail possum were also recorded (Figure 4).

5.2.4.3 Habitat Assessment

Most of the remnant native vegetation (including advanced regrowth) present within the survey area appears to be suitable for western ringtail possums though the level of occupancy varies from area to area and appears overall to be generally low. The species is likely to be favouring the denser woodland/low woodland habitats with lower levels of occupancy within the areas of tall shrubland which make up about half of the survey area.

6. CONSERVATION SIGNIFICANT FAUNA SPECIES

Based on the information gathered during the site reconnaissance survey and the documented distribution and habitat preferences of the species of conservation significance identified as potentially being present in the general area, their likelihood of occurrence has been assessed. A summary of this assessment is presented in Table 5.

Some comments on the possible impacts of any proposed development are also provided though as no specific development plan has been put forward these are preliminary comments that should be reviewed as planning progresses.

Four vertebrate fauna species of conservation significance (listed as State or Federal threatened/migratory species or as DBCA priority species) was positively identified as utilising the survey area for some purpose during the survey period, these being :

- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* – S3 (*BC Act*), Vulnerable (*EPBC Act*). Foraging evidence attributed to this species detected. The survey area contains areas of potential black cockatoo breeding habitat (trees with a DBH \geq 50cm) but the number of possibly suitable hollows is low (one

recorded). The majority of the native vegetation within the survey area represents marginal foraging habitat for this species. No evidence of roosting observed.

- Baudin’s Black-Cockatoo *Zanda baudinii* – S2 (BC Act), Endangered (EPBC Act). Foraging evidence attributed to this species detected. The survey area contains areas of potential black cockatoo breeding habitat (trees with a DBH >50cm) but the number of possibly suitable hollows is low (one recorded). The majority of the native vegetation within the survey area represents marginal foraging habitat for this species. No evidence of roosting observed.
- Quenda *Isodon fusciventer* – P4 (DBCA Priority Species) Digging attributed to this species observed. Potentially utilises all areas within the survey area with dense groundcover.
- Western Ringtail Possum *Pseudocheirus occidentalis* – Critically Endangered (BC Act), Critically Endangered (EPBC Act) This species was detected within the survey area. Most of the remnant native vegetation (including advanced regrowth) present represents suitable habitat for this species though its quality varies considerably from area to area, but appears overall to be generally low.

Several additional species of conservation significance may utilise the survey area for some purpose at times, but their status on-site and/or in the general area is difficult to determine because they were not sighted during the field survey, or evidence of use was not observed:

- Carnaby’s Black-Cockatoo *Zanda latirostris* – S2 (BC Act), Endangered (EPBC Act). No evidence of this species recorded. The survey area contains areas of potential black cockatoo breeding habitat (trees with a DBH >50cm) but the number of possibly suitable hollows is low (one recorded). The majority of the native vegetation within the survey area represents marginal foraging habitat for this species. No evidence of roosting observed. Listed as a potential species based on available information.
- Peregrine Falcon *Falco peregrinus* – S7 (BC Act) This species potentially utilises some sections of the survey area as part of a much larger home range though it is only likely to occur infrequently. All areas represent potential foraging habitat for this species. Listed as a potential species based on available information.
- Masked Owl *Tyto novaehollandiae* – P3 (DBCA Priority Species) Status in the general area is difficult to determine. May utilise woodland areas within and near the survey area for roosting and may forage in more open areas. Probably only present occasionally and for short periods. Limited number of hollow bearing trees, some of which may represent suitable nest sites. Listed as a potential species based on available information.

- South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger* – S6 (BC Act)
This species has previously been recorded in the general area (Greg Harewood pers. obs.) and so it may occur in the survey area given the presence of suitable habitat. Listed as a potential species based on available information.
- Western False Pipistrelle *Falsistrellus mackenziei* – P4 (DBCA Priority Species)
Status of this species within the survey area is difficult to determine, however, given the location is within its documented range, some recent nearby records (e.g. Capel Wetlands) and the presence of habitat that appears suitable it must be assumed to be present. All sections of the survey area represent potential foraging habitat for this species and any hollow bearing trees represent possible day time roost sites. Listed as a potential species based on available information.

A number of other species of conservation significance (as listed in Table 5), while possibly present in the larger bush remnants in the wider area (e.g. State forest /reserve areas to the east) are not listed as potentially occurring within the survey area primarily due to a complete lack of suitable habitat (quality and extent) and/or known local/regional extinction.

The actual extent of proposed clearing within the survey area has not been finalised and therefore specific impacts on fauna species are difficult to predict. In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Potential impacts on fauna should be reviewed as planning progresses.

Table 5: Likelihood of Occurrence – Fauna Species of Conservation Significance

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Carter's Freshwater Mussel <i>Westralunio carteri</i>	S3	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Pouched Lamprey <i>Geotria australis</i>	P3	-	This species lives in mud burrows in the upper reaches of coastal streams for the first four years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Swan Coastal Plain Shield-backed Trapdoor Spider <i>Idiosoma sigillatum</i>	P3	-	Burrows of this species usually found in <i>Banksia</i> woodland and heathland on sandy soils.	Yes/Marginal	Possibly Occurs	Status of this species in the general area unknown but must be assumed to be present. Loss/modification of small areas of potential habitat.
Salamander Fish <i>Lepidogalaxias salamandroides</i>	S2	-	Inhabit small semi-permanent heathland pools and streams that are usually acidic (pH ~3-6) and high in tannins. They 'aestivate' by burrowing into the sandy bottom which remains moistened by ground water.	Yes	Would Not Occur.	Outside of current documented distribution. Known only from heathland peat flats between the Blackwood and Kent Rivers. No impact on this species will occur.
Coastal Plains Skink <i>Ctenotus ora</i>	P3	-	Sandy substrates with low vegetation (including heath) in open <i>Eucalyptus/Corymbia</i> woodland over <i>Banksia</i> .	Yes	Possibly Occurs	Status of this species in the general area unknown but must be assumed to be present. Loss/modification of small areas of potential habitat.
Lined Skink <i>Lerista lineata</i>	P3	-	Inhabits loose white sands and leaf litter under areas of shrubs and heath particularly in association with banksias.	Yes	Unlikely to occur.	Outside of current documented distribution. No impact on this species will occur.
Australasian Bittern <i>Botaurus poiciloptilus</i>	S1	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense <i>Typha</i> , <i>Baumea</i> and sedges in freshwater swamps.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No	Would Not Occur.	No suitable habitat. No impact on this range of species will occur.
Hooded Plover <i>Thinornis rubricollis</i>	P4	-	Broad sandy ocean beaches and bays, coastal and inland salt lakes.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Eastern Osprey <i>Pandion haliaetus</i>	S5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Peregrine Falcon <i>Falco peregrinus</i>	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	This species is uncommon but the survey area may represent part of a larger home range used by individuals of this species. No suitable nest sites observed. Loss/modification of small areas of potential habitat.
Grey Falcon <i>Falco hypoleucos</i>	S3	VU	Lightly treed plains, gibber deserts, sand ridges, pastoral lands, timbered water courses but seldom in driest deserts	No	Would Not Occur.	Rarely if ever recorded in the lower south west. No impact on this species will occur.
Masked Owl (SW population) <i>Tyto n. novaehollandiae</i>	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	Yes	Possibly Occurs.	This species is uncommon but may occur, if only occasionally. Loss/modification of small areas of potential habitat.
Blue-billed Duck <i>Oxyura australis</i>	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No/Very Marginal	Unlikely to Occur.	No suitable habitat. No significant impact on this species anticipated
Carnaby`s Black Cockatoo <i>Zanda latirostris</i>	S2	EN	Forests, woodlands, heathlands, farms; feeds on <i>Banksia</i> , <i>Hakea</i> and Marri.	Yes	Possibly Occurs.	Loss/modification of small areas of habitat.
Baudin`s Black Cockatoo <i>Zanda baudinii</i>	S2	EN	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Known to Occurs.	Loss/modification of small areas of habitat.
Forest Red-tailed Black Cockatoo <i>Calyptorhynchus banksii naso</i>	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Known to Occurs.	Loss/modification of small areas of habitat.
Fork-tailed Swift <i>Apus pacificus</i>	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	May occur very occasionally for brief periods. Entirely aerial. No impact on this species will occur.
Grey Wagtail <i>Motacilla cinerea</i>	S5	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Chuditch <i>Dasyurus geoffroi</i>	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	Yes	Unlikely to Occur,	Locally extinct. Occasional transient individuals may occur but very rarely if at all. No impact on this species anticipated.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	EPBC Act				
Quenda <i>Isoodon fusciventer</i>	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	Yes	Known To Occur	Loss/modification of small areas of habitat.
Bilby <i>Macrotis lagotis</i>	S3	VU	Acacia shrublands, spinifex and hummock grassland. Mitchell grass and stony downs country if cracking clay, also desert sand plains and dune fields sometimes with spinifex hummock grassland and acacia shrubland.	No	Would Not Occur.	Regionally extinct. No impact on this species will occur.
South-west Brush-tailed Phascogale <i>Phascogale tapoatafa wambenger</i>	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes	Possibly Occurs.	Loss/modification of small areas of habitat.
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	S1	CE	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes	Known To Occur	Loss/modification of small areas of habitat.
Quokka <i>Setonix brachyurus</i>	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems.	No	Would Not Occur.	This species is locally extinct. No impact on this species will occur.
Woylie <i>Bettongia penicillate ogiby</i>	S1	EN	Open sclerophyll forest and woodland with a low, dense, understorey of tussock grasses or woody scrub.	No	Would Not Occur.	This species is locally extinct. No impact on this species will occur.
Western Brush Wallaby <i>Notamacropus irma</i>	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	No	Would Not Occur.	Fragmented and degraded state of habitat within and around the survey area suggests this species is unlikely to persist. No impact on this species will occur.
Western False Pipistrelle <i>Falsistrellus mackenziei</i>	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes	Possibly Occurs.	Loss/modification of small areas of habitat.
Western Mouse <i>Pseudomys occidentalis</i>	P4	-	Long unburnt open woodlands, low and tall shrubland, mallee and heath.	No	Would Not Occur.	This species is regionally extinct. No impact on this species will occur.
Water Rat <i>Hydromys chrysogaster</i>	P4	-	Permanent water, fresh, brackish or marine.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.

See Appendix A for conservation status codes

7. CONCLUSION

The fauna assessment within the survey area was primarily undertaken to document black cockatoo habitat and to determine the possible presence of western ringtail possums and other conservation significant fauna species and/or their habitat.

The fauna habitats present range from completely degraded (existing cleared areas) to very good (intact remnant native vegetation), however the majority is degraded, largely a consequence of historical clearing and livestock grazing. Given the degree of disturbance the original fauna assemblage within the survey area is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is absent/sparse in many areas.

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.

The actual extent of proposed clearing within the survey area has not been finalised and therefore specific impacts on fauna species are difficult to predict. In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Potential impacts on fauna should be reviewed as planning progresses.

8. REFERENCES

Commonwealth of Australia (2012). EPBC Act Referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest Red-tailed Black Cockatoo (vulnerable) *Calyptorhynchus banksii naso*.

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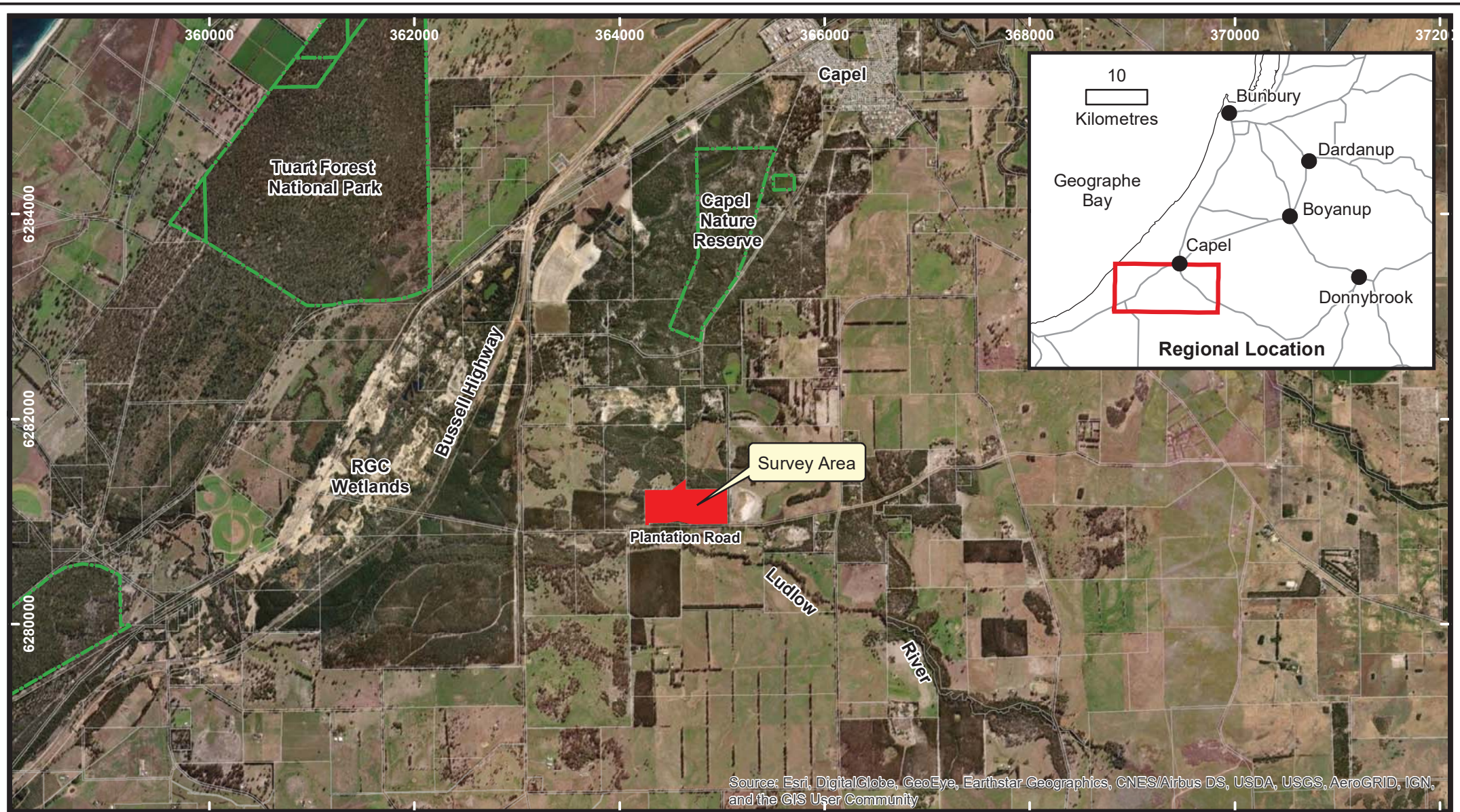
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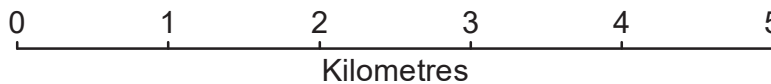
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FIGURES



Legend

 Survey Area



Drawn: G Harewood
Date: 14-Dec-21
Scale: 1:50,000


Lot 43 Planation Road
Ludlow

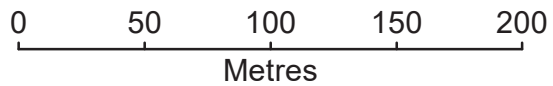
**Survey Area
and
Surrounds**

Projection/Coordinate System: UTM/MGA Zone 50 Figure: 1



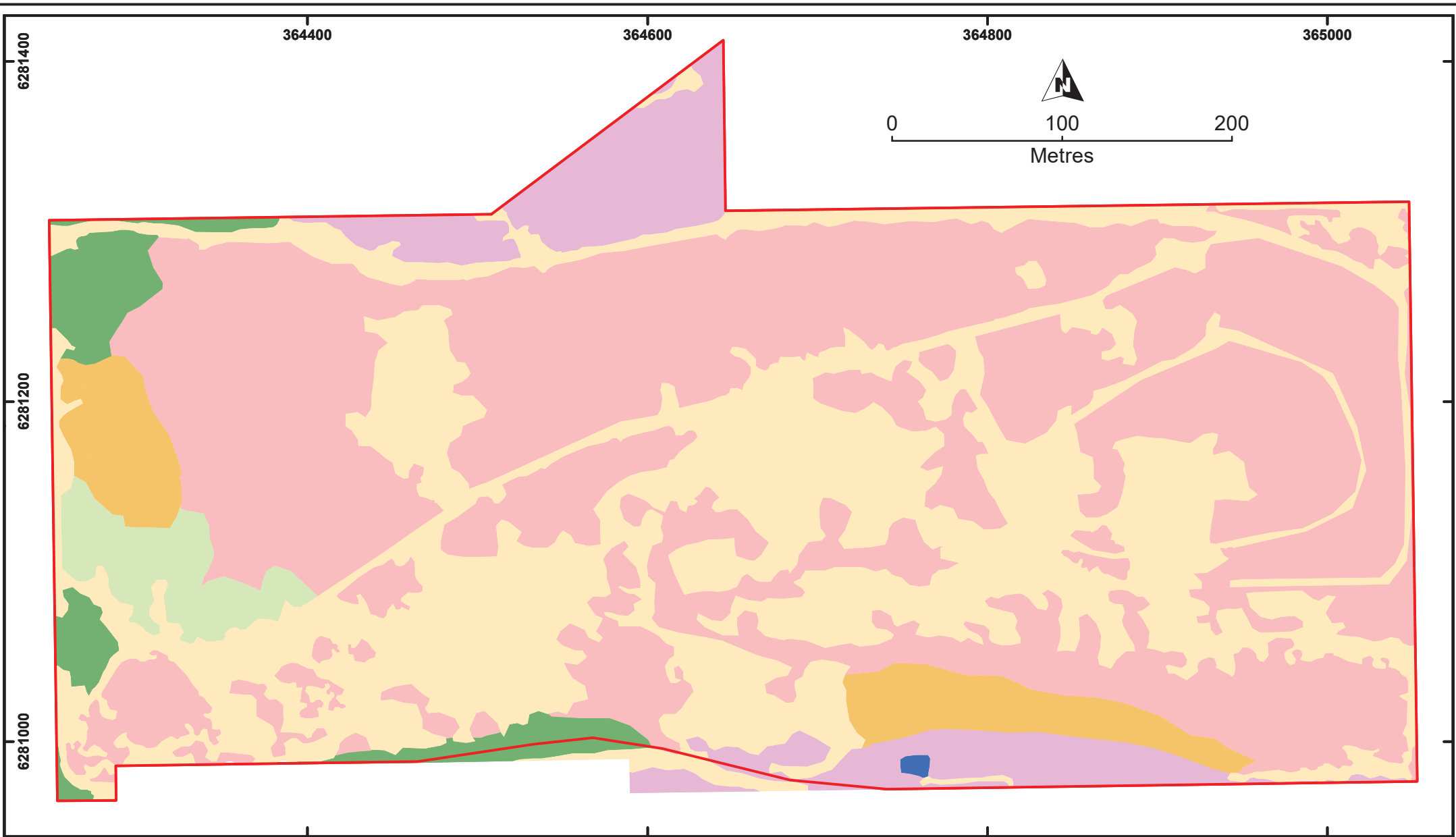
Legend

 Survey Area



Drawn: G Harewood
Date: 14-Dec-21
Scale: 1:3,000

Lot 43 Plantation Road
Ludlow
**Survey Area
Aerial Photograph**



Legend

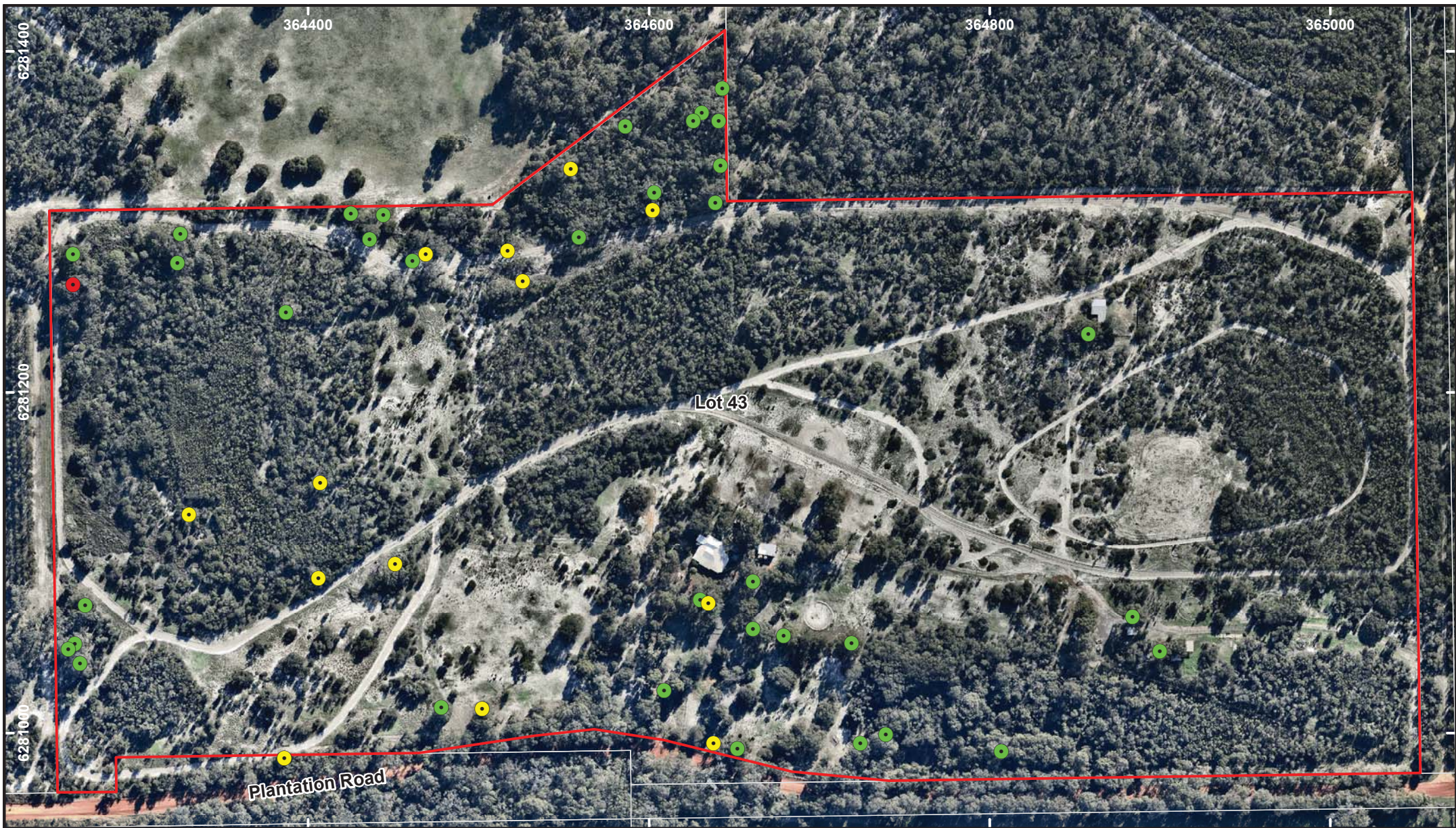
- Survey Area
- Open low woodland of paperbark over sedgeland with patches of tall shrubland
- Very open medium woodland of marri over medium woodland of paperbark
- Medium open forest of marri over a very open low woodland over tall sparse shrubland
- Medium woodland of marri and flooded gum over low woodland of peppermint and paperbark
- Tall shrubland with occasional emergent jarrah, peppermint, Banksia and Nuytsia on grey sand.
- Existing cleared areas
- Dam



Drawn: G Harewood
 Date: 11-Jul-22
 Scale: 1:3,000




**Lot 43 Plantation Road
 Ludlow**

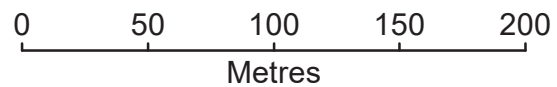
**Fauna
 Habitats**



Legend

 Survey Area

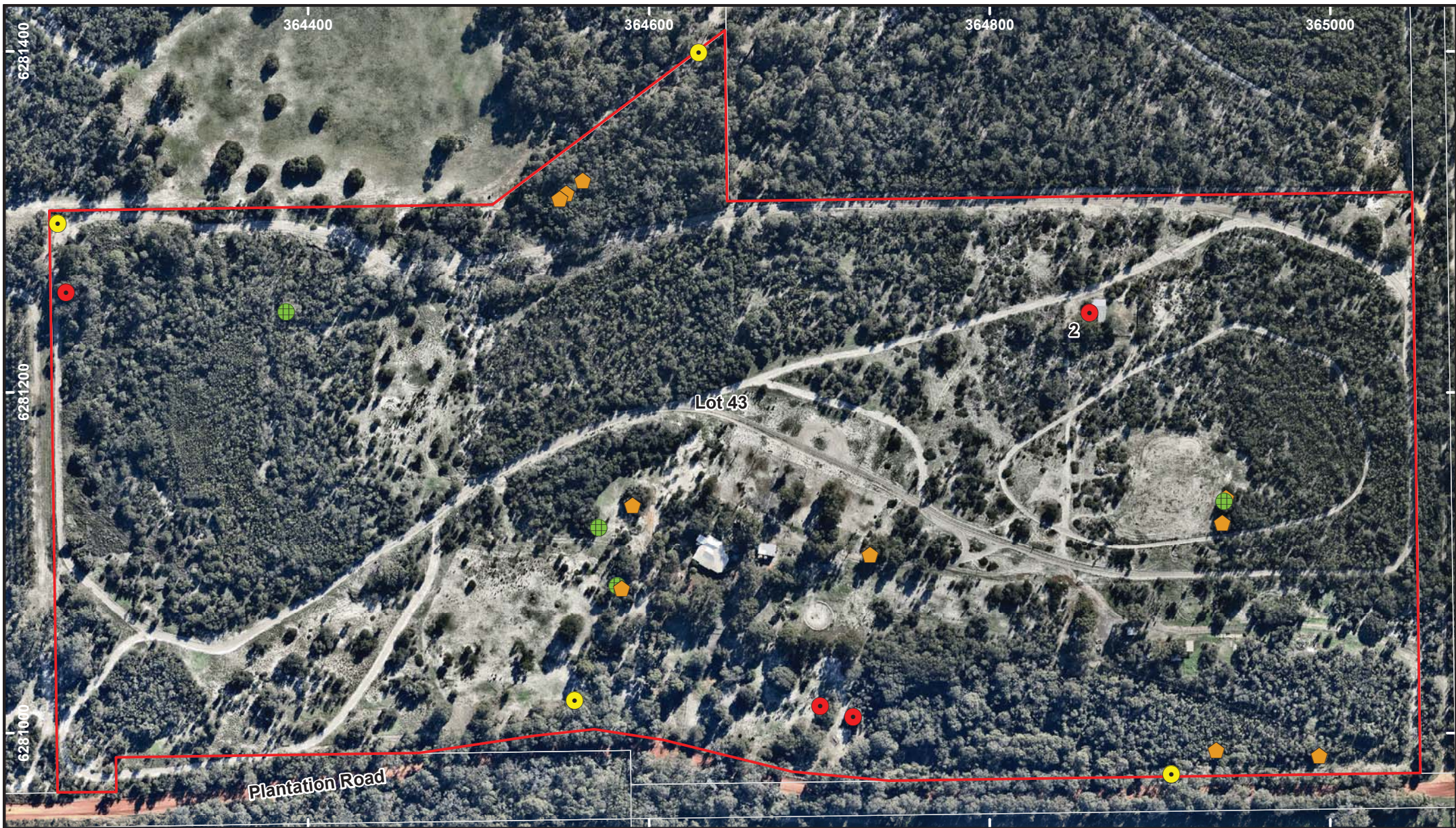
-  Habitat Tree - One or more large hollows possibly suitable for black cockatoos
-  Habitat Tree - One or more possible small/medium hollows
-  Habitat Tree - No hollows seen



Drawn: G Harewood
Date: 12-Jan-22
Scale: 1:3,000

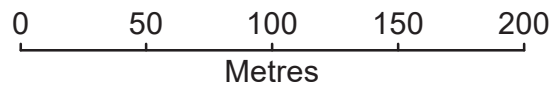
Lot 43 Plantation Road
Ludlow

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



Legend

- Survey Area
- Western Ringtail Possum (WRP)
- ⊗ WRP Scats
- ⬠ WRP Drey
- Common Brushtail Possum



Drawn: G Harewood
 Date: 12-Jan-22
 Scale: 1:3,000

**Lot 43 Plantation Road
 Ludlow**

**Possum
 Observations**

APPENDIX A

CONSERVATION CATEGORIES

EPBC Act (1999) Threatened Fauna Categories

Threatened fauna may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* in any one of the following categories:

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

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

Wildlife Conservation (Specially Protected Fauna) Notice 2018 Categories

Published as Specially Protected under the *Wildlife Conservation Act 1950*, and listed under Schedules 1 to 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

Category	Code	Description
Schedule 1 (S1) Critically Endangered species	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild in the immediate future.
Schedule 2 (S2) Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild in the near future.
Schedule 3 (S3) Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild in the medium-term future.
Schedule 4 (S4) Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last member of the species has died.
Schedule 5 (S5) Migratory birds protected under an international agreement	MI	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
Schedule 6 (S6) Fauna that is of special conservation need as conservation dependent fauna	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Schedule 7 (S7) Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.

Western Australian DBCA Priority Fauna Categories

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Category	Code	Description
Priority 1 (P1) Poorly Known Species.	P1	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2 (P2) Poorly Known Species.	P2	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3 (P3) Poorly Known Species.	P3	Species that are known from several locations and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4 (P4) Rare, Near Threatened and other species in need of monitoring.	P4	<p>(a) Rare: Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Near Threatened: Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

IUCN Red List Threatened Species Categories

The *IUCN Red List of Threatened Species*[™] is a checklist of taxa that have undergone an extinction risk assessment using the *IUCN Red List Categories and Criteria*.

Categories are summarized below.

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

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

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

APPENDIX B
NATUREMAP DATABASE SEARCH
AND
PROTECTED MATTERS SEARCH TOOL RESULTS

NatureMap - Lot 43 20km Buffer

Created By Greg Harewood on 30/07/2021

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 32' 27" E, 33° 36' 02" S
Buffer 20km
Group By Species Group

Species Group	Species	Records
Amphibian	11	109
Bird	196	14868
Fish	48	137
Invertebrate	164	732
Mammal	33	2199
Reptile	38	226
TOTAL	490	18271

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Amphibian				
1.	25398 <i>Crinia georgiana</i> (Quacking Frog)			
2.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
3.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
4.	25401 <i>Crinia pseudinsignifera</i> (Bleating Froglet)			
5.	25404 <i>Geocrinia leai</i> (Ticking Frog)			
6.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
7.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
8.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
9.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
10.	25419 <i>Metacrinia nichollsi</i> (Forest Toadlet)			
11.	25433 <i>Pseudophryne guentheri</i> (Crawling Toadlet)			
Bird				
12.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
13.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
14.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
15.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
16.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
17.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
18.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
19.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
20.	25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar)			
21.	24310 <i>Anas castanea</i> (Chestnut Teal)			
22.	24312 <i>Anas gracilis</i> (Grey Teal)			
23.	24313 <i>Anas platyrhynchos</i> (Mallard)			
24.	<i>Anas platyrhynchos</i> subsp. <i>domesticus</i>			
25.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
26.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
27.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
28.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
29.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
30.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
31.	25558 <i>Ardea ibis</i> (Cattle Egret)			
32.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
33.	41324 <i>Ardea modesta</i> (great egret, white egret)			
34.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
35.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
36.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
37.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
38.	24318 <i>Aythya australis</i> (Hardhead)			
39.	<i>Barnardius zonarius</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
40.	24319 <i>Biziura lobata</i> (Musk Duck)			
41.	24345 <i>Botaurus poiciloptilus</i> (Australasian Bittern)		□	
42.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
43.	25715 <i>Cacatua roseicapilla</i> (Galah)			
44.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
45.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
46.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
47.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
48.	24780 <i>Calidris alba</i> (Sanderling)		IA	
49.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		□	
50.	24786 <i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
51.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
52.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
53.	24790 <i>Calidris tenuirostris</i> (Great Knot)		□	
54.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
55.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		□	
56.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		□	
57.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		□	
58.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		□	
59.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		□	
60.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
61.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
62.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
63.	<i>Chroicocephalus novaehollandiae</i>			
64.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
65.	25601 <i>Chrysococcyx lucidus</i> (Shining Bronze Cuckoo)			
66.	24432 <i>Chrysococcyx lucidus</i> subsp. <i>plagosus</i> (Shining Bronze Cuckoo)			
67.	<i>Circus aeruginosus</i>			Y
68.	24288 <i>Circus approximans</i> (Swamp Harrier)			
69.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
70.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
71.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
72.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
73.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
74.	25592 <i>Corvus coronoides</i> (Australian Raven)			
75.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
76.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
77.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
78.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
79.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
80.	24322 <i>Cygnus atratus</i> (Black Swan)			
81.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
82.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
83.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
84.	25618 <i>Diomedea exulans</i> (Wandering Albatross)		□	
85.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
86.	<i>Egretta garzetta</i>			
87.	<i>Egretta novaehollandiae</i>			
88.	<i>Elanus axillaris</i>			
89.	47937 <i>Euseyornis melanops</i> (Black-fronted Dotterel)			
90.	<i>Eolophus roseicapillus</i>			
91.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
92.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
93.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
94.	24379 <i>Erythronyctes cinctus</i> (Red-kneed Dotterel)			
95.	25621 <i>Falco berigora</i> (Brown Falcon)			
96.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
97.	24472 <i>Falco cenchroides</i> subsp. <i>cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
98.	25623 <i>Falco longipennis</i> (Australian Hobby)			
99.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
100.	25727 <i>Fulica atra</i> (Eurasian Coot)			
101.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
102.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
103.	42314 <i>Gavicalis virescens</i> (Singing Honeyeater)			
104.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
105.	24271 <i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone)			
106.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
107.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
108.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
109.	24295 <i>Haliastur spheurnus</i> (Whistling Kite)			
110.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
111.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
112.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
113.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
114.	24367 <i>Lalage tricolor</i> (White-winged Triller)			
115.	25638 <i>Larus pacificus</i> (Pacific Gull)			
116.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
117.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
118.	<i>Lophoictinia isura</i>			
119.	24690 <i>Macronectes giganteus</i> (Southern Giant Petrel)		IA	
120.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
121.	25650 <i>Malurus elegans</i> (Red-winged Fairy-wren)			
122.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
123.	24552 <i>Malurus splendens</i> subsp. <i>splendens</i> (Splendid Fairy-wren)			
124.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
125.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
126.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
127.	<i>Microcarbo melanoleucos</i>			
128.	25542 <i>Milvus migrans</i> (Black Kite)			
129.	48008 <i>Morus serrator</i> (Australasian Gannet)			
130.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
131.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
132.	24739 <i>Neophema petrophila</i> (Rock Parrot)			
133.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
134.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
135.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		□4	
136.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
137.	<i>Pachycephala</i> sp.			Y
138.	24692 <i>Pachyptila belcheri</i> (Slender-billed Prion)			
139.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
140.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
141.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
142.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
143.	24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
144.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
145.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
146.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
147.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
148.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
149.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
150.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
151.	24668 <i>Phalacrocorax varius</i> subsp. <i>hypoleucos</i> (Pied Cormorant)			
152.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
153.	24463 <i>Phoebastria palpebrata</i> (Light-mantled Albatross)		□4	
154.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
155.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
156.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
157.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
158.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
159.	24745 <i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
160.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
161.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
162.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
163.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
164.	24382 <i>Pluvialis fulva</i> (Pacific Golden Plover)		IA	
165.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
166.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
167.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
168.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
169.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
170.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
171.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
172.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
173.	24769 <i>Porzana fluminea</i> (Australian Spotted Crane)			
174.	25732 <i>Porzana pusilla</i> (Baillon's Crane)			
175.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
176.	24703 <i>Pterodroma lessonii</i> (White-headed Petrel)			
177.	25710 <i>Pterodroma macroptera</i> (Great-winged Petrel)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
178.	<i>Purpurecephalus spurius</i>			
179.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
180.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
181.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
182.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
183.	24279 <i>Sericornis frontalis</i> subsp. <i>maculatus</i> (White-browed Scrubwren)			
184.	30948 <i>Smicronis brevirostris</i> (Weebill)			
185.	24645 <i>Stagonopleura oculata</i> (Red-eared Firetail)			
186.	48116 <i>Stercorarius antarcticus</i> (Brown Skua)		□4	
187.	24329 <i>Stictonetta naevosa</i> (Freckled Duck)			
188.	25655 <i>Stipiturus malachurus</i> (Southern Emu-wren)			
189.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
190.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
191.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
192.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
193.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
194.	48135 <i>Thinornis rubricollis</i> (Hooded Plover, Hooded Dotterel)		□4	
195.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
196.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
197.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
198.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
199.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
200.	24809 <i>Tringa stagnatilis</i> (Marsh Sandpiper, little greenshank)		IA	
201.	48147 <i>Turnix varius</i> (Painted Button-quail)			
202.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
203.	24855 <i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		□3	
204.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
205.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
206.	41351 <i>Xenus cinereus</i> (Terek Sandpiper)		IA	
207.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

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208.	??			
209.	<i>Acanthaluteres brownii</i>			
210.	<i>Acanthaluteres spilomelanurus</i>			
211.	<i>Acanthaluteres vittiger</i>			
212.	<i>Anoplocapros robustus</i>			
213.	<i>Apogon rueppellii</i>			
214.	<i>Aseraggodes haackeanus</i>			
215.	<i>Atherinosoma</i> sp.			
216.	<i>Austrolabrus maculatus</i>			
217.	<i>Bostockia porosa</i>			
218.	<i>Brachaluteres jacksonianus</i>			
219.	<i>Cantheschenia longipinnis</i>			
220.	<i>Carassius auratus</i>			
221.	<i>Chelmonops curiosus</i>			
222.	<i>Cochleoceps viridis</i>			
223.	<i>Coryphaena hippurus</i>			
224.	<i>Cristiceps australis</i>			
225.	<i>Dotalabrus aurantiacus</i>			
226.	<i>Echeneis naucrates</i>			
227.	<i>Edelia vittata</i>			
228.	<i>Eubalichthys cyanoura</i>			
229.	34028 <i>Galaxias occidentalis</i> (Western Minnow)			
230.	<i>Gambusia affinis</i>			
231.	<i>Gambusia holbrooki</i>			
232.	34030 <i>Geotria australis</i> (Pouched Lamprey)		□3	
233.	<i>Gymnapistes marmoratus</i>			
234.	<i>Haletta semifasciata</i>			
235.	<i>Halichoeres brownfieldi</i>			
236.	<i>Heteroclinus adelaidae</i>			
237.	<i>Heteroclinus</i> sp.			
238.	47983 <i>Lepidogalaxias salamandroides</i> (Salamanderfish)		□	
239.	<i>Lotella rhacinus</i>			
240.	<i>Meuschenia freycineti</i>			
241.	<i>Meuschenia galii</i>			
242.	<i>Nannoperca vittata</i>			
243.	<i>Parapercis haackei</i>			
244.	<i>Perca fluviatilis</i>			
245.	<i>Phyllophryne scortea</i>			
246.	<i>Posidonichthys hutchinsi</i>			

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247.	<i>Pseudogobius olorum</i>			
248.	<i>Scobinichthys granulatus</i>			
249.	<i>Siphamia cephalotes</i>			
250.	<i>Siphonognathus radiatus</i>			
251.	<i>Stigmatopora argus</i>			
252.	<i>Thunnus maccoyii</i>			
253.	<i>Trachinops noarlungae</i>			
254.	<i>Vanacampus poecilolaemus</i>			
255.	<i>Vincentia punctata</i>			

Invertebrate

256.	<i>Acariformes sp.</i>			
257.	<i>Aeshnidae sp.</i>			
258.	<i>Akamptogonus novarae</i>			
259.	<i>Amblyomma albolimbatum</i>			
260.	<i>Aname mainae</i>			
261.	<i>Aname tepperi</i>			
262.	<i>Ancylidae sp.</i>			
263.	<i>Anisops sp.</i>			
264.	<i>Antichiropus nanus</i>			
265.	<i>Antiporus occidentalis</i>			
266.	<i>Antiporus sp.</i>			
267.	<i>Arachnura higginsi</i>			
268.	<i>Araneus cyphoxis</i>			
269.	<i>Araneus eburneiventris</i>			
270.	<i>Araneus reherchensis</i>			
271.	<i>Araneus senicaudatus</i>			
272.	<i>Argiope protensa</i>			
273.	<i>Argiope trifasciata</i>			
274.	<i>Arkys alticephala</i>			
275.	<i>Arkys walckenaeri</i>			
276.	<i>Arrenuridae sp.</i>			
277.	<i>Artoria flavimana</i>			
278.	<i>Athericidae sp.</i>			
279.	<i>Aturidae sp.</i>			
280.	<i>Austracantha minax</i>			
281.	<i>Austrochthonius strigosus</i>			Y
282.	33972 <i>Austromerope poultoni</i> (earwigfly (southwest), scorpionfly)			
283.	<i>Backobourkia brounii</i>			
284.	<i>Badumna insignis</i>			
285.	<i>Baetidae sp.</i>			
286.	<i>Baiami volucripes</i>			
287.	<i>Berosus discolor</i>			
288.	<i>Berosus munitipennis</i>			
289.	<i>Botryocladus freemani</i>			
290.	<i>Caenidae sp.</i>			
291.	<i>Ceiniidae sp.</i>			
292.	<i>Ceratopogonidae sp.</i>			
293.	<i>Cercophonium sulcatus</i>			
294.	<i>Cherax destructor</i>			
295.	<i>Cherax preissii</i>			
296.	<i>Cherax quinquecarinatus</i>			
297.	<i>Chironominae sp.</i>			
298.	<i>Chironomus aff. alternans</i> (V24) (CB)			
299.	<i>Chironomus tepperi</i>			
300.	<i>Chrysomelidae sp.</i>			
301.	<i>Clynotis severus</i>			
302.	<i>Coenagrionidae sp.</i>			
303.	<i>Copepoda sp.</i>			
304.	<i>Corduliidae sp.</i>			
305.	<i>Corixidae sp.</i>			
306.	<i>Corynoneura sp.</i> (V49) (SAP)			
307.	<i>Cricotopus 'parbicinctus'</i>			
308.	<i>Culex (Culex) australicus</i>			
309.	<i>Culicidae sp.</i>			
310.	<i>Cyclosa trilobata</i>			
311.	<i>Cyrtophora parnasia</i>			
312.	<i>Dicrotendipes sp. A</i> (V47) (SAP)			
313.	<i>Dytiscidae sp.</i>			
314.	<i>Ecnomidae sp.</i>			
315.	<i>Eriophora biapicata</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
316.	<i>Eriophora pustulosa</i>			
317.	<i>Gelastocoridae</i> sp.			
318.	<i>Geogarypus taylori</i>			
319.	<i>Gomphidae</i> sp.			
320.	<i>Gripopterygidae</i> sp.			
321.	<i>Gyrinidae</i> sp.			
322.	<i>Harrisius</i> sp.			
323.	<i>Harrisius</i> sp. B (SFM)			
324.	<i>Helochares tenuistriatus</i>			
325.	<i>Helpis minitabunda</i>			
326.	<i>Hemicorduliidae</i> sp.			
327.	<i>Henicops dentatus</i>			
328.	<i>Heurodes turritus</i>			
329.	<i>Hydraenidae</i> sp.			
330.	<i>Hydrobiosidae</i> sp.			
331.	<i>Hydrophilidae</i> sp.			
332.	<i>Hydroptilidae</i> sp.			
333.	<i>Hyriidae</i> sp.			
334.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		□3	
335.	<i>Insulodrilus bifidus</i>			
336.	<i>Isopeda leishmanni</i>			
337.	<i>Isopedella cana</i>			
338.	<i>Kiefferulus intertinctus</i>			
339.	<i>Lampona cylindrata</i>			
340.	<i>Lampona punctigera</i>			
341.	<i>Lancetes lanceolatus</i>			
342.	<i>Latroectus hasseltii</i>			
343.	<i>Leptoceridae</i> sp.			
344.	<i>Leptoperla australica</i>			
345.	<i>Leptophlebiid</i> genus S sp. AV1			
346.	<i>Leptophlebiidae</i> sp.			
347.	<i>Lestidae</i> sp.			
348.	<i>Libellulidae</i> sp.			
349.	<i>Limbodessus inornatus</i>			
350.	<i>Limnophyes vestitus</i> (V41)			
351.	<i>Limnoxenus zelandicus</i>			
352.	<i>Maratus pavonis</i>			
353.	<i>Megapodagrionidae</i> sp.			
354.	<i>Micronecta robusta</i>			
355.	<i>Microvelia</i> sp.			
356.	<i>Missulena granulosa</i>			
357.	<i>Missulena occatoria</i>			
358.	<i>Mitullodon tarantulinus</i>			
359.	<i>Neoniphargidae</i> sp.			
360.	<i>Nephila edulis</i>			
361.	<i>Newmanoperla exigua</i>			
362.	<i>Notonectidae</i> sp.			
363.	<i>Nousia</i> sp. AV16			
364.	<i>Nunciella aspera</i>			
365.	<i>Ocrisiona parmelliae</i>			
366.	<i>Oligochaeta</i> sp.			
367.	<i>Ommatoiulus moreletii</i>			
368.	<i>Opisthopora</i> sp.			
369.	<i>Oratemnus curtus</i>			
370.	<i>Orthoclaadiinae</i> sp.			
371.	<i>Ostracoda</i> (unident.)			
372.	<i>Palaemonidae</i> sp.			
373.	<i>Paracymus spenceri</i>			
374.	<i>Parakiefferiella variegatus</i>			
375.	<i>Paralimnophyes pullulus</i> (V42)			
376.	<i>Paramerina levidensis</i>			
377.	<i>Parastacidae</i> sp.			
378.	<i>Pentaneurini</i> genus V20			
379.	<i>Perthiidae</i> sp.			
380.	<i>Philopotamidae</i> sp.			
381.	<i>Phreatoicidae</i> sp.			
382.	<i>Phreodrilidae</i> sp.			
383.	<i>Planorbidae</i> sp.			
384.	<i>Platynectes decempunctatus</i> var <i>polygrammus</i>			
385.	<i>Platynectes</i> sp.			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
386.	<i>Polypedilum nr. convexum (SAP)</i>			
387.	<i>Polypedilum watsoni</i>			
388.	<i>Protoneuridae sp.</i>			
389.	<i>Pyralidae sp.</i>			
390.	<i>Raveniella peckorum</i>			
391.	<i>Rhantus suturalis</i>			
392.	<i>Richardsonianidae sp.</i>			
393.	<i>Riethia v5</i>			
394.	<i>Scirtidae sp.</i>			
395.	<i>Simuliidae sp.</i>			
396.	<i>Staphylinidae sp.</i>			
397.	<i>Sternopriscus browni</i>			
398.	<i>Sternopriscus sp.</i>			
399.	<i>Synsphyronus magnus</i>			
400.	<i>Synthemistidae sp.</i>			
401.	<i>Tabanidae sp.</i>			
402.	<i>Tamopsis distinguenda</i>			
403.	<i>Tamopsis perthensis</i>			
404.	<i>Tanypodinae sp.</i>			
405.	<i>Tanytarsus nr K5</i>			
406.	<i>Tanytarsus palmatus</i>			
407.	<i>Tasmanicosa leuckartii</i>			
408.	<i>Telephlebiidae sp.</i>			
409.	<i>Temnocephalidea sp.</i>			
410.	<i>Tetragnatha demissa</i>			
411.	<i>Tipulidae sp.</i>			
412.	<i>Triplectides sp. AV21 (SFM)</i>			
413.	<i>Urodacus novaehollandiae</i>			
414.	<i>Uvarus pictipes</i>			
415.	<i>Veliidae sp.</i>			
416.	<i>Venator immansueta</i>			
417.	<i>Venatrix pullastra</i>			
418.	34113 <i>Westralunio carteri (Carter's Freshwater Mussel)</i>		□	
419.	<i>Zachria flavicoma</i>			

Mammal

420.	24088 <i>Antechinus flavipes subsp. leucogaster (Yellow-footed Antechinus, Mardo)</i>			
421.	24209 <i>Arctocephalus tropicalis (Subantarctic fur-seal)</i>		□	
422.	24162 <i>Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)</i>		□	
423.	24251 <i>Bos taurus (European Cattle)</i>	Y		
424.	24072 <i>Caperea marginata (Pygmy Right Whale)</i>			
425.	24086 <i>Cercartetus concinnus (Western Pygmy-possum, Mundarda)</i>			
426.	24186 <i>Chalinolobus gouldii (Gould's Wattled Bat)</i>			
427.	24092 <i>Dasyurus geoffroyi (Chuditch, Western Quoll)</i>		□	
428.	24189 <i>Falsistrellus mackenziei (Western False Pipistrelle, Western Falsistrelle)</i>		□4	
429.	24056 <i>Grampus griseus (Risso's Dolphin)</i>			
430.	24215 <i>Hydromys chrysogaster (Water-rat, Rakali)</i>		□4	
431.	48588 <i>Isoodon fusciventer (Quenda, southwestern brown bandicoot)</i>		□4	
432.	24132 <i>Macropus fuliginosus (Western Grey Kangaroo)</i>			
433.	24168 <i>Macrotis lagotis (Bilby, Dalgyte, Ninu)</i>		□	
434.	24076 <i>Mesoplodon bowdoini (Andrew's Beaked Whale)</i>			
435.	24078 <i>Mesoplodon grayi (Gray's Beaked Whale)</i>			
436.	24223 <i>Mus musculus (House Mouse)</i>	Y		
437.	48022 <i>Notamacropus irma (Western Brush Wallaby)</i>		□4	
438.	24194 <i>Nyctophilus geoffroyi (Lesser Long-eared Bat)</i>			
439.	24085 <i>Oryctolagus cuniculus (Rabbit)</i>	Y		
440.	25508 <i>Phascogale tapoatafa (Brush-tailed Phascogale)</i>		S	
441.	48070 <i>Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)</i>		S	
442.	24166 <i>Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)</i>		□	
443.	24240 <i>Pseudomys occidentalis (Western Mouse)</i>		□4	
444.	24245 <i>Rattus rattus (Black Rat)</i>	Y		
445.	24145 <i>Setonix brachyurus (Quokka)</i>		□	
446.	24167 <i>Tarsipes rostratus (Honey Possum, Noolbenger)</i>			
447.	25521 <i>Trichosurus vulpecula (Common Brushtail Possum)</i>			
448.	24158 <i>Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)</i>			
449.	30954 <i>Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)</i>			
450.	24069 <i>Tursiops truncatus (Bottlenose Dolphin)</i>			
451.	24206 <i>Vespadelus regulus (Southern Forest Bat)</i>			
452.	24040 <i>Vulpes vulpes (Red Fox)</i>	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Reptile				
453.	42368 <i>Acritoscincus triineatus</i> (Western Three-lined Skink)			
454.	44629 <i>Anilius australis</i>			
455.	24990 <i>Aprasia pulchella</i> (Granite Worm-lizard)			
456.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		□	
457.	43380 <i>Chelodina colliei</i> (South-western Snake-necked Turtle)			
458.	25336 <i>Chelonia mydas</i> (Green Turtle)		□	
459.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
460.	30893 <i>Cryptoblepharus buchananii</i>			
461.	25020 <i>Cryptoblepharus plagiocephalus</i>			
462.	25047 <i>Ctenotus impar</i>			
463.	25049 <i>Ctenotus labillardieri</i>			
464.	25346 <i>Dermochelys coriacea</i> (Leatherback Turtle)		□	
465.	25096 <i>Egernia kingii</i> (King's Skink)			
466.	25100 <i>Egernia napoleonis</i>			
467.	25250 <i>Elapognathus coronatus</i> (Crowned Snake)			
468.	30919 <i>Hemiergis gracilipes</i> (skink)			
469.	25475 <i>Hemiergis peronii</i>			
470.	25118 <i>Hemiergis peronii</i> subsp. <i>tridactyla</i>			
471.	25119 <i>Hemiergis quadrilineata</i>			
472.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
473.	25131 <i>Lerista distinguenda</i>			
474.	25133 <i>Lerista elegans</i>			
475.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		□3	
476.	25005 <i>Lialis burtonis</i>			
477.	42413 <i>Lissolepis luctuosa</i> (Western Swamp Skink)			
478.	25184 <i>Menetia greyii</i>			
479.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
480.	25191 <i>Morethia lineocellata</i>			
481.	25192 <i>Morethia obscura</i>			
482.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
483.	25255 <i>Parasuta nigriceps</i>			
484.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
485.	25511 <i>Pseudonaja affinis</i> (Dugite)			
486.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
487.	25519 <i>Tiliqua rugosa</i>			
488.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
489.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
490.	25225 <i>Varanus rosenbergi</i> (Heath Monitor)			

Conservation Codes

- Rare or likely to become extinct
- Resumed extinct
- IA Protected under international agreement
- S Other specially protected fauna
- 1 Priority 1
- 2 Priority 2
- 3 Priority 3
- 4 Priority 4
- 5 Priority 5

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



EBC Act Protected Matters Report

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

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

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

Report created 30/07/21 12:45:31

[Summary](#)

[Details](#)

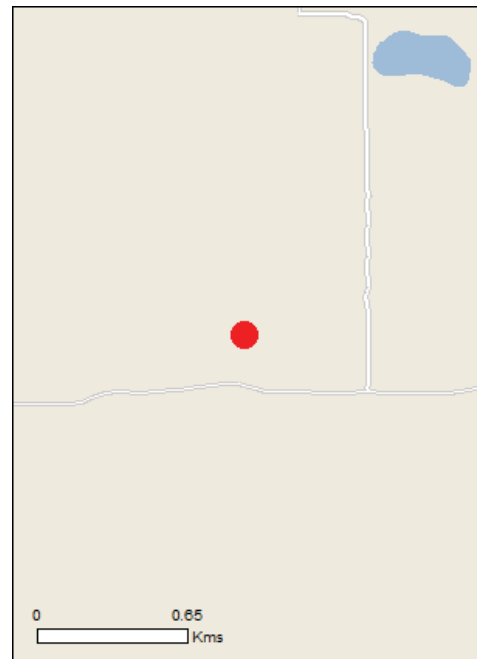
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

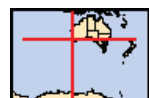
[Acknowledgements](#)



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

Buffer 0.00m



Summary

Matters of National Environmental Significance

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

World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	2
Listed Threatened Species	24
Listed Migratory Species	10

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land	None
Commonwealth Heritage Places	None
Listed Marine Species	13
Whales and Other Cetaceans	None
Critical Habitats	None
Commonwealth Reserves (Terrestrial)	None
Australian Marine Parks	None

Extra Information

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

State and Territory Reserves	None
Regional Forest Agreements	None
Invasive Species	21
Nationally Important Wetlands	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	Resource Information
Name	Proximity
Casse/Donnerup system	Within 10km of Ramsar

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Quart Eucalyptus Pomphocephala Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area

Listed Threatened Species	Resource Information
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Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus		
Australasian Bittern 1001	Endangered	Species or species habitat may occur within area
Calidris canutus		
Red Knot, Knot 1855	Endangered	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper 1856	Critically Endangered	Species or species habitat likely to occur within area
Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo, Carrak 167034	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus baudinii		
Baudin's Cockatoo, Long-billed Black-Cockatoo 1769	Endangered	Breeding known to occur within area
Calyptorhynchus latirostris		
Carnaby's Cockatoo, Short-billed Black-Cockatoo 159523	Endangered	Breeding likely to occur within area
Falco hypoleucos		
Grey Falcon 1929	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
Sternula nereis nereis		
Australian Fairy Tern 182950	Vulnerable	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii		
Chuditch, Western Quoll 1330	Vulnerable	Species or species

Name	Status	Type of Presence
Pseudocheirus occidentalis Western Ringtail Possum, Numbayir, Womp, Woder, Nabor, Noolan 25911	Critically Endangered	Species or species habitat known to occur within area

Plants

Banksia nivea subsp. uliginosa Swamp Bonepot 82766	Endangered	Species or species habitat likely to occur within area
Banksia squarrosa subsp. arillacea Whicher Range Dryandra 82769	Vulnerable	Species or species habitat may occur within area
Brachyscias verecundus Ironstone Brachyscias 81321	Critically Endangered	Species or species habitat may occur within area
Chamelaucium sp. S coastal plain (R.D.Royce 4872) Royce's Wattleflower 87814	Vulnerable	Species or species habitat likely to occur within area
Diuris drummondii Wall Donkey Orchid 4365	Vulnerable	Species or species habitat may occur within area
Diuris micrantha Dwarf Beeorchid 55082	Vulnerable	Species or species habitat may occur within area
Drakaea elastica Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid 16753	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammerorchid 56755	Vulnerable	Species or species habitat may occur within area
Gastrolobium papilio Butterfly-leaved Gastrolobium 78415	Endangered	Species or species habitat may occur within area
Lambertia echinata subsp. occidentalis Western Rickly Oneysuckle 64528	Endangered	Species or species habitat may occur within area
Letrophile latericola Laterite Letrophile 64532	Endangered	Species or species habitat may occur within area
Lerticordia densiflora var. pedunculata Non-stalked Featherflower 55689	Endangered	Species or species habitat may occur within area
Lerticordia plumosa var. vassensis Grass Featherflower 55804	Endangered	Species or species habitat may occur within area

Listed Migratory Species

Resource Information

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

Name	Threatened	Type of Presence
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Migratory Marine Birds

Apus pacificus Fork-tailed Shearwater 678		Species or species habitat likely to occur within area
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Migratory Terrestrial Species

Motacilla cinerea Grey Wattlebird 642		Species or species habitat may occur within area
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Name	Threatened	Type of Presence
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper (59309)		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper (874)		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot (855)	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper (856)	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Spectacular Sandpiper (858)		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew (847)	Critically Endangered	Species or species habitat may occur within area
Haliaeetus haliaetus Osprey (952)		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank (832)		Species or species habitat likely to occur within area

Other Matters Protected by the EBC Act

Threatened Marine Species	Resource Information
Species is listed under a different scientific name on the EBC Act Threatened Species list.	
Name	Threatened
Birds	

Actitis hypoleucos Common Sandpiper (59309)		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift (678)		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret (59542)		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper (874)		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot (855)	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper (856)	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Spectacular Sandpiper (858)		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Halimastur leucogaster White-bellied Sea Eagle 1943		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater 1670		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail 1642		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew 1847	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Spreey 1952		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank 1832		Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information](#)

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

Name	Status	Type of Presence
Birds		
<i>Anas platyrhynchos</i> Mallard 1974		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon 1803		Species or species habitat likely to occur within area
<i>Streptopelia senegalensis</i> Australian Quiltedove, Australian Dove 1781		Species or species habitat likely to occur within area
<i>Sturnus vulgaris</i> Common Starling 1389		Species or species habitat likely to occur within area
Mammals		
<i>Bos taurus</i> Domestic Cattle 116		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog 182654		Species or species habitat likely to occur

Name	Status	Type of Presence
<i>Felis catus</i> Cat, House Cat, Domestic Cat 19		Within area Species or species habitat likely to occur within area
<i>Mus musculus</i> House Mouse 120		Species or species habitat likely to occur within area
<i>Lepus cuniculus</i> Rabbit, European Rabbit 128		Species or species habitat likely to occur within area
<i>Rattus rattus</i> Black Rat, Ship Rat 84		Species or species habitat likely to occur within area
<i>Sus scrofa</i> Pig 6		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox 18		Species or species habitat likely to occur within area
Plants		
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus 22473		Species or species habitat likely to occur within area
<i>Brachiaria mutica</i> Para Grass 5879		Species or species habitat may occur within area
<i>Cenchrus ciliaris</i> Buffelgrass, Black Buffelgrass 20213		Species or species habitat may occur within area
<i>Chrysanthemoides monilifera</i> Bitou Bush, Boneseed 18983		Species or species habitat may occur within area
<i>Genista sp.</i> <i>Genista monspessulana</i> Broom 67538		Species or species habitat may occur within area
<i>Ulex europaea</i> Live, Common Live 9160		Species or species habitat may occur within area
<i>Pinus radiata</i> Radiata Pine Monterey Pine, Insular Pine, Wilding Pine 20780		Species or species habitat may occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry 68406		Species or species habitat likely to occur within area
<i>Salix</i> spp. except <i>S. babylonica</i> , <i>S. calodendron</i> and <i>S. reichardtii</i> Willows except Weeping Willow, Gully Willow and Sterile Gully Willow 68497		Species or species habitat likely to occur within area

Caveat

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

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

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

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

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) or with point locations and described habitat or environmental modelling (MACE or BCCIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time frame, maps are derived either from 0.04 or 0.02 decimal degree cells by an automated process using polygon capture techniques (static 100 kilometre grid cells, alpha hull and convex hull) or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100 or 250 map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

- migratory and
- marine

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

- threatened species listed as extinct or considered as variants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, variant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

33.60069 115.5409

Acknowledgements

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

[Office of Environment and Heritage, New South Wales](#)
[Department of Environment and Primary Industries, Victoria](#)
[Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
[Department of Environment, Water and Natural Resources, South Australia](#)
[Department of Land and Resource Management, Northern Territory](#)
[Department of Environmental and Heritage Protection, Queensland](#)
[Department of Parks and Wildlife, Western Australia](#)
[Environment and Planning Directorate, ACT](#)
[Biodlife Australia](#)
[Australian Bird and Bat Banding Scheme](#)
[Australian National Wildlife Collection](#)
[Natural history museums of Australia](#)
[Museum Victoria](#)
[Australian Museum](#)
[South Australian Museum](#)
[Queensland Museum](#)
[Online Zoological Collections of Australian Museums](#)
[Queensland Herbarium](#)
[National Herbarium of NSW](#)
[Royal Botanic Gardens and National Herbarium of Victoria](#)
[Tasmanian Herbarium](#)
[State Herbarium of South Australia](#)
[Northern Territory Herbarium](#)
[Western Australian Herbarium](#)
[Australian National Herbarium, Canberra](#)
[University of New England](#)
[Ocean Biogeographic Information System](#)
[Australian Government, Department of Defence Forestry Corporation, NSW](#)
[Geoscience Australia](#)
[CSIRO](#)
[Australian Tropical Herbarium, Cairns](#)
[eBird Australia](#)
[Australian Government Australian Antarctic Data Centre](#)
[Museum and Art Gallery of the Northern Territory](#)
[Australian Government National Environmental Science Program](#)
[Australian Institute of Marine Science](#)
[Reef Life Survey Australia](#)
[American Museum of Natural History](#)
[Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
[Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
[Other groups and individuals](#)

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

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

APPENDIX C

OBSERVED FAUNA LISTING

Fauna Observed During Survey Period

Lot 43 Plantation Road, Ludlow

Compiled by Greg Harewood - Nov 2021

Class Family Species	Common Name	Conservation Status
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Amphibia

Myobatrachidae

Ground or Burrowing Frogs

<i>Heleioporus eyrei</i>	Moaning Frog	LC
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Hylidae

Tree or Water-Holding Frogs

<i>Litoria adelaidensis</i>	Slender Tree Frog	LC
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Reptilia

Varanidae

Monitor's or Goanna's

<i>Varanus rosenbergi</i>	Heath Monitor	LC
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Scincidae

Skinks

<i>Tiliqua rugosa</i>	Bobtail	LC
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Aves

Accipitridae

Kites, Goshawks, Eagles, Harriers

<i>Accipiter fasciatus</i>	Brown Goshawk	Bp LC
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<i>Circus approximans</i>	Swamp Harrier	LC
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Psittacidae

Parrots

<i>Cacatua roseicapilla</i>	Galah	LC
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<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	S3 VU Bp LC
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<i>Calyptorhynchus baudinii</i>	Baudin's Cockatoo	S2 EN Bp EN
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<i>Platycercus spurius</i>	Red-capped Parrot	LC
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<i>Platycercus zonarius</i>	Australian Ringneck	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
Cuculidae Parasitic Cuckoos		
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	LC
Halcyonidae Tree Kingfishers		
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Introduced
Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces		
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	Bh LC
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC
<i>Gerygone fusca</i>	Western Gerygone	LC
<i>Smicrornis brevirostris</i>	Weebill	LC
Pardalotidae Pardalotes		
<i>Pardalotus striatus</i>	Striated Pardalote	LC
Meliphagidae Honeyeaters, Chats		
<i>Anthochaera carunculata</i>	Red Wattlebird	LC
<i>Lichmera indistincta</i>	Brown Honeyeater	LC
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Bp LC
Petroicidae Australian Robins		
<i>Petroica multicolor</i>	Scarlet Robin	Bh LC
Pachycephalidae Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers		
<i>Pachycephala occidentalis</i>	Western Whistler	Bh LC
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo		
<i>Rhipidura fuliginosa</i>	Grey Fantail	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.

Class Family Species	Common Name	Conservation Status
Cracticidae Currawongs, Magpies & Butcherbirds		
<i>Cracticus tibicen</i>	Australian Magpie	LC
Corvidae Ravens, Crows		
<i>Corvus coronoides</i>	Australian Raven	LC
Hirundinidae Swallows, Martins		
<i>Hirundo neoxena</i>	Welcome Swallow	LC
Mammalia		
Peramelidae Bandicoots		
<i>Isoodon obesulus fusciventer</i>	Quenda	P5 LC
Phalangeridae Brush-tail Possums, Cuscuses		
<i>Trichosurus vulpecula vulpecula</i>	Common Brush-tail Possum	LC
Pseudocheiridae Ringtail Possums		
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	S1 CR CR
Macropodidae Kangaroos, Wallabies		
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	LC
Leporidae Rabbits, Hares		
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced

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.

APPENDIX D

HABITAT TREE DETAILS

Habitat Trees

DBH >50cm

Datum - GDA94

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

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	364719	6281053	Non-Endemic Eucalyptus	15-20	0					Planted Non-endemic
wpt002	50H	364679	6281057	Non-Endemic Eucalyptus	15-20	0					Planted Non-endemic
wpt003	50H	364661	6281061	Non-Endemic Eucalyptus	10-15	0					Planted Non-endemic
wpt004	50H	364609	6281025	Non-Endemic Eucalyptus	10-15	0					Planted Non-endemic
wpt005	50H	364638	6280994	Dead Unknown	15-20	2+	Small	No Signs	No Signs	No	
wpt006	50H	364652	6280991	Marri	15-20	0					
wpt007	50H	364724	6280994	Marri	15-20	0					
wpt008	50H	364739	6280999	Marri	20+	0					
wpt009	50H	364807	6280989	Marri	20+	0					
wpt010	50H	364630	6281078	Jarrah	15-20	0					
wpt011	50H	364635	6281076	Jarrah	5-10	2+	Small-Medium	No Signs	No Signs	No	
wpt012	50H	364661	6281089	Flooded Gum	15-20	0					
wpt015	50H	364900	6281048	Flooded Gum	10-15	0					
wpt016	50H	364639	6281311	Marri	15-20	0					
wpt017	50H	364858	6281234	Marri	15-20	0					
wpt018	50H	364642	6281333	Marri	15-20	0					
wpt019	50H	364641	6281359	Marri	15-20	0					
wpt020	50H	364631	6281364	Marri	15-20	0					
wpt021	50H	364884	6281068	Tuart	15-20	0					Planted
wpt022	50H	364626	6281359	Marri	15-20	0					
wpt023	50H	364643	6281378	Jarrah	15-20	0					
wpt024	50H	364586	6281356	Marri	15-20	0					
wpt025	50H	364554	6281331	Dead Jarrah	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt029	50H	364559	6281291	Marri	15-20	0					
wpt030	50H	364517	6281283	Dead Unknown	15-20	2+	Small	No Signs	No Signs	No	
wpt031	50H	364526	6281265	Jarrah	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt032	50H	364469	6281281	Marri	15-20	2+	Small-Medium	Bees	No Signs	No	
wpt033	50H	364461	6281277	Dead Jarrah	15-20	0					
wpt034	50H	364436	6281290	Marri	20+	0					
wpt035	50H	364425	6281305	Marri	20+	0					
wpt036	50H	364444	6281304	Marri	20+	0					
wpt037	50H	364387	6281247	Jarrah	15-20	0					
wpt038	50H	364323	6281276	Marri	20+	0					
wpt039	50H	364325	6281293	Marri	20+	0					

Waypoint Number	Zone	mE	mN	Tree Species	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt040	50H	364262	6281281	Marri	20+	0					
wpt041	50H	364262	6281263	Marri	20+	2+	Small-Large (cockatoo)	No Signs	No Signs	Yes	Large Side entry
wpt042	50H	364269	6281075	Marri	20+	0					
wpt043	50H	364263	6281052	Marri	20+	0					
wpt044	50H	364259	6281049	Marri	20+	0					
wpt045	50H	364266	6281041	Marri	20+	0					
wpt046	50H	364330	6281128	Jarrah	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt047	50H	364407	6281147	Jarrah	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt048	50H	364451	6281099	Jarrah	10-15	2+	Small-Large	No Signs	No Signs	No	Near horizontal - appears unsuitable for BCs
wpt049	50H	364406	6281091	Jarrah	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt050	50H	364386	6280985	Jarrah	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt051	50H	364478	6281015	Marri	15-20	0					
wpt052	50H	364502	6281014	Jarrah	15-20	1	Small	Bees	No Signs	No	
wpt053	50H	364602	6281307	Dead Jarrah	15-20	2+	Small	No Signs	No Signs	No	
wpt054	50H	364603	6281317	Marri	15-20	0					

DISCLAIMER

This fauna assessment report (“the report”) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Greg Harewood (“the Author”). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. In accordance with the scope of services, the Author has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

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.

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

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