

40 RIVERGUM WAY DARRADUP

BLACK COCKATOO HABITAT ASSESSMENT

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The logo for PGV Environmental is located in the bottom right corner of the page. It features the letters 'PGV' in a large, bold, white sans-serif font. Below 'PGV', the word 'ENVIRONMENTAL' is written in a smaller, white, all-caps sans-serif font. The background of the logo area is a dark orange color with a subtle pattern of fine, white, curved lines that create a sense of movement or a landscape horizon.

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1 INTRODUCTION

1.1 Site Location

Evernow Pty Ltd (the Proponent) is proposing to construct a light aircraft runway on 40 Rivergum Way, Darradup (the site). The site is located to the west of Brockman Highway and south of the Blackwood River in the Shire of Nannup (Figure 1). The site is 40.8715ha in size.

The site, together with a small special rural development enclave of seventeen 2-5ha lots is surrounded by the Darradup, Blackwood and Sollya State Forest Blocks.

1.2 Background

The Proponent has applied for approval to construct a light aircraft runway in the centre of the site, approximately 900m long in a north south orientation. The proposed runway slopes down from a high point of around 81m AHD at the southern end down to around 44m AHD at the northern end.

Construction of the runway will require the clearing of native vegetation from three areas as shown in Appendix 1. The Proponent has applied for a clearing permit (CPS 9217/1) under the State *Environmental Protection Act, 1986* (EP Act) to clear 1.593ha of native vegetation, which includes 130 trees. Assessment of the clearing permit has been put on hold by the Department of Water and Environmental Regulation (DWER) pending the outcome of a Black Cockatoo habitat assessment of the trees proposed to be cleared.

The Proponent commissioned PGV Environmental to undertake a Black Cockatoo habitat assessment of the area proposed to be cleared for the runway.

1.3 Scope of Work

The Black Cockatoo Habitat assessment of the trees in the proposed runway area was undertaken in accordance with the *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii and Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines).

The relevant species of Black Cockatoo are:

- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered);
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (Endangered); and
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable).

The scope of work included the following:

- A description of the Black Cockatoo habitat on the site;
- Preparation of a map foraging habitat, breeding and potential roosting habitat;
- Assessment of the impact of the proposed clearing on Black Cockatoos;
- Determine if referral of the proposed runway is required under the EPBC Act; and
- Make recommendations on mitigating any impact on Black Cockatoos.

2 SITE DESCRIPTION

2.1.1 Site History

Examination of historic aerial photography shows that the site has been largely cleared since at least 1985 and likely many years before then.

Comparison of the 2000 aerial photograph with the most recent clear image of the site from 2018 shows the stands of vegetation on the site have remained the same over that period. A dam has been constructed on the northern part of the site. The semi-rural lots directly to the east were crated around 2000. The Blackwood River can be seen to the north of the site (Plates 1 and 2).

Plate 1: Aerial Photography from 2000 (Landgate, 2021)



Plate 2: Aerial Photography from 2018 (Google Earth, 2021)



2.1.2 Vegetation

The parcels of native vegetation on the site are all mapped as the Kingia Vegetation Complex. The vegetation along the northern boundary of the lot adjacent to the Blackwood River is within the Blackwood and Darradup Complexes. The descriptions of the vegetation complexes are in Table 1.

Table 1: Vegetation Complex Descriptions (Mattiske and Havel, 1998)

Complex	Description	Landform
Kingia	Open forests of Jarrah (<i>E. marginata</i> ssp. <i>marginata</i>), Marri (<i>Corymbia calophylla</i>), Sheoak (<i>Allocasuarina fraseriana</i>), Bull Banksia (<i>Banksia grandis</i>) and Woody Pear (<i>Xylomelum occidentale</i>)	Lateritic uplands in perhumid and humid zones
Blackwood	Woodland to open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Corymbia calophylla</i> - <i>Xylomelum occidentale</i> - <i>Agonis flexuosa</i>	Raised river terrace in the perhumid zone.
Darradup	Open forest to woodland of <i>Corymbia calophylla</i> with some <i>Eucalyptus marginata</i> subsp. <i>marginata</i> on slopes, woodland of <i>Eucalyptus rudis</i> - <i>Banksia seminuda</i> - <i>Melaleuca preissiana</i> - <i>Agonis flexuosa</i> and tall shrubland of <i>Agonis linearifolia</i> - <i>Callistachys lanceolata</i> .	fringes of streams in perhumid and humid ones.

2.1.3 Vegetation Type

PGV Environmental undertook a site assessment on 9 June 2021. The vegetation type of all three parcels of vegetation was described as:

- Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) Woodland over a cleared understorey (Plates 3 and 4).

The southernmost parcel of vegetation contained some Sheoak (*Allocasuarina fraseriana*) and Bull Banksia (*Banksia grandis*) trees in the mid-canopy with the Marri and Jarrah trees and also had a cleared understorey. The vegetation type on the site matches the description of the Kingia Vegetation Complex very closely.

The central stand contained a small group of young WA Peppermint trees (*Agonis flexuosa*).

Plate 3: Parkland Cleared Marri and Jarrah in the Northern Stand



Plate 4: Cleared Understorey in the Central Stand



2.1.4 Vegetation Condition

The condition of the vegetation on the site was assessed by PGV Environmental on 9 June 2021 according to the Bush Forever rating scale shown in Table 2.

The vegetation condition was rated as Degraded to Completely Degraded.

Table 2: Vegetation Condition Rating Scale

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

Source: Government of Western Australia, 2000.

2.1.5 Flora

PGV Environmental recorded a very low number of native species on the site during the 9 June 2021 site assessment. Some native ephemeral species, such as orchids, are likely to occur in the understorey during spring. Native species recorded on site are listed below:

- *Acacia pulchella*
- *Agonis flexuosa* (WA Peppermint)
- *Allocasuarina fraseriana* (Sheoak)
- *Corymbia calophylla* (Marri)
- *Desmocladius fascicularis*
- *Eucalyptus marginata* (Jarrah)
- *Leucopogon propinquus*
- *Opercularia hispidula*
- *Orthrosanthus laxus*
- *Stylidium piliferum*

3 BLACK COCKATOOS

3.1 Forest Red-tailed Black Cockatoo

Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksii naso*) are endemic to the humid to sub-humid south-west of Western Australia (SEWPaC, 2012). The range of Forest Red-tailed Black Cockatoos is bound by Gingin in the north to Mt Helena, Christmas Tree Well, West Dale, North Bannister, Mt Saddleback, Kojonup, Rocky Gully, upper King River and Green Range (east of Albany) (SEWPaC, 2012; DoE, 2016). Forest Red-tailed Black Cockatoos nest in tree hollows with a depth of 1-5m, that are predominately Marri, Jarrah and Karri and feed primarily on the seeds of Marri and Jarrah (Johnstone and Kirkby, 2011).

The site is within the modelled distribution for Forest Red-tailed Black Cockatoos (SEWPaC, 2012).

3.2 Carnaby's Black Cockatoo

Carnaby's Black Cockatoos (*Calyptorhynchus latirostris*) are found in the south-west of Australia from Kalbarri through to Ravensthorpe. The species has a preference for feeding on the seeds of Banksia, Dryandra, Hakea, Eucalyptus, Grevillea, Pinus and Allocasuarina spp. Carnaby's Black Cockatoos are nomadic, often moving toward the coast after breeding. The species breeds in tree hollows that are 2.5 – 12m above the ground and have an entrance of 23-30cm with a depth of 1-2.5m. Nesting mostly occurs in smooth-barked trees (eg. Salmon Gum, Wandoo, Red Morrell). Eggs are laid from July to October, with incubation lasting 29 days (DoE, 2014).

The site is within the modelled distribution and breeding range for Carnaby's Black Cockatoos (SEWPaC, 2012).

3.3 Baudin's Black Cockatoo

Baudin's Black Cockatoos (*Calyptorhynchus baudinii*) are most common in the far south-west of Western Australia. The species is known to breed from the southern forests north to Collie and east to near Kojonup. Baudin's Black Cockatoo is typically found in vagrant flocks and utilises the taller, more open Jarrah and Marri woodlands where it feeds mainly on Marri seeds and various Proteaceous species (Johnstone and Kirkby, 2011).

The site is within the modelled distribution for Baudin's Black Cockatoos (SEWPaC, 2012).

4 BLACK COCKATOO HABITAT ASSESSMENT

4.1 Methodology

PGV Environmental undertook a Black Cockatoo Habitat Assessment in accordance with the *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* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines) and the methodology that is outlined in the SPRAT Database for each of the Black Cockatoo species for Black Cockatoo Habitat Assessments.

A site visit was undertaken by PGV Environmental on 9 June 2021. The site was traversed on foot using a hand-held GPS to navigate within the boundary of the proposed runway footprint.

The extent, type and quality of the vegetation present, including the presence and extent of plants known to be used by Black Cockatoos, was investigated during the assessment. The quality of the vegetation was determined in the context of foraging habitat for Black Cockatoos. During the site visit a search for feeding signs or feeding debris such as chewed Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*) and Sheoak (*Allocasuarina fraseriana*) was undertaken.

The assessment also searched for evidence of roosting including areas of droppings, moulted feathers, feather down or clippings from branches under trees.

Breeding habitat was assessed using the definition in the Black Cockatoo Referral Guidelines, which is trees of species known to support breeding within the range of the Black Cockatoo species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For the relevant tree species on the site, Marri and Jarrah, the suitable DBH is 500mm. The assessment recorded all trees within the site that have a DBH of 500mm or greater. The location, species, trunk DBH and any other important descriptive information about each tree located within the site was recorded. The presence of hollows or spouts was recorded, and any potential large hollows were examined using 20x binoculars from the ground.

4.2 Results

4.2.1 Foraging

Four native plant species were recorded on the site by PGV Environmental that are recognised as foraging habitat for Black Cockatoos (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Valentine and Stock, 2008; Groom 2011; Johnstone *et al.*, 2011; SEWPaC, 2012; Johnstone, *et al.*, 2013; Johnstone *et al.*, 2016) as shown in Table 2 (Figure 3).

Table 2: Foraging Species for Black Cockatoos Recorded on the Site

Species	Common Name
<i>Eucalyptus marginata</i>	Jarrah
<i>Corymbia calophylla</i>	Marri
<i>Agonis flexuosa</i>	WA Peppermint
<i>Allocasuarina fraseriana</i>	Sheoak

Marri and Jarrah were the dominant species in the three patches of remnant vegetation. There was a small group of young Peppermint Trees at the north-west corner of the central stand of vegetation and three Sheoak trees in the southern patch mixed with the Jarrah and Marri. The understorey was largely cleared of native vegetation.

The use of these flora species by each Black cockatoo species and their foraging value is shown in Table 3.

Table 3: Foraging Value for each Black Cockatoos Species

Species	Common Name	Carnaby's Black Cockatoo	Forest red-tailed Black Cockatoo	Baudin's Black Cockatoo
<i>Eucalyptus marginata</i>	Jarrah	High	High	High
<i>Corymbia calophylla</i>	Marri	High	High	High
<i>Agonis flexuosa</i>	WA Peppermint	Low		

There was fresh and old evidence of foraging by Black Cockatoos on the site.

Plate 5: Fresh Foraging Evidence on Marri Nuts



Plate 6: Old Foraging Evidence on Marri Nuts



The extent of foraging habitat species on the site is estimated at 1.528ha which is a calculated using an average of 70% canopy cover for the Marri and Jarrah trees, and a few Sheoak trees, on the site.

The Black Cockatoo Referral Guidelines refer to the quality of the foraging habitat as an important characteristic in determining the significance of the impact. However, there is no guidance as to how the quality is determined in the Black Cockatoo Referral Guidelines other than specifying that ‘quality’ foraging habitat refers to the use of the habitat by Black Cockatoos rather than the overall quality of the vegetation which would normally be described using understorey as well as tree canopy.

The foraging habitat on the site is considered to be quality foraging habitat for all three species of Black Cockatoo.

4.2.2 Roosting

The site does not contain a known roosting site for Black Cockatoos. The current landowners, who have been living on the property for the last 12 years, and are bird enthusiasts, have not observed any overnight roosting in the trees.

There was no evidence of roosting observed during the site assessment on 9 May 2021.

4.2.3 Breeding

Black Cockatoos are known to breed in hollows of large eucalypts. The Black Cockatoo Referral Guidelines define trees of certain species with a DBH of 500mm or greater as breeding habitat regardless of the presence or not of hollows. The theory behind this definition is the concept that while the trees may not currently contain hollows, they are mature enough that in the next 50 years or so a hollow might form and be of use to Black Cockatoos for the purposes of breeding.

The survey recorded 68 trees, including 53 Marri and 15 Jarrah with a DBH \geq 500mm. Three trees had a potential spout (Table 4) (Appendix 1 and 2). None of the trees had hollows large enough for Black Cockatoos to breed in. Consequently, no recent or old evidence of breeding in hollows was observed on the site.

Figure 3 shows the location of the potential breeding habitat trees.

Table 4: Significant Trees Recorded on the site

Species	Marri	Jarrah	Total
Hollows/spouts	2	1	3
No Hollows/Spouts	51	14	67
Total	53	15	68

4.3 Regional Context

The site is surrounded by Marri-Jarrah Forest that are managed by the Department of Biodiversity, Conservation and Attractions (DBCA). The forest blocks directly adjacent to the site are listed in Table 5 and shown in Plate 7 and Figure 1).

The extent of forested woodland within 12km of the site is estimated to be around 359,500ha which equates to a forest coverage of 95% in that area. The amount of Marri-Jarrah Woodland proposed to be cleared (1.593ha) represents 0.00044% of the Black Cockatoo habitat in a 12km radius. The 12km radius is used as this is the distance a Black Cockatoo male bird will fly up to from a nest in search of food during chick rearing times.

Plate 7: Jarrah Forest Blocks Surrounding the Site (SLIP, 2021)



4.4 Significance of Impact

According to the *EPBC Act Significant Impact Guidelines 1.1* (DoE, 2013), the significance of the impact on Black Cockatoos depends on the sensitivity, value and quality of the environment and the intensity, duration, magnitude and geographic extent of the impacts. The category of listing (for example; Endangered, Vulnerable or Migratory) determines the significant impact criteria for listed flora and fauna species and ecological communities.

This Black Cockatoo Habitat Assessment assumes all of the foraging and potential breeding trees on the site would be cleared during the construction of the runway. Using this assumption, the clearing would result in approximately 1.529ha of foraging habitat and 68 potential breeding trees being cleared.

The following assessments are for Forest Red-tailed and Baudin's Black Cockatoos which are listed as Vulnerable and Carnaby's Black Cockatoos which are listed as Endangered.

Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo

The impact on Forest Red-tailed Black and Baudin's Cockatoos from clearing the Black Cockatoo habitat on the site has been assessed against the criteria set out in the *Significant Impact Guidelines 1.1* for the impact on a Vulnerable species and is shown below:

- *Lead to a long-term decrease in the size of an important population of a species*

In the *Significant Impact Guidelines 1.1* an important population is defined as "a population that is necessary for a species' long-term survival and recovery" and may be "key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species' range".

There was no evidence of breeding occurring on the site and the surrounding area contains large tracts of forest providing large areas of foraging, roosting, and breeding habitat for Black Cockatoos that utilise the site.

Clearing 1.529ha of native vegetation for the construction of a runway on the site would not impact on the long-term survival or recovery of the species due to the large amount of Black Cockatoo habitat in the surrounding area.

- *Reduce the area of occupancy of an important population*

There was no evidence found of Forest Red-tailed or Baudin's Black Cockatoos breeding or roosting on the site. Clearing for the runway will reduce the area of foraging available, however the amount of clearing is extremely small compared to the amount within 500m of the site in State Forest.

Clearing 1.529ha of native vegetation for the construction of a light aircraft runway on the site would not reduce the area of occupancy of the population.

- *Fragment an existing important population into two or more populations*

There are large areas of suitable habitat within 500m of the site that provide foraging and potential breeding habitat. Forest Red-tailed and Baudin's Black Cockatoos are highly mobile and can fly large distances between foraging areas.

Clearing 1.1529ha of native vegetation for the construction of a light aircraft runway on the site will not fragment the existing population.

- *Adversely affect habitat critical to the survival of a species*

There was no evidence that Forest Red-tailed and Baudin's Black Cockatoos breed on the site and there are large areas of foraging habitat within 500m of the site.

Construction of a light aircraft runway on the site would not adversely affect habitat critical to the survival of the species.

- *Disrupt the breeding cycle of an important population*

There was no evidence that Forest Red-tailed or Baudin's Black Cockatoos breed on the site and there were no suitable hollows for breeding.

Clearing native vegetation for the construction of a light aircraft runway on the site would not disrupt the breeding cycle.

- *Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The large areas of high quality foraging and breeding habitat located in the surrounding forest within 500m of the site would prevent the population from declining.

Clearing native vegetation for the construction of a light aircraft runway will not reduce the availability or quantity of foraging habitat when considered in terms of the surrounding area.

- *Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Clearing the site will not result in invasive species being introduced, therefore would not result in this outcome.

- *Introduce disease that may cause the species to decline*

Clearing the site will not result in disease being introduced, therefore would not result in this outcome.

- *Interfere substantially with the recovery of the species*

The Forest Red-tailed and Baudin's Black Cockatoos that would utilise the site have access to vast tracts of native forest within 500m and 12km of the site. Therefore, the clearing of approximately 1.1529ha of foraging habitat on the site would not interfere substantially with the recovery of the species.

In accordance with the criteria set out in the *Significant Impact Guidelines 1.1* the conclusion of this assessment is that development of the site would not have a significant impact on Forest Red-tailed Black Cockatoos or Baudin's Black Cockatoos.

Carnaby's Black Cockatoo

The impact on Carnaby's Black Cockatoos from clearing the Black Cockatoo habitat on the site has been assessed against the criteria set out in the Significant Impact Guidelines 1.1 for the impact on an Endangered species and is shown below:

- *Lead to a long-term decrease in the size of a population*

In the *Significant Impact Guidelines 1.1* an important population is defined as "a population that is necessary for a species' long-term survival and recovery" and may be "key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species' range".

There was no evidence of breeding occurring on the site. The surrounding area contains large tracts of forest providing large areas of foraging, roosting, and breeding habitat for Carnaby's Black Cockatoos.

Clearing 1.529ha of native vegetation for the construction of a light aircraft runway on the site would not impact on the long term survival or recovery of the species due to the large amount of Carnaby's Black Cockatoo habitat in the surrounding area.

- *Reduce the area of occupancy of the species*

There was no evidence of Carnaby's Black Cockatoos breeding or roosting on the site. Clearing for the light aircraft runway will reduce the area of foraging available, however the large areas of high-quality foraging and breeding habitat located in the surrounding forest within 500m of the site would prevent the population from declining

Clearing 1.529ha of native vegetation for the construction of a light aircraft runway on the site would not reduce the area of occupancy of the population.

- *Fragment an existing population into two or more populations*

There are large areas of suitable habitat within 500m of the site that provide foraging and potential breeding habitat. Carnaby's Black Cockatoos are highly mobile and can fly large distances between foraging areas.

Clearing 1.529ha of native vegetation for the construction of a light aircraft runway on the site will not fragment the existing population.

- *Adversely affect habitat critical to the survival of a species*

There was no evidence that Carnaby's Black Cockatoos breed on the site and there are large areas of habitat within 500m of the site.

Construction of a light aircraft runway on the site would not adversely affect habitat critical to the survival of the species.

- *Disrupt the breeding cycle of a population*

The site contained no evidence of breeding and there were no trees that contained suitable hollows/spouts therefore clearing of the site would not result in this outcome.

- *Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The large areas of high quality foraging and breeding habitat located in the surrounding forest within 500m of the site would prevent the population from declining.

Clearing native vegetation for the construction of a light aircraft landing strip will not reduce the availability or quantity of foraging habitat when considered in terms of the 359,500ha within 12km surrounding the site.

- *Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Clearing of the site will not result in the establishment of an invasive species harmful Carnaby's Black Cockatoos.

- *Introduce disease that may cause the species to decline*

Clearing of the site will not cause disease to be introduced therefore will not result in this outcome.

- *Interfere with the recovery of the species*

Carnaby's Black Cockatoos have access to vast tracts of native forest within 500m and 12km of the site. Therefore, the clearing of approximately 1.529ha of foraging habitat and 68 potential breeding habitat trees on the site would not interfere substantially with the recovery of the species.

In accordance with the criteria set out in the *Significant Impact Guidelines 1.1* the conclusion of this assessment is that development of the site would not have a significant impact on Carnaby's Black Cockatoos.

4.5 Black Cockatoo Referral Guidelines

The 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* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines) contain several steps to determine whether or not a referral is required. These steps are:

1. The definition of habitat (breeding, roosting and foraging – Table 1 in the Black Cockatoo Referral Guidelines);
2. A description of the type of action that may have a high or low risk of being a significant impact and therefore require referral (Table 3 in the Black Cockatoo Referral Guidelines);

3. Formulation of a mitigation strategy to reduce the scale of impact; and
4. A flowchart to assist in decision making on whether or not an action should be referred.

Step 1 Black Cockatoo Habitat

There is approximately 1.529ha of foraging habitat on the site with evidence that Black Cockatoos do forage on Marri nuts on the site.

The site contains 68 trees that are considered to be potential breeding trees. There is no evidence of breeding or roosting on the site.

Step 2 Level of Impact

Foraging

According to Table 3 in the Black Cockatoo Referral Guidelines the clearing of more than 1ha of quality foraging habitat has a high risk of causing a significant impact. Degradation of more than 1ha of quality habitat by things such as altered hydrology or fire regimes has an uncertain risk. The significance of degradation depends on the type of degradation and the quality of the habitat.

The site contained approximately 1.529ha of foraging habitat for Black Cockatoos. There was recent foraging evidence observed during the site visit. The Marri and Jarrah trees provide quality foraging for all three species of Black Cockatoos. Construction of the light aircraft runway will lead to the loss of more than 1ha of quality foraging habitat and result in a potential significant impact according to the guidelines.

Roosting

The Black Cockatoo Referral Guidelines consider the clearing of a known roosting site as a high risk of being a significant impact. Anecdotally, there is no evidence of roosting on the site and there was no evidence of roosting found during the site visit on 9 May 2021. The risk of a significant impact on a known roosting site is considered to be low.

Breeding

According to Table 3 in *the Black Cockatoo Referral Guidelines* the clearing of any known nesting tree has a high risk of being a significant impact. A known nesting tree is defined in the Black Cockatoo Referral Guidelines as any existing tree in which breeding has been recorded or suspected. There are no known nesting trees that occur on the site and therefore there is no risk of a significant impact on known breeding habitat of Black Cockatoos.

The *Black Cockatoo Referral Guidelines* also consider that the clearing or degradation of any part of a vegetation community known to contain breeding habitat is likely to have a high risk of a significant impact. In Table 1 of the *Black Cockatoo Referral Guidelines* breeding habitat is defined as woodlands, forests or isolated trees that contain or consist of live or dead trees of certain species with either a DBH of or greater than 500mm or the presence of suitable nest hollows.

The site contains 68 trees with a DBH of or greater than 500mm three of which contained hollows/spouts suitable for Black Cockatoos.

According to the Black Cockatoo Referral Guidelines the risk of a significant impact on breeding habitat of Carnaby's and Forest Red-tailed Black Cockatoos is high.

Surrounding Habitat

According to the Black Cockatoo Referral Guidelines clearing of vegetation that results in a gap of greater than 4km between patches of Black Cockatoo habitat (foraging, roosting or breeding) has a high risk of having a significant impact.

Clearing the native vegetation for the construction of a runway will not create large gaps between native vegetation therefore the risk is considered to be low.

Step 3 Mitigation

The consideration of a mitigation strategy during the determination of the level of impact and requirement to refer is allowed by the *Black Cockatoo Referral Guidelines* and setting in place the best practice mitigation strategy may reduce the level of impact and in turn the risk of a significant impact. Mitigation strategies include avoiding impact, managing impact so that there is no net decline in habitat and monitoring the effectiveness of mitigation.

This assessment is based on the entire 1.529ha of foraging habitat and all 68 potential breeding trees being cleared. There is no alternative for moving the location of the light airstrip that would be practical from a runway perspective or that would result in no clearing of Black Cockatoo habitat.

Step 4 Referral Advice

The Decision Making flowchart in Figure 1 of the Black Cockatoo Referral Guidelines was applied to the site without consideration of mitigation strategies and is shown in sequence below:

- 1 Could the impacts of your action occur within the modelled distribution of the black cockatoos? – YES
- 2 Could the impacts of your action affect any black cockatoo habitat or individuals? - YES
- 3 Have you surveyed for black cockatoo habitat using the recommended methods? – YES
- 4 Could your action have an impact on black cockatoos or their habitat? – YES
- 5 Is your impact mitigation best practice so that it may reduce the significance of your impacts on black cockatoos? Prioritise impact avoidance over impact minimisation - NO

RESULT – Referral Recommended: High risk of resulting in significant impact.

5 SUMMARY AND CONCLUSION

5.1 Black Cockatoo Habitat Assessment

The Black Cockatoo Habitat Assessment identified 1.529ha of foraging habitat on the site consisting predominantly of Marri and Jarrah trees. Evidence of foraging by Black Cockatoos was observed on the site.

The site does not contain a known roosting site and no evidence was observed that the site has been used as roosting habitat.

The site does not contain known breeding sites and no evidence of breeding was recorded on the site. Seventy potential breeding habitat trees were recorded on site consisting of 53 Marri and 15 Jarrah trees. Three of the trees contained hollows or spouts but were not large enough for Black Cockatoos to breed in.

Clearing of the site will result in the loss of 1.529ha of Black Cockatoo habitat. According to the EPBC Act Significant Impact Guidelines, the impact on Forest Red-tailed Black Cockatoos, Baudin's Black Cockatoo and Carnaby's Black Cockatoos is not likely to be significant. The surrounding forest contains vast black cockatoo habitat (359,500 within 12km of the site). The proportion of the habitat to be cleared (1.593ha) represents 0.00044% of the habitat within 12km of the site.

However, in accordance with the Black Cockatoo Referral Guidelines the clearing of Black Cockatoo habitat is likely to have a high risk of being a significant impact due to the loss 1.529ha and 68 potential breeding trees. Referral to the Department of Agriculture, Water and the Environment under the EPBC Act is therefore recommended.

5.1.1 Jamarri Black Cockatoo Rehabilitation Centre

The Jamarri Black Cockatoo Rehabilitation Centre in Jalbarragup located 7km to the north east of the site is no longer operating.

5.2 Conclusion

According to the referral guidelines clearing the 1.529ha and 68 potential breeding habitat trees would likely lead to a significant impact on the three species of Black Cockatoos. Referral under the EPBC Act is therefore recommended. It is PGV Environmental's opinion the impact will not be significant due to the vast tracts of forest surrounding the site that contains Black Cockatoo habitat.

6 REFERENCES

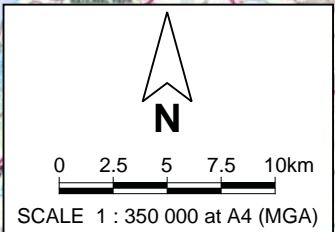
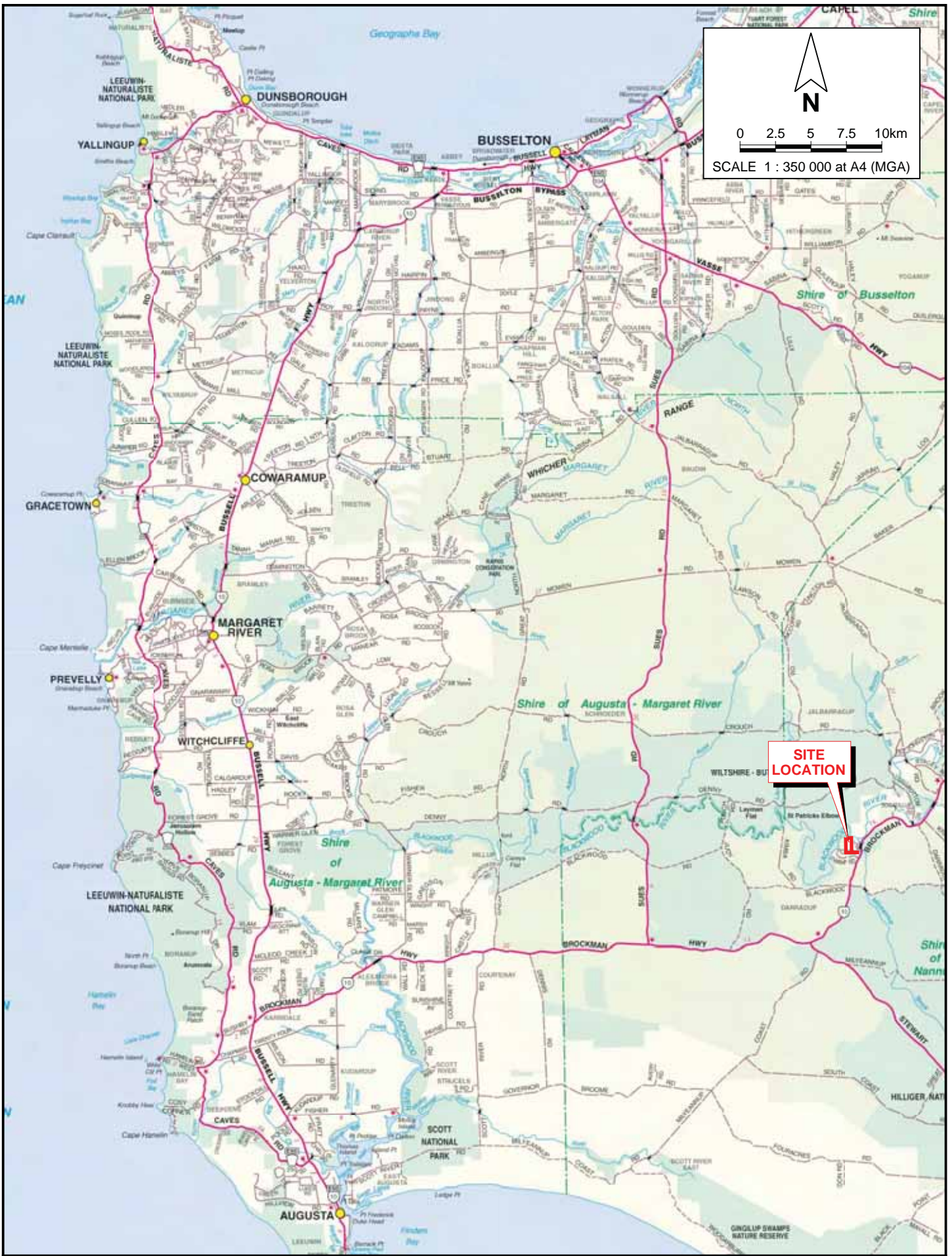
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FIGURES



SITE LOCATION

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-593-01.dgn

pgv ENVIRONMENTAL	
Drawn: P. van der Moezel	Date: 17 Jun 2021
Job: 10433 Rpt: 2021-593	Revision: A

Evernow Pty Ltd
 BLACK COCKATOO HABITAT ASSESSMENT
 40 RIVERGUM WAY, DARRADUP

SITE LOCATION

Figure 1



N

0 20 40 60 80 100m

SCALE 1 : 3 000 at A3 (MGA)

Legend

- - - Site Boundary
- Cadastral Boundary
- Topographic Contour
- Proposed Development
- Clearing Extent

CADASTRAL SOURCE: Landgate, June 2021.
 CONTOUR SOURCE: Landgate 1:50 000 Topographic Mapping.
 AERIAL PHOTOGRAPH SOURCE: Google Earth, flown November 2017.

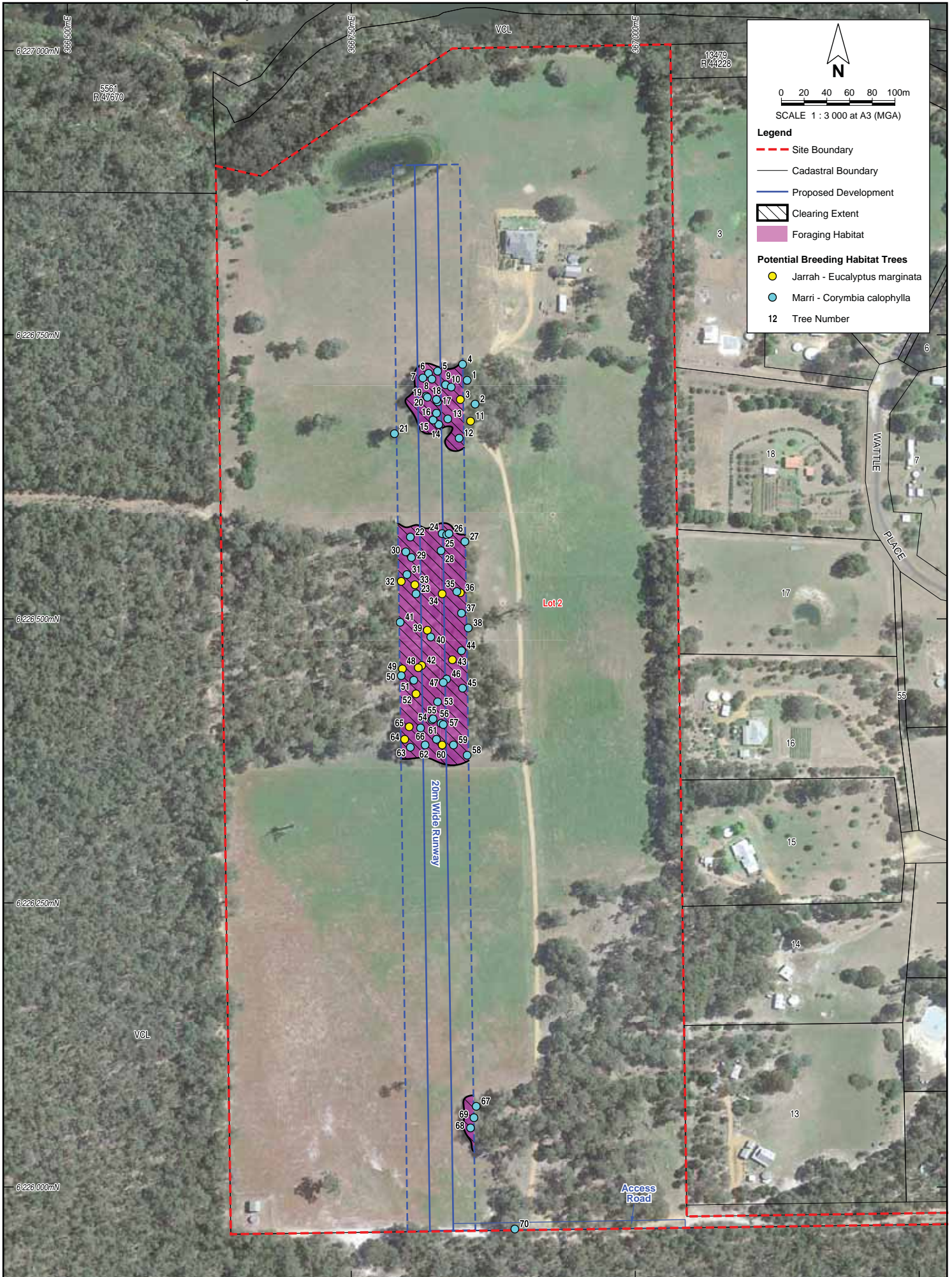


Drawn: P. van der Moezel Date: 17 Jun 2021
 Job: 10433 Rpt: 2021-593 Revislon: A

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 40 RIVERGUM WAY, DARRADUP

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



N

0 20 40 60 80 100m

SCALE 1 : 3 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Proposed Development
- Clearing Extent
- Foraging Habitat

Potential Breeding Habitat Trees

- Jarrah - *Eucalyptus marginata*
- Marri - *Corymbia calophylla*
- 12 Tree Number

APPENDIX 1

TREE DATA

Map and describe trees greater than mm in diameter				Date:		Observer:			Notes (hollows, bees etc.)
Tree Number	Species	Easting MGA zn50	Northing MGA zn50	Photo Number	Height	Diameter	Second Branch	Third Branch	
1	Marri	366852	6226710	10:08 X 2	15	83			just outside runway?
2	Marri	366859	6226689		15	102			
3	Jarrah	366846	6226693		15	82			
4	Marri	366848	6226724		15	61			
5	Marri	366826	6226718	10:13	15	94			potential hollow 10m up but binoculars show no hollow or bite marks
6	Marri	366818	6226716		12	78			
7	Marri	366813	6226712		12	54			
8	Marri	366821	6226711		12	51			
9	Marri	366833	6226706		10	57			
10	Marri	366838	6226704		14	59			
11	Jarrah	366855	6226674		10	53	36		
12	Marri	366845	6226659		9	74	43		
13	Marri	366835	6226676	10:26	15	60			
14	Marri	366827	6226671		12	64			
15	Marri	366822	6226675		11	54			
16	Marri	366825	6226681		15	55			
17	Marri	366826	6226691		13	52			
18	Marri	366825	6226693	10:34	15	65			spout, too small for cockatoos
19	Marri	366816	6226696		12	58			
20	Marri	366817	6226695		16	97			
21	Marri	366788	6226663		16	160			probably just outside of runway
22	Marri	366802	6226572		15	128			
23	Marri	366807	6226522		12	57			
24	Marri	366830	6226575		14	72			
25	Marri	366834	6226574		14	51	28		
26	Marri	366836	6226575		12	73			
27	Marri	366850	6226568		14	56			
28	Marri	366829	6226560	10:57	15	109			large break 8m up. Not hollow
29	Marri	366803	6226554		14	56			
30	Marri	366798	6226559		14	92			
31	Marri	366799	6226539		12	53			
32	Jarrah	366794	6226533		14	88			
33	Jarrah	366806	6226530		10	82			split stem, unhealthy
34	Jarrah	366830	6226522		14	57			
35	Marri	366843	6226524		15	65			short branch stump, not hollow
36	Jarrah	366846	6226523		14	50			
37	Marri	366847	6226505		13	52			
38	Marri	366853	6226492		16	95			
39	Jarrah	366817	6226490		14	67			
40	Marri	366820	6226484		14	99			small spouts

Map and describe trees greater than mm in diameter				Date:		Observer:			Notes (hollows, bees etc.)
Tree Number	Species	Easting MGA zn50	Northing MGA zn50	Photo Number	Height	Diameter	Second Branch	Third Branch	
41	Marri	366793	6226497		15	117			
42	Jarra	366812	6226459		12	56			
43	Jarra	366839	6226464	11:32	14	89			broken large spout, not hollow
44	Marri	366847	6226472		15	76			
45	Marri	366848	6226439		14	77			
46	Marri	366834	6226447		13	64			
47	Marri	366831	6226444		12	72			
48	Jarra	366809	6226457		13	60			
49	Jarra	366795	6226456		13	50			
50	Marri	366794	6226450		13	54			
51	Marri	366805	6226446	11:44	15	89			small hollow, pointing down
52	Jarra	366807	6226434		14	52			
53	Marri	366826	6226427		15	51			
54	Marri	366821	6226411		15	67			
55	Marri	366822	6226412		13	53			
56	Marri	366829	6226408		15	64			
57	Marri	366831	6226407		12	57			sick
58	Marri	366852	6226380		15	106			
59	Marri	366840	6226389		15	84			
60	Jarra	366830	6226389		10	57	51	30	
61	Marri	366825	6226394		12	60			
62	Marri	366815	6226389		15	89			
63	Marri	366802	6226387		15	88			
64	Jarra	366797	6226394		14	66			
65	Jarra	366801	6226405		13	57			
66	Marri	366811	6226404		17	77			
67	Marri	366860	6226071	12:23	10	78			Tree on proposed accessway extension, 2m from fence
68	Marri	366855	6226052		13	87			
69	Marri	366858	6226061		11	57			
70	Marri	366894	6225963		16	208			

APPENDIX 2
TREE PHOTOS



Taken from water trough facing north (1a) - 312



Taken from water trough facing north towards dam (1b) - 313



From water trough facing south 2a - 314



South facing from water trough in North paddock 2b Pink tape show extent of eastern boundary of airstrip
- 315



Taken from water trough facing south (2c) - 316



Taken from water trough. Tank in the background is 4m from western boundary of airstrip (2d) - 317



Taken from northern fence around bush block facing north (3a) - 319



Taken from middle of paddock north of bush block facing south. (4a) - 320



(4b) - 321



Taken at middle of bush block facing south (6a) - 323



Taken from bush block inline with tree on drive. facing south (7a) - 324



Second tape to right of peppermint saplings shows center of airstrip. (8a) - 325



Peppermint sapplings on southern boundary of bush block facing south (8b) 326



Southern boundary of bush block facing south(8c) 327



southern side of bush block facing south (8d) 328



Bush block southern fence line facing north (9a) 331



Southern internal fence facing south (11a) - 334



Taken from middle of southern internal fence facing north. Middle of airstrip indicated by person and bike (12a) - 335



Taken from middle of southern internal fence facing north. (12b) - 336



12c - 337



Taken from southern most paddock at beginning of tree line facing north(13a) - 339



Taken from southern most paddock at north side of clump of trees on western side of tree grove (14a) - 340



Taken from southern most paddock at north side of clump of trees on western side of tree grove (14b) - 342



Taken from southern boundary fence approx middle of airstrip. (15a) - 343



Taken from southern boundary fence approx middle of airstrip. (15b) - 344



Taken from southern boundary fence approx middle of airstrip. (15c) - 345



Taken from eastern side of southern most grove of trees facing west (16a) - 346



Taken from eastern side of southern most grove of trees facing west (17a) - 347



Taken from eastern boundary of southern side of bush block facing west (18a) - 348



Taken from eastern side southern end of bush block (18b) - 349



Taken from eastern side o bush block facing east. Inline with tree on east side of driveway (19a) - 350



Taken from eastern side o bush block facing east. Inline with tree on east side of driveway (19b) - 351



Taken from eastern boundary from tree on western side of driveway facing west. (21a) - 352



Taken from eastern boundary from tree on western side of driveway facing west. (22a) - 353



Taken from eastern boundary from tree on western side of driveway facing west. (22b) - 354



Taken at roundabout facing west (23a) - 355



From roundabout facing north west (24a) - 356