



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9226/1
File Number: DWERVT7595
Duration of Permit: From 4 June 2021 to 4 June 2033

PERMIT HOLDER

Shire of Augusta Margaret River

LAND ON WHICH CLEARING IS TO BE DONE

Lot 1003 within Deposited Plan 416781, Margaret River

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.242 hectares of native vegetation within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

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

In determining the native vegetation authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending 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. 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.

3. Period during which clearing is authorised

The permit holder must not clear any native vegetation after 4 June 2023.

4. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner from northeast to southwest to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

5. Fauna management – western ringtail possum

- (a) In relation to the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the Permit Holder must engage a *fauna specialist* to inspect that area within 24 hours prior to, and for the duration of clearing, for the presence of western ringtail possum(s) (*Pseudocheirus occidentalis*).
- (b) Clearing activities must cease in any area where fauna referred to in condition 5(a) are identified until either:
 - (i) the western ringtail possum(s) individual has moved on from that area to adjoining *suitable habitat*; or
 - (ii) the western ringtail possum(s) individual has been removed by a *western ringtail possum specialist*.
- (c) Any western ringtail possum individual(s) removed in accordance with condition 5(b)(ii) must be relocated by a *western ringtail possum specialist* to a *suitable habitat*.
- (d) Where fauna is identified under condition 5(a) of this Permit, the Permit Holder must provide the following records to the *CEO* as soon as practicable:
 - (i) the number of individuals identified;
 - (ii) the date each individual was identified;
 - (iii) the location where each individual was identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iv) the number of individuals removed and relocated;
 - (v) the relevant qualifications of the *western ringtail possum specialist* undertaking removal and relocation;
 - (vi) the date each individual was removed;
 - (vii) the method of removal;

- (viii) the date each individual was relocated;
- (ix) the location where each individual was relocated to, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees; and
- (x) details pertaining to the circumstances of any death of, or injury sustained by, an individual.

6. Fauna management –habitat trees

- (a) Prior to undertaking any *clearing* authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to conduct a *fauna survey* of the permit area to identify *habitat tree/s* for species listed below:
 - (i) *Calyptorhynchus lateriosis* (Carnaby’s cockatoo);
 - (ii) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo);
 - (iii) *Calyptorhynchus baudinii* (Baudin’s cockatoo);
 - (iv) *Tyto novaehollandiae novaehollandiae* (masked owl (southwest)); and
 - (v) *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale).
- (b) Where *habitat tree/s* are identified under condition 6(a), the permit holder must engage a *fauna specialist* to map *habitat tree/s* within the permit area.
- (c) Each *habitat tree* identified must be inspected by a *fauna specialist* for *evidence* of current or past breeding use by species listed in condition 6(a)
- (d) Where a *habitat tree* with no *evidence* of current or past use by species listed in condition 6(a) is identified in accordance with condition 6(a), that tree must only be cleared immediately after the inspection.
- (e) Where a *habitat tree* is identified within the combined areas cross-hatched yellow on Figure 1 of Schedule 1 and that tree shows *evidence* of current or past breeding use by species listed in condition 6(a), and clearing of that tree cannot be avoided, that tree must be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.
- (f) Any *habitat tree* with *evidence* of current breeding use by species listed in condition 6(a) must not be cleared whilst it is in use for that breeding season as determined by the *fauna specialist* under condition 6(e).
- (g) For each *habitat tree* with *evidence* of current or past breeding use by *black cockatoo species* identified that cannot be avoided, the permit holder must install an artificial black cockatoo nest hollow.
- (h) Each artificial black cockatoo nesting hollow required by condition 6(g) must be installed prior to commencement of the next black cockatoo breeding season following clearing of the related *habitat tree(s)*.
- (i) The artificial black cockatoo nest hollow(s) required by condition 6(g) of this permit must:

- (i) be installed within the area cross-hatched red on Figure 1 of Schedule 1;
 - (ii) be designed and placed in accordance with the specifications detailed in Schedule 2; and
 - (iii) be monitored and maintained in accordance with the specifications detailed in Schedule 3, for a period of at least ten years.
- (j) Within two months of clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must provide the results of the *fauna survey* in a report to the *CEO*.
- (k) The *fauna survey* report must include the following;
- (i) the location of the *habitat tree(s)* recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the location of any fauna species listed in condition 6(a), if identified, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iii) the name and amount of each fauna species identified;
 - (iv) whether the *habitat tree/s* identified show current or past use by species listed in condition 6(a);
 - (v) the methodology, used to survey the permit area;
 - (vi) a photo of the *habitat tree(s)* identified; and
 - (vii) a description of the *habitat tree(s)* identified, including the:
 - (A) species of *habitat tree(s)*; and
 - (B) condition of the *habitat tree(s)*.

7. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) 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; (c) the date that the area was cleared;

No.	Relevant matter	Specifications
		<ul style="list-style-type: none"> (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 1; (f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 2; (g) actions to undertake directional clearing in accordance with condition 4; and (h) actions taken to manage and mitigate impacts to western ringtail possums in accordance with condition 5.
2.	In relation to fauna management pursuant to condition 6	<ul style="list-style-type: none"> (a) the time(s) and date(s) of inspection(s) of suitable <i>habitat tree/s</i> by the <i>fauna specialist</i>; (b) a description of the inspection methodology employed by the <i>fauna specialist</i>; (c) the species name of any fauna determined by the fauna specialist to be occupying suitable <i>habitat tree/s</i>; (d) where suitable <i>habitat tree/s</i> are determined by the fauna specialist to be occupied by species listed in condition 6(a): <ul style="list-style-type: none"> (i) the time and date that it was determined to be no longer occupied; and (ii) a description of the evidence by which it was determined to be no longer occupied; (e) the time and date that suitable <i>habitat tree/s</i> were cleared; (f) in relation to the installation of artificial black cockatoo nest hollow/s pursuant to condition 6(g) of this Permit: <ul style="list-style-type: none"> (iii) the date(s) the artificial black cockatoo nest hollow/s were installed; (iv) the locations at which the artificial black cockatoo nest hollow/s were installed recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees; (v) photos of the installed artificial black cockatoo nest hollow/s;

No.	Relevant matter	Specifications
		<ul style="list-style-type: none"> <li data-bbox="805 271 1369 338">(vi) the date(s) the artificial black cockatoo nest hollow/s installed were monitored; <li data-bbox="805 353 1369 454">(vii) a description of the monitoring methods employed for the artificial black cockatoo nest hollow/s installed; <li data-bbox="805 470 1369 571">(viii) a description of the monitoring observations for the artificial black cockatoo nest hollow/s installed; <li data-bbox="805 586 1369 687">(ix) the date(s) the artificial black cockatoo nest hollow/s installed were maintained; and <li data-bbox="805 703 1369 804">(x) a description of the maintenance activities undertaken for the artificial black cockatoo nest hollow/s installed.

8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
habitat trees	means trees that have a diameter, measured at 150 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for <i>Eucalyptus salmonophloia</i> or <i>Eucalyptus wandoo</i>) that contain hollows suitable for breeding by black cockatoo species, <i>Tyto novaehollandiae novaehollandiae</i> (masked owl (southwest)) or <i>Phascogale tapoatafa wambenger</i> (south-western brush-tailed phascogale).
black cockatoo species	means one or more of the following species: (a) <i>Calyptorhynchus lateriosis</i> (Carnaby's cockatoo); (b) <i>Calyptorhynchus baudinii</i> (Baudin's cockatoo); and/or (c) <i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
evidence	means showing chew marks or scratchings on the habitat tree representative of the species being surveyed, the presence of the species entering or leaving the habitat tree, and/or the presence of chicks/young.
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the CEO as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
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.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
suitable habitat (western ringtail possum)	means habitat known to support western ringtail possums (<i>Pseudocheirus occidentalis</i>) within the known current distribution of the species, typically characterised by abundant foliage, presence of suitable nesting structures such as tree hollows, as well as high canopy

Term	Definition
	cover and continuity. Known habitat includes peppermint (<i>Agonis flexuosa</i>) dominated woodlands, jarrah (<i>Eucalyptus marginata</i>) and marri (<i>Corymbia calophylla</i>) forests, riparian vegetation with a canopy of Bullich (<i>Eucalyptus megacarpa</i>) or flooded gum (<i>Eucalyptus rudis</i>), karri (<i>Eucalyptus diversicolor</i>) forests, sheoak (<i>Allocasuarina fraseriana</i>) dominated woodlands, and other stands of myrtaceous trees growing near swamps, watercourses or floodplains.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.
western ringtail possum specialist	means a fauna specialist who holds a tertiary qualification specialising in environmental science or equivalent, has a minimum of two years of work experience in western ringtail possum (<i>Pseudocheirus occidentalis</i>) identification, surveys of western ringtail possums and capture and handling of western ringtail possums, and holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .

END OF CONDITIONS



Meenu Vitarana
A/MANAGER
 NATIVE VEGETATION REGULATION

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

12 May 2021

SCHEDULE 1

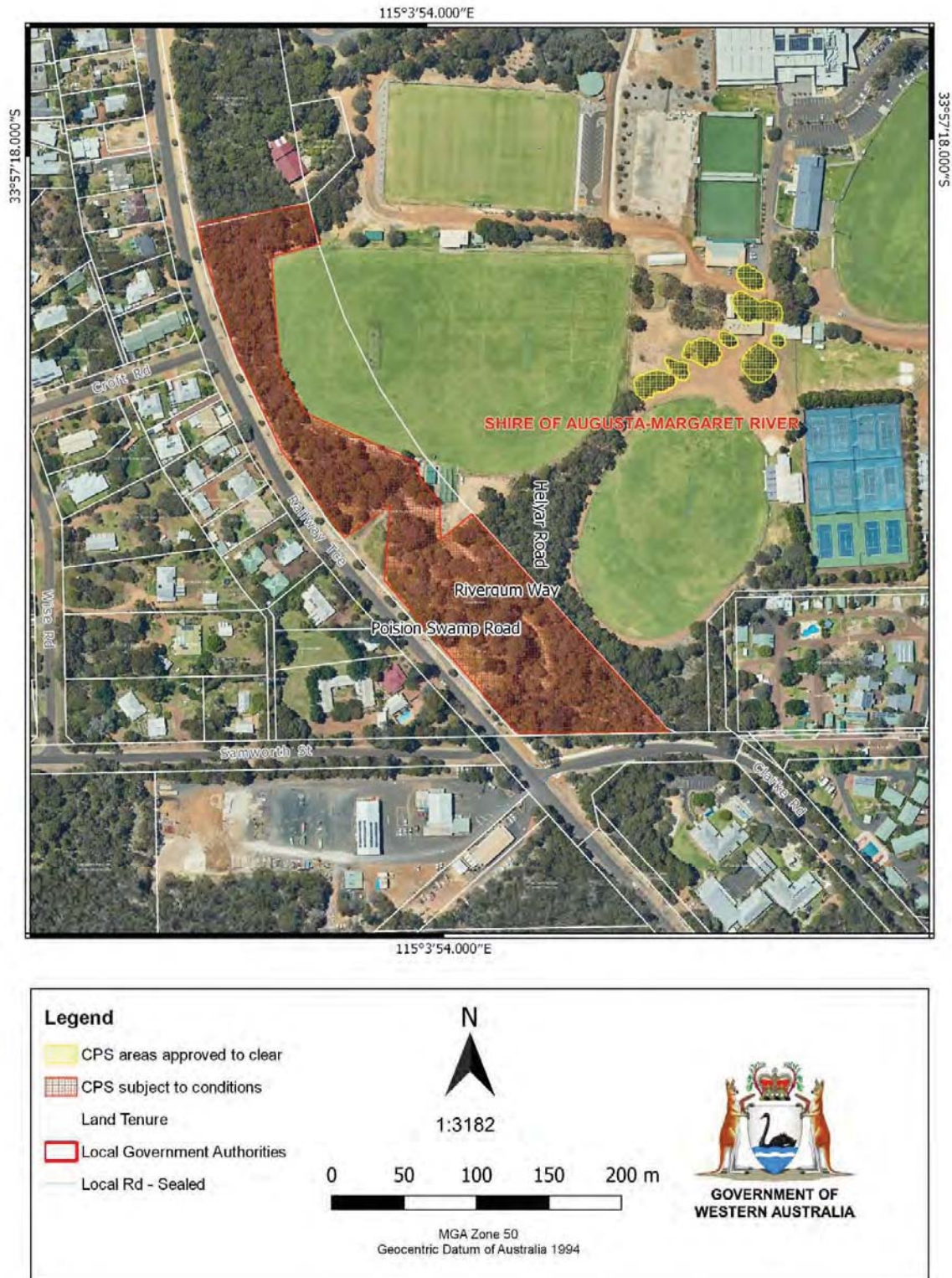


Figure 1: Map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared. The area cross-hatched red indicates the area within which artificial hollows are to be installed in accordance with condition 6(g).

SCHEDULE 2

How to design and place artificial hollows for Caraby's cockatoo



Artificial hollows for Carnaby's cockatoo



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.

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. Zincolume ®), 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

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.

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.
-

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.

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.

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 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

Disclaimer: This publication may be of assistance to you but the Government of Western Australia and its officers do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication

SCHEDULE 3

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



Artificial hollows for Carnaby's cockatoo



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).

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.

Observing parent behaviour around the hollow

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

Parent behaviour	Approximate age/stage of young
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)

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).

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.

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.

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.

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.

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.

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.

Monitoring of artificial hollows:

Monitoring aim	Frequency of visits	Monitoring techniques
To determine possible use by Carnaby's cockatoo	At least once during peak breeding season (i.e. between September and December)	<ul style="list-style-type: none"> • Observing behaviour of adults around hollow • Tapping to see if female will flush from hollow (best undertaken between 10am and 3pm when females most likely to be sitting) • Listening for nestlings • Looking for evidence of chewing • Looking inside nest
To confirm use by Carnaby's cockatoo	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"> • Breeding behaviour of adults around hollow or evidence of chewing • Female flushed from hollow • Noises from nestlings in hollow <p>Or to observe:</p> <ul style="list-style-type: none"> • Nestlings or eggs in nest
To determine nesting success by Carnaby's cockatoo	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"> • Looking inside nest to observe eggs or nestlings.
To determine use by any species	As often as possible.	<ul style="list-style-type: none"> • Inspection from ground as a minimum. • Looking inside nest for detailed observations.
To determine maintenance requirements	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"> • 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

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. The updated version was compiled by Rick Dawson (Department of Parks and Wildlife) with assistance from Denis Saunders.

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 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

Disclaimer: This publication may be of assistance to you but the Government of Western Australia and its officers do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9226/1
Permit type:	Area permit
Applicant name:	Shire of Augusta Margaret River
Application received:	3 March 2021
Application area:	0.242 hectares
Purpose of clearing:	Construction of a hockey field
Method of clearing:	Mechanical
Property:	Lot 1003 within Deposited Plan 416781
Location (LGA area/s):	Shire of Augusta Margaret River
Localities (suburb/s):	Margaret River

1.2. Description of clearing activities

The vegetation proposed to be cleared comprises 0.242 hectares, consisting of approximately 32 trees within a span of approximately 120 metres by 60 metres (see Figure 1, Section 1.5). The clearing is required to facilitate the construction of a hockey pitch, associated carparking and road network within the existing Gloucester Park sporting precinct.

The application was revised during the assessment process to add an area with approximately 8 trees to the application area, as the Shire identified additional trees required removal whilst refining the project design.

1.3. Decision on application

Decision:	Granted
Decision date:	12 May 2021
Decision area:	0.242 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 25 days, the last 7 days of which included the revised application area, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets and references (see Appendix E), the findings of a site inspection undertaken by and photographs provided by the applicant (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in the loss of:

- 18 trees providing suitable foraging and roosting habitat for black cockatoo species;
- One tree that may provide suitable breeding and/or nesting habitat for black cockatoo species, the masked owl and the south-western brush-tailed phascogale; and
- 0.242 hectares of suitable habitat for the western ringtail possum and quenda

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the applicant has suitably demonstrated avoidance and minimisation measures and that the impacts of the proposed clearing listed above can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to the following conditions:

- Avoid and minimise clearing to reduce the impacts and extent of clearing;
- Take hygiene steps to minimise the risk of the introduction and spread of weeds;
- Habitat trees for the black cockatoo species, the masked owl and the south-western brush-tailed phascogale are required to be inspected and can only be cleared when not in use to mitigate impacts to individuals of these species. Artificial hollows are required to be installed for each hollow with evidence of use by black cockatoo species, which will mitigate impacts to future black cockatoo breeding habitat.
- Trees are required to be inspected for western ringtail possums, and should they be found to be present, clearing cannot be undertaken until the possums have moved on or have been manually relocated into adjacent suitable vegetation.
- Clearing is required to be undertaken progressively in a northeast to southwest direction to allow fauna to move into adjacent vegetation ahead of the clearing activity to minimise impact to individuals.

1.5. Site map

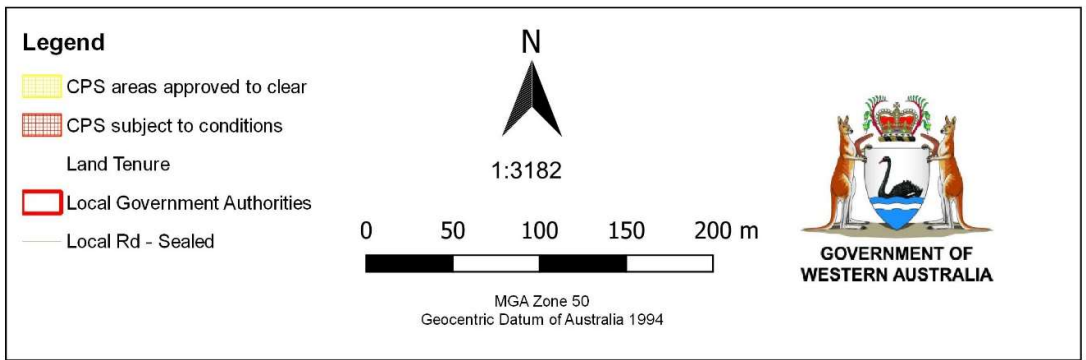


Figure 1. Map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit. The area cross-hatched red indicates the area within which artificial hollows for black cockatoos, are to be installed (if required).

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 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant advised that a number of alternative locations for the hockey pitch were considered but were ruled out; two of which were suitable but contained dense vegetation in good condition, and one of which contained no native vegetation but was too steeply sloped and compromised road access (Shire of Augusta Margaret River, 2020c). The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the risks of impacts of the proposed clearing to fauna required further consideration. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment: The 18 *Corymbia calophylla* (marri) and *Eucalyptus marginata* (jarrah) trees within the application area are likely to provide suitable foraging and roosting habitat for three threatened black cockatoo species recorded within the local area: *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo), *Calyptorhynchus baudinii* (Baudin's cockatoo) and *Calyptorhynchus latirostris* (Carnaby's cockatoo) (hereafter referred to as 'black cockatoo species'), particularly given the presence of surface waterbodies within one kilometre of the application area and presence of a confirmed roost site approximately 730 metres from the application area (DSEWPC, 2012). However, given the extent of the application area and presence of considerable similar vegetation within the local area, the proposed clearing is unlikely to significantly impact the availability of foraging and roosting habitat for black cockatoo species.

Black cockatoo species breed in hollows in suitable tree species, including marri and jarrah (DSEWPC, 2012), and one marri tree within the application area has been identified by the Shire of Augusta Margaret River (2021a) to contain a hollow that may be suitable for black cockatoo breeding (Tree 1 - refer to Appendix D for details). Although no known black cockatoo breeding locations are present within the local area, this tree is still considered likely to provide suitable breeding habitat for black cockatoo species. This tree may also provide suitable nesting habitat for the priority *Tyto novaehollandiae* (masked owl (southwest)) and the conservation dependent *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale), as they are also known to nest within hollows of large marri trees (Owl Friendly Margaret River Region, 2020 and Rhind, 1996). Given the proximity of records of these species to the application area, they are considered relatively likely to utilise the application area as habitat. A condition placed upon the permit requiring that habitat trees are inspected and can only be cleared when not in use is

considered adequate to mitigate impacts to black cockatoos, masked owls and south-western brush-tailed phascogale individuals nesting in hollow bearing trees. This condition will also require the applicant to install an artificial hollow for each hollow with evidence of use by black cockatoo species, which will mitigate impacts to future black cockatoo breeding habitat.

Threatened species *Pseudocheirus occidentalis* (western ringtail possum) inhabits peppermint (*Agonis flexuosa*) woodlands with high canopy continuity and jarrah and marri forests and woodlands (DPAW, 2017). The application area is therefore likely to provide suitable habitat for the western ringtail possum. It is also noted that a drey and scats were recorded by the Shire of Augusta Margaret River within the area of peppermint trees in the southern portion of the proposed clearing area (Shire of Augusta Margaret River, 2021b), and a western ringtail possum was recorded in 2020 within vegetation only 35 metres from the application area. Given the extent of the proposed clearing area, the level of disturbance in the immediate surrounds and the presence of surrounding similar vegetation in better condition that could provide suitable habitat, the proposed clearing is not considered likely to have significant impacts on western ringtail possum habitat availability. A western ringtail possum management condition is considered adequate to mitigate impacts to western ringtail possum individuals.

The application area may also provide suitable habitat for *Isoodon fusciventer* (Quenda, southwestern brown bandicoot), however given the small extent of the proposed clearing area and the presence of surrounding similar vegetation that could provide suitable habitat, the proposed clearing is not considered likely to have significant impacts on this species. A condition requiring that clearing is undertaken from a north to south direction will allow individual quenda, as well as other fauna species present, to move into adjacent habitat during clearing.

Conclusion: Based on the above assessment, the proposed clearing will result in a loss of:

- 18 trees providing suitable foraging and roosting habitat for black cockatoo species;
- One tree which may provide suitable breeding and/or nesting habitat for black cockatoo species, the masked owl and the south-western brush-tailed phascogale; and
- 0.242 hectares of suitable habitat for the western ringtail possum and quenda

For the reasons set out above, it is considered that the impacts of the proposed clearing on black cockatoo breeding and foraging habitat, masked owl and south-western brush-tailed phascogale nesting habitat and western ringtail possum and quenda habitat species does not constitute a significant residual impact, although may have impacts on fauna individuals. However, should the hollow identified be found to be suitable for black cockatoo species, the loss of this hollow would constitute a significant residual impact. It is considered that these impacts can be managed through the conditions outlined below.

The applicant may have notification responsibilities under the EPBC Act for impacts to Baudin's black cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo and their habitats, as set out in the *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris, Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii, Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso* (DSEWPC, 2012). The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

Conditions: To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Habitat trees for the black cockatoo species, the masked owl and the south-western brush-tailed phascogale are required to be inspected and can only be cleared when not in use to mitigate impacts to individuals of these species. Artificial hollows are required to be installed for each hollow with evidence of use by black cockatoo species, which will mitigate impacts to future black cockatoo breeding habitat.
- Trees are required to be inspected for western ringtail possums, and should they be found to be present, clearing cannot be undertaken until the possums have moved on or have been manually relocated into adjacent suitable vegetation.
- Clearing is required to be undertaken progressively in a northeast to southwest direction to allow fauna to move into adjacent vegetation ahead of the clearing activity to minimise impact to individuals.

3.3. Relevant planning instruments and other matters

Several Aboriginal sites of significance have been mapped within the local area. 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.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared consists of isolated trees and clumps of trees. The area is loosely contiguous with a strip of native vegetation to the southwest which is connected to an extensive patch of native vegetation. Other than this strip of vegetation and other sporadic trees in the immediate surrounds, the area surrounding the proposed clearing area largely consists of sporting ovals and buildings. The proposed clearing area is in the intensive land use zone of Western Australia.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 56.7 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>A South West Regional Ecological Linkage axis line is mapped 1.4 km northeast of the proposed clearing area (Molloy et al., 2009). The proposed clearing area is not part of this ecological linkage is not likely to be part of a local ecological linkage.</p>
Conservation areas	<p>The closest conservation area to the proposed clearing area is Wooditjup National Park, approximately 1.5 km to the northeast.</p>
Vegetation description	<p>Photographs and a site inspection report supplied by the applicant indicate the vegetation proposed to be cleared consists of <i>Corymbia calophylla</i> (marri), <i>Agonis flexuosa</i> (peppermint) and <i>Eucalyptus marginata</i> (jarrah) trees. Representative photos and a table containing tree sizes and descriptions are available in 0.</p> <p>This is consistent / inconsistent with the mapped vegetation type Cowaramup C1 (40), described as open to tall open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i>-<i>Corymbia calophylla</i>-<i>Banksia grandis</i> on lateritic uplands in the hyperhumid zone (Mattiske and Havel, 1998).</p> <p>The mapped vegetation type retains approximately 34.6 per cent of the original extent (Government of Western Australia, 2019b).</p>
Vegetation condition	<p>Photographs and a site inspection report supplied by the applicant indicate the vegetation proposed to be cleared is in Completely Degraded (Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> 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. <p>The full Keighery (1994) condition rating scale is provided in 0. Representative photos are available in 0.</p>
Climate	<p>Rainfall: 1200 mm</p> <p>Evapotranspiration: 800 mm</p>
Topography	<p>Approximately 95 m AHD, mostly flat</p>
Soil description	<p>The soil is mapped as Cowaramup, undifferentiated upland Phase (216CoCOu), described as flats and gentles slopes (0-5% gradient) with gravelly duplex (Forest Grove) and pale grey mottled (Mungite) soils (DPIRD, 2019).</p>
Land degradation risk	<ul style="list-style-type: none"> Flood risk - <3% of the map unit has a moderate to high flood risk Waterlogging risk - 30-50% of map unit has a moderate to very high waterlogging risk Salinity risk – <3% of map unit has a moderate to high salinity risk or is presently saline

Characteristic	Details
	<ul style="list-style-type: none"> Phosphorus export risk - 3-10% of map unit has a high to extreme phosphorus export risk Subsurface acidification risk - >70% of map unit has a high subsurface acidification risk or is presently acid Water erosion risk – <3% of map unit has a high to extreme water erosion risk Wind erosion risk - >70% of map unit has a high to extreme wind erosion risk (Schoknecht et al., 2004).
Waterbodies	A floodplain wetland associated with a minor non-perennial watercourse in the Margaret River catchment is mapped approximately 500 m southeast of the proposed clearing area.
Hydrogeography	<p>Hydrogeology: Rocks of Low Permeability, Fractured and Weathered Rocks - Local Aquifers, gneiss, migmatite lithology.</p> <p>Groundwater salinity: 1000-3000 mg/L TDS</p> <p>The application area is mapped within the Busselton-Capel Groundwater Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i>.</p>
Flora	There are records of two threatened and 18 priority flora species within the local area, the closest records of which are <i>Pultanaea pinifolia</i> and <i>Stylidium lowrieianum</i> approximately 600 m northeast of the proposed clearing area.
Ecological communities	There are records of one threatened and one priority ecological community within the local area, the closest record of which is the <i>Melaleuca lanceolata</i> forests priority ecological community approximately 6.7 km northwest.
Fauna	There are records of 25 threatened and 10 priority fauna species within the local area, the closest record of which is the threatened species <i>Pseudocheirus occidentalis</i> (western ringtail possum) approximately 40 m southeast.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Warren	833,985.56	659,432.21	79.07	558,485.38	66.97
Vegetation complex					
Mattiske vegetation complex 40**	18,981.79	6,540.87	34.46	2,286.01	12.04
Local area					
10km radius	288,108,316.3	163,254,140.3	56.66	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features?	Distance of closest record to application area (km)	Number of known records in local area	Most recent record	Are surveys adequate to identify?
<i>Calyptorhynchus banksii naso</i> (Forest red-tailed black cockatoo)	VU	Y	2.1	11	2019	NA
<i>Calyptorhynchus baudinii</i> (Baudin's cockatoo)	EN	Y	0.2	522*	2019	NA
<i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo)	EN	Y	0.3	122*	2019	NA
<i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)	P4	Y	0.3	94	2019	NA
<i>Phascogale tapoatafa wambenger</i> (South-western brush-tailed phascogale, wambenger)	CD	Y	0.6	91	2020	NA
<i>Pseudocheirus occidentalis</i> (Western ringtail possum, ngwayir)	CR	Y	0.04	434	2020	NA
<i>Tyto novaehollandiae novaehollandiae</i> (masked owl (southwest))	P3	Y	0.6	3	2006	NA

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

* An additional 86 records of *Calyptorhynchus* sp. 'white-tailed black cockatoo' (White-tailed black cockatoo) were recorded in the local area, which may comprise either of these species.

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<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 area proposed to be cleared contains habitat for black cockatoo species and the western ringtail possum.</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 area proposed to be cleared contains foraging, roosting, and potential breeding habitat for black cockatoo species and habitat for the western ringtail possum.</p>	May be at variance	Yes Refer to Section 3.2.1, 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 area proposed to be cleared is likely to contain flora species listed under the BC Act.</p>	Not likely to be at variance	No
<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 area proposed to be cleared does not contain species that are indicative of a threatened ecological community listed under the BC Act.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> Extents of the mapped vegetation type and native vegetation in the local area are consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared 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> <i>“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.”</i></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 nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> No water courses or wetlands are recorded within the application area and the proposed clearing area does not include riparian vegetation.</p>	Not likely to be at variance	No
<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 subsurface acidification and wind erosion. However, noting the extent of the application area and the condition of the vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	No
<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> Given the distance to the nearest surface waterbody and extent of the proposed clearing area, the proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<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> Given the mapped soils and topographic contours in the surrounding area, the extent of the clearing and the distance to the nearest watercourse, the proposed clearing is unlikely to contribute to increased incidence or intensity of flooding or waterlogging.</p>	Not likely to be at variance	No

Appendix C. 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.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery (1994).

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 D. Photographs of the vegetation and tree details

Table D-1 – Details of trees within proposed clearing area (Shire of Augusta Margaret River, 2021a and 2021b)

Tree Number	Species	DBH cm	Notes
1	Marri	50	Good condition marri, 1 possible hollow
2	Jarrah	1 stem 30cm, 1 stem 40cm	dying, no evidence of hollows
3	Marri	1 stem 30, 1 stem 50	no evidence of hollows
4	Marri	1 stem 20, 1 stem 50	no evidence of hollows
5	Jarrah	25	too small to provide nesting hollows
6	Jarrah	20	too small to provide nesting hollows
7	Marri	25	too small to provide nesting hollows
8	Marri	50	only stump remains following storm damage
9	Marri	50	severe canker damage, no evidence of hollows
10	Marri	50	severe canker damage, no evidence of hollows
11	Marri	40	no evidence of hollows
12	Marri	5	too small to provide nesting hollows
13	Marri	5	too small to provide nesting hollows
14	Marri	20	too small to provide nesting hollows
15	Marri	20	too small to provide nesting hollows
16	Peppermint	10	no dreys or suitable hollows for WRP
17	Marri	100	comprised of 3 stems combined DBH 100
18	Marri	2 stems 20, 1 stem 40	in poor health, no evidence of hollows
19	Jarrah	3 stems all 40	no evidence of hollows

Table D-1 (continued) – Details of trees within proposed clearing area (Shire of Augusta Margaret River, 2021a and 2021b)

25	peppermint	50cm total	Good condition multi stem semi mature peppermint. no dreys or suitable hollows for WRP. WRP scats underneath, WRP presumed to occupy adjacent shed. Tree 25
26	Peppermint	1 stem 10cm	Probably planted, no dreys or suitable hollows for WRP
Clump comprising trees 20-24 and 27-32	Peppermints	Multiple individual small to medium peppermints with combined area of approximately 330m2	Clump of juvenile and mature peppermint trees including trees 20-24 previously submitted and seven additional peppermints ranging in size from 5cm DBH to 40cm DBH. One WRP drey noted – presumed to be occupied due to condition of drey, including fresh leaves visible.

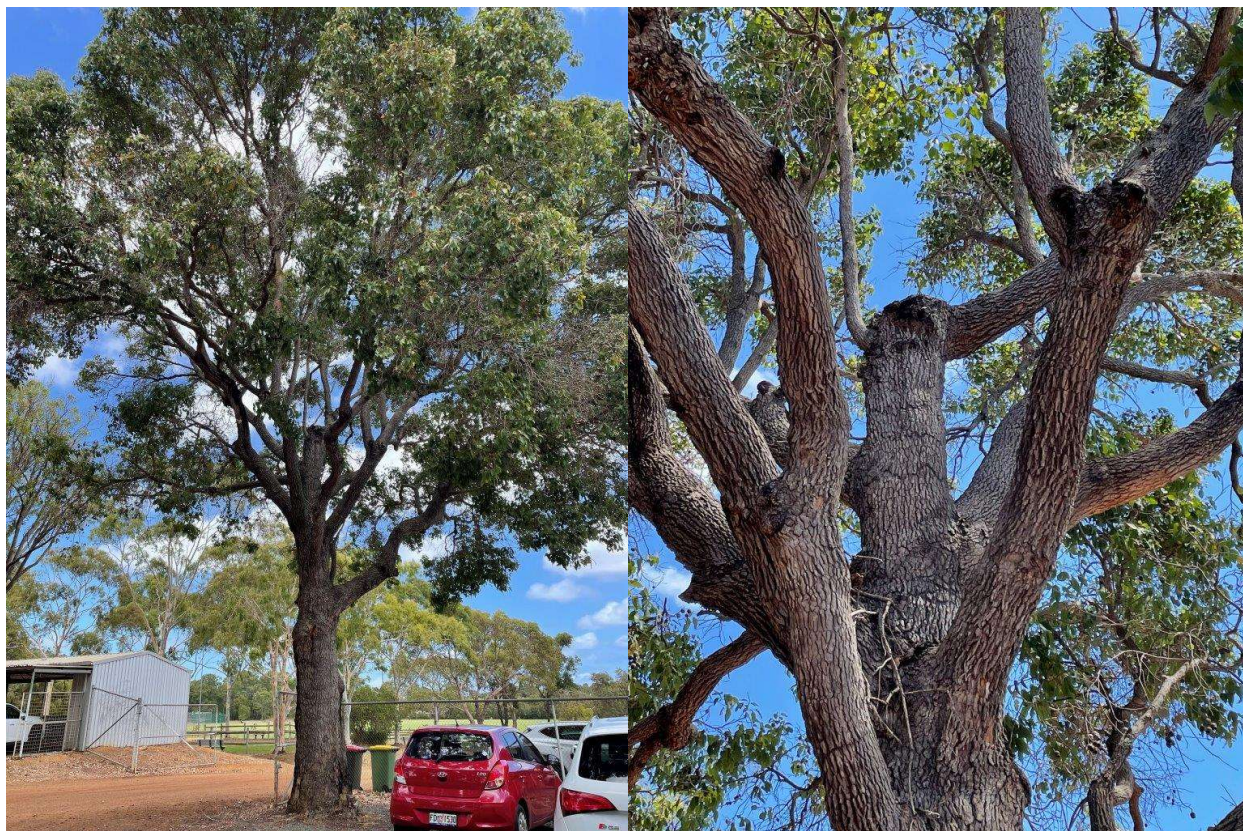


Figure D-1 – Tree 1 in proposed clearing area – marri tree (left) containing potential hollow suitable for use by black cockatoos (right) (Shire of Augusta Margaret River, 2021a).



Figure D-2 – Trees 4 (left) and 17 (right) in proposed clearing area, both marri trees (Shire of Augusta Margaret River, 2021a).

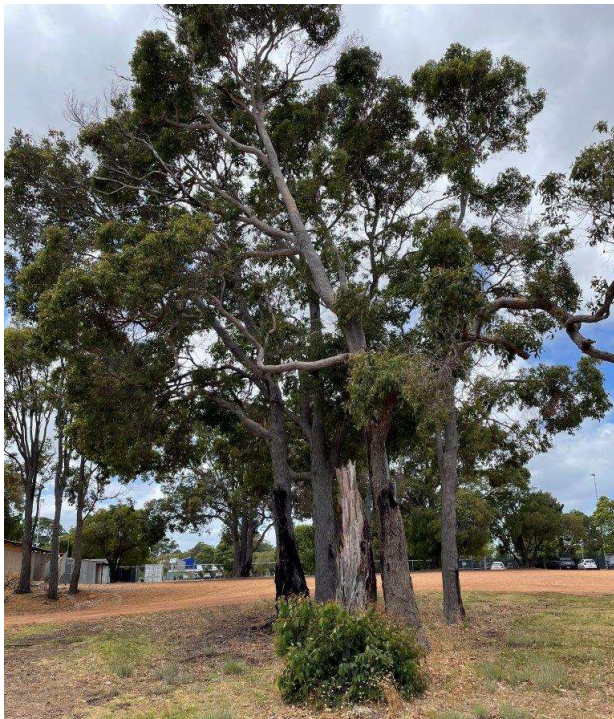


Figure D-3 – Trees 8, 9, 10, 11, 12, 13 and 14 in proposed clearing area – marri trees (Shire of Augusta Margaret River, 2021a).



Figure D-4 – Trees 20, 21, 22, 23 and 24 in proposed clearing area – peppermint trees (Shire of Augusta Margaret River, 2021b).



Figure D-5 – Trees 27, 28, 29, 30, 31 and 32 in proposed clearing area – peppermint trees (Shire of Augusta Margaret River, 2021b).



Figure D-6 – Tree 27 in proposed clearing area – western ringtail possum drey in peppermint tree (Shire of Augusta Margaret River, 2021b).

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Geomorphic Wetlands South West – Unreviewed (DBCA-040)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics

- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

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)

E.1. References

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Department of Parks and Wildlife (DPAW) (2017). Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan. Perth. Available from: <https://www.environment.gov.au/system/files/resources/e95bcb47-3db8-45d1-aae7-2cfd360097c9/files/recovery-plan-western-ringtail-possum.pdf>

Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed 20 April 2021).

Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2012). EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*. Canberra. Available from: <https://www.environment.gov.au/system/files/resources/895d4094-af63-4dd3-8dff-ad2b9b943312/files/referral-guidelines-wa-black-cockatoo.pdf>

Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Government of Western Australia (2019) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>

Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>

- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske, E.M. and Havel, J.J. (1998) *Vegetation Complexes of the South-west Forest Region of Western Australia*. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
- Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Owl Friendly Margaret River Region (2020). *The Masked Owl*. Retrieved from <https://owlfriendly.org.au/our-nocturnal-birds/the-masked-owl/#population>
- Rhind, S. G. (1996). Habitat tree requirements and the effects of removal during logging on the marsupial brush-tailed phascogale (*Phascogale tapoatafa tapoatafa*) in Western Australia. *Western Australian Naturalist* 21, 1–22.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shire of Augusta Margaret River (2021a). *Application and supporting information provided for CPS 9226/1*, received 3 March 2021. DWER ref: DWERDT422560
- Shire of Augusta Margaret River (2021b). *Additional supporting information provided for CPS 9226/1*, received 31 March 2021. DWER ref: A1993317
- Shire of Augusta Margaret River (2021c). *Additional information regarding avoidance and minimisation considerations*, received 29 April 2021. DWER ref: A2000440