



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

### PERMIT DETAILS

Area Permit Number: 8852/1

File Number: DWERVT5590

Duration of Permit: From 3 December 2020 to 3 December 2032

### PERMIT HOLDER

Mr Michael Hair

### LAND ON WHICH CLEARING IS TO BE DONE

Lot 12378 on Deposited Plan 206991, Frankland River

### AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 2.58 hectares of native vegetation within the area cross-hatched yellow on attached Plan 8852/1a.

### PERIOD DURING WHICH CLEARING IS AUTHORISED

The Permit Holder shall not clear any native vegetation after 3 December 2022.

### CONDITIONS

#### 1. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

- (a) avoid the clearing of native vegetation;
- (b) minimise the amount of native vegetation to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

#### 2. Clearing not authorized

This Permit does not authorise the Permit Holder to clear any tree with a diameter of 500 millimetres or more at breast height at the locations specified in Table 1.

**Table 1**

Latitude	Longitude
-34.2335583	116.8516017
-34.2331567	116.8513467
-34.2327933	116.85155
-34.23197	116.851225
-34.232025	116.8508267
-34.232015	116.8506367
-34.2320633	116.8503033
-34.23258	116.85131
-34.23248	116.85147
-34.23237	116.85166

### 3. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known dieback or weed-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

### 4. Fauna management - black cockatoo nesting trees

The Permit Holder shall not clear the *black cockatoo nesting trees* at the locations specified in Table 2 during the *breeding season* for *black cockatoos*.

Table 2

Latitude	Longitude
-34.2339	116.851795
-34.2318733	116.8498033

### 5. Fauna management – artificial black cockatoo nest hollows

- (a) Within three months of clearing of the *black cockatoo nesting trees* at the locations specified in Table 2, and before the following *breeding season*, the Permit Holder shall install two artificial black cockatoo nest hollows within one of the areas cross-hatched red on attached Plan 8852/1b;
- (b) The artificial black cockatoo nest hollows required by condition 5(a) of this Permit must:
  - (ii) be designed and placed in accordance with the guidelines provided in Schedule 1 to this Permit; and
  - (iii) be monitored and maintained in accordance with the guidelines provided in Schedule 2 to this Permit, for a period of at least ten years.

### 6. Records must be kept

The Permit Holder must maintain the following records for activities done in pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
  - (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
  - (ii) the date that the area was cleared; and
  - (iii) the size of the area cleared (in hectares);
  - (iv) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 1 of this Permit;
  - (v) actions taken to avoid the clearing of any tree with a diameter of 500 millimetres or more at breast height in accordance with condition 2 of this permit;
  - (vi) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 3 of this Permit; and
  - (vii) the date the *black cockatoo nesting trees* at the locations specified in Table 2 were cleared.
- (b) In relation to the installation of artificial *black cockatoo* nest hollow pursuant to condition 5 of this Permit:
  - (i) the date(s) the artificial *black cockatoo* nest hollows were installed;
  - (ii) the locations at which the artificial *black cockatoo* nest hollows were installed recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
  - (iii) photos of the installed artificial *black cockatoo* nest hollows;
  - (iv) the date(s) the artificial *black cockatoo* nest hollows installed were monitored;

- (v) a description of the monitoring methods employed for the artificial *black cockatoo* nest hollows installed;
- (vi) a description of the monitoring observations for the artificial *black cockatoo* nest hollows installed;
- (vii) the date(s) the artificial *black cockatoo* nest hollows installed were maintained; and
- (viii) a description of the maintenance activities undertaken for the artificial *black cockatoo* nest hollows installed.

## 7. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
  - (i) of records required under condition 6 of this Permit; and
  - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 3 September 2032, the Permit Holder must provide to the *CEO* a written report of records required under condition 6 of this Permit where these records have not already been provided under condition 7(a) of this Permit.

## DEFINITIONS

The following meanings are given to terms used in this Permit:

**black cockatoo(s)** means Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*);

**black cockatoo nesting tree/s** means trees that have a diameter, measured at 1.5 metres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *Euclayptus salmonophloia* or *Eucalyptus wandoo*) that contain hollows suitable for nesting by Carnaby's cockatoo, Baudin's cockatoo or forest red-tailed black cockatoo;

**breeding season** means the period from 1 June to 29 February of any given year;

**CEO:** means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

**dieback** means the effect of *Phytophthora* species on native vegetation;

**fill** means material used to increase the ground level, or fill a hollow;

**mulch** means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

**weed/s** means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
- (b) published in a Department of Biodiversity, Conservation and Attractions Regional Weed Rankings Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.




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Meenu Vitarana  
A/MANAGER  
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20  
of the Environmental Protection Act 1986*

9 November 2020



## How to design and place artificial hollows for Carnaby's cockatoo

Artificial hollows can be used to help conserve the threatened Carnaby's cockatoo by enabling the cockatoos to breed in areas where natural hollows are limited.

A wide variety of artificial hollow designs have been used with mixed success. Evidence suggests that, while the hollow must meet some basic requirements, other factors such as proximity to existing breeding areas may be more important in determining the success of artificial hollows. Before using this information sheet to construct or install an artificial hollow, you should refer to the criteria listed in the separate information sheet; *When to use artificial hollows for Carnaby's cockatoo*.

This information sheet contains broad guidelines for the design and placement of artificial hollows for Carnaby's cockatoo.

Below are three examples of successful artificial hollows used by Carnaby's cockatoo for nesting. Artificial hollows made from a natural log with cut side entrance (left), white industrial pipe with top entrance (centre) and natural log with natural side entrance (right).



Photos by Christine Groom (left and right) and Rick Dawson (centre)

## Walls

The walls of the artificial hollow need to be constructed from a material that is;

- Durable enough to withstand exposure to elements for an extended period of time (i.e. 20+ years).
- Able to simulate the thermal properties of a natural tree hollow.
- Not less than 380 mm in internal diameter.
- Preferably 1.2 m deep overall and 1m deep to top of substrate/nesting material.

Successful artificial hollows have been constructed from sections of salvaged natural hollow, black and white industrial pipe. When using non-natural materials care must be taken to ensure there are no toxic residues and that the materials are safe to ingest.

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## Base

The base of the artificial hollow must be;

- Able to support the adult and nestling(s).
- Durable enough to last the life of the nest.
- Free draining.
- At least 380 mm in diameter.
- Covered with 200 mm of sterile, dry, free draining material such as charcoal, hardwood woodchips or wood debris.

### Do not use:

- Saw dust or fibre products that will retain moisture.

Example materials that could be used for artificial hollow bases include heavy duty stainless steel, galvanised or treated metal (e.g. Zinalume ®), thick hardwood timber slab or marine ply (not chipboard or MDF). The base material must be cut to size to fit internally with sharp or rough edges ground away or curled inwards and fixed securely to the walls.



Carnaby's cockatoo eggs in an artificial hollow.  
*Photo by Rick Dawson*

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## Entrance

The entrance of the artificial hollow must;

- Have a diameter of at least 270 mm).
- Preferably be top entry which will minimise use by non-target species.

Top entry hollows are unattractive to nest competitors such as feral bees, galahs and corellas. Side entry hollows have been successful in areas where feral bees are not a problem and where galahs and corellas are deterred.

## Ladder

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide a ladder to enable the birds to climb in and out of the hollow easily.

The ladder must be;

- Securely mounted to the inside of the hollow.
- Made from an open heavy wire mesh such as WeldMesh™ with mesh size of 30 - 50 mm, or heavy chain.

### Do not use:

- A material that the birds can chew.
- Galvanized because the birds may grip or chew the ladder and ingest harmful compounds.

If using mesh for the ladder, the width will depend on the curvature of the nest walls. A minimum width of about 60 - 100 mm is recommended.

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## Sacrificial chewing posts

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide sacrificial chewing posts. The birds chew material to prepare a dry base on which to lay their egg(s).

The sacrificial chewing posts must:

- Be made of untreated hardwood such as jarrah, marri or wandoo
- Be thick enough to satisfy the birds' needs between maintenance visits.
- Extend beyond the top of the hollow as an aid to see whether the nest is being used.
- Be placed on the inside of the hollow.
- Be attached in such a way that they are easy to replace e.g. hook over the top of hollow or can slide in/out of a pair of U bolts fitted to the side of the hollow.

It is recommended that at least two posts are provided. Posts 70 x 50 mm have been used, but require replacing at least every second breeding season when the nest is active. Birds do vary in their chewing habits and therefore the frequency at which the chewing posts require replacement will also vary.



Bottom of an artificial hollow showing ladder that is fixed to the wall and a chewed sacrificial post which is 200 mm from the floor.

*Photo by Rick Dawson*

## Mountings

The artificial hollows must be mounted such that:

- The fixings used will last the duration of the nest e.g. galvanized bracket or chain fixed with galvanized coach screws.
  - It is secured by more than one anchor for security and stability.
  - It is positioned vertically or near vertically.
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## **Placement**

Sites should be chosen within current breeding areas and where they can be monitored, but preferably not conspicuous to the general public. It is important that artificial hollows are placed where they will be accessible for future monitoring and maintenance. For more detail refer to the separate information sheet; *When to use artificial hollows for Carnaby's cockatoo*.

The height at which artificial hollows should be placed is variable. The average height of natural hollows in dominant tree species in the area is a good guide. Natural hollows used by Carnaby's cockatoos have been recorded as low as 2 m above the ground. If located on private property the hollows can be placed lower to the ground so they are accessible by ladder or a rope and pulley system can be used. Where public access is possible artificial hollows should be placed at least 7 m high (i.e. higher than most ladders) and on the side of the tree away from public view to reduce the chance of interference or poaching.

Carnaby's cockatoo show no preference for aspect of natural hollows, however, it may still be beneficial to place artificial hollows facing away from prevailing weather and where they receive the most shade and protection.

Artificial hollows to be placed in trees require:

- Accessibility of the tree for a vehicle, elevated work platform or cherry picker.
- A section of trunk 2-3 m long suitable for attaching the hollow

If necessary, artificial hollows may be placed on poles, but this may result in excessive exposure to sun during very hot weather. When erected on poles there should be"

- A hinge at the bottom of the pole that can be secured when the pole is in the upright position.
- Access for a vehicle to assist raising the pole.

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## **Safety**

Care needs to be taken when placing artificial hollows to ensure safety is considered at all times. Artificial hollows are heavy and require lifting and manoeuvring into position up to 7 m above the ground.

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## **Maintenance and monitoring**

Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoo. It is important to monitor artificial hollows to determine use by Carnaby's cockatoo, other native species as well as pest species. By undertaking monitoring the success of the design and placement of artificial hollows can be determined and areas for improvement identified for future placement of artificial hollows.

Monitoring can also assess whether any maintenance is required. Without regular maintenance artificial hollows are unlikely to achieve their objective (that is, they will fail to provide nesting opportunities for threatened cockatoos). Therefore it is important to continue a regime of regular maintenance while the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available.

For further advice on monitoring and maintenance of artificial hollows please refer to the separate information sheet; *How to monitor and maintain artificial hollows for Carnaby's cockatoo*.



Carnaby's cockatoo female prospecting an artificial hollow.  
*Photo by Rick Dawson*



Example fixing for artificial hollow  
*Photo by Christine Groom*

### **Acknowledgements**

This information sheet is a joint initiative of Birdlife Australia, the Western Australian Museum and the Department of Parks and Wildlife. Many individuals have contributed to its preparation. Special acknowledgement is made for the contributions of Ron Johnstone from the WA Museum, Alan Elliott from the Serpentine-Jarrahdale Land care Centre and Denis Saunders. This updated version was compiled by Rick Dawson (Department of Parks and Wildlife).

### **Other information sheets in the series: Artificial hollows for Carnaby's cockatoo**

- *How to design and place artificial hollows for Carnaby's cockatoo*
- *How to monitor and maintain artificial hollows for Carnaby's cockatoo*

Information sheets available on the *Saving Carnaby's cockatoo* webpage:

<http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals/208-saving-carnaby-s-cockatoo>

#### **Further information**

Last updated 28/04/2015

Contact [fauna@dpaw.wa.gov.au](mailto:fauna@dpaw.wa.gov.au) or your local office of the Department of Parks and Wildlife

See the department's website for the latest information: [www.dpaw.wa.gov.au](http://www.dpaw.wa.gov.au)

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## How to monitor and maintain artificial hollows for Carnaby's cockatoo

It is important to monitor and maintain artificial hollows after they have been erected. Monitoring ensures that the effectiveness of the artificial hollow can be determined. It also means that problems with pest species or any maintenance requirements can be identified and resolved.

Without regular maintenance, artificial hollows are likely to fail to achieve their objective (that is, they will fail to provide nesting opportunities for threatened cockatoos). Therefore it is important to continue a regime of regular maintenance while the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available.

Monitoring should be undertaken in order to detect:

- Use by Carnaby's cockatoo
- Maintenance requirements
- Use by other native species
- Use by pest species (e.g. feral bees, galahs, corellas etc.)



Carnaby's cockatoo female prospecting an artificial hollow.  
*Photo by Rick Dawson*

### **How do I monitor artificial hollows?**

Before undertaking monitoring of artificial hollows for Carnaby's cockatoo it is recommended that you seek advice from BirdLife Australia, the WA Museum or the Department of Parks and Wildlife. It is also important to contact Parks and Wildlife, Wildlife Licensing Section, to determine if a scientific licence is required ([wildlifelicencing@dpaw.wa.gov.au](mailto:wildlifelicencing@dpaw.wa.gov.au)).

Monitoring artificial hollows requires keen observation and naturalist skills. It is often not possible to observe evidence of breeding directly (i.e. nestlings or eggs) and inferences must be made based on observation. There are many techniques available to monitor artificial hollows. A combination of several is likely to achieve the best results.

### **Looking for signs of use**

Cobwebs covering the entrance to the hollow will indicate that the hollow has not been used recently. This would also apply to other light debris that may have fallen to cover the opening partially. Signs of recent use or interest in the hollow include evidence of chewing.

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### **Observing parent behaviour around the hollow**

The behaviour of parent birds around a hollow will indicate an approximate age of young in the nest.

<b>Parent behaviour</b>	<b>Approximate age/stage of young</b>
Prospecting for hollow	Unborn
Male only seen out of hollow	Egg or very young nestling (< 3 - 4 weeks)
Both parents seen entering/exiting the hollow	Nestling(s) have hatched (> 3 - 4 weeks)

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### **Observing feeding flocks**

Flocks of all male birds indicate that the females are incubating eggs. When flocks are mixed it suggests the birds have either not laid yet or that the nestlings have hatched and no longer require brooding (approximately 3 - 4 weeks old).

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### **Tapping**

When females are sitting on eggs they will usually respond to tapping at the base of their tree (or pole) by appearing at the entrance or flying from the hollow opening. This is not a guarantee of breeding activity, but an indication that it is possibly occurring in the hollow.

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### **Observing insect activity around nest**

The faecal matter produced by nestlings in a nest attracts insects, especially flies and ants. The type and number of these insects will help indicate how old any nestlings present may be. Factors such as temperature and humidity will also affect insect activity and so observations of insect activity should only be used as supporting evidence for other indications of age/use. Blowflies around a nest usually indicate that a death has occurred.

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### **Listening for nestlings**

With experience it is possible to determine if one or two nestlings are present and a broad estimate of age based on the type and loudness of noises they make.

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### **Looking inside the nest**

This can be achieved either with the aid of a telescopic pole and camera or mirror, or with the use of a ladder or other climbing equipment. This method can obtain the most detailed monitoring information for artificial hollows. However it is also the most time consuming and difficult to organise. Special equipment is likely to be needed depending on the height and positioning of artificial hollows. There are also safety issues associated with ladder or rope climbing options to reach nests to undertake observations.

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### **How often should I monitor artificial hollows?**

The minimum frequency of monitoring and the techniques used will be determined by the aims of the monitoring and the resources available. It is important to limit disturbance to breeding birds and this should be considered when determining the techniques used and frequency.

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### **How do I maintain artificial hollows?**

Artificial hollows require maintenance to ensure they continue to have the greatest chance of them being used by Carnaby's cockatoos. Periodic maintenance checks should be undertaken at least every two years, preferably annually. These checks should be undertaken prior to the breeding season which is between July and January with breeding occurring later in this period in southern areas. It is important to maintain a regime of regular maintenance as long as the artificial hollow is required. It may take several (to many) decades until a natural replacement hollow is available.

Maintenance checks should assess the following as a minimum:

- Condition of chewing posts (if present)
- Condition of attachment points
- Condition of hollow bases
- Stability of tree or pole used to mount the artificial hollow



Artificial hollow base needing repair.  
Photo by Christine Groom

### **Repairing hollows**

Any problems identified during maintenance checks should be addressed, and any repairs required done, as soon as possible. If breeding is currently occurring, maintenance may need to be delayed if it is likely to disturb the parents or nestling. Likely maintenance needs include replacement of chewing posts (frequently) or nest bases (occasionally) and repairing of any cracks (infrequently). Maintenance concerns regarding the security of attachment points or the stability of the tree or pole should be addressed as a priority for safety reasons.

For artificial hollows known to be used, spare chewing posts should be taken into the field when undertaking maintenance checks.

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**Monitoring of artificial hollows:**

Monitoring aim	Frequency of visits	Monitoring techniques
<b>To determine possible use by Carnaby's cockatoo</b>	At least once during peak breeding season (i.e. between September and December)	<ul style="list-style-type: none"> <li>• Observing behaviour of adults around hollow</li> <li>• Tapping to see if female will flush from hollow (best undertaken between 10am and 3pm when females most likely to be sitting)</li> <li>• Listening for nestlings</li> <li>• Looking for evidence of chewing</li> <li>• Looking inside nest</li> </ul>
<b>To confirm use by Carnaby's cockatoo</b>	At least two visits during peak breeding season (i.e. between September and December)	<p>To observe at least two of the following:</p> <ul style="list-style-type: none"> <li>• Breeding behaviour of adults around hollow or evidence of chewing</li> <li>• Female flushed from hollow</li> <li>• Noises from nestlings in hollow</li> </ul> <p>Or to observe:</p> <ul style="list-style-type: none"> <li>• Nestlings or eggs in nest</li> </ul>
<b>To determine nesting success by Carnaby's cockatoo</b>	The more visits, the better. Preferably fortnightly visits between July and December. As a minimum, at least 3 visits spread throughout breeding season.	<ul style="list-style-type: none"> <li>• Looking inside nest to observe eggs or nestlings.</li> </ul>
<b>To determine use by any species</b>	As often as possible.	<ul style="list-style-type: none"> <li>• Inspection from ground as a minimum.</li> <li>• Looking inside nest for detailed observations.</li> </ul>
<b>To determine maintenance requirements</b>	At least every two years and preferably annually if hollow fitted with sacrificial chewing posts, can be longer if without.	<ul style="list-style-type: none"> <li>• A basic maintenance check can be undertaken from the ground. A ladder or elevated work platform will be required for a comprehensive check and to replace sacrificial chewing posts</li> </ul>

**Acknowledgements**

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Further information

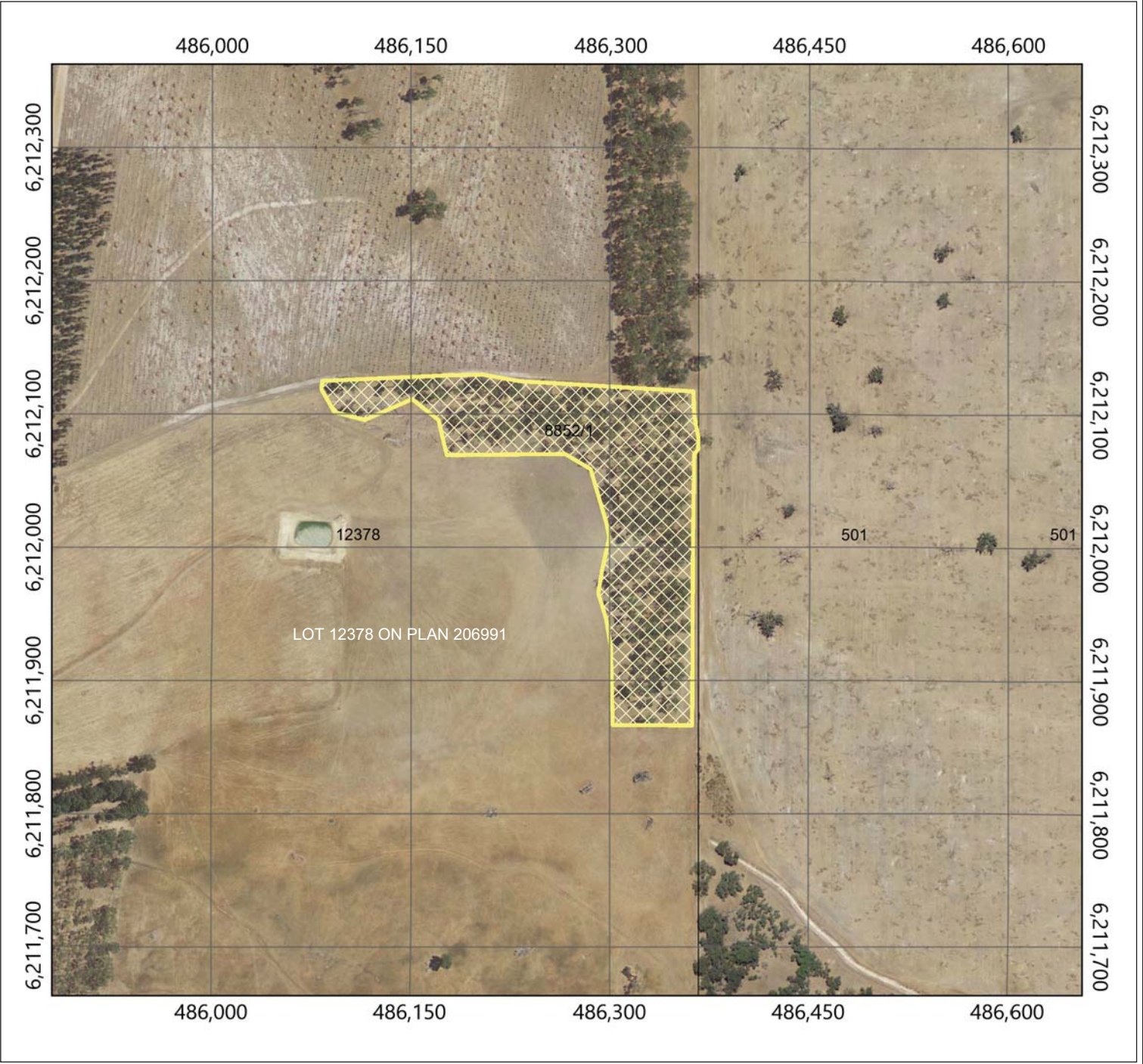
Last updated 28/04/2015

Contact [fauna@dpaw.wa.gov.au](mailto:fauna@dpaw.wa.gov.au) or your local office of the Department of Parks and Wildlife

See the department's website for the latest information: [www.dpaw.wa.gov.au](http://www.dpaw.wa.gov.au)

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# Plan 8852/1a



## Legend

- CPS areas approved to clear
- Roads - State Roads
- Cadastre

0.1      0.07      0.1 Kilometers



WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

Meenu Vitarana  
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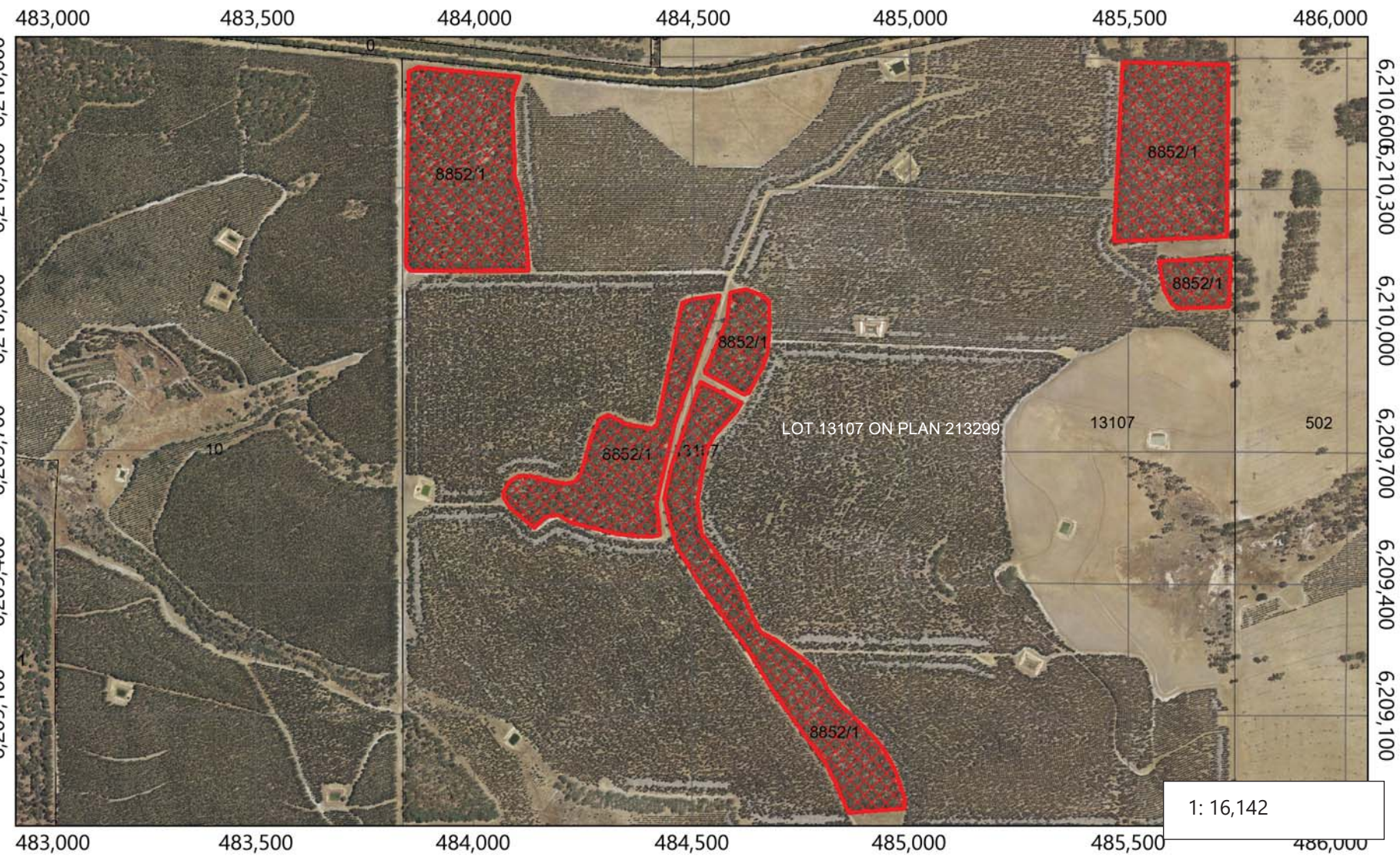
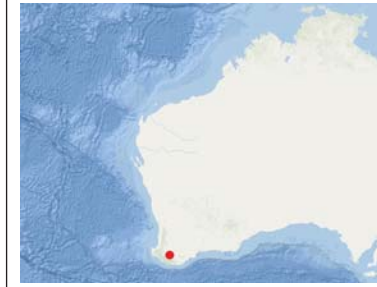
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## Locality Map



Government of Western Australia  
Department of Water and Environmental Regulation

# Plan 8852/1b



## Legend

- CPS subject to conditions
- Roads - State Roads
- Cadastre

Meenu Vitarana  
2020.11.09  
12:20:29 +08'00'

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986.



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Government of Western Australia, Department of Water and Environmental Regulation

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# Clearing Permit Decision Report

## 1. Application details and outcome

### 1.1. Permit application details

<b>Permit number:</b>	CPS 8852/1
<b>Permit type:</b>	Area Permit
<b>Applicant name:</b>	Michael Hair
<b>Application received:</b>	1 April 2020
<b>Application area:</b>	2.58 hectares of native vegetation
<b>Purpose of clearing:</b>	Cropping and grazing
<b>Method of clearing:</b>	Mechanical clearing – front end loader/bulldozer
<b>Property:</b>	Lot 12378 on Deposited Plan 206991
<b>Location (LGA area/s):</b>	Shire of Cranbrook
<b>Localities (suburb/s):</b>	Frankland River, 6396

### 1.2. Description of clearing activities

The vegetation applied to be cleared is contained within a single contiguous area (see Figure 1, section 1.5). The proposed clearing area includes approximately 2.58 hectares of native vegetation for the purpose of cropping, grazing and general farming practices.

### 1.3. Decision on application and key considerations

<b>Decision:</b>	Granted
<b>Decision date:</b>	9 November 2020
<b>Decision area:</b>	2.58 hectares of native vegetation as depicted in Figure 1 below

### 1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Water and Environmental Regulation (DWER) on 1 April 2020. DWER advertised the application for public comment and one submission was received.

In undertaking their assessment, and in accordance with section 51O of the EP Act, the Delegated Officer has given consideration to the Clearing Principles in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments, and any other pertinent matters they deemed relevant to the assessment (see Sections 3 and 4). Consideration of matters raised in the public submission is summarised in Appendix A.

In particular, the Delegated Officer has determined that:

- Conditions on the permit requiring the Permit Holder to retain ten potential black cockatoo breeding trees, clear two potential black cockatoo breeding trees only outside of the breeding seasons for black cockatoo species and install artificial black cockatoo nesting hollows for each potential black cockatoo breeding tree cleared, are considered adequate to mitigate impacts to black cockatoo species;
- Findings of a site inspection and review of relevant available information have identified that the proposed clearing is unlikely to impact conservation significant flora;
- The proposed clearing is considered unlikely to have impacts upon soil or water resources.

In determining to grant a clearing permit, the Delegated Officer found that the proposed clearing is not likely to lead to an unacceptable risk to the environment.

## 1.5. Site map

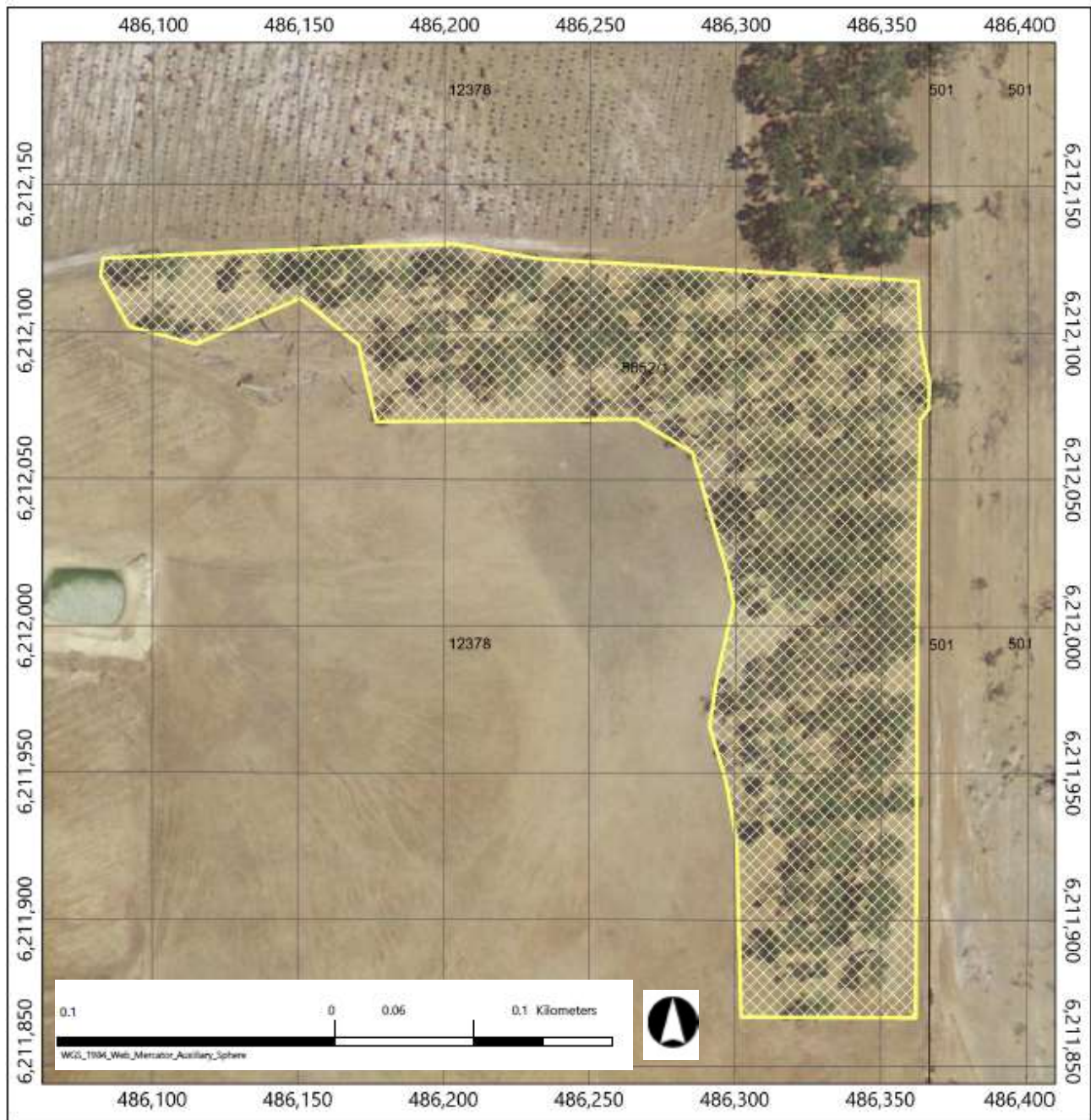


Figure 1. Map of the application area. The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.



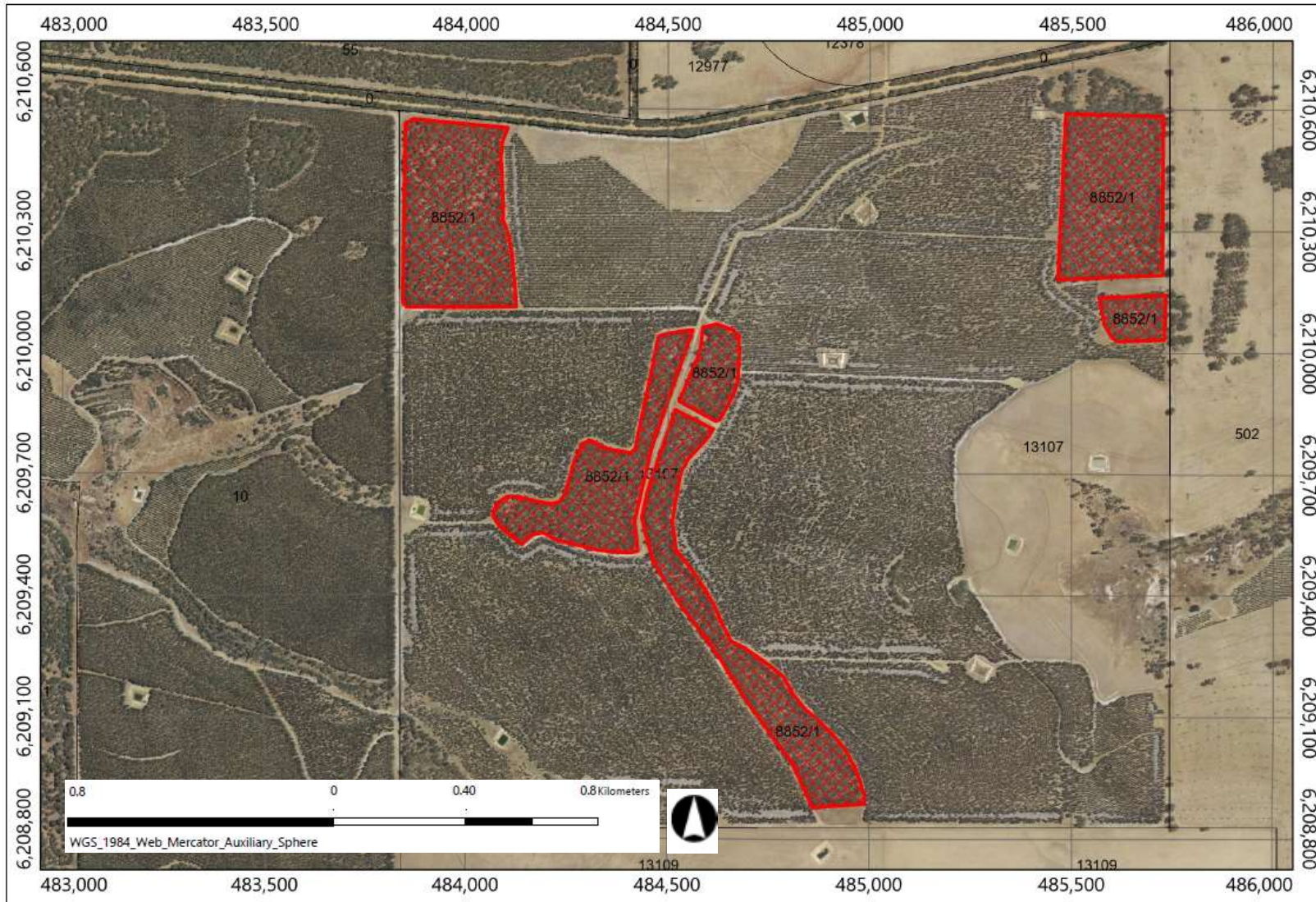


Figure 2. Map of areas subject to conditions. The areas cross-hatched red indicate areas within which artificial hollows for black cockatoos are required to be installed.

## **2. Legislative context**

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.3), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

1. the precautionary principle;
2. the principle of intergenerational equity;
3. the principle of the conservation of biological diversity and ecological integrity;

Other legislation of relevance for this assessment include:

- *Country Areas Water Supply Act 1947* (CAWS Act)
- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Soil and Land Conservation Act 1945* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)

## **3. Detailed assessment of application**

### **3.1. Avoidance and mitigation measures**

Prior to submitting the application, the applicant reduced the clearing from 3.35 hectares to 2.58 hectares based on a reconsideration of cropping requirements (Accendo, 2020a). Additional management and mitigation measures proposed by the applicant include the implementation of a Construction Environmental Management Plan, which contains the following measures:

- Contractors undertaking the clearing will receive an induction prior to clearing outlining the extent of the clearing and required management measures;
- Stockpiling will occur in cleared areas; and
- Clean on entry/exit measures (Accendo, 2020a).

The applicant has stated that daily checks were proposed to be undertaken to ensure clearing is consistent with the area shown in Figure 1 of this report (Accendo, 2020a). Daily checks will also be undertaken to ensure no fauna is impacted (Accendo, 2020a).

Following a request to avoid vegetation sent by DWER on 21 July 2020, the applicant advised that they would consider retaining large trees on the property where practicable. Following this, DWER undertook a site inspection (DWER, 2020a) and asked the applicant whether they could retain 18 trees with a diameter at breast height of over 500 millimetres, and the applicant advised they could retain ten of these trees (seven of which had hollows that may provide suitable nesting habitat for black cockatoo species (DWER, 2020a)) and that the remaining eight trees could not be removed due to location constraints or they were too close to each other to allow machinery to pass between (Accendo, 2020b). Two of the trees that could not be retained had hollows that may provide suitable nesting habitat for black cockatoo species (DWER, 2020a), however the applicant committed to installing artificial nest boxes in adjacent vegetation to mitigate potential impacts. Fauna management conditions have been placed on the permit to mitigate impacts to black cockatoo habitat (see Section 3.2.2 below).

### **3.2. Assessment of environmental impacts**

In assessing the application in accordance with section 51O of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix C) and considered whether the clearing poses a risk to environmental values. The assessment against the Clearing Principles is contained in Appendix D.

This assessment identified that the clearing may pose a risk to the environmental values of significant habitat for flora and fauna, and land and water resources, and that these required further consideration. The detailed consideration and assessment of the clearing impacts against the specific environmental values is provided below. Where the assessment found that the clearing presents an unacceptable risk to environmental values, conditions aimed at controlling and/or ameliorating the impacts have been imposed under sections 51H and 51I of the EP Act. These are also identified below.

### 3.2.1. Environmental value: biological values (flora) – Clearing Principle (a) to (d)

**Assessment:** A desktop assessment of available datasets did not identify any threatened or priority flora species occurring within the clearing area. However the desktop assessment identified a number of threatened and priority flora species that are present within the local area (10 kilometre radius) have the potential to occur within the proposed clearing area based on habitat requirements, including soil type and associated vegetation (see Appendix B).

Within the local area, one state and federally listed threatened flora species was recorded; *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896), occurring approximately 15.4 kilometres from the application area and known from a total of five records from Kingston to Frankland River (Western Australian Herbarium, 1998-). Habitat and soil type suitable for this species is described as “Jarrah/marri woodland over a limited number of medium to low shrubs, sedges and forbs; up-slope from a shallow depression on sandy loam soils over laterite” (TSSC, 2018). *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896) has also been recorded in previously logged and grazed areas in Completely Degraded (Keighery, 1994) condition, under a canopy of dominated by marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*) and is known to re-sprout from root stock following grazing (TSSC, 2018). However, a site inspection found that the application area appeared to be completely devoid of native understorey and mid-storey species, and as such it is considered unlikely that *Bossiaea* sp. Frankland (E.M. Sandiford EMS 896) is present within the application area.

One priority flora species, *Synaphea otio stigma*, was also recorded within the local area within the same mapped soil and vegetation types as the application area (see Appendix B), however it is considered unlikely to occur within the proposed clearing area given the Completely Degraded (Keighery, 1994) condition of the vegetation present (see Appendix B), distance of the current populations from the clearing area, and a review of habitat requirements (Western Australian Herbarium, 1998).

Within the proposed clearing area, no state or federally listed threatened or priority ecological communities are considered to occur. Given the vegetation is in Completely Degraded (Keighery, 1994) condition, is devoid of native mid- and understorey species, and comprises a canopy of only marri and jarrah, the proposed clearing area is unlikely to be representative of any threatened or priority ecological community.

**Outcome:** Based on the above assessment, the Delegated Officer has determined the proposed clearing is considered acceptable in relation to this environmental value.

### 3.2.2. Environmental value: biological values (fauna) – Clearing Principle (b)

**Assessment:** Based on available datasets 16 conservation significant species have been recorded within the local area (Appendix C). Conservation significant species that could potentially occur in the area include:

- *Calyptorhynchus latirostris* (Carnaby’s cockatoo);
- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo);
- *Calyptorhynchus baudinii* (Baudin’s cockatoo);
- *Bettongia penicillata ogilbyi* (woylie); and
- *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale)

The application area is within the known distribution and predicted breeding range of the Carnaby’s cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) and Baudin’s cockatoo (*Calyptorhynchus baudinii*) (hereafter referred to as “black cockatoo species”) (DSEWPaC, 2012). The closest confirmed breeding area for Carnaby’s cockatoo occurs approximately 350 metres north-east of the application area. In the Jarrah Forest IBRA bioregion, Carnaby’s cockatoo typically nests in eucalypt woodlands, primarily in hollows of wandoo (*Eucalyptus wandoo*), salmon gum (*Eucalyptus salmonophloia*), marri (*Corymbia calophylla*), karri (*Eucalyptus diversicolor*) and swamp yate (*Eucalyptus occidentalis*) (Groom, 2010). With regards to forest red-tailed black cockatoo and Baudin’s cockatoo, marri trees containing suitably sized hollows are considered to be the most important nesting habitat throughout their range. The site inspection conducted by DWER (2020a) found 18 marri and jarrah trees of suitable diameter at breast height (DBH) to develop a nest hollow (i.e. 500 millimetres for most tree species (Commonwealth of Australia, 2012)), nine of which may contain hollows suitable for breeding. The applicant advised that ten of these 18 trees were practicable for retention (Applicant, 2020), seven of which contained hollows, and a condition has been placed on the permit to retain these ten trees. As such, two trees each containing one hollow potentially suitable for black cockatoo breeding habitat will be cleared. To mitigate impacts to black cockatoo breeding habitat, conditions have been placed on the permit prohibiting the clearing of these two trees within the breeding seasons for black cockatoo species (i.e. 1 June to 29 February of any given year) and requiring

that the applicant install two artificial nest hollows within areas of applicant owned land located on an adjacent property and subject to an Agreement to Reserve under the *Soil and Land Conservation Act 1945* (refer to Figure 2).

While breeding, black cockatoos also generally forage within a 6 to 12 kilometre radius of their nesting site (Commonwealth of Australia, 2012). Black cockatoo species are noted to forage on a range of plant species, predominantly the seeds and flowers of marri, jarrah and proteaceous species (e.g. *Banksia* spp., *Hakea* spp. and *Grevillea* spp.) (Commonwealth of Australia, 2012). Within the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion, jarrah and marri are considered important foraging species for all three species of black cockatoo. Noting that the application area comprises marri and jarrah, and is adjacent to a confirmed breeding area for Carnaby's cockatoos, the application area is likely to comprise 2.58 hectares of suitable foraging habitat for black cockatoo species. However, when considered in the local and regional context for black cockatoos (6 and 12 kilometres respectively), the proposed clearing area represents 0.067 per cent and 0.01 per cent of remnant vegetation respectively, the majority of which is mapped as areas requiring investigation as feeding habitat within the Jarrah Forest IBRA Region. Furthermore, no evidence of foraging by black cockatoo species was observed during a site inspection undertaken by DWER (2020a). Therefore, given the extent of the proposed clearing, the condition of the vegetation within the application area, that 10 habitat trees are required to be retained, that the local area is not extensively cleared, and that majority of remnant vegetation within the local area is mapped as potential foraging habitat, the application area is not considered likely to comprise significant foraging habitat for black cockatoo species and the proposed clearing is not considered likely to significantly impact black cockatoo foraging in the local area.

Based on available datasets, the woylie (*Bettongia penicillata ogilbyi*) has been recorded within 6 kilometres of the application area. Both records, from 1995, were opportunistic sightings in an area surrounded by intact jarrah/marri woodland with a dense understory. Habitat considered critical to the species' survival includes tall eucalypt forests and woodlands, dense myrtaceous shrublands, and kwongan (proteaceous) or mallee heath (Yeatman and Groom, 2012). Woylies are also considered more likely to be present in larger pockets of native vegetation that are subject to feral animal control (Yeatman and Groom, 2012). Noting this, and the degraded nature and absence of understorey vegetation within the application area, it is considered unlikely that the vegetation within the application area constitutes significant habitat for woylie.

The south-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) is an arboreal mammal, typically associated with woodlands dominated by a variety of canopy species, but often characterised by the presence of hollow-bearing trees, as well as high canopy cover and connectivity (DEC, 2012). Given the application area consists of a canopy of marri and jarrah, and may contain hollow-bearing trees, the application area may comprise suitable habitat for the south-western brush-tailed phascogale. However, noting only a single record of the species occurs within the local area (10 kilometre radius), that the application area is fairly isolated from larger remnants of vegetation, and that canopy connectivity within the application area is sparse, it is considered unlikely that the south-western brush-tailed phascogale would be present within the application area or that the application area comprises significant habitat.

**Outcome:** Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions (see below) in relation to this environmental value.

**Conditions:** The following conditions have been placed on Permit 8852/1:

- **Clearing not authorised:**
  - The permit holder is not permitted to clear any tree with a diameter of 500 millimetres or more at the locations where ten of the potential habitat trees were identified.
- **Fauna management:**
  - Clearing of the two trees containing potential black cockatoo breeding is not permitted from 1 June to 29 February of any given year (peak breeding season for black cockatoo species); and
  - To mitigate the impacts to potential black cockatoo breeding habitat, the applicant will be required to install two artificial nesting hollow within one of the areas cross-hatched red shown on Figure 2, which must be monitored and maintained for a period of at least ten years.

### **3.2.3. Environmental value: land and water resources – Clearing Principles (g) and (i)**

**Assessment:** The application area is mapped within two proclaimed surface water areas; the Warren River and Tributaries proclaimed under the Rights in Water and Irrigation Act 1914 (RIWI Act), and the Warren River Water Reserve gazetted under the *Country Areas Water Supply Act 1947* (the CAWS Act). The application area is mapped within Zone A of the Warren River Water Reserve, considered a very high salinity risk area and subject to native vegetation clearing controls to prevent salinisation of water resources (DWER, 2020b). However, it is noted that the application area actually falls outside of the hydrological boundary of the Warren River catchment (see section 3.3). Given this, that soil types mapped within the application area are considered to have a low to moderate salinity risk,

and the Completely Degraded (Keighery, 1994) nature of the vegetation to be cleared, it is considered the proposed clearing is unlikely to result in significant impacts to surface and groundwater resources from salinisation.

The mapped soils are highly susceptible to wind erosion, however given that the vegetation to be cleared consists of individual trees with a lack of native understorey species, the proposed clearing is not likely to have an appreciable impact on land degradation resulting from wind erosion.

Outcome: Based on the above and advice received from DWER's Salinity and Land Use Impacts branch (see section 3.3), the Delegated Officer has determined that the proposed clearing is considered acceptable in relation to this environmental value.

### **3.3. Relevant planning instruments and other matters**

The shire of Cranbrook advised that they do not have any objections to the proposed clearing given that the lot is zoned 'Rural' under the Shire of Cranbrook's Town Planning Scheme and the proposed land use of extensive agriculture is permitted in the Rural zone, the removal of vegetation will facilitate further extensive agriculture activities and that they do not foresee any significant environmental issues, subject to DWER's assessment (Shire of Cranbrook, 2020).

The application area lies within the Warren River Water Reserve, a proclaimed surface water resource under the CAWS Act. The Warren River Water Reserve has been subject to CAWS Act native vegetation clearing controls since December 1978 to prevent salinisation of water resources (DWER, 2020b). The application area is located in Zone A, a very high salinity risk area of the catchment, where Department of Water and Environmental Regulation (DWER) Policy and Guidelines for the "Granting of Licences to Clear Native Vegetation" do not allow for the granting of licences to clear for the broad acre clearing of indigenous vegetation under the CAWS Act (DWER, 2020b). However, the Salinity and Land Use Impacts branch of DWER advised that, while the land holding occurs within the mapped Warren River Water Reserve, the property falls outside of the hydrological boundary of the catchment, noting the topography of the land falls away from the Warren River and towards the Frankland River (DWER, 2020b). As a result, the proposed clearing is consistent with the CAWS Act guidelines (DWER, 2020b).

It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

## Appendix A – Details of public submissions

One public submission was received. A summary of the comments included within the submission, and DWER's consideration of these comments, is outlined in the table below.

Summary of comments	Consideration of comment
<p>Lack of supporting information regarding black cockatoo habitat within application area provided in advertised material, means public comments cannot be informed in regards to black cockatoo species;</p>	<p>In the absence of a fauna survey conducted by a fauna specialist, a site inspection was conducted by DWER (2020) to inform the assessment of impacts to black cockatoo species.</p>
<p>Vegetation within the site comprises important food sources for black cockatoo species, and any remaining foraging habitat may be important to the persistence of these species</p>	<p>As outlined in Section 3.2.2, DWER considers that while the application area is likely to comprise 2.58 hectares of suitable foraging habitat for black cockatoo species, given the extent of the proposed clearing, the condition of the vegetation within the application area, that 10 habitat trees within the application area will be retained, that the local area is not extensively cleared, and that majority of remnant vegetation within the local area is mapped as potential foraging habitat, the application area is not considered likely to comprise significant foraging habitat for black cockatoo species and the proposed clearing is not considered likely to significantly impact black cockatoo foraging in the local area.</p>
<p>Insufficient information is available in supporting documentation in regards to the following:</p> <ul style="list-style-type: none"> <li>• Quality and significance of habitat for black cockatoo species; and</li> <li>• Lack of independent inspection or habitat tree assessment for tree hollows within application area.</li> </ul>	<p>A site inspection was conducted by DWER (2020), which noted the vegetation species present and the presence of trees of sufficient diameter to contain breeding hollows suitable for black cockatoo species. In the absence of a fauna survey conducted by a fauna specialist, for the purposes of this assessment it has been assumed that all hollows observed by DWER (2020) are suitable for use by black cockatoos (precautionary principle) and potentially have been/are used, and conditions to mitigate impacts to black cockatoos have been imposed on the permit accordingly.</p>
<p>Cumulative impacts of clearing on black cockatoo species should be considered</p>	<p>DWER notes that although many clearing actions in Western Australia may not reach the threshold for Federal level referral for impacts to black cockatoos, the State system for managing these smaller areas of clearing, Part V of the EP Act, includes assessment of the impacts on habitat for black cockatoos, including the context of available habitat in the wider region and at a local scale.</p> <p>DWER consider cumulative impacts in the assessment of clearing permit applications primarily through Clearing Principle (e). Through this assessment, the proportion of native remnant vegetation remaining within the wider region (IBRA region) and at a smaller scale, such as within buffers surrounding application areas, is considered. The proportion of vegetation remaining in specific vegetation complexes, and the value of the area as a remnant, such as ecological linkage value, are also considered in the assessment. This assessment allows for the consideration of these smaller areas of clearing, which are reflected in remnant vegetation databases.</p>

Summary of comments	Consideration of comment
	Consideration has been given to the context for this application area and the value of the vegetation to be cleared in comparison to the quantity and value of the vegetation in the local area and beyond.
Federal referral of the application due to impacts on black cockatoo species should be undertaken	It is recognised that a referral under the EPBC Act should be considered by the Permit Holder and the Department has advised the applicant that they may have notification responsibilities under the EPBC Act in relation to black cockatoos. It is the Permit Holder's responsibility to refer proposed clearing that may have a significant impact on matters of national environmental significance under the EPBC Act.
Mitigation measures to counteract impacts to black cockatoo species have not been specified	As detailed in Section 3.2.2, the granted clearing permit contains conditions to mitigate impacts to black cockatoos, including not permitting clearing of ten potential black cockatoo habitat trees, not permitting clearing to occur in the breeding season of black cockatoos for two trees that cannot be avoided, and requiring the installation of two artificial black cockatoo nest hollows. These measures are considered sufficient to mitigate impacts on black cockatoo habitat.

## Appendix B – Site specific information

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D.

### 1. Site characteristics

Site characteristic	Details
Local context	<p>The proposed clearing area is a 2.58 ha isolated patch of native vegetation. It is surrounded by predominantly cleared agricultural land to the east, south and west with some isolated patches of remnant native vegetation to the north. The remnants of a Blue Gum (<i>Eucalyptus globulus</i>) plantation exists immediately adjacent to the clearing area to the north. The proposed clearing area represents a small isolated remnant in a highly cleared surrounding landscape.</p> <p>Spatial data indicates the local area (10 km radius of the proposed clearing area) retains approximately 36.4% of the original native vegetation cover.</p>
Vegetation description	<p>A site inspection conducted by DWER (2020) found that vegetation within the application area consisted of an open forest of <i>Eucalyptus marginata</i> (jarrah) and <i>Corymbia calophylla</i> (marri) and was completely devoid of native mid- and understorey species. Vegetation understorey was weed-infested and comprised of <i>Arctotheca calendula</i> (Capeweed), <i>Lolium</i> sp. (ryegrass), <i>Ehrharta longiflora</i> (annual veldt-grass) and <i>Triticum aestivum</i> (wheat). Representative photos are available in Appendix F.</p> <p>This is consistent with two of the three (FH1 and FH2) vegetation complexes mapped by Mattiske and Havel (1998) within the application area:</p> <ul style="list-style-type: none"> <li>Frankland Hills (FH1) - Woodland to low open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> with some <i>Corymbia calophylla</i> on uplands in subhumid and semiarid zones;</li> <li>Frankland Hills (FH2) - Woodland of <i>Eucalyptus wandoo</i>-<i>Corymbia calophylla</i> with some <i>Eucalyptus marginata</i> subsp. <i>marginata</i> on slopes of low undulating hills in</li> </ul>

Site characteristic	Details																																																								
	subhumid and semiarid zones; and <ul style="list-style-type: none"> <li>Gordon Flats (GD1) - Mixture of low woodland of <i>Melaleuca cuticularis</i>, woodland of <i>Eucalyptus rudis-Eucalyptus occidentalis</i> and woodland of <i>Eucalyptus wandoo-Eucalyptus decipiens</i> on broad flats with some <i>Banksia littoralis</i> in the semiarid zone.</li> </ul>																																																								
Vegetation condition	DWER's site inspection found that vegetation within the application area was in is in Completely Degraded (Keighery, 1994) condition, being heavily disturbed through weed invasion and completely devoid of native mid- and understorey species. The full Keighery (1994) condition rating scale is provided in Appendix E, below. Representative photos are available in Appendix E.																																																								
Soil description	<p>The proposed clearing area is mapped within the Frankland Hills system and within three subsystems, being the 'Frankland Hills 1', 'Frankland Hills 2' and 'Gordon Flats 1' subsystems.</p> <p>The 'Frankland Hills 1' subsystem is described as lateritic crests, upper slopes and isolated low gravelly rises with widespread lateritic duricrust, and loamy and duplex sandy gravels also common (DPIRD, 2017).</p> <p>The 'Frankland Hills 2' which is described as widespread loamy gravels, duplex sandy gravels and deep sandy gravels, with grey deep sandy duplex and loamy earth soils also common (DPIRD, 2017).</p> <p>The 'Gordon Flats 1' subsystem is described as semi wet soil and Grey deep sandy duplex are common with Saline wet soil, Duplex sandy gravel and Pale deep sand (DPIRD, 2017).</p>																																																								
Land degradation risk	<p>The clearing area is mapped within the Frankland Hills system and within three subsystems, being the 'Frankland Hills 1', 'Frankland Hills 2' and 'Gordon Flats 1' subsystems (DPIRD, 2017). Land degradation risks for each subsystem are summarised in the table below and are expressed as the percentage of that subsystem being at risk and its associated risk rating.</p> <table border="1" data-bbox="418 1140 1425 1780"> <thead> <tr> <th data-bbox="418 1140 581 1213">Risk categories</th> <th colspan="2" data-bbox="581 1140 865 1213">Frankland Hills 1 subsystem</th> <th colspan="2" data-bbox="865 1140 1149 1213">Frankland Hills 2 subsystem</th> <th colspan="2" data-bbox="1149 1140 1425 1213">Gordon 1 subsystem</th> </tr> <tr> <th data-bbox="418 1213 581 1308"></th> <th data-bbox="581 1213 743 1308">Degradation risk (% of map unit)</th> <th data-bbox="743 1213 865 1308">Risk rating</th> <th data-bbox="865 1213 1027 1308">Degradation risk (% of map unit)</th> <th data-bbox="1027 1213 1149 1308">Risk rating</th> <th data-bbox="1149 1213 1312 1308">Degradation risk (% of map unit)</th> <th data-bbox="1312 1213 1425 1308">Risk rating</th> </tr> </thead> <tbody> <tr> <td data-bbox="418 1308 581 1371">Wind erosion</td> <td data-bbox="581 1308 743 1371">90%</td> <td data-bbox="743 1308 865 1371">High to Extreme</td> <td data-bbox="865 1308 1027 1371">78%</td> <td data-bbox="1027 1308 1149 1371">High to Extreme</td> <td data-bbox="1149 1308 1312 1371">57%</td> <td data-bbox="1312 1308 1425 1371">High to Extreme</td> </tr> <tr> <td data-bbox="418 1371 581 1465">Waterlogging and inundation</td> <td data-bbox="581 1371 743 1465">0%</td> <td data-bbox="743 1371 865 1465">Moderate to Very High</td> <td data-bbox="865 1371 1027 1465">8%</td> <td data-bbox="1027 1371 1149 1465">Moderate to Very High</td> <td data-bbox="1149 1371 1312 1465">79%</td> <td data-bbox="1312 1371 1425 1465">Moderate to Very High</td> </tr> <tr> <td data-bbox="418 1465 581 1560">Water Erosion</td> <td data-bbox="581 1465 743 1560">0%</td> <td data-bbox="743 1465 865 1560">Very High to Extreme</td> <td data-bbox="865 1465 1027 1560">0%</td> <td data-bbox="1027 1465 1149 1560">Very High to Extreme</td> <td data-bbox="1149 1465 1312 1560">0%</td> <td data-bbox="1312 1465 1425 1560">Very High to Extreme</td> </tr> <tr> <td data-bbox="418 1560 581 1602">Salinity</td> <td data-bbox="581 1560 743 1602">0%</td> <td data-bbox="743 1560 865 1602">Moderate</td> <td data-bbox="865 1560 1027 1602">0%</td> <td data-bbox="1027 1560 1149 1602">Moderate</td> <td data-bbox="1149 1560 1312 1602">27%</td> <td data-bbox="1312 1560 1425 1602">Moderate</td> </tr> <tr> <td data-bbox="418 1602 581 1665">Flood risk</td> <td data-bbox="581 1602 743 1665">0%</td> <td data-bbox="743 1602 865 1665">Moderate to High</td> <td data-bbox="865 1602 1027 1665">0%</td> <td data-bbox="1027 1602 1149 1665">Moderate to High</td> <td data-bbox="1149 1602 1312 1665">75%</td> <td data-bbox="1312 1602 1425 1665">Moderate to High</td> </tr> <tr> <td data-bbox="418 1665 581 1780">Phosphorus export</td> <td data-bbox="581 1665 743 1780">8%</td> <td data-bbox="743 1665 865 1780">High to Extreme</td> <td data-bbox="865 1665 1027 1780">9%</td> <td data-bbox="1027 1665 1149 1780">High to Extreme</td> <td data-bbox="1149 1665 1312 1780">77%</td> <td data-bbox="1312 1665 1425 1780">High to Extreme</td> </tr> </tbody> </table>	Risk categories	Frankland Hills 1 subsystem		Frankland Hills 2 subsystem		Gordon 1 subsystem			Degradation risk (% of map unit)	Risk rating	Degradation risk (% of map unit)	Risk rating	Degradation risk (% of map unit)	Risk rating	Wind erosion	90%	High to Extreme	78%	High to Extreme	57%	High to Extreme	Waterlogging and inundation	0%	Moderate to Very High	8%	Moderate to Very High	79%	Moderate to Very High	Water Erosion	0%	Very High to Extreme	0%	Very High to Extreme	0%	Very High to Extreme	Salinity	0%	Moderate	0%	Moderate	27%	Moderate	Flood risk	0%	Moderate to High	0%	Moderate to High	75%	Moderate to High	Phosphorus export	8%	High to Extreme	9%	High to Extreme	77%	High to Extreme
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Flood risk	0%	Moderate to High	0%	Moderate to High	75%	Moderate to High																																																			
Phosphorus export	8%	High to Extreme	9%	High to Extreme	77%	High to Extreme																																																			
Waterbodies	The desktop assessment and aerial imagery indicated that there are no mapped surface water features traversing the proposed clearing area. The nearest surface water feature is a man-made dam, which is approximately 90 m south of the western-most boundary of the																																																								



Site characteristic	Details
	<p>proposed clearing area. A manmade drainage line is mapped approximately 250 m to the south of the proposed clearing area.</p> <p>The closest natural source of surface water is a non-perennial tributary of Frankland River, occurring approximately 800 m north of the application area, separated from the application area by previously cleared land.</p> <p>There are no geomorphic wetlands mapped within or adjacent to the proposed clearing area.</p> <p>The application area is mapped within the Warren River and Tributaries proclaimed surface water area under the Rights in Water and Irrigation Act 1914 (RIWI Act) and within the 1 September 1978 <i>Country Areas Water Supply Act 1947</i> (CAWS Act) gazetted Warren River Water Reserve.</p>
Conservation areas	<p>There are no Bush Forever sites or Department of Biodiversity, Conservation and Attractions (DBCA) managed lands within or adjacent to the proposed clearing area.</p> <p>The nearest conservation areas to the application area are:</p> <ul style="list-style-type: none"> <li>• Cootayerup Nature Reserve – 4.8 km</li> <li>• Wandoorra Nature Reserve – 7 km</li> <li>• Kulunilup Nature Reserve – 11.6 km</li> <li>• Unicup Nature Reserve – 13 km</li> </ul>
Climate and landform	<p><b>Climate</b></p> <p>Rainfall: 600-700 mm</p> <p>Evapotranspiration: 600 mm</p> <p>The proposed clearing area is situated within the 'Temperate – distinctly dry and warm summer' Köppen climate class (Commonwealth of Australia 2005).</p> <p><b>Landform</b></p> <p>Topography ranges from 260 m AHD from in the north of the application area to 245 m AHD in the south.</p> <p>Hydrogeology: Rocks of low permeability, fractured and weathered rocks - local aquifers, granitoid geology.</p> <p>The proposed clearing area is situated within the 'Warren-Denmark Southland Zone', described as "Rises in a series of broad benches from the Southern Ocean north to the Blackwood Valley. Deeply weathered granite and gneiss overlain by Tertiary and Quaternary sediments in the south. Swampy in places" (DPIRD, 2017).</p>

## 2. Flora, fauna and ecosystem analysis

With consideration for the site characteristics set out above, relevant datasets (see Appendix G), the following conservation significant flora and fauna species, and ecological communities may be impacted by the clearing.

Species / Ecological Community	Distance of closest record to application area (km)	Number of records within local area	Suitable soil type? (flora, ecological community)	Suitable vegetation type? (flora, ecological community)	Suitable habitat features (fauna)	Are surveys adequate to identify? (Y, N, N/A)
<b>Fauna</b>						
<i>Calyptorhynchus banksii naso</i> (Forest Red-tailed Black Cockatoo)	4.95	8	N/A	N/A	Yes	N/A
<i>Calyptorhynchus</i> sp. 'white-tailed black cockatoo'	9.2	1	N/A	N/A	Yes	N/A
<i>Cacatua pastinator pastinator</i> (Muir's Corella)	1.38	15	N/A	N/A	Yes	N/A
<i>Bettongia penicillata ogilbyi</i> (Woylie)	5.89	2	N/A	N/A	Yes	N/A
<i>Phascogale tapotafa wambenger</i> (south-western brush-tailed phascogale)	9.2	2	N/A	N/A	Yes	N/A
<b>Flora</b>						
<i>Bossiaea</i> sp. Frankland (E.M. Sandiford EMS 896)	15.4	1	Yes	Yes	N/A	N/A
<i>Senecio gilbertii</i>	9.1	1	No	No	N/A	N/A
<i>Ornduffia submersa</i>	7.44	1	No	No	N/A	N/A
<i>Caladenia integra</i>	8.29	1	No	No	N/A	N/A
<i>Wurmbea</i> sp. Cranbrook	7.3	1	No	No	N/A	N/A
<i>Synaphea otio stigma</i>	9.6	1	Yes	Yes	N/A	N/A

## 3. Vegetation extent

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

Vegetation association	Pre-European extent (ha)	Current extent (ha)	% remaining	Current extent in all DBCA managed land (ha)	% current extent in all DBCA managed land (proportion of pre-European extent)
IBRA bioregion					
Jarrah Forest	2,390,591.53	1,604,101.56	67.10	1,299,263.74	54.35
Vegetation complex in IBRA Bioregion					
Frankland Hills (FH1)	15,476.50	7,725.02	49.91	2,953.73	19.09
Frankland Hills (FH2)	47,878.62	18,736.16	39.13	8,846.00	18.48
Gordon Flats (GD1)	8,394.99	3,764.73	44.84	531.86	6.34

## Appendix C – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><u>Assessment:</u> The proposed clearing area may contain habitat for regionally significant fauna species.</p>	May be at variance	Yes: Refer to Section 3.2.1 above
<p><u>Principle (b):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</p> <p><u>Assessment:</u> The proposed clearing area may contain foraging and breeding habitat for conservation significant fauna.</p>	May be at variance	Yes: Refer to Section 3.2.2 above.
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u> The proposed clearing area is not likely to contain flora species listed under the BC Act.</p>	Not likely to be at variance	Yes: Refer to Section 3.2.1 above
<p><u>Principle (d):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.”</p> <p><u>Assessment:</u> The proposed clearing area does not contain species that indicate the presence a threatened ecological community.</p>	Not likely to be at variance	No
<b>Environmental values: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><u>Assessment:</u> The extent of Pre-European vegetation associations and complexes, as well as the extent of native vegetation present within the local area (10 km radius) is consistent with the national objectives and targets for biodiversity conservation in Australia. Vegetation in the proposed clearing area is not considered to be part of a significant ecological linkage in the local area.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</p> <p><u>Assessment:</u> Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of adjacent or nearby conservation areas.</p>	Not likely to be at variance	No
<b>Environmental values: land and water resources</b>		
<p><u>Principle (f):</u> “Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</p> <p><u>Assessment:</u> No water courses or wetlands are present within the proposed clearing area.</p>	Not likely to be at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The mapped soils are highly susceptible to wind erosion, however given the nature of the proposed clearing, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	Yes: Refer to Section 3.2.1 above
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> The application area lies within the Warren River Water Reserve, a proclaimed surface water resource under the CAWS Act, however the risk of impacts to surface and groundwater resources from salinisation is considered to be low. Noting that no watercourses or wetlands are recorded within 2 km of the proposed clearing area, other impacts from the proposed clearing to surface water are considered unlikely.</p>	Not likely to be at variance	Yes: Refer to Section 3.2.1 above
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. Given no water courses or wetlands are recorded within 2 km of the proposed clearing area, the clearing is unlikely to contribute to waterlogging.</p>	Not likely to be at variance	No

## Appendix D – Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

### Measuring Vegetation Condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very Good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. 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/or 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/or grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E – Photographs of the vegetation



Figure E-1 - Looking north from the southern portion of the area to be cleared: *Eucalyptus marginata* and *Corymbia calophylla* trees present with an understorey of exotic species.



Figure E-2 - Looking north from the southern portion of the area to be cleared: *Eucalyptus marginata* and *Corymbia calophylla* trees present with an understorey of exotic species.



Figure E-3 – Stag tree (left) and *Corymbia calophylla* (marri) each with diameter at breast height greater than 500 mm and containing hollows potentially suitable for black cockatoo breeding habitat which are being cleared outside of the black cockatoo breeding seasons and are being replaced by artificial nest boxes in adjacent vegetation.

## Appendix F – References and databases

### 1. GIS datasets

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://www.data.wa.gov.au)):

- Aboriginal Heritage Places (DPLH-001)
- Bush Forever Areas 2000 (DPLH-019)
- Cadastre Address (LGATE-002)
- CAWSA Part 2A Clearing Control Catchments (DWER-004)
- Consanguineous Wetlands Suites (DBCA-020)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- DBCA Statewide Vegetation Statistics
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Geomorphic Wetlands, Augusta to Walpole (DBCA-017)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography Linear (Hierarchy) (DWER-031)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Vegetation Extent (DPIRD-005)
- Pre-European Vegetation (DPIRD-006)

- Public Drinking Water Source Areas (DWER-033)
- Regional Parks (DBCA-026)
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Rivers (DWER-036)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil and Landscape Mapping – Best Available
- Soil Landscape Land Quality datasets
- Vegetation Complexes – South West (DBCA-046)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System)– Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

## 2. References

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