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## MEMORANDUM TO:

Shire of Denmark
953 South Coast Highway
Denmark 6333

DATE: 21/11/2022
PROJECT: SE2108

# COCKATOO HABITAT ASSESSMENT - SHIRE OF DENMARK LIGHTS ROAD UPGRADE

## SUMMARY


- Road upgrades are proposed on a 1.25 km section of Lights Road in Shire of Denmark for purposes of traffic safety improvements that may involve the removal of up to 28 native trees.
- An assessment was undertaken (by Southern Ecology and Shire of Denmark personnel) on the 16th November 2022 to determine the suitability of the trees as habitat for Black Cockatoos, as a follow-up from the findings of a broader fauna habitat assessment of the site area, as requested by Department of Water and Environmental Regulation (DWER).
- Nine (9) potential breeding trees were recorded (ie. diameter at breast height (DBH) ≥ 500 mm) comprising of the tree species *Corymbia calophylla* (4), *Eucalyptus marginata* (3) 2 live, 1 dead) and *E. diversicolor* (2).
- Within the assessed area, 23 trees are suitable foraging species of Black Cockatoo, which comprise a total of 1,767.9 m2.
- No hollows suitable for cockatoo breeding were present.
- No individuals, feeding evidence or apparent roosting trees were observed during the assessment.

## BACKGROUND

Lights Road is identified as a road of significance with a higher volume of traffic particularly during peak tourism periods. Currently it is only a one-way windy road with blind corners and limited opportunities to pullover; with significant sized trees located close to the road edge. It is also used by heavy vehicles and is on a school bus route.

The Shire of Denmark submitted an application to Department of Water and Environmental Regulation (DWER) on 28/07/2022 to clear up to 0.715 ha of native vegetation including a maximum of 32 trees along a 1.25 km section of Lights Road for purposes of widening between 4-6 m to improve traffic safety. The Shire has since amended the road construction plans in order to reduce and minimise the amount of native vegetation clearing required from 32 trees to a maximum of 28 trees.

The Shire received notification that the clearing permit application was accepted for assessment on 31/08/2022. Verbal correspondence between the Shire and DWER suggested a fauna habitat assessment be undertaken which was conducted in-house and provided in the form of a report to DWER on 02/11/2022. The Shire was then notified on 10/11/2022 that subsequent to the fauna habitat assessment, additional information be required to be obtained in regards Black Cockatoo habitat specifically to confirm evidence of hollows.

A black cockatoo habitat assessment has therefore been undertaken, engaging the services of environmental consultancy Southern Ecology Principal Ecologist [redacted] in collaboration with Shire staff conducted on 16th November 2022.

[redacted] - Southern Ecology (Principal Ecologist)
[redacted] - Manager Technical Services
[redacted] - Sustainability Officer
16/11/2022

# METHOD

## Habitat Assessment - Black Cockatoo species (Carnaby's Cockatoo (*Calyptorhynchus latirostris)* (T-EN); Baudin's Cockatoo (*Calyptorhynchus baudinii)* (T-EN); and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (T-VU)

Breeding, foraging and roosting habitat was assessed in accordance with the Environmental Protection Biodiversity Conservation Act (EPBCA) Referral guidelines for the three threatened Black Cockatoo species (Table 1). (Department of Sustainability, Environment, Water, Populations and Communities (DSEWPaC, 2012). This included:

- recording the species, location, number, and behaviour of any observed Black Cockatoos;
- recording the number, location and species of breeding trees above or equal to a diameter at breast height (DBH) of 500 mm;
- the presence and extent of potential and known foraging habitat (identification of areas with known feeding species and observations of feeding evidence);
- notes on whether trees contain hollows;
- and the presence and extent of potential roosting habitat.

The survey timing coincided with the use of hollows by nesting cockatoos and hollow assessments were undertaken from ground level only. No additional assessments (i.e., drone, pole camera or tree climber) were considered necessary as all trees could be adequately assessed for cockatoo breeding suitability from ground level.

Two photographs were taken of each individual tree (numbered from the northern end); one photograph oblique, from the perspective along the roadside (marked as 'a'), and one looking up the trunk of each tree to depict the canopy (marked as 'b'). These are depicted below in Appendix B.

# RESULTS

## Breeding Habitat of Black Cockatoo (inc. three species)

The survey area occurs within the known distribution and predicted breeding range of Carnaby's Cockatoo and Baudin's Cockatoo. Forest Red-tailed Black Cockatoo are known to occur and may breed in suitable trees anywhere within their range of occurrence (DSEWPaC, 2012). Breeding sites for Baudin's Cockatoo are known within 10 km of the survey area.

In total, nine (9) potential breeding trees were recorded (DBH ≥ 500 mm) comprising of the tree species *Corymbia calophylla* (4), *Eucalyptus marginata* (2 live, 1 dead) and *E. diversicolor* (2) (Figure 1). The trees were generally too immature (< 50 years old) to form hollows suitable for Black Cockatoos. No hollows with openings greater than 100 mm were be observed from ground level. All trees could be adequately assessed from ground level and no further assessment for cockatoo breeding suitability is required.

## Feeding Habitat of Black Cockatoo (inc. three species)

Field recording of feeding evidence by Black Cockatoos was done in a single traverse of the survey area. No recent evidence of feeding (i.e., chewed nuts or species presence) was observed on/under any of the assessed trees. No individual Black Cockatoos were observed or heard during the brief assessment.

Any area within the range of the Black Cockatoos that contains known food plant species is considered to be potential foraging habitat for the species (DSEWPaC, 2012). Consequently, the survey area is deemed to contain suitable foraging habitat for each species as tabulated below (Table 1). On a local scale, a large extent of forest dominated by *Eucalyptus marginata* and *Corymbia calophylla* (high-quality foraging habitat) is contiguous to the survey area (Figure 2).

**Table 1. Foraging habitat for Black Cockatoo Species (Carnaby's Cockatoo (*Calyptorhynchus latirostris*) (T-EN); Baudin's Cockatoo (*Calyptorhynchus baudinii*) (T-EN); and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (T-VU) within the survey area. Determined using canopy cover of potentially impacted individual trees (Appendix A).**

| Taxon | Food plants | Area ($m^2$) |
|---|---|---|
| Black Cockatoo (all three species) | *Eucalypts* marginata and *Corymbia calophylla* | 1,634.4 |
| Forest Red-tailed Black Cockatoo only | *Allocasuarina decussata* | 133.5 |
| | **Total:** | **1,767.92** |

## Roosting Habitat of Black Cockatoo (inc. three species)

Potential roosting habitat for all three species of Black Cockatoo could occur within the survey area due to the close proximity of foraging and water sources (including dams). However, most trees assessed in survey area were in the 'sub-canopy' and many larger and more suitable roosting trees occur adjacent to the survey area. No evidence of roosting was observed within the survey area.

## REFERENCES

Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC] (2012) *Referral guidelines for three species of Western Australian black cockatoos.*

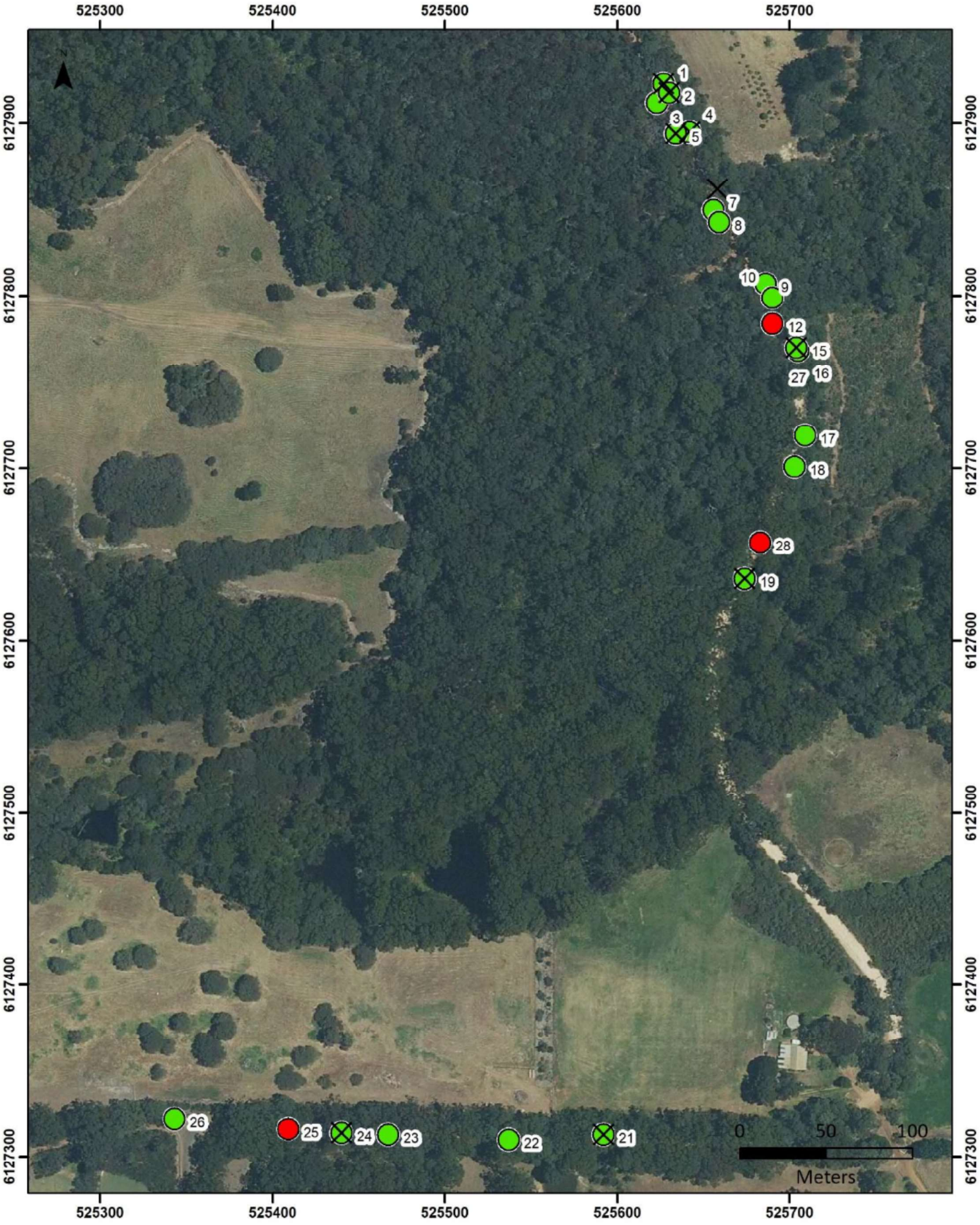


**Figure 1: Black Cockatoo Potential Breeding and Foraging Trees, Lights Road, Denmark**

Tree No corresponds with report Appendix A. Map produced by [redacted] on 16/11/2022.
Map Projection: Transverse Mercator Horizontal Datum GDA 1994 Grid: MGA Zone 50 Map Size: A4


southern ecology
FLORA | FAUNA | HABITAT
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- Black Cockatoo (inc. three species) Potential Breeding Tree (DBH > 500 mm)
- Black Cockatoo (inc. three species) Foraging - Eucalypts and *Corymbia* Alive trees only
- Black Cockatoo (Forest Red-tailed Black Cockatoo Only) Foraging - *Allocasuarina decusatta*

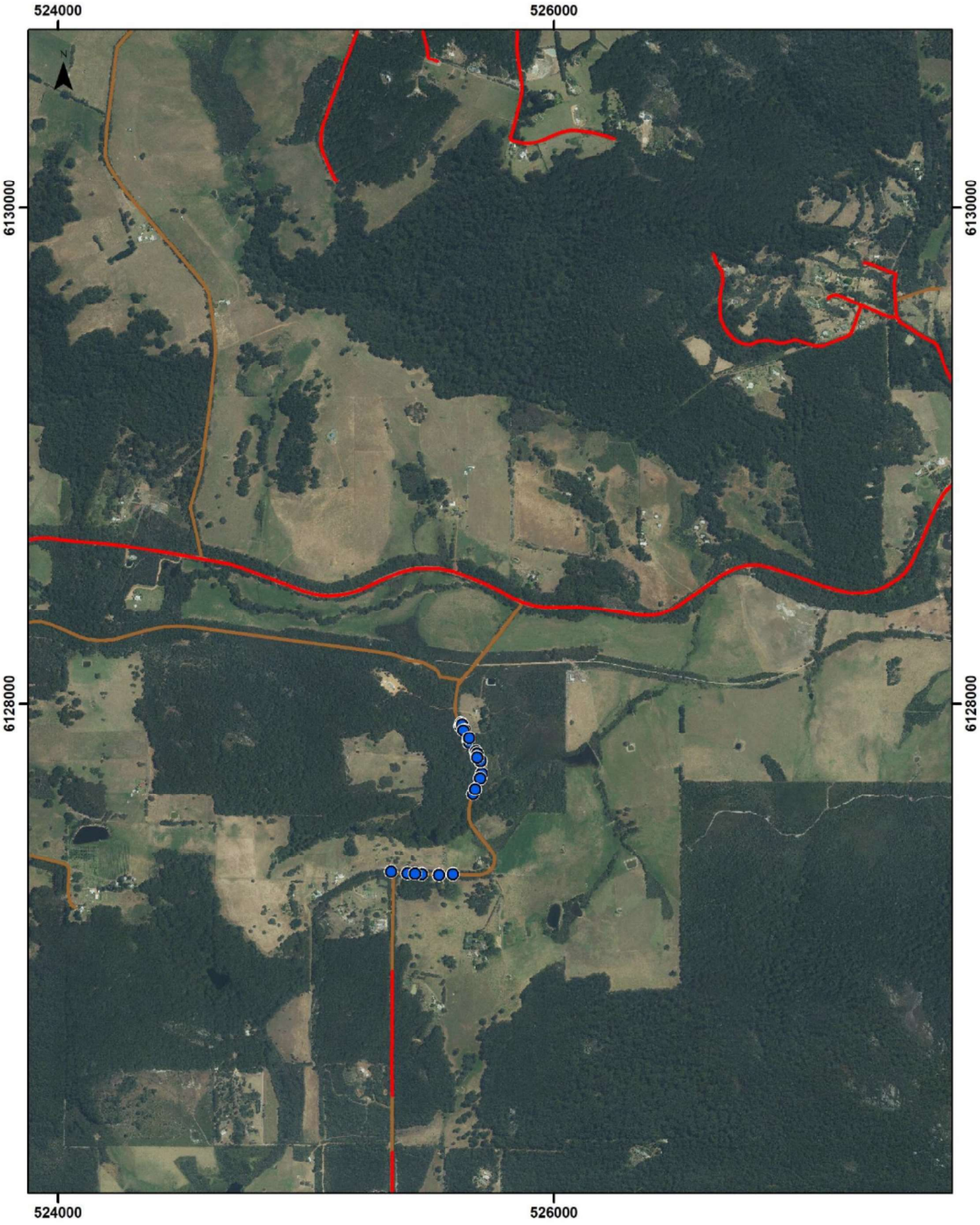


**Figure 2: Local Context of Black Cockatoo Habitat, Lights Road, Denmark**

Map produced by [redacted] on 16/11/2022.
Map Projection: Transverse Mercator Horizontal Datum GDA 1994 Grid: MGA Zone 50 Map Size: A4

[redacted] | Ecologist
E: [redacted]
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Black Cockatoo Habitat Assessment - Individual Trees
Sealed Roads
Unsealed Roads

0 250 500
Meters

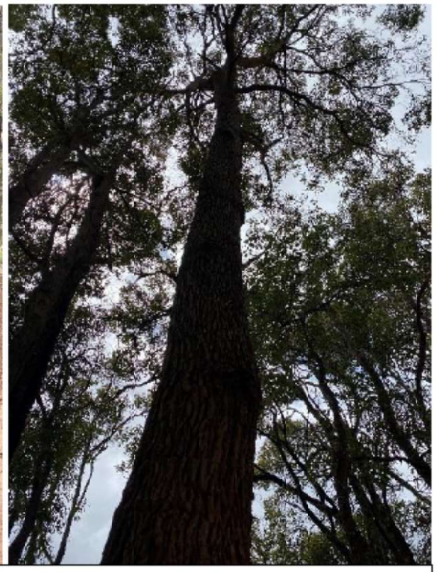
# APPENDIX A - FIELD DATA

| Tree No | Trunk No | Road Side | Taxon | Ht (m) | DBH (mm) | LIFE STAGE | canopy COVER (Diameter m) | CANOPY SPREAD (m2) | BREEDING SIZE (Y/N) | HOLLOWS(Y/N) | ROOSTING (Y/N) | FORAGING (Y/N) | COMMENTS | EASTINGS | NORTHINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | L | *Corymbia calophylla* (Marri) | 30-40 | 740 | Mature | 12 | 113.1 | Y | N | N | Y | evidence of canker | 525627 | 6127923 |
| 2 | | L | *Corymbia calophylla* (Marri) | 30-40 | 620 | Mature | 14 | 153.9 | Y | N | N | Y | healthy | 525630 | 6127918 |
| 3 | | R | *Eucalyptus marginata* (Jarrah) | 30-40 | 240 | Immature | 7 | 38.5 | N | N | N | Y | unhealthy - due to rubbing from adjacent tree | 525623 | 6127912 |
| 4 | | R | *Corymbia calophylla* (Marri) | 30-40 | 740 | Mature | 14 | 153.9 | Y | N | N | Y | 20% canopy loss due to Jarrah under same canopy space | 525642 | 6127895 |
| 5 | | L | *Eucalyptus marginata* (Jarrah) | 30-40 | 580 | Mature | 12 | 113.1 | Y | N | N | Y | healthy | 525634 | 6127894 |
| 6 | A | L | *Eucalyptus marginata* (Jarrah) | 30-40 | 530 | Dead | 8 | | Y | N | N | N | double trunk | 525658 | 6127862 |
| 6 | B | L | *Eucalyptus marginata* (Jarrah) | 30-40 | <500 | Dead | | | N | N | N | N | second stem (inc. in trunk A canopy) | 525658 | 6127862 |
| 7 | | R | *Eucalyptus marginata* (Jarrah) | 30-40 | 250 | Immature | 6 | 28.3 | N | N | N | Y | healthy | 525656 | 6127850 |
| 8 | A | R | *Eucalyptus marginata* (Jarrah) | 30-40 | 370 | Mature | 12 | 113.1 | N | N | N | Y | double trunk - healthy | 525659 | 6127843 |
| 8 | B | R | *Eucalyptus marginata* (Jarrah) | 30-40 | 330 | Mature | | | N | N | N | Y | second stem (inc. in trunk A canopy) | 525659 | 6127843 |
| 9 | | L | *Corymbia calophylla* (Marri) | 30-40 | 460 | Mature | 8 | 50.3 | N | N | N | Y | healthy | 525686 | 6127807 |
| 10 | A | L | *Corymbia calophylla* (Marri) | 30-40 | 470 | Senescing | 9 | 63.6 | N | N | N | Y | double trunk; extensive damage sustained | 525690 | 6127799 |
| 10 | B | L | *Corymbia calophylla* (Marri) | 30-40 | 460 | Senescing | | | N | N | N | Y | second stem - unhealthy (inc. in trunk A canopy) | 525690 | 6127799 |
| 11 | | R | *Allocasuarina decussata* (Sheoak) | 20 | 400 | Dead | | | N | N | N | N | exclude from canopy cover | 525690 | 6127782 |
| 12 | | R | *Allocasuarina decussata* (Sheoak) | 20 | 600 | Mature | 9 | 63.6 | N | N | N | Y(RT) | foraging for red-tailed cockatoos only | 525690 | 6127784 |
| 13 | | L | *Eucalyptus marginata* (Jarrah) | 30-40 | 190 | Dead | | | N | N | N | N | exclude from canopy cover | 525701 | 6127775 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | L | *Eucalyptus marginata* (Jarrah) | 30-40 | 360 | Dead | | | N | N | N | N | damage sustained - exclude from canopy cover | 525702 | 6127772 |
| 15 | | L | *Eucalyptus marginata* (Jarrah) | 30-40 | 510 | Mature | 7 | 38.5 | Y | N | N | Y | healthy | 525704 | 6127770 |
| 16 | | L | *Corymbia calophylla* (Marri) | 30-40 | 410 | Mature | 3 | 7.1 | N | N | N | Y | 80% unhealthy canopy cover | 525705 | 6127768 |
| 27 | | L | *Eucalyptus marginata* (Jarrah) | 30-40 | 200 | Mature | 4 | 12.6 | N | N | N | Y | healthy | 525705 | 6127768 |
| 17 | | L | *Corymbia calophylla* (Marri) | 30-40 | 400 | Mature | 10 | 78.5 | N | N | N | Y | rubbing against karri | 525709 | 6127719 |
| 18 | | L | *Corymbia calophylla* (Marri) | 30-40 | 420 | Mature | 8 | 50.3 | N | N | N | Y | healthy | 525703 | 6127701 |
| 28 | | L | *Allocasuarina decussata* (Sheoak) | 20 | <500 | Mature | 8 | 50.3 | N | N | N | Y(RT) | foraging for red-tailed cockatoos only | 525683 | 6127657 |
| 19 | | L | *Eucalyptus diversicolor* (Karri) | 40-50 | 720 | Mature | 22 | 380.1 | Y | N | N | Y | healthy | 525674 | 6127636 |
| 20 | | R | *Callistachys lanceolata* (Wonnich) | 10 | 300 | Mature | | | N | N | N | N | removal required due to drainage, not Cockatoo habitat | 525670 | 6127497 |
| 21 | | R | *Corymbia calophylla* (Marri) | 30-40 | 530 | Mature | 6 | 28.3 | Y | N | N | Y | damaged at trunk base | 525592 | 6127313 |
| 22 | | L | *Corymbia calophylla* (Marri) | 30-40 | 420 | Mature | 4 | 12.6 | N | N | N | Y | damage sustained | 525537 | 6127310 |
| 23 | | L | *Corymbia calophylla* (Marri) | 30-40 | 310 | Immature | 3 | 7.1 | N | N | N | Y | minimal canopy cover | 525467 | 6127313 |
| 24 | | L | *Eucalyptus diversicolor* (Karri) | 40-50 | 600 | Mature | 12 | 113.1 | Y | N | N | Y | minimal canopy cover | 525440 | 6127314 |
| 25 | | L | *Allocasuarina decussata* (Sheoak) | 20 | 350 | Mature | 5 | 19.6 | N | N | N | Y(RT) | foraging for red-tailed cockatoos only | 525409 | 6127316 |
| 26 | | R | *Corymbia calophylla* (Marri) | 30-40 | 410 | Mature | 10 | 78.5 | N | N | N | Y | healthy | 525343 | 6127322 |

## APPENDIX B – TREE PHOTOS

Tree ID: 1a



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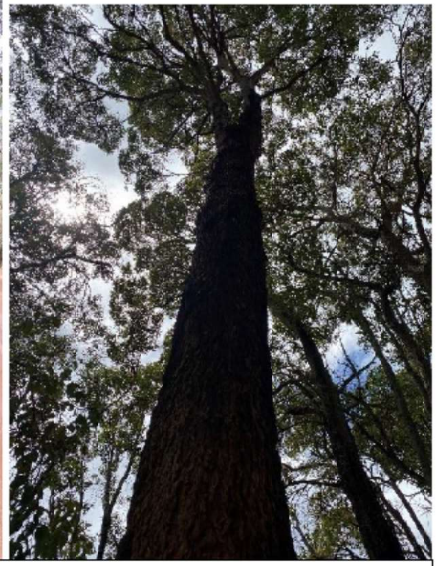

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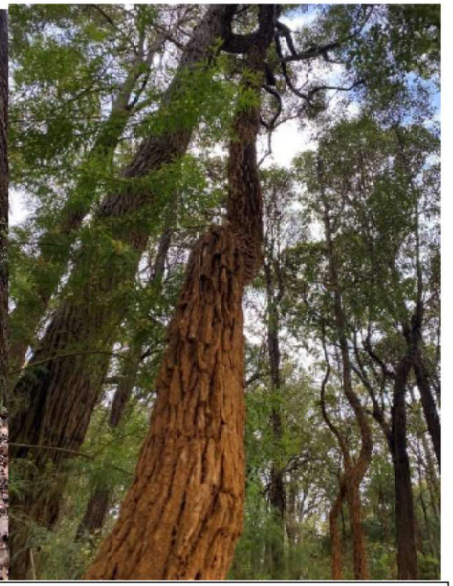
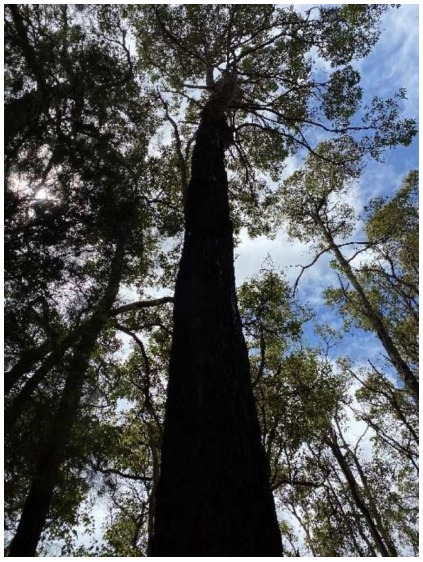


Tree ID: 3b

Tree ID: 4a

Tree ID: 4b

Tree ID: 5a



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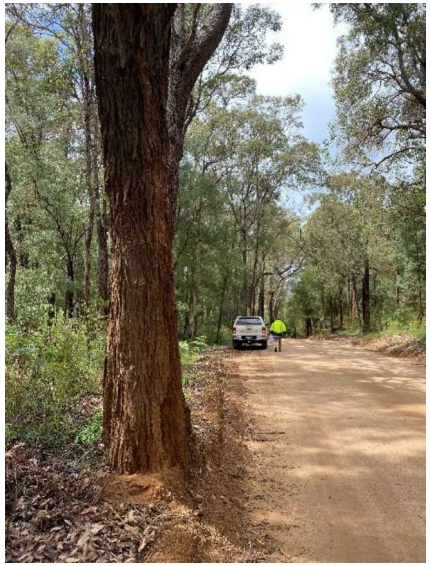

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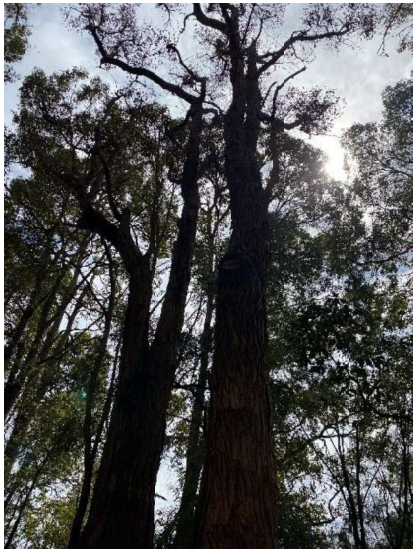

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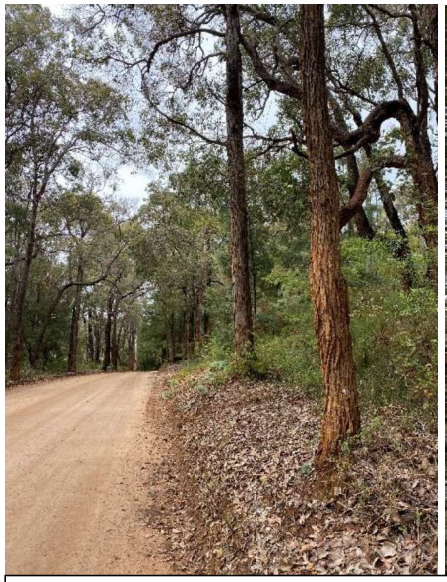

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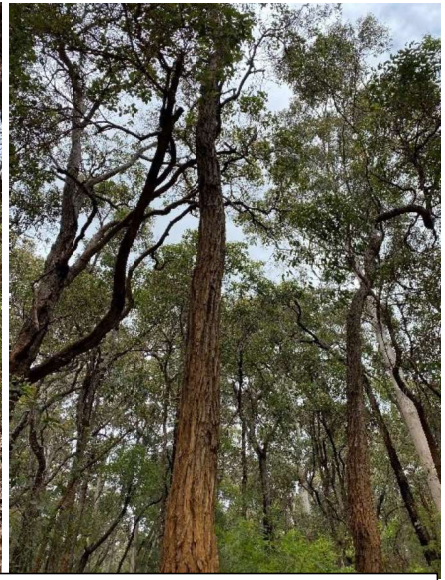


Tree ID: 7b

Tree ID: 8a

Tree ID: 8b

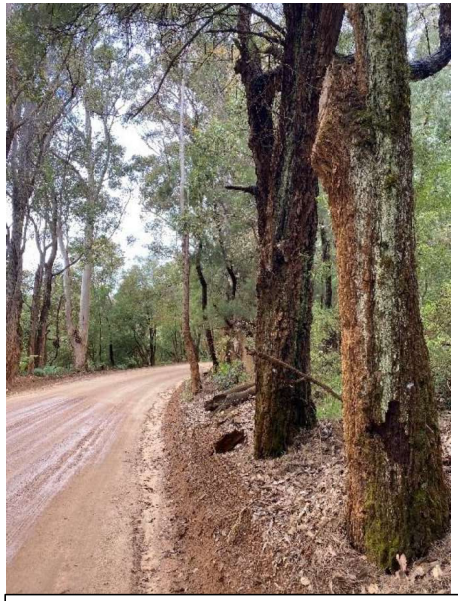
Tree ID: 9a

Tree ID: 9b

Tree ID: 10a

(sustained damage)

Tree ID: 10b



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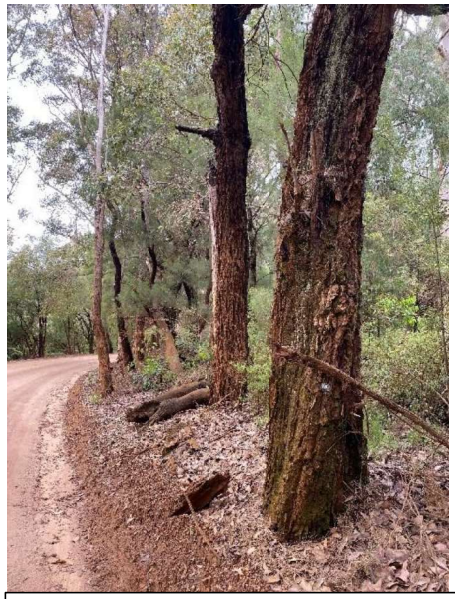

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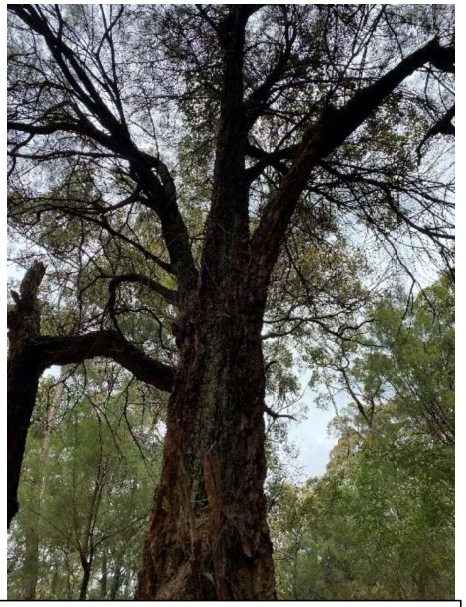

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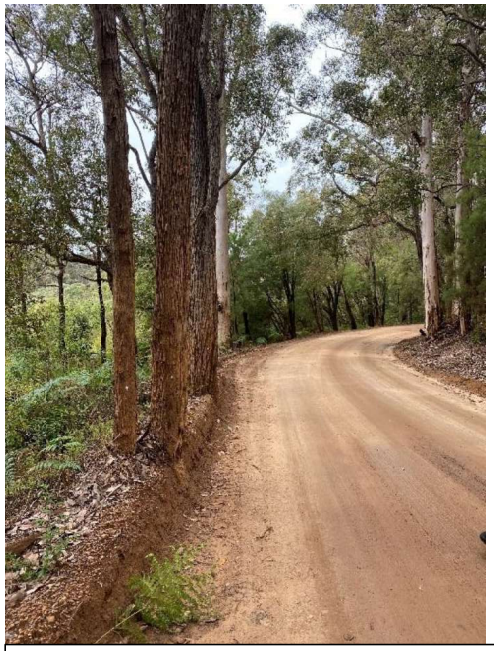

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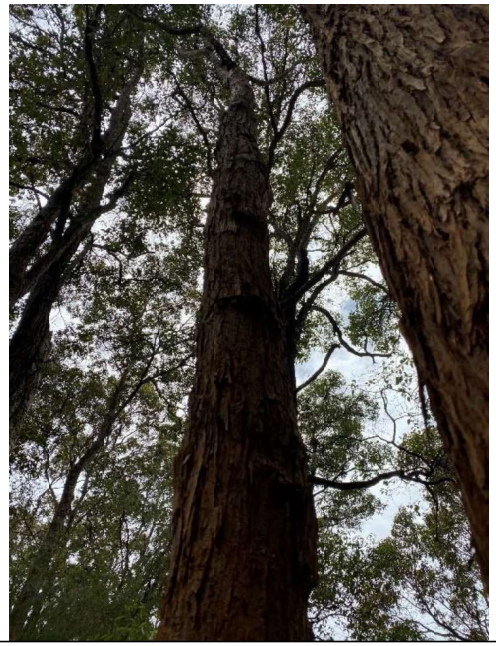

Tree ID: 13b

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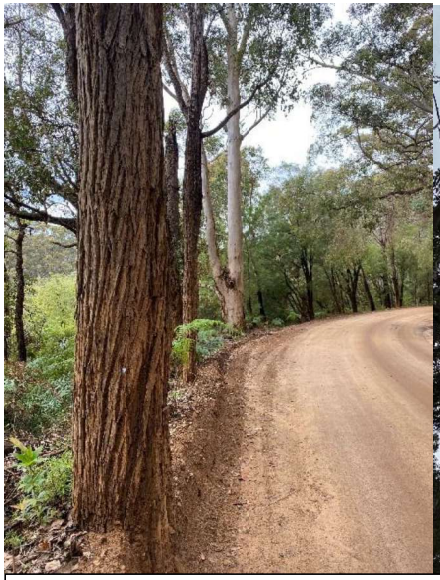

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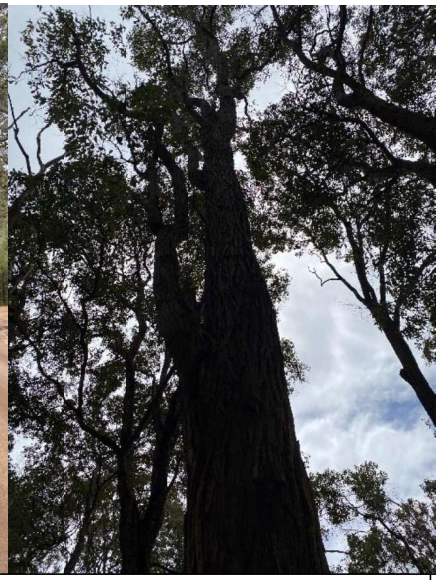

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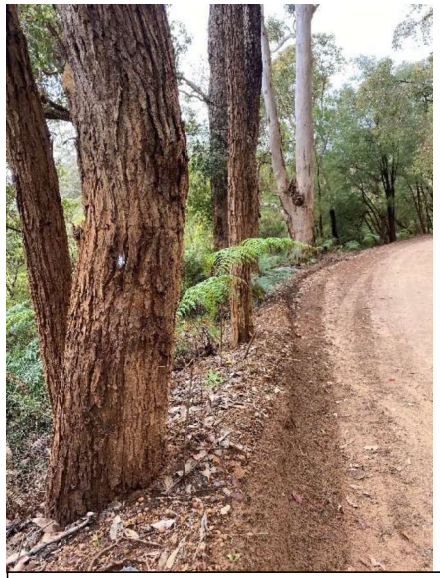

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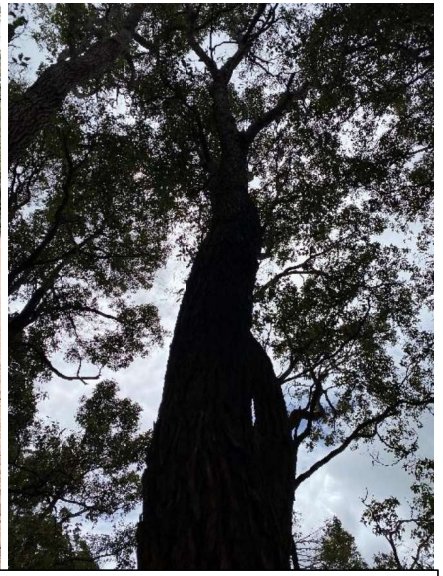

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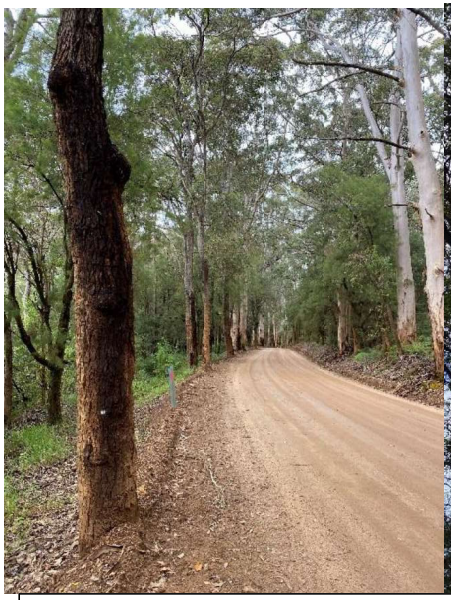

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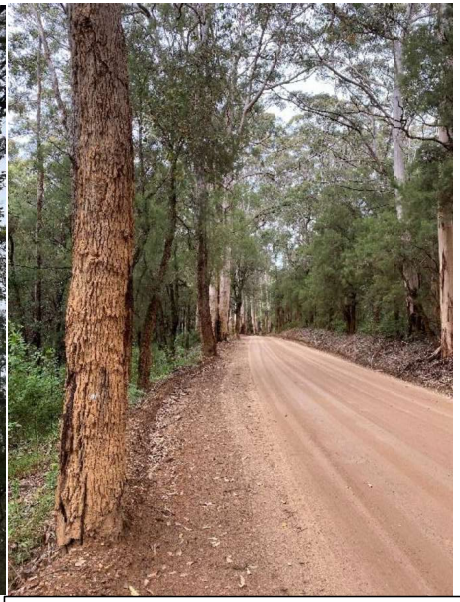

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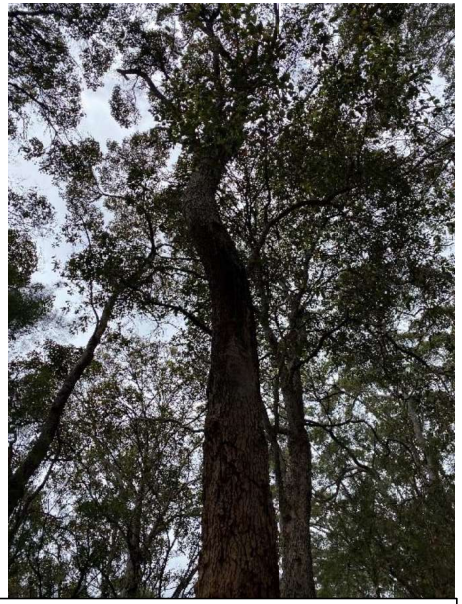

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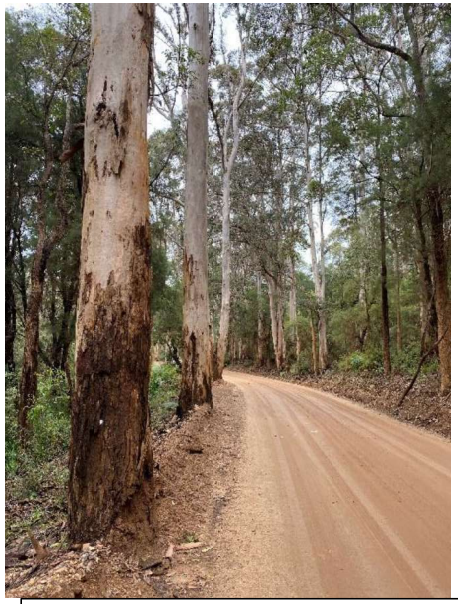

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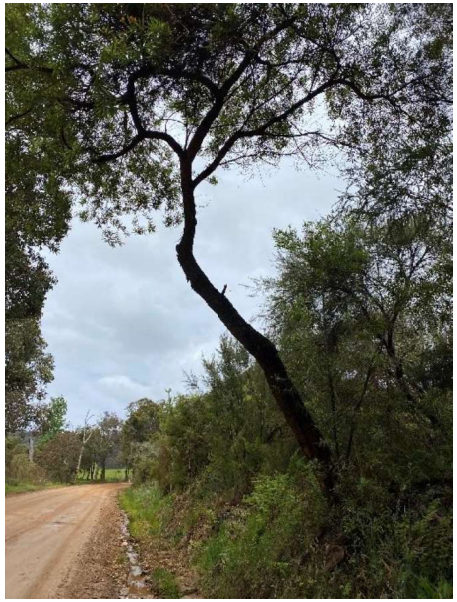

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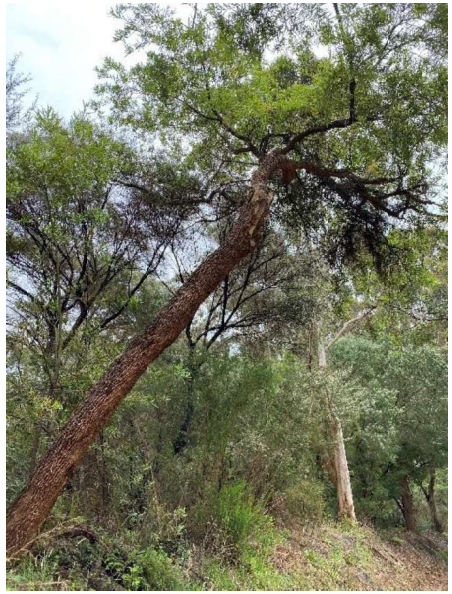
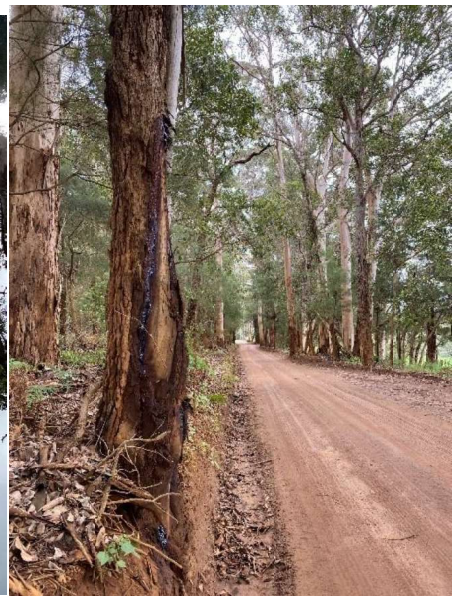


Tree ID: 20b

Tree ID: 21a

Tree ID: 21b



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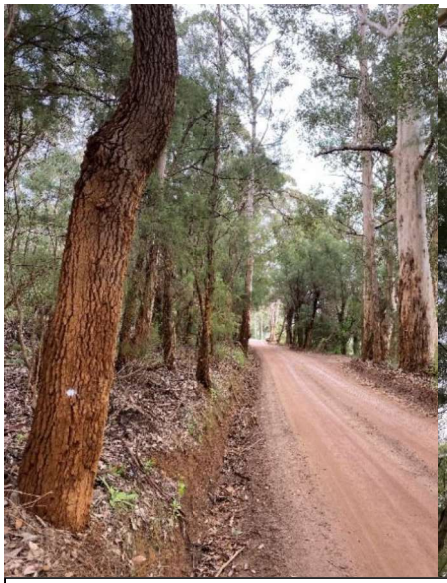
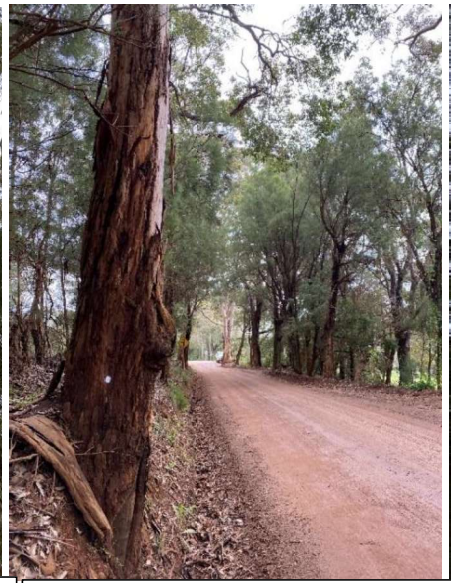
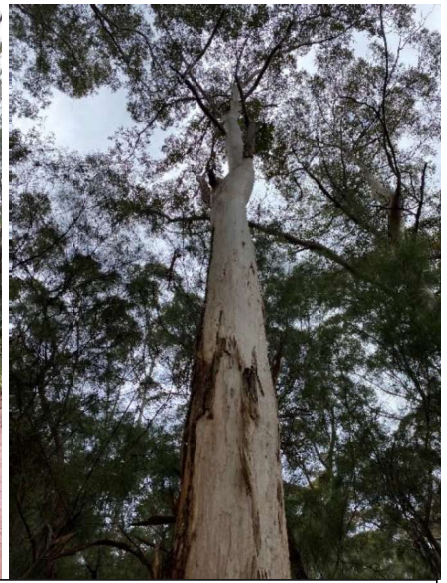


Tree ID: 23a

Tree ID: 23b



Tree ID: 24a



Tree ID: 24b

Tree ID: 25a

Tree ID: 25b

Tree ID: 26a

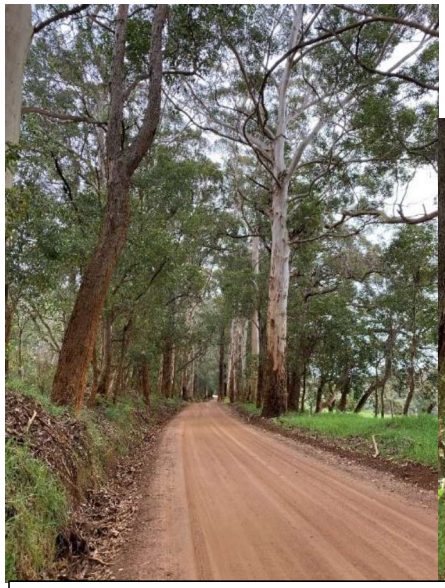
Tree ID: 26b

Tree ID: 27a

Tree ID: 27b

Tree ID: 28a

Tree ID: 28b

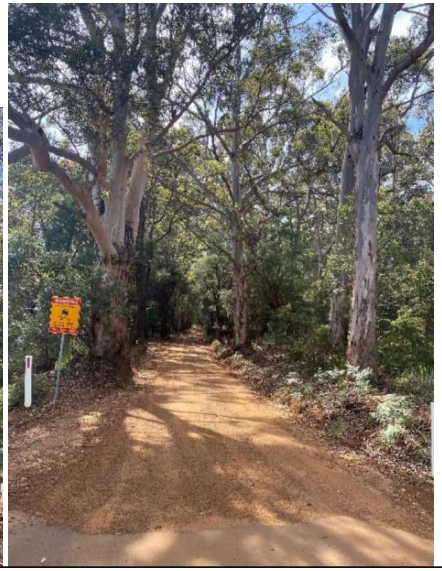


Lights Road northern section

Lights Road bend

Lights Rd verge and neighbouring bush

Lights Road southern end



Lights Rd where seal meets gravel southern end